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COMPUTERWORLD

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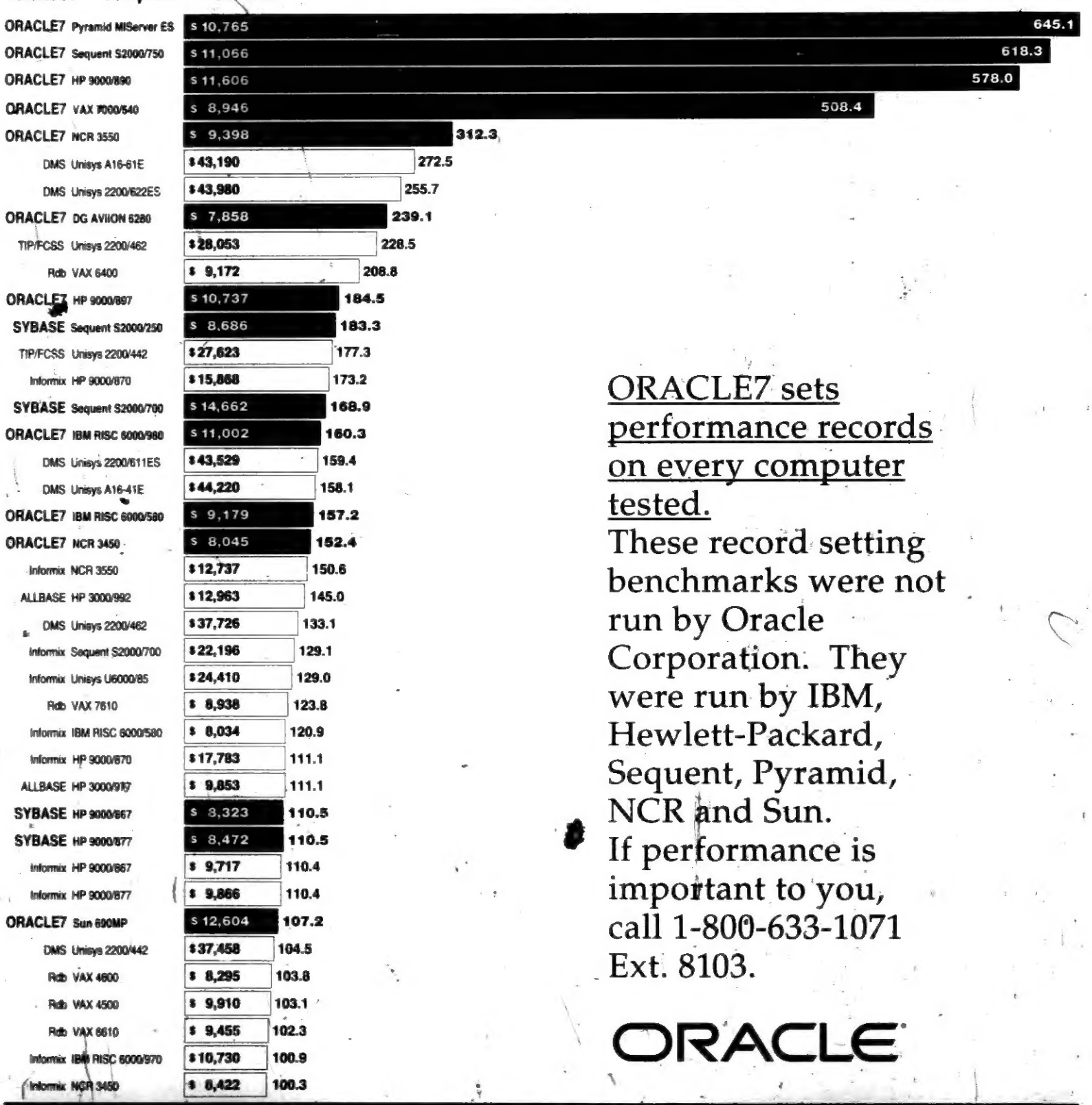

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You'd think someone had just invented the word "change," the way it's been flung about this past year. As everyone knows, there's nothing new about it.

There *is* something new about *how much* change is taking place. For many reasons — not the least of which are new technology, overexpansion in the '80s and an inevitable shrinking of the economy — almost every company and industry will undergo what we've fondly learned to call re-engineering: bottom-up, no holds-barred change, all in the name of better business.

Look at the computer industry. The advent of smaller, more powerful systems has brought some longtime standards bearers to their knees. At the low end, less expensive systems and locked-up market shares have forced suppliers to search for new target markets and more profitable areas of emphasis.

What does that mean for you? It *can* mean those three companions in every crisis: fear, uncertainty and doubt. But it doesn't have to. The new rules haven't been established yet, save for some broad guidelines to be efficient and optimize resources. As threatening as all this can be, it's a prime time to make your own rules.

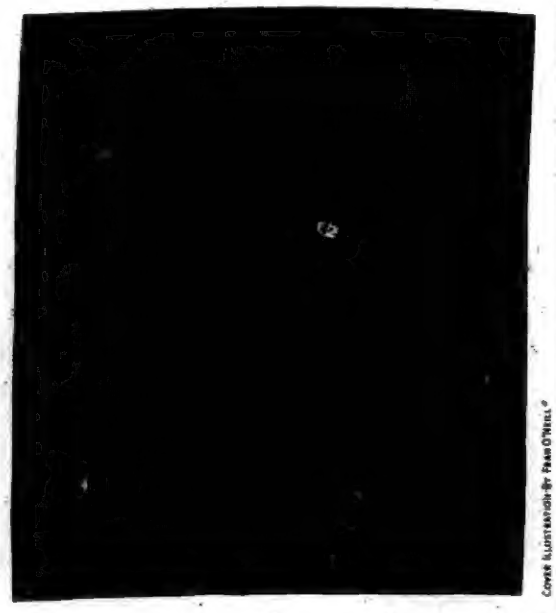
Now is the time to question everything, dare to rethink and restructure your department, the way you do business, even with whom you do business. There's no looking back — the answers to today's problems lie in future choices, some of which have never been tried, some of which are just starting to get under way.

For those unwilling to let their eyes glaze over in the face of buzzwords, "trends" and paradigm-talk, it can be a very liberating age, where there's nothing to stop you from succeeding but your own know-how, innovation and ability to motivate.

There's no question that this can be a threatening time; some of us will opt or be forced to just drop out. And certainly change will come more slowly in some facets of the industry. But to survive the transformation and to help usher in the new era of IS, it's best to be flexible, up-to-date, a little outspoken and very open-minded.

If you're up for the ride, 1993 promises to take IS, its constituency and its suppliers to places where none have gone before.

Mary Grover Brandel
Joyce Chutchian Ferranti
Patricia Keefe



COVER ILLUSTRATION BY FRANK O'NEILL

IN FACT...

15%
Percentage of IS departments with "deep" (17%) staff cuts in '92

$155,000
Average total cash compensation for CIOs in '92

$203 million
Annual budget of U.S. military bands

$68 million
Annual budget of the U.S. Advanced Technology Program

+10.3%
Annual percentage change in employment in Silicon Valley '72-'84

-0.7%
Annual percentage change '84-'91

51%
Percentage of IBM mainframe sites planning new host applications in '91

41%
Percentage in '92

21.7 million
U.S. installed base of DOS-based PCs in '90

12.6 million
Predicted U.S. installed base in '94

19
Number of companies still producing software that works with CP/M

1,500
Estimated number of DOS viruses in existence today

Less than 40
Number of Macintosh-based viruses

More than 100
New DOS viruses discovered in summer '92

500,000
Number of mobile data users in '92

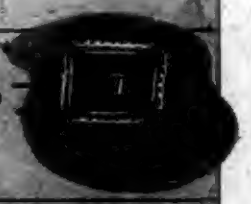
5 million
Number predicted in '95

$10,000
Average amount "hit men" are paid to steal portables from Fortune 1,000 execs

60 cents
Amount a woman earned for every dollar earned by a man in '80

72 cents
Amount she earned in '92

80 cents
Amount she'll earn in the year 2000



1.4 million
U.S. installed base of PCs with graphical interfaces in '90

25.3 million
Predicted U.S. installed base in '94

Sources: Computer Intelligence, The Yankee Group, International Data Corp., Digital Equipment Corp., John Shay (federal security consultant), The Center for the Continuing Study of the California Economy, "The Joint Venture: Silicon Valley consortium," Computer Select, Forrester Research, Inc., William M. Mercer, Inc., Gateway Information Services, "The Progressive Review," the U.S. Department of Commerce, Professor Jane O'Neill (Baruch College), Shaping the Future by Peter G. W. Keen, U.S. News & World Report.

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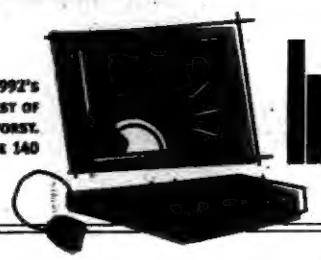

1992's BEST OF THE WORST. – PAGE 140

CHANGING BELIEFS

Question everything! Page 6

Cliches and common wisdom aren't all they're cracked up to be. True leaders are looking beneath the surface of popular trends such as downsizing, open systems and outsourcing.

CHANGING STAFF

It's all in the people Page 13

Successful companies are no longer just paying lip service to the importance of teamwork. They are figuring out how to best manage the 55% of the IS budget allotted for human resources.

CHANGING TECHNOLOGY

What's hot; what's not Page 20

Who has time to sift through all the new technologies? We've condensed some of the standouts for the next year – both good and bad.

TECHNOLOGY PRICING WILL TAKE YOU FOR A WILD RIDE. – PAGE 46

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CHANGING ENTERPRISE

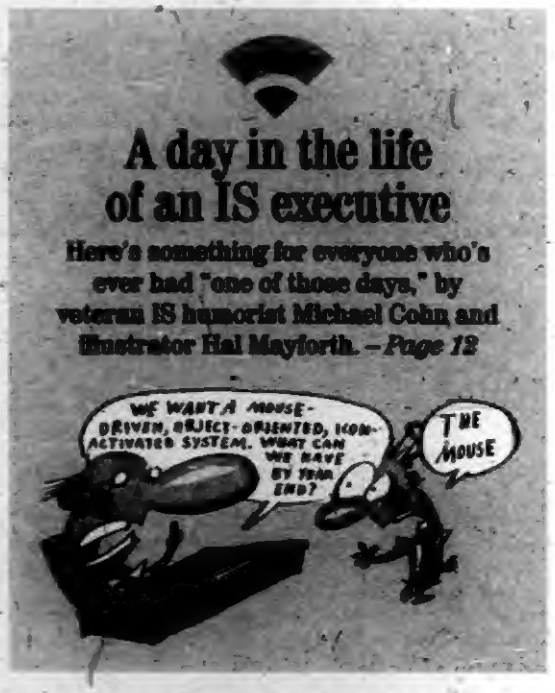
Overhaul ahead Page 29

From sales to engineering to finance to manufacturing, every department is using technology differently to change the way they do business.

CHANGING INDUSTRY

On the survival track Page 41

The big guys are shedding pounds. The little guys are bulking up. And those in between are doing just about *anything* to stay alive in the '90s.



INTERVIEWS

■ **Frank Gens**, consultant and self-professed "recovering mainframe bigot," talks about the need to reshape IS. – *Page 4*

■ **Two re-engineering** veterans who've been there and lived to tell about it. – *Page 16*

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MOST PEOPLE ARE GETTING WHAT THEY ASK FOR – BUDGETWISE. – PAGE 39

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Interview: Frank Gens

RE-ENGINEER *thyself*

FRANK GENS LIKES TO POINT OUT *that when he began consulting with information systems organizations, some of the big names in end-user computing were Reductron, Wang, Cullinane Database Systems and Basic Four, the predecessor to MAI Basic Four. That's his way of pointing out that desktop computing has drastically changed the measures of success for IS suppliers and customers alike.*

During the past 12 turbulent years, IS has had few more stalwart allies than Gens, 38, a self-professed "recovering mainframe bigot." As president of Framingham, Mass.-based Technology Investment Strategies Corp., he offers the following advice to IS managers: Don't worry about re-engineering the business until you re-engineer IS and embrace open systems as a core principle.

Q: Is this a good time to build a career in IS?
A: It's a great time. There's barely a corporation out there that isn't looking for ways to conduct business more effectively. The IS organization opens a wide world of possibilities to support those new ways of doing business. But it must aggressively refresh its technical knowledge base in order to [handle] this role. It [must] address current and future needs while fulfilling existing commitments. This means it must become very good at focusing more resources on high-impact projects, which may mean cutting others.

Q: Should IS be comfortable delivering that lower level of service?
A: No, but comfort is a rarity for most senior managers today. Corporate management won't be sympathetic to IS [not doing] something strategic because they were busy taking care of their legacy systems. IS executives are not going to be prepared to take part in re-engineering projects without doing their own internal re-engineering to support new technologies.

Q: Explain "re-engineering IS."
A: Keeping the organization up-to-date on the capabilities of the desktop, particularly the system software, applications and development tools. Today's desktop software has little in common with traditional data center-oriented tools. An obvious one: They have to become more familiar with the desktop, particularly the software. CICS and Cobol don't buy you anything with [Microsoft Corp.'s] Visual Basic or [Powersoft Corp.'s] PowerBuilder. A guy who's used to tuning a DB2 environment isn't going to know much about tuning PCs connected on a LAN with a Sybase database and a gateway to the mainframe. While some users may actually know more than IS about these technologies, IS has to make the transition while maintaining a mainframe environment.

STEVEN LEWIS

Q: Sounds like you think CIOs should focus more on technology.
A: Absolutely. Some CIOs think their role is to play the lead in redesigning business processes. That's just plain wrong. The IS organization's role is to facilitate, not dictate, business change. That impetus has to come from the executive suite. For now, IS doesn't need to re-engineer business processes; IS needs to re-engineer IS.

Q: Are you saying IS should focus less on business than it has been?
A: The short answer is yes. I'm not saying CIOs shouldn't focus on business, but first things first. When IS gets involved in re-engineering, it has to be prepared to support the project using the best technology available. For a CIO, the most important issue is to back up IS when people complain that service levels are deteriorating so that IS can focus on the more strategic jobs.

Q: How should IS regard outsourcing — as an opportunity or a threat?
A: Outsourcing is a reasonable tactical option for organizations that want to focus their resources. But as a comprehensive strategy, I take a dim view of it. It hobbles your ability to respond to changing business requirements. The re-engineering movement offers tighter ties between IS and business management, and those are impossible to have with a contractor. I think what we're seeing in outsourcing today is a reaction of frustrated senior managers who can't get their new systems built quickly. To me, outsourcing an entire data center is sort of a surrender.

Q: What's going to happen to the downsizing trend?
A: Rightsizing is the thing to think about. It means simply fitting the appropriate technology to the business requirement. It should include a portfolio of options: not just downsizing and client/server but also less politically correct options like mainframe consolidation and tactical outsourcing.

Q: How does IS assert its authority over hostile users?
A: The imperial IS organization doesn't exist anymore. IS is in the influence business, and ultimately end users will have authority over technology. IS will compete with contractors to serve these business-people.

Industrywide standards are the best friends of IS. The best of these standards focus on interfaces so users can do their own thing but still achieve that integrated perspective. In building new systems, IS should incorporate interface — not product — standards such as SQL and Posix as much as possible. There isn't a single vendor out there today who can guarantee it will continue to support a given product long-term. If you've got a vendor-independent specification, your long-term risk is very low.

Q: Why is open systems such an important mandate?
A: An infrastructure that minimizes single-source supply is the most important thing IS can build. It reduces the risk of vendor failure and incorporates new technologies as they come along. If you aren't using an open architecture, then you are undercutting the system's viability long-term.

Q: What will be the most important information technology changes coming up?
A: The most innovative technologies will come from the mass market. Mainframes and disk drives will be built around technologies designed for the desktop. This will open many established environments to new suppliers and threaten the existing suppliers.

Interview by Paul Gillin, *Computerworld*'s executive editor.

YOUR MAINTENANCE BACKLOG IS CONSUMING A LOT MORE THAN TIME.

No one denies the importance of maintaining and enhancing existing systems. They represent an enormous investment of time and money. And remain critical to the operation of most companies. But many IS departments devote so much talent and time to maintenance that they are unable to staff new application development.

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Forecast: Changing Beliefs

It's time

to get beyond common wisdom and expose what's behind widely believed myths — even the ones born in the post-mainframe era.

QUESTION *everything!*

Downsizing, rightsizing, somethingsizing

By Jean S. Bozman

Downsizing is like an airplane rolling down the runway gathering speed for takeoff. The reason it isn't already cruising along at 30,000 feet is simple: The accumulated baggage of 25 years of data processing is proving extremely hard to jettison.

The fact is, the only place that downsizing is going full speed ahead is in the planning stages. Billions of dollars of investment in Cobol code will keep downsizing at many sites to a one-application-at-a-time affair for much of the early 1990s. Moreover, those jet engines in the data center will have to be overhauled before large firms can hope to shut down their mainframes.

Meanwhile, information systems mechanics are rolling up their sleeves and drafting re-engineering plans that could strip off 40% to 50% of the applications now on mainframes by 1996.

Some things will change right away, mostly because of users' needs to rein in the high costs of computing. For every application rewritten in C or C++, the cost of software maintenance plummets compared with the cost of maintaining Cobol code. And by reducing new demands on existing hosts, many users will be able to postpone — or cancel — expensive mainframe upgrades.

But mainframes won't be mothballed, at least not in this decade. This and other downsizing myths are explored below:

EXCLUSIVE SURVEY

Most respondents to a recent survey plan to downsize applications in 1993

Percent of respondents
Total: 102

MYTH: *Users are unplugging mainframe dinosaurs.*

Even companies that have been downsizing for years are not finished with their mainframes. Two large enterprises, United Parcel Service, Inc. in Atlanta and BankAmerica Corp. in San Francisco, have 10 years of downsizing experience between them, and neither is planning to close their large data centers. Mainframes handle the number-crunching transactions that are the lifeblood of those businesses, while local-area networks handle the decision-support and office applications. But mainframe data is often relayed to networked PCs for further analysis.

Changing Beliefs

For large corporations, downsizing will become a slow and steady process of peeling applications off the mainframe, much like the layers of an onion, says Colin Crook, the senior technology officer at Citicorp, the nation's largest bank. "I'd say that within five to 10 years, we'll have either rewritten or done away with 50% of our mainframe applications," he says. Many of these applications will be rewritten in object-oriented languages.

Some sites, such as Kash-n-Karry Food Stores, Inc. in Tampa, Fla., have taken an even more radical approach: All new applications are being rewritten for client/server environments.

It's more in the realm of elderly IBM midrange machines, such as aging IBM 4381s, that machines are being unplugged. By writing new applications for Unix workstations and midrange computers, these users are reducing hardware costs and cutting software maintenance budgets by 60% or more.

MYTH: *It's cheap to downsize.*

It may be cheaper in the long run, but up-front costs are high, particularly in the "soft" areas of programmer training and consultant fees. At Kash-n-Karry, which is rewriting most of its Cobol applications in the object-oriented C++ language, a three-year budget for installing a Unix network with 25 servers is $3 million. By 1994, costs should decrease steadily, MIS Vice President Bonnie VanOverbeke says.

MYTH: *Downsizing makes computing more manageable.*

Actually, users say LANs — and even Unix servers — lack the administrative software to manage the systems, networks and storage customary with glasshouse data processing. And tape backup devices often break under the pressure of backing up large databases of multiple gigabytes on a regular basis, users report.

However, a new wave of LAN storage devices is coming in 1993, including some built on redundant arrays of inexpensive disks technology (EMC Corp.) and others on IBM mainframe-compatible tape-cartridge technology (Memorex Telex Corp.).

More help is on the way for LAN management, too. Novell, Inc. plans to provide NetWare consoles while vendors such as Computer Associates International, Inc. and Legent Corp. are working on LAN management consoles.

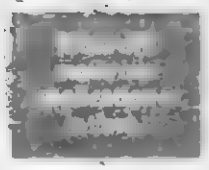
MYTH: *Development is faster on a client/server platform.*

Like all new technologies, this one has a time-consuming learning curve. The initial phases of rewriting applications for LANs are usually the most difficult, users report.

"Our application developers have to learn a whole new way of thinking," says Marianne Levandowski, systems architect at AT&T's tax department in Morristown, N.J. "That has been one of our biggest roadblocks in downsizing applications."

MYTH: *All applications should be moved to LANs.*

Large companies have many large, centralized, stable mainframe-based applications that would not be candidates for LAN processing.

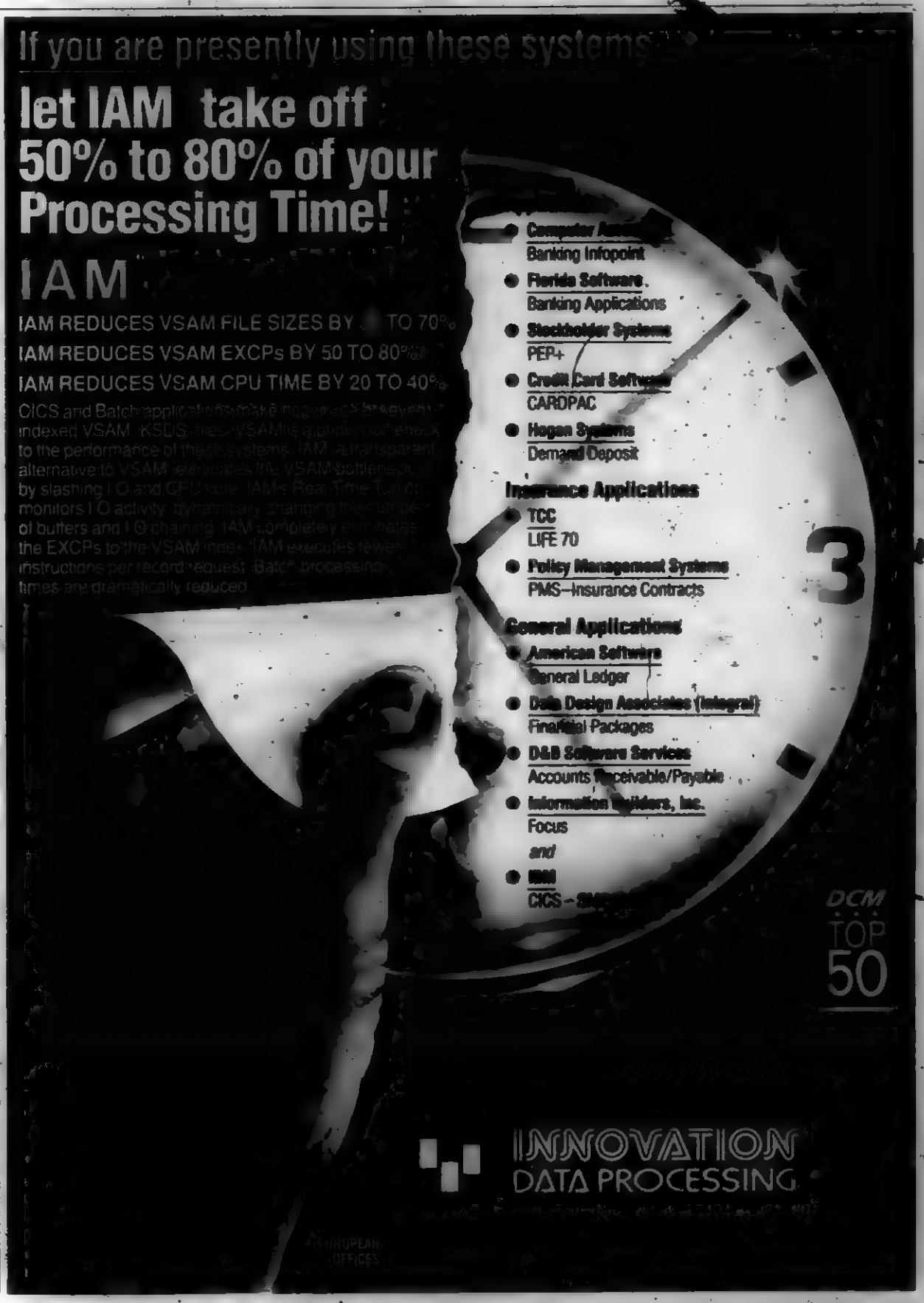


At Citibank NA, central IS will create a distributed architecture and provide common data services that business units can share. "You need to develop a rich set of servers sitting inside the network for directory, security and customer information," Crook says. Key pieces of "legacy" systems will be preserved, enveloped by layers of new technology, such as object-oriented programs.

MYTH: *IS departments are ready to embrace downsizing.*

Actually, IS first needs to adapt its traditional role as a central point for control and security to a client/server architecture. That means getting the traditional IS structure, with its separate departments, to work as a team and to provide a single point of responsibility for the system. ■

Computerworld West Coast correspondent Michele Poslert contributed to this report.



Changing Beliefs

'It's open – really!'

There's nothing simple about open systems. People really are phasing them in, but in ways vendors may not have imagined

By Maryfran Johnson

In the beginning, there were wild-eyed promises and a fondness for overstatement.

Open systems was going to bring about freedom from vendor lock-in and put an end to high-priced proprietary gear. This user-driven revolution was supposed to produce a dizzying array of standardized products, all of which would work together as harmoniously as a celestial orchestra belting out "The Messiah."

Reality is so cacophonous by comparison.

"Open systems is still just a buzzword. There's this whole thing about open systems meaning Unix, or relational databases, or object-oriented development or client/server, but those are just examples of tools you can use to get to open systems," says Mark Factor, MIS director at Au Bon Pain, Inc. in Boston.

Better safe than sorry

Despite some formidable obstacles, the journey to open systems is well into early implementation of production applications at many Fortune 500 shops. A practical, phased-in approach is the dominant game plan, however.

Research data from multiple sources often shows that about half those surveyed are steering clear of proprietary systems and opting for cross-platform development tools and standardized operating systems: Unix-based at the server or mid-range level, with MS-DOS clients.

One interesting trend is that users no longer equate open systems solely with Unix, according to a recent study of 7,000 information systems sites worldwide by International Data Corp. in Framingham, Mass.

Reality check

97,000 IS sites worldwide, 45% said they are pursuing open systems, according to a study published by International Data Corp. Of those, almost half were building Unix systems migration; however,

Instead, open systems proponents often cite the need for interoperability between Unix and non-Unix multivendor systems.

The most compelling reasons for heading toward open systems are accelerating time to market, improving customer service and fostering the flexibility to change with market conditions.

But, as more people deploy open systems, so grows the list of problems users must deal with across multiple platforms. Among these problems are software installation snafus, training costs, coordinated support issues and a spotty selection of high-quality client/server development tools.

Industry analysts at Gartner Group, Inc. in Stamford, Conn., argue that truly open systems — broadly defined as interoperable, portable, vendor-neutral and inclusive of legacy systems — do not yet fully exist.

Users, meanwhile, are standardizing on interfaces such as Posix that span multiple types of platforms.

EXCLUSIVE SURVEY

Most respondents to a recent survey have a down-to-earth view on what open systems means

Ability of proprietary environments to communicate with one other	36
Ability to develop applications on a common standard	27
Complete interoperability among major installed systems	16
Replacement of proprietary environments with Unix systems	8
Other/Don't know	21

Number of respondents
Total: 102
Multiple responses allowed

Analysts say they expect a slew of vendors to port their proprietary software to multiple platforms this year.

A prominent harbinger of this trend is IBM's recent decision to port its CICS to both its own Unix (AIX) and Hewlett-Packard Co.'s HP/UX Unix.

"There are some great tools out there, but they all lack a little something," Factor notes. "There's a lot of paralysis now, with everyone looking for the perfect tool. Only there isn't one."

Still, some of the initial fears about Unix and open systems have evaporated in the past few years, contends Mike Prince, MIS director at Burlington Coat Factory, Inc. in Lebanon, N.H., an early adopter of open systems based on Sun Microsystems, Inc. Unix hardware.

Users are also pleased to find vendors responding with great alacrity to their needs, particularly through strategic alliances.

Some prominent examples include standardized technologies for system and network management — the Distributed Computing Environment and Distributed Management Environment — that are expected to emerge this year and next year from IBM, HP, Digital Equipment Corp. and others that belong to the Cambridge, Mass.-based Open Software Foundation.

HP is also working with Sun in object-oriented development technology, and DEC has teamed up with Microsoft Corp. to put the Windows NT operating system on its Alpha systems. ■

Smarts prevail in an era of doubtsourcing

By Mark Halper

People will think twice before handing over the keys to their kingdom.

Outsourcing will become a harder sell in 1993, as chief executive officers and chief information officers learn from the horror stories told by their pioneering peers and start to drive better bargains.

This has already resulted in more than a few myths and ironclad truisms about outsourcing either weakening or falling by the wayside.

Some information systems officials and industry observers say the 10-year megadeal will become passe. Others say the emphasis will shift from length to increasingly more flexible terms.

"We believe no major long-term deal signed in 1992 will run its full course," says Ray Mangianelli, CEO of New York-based consultancy Gateway Information Services, Inc. "Most of the large outsourcing deals are built on voodoo economics," he claims, explaining that in reality, costs and needs are impossible to predict more than two or three years out.

Reality check

The vast majority (96%) of 121 non-IS senior executives surveyed by Gateway Management Consulting Group said they have contracted out work in the past year. Data processing is the function contracted out most often (40%) followed by finance and human resources, the survey says.

Several companies that signed long-term deals in the late 1980s have undergone significant business changes that have led to major revisions of their outsourcing pacts. These changes have been accomplished with varying degrees of difficulty.

In one case, New Orleans-based Freeport McMoRan, Inc. replaced its incumbent supplier — Electronic Data Systems Corp. — with a team consisting of IBM's Integrated Systems Solutions Corp. subsidiary, Andersen Consulting and Businessland, Inc. In another case, Bank South Corp. restructured its contract to reflect changes such as its shrunken size and a move toward distributed processing [CW, Nov. 2].

"Technology and cost structures change so quickly, I can't fathom doing a 10-year deal," says Ingvar Petursson, McCaw Cellular Communications, Inc.'s CIO. While McCaw recently signed a three-year outsourcing renewal with Cincinnati Bell Information Systems, Inc. (CBIS), it also plans to gradually unplug the CBIS solution while building its own in-house Unix system [CW, Nov. 16].

"This concept of handing over the keys to the kingdom — we just won't see that anymore," predicts Mary Lacity, an assistant professor of MIS at the University of Missouri.

EXCLUSIVE SURVEY

PC maintenance is the main target of those respondents who said they would outsource next year

Net outsourcing	50%
PC maintenance	20%
New application development	13%
Routine maintenance	6%
Other	7%

Percent of respondents
Total: 102

Saving money is the biggest perceived benefit

Get more done with a lower financial investment	25
Get better expertise from outside sources	10
Allows you to try more innovative services	5
Get more done in less time	4
Gives more certainty that the job will get done	1
Other/Don't know	6

Number of respondents
Total: 93

Yet that concept has paid off for some prudent users. Fred Cisewski, Bank South's MIS director, says the bank was able to negotiate changes with IBM because of change provisions written into the original contract. Another

Doubtsourcing, *page 10*

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Changing Beliefs

Doubtsourcing

CONTINUED FROM PAGE 8

IBM customer, Eastman Kodak Co., also has review clauses in its contract, enabling it to alter its terms and conditions.

However, it's important not to confuse flexibility with ambiguity. Lacity notes that outsourcing arrangements have been more loosely negotiated in the past, leading to disputes over ambiguities in processing charges. Arguments often arise when a client's use exceeds a prescribed baseline volume or activity and exorbitant above-baseline rates kick in.

Lacity recommends that the two parties carefully establish what constitutes baseline work. Clients should also insist on better reporting measures by the vendor to help ensure that they are receiving what they are paying for.

In some cases, notes Denny McGuire, principal at Houston consultancy Technology Partners, Inc., CEOs have gotten into trouble by relying too little on the technical knowledge of their CIOs and agreeing to use linked deals they don't understand.

McGuire further notes that customers are "asking vendors to prove they are as good as they say they are."

Another change under way involves piecemeal or "selective" outsourcing, according to analysts such as Chuck Phillips at Soundview Financial Corp., a Stamford, Conn.-based research firm. For instance, Browning Ferris Industries recently tapped SHL Systemhouse, Inc. for application development and maintenance only.

Users are also beginning to look more for strategic gains, as opposed to financial relief, from outsourcing.

Charles Biebighauser, a principal at Insource Management Group, Inc., predicts that outsourcing will remain appropriate for companies in a high-growth mode whose "technology demands exceed their ability to attract people who have the talent," and for firms in dire financial straits. His belief is that for any company in between those stages, "outsourcing is unacceptable."

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Outsourcing global nets

Global network outsourcing will be hot next year, compared with tepid interest in local-area network outsourcing.

Several of last year's developments will intensify this year, pushing more companies to take the global network outsourcing plunge.

A growing list of major corporations — notably J. P. Morgan & Co. and The Gillette Co. — signed sweet deals under which carriers took over deployment of global networks and agreed to pay financial penalties if service levels fell below a certain point.

Those deals should get sweeter next year, and the choices could get broader as BT Syncordia and Advantis, the IBM/Sears, Roebuck and Co. venture, become major players, and the three U.S.-based long-distance carriers continue their expansion overseas. Two more key changes are expected next year:

- Carriers will begin to offer services enabling users to monitor their own networks' performance while leaving network operations, maintenance and deployment to the carrier.
- Overseas carriers are creating one-stop shopping consortia that promise users one contact for troubleshooting, deployment and billing on their global networks. But there is skepticism over whether this is little more than a marketing gimmick.

If it isn't, Aldus Corp., a Seattle-based software maker, is one shop looking for "full accountability for end-to-end service and single-point billing across local and interexchange" links, a spokesman said.

—Elisabeth Horwitt

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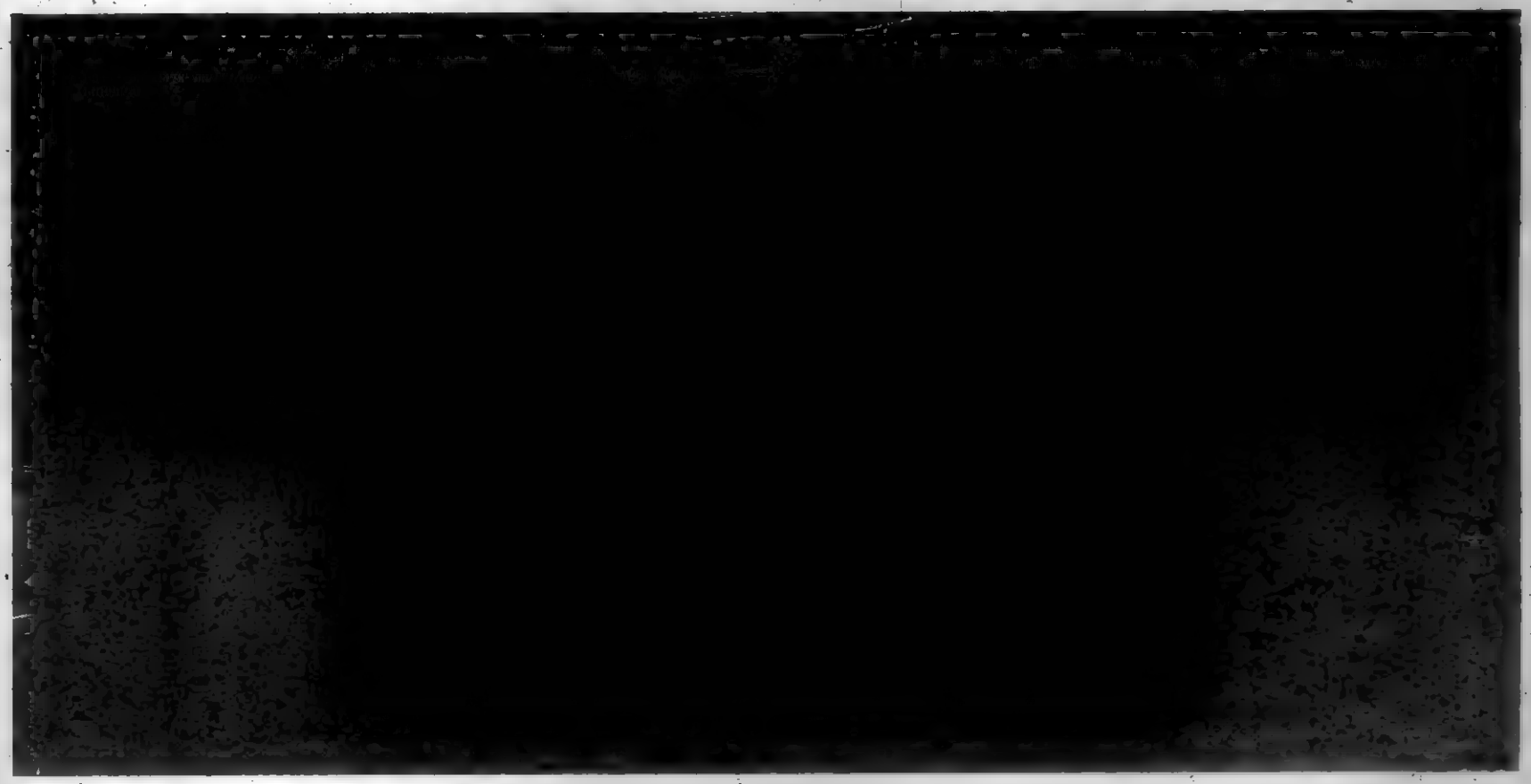

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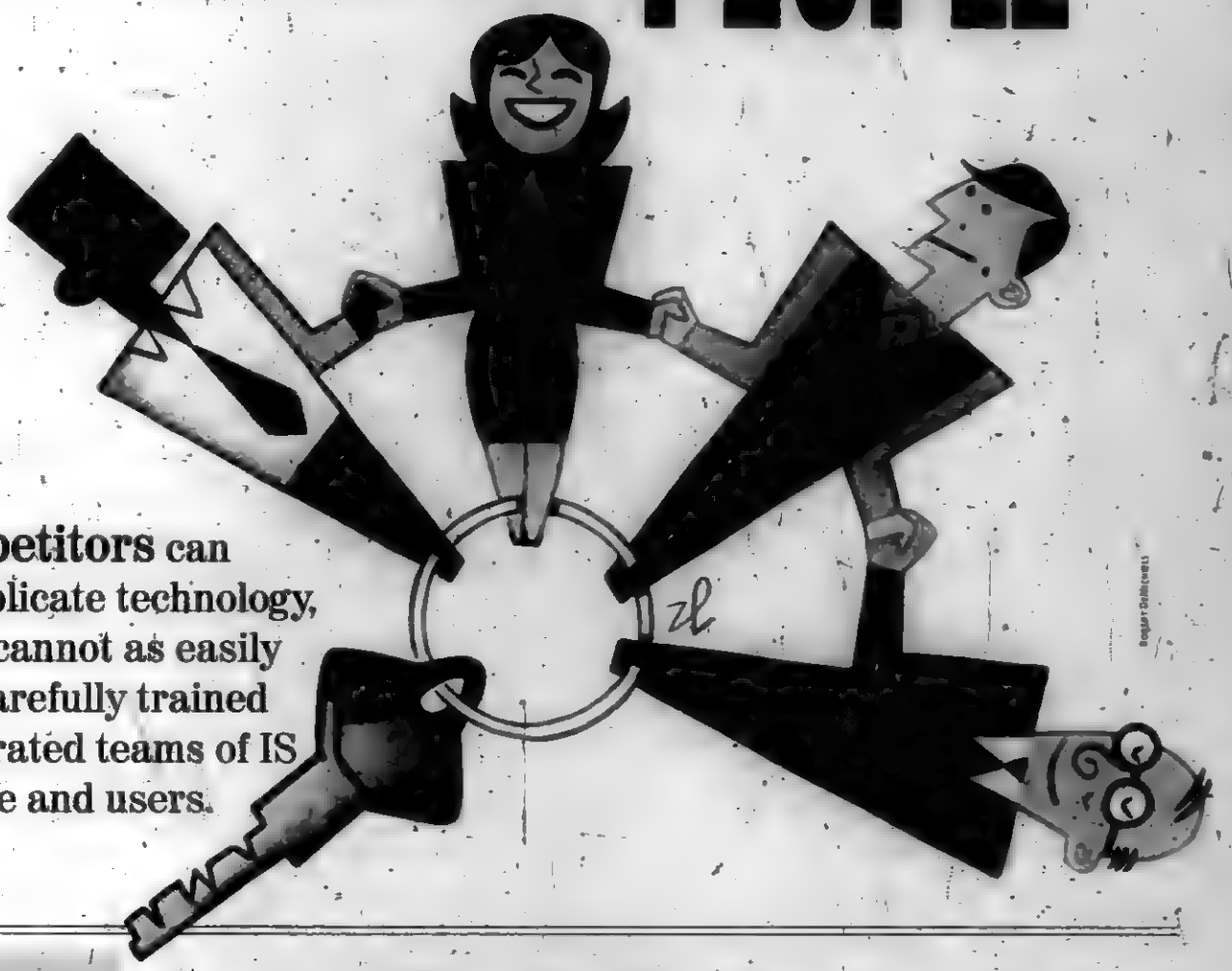
A DAY in the LIFE of an IS EXECUTIVE

Text by Michael Cohn, Illustration by Hal Mayforth

It's all in the PEOPLE



Competitors can quickly duplicate technology, but they cannot as easily match carefully trained and integrated teams of IS people and users.

Future teams

In the future, the best information systems organizations will be populated by self-directed, self-motivated teams in which a traditional supervisor has retreated to an advisory role, says Robert A. Zawacki, an expert on IS personnel issues.

Taking a cue from Zawacki, Employers Health Insurance, a group health insurer in Green Bay, Wis., is nearing the midpoint of a 24-month experiment on self-directed teams. Its 20-person microfilming group is now operating without any formal supervision. The experiment was prompted when earlier suggestions from workers solved several problems that had defied management efforts.

Say goodbye to the lone worker

By Gary H. Anthes

In real estate, what counts most is "location, location and location." Well, in information systems, the future key to success will be people, people and people.

As attention shifts to serving the end user, IS employees must be more versatile, more broadly trained and empowered to get the job done.

"To anyone who says, 'We're a leading-edge, technology-driven bank, and we have a competitive advantage from that,' I say, 'That's bunk,'" says Webb Edwards, executive vice president and manager of information services at Los Angeles-based First Interstate Bancorp. Competitors can quickly duplicate technology, he continues, but they cannot as easily match carefully trained and integrated teams of IS people and users.

First Interstate recently consolidated 13 data centers into two, reduced its IS staff from 2,100 to 700 people and lopped $93 million off its annual IS budget. Pulling that off and positioning the company for a new future required a major overhaul of its training, recruiting and management practices.

What prompted these efforts were losses from bad real estate loans and the bank's decision to standardize applications, processes and banking products across all of its affiliated, semiautonomous banks. IS was told to become "a catalyst for a change in culture" for the entire organization, Edwards says. This required IS practitioners to break out of their specialty molds.

"For example, we might have had a guy whose sole job was to oversee the writing of code," Edwards says. "Today, we'd expect him to be involved with the user group, to be involved in planning where that business is going, to be conversant in

Lone worker, *page 14*

Changing Staff

No rest for help desks

By Kelly E. Sewell

Personal computers will continue to wreak havoc on help desks and anyone else who's in the business of supporting end users. As a result, end-user support groups will become serious business.

"There'll be memory and disk space problems that we've never seen before. You'll have a lot of users asking questions about the applications they've installed," says Dean Wortham, store systems line manager at JC Penney Co. in Dallas. "Host-based applications don't let you get off course. On a PC, you can get off into never-never land and not know where you are."

As a result, companies without help desks are creating formal end-user support groups, while those with support already in place are buttressing their resources to better serve PCs (see chart).

The best buttress of all is a well-trained help desk staff. You can't recruit entry-level workers only. "There will be increasing demands on the expertise and flexibility of help desk analysts," says Glenn Weadock, president of help desk consultancy Independent Software, Inc. in Evergreen, Colo. "They're going to have to become more familiar with networks and with all the many different possible failure modes with small systems interconnected in networks."

Most companies will have to invest in a more aggressive education program for their end-user support representatives. That training has to be more in-depth than what the average user gets. "I had one help desk person tell me, 'How can I give them any support? We receive the same training they do!'" says Ron Muns, chairman of the Help Desk Institute in Colorado Springs.

It also means elevating the stature of the help desk worker. These staff members should play a more active role in choosing which products get implemented. "The help desk is where the expertise lies with regard to supportability and ease of use," Weadock says.

When a help desk can't support a product or isn't staffed properly, end users tend to go straight to specialists — that is, to highly paid professionals. "That impacts an organization's productivity if the investments aren't made at the help desk level," Weadock says.

Investments in technology also need to be made. "Help desks are going to be relying on tools — expert systems, knowledge bases, CD-ROM information bases," says Fred Schreengost, director of the Help Desk Institute. "There's also going to be a demand for vendors to put together troubleshooting, diagnostic software with common failure scenarios to disseminate to help desks."

These would be helpful for any support organization because problems in a PC environment tend to be very repetitive.

As he begins the new year, Wortham has a couple of wishes for the help desk: "We want to make our solution database available to users so they can attempt to solve their own problems. We're ready to do it; we just need approval at this point." ■

Bob Singleton, director of IS at the Orange County Appraiser's Office in Orlando, Fla., started a major downsizing effort to eliminate a mainframe. The new system integrates imaging, fiber optics and servers to create a flexible environment that helps end users better perform their jobs. And most importantly, "I want to help train 'superusers' that will be able to take on many functions that were previously performed by systems personnel," Singleton says.

R. William Eaton As CIO and senior vice president of Levi Strauss Associates, Inc. in San Francisco, Eaton has succeeded in breaking functional and company boundaries to get products to customers. Currently, he is involved in creating a unique organizational structure based on a circular rather than hierarchical organization chart. IS "action" groups focus on tasks related to the business, such as customer service or business systems, rather than databases or operations.

EXCLUSIVE SURVEY

Most respondents to a recent survey said they plan to ramp up end-user support programs

Percent of respondents
Total: 102

Automated tools are the preferred method to accomplish that.

Add automated tools such as problem management, inventory management, voice response and call distribution systems	51
Add staff	22
Other	10

Number of respondents
Total: 72
Multiple answers allowed

Lone worker

CONTINUED FROM PAGE 13

business concepts."

Employers Health Insurance in Green Bay, Wis., has also immersed its IS people in the business units — not as part of a dramatic upheaval but simply as a means of improving quality. IS workers at the group health insurer are given six- to 12-month "sabbaticals" in user departments, says Ken Roesler, vice president of MIS.

The relationship isn't one-sided: Roesler says users need to better understand IS. Employers Health is about to kick off a new program in which seven senior IS managers, selected from 18 applicants, will be assigned to business units to educate user management on the application of automation. "The idea is to go out and preach the gospel according to St. Technology," Roesler says.

Reality check

Nearly half of IS professionals will increase their training budget this year. Only 7% will decrease it. LANs, PC development and working with end users dominate the subject matter.

For teams to work, each individual on the team needs to feel empowered — that he can make a difference.

Empowerment was once "just a word" at AT&T Transmission Systems, according to Constandino Lambros, a technical staff member. But as part of a successful three-year quest for a Malcolm Baldrige National Quality Award, the AT&T business unit greatly beefed up its training programs, set up quality teams throughout the organization and put empowerment into practice.

The result: AT&T realized an estimated 35% improvement in the quality of its software after the quality team diagnosed and fixed recurring problems in a key software module. ■

It's time for true team spirit

Now that integration is the rule, IS teams are forming

By Garry Ray

Now that integration is rampant and one-stop shopping is a thing of the past, information systems departments need to develop systems integration teams to cover what used to be handled by one or two major vendors. That includes all the new technologies and products spawned by decentralized computing — from analysis to hardware.

Decentralized systems "get rid of the old vendor lock-in and provide tremendous leverage," says David Cearley, vice president and service director of desktop computing at Meta Group, Inc., a Westport, Conn., consultancy. "But with that comes a new degree of complexity."

How do you establish in-house systems integration teams? Launch training opportunities for IS staff members in small, pilot projects.

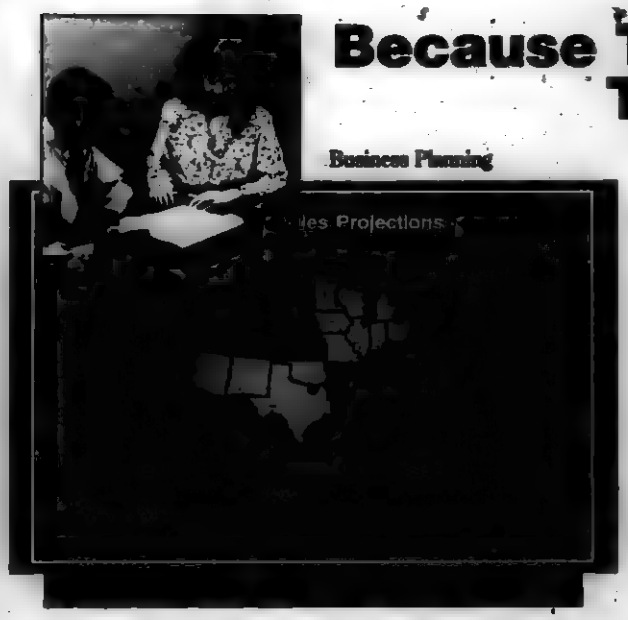
At one Missouri company, "A small group from the old information center is now the internal systems integration staff," says Joe Haspiel, senior associate at the Center for the Study of Data Processing, a nonprofit consortium of 35 IS shops based at Washington University in St. Louis. The team found that small, pilot projects were the best way to train staff on new technologies.

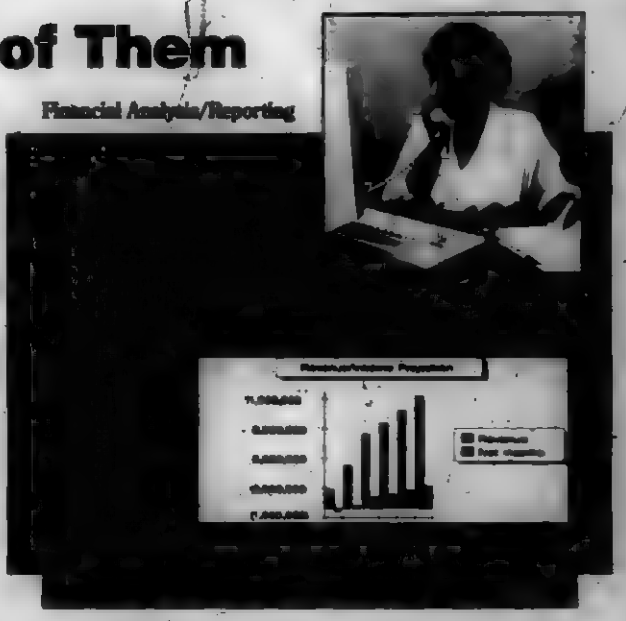
Internal teams cover systems integration.

"They're coming up with subset projects, such as [downsizing] mainframe applications that shouldn't have been there in the first place," Haspiel says.

Another alternative is to group your vendors into a systems integration team. Theresa Doyle, vice president of information services at the Dean Whitter Reynolds Equity Research Department in New York, gained cooperation from a number of vendors and service providers, which now participate in conference calls and meetings to discuss integration issues at her company.

"I really wanted them to work together and to be on friendly terms" Doyle says. But, "it's been a learning process to get vendors to work together and learn each other's products." The benefit? "If they make a change to one system, they know how it affects another," she says. ■





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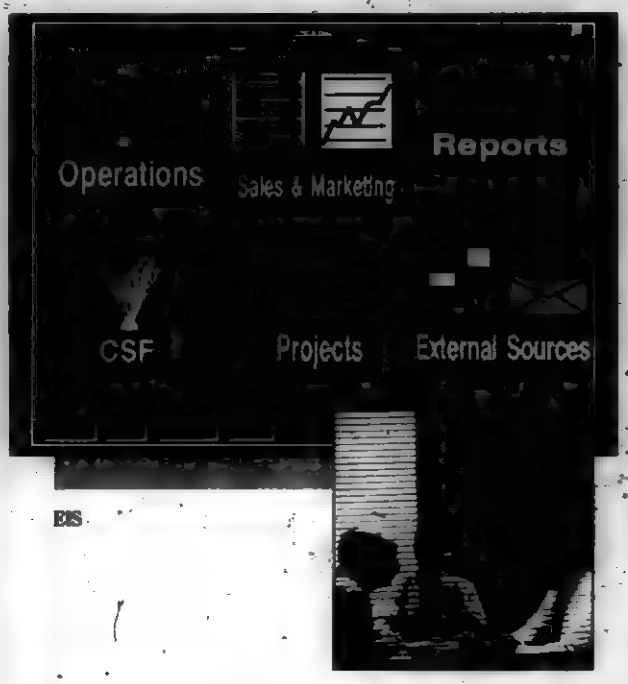

The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

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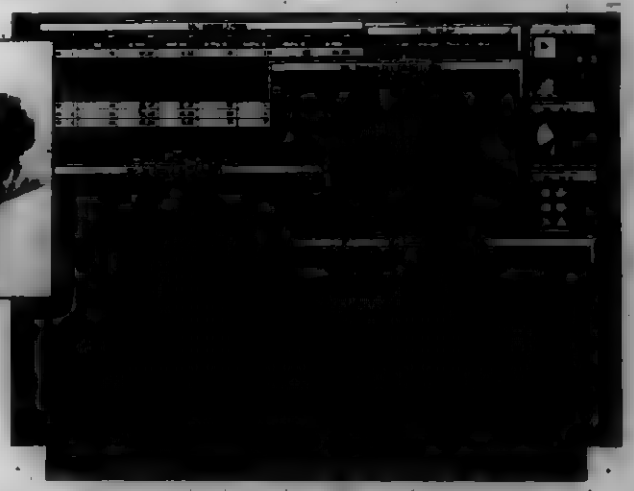
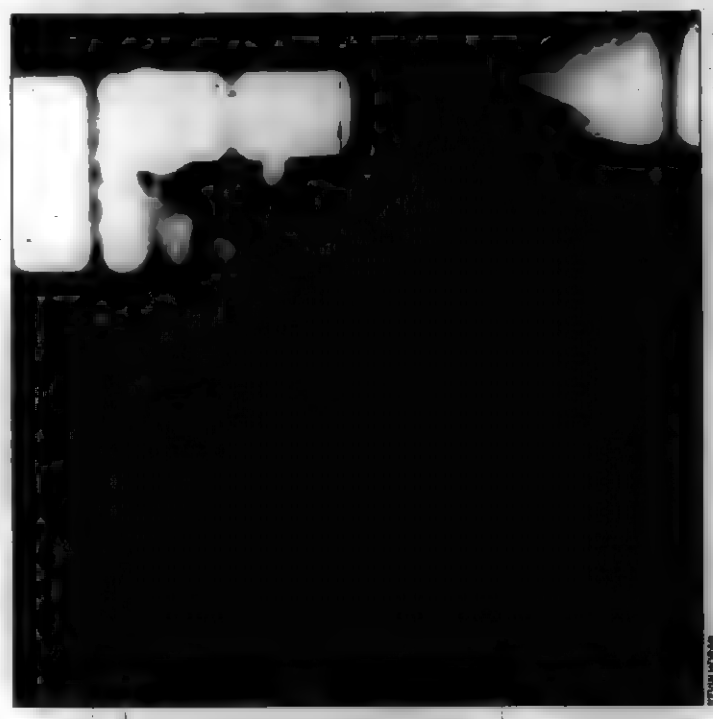


Changing Staff

VOICES of EXPERI

If you haven't been involved yet in a re-engineering project, chances are you will next year. To prepare you for the huge change this brings about, Senior Editor Nell Margolis asked two veterans to relate their experiences — mistakes and all.

Kimberly-Clark Corp. backed into re-engineering, says former Chief Information Officer John Kohler, who headed up the successful first stage. Here's how: Several years ago, the consumer products industry underwent "a fundamental cost shift," he says.



Large retailers were shuffling inventory management costs off their books by "allowing" suppliers such as Kimberly-Clark to take over that function. The new responsibilities did increase the amount of data processing required but did not result in more revenue.

Kimberly-Clark's once-innovative and profitable manual-entry, sequential-step order-entry set-up suddenly became an unaffordable luxury.

Kohler, now a partner at the Chicago-based systems integration firm Technology Solutions Corp., says Kimberly-Clark set up a steering committee to orchestrate the overhaul of all of the firm's order-entry systems and processes.

The re-engineering effort was on its way.

□

I thought the hardest part of re-engineering would be managing change. In retrospect, my first assumption was right on the money! Everyone in the organization has to change.

Change comes naturally to executives, so they forget that it will come with great difficulty to the rest of the organization. And that miscalculation costs a *lot* of dollars in retraining.

At Kimberly-Clark, a lot of people found their jobs changing without having any concrete idea of what the changes were going to be. So an atmosphere of fear and dislocation grew up.

If we executives had been very up front, first about the fact that jobs were going to change and then about exactly what we intended to do with the surplus people and how and why, the company could've saved wear and tear and dollars.

□

This is perhaps the most important lesson from the re-engineering front: be open. Communicate. Not once in a while, not when it's comfortable but early, often — every chance you get.

On one project, we moved the accounts payable processing operation from Wisconsin to Texas because the work could be done more cost-effectively out of the Waco facility. Understandable reason, right?

But nobody told the people involved why it was happening, so employees were stumbling around saying, "What *is* this thing? A dog or a pigeon?" Nobody knew what they were looking at.

JOHN KOHLER

"If we executives had been very up front, the company could've saved wear and tear and dollars. This is perhaps the most important lesson from the re-engineering front: be open. Communicate. Not once in a while, not when it's comfortable but early, often — every chance you get."

The moral, again: Spit it out. If you're going to re-engineer, recognize that you need a very strong change agent.

□

That leads directly to another critical reality: The change agent isn't someone who's going to win a lot of popularity contests. Nobody likes disruption, and few like the person who instigates it.

It's a good idea to make sure the change agent is someone who isn't necessarily planning to be here after the changes are done, an outside consultant, maybe, or a seasoned executive nearing retirement.

It's in the nature of the job: Where management sees a hero, employees further down the ladder are going to see The Terminator.

□

I remember one instance at K-C in which we had a manufacturing cost system that was scheduled to be re-engineered. The guy put in charge of [the project] was a fellow with a brazen personality, determined to drive the changes and brook no opposition. Manufacturing was never brought into the plans; the game plan was communicated only by directives issued on a need-to-know basis. The re-engineering never happened.

The ideal change agent will be someone who will be able to take the aggressive skills that got him chosen for the job in the first place and tone them down a little. Right now, these folks are in short supply. Finding the right change agent may be K-C's biggest challenge for 1993. ■

Changing Staff

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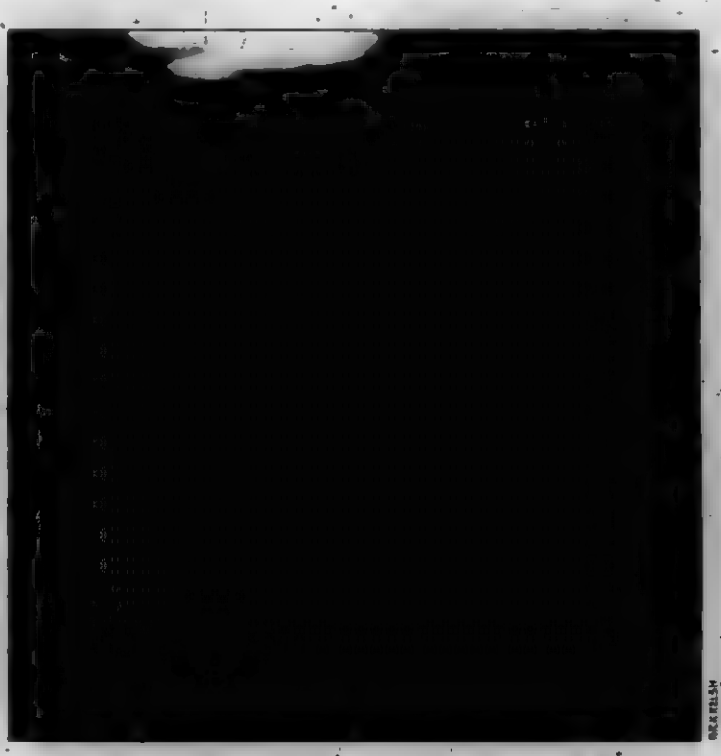

Coining of the term "re-engineering" is generally credited to management guru Michael Hammer, but Cigna Corp. Chief Information Officer Raymond Caron may well go down in information systems history as one of the first to turn the word into action.

Caron's ambitious attempt to align Cigna Systems with the business goals of its reinsurance business, Cigna RE, met near-legendary success, resulting in a 52% head count reduction, a 1,200% transaction time improvement and a 42% operating cost reduction. Today some 20 re-engineering projects are afoot at the firm.

Senior Vice President Erich Scheffler was IS head of the Property and Casualty Division when the re-engineering bandwagon pulled up at the door with its cargo of promise — and problems.

Scheffler recognized early on that "we had to find a different way of thinking about what we were doing or else be stuck with a smokestack juggernaut."

That led him to the "team training" concept, which, in turn, he says, is leading him and his teammates through an unsparing and often painful re-examination of how they act and why.

□

The first problem you hit when you start team training isn't that nobody wants to do it. It's just the opposite: Everybody believes they're *already* working as a team. That's the beginning of the process of unlearning, which can be pretty traumatic stuff.

For instance, before, I thought of myself as a manager. I thought my job entailed top-down direction and lots of reports and meetings.

Suddenly I'm not a "manager" — I'm a "counselor," and I'm supposed to be "guiding" rather than "controlling." You're used to having three or four levels of people reporting to you, and overnight, all that's gone. Tell me you're not going to feel dislocated.

□

This brings you right up against the issue that's key to the success of a transition to teamwork: rewards.

Like virtually all companies, our rewards have traditionally been based on individual contribution. In IS, for instance: Say you were working on a unique project and came up with a creative way to do it; you might get extra money over and above your salary.

But now you're part of a team. All the old rules are off. Uh-oh — so are the old rewards. Beating your colleague to the punch got you a bonus; beating your teammate to the punch is meaningless, if not bad.

If there's no way at all to get rewarded, people aren't going to accept the team concept. But if you preach teamwork and keep rewarding individual action, you're attempting the impossible. The only choice left is to come up with an entirely new reward system. That's what we did, and why.

□

Under our old structure, each individual was reviewed periodically, based on a five-grade performance system: basically, 1 meant that you walked on water and 5 meant that you passed water.

No way could that system be adapted to the team model. So we threw away the grading system. All the numbers went away. So did individual reviews. Now, an entire team's effort is considered as one performance. It works just the way it does in sports: gives stronger players an impetus to help weaker ones improve, and on the other hand, if you're not pulling your weight, you have to live with knowing you brought down the whole team.

□

What else went away? Huge chains of control that created middle-management layers. For instance, our research, testing and training department used to test code. This was replaced by a soup-to-nuts development process that requires the people who developed the code to test it and the business partners for whom it's being developed to be involved at every step.

Great? Sure — for the developers, for the users, for the end product. But you can see why re-engineering is very threatening to large groups of people. If testing is taken out of the mix, how do they fit in? The fact is, some *don't*.

□

And there's another hard part of the re-engineering process: layoffs. This issue isn't pretty, it isn't nice, and it isn't going to go away. You've got to face up to it and do what you can to reduce the pain.

One thing you can do is to have metrics in place well before you start so that you can really take your best shot at eliminating inefficiencies and redundancies. As you start teams, for instance, start doing a lot of surveys because you have to know what's working and what's not.

Another is, be completely open about what you're doing and when and why. Both of these — metrics and openness — increase understanding.

One of the teams we started out with was an administrative team. It performed a lot of business-oriented IS functions. By and by, the folks from the business side with whom the IS team was working didn't need it anymore. But, awful as that is, everyone on the team understood that they weren't needed anymore because they had been kept in the information loop all along. They saw it as a natural evolution.

Let everybody know what's going on. That's part of the meaning of teamwork. If you learn that one thing, you've learned a lot. ■

"Suddenly I'm not a 'manager' — I'm a 'counselor,' and I'm supposed to be 'guiding' rather than 'controlling.' ... But now you're part of a team. Beating your colleague to the punch got you a bonus; beating your teammate to the punch is meaningless, if not bad."

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Forecast: Changing Technology

WHAT'S HOT

WHAT'S NOT

A LOOK AT WHAT TO AVOID AND WHAT TO FOCUS ON IN 1993

The battle for the desktop

By Christopher Lindquist
and Rosemary Cafasso

What we have here is a battle with no winners — and no losers, either.

Yes, after all the coverage and hype about who will win the 32-bit desktop war, this year might just see the market roughly split between IBM's OS/2 and Microsoft Corp.'s Windows NT and still leave more than crumbs for Unix to mop up.

"The phenomenal success of MS-DOS in the 1980s created the expectation that the same kind of dominance [by some operating system] would appear in the 1990s," says David Rothchild, an analyst at Piper, Jaffray & Hopwood in Minneapolis. "I don't think that's going to happen."

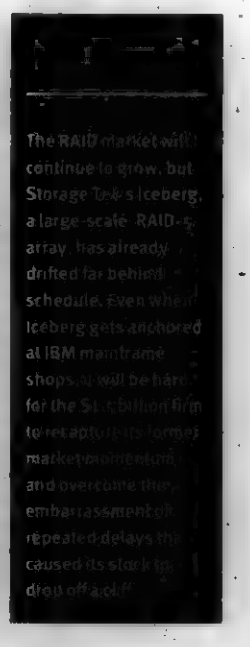
Instead, he says, the market will likely fragment into "Big Blue" shops running OS/2 2.0, "Bill Gates is God" shops running Windows NT and "academics" running Unix. What users will buy also depends in large part on the immediacy of their situation.

"If you're looking at the future, it's probably NT or Unix. If you're looking at the present, it's OS/2 or Unix," he says, noting that NT's portability and multiprocessor support give it a huge advantage over OS/2 for users looking several years out.

In terms of users creating real applications, Unix and OS/2 2.0 will likely be further along in 1993 than Windows NT, primarily because OS/2 prototypes begun in 1992 will shift to production mode this year, and Unix has been building up its own steam for some time now.

That might give the impression that Unix and OS/2 have the advantage, but "remember, Microsoft has shipped 20,000 [now 30,000] NT SDKs so far," says Tim Bajarin, president of Creative Strategies Research International, Inc. "If it

What's hot, not, *page 24*



The RAID market will continue to grow, but Storage Tek's Iceberg, a large-scale RAID-5 array, has already drifted far behind schedule. Even when Iceberg gets anchored at IBM mainframe shops, it will be hard for the $1.5-billion firm to retrieve its former market momentum and overcome the embarrassment of repeated delays that caused its stock to drop off a cliff.

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Changing Technology

What's hot, not

CONTINUED FROM PAGE 20

keeps on schedule, NT will have the biggest growth in calendar 1993."

Indeed, it's not difficult to find people developing with OS/2 2.0 — some of them planning major rollouts. Within three or four years, 15,000 to 20,000 desktops at the Royal Bank of Canada will be running OS/2, says George Oliver, manager of information delivery technology. The bank has several OS/2 2.0-based applications that are scheduled for a "very, very early deployment," he says.

> In terms of users creating real applications, Unix and OS/2 2.0 will likely be further along in 1993 than NT.

Applications expected to run under OS/2 2.0 include credit management for chief inspectors and a rewrite of its 8,000-user bank teller system. "We are deploying as fast as we can find the money to do it," Oliver says.

Many users express an interest in evaluating Windows NT upon shipment, but few have definite plans for it at this point. Dean Witter in New York plans to evaluate Windows NT as a platform for real-time research analyst workstations, says Theresa Doyle, vice president of computer and information resources.

Meanwhile, Unix users say they are pleased with the reliability of their current systems but are aware of the action on other 32-bit fronts. Whether Windows NT or OS/2 will provide them with reason to change remains to be seen.

"We're not Unix bigots at all, just powerful desktop system bigots," says Harry Perrin, assistant vice president of investment systems at Teachers Insurance Annuity Association in New York. Even though the vast majority of his department runs on Unix, Perrin says he could be persuaded to switch to something like Windows NT — if the advantage was significant and if it was ported to the Sun Microsystems, Inc. Scalable Processor Architecture (SPARC).

Until then, Perrin is keeping his stakes in Unix and looking to Solaris as his means of entry to perhaps less expensive platforms such as Intel Corp., while still retaining his current SPARC investment.

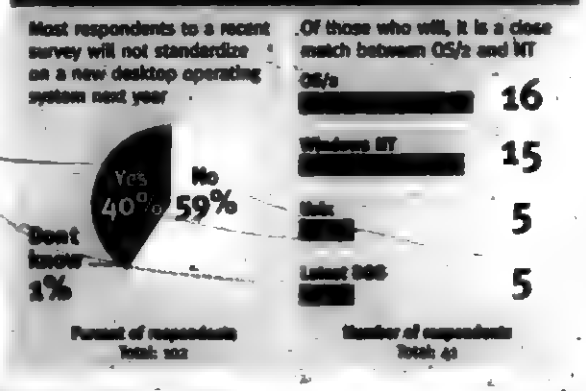
Greg Feeler, information systems manager at Employer's Resource Corp., said he is less likely to switch from his version of Unix, The Santa Cruz Operation's SCO Unix. The system handles payroll for 4,000 to 5,000 employees, and "when paychecks don't happen like they're supposed to, tempers get short" so reliability is key. Feeler is looking to other operating systems for potential use in 1993 but is more inclined toward OS/2, than Windows NT. He says he sees a hybrid environment in his future, with Unix running custom database software on servers and DOS or OS/2 workstations being used as nodes.

No matter who chooses what, it's clear that we're talking big applications here. These 32-bit operating systems will most likely be running reliable line-of-business applications that take advantage of the speed and multitasking capability of these robust operating systems. These could be graphical front ends, on-line transaction processing, real-time multiprocessed stock analyst workstations or multimedia.

"You don't really need a 32-bit operating system for spreadsheets," says Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. She says the focus will be on database-driven application development, customized applications that can take advantage of 32-bit data paths and memory capacities.

As pieces fall into place and lines are more sharply drawn, the battle will switch from the vendor's to the user's turf as decision-makers face their own internal struggle: selecting which 32-bit environment is right for them. ■

EXCLUSIVE SURVEY



In 1992 Computerworld readers spent **$81 Billion** on Information Technology – representing nearly half of all IT spending in 1992.

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Changing Technology

Groupware is in; pens are out

GROUPWARE

Everyone, it seems, will be getting into workgroup computing this year. Many users will take first steps with pilot programs, while scores of software and systems companies will put a groupware spin on their products.

More established workgroup players will add expanded functions to their base platforms, including imaging, better text management and, later in the year, videoconferencing.

David Marshak, a senior consultant at the Patricia Seybold Group in Boston, says vendors will incorporate functions such as "shared screens" in software to allow remote workers to make changes in an application and view them in real time.

Meanwhile, the Big Three desktop software companies are expecting this year to be a big one. The schedule is as follows:

- Lotus Development Corp. will ship Notes Version 3 in the first half of this year. Among other features, it will include better text management and retrieval via technology from Verity, Inc.
- Microsoft Corp. will be pushing ahead with Windows for Workgroups and expects dozens of supporting third-party products to ship.
- Borland International, Inc. is scheduled to ship the first piece of its workgroup strategy, Object Exchange, in the first half of the year. Borland has yet to fully explain how this will allow its applications and other vendors' to be shared by groups of users.

Also watch for "smarter" workgroup software, such as Beyond, Inc.'s BeyondMail, which can be tailored to users' needs. Lotus is working on similar, "smarter" technology designed to allow "agents" to filter mail and information to an individual's requirements.

IBM has outlined several possibilities for OS/2 with workgroup extensions. It will likely ship a version of OS/2 with basic peer-to-peer networking capabilities, which was demonstrated at Comdex/Fall '92 in November. — *Rosemary Cafasso*

Many hot technologies in the coming year will be those that focus on changing the way businesses get things done.

NETWORK MANAGEMENT

After much vapor and many promises, vendors should finally start shipping some products to enable users to manage their local-area networks as well as inter-LAN, intersite networking backbones in an integrated, centrally coordinated manner.

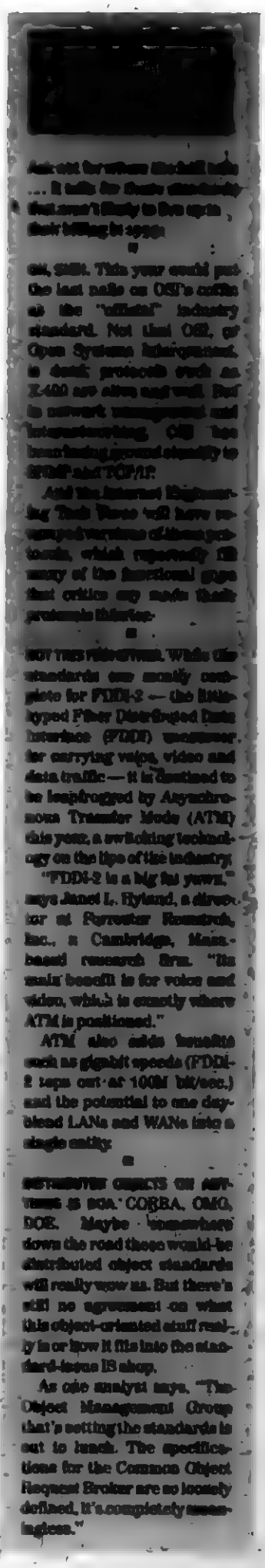
Centralized LAN systems managers, such as IBM's LANfocus, purport to monitor, configure, troubleshoot and download software to LANs from a single OS/2 server. LAN analysis and simulation tools are extending across the wide-area network to pinpoint bottlenecks and trouble spots across a LAN-to-LAN connection.

IBM, Cabletron Systems, Inc. and Digital Equipment Corp. will ship products designed to integrate management of the LAN internetwork and IBM's Systems Network Architecture.

Expert systems, icons that change color and automated "discovery" mechanisms will proliferate as a way to farm out network management tasks to less technical users and save on management gruntwork. Breakthroughs to watch out for in the standards arena include the following:

- The Open Software Foundation should finalize its Distributed Management Environment protocols by year's end.
- A new version of Simple Network Management Protocol will emerge in products with security features, LAN protocol independence and manager-to-manager communications.

— *Elisabeth Horwitt*



Ask not for whom the bell tolls ... It tolls for those standards that aren't likely to live up to their billing in 1993:

■

OSI, SNA. This year could put the last nails in OSI's coffin as the "official" industry standard. Not that OSI, or Open Systems Interconnect, is dead; protocols such as X.400 are alive and well. But in network management and internetworking, OSI has benefiting ground steadily to SNMP and TCP/IP.

And the Internet Engineering Task Force will have revamped versions of these protocols, which reportedly fill many of the functional gaps that critics say make them problematic.

■

NOT THIS PERMUTATION. While the standards are nearly complete for FDDI-2 — the fiber-optic Fiber Distributed Data Interface (FDDI) successor for carrying voice, video and data traffic — it is destined to be leapfrogged by Asynchronous Transfer Mode (ATM) this year, a switching technology on the tips of the industry's

"FDDI-2 is a big fat yawn," says Janet L. Ryland, a director at Forrester Research, Inc., a Cambridge, Mass.-based research firm. "Its main benefit is for voice and video, which is exactly where ATM is positioned."

ATM also adds benefits such as gigabit speeds (FDDI-2 tops out at 100M bit/sec.) and the potential to one day blend LANs and WANs into a single entity.

■

DISTRIBUTED OBJECTS ON ANYTHING IS SOA: CORBA, OMG, DOE. Maybe somewhere down the road these would-be distributed object standards will really wow us. But there's still no agreement on what this object-oriented stuff really is or how it fits into the standard-issue IS shop.

As one analyst says, "The Object Management Group that's setting the standards is out to lunch. The specifications for the Common Object Request Broker are so loosely defined, it's completely meaningless."

IMAGING

Not exactly sluggish but not as big as projected, the electronic document imaging industry may be due for a shakeout among its 200-plus vendors.

Safe from any fallout is the boisterous PC local-area network segment of the market. While hardware and software are standardizing, third parties will concentrate on providing application solutions. We might even see some new players appear.

Items to watch in the PC LAN category include the following:

- Lotus Development Corp.'s Notes: Document Imaging, the companion product to Notes, developed in conjunction with Eastman Kodak Co.
- Kodak's image extensions to Novell, Inc.'s NetWare.
- Microsoft Corp.'s groupware entry is due in '93; however, it will not have imaging capabilities in its first release.

Also, Microsoft's anticipated Windows NT debut will give PC LAN imaging vendors a suitable platform for client/server products.

However, it's the workgroup category, which consists mainly of four- to 15-user imaging systems, that will account for the highest growth in the marketplace, according to BIS Strategic Decisions in Norwell, Mass. It estimates that the current $1.35 billion market for imaging hardware, software and support will grow to $11.1 billion by 1996.

Also slated to arrive this year are the following:

- Work-flow software — which automates the routing of images between individuals and applications — will increasingly break off into its own category. It will fit into users' process re-engineering and redesign efforts.
- Lots of inexpensive "personal imaging" products. These are intended for stand-alone PCs outfitted with a scanner, a fax board and (for the heavy filer) an optical disc drive.

A big worry for information systems departments will be the scalability of these generally nonstandard products.

- Important technical strides made last year in optical character recognition (OCR) will bear fruit this year with mature applications. OCR will let users absorb forms and documents more easily, eliminating manual indexing.
- Forms recognition scanners and software that recognize different kinds of images, apply the proper OCR and then send the result to one or more applications. Insurance companies, for instance, have several kinds of forms sent to patients and care providers. A single system able to recognize and route different forms to different applications would boost productivity by eliminating what is still a largely manual task. — *Ellis Booker*

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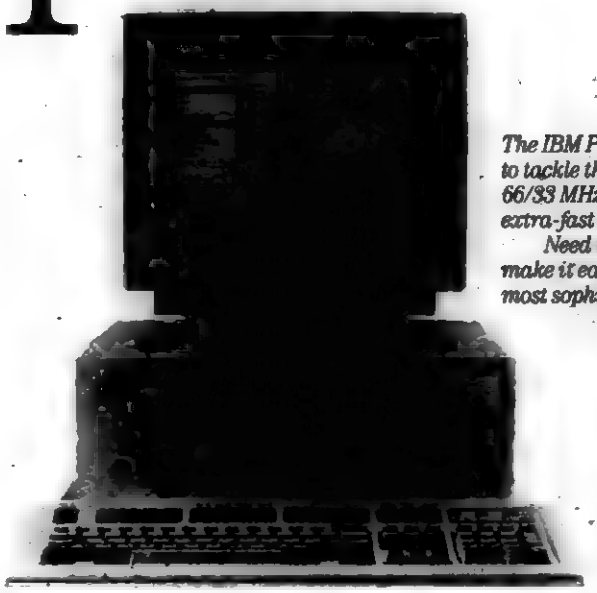

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Changing Technology

AI is out; objects are in

It's often difficult for busy information systems professionals to sift through the vendor hype and pundit generalizations to ferret out what really works.

So Computerworld's staff went right to those in the know — your peers — to find out which technologies and methodologies promise the best return on investment.

■

WIRELESS. At Toys R Us, Inc., radio frequency technology is the thing to watch, according to Dennis Healey, vice president of MIS at the Paramus, N.J.-based company. Healey says the chain is considering adding wireless point-of-sale devices to its outlets.

Until recently, Toys R Us and other retailers required a Federal Communications Commission license to transmit inventory and store data to the company's data center, which Healey says was needlessly bureaucratic. But the advent of spread-spectrum technologies, which enable users to transmit data using wireless communications systems, means data transfer is faster and no FCC licenses are required.

■

ELECTRONIC DATA INTERCHANGE (EDI). Texas Instruments, Inc. has already reduced shipping errors by 99%, reassigned 70% of the firm's clerks and produced 95% on-time delivery and 75% cycle-time improvement — thanks to EDI, says Ralph Szygenda, vice president of corporate IS and services.

■

486 CHIP. 486-based PCs represent "a tremendous price break in the market," according to Jude Gartland, senior vice president at New York's Lehman Brothers. "[The 486] has let us look more at operating systems like Windows because it makes those operating environments much more usable."

Gartland adds that the 486 chip has also made it possible to introduce client/server applications, Windows applications and graphical user interfaces.

OBJECT-ORIENTED

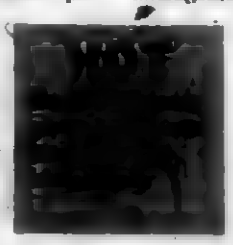
Users will turn up the volume on object-oriented technology in 1993, as more of them use the C++ and SmallTalk languages to write new applications — and rewrite old ones.

In many cases, objects are being put to work in corporate downsizing and re-engineering efforts. Some sites are even turning to object-oriented "wrappers" to "hide" procedural code by encapsulating it as an object. Wrapping is one way users hope to accelerate re-engineering projects without rewriting legacy Cobol programs.

Last year, many large corporations, including American Airlines and CSX Corp., deployed object-oriented pilot applications as production programs.

This year, many others, such as Citicorp and Levi Strauss & Co., plan to begin development of new client/server applications in object-oriented languages.

However, many commercial sites have placed object-oriented programming (OOP) on the sidelines, waiting for the learning curve to get somewhat easier.



To spur OOP projects at more corporate sites, several vendors shipped application-development frameworks with icon-based user interfaces last year, including ParcPlace Systems, Inc.'s VisualWorks and Digitalk, Inc.'s Parts.

Object-oriented databases got off to a slow start in the early 1990s, with just a handful of vendors sharing $30 million in worldwide sales.

To some extent, many large users are waiting for relational database vendors to support objects, which would make database servers more versatile.

Some object-oriented database management system firms, such as Versant Object Technology Corp. and Servio Corp., made joint marketing alliances with several relational database management system vendors.

In general, object technology has been hampered by a lack of standards. However, the Object Management Group in Framingham, Mass., is working on several, while the International Standards Organization committee in Europe is working on SQL 3, an SQL database query language that supports objects.

—Jean S. Bozman

MULTIPROCESSING

The PC multiprocessing market will develop considerably this year, but it still needs to build user trust and vendor consensus. Users will start to develop multiprocessing applications in hopes of garnering big savings over mainframes and minicomputers.

A major step is its shift this year from Unix toward a more desktop-oriented environment. Some of the key advances include the following:

- Windows NT from Microsoft Corp. If delivered as expected, NT will give the market a multiprocessing application development environment.
- Multiprocessing extensions for OS/2.
- Pentium, Intel Corp.'s i486 follow-on, combined with its recently announced Advanced Programmable Interrupt Controller, will give users multiprocessing-optimized hardware platforms.

Hardware vendors will fight to bring some semblance of standards to the hardware market in terms of bus architecture and overall systems design. Systems security and management features will also mature this year, with help from companies such as IBM, Compaq Computer Corp. and AST Research, Inc. *—Michael Fitzgerald*

PORTABLES

In an attempt to put more functionality and better communications in a small package, portable computer vendors are starting to experiment with the traditional categories, such as "palmtop" and "notebook." We'll see more personal digital assistants, a la Apple Computer, Inc.'s Newton, as well as hybrid pen/keyboard machines. Grid Systems Corp.'s Gridpad Convertible, which combines pen-input and conventional notebook computer, will likely have competitors.

Notebooks remain the only sure area for big growth. The biggest trend will be the push for wireless communications, such as cellular and radio frequency modems. Credit-card-size devices following the Personal Computer Memory Card International Association standard will give notebook users the ability to add various functions to their notebooks, such as memory, fax and modem capabilities.

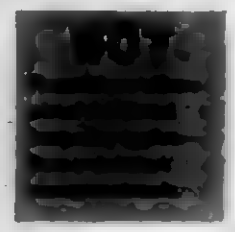
—Michael Fitzgerald

UNIX

Unix operating systems are geared up to wage desktop war against Microsoft Corp.'s Windows NT — and to a lesser extent, IBM's OS/2.

Intel Corp.'s Pentium chip will be a hot spot for Unix, especially for Solaris and Unix System Laboratories, Inc.'s (USL) Unix System V 4.2. Another desktop market force and pending threat to Unix workstation vendors will be PowerPC products from the alliance of IBM, Apple Computer, Inc. and Motorola, Inc.

Based on IBM's RISC System/6000 Power RISC architecture, the PowerPC venture aims to produce a family of next-generation reduced instruction set computing microprocessors competitive with those from Hewlett-Packard Co., Sun Microsystems, Inc., Digital Equipment Corp. and Mips Technologies, Inc. (now part of Silicon Graphics, Inc.). PowerPC products will start arriving toward the latter part of the year.



There will be fewer industry alliances along the lines of last year's PowerPC consortium or HP's Precision RISC Organization. The appearance of more system and network management software — which already tops the IS "must have" list — is a given for 1993, along with a plethora of distributed computing tools and applications. This should also prove to be a make-or-break year for the Open Software Foundation's (OSF) Distributed Computing Environment.

Users will also see vendors paying a lot more attention to branding and certification programs for Unix products, from organizations such as SPARC International, USL and the OSF. *—Maryfran Johnson*

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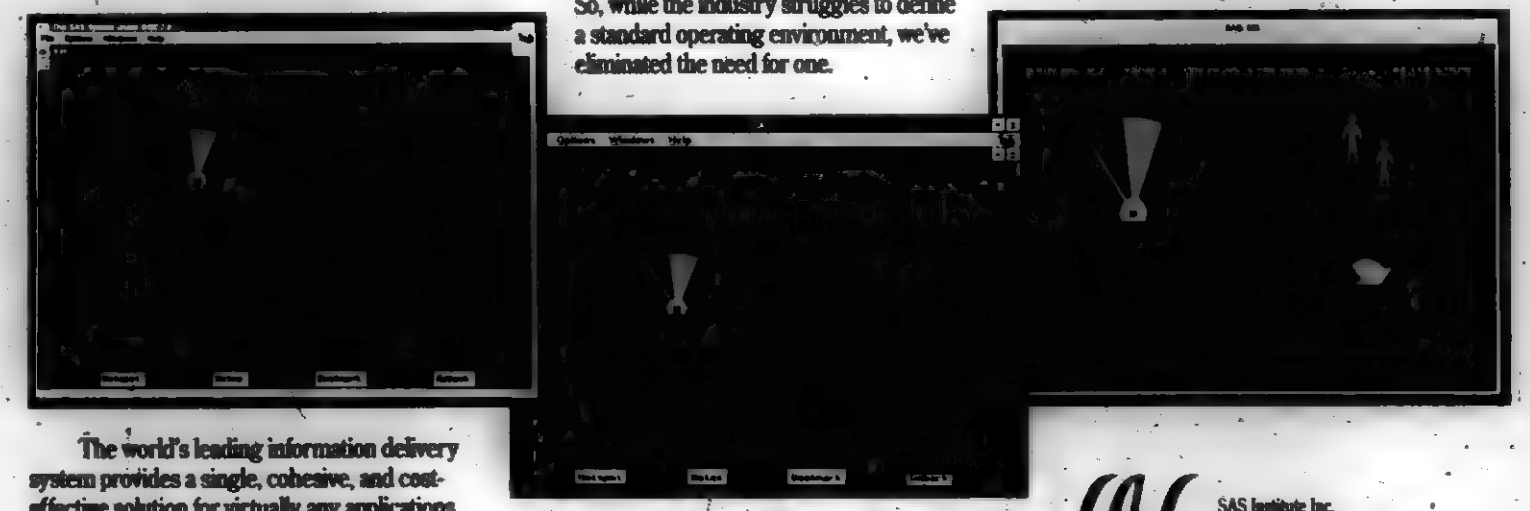

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Overhaul AHEAD

'Re-engineering' means different things in different parts of the enterprise. Here's how key departments will use technology to change the way they work.

Serve or else

By Mitch Betts

Slowly but surely, corporate America is learning that the customer is king, and the king is very demanding. He wants one-stop shopping from multidivision companies, easy-to-get status reports on what's happening with his order and superefficient transactions over the telephone.

In 1992, a few pioneers started to invest in the broad range of technologies that can help meet those demands, but in 1993 the rest of the pack will have to stop paying lip service to customer service and open their pocketbooks.

"Extraordinary customer service" will be the key to whether some companies survive or die in the 1990s, says John Tschohl, president of the Service Quality Institute in Minneapolis.

Faced with this business mandate, chief information officers are digging into their bag of technology tricks and pulling out such familiar applications as electronic data interchange (EDI), imaging and work-flow software to speed up the processing of customer transactions.

But progressive CIOs will have to go beyond conventional data processing and embrace a variety of less familiar technologies, too, including fax servers and voice processing.

Because customers like one-stop shopping, for example, San Antonio-based United Services Automobile Association (USAA) has a single toll-free number backed by a voice processing system that directs customers to USAA's various business units, including auto, fire and life insurance and mutual funds.

"We're committed to a one-company image, despite our diversified services," says Charles Cockerell, director of telecommunications, office and voice systems.

CUSTOMER SERVICE

Another customer-focused company is Carolina Freight Corp. in Cherryville, N.C., which is using a whole family of technologies to give customers a window into the trucking company's operations. The business goal, simply put, is to make it easier for customers to do business with Carolina Freight than with its competitors, says John Rudasill, president of the firm's computer services subsidiary.

The company's suite of technologies includes an EDI network for its high-end customers, a PC-based software package for midsize customers and a voice-response system that allows smaller customers to use a push-button phone to access the shipper's computer systems.

The voice-response system provides information about rates and routes and even allows customers to trace their shipments by the waybill number, Rudasill says. Customers can also get a shipment status report faxed to them.

That capability has emerged in the last few years, thanks to a new breed of computer-based fax systems from vendors such as Optus Software, Inc. in Somerset, N.J.; Brooktrout Technology, Inc. in Needham, Mass.; and Biscom, Inc. in Billerica, Mass. The fax servers allow companies to send price lists, product details and advisories from their computer databases to customers' fax machines.

The technology is red hot. In 1993, the number of installed computer/fax systems is expected to double, and 15% of all local-area networks will have a fax server, according to Camarro Research in Fairfield, Conn.

Because so much business today is conducted over toll-free telephone lines, another hot technology is "computer/telephone integration."

Serve, *page 30*

Changing Enterprise

Beyond laptops and notebooks

Real-time access to data will be key for on-the-roaders and office-bound sales teams seeking on-the-spot decisions

By Joanie M. Wexler and Michael Fitzgerald

Most large sales departments have equipped their sales teams with portable computers. Now they're ready to go a step further: On-the-roaders and office-bound users alike will be given the tools to slice and dice corporate information quickly, keep inventory on shelves and stop fiddling with paperwork.

Sales forces will also enter "virtual office" mode, with real-time access to corporate databases and messaging systems, users say. The enabling technologies will include the following:

- Smaller, more powerful portable computers with communications enhancements.
- Groupware applications.
- Interactive, platform-independent databases.
- Pen-based systems.
- Wireless wide-area networks.

This is the year that New York Life Insurance Co. says it can finally implement its plan to serve customers more quickly. The company wants traveling agents to be able to set up hypothetical situations with potential customers and perform actuarial calculations on the spot.

To do that, the insurer plans to use database tools that will automatically link data entered into one program with all its other programs, says Richard E. Nelson, vice president of agency systems.

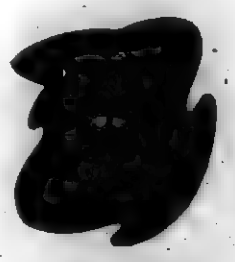
New York Life tried this three years ago but aborted the effort in the face of ineffective tools. However, with vendors such as Borland International, Inc. likely to enhance their products with interactive characteristics, Nelson says this could be the year to resurrect the project.

Ryder Systems, Inc. is simply looking to "put more people on the street with real-time access to corporate information," says Henry P. Fiallo, group director of corporate telecommunications at the Miami firm.

Remote wireless communications will be a key enabler, Fiallo says, and will be spurred by such recent developments as a nationwide wireless messaging network from RAM Mobile Data. RAM Mobile aims to cover 90% of the urban business population with its wireless packet data network by June.

The emergence of wireless personal communications networks — which will designate a "phone number" to a person rather than a place — should also help, he says.

Clothing manufacturers have their own issues to deal with these days: shorter product cycles and increased garment volume. This makes it impossible to complete a physical garment sample for every show floor, explains Michael Higgins, technical support manager at Byer California, a San Francisco-based company.



SALES AND MARKETING

The company plans to leverage terminals based on the X Window System — a high-resolution graphics-oriented protocol — to electronically send high-quality photographs of a garment to retailers "within hours or a day so we can sell directly from the picture," Higgins says.

The photos will be transmitted by a BT frame-relay network, he added.

Back in the office, salespeople at Byer have also found a way to leverage X systems. Higgins has set up a configuration that merges text with pictures of garments onto users' X terminal screens. The text is stored on SQL databases running on Sequent Computer Systems, Inc. minicomputers, and the photos reside in a magnetic optical jukebox. The setup allows users to visually identify garments and intelligently discuss a larger product set with customers, he says. ■

[redacted]

[redacted] will ship 2.4 million units, including [redacted] palmtop, notebook and peripheral products, tracking the $43 billion sales mark, according to Market Intelligence Research Corp. (MIRC). Overall market growth will be 19.2% — the first time in four years that the growth rate for the overall portable market will fall below 100% — MIRC says.

Meanwhile, in the bread-and-butter notebook market, International Data Corp. predicts 1.4 million units will ship in 1993 in the U.S., a 17% increase in unit volume.

■ THE SALES FORCE will account for the largest chunk (26%) of [redacted] mobile professionals, according to The Yankee Group in Boston. Field service personnel [redacted] is the next largest on-the-go group of computer users, according to the firm.

■ THE Lotus Application Programming Interface Association is proposed to define how [redacted] will interface in June. This should result in the proliferation of more mail-enabled applications as development gets easier.

■ THE FIRST BATCH of wireless mail-enabled applications will appear during the first quarter, rendering more portability for mobile users and giving them the ability to work in real time.

■ WIRELESS NETWORK SERVICE providers will increase their service coverage. RAM Mobile Data network, for example, which is working with several software developers for message-enabling applications for wireless networking, intends to increase service from 55 metropolitan areas now to 200 by June.

■ IN A RECENT A TORCH SURVEY of 3,500 executives, 40% say users will be unable to distinguish between wireless and wireline communications by the mid-1990s. More than 90% said wireless will improve productivity.

Approaches to improved service

LOOK FOR THE FOLLOWING developments in customer service technology in 1993:

■ THE TRAVELERS CORP. plans to implement a text-to-speech application that will inform callers of Travelers-approved doctors in their area.

■ CLARIFY, INC. in San Jose, Calif., recently introduced client/server software to help large customer service organizations provide technical support and track complaints and product defects. Field service and inventory management modules will be out in the first quarter.

■ PROACTIVE SOFTWARE, INC. in Mountain View, Calif., has developed client/server software for customer support throughout an enterprise. The first module for help desks is shipping (CW, Oct. 12), and other modules for sales, marketing and engineering departments will be forthcoming, the company said.

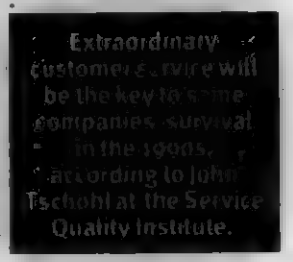
Serve or else: Customer service key in '93

CONTINUED FROM PAGE 29

When consumers call that 800 number, they can get either a voice-response system that extracts information from a computer system or a live operator who has immediate access to the customer's files.

One of the pioneers is The Travelers Corp. in Hartford, Conn., which has both types of systems. "I'm absolutely convinced we have to do this because customers are going to expect it. Otherwise, they're going to think something is wrong with us," says Gus Bender, vice president of telecommunications.

Travelers has 12 applications running on 50 voice-response units, which now handle 30% of the company's incoming calls. Callers use their telephones to get status reports on their latest insurance claims and check eligibility information.



If the caller then needs a live operator, Travelers uses "automatic screen transfer" technology to ensure that the caller and the caller's computerized records arrive at the customer service agent's terminal at the same instant. Customers do not have to identify themselves once again, which shaves 20 seconds off each call.

Firms entering the world of voice processing must make sure the "scripts" of instructions and prompts through which callers must navigate are user-friendly and that a live operator is just a button away. Otherwise, the system will backfire and become a real customer turn-off. ■

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/ VARs/Consulting Mgt.
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Changing Enterprise

Hold down that fort

By Jean S. Bozman

As information systems managers try to reduce their fabled backlog of Cobol applications, they should look toward the exit door of the central computer room.

That's because a sizable amount of this year's development will be done near the glasshouse but within corporate business units. There, end users will work directly with programmers to develop new applications.

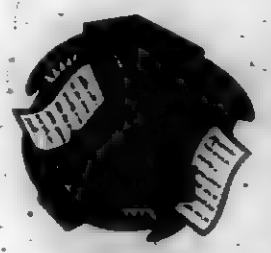
The localization of application development makes eminent sense because field personnel are at the front lines of any business. And certainly the rapid proliferation of end-user programming tools and locally installed local-area networks and databases has accelerated outbound development.

With users now able to easily prototype their own applications and graphical user interfaces, why push to central IS what can better be done at local sites?

"IS is beginning to sense that their lives might be easier if they handle the corporate infrastructure and let the business units handle more of the development," says Neal Hill, a senior analyst at Forrester Research, Inc., a market research firm in Cambridge, Mass.

IS organizations already committing to this vision of decentralized development include DHL Airways, Inc., Fidelity Investments, Levi Strauss & Co. and Kash-n-Karry Food Stores, Inc. Armed with technologies such as fourth-generation languages, object-oriented tools and relational databases, the intrepid programmers-at-large may travel to business units for a short time — or take up permanent residence.

"We'll make the information available in a centralized data repository, but we want [each unit] to have its own operational views of that data," says Donald Chaney, manager of advanced research and development at DHL Airways, an international shipper based in Redwood City, Calif.



INFORMATION SYSTEMS

Need for structure

That's a theme that is now beginning to be heard throughout corporate IS: Provide guidelines and data structures for the organization, and let local operations do what they will within the central structure.

But users and IS managers alike must beware: There are many pitfalls to business unit programming in a vacuum. "The business units are more purely driven by day-to-day profits, but they are also out of the direct sight of IS," Hill says.

Applications developed in one business unit may not work reliably against another business unit's database. Without the benefit of central-site advice and counsel, those roving developers could give rise to chaos.

A mediating role

To prevent chaos, information systems directors will be summoned to mediate disputes, set standards and oversee the IS infrastructure as it becomes a shared resource.

"There has to be a balance between the LAN's ease of use, common user interface and local data vs. the [central] data center's control, security and data integrity," says Evan Wride, director of information systems at Nissan Motor Corp. in Gardena, Calif.

> As users take on more development work, IS needs to keep an eye on the corporate infrastructure.

To lend that oversight, many IS managers will return to computer-aided software engineering (CASE) tools to fashion approved corporate data models and to get a fix on information flows throughout the organization.

Although many in IS have become disenchanted with CASE, it may provide the bird's-eye view needed to create these high-level information models.

"You don't want stand-alone, non-integrated systems that don't give you the big picture about your business," Wride adds.

Setting corporate standards for data types and formats and where that data is to be located will become paramount concerns for IS. ■

Stamping for standards

■ [illegible], a preliminary recommendation for object-oriented Cobol standards will emerge from the Object Oriented Cobol Task Group of the ANSI X3J4 committee. Object-oriented Cobol will spur a wholesale evaluation of applications to determine which should be "encapsulated" for redeployment in new systems.

■ [illegible] CASE will get a new lease on life as commercial tools become widely available for IBM's AIX SDE Workbench/6000. Evolving standards will drive CASE and software engineering into the Unix arena. This will come as a relief to those launching complex client/server efforts because accessible and manageable midrange CASE tools will make it easier to model information flows and structures within an organization.

■ [illegible] Distributed Computing Environment will gain wider acceptance in commercial tool kits and applications, pressing IS to deliver more distributed and client/server applications.

Dealing with chaos - and learning to love it

By Garry Ray

Object-oriented, client/server, rules-based systems, relational databases, CASE: The array of new and old technologies for corporate development can be dizzying.

But hold onto your seat belt because this year promises to unleash more technologies at a frenzied pace.

Even more difficult for information systems managers will be the intricate job of welding together a raft of new and old software systems and technologies and redeploying applications on a variety of platforms.

"The dirty little secret of client/server technology is that you have to embrace complexity," says Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

"I think people are overwhelmed now," says John Morrell, senior Unix systems analyst at International Data Corp. in Framingham, Mass. "They should focus on what they're trying to build and not get too complex about it."

> The new technology frenzy will continue, but you can cope if you take it one step at a time.

Keeping it simple, though, is more easily said than done. Some companies have tried setting up new-technology labs to narrow the selection — and to spot the technology winners for their organizations.

Technology fast lane

Fidelity Investments in Boston has a team of first-look evaluators who bring many client/server products — and even a few high-end transaction processing technologies — in-house for evaluation. In Fidelity's fast-paced funds management business, timeliness is everything, and technology can help.

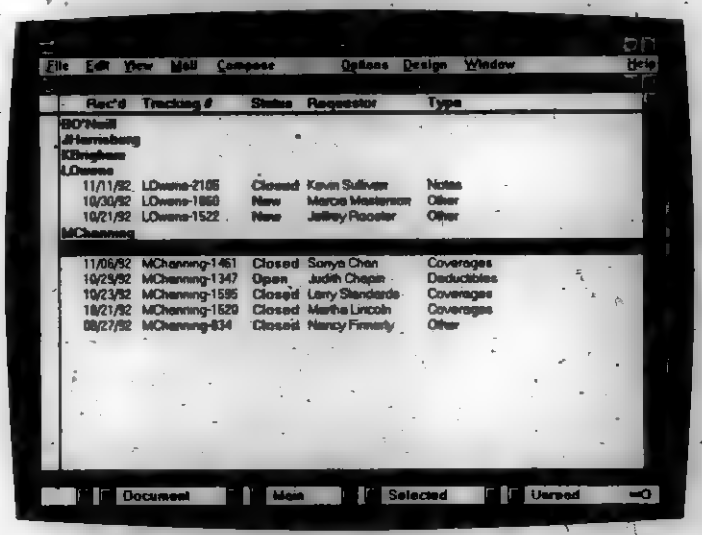
"We want to be aware of everything that's happening, and then we want to make our decisions as to where we should be in terms of technology implementation," says Fidelity Investments' Chief Information Officer, Albert Aiello Jr. But the gleam of a new technology is not enough for Fidelity to put it into immediate production. "There's no need for us to be the first one out with a new technology," he adds.

Citicorp also tracks new technology and pilot-tests promising new products in-house. "We have an extensive web of contacts at universities and other companies to find out which [new technologies] are working and which ones are interesting," says Colin Crook, senior technology officer at the bank. "Those deemed to be valuable are tested thoroughly in-house before deployment" to the bank's operations in 96 countries.

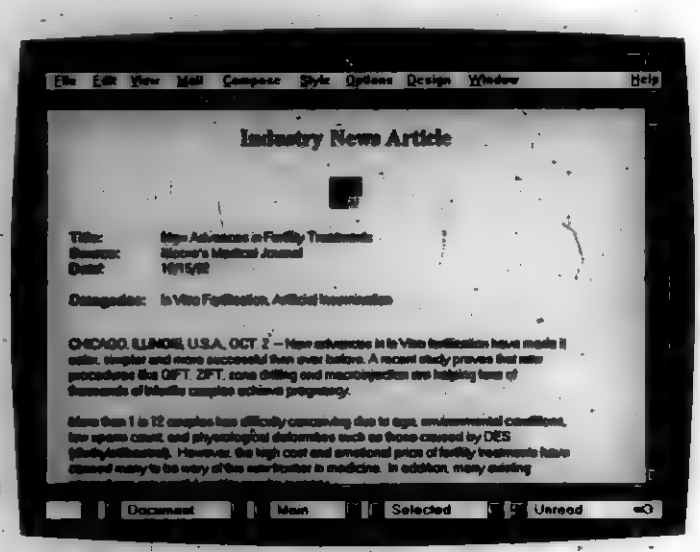
In short, experienced IS managers say don't let new technology overwhelm you. Technology is not an end in itself, and those who think otherwise are destined to fail.

"Probably the place to start is to try to get people to reach consensus on products, one product at a time," Hill says. ■

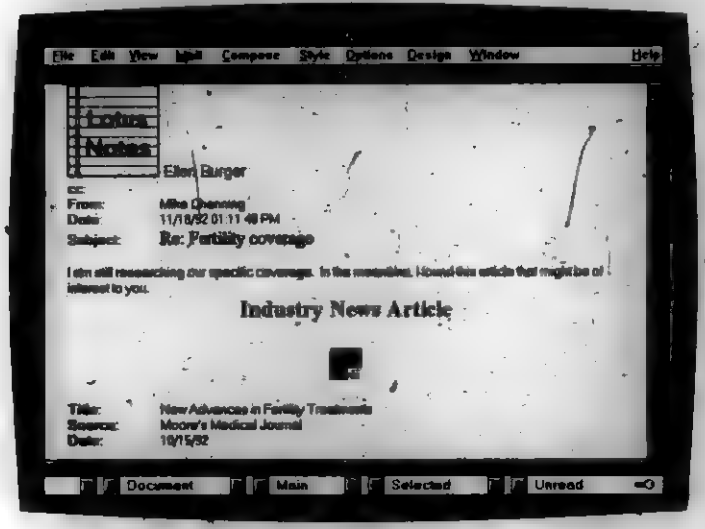
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, these are the ones he uses most frequently. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the HR INQUIRY TRACKING icon.



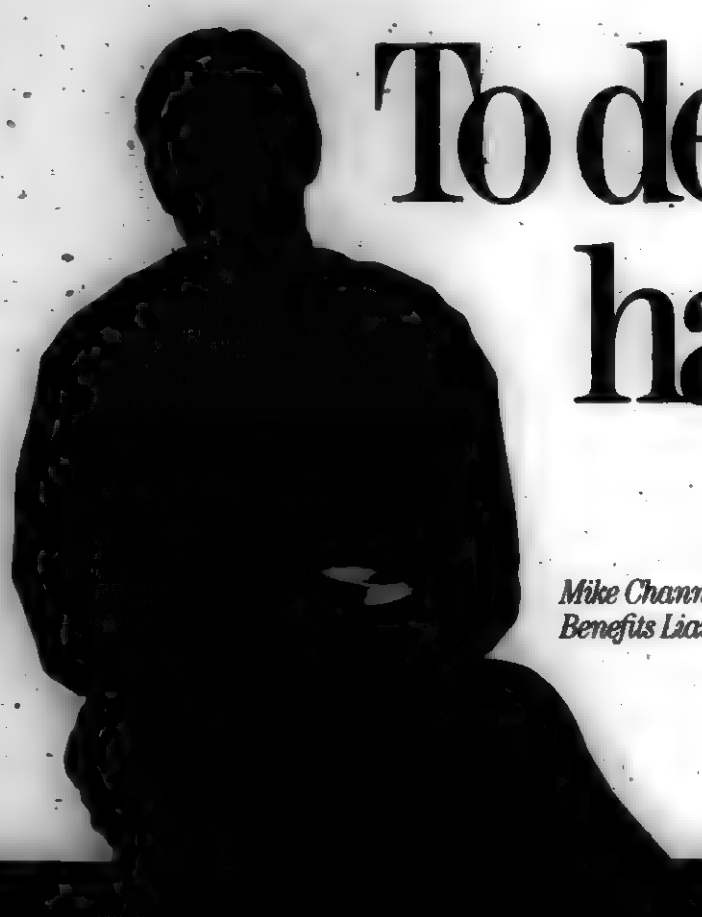
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note and forwards this document directly to Ellen. That done, he gets himself a cup of coffee.



To demonstrate th
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Mike Channing
Benefits Liaison

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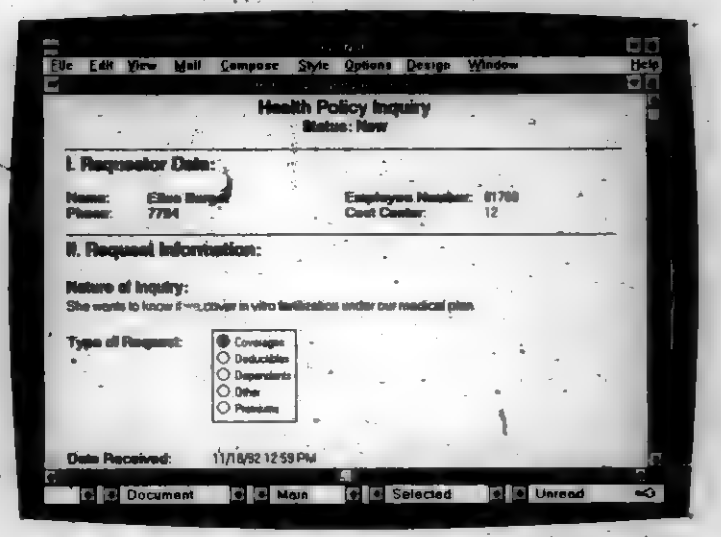
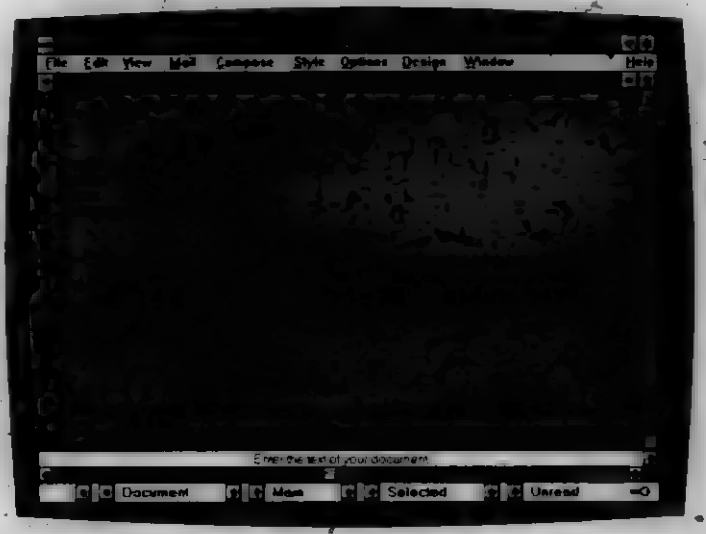
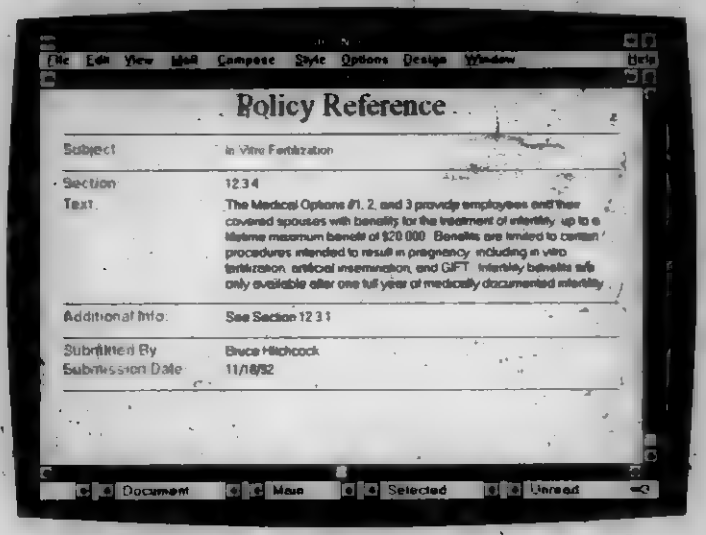


3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.

7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

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Changing Enterprise

Laggards no longer

Client/server is here to speed up those day-to-day processes

By Kim S. Nash

Speed isn't the first thing that comes to mind when you think of accounting, human resources and other financial operations. But that's bound to change.

Financial departments will at least start to consider a full or partial move to client/server this year in an attempt to speed up day-to-day processes and make financial data more accessible.

The need for speed is pushing these departments into client/server waters, but they are also being pulled by the many newly architected packages being developed (see box.)

In the pipeline are client/server applications, where part of the process logic is done on a PC or workstation and part occurs on a host. Because accounting, payroll, personnel and applications of that ilk are more generic than, say, manufacturing systems, they're an easier target for software makers to redevelop for a distributed computing model.

The move isn't as easy, though, for users. In a survey conducted by Dun & Bradstreet Software, which polled more than 350 attendees at its annual user group meeting in mid-1992, half of the information systems managers said adopting the architecture would be "extremely difficult," up from 37% the year before. The main trouble spots that have emerged include networking issues and retraining end users.

Tight finances have prohibited pilot projects at some companies. Resources are better spent by applying the new technology to small chunks of larger, real applications.

FINANCIAL

The credit department at Armstrong World Industries, Inc., for example, is taking tentative steps into networked setups anchored with file servers. The Lancaster, Pa.-based paint supplier slid some financial applications off an IBM 3090 mainframe during the past year onto a local-area network of Apple Computer, Inc. Macintoshes, some of which are clients, others servers.

That's a nimbler setup as far as Phil Cooper is concerned. As a senior credit analyst at Armstrong, Cooper bestows credit lines to customers. Figuring out these credit lines is a "major investment for us that we can now do with greater efficiency," Cooper says.

He explains that he now has more information at his fingertips while he's on the phone with a customer and can make faster but more informed decisions about finance.

Paper powerhouse Weyerhauser Co. is getting its feet wet with several small client/server projects in its financial departments, according to Tom Jones, a software manager at the Tacoma, Wash.-based company.

An IBM mainframe remains central because of the horsepower it provides, Jones says, but more of the data housed there is now available to finance users.

PC-based query and report packages will also prove a boon to financial departments. Rather than going to full client/server, users can drag chunks of data down from the mainframe and manipulate and write queries to it.

Say a customer orders more paper goods than his current credit account allows. Instead of holding the order for a few days while his credit history is checked and a decision is made about approving his order, nontechnical types can produce a report showing historical data and a summary that explains the numbers via a PC-based credit management package, such as one from SR Research, a start-up company in Cambridge, Mass. ■

MOVERS & SHAKERS

Among the vendors to watch on 1993's client/server financial scene are PeopleSoft, Inc. and Integral Systems, Inc. in Walnut Creek, Calif.; The Dodge Group in Cambridge, Mass.; Oracle Corp. in Redwood City, Calif.; and Dun & Bradstreet Software in Framingham, Mass.

More power please

Floating in chips

Customers can look for the following products next year:

DIGITAL EQUIPMENT CORP. will release some of its Alpha AXP platforms running on DEC's Open VMS and Microsoft Corp.'s Windows NT — also slated to ship next year — and on the Open Software Foundation's OSF/1 operating system, plus software to go along with the boxes.

THE MIPS COMPUTER division of Silicon Graphics, Inc. will release the T5 higher performance R4400 commercial computing chip; the VR4 chip, on which low-cost PCs will be built and available; and TFP, which offers multiprocessor capabilities for scientific high-end computing.

HEWLETT-PACKARD CO. will increase the capabilities of the company's reduced instruction set computing chip with a 64/128-bit bus structure, enhanced virtual addressing, enhanced floating-point data path and use of denser memory chips in preparation for taking advantage of 64-bit addressing in 1994.

SUN MICROSYSTEMS, INC., in the guise of SPARC International, released specifications for the company's 64-bit architecture, for which Sun and others will release platforms in 1994, officials say.

By Melinda-Carol Ballou

At engineering sites, as at comparable business organizations, the primary goal this year is to get products to market more quickly and efficiently.

As a result, all eyes are on emerging 64-bit architectures, less expensive workstations with more computing power and software tools, such as computer-aided design and manufacturing (CAD/CAM), that make use of these increased resources.

"Putting more compute power in the hands of more [engineering] users is going to stimulate the migration of sophisticated applications to broader audiences who couldn't afford them before," says Ted Krum, a senior analyst at DH Brown & Associates, a consulting firm in Port Chester, N.Y.

One of those previously unaffordable applications is "concurrent engineering," where engineers perform various parts of the design cycle in tandem rather than sequentially.

Thanks to 64-bit addressing, superscalar and superpipelining architectures and multiprocessing technologies and systems, more people can make use of that technique.

The 64-bit systems will mature in the next few years in terms of compute and I/O throughput, operating systems functionality and memory bandwidth.

ENGINEERING

As they do — and as applications evolve that make use of the new systems — user sites will have access to sophisticated simulation models that were previously unavailable or required the use of prohibitively expensive platforms such as supercomputers.

The Mayo Foundation in Rochester, Minn., for instance, will use Digital Equipment Corp.'s 64-bit Alpha systems this year to enable faster electromagnetic simulations for chip development, according to Brian Shamblin, computer systems manager.

The Mayo Foundation, parent organization for the Mayo Clinic, makes chips for use in high-speed data acquisition.

In the CAD arena, tools running on the new 64-bit workstations will speed product development by allowing users to perform more iterations of a design before committing to a physical prototype, says John Donovan, senior analyst at WorkGroup Technologies, Inc., a market research firm based in Hampton, N.H.

The following advances are expected to result from the increase in computing resources:

- High-performance, three-speed graphics at lower price points.
- Higher bandwidth networking.
- Interactive videoconferencing for design sessions.
- Tools that create prototypes from designs.

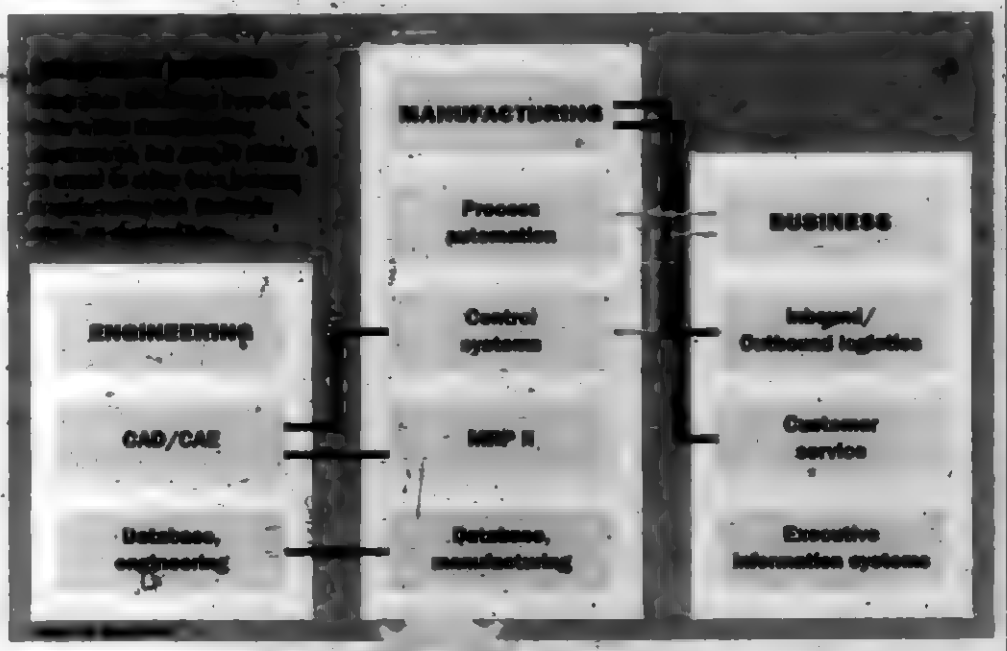
To ease application development for massively parallel computers, a number of vendors are working to standardize High Performance Fortran by early this year. This standard is likely to become more broadly used. ■

Changing Enterprise

Talk to your PLANTS

By Lory Zottola Dix and Jodie Nann

Manufacturing can no longer operate in isolation. The most pressing concern for manufacturers in the '90s will be integrating their operations with other areas of the business, according to a survey of 134 IS managers by The Yankee Group.



Integrating manufacturing with customer service/sales

■ **Enabling technologies**
Client/server technology, electronic data interchange (EDI), voice recognition.

■ **Insight**
Want to shrink your order processing time in half? You could if your system took electronic orders and used them to trigger the manufacturing process automatically. Using this method, Tandem Computers, Inc. has shrunk its turnaround time – receiving an order to shipping the product – from 17 days to two.

Client/server is one key; it enables orders to be entered into the pipeline much faster than a batch process. EDI gets orders transmitted almost instantly to suppliers, avoiding errors made from retyping information.

■ **Outlook**
Most manufacturers will head in this direction during the next few years.

Integrating control systems with business areas

■ **Enabling technologies**
Manufacturing execution systems (MES).

■ **Insight**
MES will increasingly be used to transform business plans automatically into details, schedules, assignments and material and labor requirements. It also provides a real-time reflection of what's happening on the factory floor.

Companies can also analyze MES-generated historical data to continuously improve the production process.

For the semiconductor arena, historical data analysis has become absolutely essential because yield rates (the number of good vs. bad parts made) can make or break a company. If a rival company makes 40% good parts and you only make 38%, you can go out of business.

■ **Outlook**
The growth rate for MES will be 15% to 20% through 1993.

Standard watch

One initiative everybody is keeping an eye on is **CALS**, a Department of Defense project that aims to standardize data by 1995 so it can be electronically shared among partners. Key to CALS success is **PDES/STEP**, a standard for representing product data in digital form, which enables it to be moved among computers. A PDES/STEP draft standard is expected in February.

Integration of CAD with control systems

■ **Enabling technologies**
Computer-aided design (CAD), networks, specialized "slicing software" and 386-based PCs.

■ **Insight**
In the next five years, key strides will be made in rapid prototyping – the ability to go from a CAD design to manufactured part in hours or days. In one technique, CAD data is sent to a machine that breaks the information down into a series of cross sections. The machine feeds the cross-section data into a computer-controlled laser beam, which scans the surface of a vat of photosensitive liquid that hardens as light hits it. The final result is a finished part, prototype or mold.

■ **Outlook**
The plan is to expand the process beyond only producing small parts or molds and to improve durability. No one is mass-producing huge products this way today.

Integrating the shop floor and back-office operations

■ **Insight**
At Texas Instruments, Inc. in Dallas, factory floor and back-office processes are coming together. When a worker logs on to a system in the shop, information on where he is working and for how long is gathered into a labor collection system. The system then generates payroll.

"We don't have time cards or time clocks," says Rusty Patterson, advanced technology operations manager. The system shuts off if a certain amount of time goes by without any user input. "It logs them into a nonrecoverable section of my overhead, so we're not charging [customers] for something we're not working on."

Integrating manufacturing with engineering

■ **Enabling technologies**
Product information management systems (PIMS).

■ **Insight**
PIMS will increasingly enable engineering and manufacturing information to be managed as a single cycle, allowing the engineering data to fall much more rapidly into the manufacturing process.

This in turn will permit new products to be created and sold much faster. If your company notices a particular trend in the marketplace, you can change the design quickly.

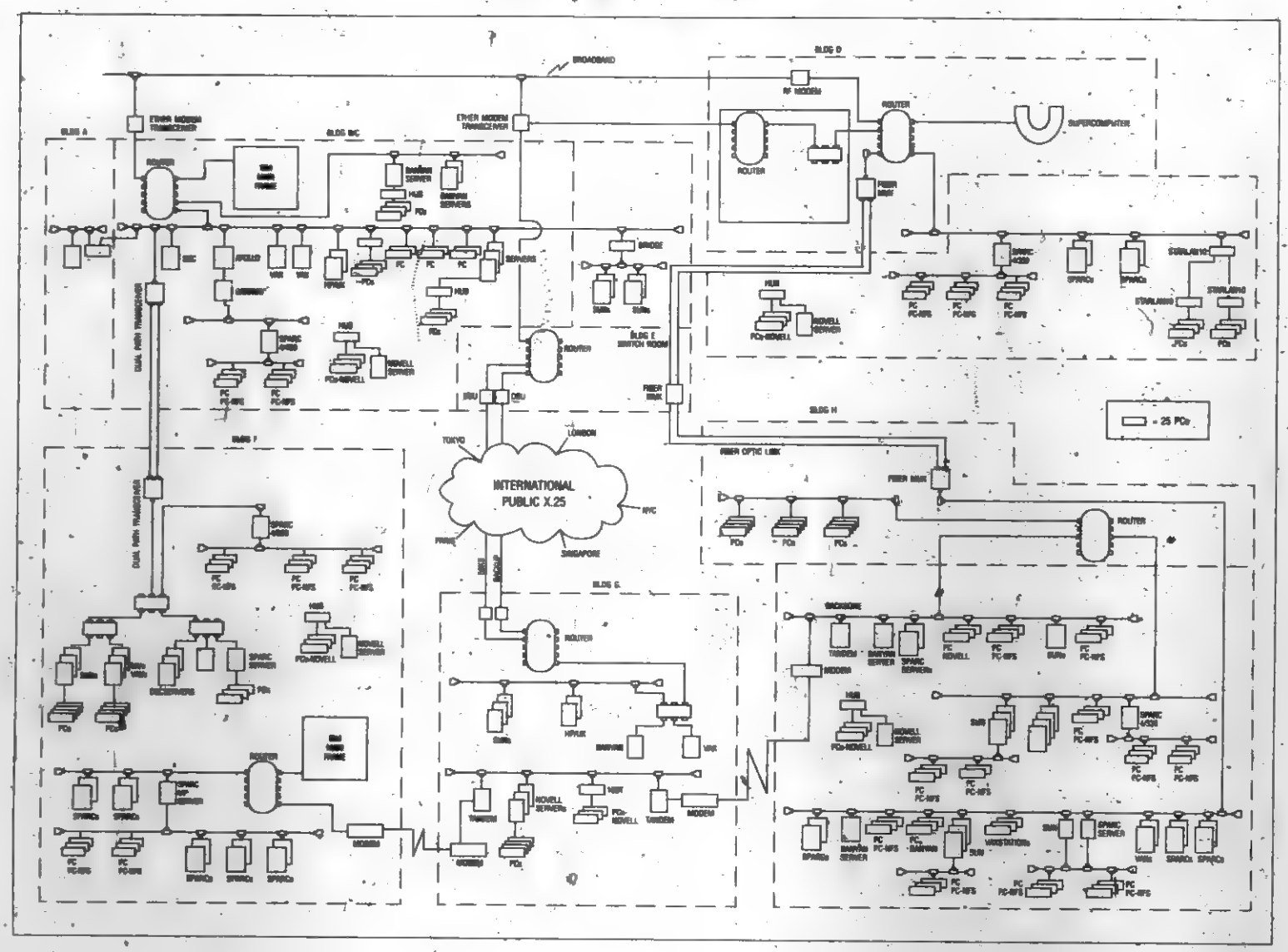
PIMS also limit quality problems. For instance, a manufacturing person can peer over an engineer's shoulder (via the system) to see what a design looks like. If he sees a potential problem, he can suggest a design change.

In the past, companies had to build these systems on their own. With the advent of the off-the-shelf turnkey PIMS, companies do not have to pay up to $20,000 per engineer to build such a system. Costs have dropped to about $2,000 per engineer.

■ **Outlook**
PIMS will continue to gather momentum in the next few years, with sales growing roughly 33% per year.

Sources: Nate Moore, manager, corporate quality services, Westinghouse Productivity and Quality Center, Pittsburgh; Bradford Smith, chairman, ISO standards subcommittee, Gaithersburg, Md.; Martin Pierczalski, director, and Harry Tse, analyst, The Yankee Group's Manufacturing Automation Planning Service, Boston; Roger N. Nagel, deputy director, The Iacocca Institute, Bethlehem, Pa.

Perception.



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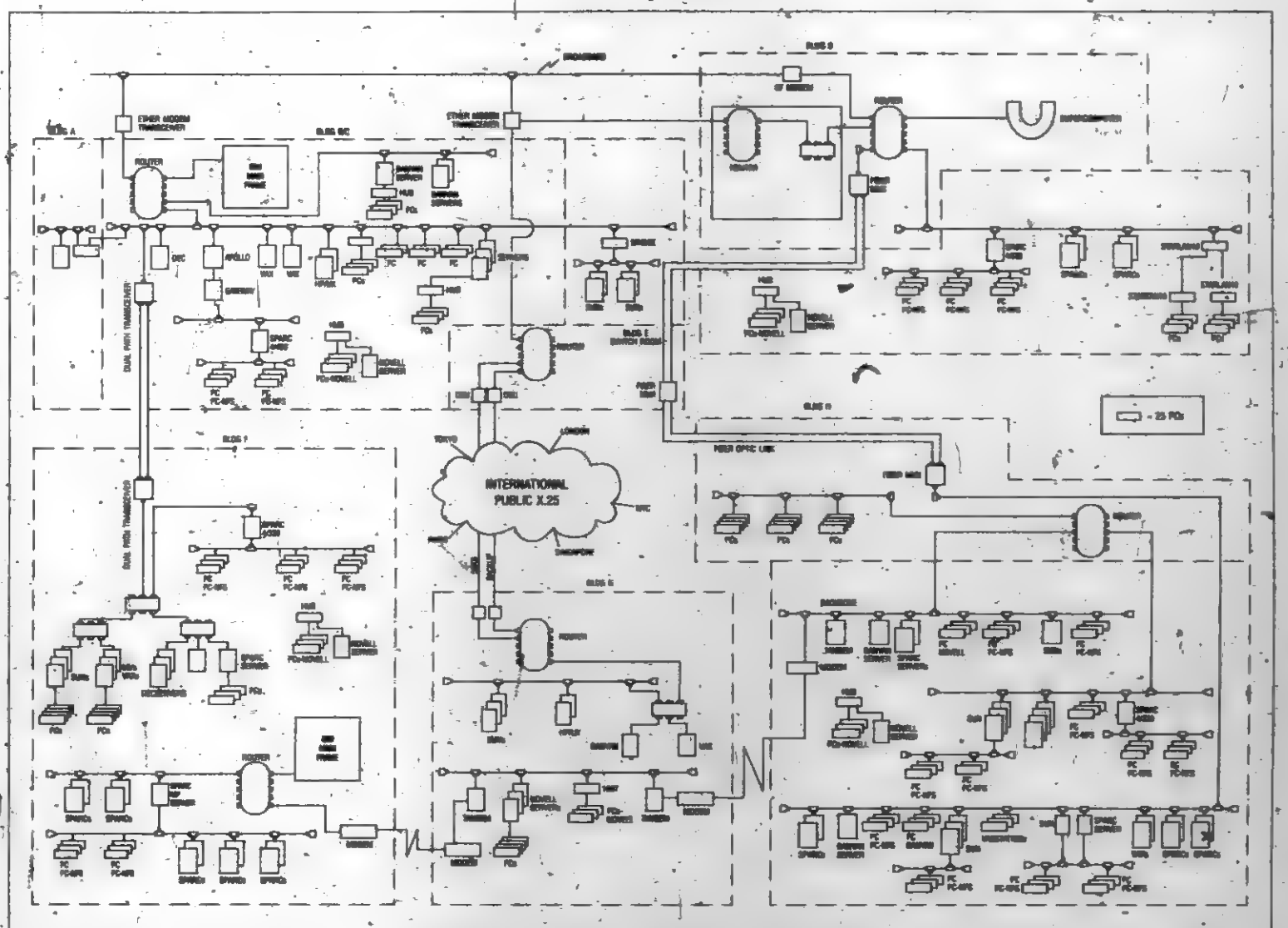
Reality.



(We should talk.)

The confusing jumble of resources you think you have, is, unfortunately, the confusing jumble of resources you actually have.

And while nobody can truthfully say it's easy connecting your PCs to these resources, there is a solution.

It's a robust, TCP/IP-based, PC networking software product called PC-NFS.®

PC-NFS software allows you to connect not just a few PCs, but hundreds, or even thousands of PCs. To over 90 major platforms, including UNIX® workstations, VMS,® and IBM® mainframes. With no gateways, bridges or routers. It supports key standards for multivendor network computing such as Sun's Open Networking Computing/Network File System (ONC™/NFS®) and TCP/IP. Giving you the most open and scalable network operating system for PCs on the market.

Today, more than one million people in major companies around the world are using PC-NFS to access corporate-wide applications, servers, printers, files, and storage devices—all without sacrificing their familiar MS-DOS® and Microsoft® Windows™ environments.

So, if you are hearing a distorted view of reality from other vendors, give SunSelect a call at 1-800-24-SELECT. You'll change your perception of PC-to-enterprise networking forever.

SunSelect
A Sun Microsystems, Inc. Business

Changing Enterprise

What happens when 'close enough' isn't close enough anymore?

By James Daly

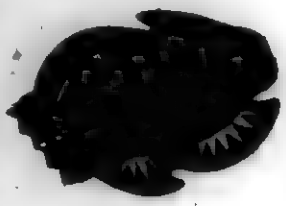
At Associated Grocers, Inc. in Seattle, hunches don't go as far as they used to. In fact, they don't go very far at all.

Faced with the task of stocking 350 grocery stores in Washington, Oregon, Alaska and Hawaii each day, the folks at Associated Grocers used to team up with suppliers to make educated guesses about how much soap powder would sell that week or whether to stock up on Bing cherries. Daily sales figures could take days to arrive at corporate headquarters.

No longer. Today, a machine at the checkout counter records the quantity of each product sold and delivers that data to product warehouses each day. For instance, a soup that sells out on a chilly Thursday evening will be completely replenished on Friday morning.

"Just-in-time inventory is no longer something we dream about but [something] which we employ every day," says Richard Lester, vice president of information systems.

What has changed is the company's increasing use of electronic data interchange, which allows it to write, authenticate and deliver electronic purchase orders. It's a move that has "fundamentally changed the nature of our business," Lester says.



DISTRIBUTION

As at many companies, technology at Associated Grocers is completely changing the way the company delivers its product or service. More and more, IS managers are being asked to help out in the critical area of distribution.

At McKesson Drug Co. in San Francisco, a new technology has all but eliminated what was once an annoying and costly thorn in the side of the $10 billion pharmaceuticals distributor: mispicks. At any complex distribution center, the chore of tracking millions of individual items as they shuffle from forklift to tote box is extremely complicated and vulnerable to human error.

Douglas Thompson, senior vice president of distribution services, estimates that each warehouse mispick was costing the company about $80 in lost time and shipping costs — seven times more than the cost of filling an order correctly the first time.

> No more mispicks, no more guesstimates. That's the goal of new distribution systems.

Accuracy in a glove

McKesson warehouse workers are now using in-house-built "wearable PCs" to track deliveries, increase the accuracy of customer shipments and generally improve service. Weighing less than 13 ounces, the AcuMax fits over the worker's hand and forearm like a glove. When the employee picks up an order form, he activates a scanner in the glove by pointing an index finger at the customer's bar-coded shipping label. The scanner then tells the picker the exact location of the item to be picked. The picker goes to the case lot and confirms the order by using laser beams from the AcuMax to read data on bar codes up to 20 feet above the warehouse floor.

Before AcuMax, McKesson tried to rely on pistol-shaped bar-code readers. But because these portable scanners require two hands to operate, they never really caught on in a warehouse where workers need both hands to do their job.

While the moves of both Associated Grocers and McKesson have brought new speed and accuracy to product delivery, IS warns of pitfalls that are often associated with such a technical evolution. The most important of these is miscalculating the real development and operations costs of the products in the channel.

Short-term costs, such as the price of all the technologies and training needed to start the program, as well as long-term factors, such as upgrading the equipment or general upkeep, may be overlooked or underestimated.

Prepare for tomorrow

Also, beware that the technology you're using to ease distribution doesn't become obsolete. If you are unwilling to keep the products modernized over the years at some suitable cost, alternative technologies should be available.

In addition, psychological considerations should not be overlooked. You will need to spend a lot of time marketing the new way of doing things as well as adjusting internal perspectives before staff members feel they can rely on and accept the new technology.

"IS needs to evaluate all these concerns," says Rick Maroit, IS manager at Great Central Insurance Co. in Peoria, Ill. "We can't simply force our own way at every opportunity." ■

Key techs

- Increased use of alternate-input technologies. These include the AcuMax scanner glove (see story at left), pen-based PCs, bar-coding and voice-recognition machines.
- Wireless technologies will arrive in an early form, heralding greater things to come mid-decade. These will be used to transmit data quickly without costly and complicated wiring setups.
- Electronic data interchange.
- Use of multimedia to provide instantaneous off-site training for new technologies.
- Expanding use of CD-ROM to collect and distribute far more information to shippers in a more timely fashion.

More users! This time, it's your CEO

As executives learn of time savings, big cheese use of computers is rising

By Joseph Maglitta

Top bosses often talk a good game about the importance of using technology to make their businesses more competitive. But when it comes to practicing what they preach, many have traditionally been — to put it bluntly — techno-cowards.

But wait: There are signs that top corporate chiefs in marketing, sales, administration and other nontechnical areas are showing more interest in using technology to improve their own productivity.

A recent *Computerworld*/Andersen Consulting survey of top executives in 200 large U.S. corporations showed that executive use of desktop technology is rising. The percentage of chief executive, operating and financial officers who said they use a PC or terminal in their daily work rose to about 56%. Many expressed interest in knowledge-based and executive information systems (EIS).

What's really nice about the increased interest is that executive fervor can help spread technology in the ranks across an entire company. That's what happened at Bay State Gas in Westboro, Mass., where high-level enthusiasm helped expand a PC-based EIS into general use, says John Doucette, vice president of administration at the 270,000-customer utility. "It's the first thing [top executives] turn on in the morning," Doucette says.

CORPORATE

Company officers using Pilot Executive Software's Lightship product installed in January have point-and-click access to group calendars, shipping and financial information and more, according to Doucette.

Topping many executives' priorities is managing the flow of outside information. Personal productivity, many bosses say, can suffer badly from information overload. Some are turning to a variety of software-based "information screens," or filters, to manage the mountain of data they need to do their jobs.

Among the enthusiastic users of these products and on-line services is a corporate licensing director at Merck & Co. in Rahway, N.J.

"I tell [the screen] what my thinking is so that I'm not weeding through 200 gazillion press releases," says the director, who uses a product from Individual, Inc. in Cambridge, Mass. ■

If you're looking for a computer that will grow with your needs, there are basically only two ways you can go.

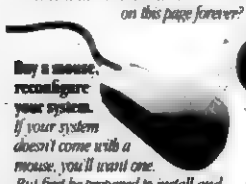
The hard way.

Add Windows, buy a new PC. *Most PCs in use today weren't designed for graphical computing. So if you want to run Windows, you may have to buy a new computer. Why not consider a Macintosh and avoid all the problems on this page forever?*

Add networking card, reconfigure your system. *To share files and send e-mail to other PCs, you may have to add a card. This means going through the long, tedious process of reconfiguring your system. On a Mac, you just plug in a cable.*

Upgrade your memory, reconfigure your system. *Add memory to a Mac, and it reconfigures itself accordingly. But add memory to a PC, and you'll almost always have to run a setup program to configure the new memory – or the computer won't know what to do with it.*

Add almost anything, reconfigure your system. *Expanding your PC's capabilities can be amazingly frustrating. But a Macintosh easily adjusts to whatever extra device you add to it.*



Buy a mouse, reconfigure your system. *If your system doesn't come with a mouse, you'll want one. But first be prepared to install and configure a special software driver. (No need with a Mac – you just plug it in.)*

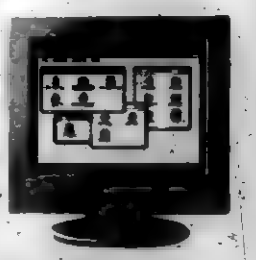
Play and record sounds, reconfigure your system. *Multimedia promises to be the future of computing. But most PCs aren't ready for it. So if you want to work with sound, it'll cost you time and trouble – not to mention money. On a Mac, sound is built in.*

Call for help, write a check. *There is one easy way to expand a complicated PC – hire somebody else to do it for you. Over time, of course, that can wind up costing you more than the PC.*

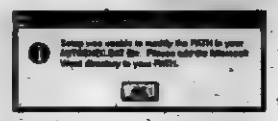
Add peripherals, reconfigure your system for each one. *Want to add a CD-ROM or hard disk drive? Then prepare to spend hours installing cards, flipping switches and editing files – for each one. With a Mac, you can add up to seven peripherals by simply plugging them in and clicking a button or two.*

Add printer, adjust DIP switches. *Hooking up a printer seems easy. Until you set your DIP switches, install your driver, locate your Windows diskettes, make an error and start all over again.*

Expand your PC, take two aspirin. *Inevitably, you'll want to expand your computer's capabilities by adding extra devices. The more instructions you slog through and switches you fiddle with, the more time it will take. And the more pain reliever you'll need.*



Change monitors, reconfigure your system. *Add a new monitor, and you'll have to reconfigure your entire system – or your monitor could look like this one. A Mac recognizes a new monitor and adjusts to it automatically.*



Whoops! *When you add something to an ordinary PC, you may have to "reconfigure" your system – a process of hardware and software adjustments, which can be complex, tedious, and take up hours of your time.*

Manual labor. *Software like Windows purports to make things easier. But the reality is, you'll still spend hours reading manuals just to make it all work – time you could spend doing more useful things with your computer.*

On a typical PC, even adding a simple hard disk can be extraordinarily complicated. You'll probably have to "reconfigure" your system – the time-consuming process of telling your computer what pieces you've added. You may have to edit complex CONFIG.SYS and SYSTEM.INI files, install special device drivers and fiddle with DIP switches. And, of course, building even a basic network is extremely difficult – what with installing

The easy way.

Macintosh is designed to make it easy to grow. Networking and sound support are already built in. File sharing and multimedia capabilities are standard. So is support for up to seven peripherals. Which means you can add everything you see on the other page to this Macintosh IIfx without using up a single expansion slot. Leaving room for things like an accelerator card, an Ethernet or Token Ring card or other cards that allow you to customize a Mac for high-performance or specialized tasks.

cards and networking software. An Apple® Macintosh, on the other hand, knows when you've added a hard drive. Installing a CD-ROM drive or scanner is a matter of plugging in a cable and clicking a couple of buttons. Even installing a network requires nothing more than plugging one Mac® into another. It's just one more example of how a Macintosh works in a simple, logical way. So you can, too.

If you know how to use a plug, you know how to expand a Macintosh.

This Macintosh IIvx has built-in monitor support for up to a 14" color monitor. Buy a card, and you can add a second monitor – significantly enlarging your desktop work area so you can move documents, files and folders across both screens.

Plug in an AppleCD™ 300 CD-ROM drive, and you'll have access to huge libraries of reference sources, fonts, clip art and video images on CD. (It even supports Kodak's exciting new Photo CD technology.)

A Mac gives you professional-quality documents even if you're on a student budget. Just plug in an Apple StyleWriter™ printer.

You can easily record sound into every new Macintosh computer. Most even come with a microphone.

Plug in a SyQuest drive, and you'll have virtually unlimited hard drive storage via removable 44MB or 88MB cartridges.

Plug in an Apple Personal LaserWriter™ NTR, and everyone in your workgroup will have access to the fastest printer in its class. (It works with PCs, too.)

Plug in an external hard drive or other storage device, and you increase your storage capacity in seconds.

Plug in an Apple LaserWriter IIg, and everyone on your network will instantly be able to take advantage of the Apple PhotoGrade™ technology that rivals 800 dpi printers costing thousands more – for spectacular-looking documents.

Plug in an Apple OneScanner,™ and you can add beautiful black-and-white photographs to your documents with one touch of a button. No fussing or fiddling required.

Adding a peripheral to a Mac is as easy as using one. Plug it in, click a couple of buttons and get back to work.

For the second consecutive year, J.D. Power and Associates ranked Apple highest among Personal Computer Companies in Overall Customer Satisfaction.** And no wonder: whether you're writing a letter or adding a CD-ROM drive, only Macintosh makes things genuinely easy. Giving you the power you really want from a personal computer. The power to be your best.* Apple

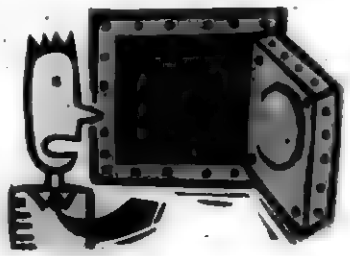
For the name of your nearest authorized Apple reseller, call 1-800-538-9696, ext. 230. In Canada, call 1-800-665-2775, ext. 910. *Invoice prices are based on industry averages. **J.D. Power and Associates' 1991 and 1992 Computer End User Satisfaction Studies. 1992 study conducted among 2,255 business and users at 1,145 business sites. © 1992 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, LaserWriter, Mac, Macintosh, StyleWriter and "The power to be your best" are registered trademarks of Apple Computer, Inc. AppleCD, OneScanner and PhotoGrade are trademarks of Apple Computer, Inc. Kodak and Photo CD are trademarks of Eastman Kodak Company. Windows is a trademark of Microsoft Corporation. SyQuest is a registered trademark of SyQuest Technology. This ad was created using Macintosh personal computers. L0366LUA

Changing Enterprise

Winning more paper chase

How IS will be getting, prioritizing and allocating money next year

By Michael Sullivan-Trainor and Lory Zottola Dix



Budget request time

Creating a shopping list

Figuring the cost

Meeting with management

Lengthy approval

HOW LONG DID IT TAKE TO OBTAIN APPROVAL FOR YOUR 1993 BUDGET?

Percent of respondents*	
Less than 1 week	11%
1 to 3 weeks	14%
3 weeks to 1 month	13%
1 to 2 months	18%
2 to 3 months	22%
3 to 6 months	15%
More than 6 months	2%
Other/don't know	5%

*Numbers have been rounded

Networks and more

WHAT IS YOUR HIGHEST INVESTMENT PRIORITY?

LANs and WANs	34%
Client/server	16%
EIS and DSS	13%
EDI	12%
Image processing	6%
CASE	5%
Fiber optics	5%
Other	9%

Requests mostly granted

HOW WAS THE AMOUNT GRANTED DIFFERENT FROM WHAT YOU REQUESTED?

IF LESS, HOW MUCH LESS?

1% to 5%	28%
6% to 10%	35%
11% to 20%	19%
More than 20%	12%
Other	6%

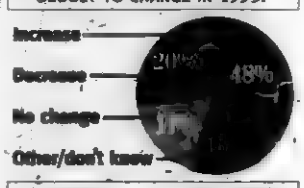
IF MORE, HOW MUCH MORE?

Less than 1%	20%
1% to 5%	80%

Trimming the fat

Bigger budgets

HOW DO YOU EXPECT YOUR IS BUDGET TO CHANGE IN 1993?



IF INCREASING, BY HOW MUCH?

1% to 10%	72%
11% to 30%	21%
31% to 100%	7%

IF DECREASING, BY HOW MUCH?

1% to 10%	55%
11% to 30%	28%
31% to 100%	17%

Response base: 7,905 IS professionals

Source: CW Database Division

Staff biggest expense

WHERE IS THE MONEY SPENT?

Staff	30%
Hardware	19%
Software	12%
Maintenance	9%
New applications	8%
Personal computers	7%
Data communications	6%
Capital investment	4%
Training	3%
Service contractors	2%

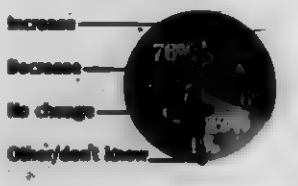
FOR EVERY IS DOLLAR SPENT, HOW MUCH IS SPENT BY USER DEPARTMENTS?

Less than 10¢	28%
11¢ to 15¢	12%
16¢ to 30¢	8%
31¢ to 50¢	11%
51¢ to $1	12%
$1 to $1.50	5%
$1.51 to $2	1%
More than $2	5%
Other/don't know	18%

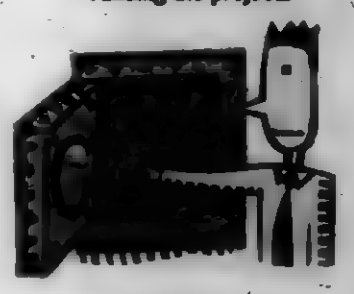
Less staff; more hardware

HOW WILL THE IS STAFF CHANGE IN 1993?

HOW WILL THE INSTALLED VALUE OF INFORMATION SYSTEMS CHANGE IN 1993?



Funding the projects



Rainy day savings

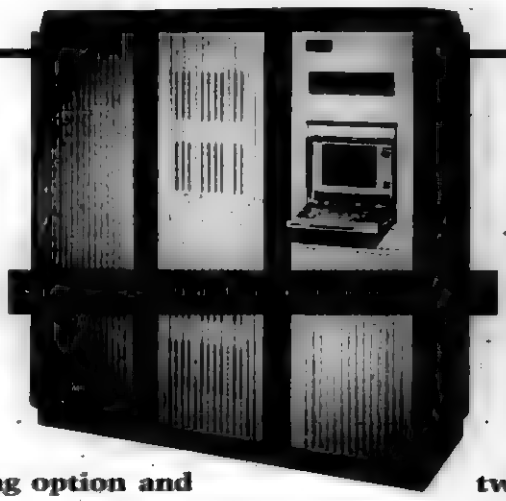
Illustrations: Robert Zimmerman

Source: Exclusive CW Forecast Survey; response base: 502

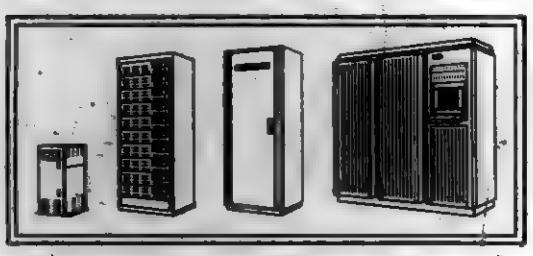
The survey also found that the bulk of the IS investment will go to customer service and manufacturing functions, with finance/administration and sales/marketing a close second. The third spending priority will be distribution.

There's one little word that can strike terror into the hearts and minds of Information Services professionals everywhere: downtime. But thanks to the new Symmetrix 5500 from EMC, it's one word you can virtually banish from your vocabulary.

If your data is mission critical, it's critical you read this ad.



You see, the Symmetrix 5500 ICDA™ is designed with redundant hardware components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime. In short, Symmetrix 5500 brings continuous operation to mission critical sites that need access to data 24 hours a day, seven days a week.



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

And because it's based on EMC's proprietary Integrated Cached Disk Arrays (ICDA™) technology, there's simply no faster way to access data on an IBM or compatible mainframe computer. The Symmetrix 5500 also brings all the features of the Symmetrix Series to mission critical environments: a small footprint, low power and cooling requirements and a two year warranty that add up to reduced cost of ownership and a maximum return on your storage investment.

Downtime can cost your business over $100,000 a day. So, if your data is mission critical, make it your mission to learn more by calling 1-800-424-EMC2, ext. LM67C.

EMC²
THE STORAGE ARCHITECTS

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Forecast: Changing Industry

For the industry, it's time to pare down, bulk up, get sophisticated, get a little crazy – anything to survive.

Staying alive

The 'little guys' try to grow up

By Carol Hildebrand

Look out, information systems managers: PC software vendors are gunning for you. No longer are they simply tempting microcomputer managers with the latest in software features; now they're coming after corporate decision makers with a much more sophisticated bag of tricks, consisting of an expanding variety of services.

All the new approaches — different distribution channels, fledgling consulting services, software bundling — are aimed at finding new ways to sell directly to a tougher and more skeptical user target: IS decision makers.

Consider the following:

• **Microsoft Corp.** has unveiled 24-hour, seven-day-a-week support programs, along with the "Open Process," under which third-party developers and user companies are invited to preview and comment on Microsoft works in progress.

The company also launched a major service and support initiative, dedicating $100 million to help revamp its image as a company cold on service.

That kitty also includes an expansion of its consulting arm. Microsoft has also tweaked pricing for single and bundled applications.

• **Borland International, Inc.** has extended technical support lines and added the "EASE" program, which encompasses prerelease evaluation, volume purchasing, maintenance and technical support.

An Integration Partners Program targets integrators such as Arthur Andersen & Co. Borland has been a leader in innovative pricing schemes.

• **Novell, Inc.** has a Consulting Services unit that works with resellers to customize NetWare. A Key Accounts program sets up large NetWare sites with an account manager and provides a direct channel to Novell for support and planning needs.

• **Lotus Development Corp.**'s consulting business preceded Microsoft's, and it works with accounts implementing complex products

Little guys, *page 42*

UP *and* COMERS

Affiliated Computer Systems, Inc.
Dallas

You may know of this outsourcer because of the publicity surrounding its claim that IBM's outsourcing practice violated antitrust laws. That went nowhere, but this 4-year-old firm is now a $179 million company and has caught onto innovative financing — such as making equity investments in its clients through its financing subsidiary, ACS Capital. Expect more noise this year, including bigger accounts.

Compaq Computer Corp.
Printer Division
Houston

Skeptics doubted that anyone could

Continued on page 42

Changing Industry

The 'little guys' try to grow up

CONTINUED FROM PAGE 41

such as groupware. It has also eased up on licensing policies and is pushing Smartsuite, its integrated application set.

• IBM spun off its entire PC division in a seemingly successful bid to react more quickly to pricing and product demands. This move is piquing the curiosity of some accounts that strayed.

Analysts say IBM's move from dictator to accommodating partner stems from efforts by many desktop software and hardware suppliers to work directly with IS management. Vendors clearly are willing to make concessions, often on price, to get the business.

For example, in early 1992, Lotus announced a huge deal with Arthur Andersen and its affiliate Andersen Consulting to acquire 20,000 copies of Notes.

Flexibility on licensing was key to the deal, says Charles Paulk, Andersen Consulting's chief information officer. He adds, "On the licensing issue, they are all struggling with how to [accommodate] large firms."

With vendors providing consulting services and often selling nonproprietary products, lines between segments of the market are blurring.

In the works

Expect more deals like the Andersen one in the PC software industry. "Users are looking to deploy enterprise-wide solutions, and that is IS' business," says Will Fastie, an analyst at Alex. Brown & Sons, Inc. in Baltimore. Ronan McGrath, vice president of IS and accounting at Canadian National Railways, agrees that many IS departments are seeking "mainframe-type relationships" with their PC vendors in order to obtain direct access to a point person who can address their problems.

McGrath adds that "any company that thinks it will continue [solely] on the retail level isn't familiar with the amount of restructuring that's going on."

Chasing corporate dollars

Many desktop vendors began wooing IS-level corporate buyers as their software took on higher visibility in corporate IS shops.

Take Novell, already the dominant player in the local-area network market, with a market share of more than 60%, analysts say.

But most of that lies in small companies, workgroups or departments. So Novell is pushing to establish NetWare as a computing platform of choice within the Fortune 1,000.

For example, in early 1993, Novell plans to release NetWare 4.0, a re-architected version of its NetWare operating system designed for the high-end, corporate LAN site.

NetWare 4.0 will include many — but not all — features high on the list of IS buyers, including a 1,000-user version, a distributed, X.500-based directory service, the ability to run applications in protected memory, support for mirrored servers and protection against hardware failures. "Novell is now providing the products that corporate NetWare users really need; and they're coming not a moment too soon," says Marc Dodge, telecommunications department manager at United Parcel Service, Inc. in Mahwah, N.J.

Users like what they're seeing, but there's always one more step. "What we'd like to see is the major [PC] vendors expend the resources needed to understand the businesses that we're in," says Craig Goldman, CIO at The Chase Manhattan Bank NA in New York. ■

Staff members Rosemary Cafasso, Christopher Lindquist and Michele Doutert contributed to this report.

Service and support — that's where the money is

By Thomas Hoffman

Heavyweights of the industry that once prospered from high-end hardware sales have been forced to refocus on service and support as their customers realign purchasing plans with a more desktop-oriented view of the enterprise.

As customers funnel dollars toward downsizing projects, big-iron vendors will turn to consulting.

Traditional hardware vendors, such as IBM, Digital Equipment Corp. and Unisys Corp., found out the hard way that dollars once reserved for big iron are now earmarked for downsizing and re-engineering projects.

All three companies have already staked out a piece of the services turf and are betting heavily that those revenues will grow. Analysts say the service sector is increasing at a 12% annual clip.

Plans to expand services next year won't be enough, industry experts say. Users are looking for vendors they can partner with, particularly in the area of multivendor integration. "We want our vendors to form an alliance to make their products work better together," says Dennis Healey, vice president of MIS at Toys R Us, Inc. in Paramus, N.J.

IBM is trying to meet these requirements. In October, it announced the IBM Consulting Group. Robert M. Howe, who heads the unit for IBM, says it will remain objective in providing the best hardware and software to fit customer needs — even when the item in question doesn't have an IBM logo on it. "You can't be a player in [client/server] today and insist that it has to be IBM," he says.

Looking to next year, Howe says all service firms will have to focus on consultation and services directed at transforming or re-engineering business processes aimed at improving customers' profitability and services to their own clients.

Users will be more focused on reducing operational costs and less concerned with cutting information systems expenditures, according to Julie Schwartz, an analyst at Dataquest/Ledgeway Group, a Framingham, Mass., services research firm.

By using a mix of technology and services to re-engineer business processes, Schwartz says users will be looking to enhance their companies' revenue potential.

IBM
IBM lost $2.76 billion in its third quarter ended Sept. 30, but services for that period grew 38% to $2.3 billion.

Lotus
Consulting revenue is just 10% of total 1992 Lotus revenue but is growing twice as fast as expected.

Better than before

Jeffrey Kaplan, another Dataquest/Ledgeway analyst, says the largest service firms — namely, Electronic Data Systems Corp., Andersen Consulting, IBM, DEC, and Hewlett-Packard Co. — have been increasing their desktop and network support.

Kaplan says IBM, through its Integrated Systems Solutions Corp. (ISSC) outsourcing unit, is offering customers considerably more downsizing services than it once did.

Dennie Welsh, ISSC's president, says Advantis, the joint venture between IBM and Sears, Roebuck and Co., will provide broader voice and data networking capabilities by expanding the scope of technologies such as electronic data interchange. IBM also introduced an Open Systems Center in Dallas.

The facility houses a wide variety of multivendor systems and was developed to enable users to come in and troubleshoot integration problems between different platforms.

• DEC plans to offer users "teams" of re-engineering and downsizing specialists in 1993, according to Nick Sharma, DEC service marketing and planning manager.

The company will focus on four major service areas in 1993: multivendor services, outsourcing, systems integration and downsizing, along with multivendor interoperability.

• HP has expanded help desk services to support customers' multivendor products on any competitive platform.

• Unisys, meanwhile, has combined professional services and maintenance support under one umbrella.

The program can bill customers for services on a monthly basis instead of a large onetime annual fee, which may remove a barrier for prospective customers who are wary about paying large up-front services fees. ■

UP *and* COMERS

go head-to-head with Hewlett-Packard Co. on printers. But Compaq cannily aimed its first two products at its traditional stronghold (networking), trumped HP's 3Si on a few printer capabilities and beat it on price as well. The addition of printers into Compaq's product line could make the idea of one-stop shopping more alluring, analysts predict.

Cooperative Solutions, Inc.
San Jose, Calif.

This venture capital-funded firm — founded by former Tandem Computers, Inc. software executives and one of the largest software ventures ever at $29 million to date — has a highly regarded client/server application development tool set named Ellipse. The product, which works like a fourth-generation language that generates code, bridges the gap between Windows, OS/2 and Unix. It also supports graphical user interfaces and code-sharing among programmers and is rumored to

Changing Industry

Small-company spirit

As revenue continues to dip, the big guys try to change their image as 'just order-takers'

By Johanna Ambrosio and Melinda-Carol Ballou

If the large systems vendors want to do anything beyond just barely scraping by this year, they will have to heed customer demands for more open, more modular and less expensive big iron.

"Cost and price are what's driving us," says Marvin Ehlers, vice president of MIS at Natural Gas Pipeline Co. in Lombard, Ill. "Any way our cost of doing business can come down is what we're looking for."

Even more than last year, 1993 will be a test of how well the mainframe and minicomputer vendors can adapt to customers' changing requirements.

IBM, for example, faces a tough fight as it brings to market its top-of-the-line eight-way mainframe, technology that some of the plug-compatible vendors, including Amdahl Corp., are already shipping for less money.

DEC

DEC's $6.23 billion in services revenue was almost 45% of its '92 fiscal $13.93 billion revenue.

Some users have already said they will look more to the plug-compatible manufacturers this year because of their lower prices.

It's also a safe bet that more client/server systems will be implemented at customer shops, forcing big-systems suppliers to pull out all the stops to compete with these smaller fry and convince customers that, yes, they still need the large machines.

Economic considerations

Although the mainframe market will grow this year (albeit in the single-digit range), the economy looms large as a big "maybe" factor. At the very least, large systems vendors will likely report another year's worth of poor to middling results and may even have to go through another round of cutbacks similar to last year's.

Another big "maybe" factor is the customer. Many are grappling with how best to tap technology to serve their businesses. "Someone put a hand grenade on the table, and we all ran," says John Stevenson, vice president of MIS at Dr Pepper/Seven Up Cos. in Dallas.

"There used to be a white stripe down the highway, and you knew if you stayed within the lines you'd be OK. But that's not there anymore, and the profusion of options has challenged us quite a bit," Stevenson said.

As a result of this confusion, customers "are not likely" to write checks — "especially big checks," says analyst Bob Djurdjevic, president of Annox Research in Phoenix.

Naturally, the big-iron vendors won't stand idly by. IBM will try to fight back with more open, modular mainframes while pledging to deliver at least initial versions of MVS ja 1993 that adhere to standards such as Posix and the Open Software Foundation's Distributed Computing Environment.

Unisys

Unisys' total service revenue is growing at an 8% annual rate, totaling approximately $1 billion.

IBM will also position its mainframe as more of a client/server computer. It is expected to unveil more products that will work within its Systems Complex (Sysplex) architecture to link mainframes with one another and with other, smaller machines.

Some users have already said they will look more to the plug-compatible mainframes this year because of their lower prices.

The big boys play

Meanwhile, Amdahl, Unisys Corp., Hewlett-Packard Co. and NCR Corp. are expected to play up their Unix-based mainframes, as well as better price/performance vs. IBM.

Other IBM strategies call for pushing current and new, higher end RISC System/6000 Unix computers further into commercial accounts and aggressively marketing its services companies, including a new consulting company formed last year, IBM Consulting Co., and Integrated Systems Solutions Corp. for outsourcing.

Late last year, however, IBM ran into some potential trouble as the U.S. Department of Justice began investigating whether ISSC violates the 1956 Consent Decree that IBM signed (CW, Nov. 9). It is unclear how it will play out and to what extent it may affect the company as a whole.

Already, IBM is garnering kind words from customers for its "we-try-harder attitude." "They are actually sending people to ask us questions about architectures, technologies and business requirements," says Terry Lowder, vice president of advanced technology at Banc One Services Corp. in Columbus, Ohio.

HP

HP's overall '92 revenue was $16.45 billion. Of that, services revenue was $2.06 billion.

"It used to be just an order-taking role, but now they're eager to hear and not just willing to listen," Lowder said.

For its part, Digital Equipment Corp. will have a whole raft of action items to execute in its bid to reverse last year's losses.

After four punishing quarters, Digital Equipment Corp. must continue to slash expenses, raise revenue with new product releases and expand its service offerings — in order to survive as a profitable company this year and beyond.

DEC Chief Executive Officer Robert Palmer pledged to do just that last year, saying the company will cut an additional 20,000 employees over the next two years, streamline matrix management and redundant engineering groups, make more use of cost-effective third-party distributors and focus more on systems integration.

DEC's future also "rests on the success and viability" of its 64-bit Alpha reduced instruction set computing-based machines, says Judith Hurwitz, president of market research firm Hurwitz Consulting in Newton, Mass.

Hurwitz added, "DEC is off the radar screen right now [on the Unix side]," but the technology is strong.

Customers are cautiously optimistic about the restructuring. "I think it makes a great deal of sense, but my concern is what they're going to do to R&D budgets," says Bill Mayhew, chairman of a special interest group in the Digital Equipment Computer Users Society.

"Research and development has been DEC's strength, and I get a little alarmed seeing them making the cuts, though some of it has to happen," he added.

But it will not be an easy year for DEC — or for any of the major players — as they all chase the ever-elusive large systems dollar and learn the hard way that bigger does not necessarily mean better. ■

Tough at the top

Last year could many industry heavyweights humming "Breaking Up is Hard to Do" as they scrambled to reorganize and redefine their businesses. This year could be same old song if big system boys don't pick up. If so, expect more layoffs and expense-cutting. Among the hardest hit of all the major vendors last year was DEC. Its new CEO is cutting costs, reorganizing the company and focusing on Alpha AXP and consulting in an attempt to regain profitability. The worst may not yet be over for IBM either. Despite a major restructuring begun in 1991, for the third quarter ended Sept. 30, IBM reported a $2.78 billion loss, including a $4.4 billion charge for the early-retirement program. Some analysts predicted that IBM may have to resort to layoffs if results do not pick up by the first half of 1993.

have an integration pact in the works with Texas Instruments, Inc.'s IEF.

Digitalk, Inc.
Los Angeles

Although it's been in the object-oriented programming (OOP) development tool arena for nearly a decade (with Methods and Smalltalk/V), Digitalk recently took object-oriented programming a step further with its Parts technology. Parts is one of the first (if not *the* first) OOP development tool to allow robust applications to be built without programming. It also allows legacy systems, such as Cobol, to be encapsulated and used in updated OOP applications. This is the future of graphical development environments: providing tools on industry-standard platforms.

HyperDesk Corp.
Westboro, Mass.

The company's HyperDesk Distributed Object Management System (DOMS) helps build applications that let users access data transparently, no matter where it is stored in the distributed environment. This type of "software backplane" is going to be crucial for developing true client/server applications. The product is also compliant with Object Management Group's Object Request Broker standard.

Intel Corp.
PC Enhancement Division
Hillsboro, Ore.

This Intel division is looking at the kinds of system functions — printing, backup, management — that are currently lacking in the local-area network environment and trying to provide plug-and-play "shrink-wrapped" servers. The goal is to make LAN systems robust and secure enough that people feel comfortable betting their company on them.

Continued on page 63

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IBM

Changing Industry

Vela Kondo

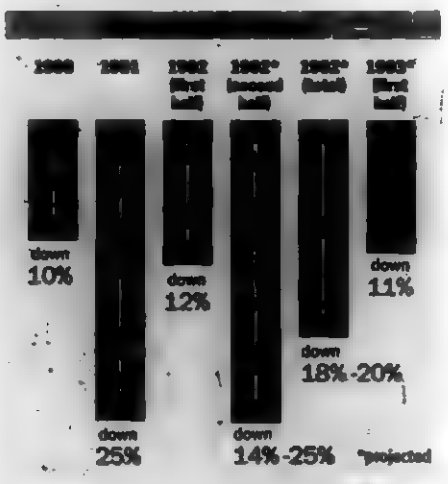
the BIG drop

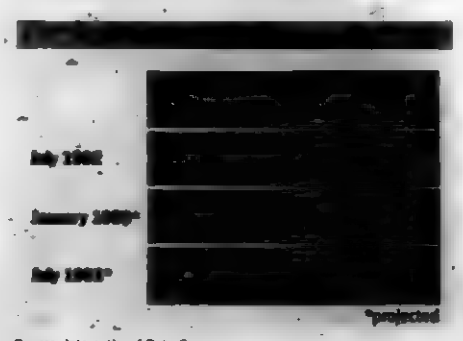
by Derek Slater

Get ready for the ride of your life — keeping track of technology pricing in 1993. In particular, software purchasing will get more complicated — for large and small systems alike. On PC and mainframe hardware, the main action has a downward pitch, at roughly the same slope as last year.

PC hardware

TREND Research firms expect PC street prices to decline at roughly the same pace as last year.





Source: International Data Corp.

PC software

TREND PC software licensing prices, while getting more complicated, are decreasing overall.

> "We're beginning to see a lot of channel-specific pricing: You pay one price if you buy from a mail-order house, another price if you buy from a retailer. You generally pay a lower price if you buy direct, but a good many corporate customers wind up paying a higher price to get important services such as handling purchase orders from retailers."
>
> Jeff Tarter, editor, "SoftLetter"

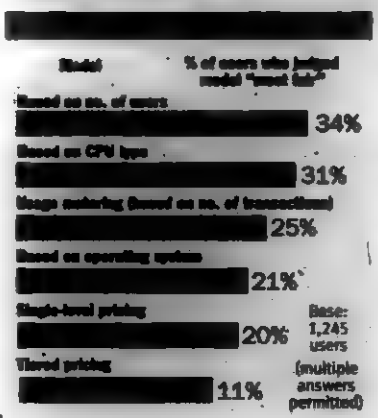
Large systems hardware

TREND The price/performance curve for IBM and compatible mainframes is expected to stay in the 18% to 20% range, allowing users to purchase a system that is between 18% and 20% more powerful for the same price.

Source: Gartner Group, Inc., Dean Witter Reynolds

Expected list price discount '93	40% to 50%	(Includes software, services and actual hard-dollar savings.)

Large systems software



Source: Nephon

TREND Mainframe software pricing is likely to undergo the most radical restructuring in the coming year. Already, Digital Equipment Corp. and Computer Associates International, Inc. offer a smorgasbord approach that allows users to mix and match licensing options. Others, such as Sybase, Inc. and Oracle Corp., have switched wholesale to a per-user pricing scheme. Usage-based pricing is also hot; charges are based on the number of transactions performed using the given software package.

Computer Associates

- An enterprise licensing option is based on total MIPS of users hardware.
- A new maintenance plan lets users pay a onetime fee to freeze software maintenance costs in a five-year period.
- Users can trade old CA applications for new ones with little extra cost when changing hardware platforms.
- A nontiered option provides savings for users who plan to rapidly upgrade processing capacity or drastically cut back on large systems.

DEC

New policies allow users to move applications between hardware platforms with no additional charges:

- CPU-based licensing for users with very stable operating environments.
- Personal-use licensing that guarantees access for particular users.

IBM

- Pricing option provides a deeper discount for running multiple operating systems on one machine.
- New pricing structure for two client/server packages that run in part on the mainframe. Price based on number of LANs connected to host.

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	Comsys Technical Services, Inc.	(301) 921-3600	Contract Programming
	Price Waterhouse	(301) 897-5900	Client/Server
	Price Waterhouse	(301) 897-5900	Systems Integration
	Price Waterhouse	(301) 897-5900	UNIX
	SHL Systemhouse	(410) 597-9040	Systems Integration
	Trusted Information Systems, Inc.	(301) 854-6889	System Security
Massachusetts			
	CSC Partners	(617) 847-0116	Systems Integration
	Lotus Consulting Services Group	(617) 693-4730	Client Server

Alaska
Business Application Developers, Inc (907) 562-5646 DBMS

	MMA Consulting Group, Inc	(617) 426-8049	Government
	Pierce Associates	(617) 492-1638	COBOL
	Price Waterhouse	(617) 437-4390	Banking
	Romac	(617) 439-4300	Staffing/Employment
Michigan			
	John Dorsey & Associates	(313) 642-2420	Government
	The Electronic Cottage	(313) 732-0605	Performance Analysis & Tuning
	Epcom Corporation	(313) 583-4760	Education/Training
Minnesota			
	Origin Technology in Business	(614) 431-2345	Applications Development
Missouri			
	Quatrix, Inc	(314) 434-6655	Banking
	Quatrix, Inc	(314) 434-6655	Contract Programming
	ICCA/St. Louis	(314) 997-4633	Associations
	Price Waterhouse	(314) 425-0500	Accounting/Payroll
	Price Waterhouse	(314) 425-0500	Banking
New Jersey			
	Computer Horizons	(800) 321-2421	Systems Integration
	Database Design Solutions	(908) 439-3727	Repositories
	Delphi International, Inc.	(201) 861-7164	Project Management
	Interact	(800) 628-5471	Education/Training
	Mehes DC, Inc.	(908) 647-8560	Accounting/Payroll
	OMNItech Consulting Services,	(908) 225-5577	Applications Development
	Performance Development Corp	(800) 554-9131	Information Engineering
	Pro-Cubed Corporation	(800) 289-2238	Automation & Control
	T.J. Brady & Associates	(908) 359-0236	Contract Programming
	The Ultimate Corp	(201) 887-9222	Network Management
	The Ultimate Corp	(201) 887-9222	Rightsizing
New Mexico			
	Sara Tokheim & Associates	(505) 984-1452	MVS
New York			
	Alicomp, Inc.	(800) 274-5656	Outsourcing
	Booz-Allen & Hamilton	(212) 697-1900	Management Consulting
	DGS Electronics	(518) 869-1305	Networking
	Dohnalk Consulting, Ltd.	(212) 460-8686	IBM
	Howard Systems Int'l.	(800) 756-0204	Contract Programming
	ICCA	(800) 438-4222	Associations
	ISDN Consor. Inc.	(516) 265-0341	Contract Programming
	MICS Applied Concepts, Inc	(212) 732-7452	Applications Development
	NETLAN, Inc	(212) 768-2273	Novell
	Origin Technology in Business	(516) 433-4091	Applications Development
	Price Waterhouse	(212) 371-2000	Banking
	Q-M Consulting Group, Inc	(212) 995-5287	DBMS
	Romac	(518) 463-6644	Staffing/Employment
	SHL Systemhouse	(212) 303-5500	Systems Integration
	SRM Associates, Ltd.	(516) 433-1817	Strategic Planning
	System 613 Inc.	(914) 425-7758	Security
North Carolina			
	Albright Consulting Services, Inc.	(704) 377-2669	Systems Integration
	Romac	(919) 725-1933	Staffing/Employment
	Seer Technologies	(919) 380-5000	CASE
Ohio			
	Bradley Company	(216) 292-7220	Inventory Control
	Concept XXI, Inc	(216) 831-2121	Automation & Control
	Origin Technology in Business	(614) 431-2345	Applications Development
	Price Waterhouse	(216) 781-3700	Automation & Control
	Price Waterhouse	(614) 365-9555	Information Engineering
	Romac	(216) 771-6822	Staffing/Employment
Oklahom			
	Rice Consulting Services	(405) 946-2978	Software Testing
Oregon			
	Claremont Consulting Group, Inc.	(800) 441-1002	Applications Development
	Pacific Management Institute	(800) 879-9879	Management Consulting
Pennsylvania			
	Decision Software Systems, Inc.	(800) 682-0794	Contract Programming
	Esprit Systems Consulting, Inc.	(215) 436-8290	Education/Training
	GRO Software Associates, Inc.	(215) 344-9573	VMS
	Ioele/Griggs & Associates, Inc.	(800) 220-6237	VMS
	Keefer Consulting	(215) 462-1801	CASE
	NBH Systems	(215) 269-0860	Performance Analysis & Tuning
	Pittsburgh Business Cons, Inc.	(412) 391-0714	Systems Integration
	Price Waterhouse	(215) 575-5000	DBMS
	Romac	(215) 687-6107	Staffing/Employment
	S. Hess & Associates	(215) 857-5196	EDI
	Spring City Software	(215) 469-4600	SAS
Rhode Island			
	Phase 2 Coconsulting	(800) 653-4536	Accounting/Payroll
Tennessee			
	Romac	(901) 685-8500	Staffing/Employment
Texas			
	Booz Allen & Hamilton	(214) 746-6500	Management Consulting
	Intelligent Financial Perspectives, Inc.	(512) 343-7964	Client Server
	JPN Associates	(800) 594-0201	Systems Integration
	EDS	(214) 490-2000	Systems Integration
	Price Waterhouse	(214) 386-9922	Imaging
	Price Waterhouse	(214) 386-9922	Methodology
	Price Waterhouse	(713) 654-4100	Networking
	Price Waterhouse	(214) 386-9922	OS2
	Price Waterhouse	(214) 386-9922	Reengineering
	Price Waterhouse	(214) 386-9922	Strategic Planning
	SHL Systemhouse	(214) 383-2700	Systems Integration
	Usability Software	(800) 243-5647	Software Testing
Virginia			
	Alliance Consulting Group, Inc.	(703) 243-6979	Contract Programming
	BayTech Systems	(703) 764-8807	Contract Programming
	IPC Technologies	(804) 285-9300	Client Server
	Information Engineering	(703) 739-2242	Information Engineering
	JMR Consulting	(800) 472-9575	FORTRAN
	PRC, Inc.	(800) 531-5489	Outsourcing
	Price Waterhouse	(804) 648-9281	Applications Development
	SHL Systemhouse	(703) 276-0500	Systems Integration
	Swann Associates	(703) 207-8630	Communications
	Synergy Group	(703) 827-5544	SGML/Text Management Sys.
Washington			
	ADA/NAT, INC.	(206) 927-1219	ADABAS
	Fredrickson Consulting Services	(206) 938-0482	DEC
	Romac	(206) 646-6646	Staffing/Employment
Wisconsin			
	Technology Consulting Corporation	(414) 792-1111	IBM

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	OMNItech Consulting Services, Inc.	(908) 225-5577	NJ	7
	Origin Technology in Business	(614) 431-2345	OH	7
	Rocajam	(404) 612-0374	GA	7
AGL				
	TechniSource, Inc.	(305) 493-8601	FL	12
Accounting/Payroll				
	Alliance Consulting Group, Inc.	(703) 243-6979	VA	9
	Arthur Ellingsen & Co.	(800) 747-9328	IL	7
	Mehes DC, Inc.	(908) 647-8560	NJ	7
	Origin Technology in Business	(614) 431-2345	OH	7
	Phase 2 Consulting, Inc.	(800) 653-4536	RI	7
	Support Strategies	(800) 233-7151	FL	7
ADABASE				
	ADA/NAT, INC.	(206) 927-1219	WA	7
Applications Development				
	ADA/NAT, INC	(206) 927-1219	WA	7
	Adia Information Services	(800) 626-8082	MD	7
	Atlis Performance Resources, Inc	(301) 770-3000	MD	7
	James Borta & Associates	(708) 882-1301	IL	7
	Claremont Consulting Group, Inc	(800) 441-1002	OR	8
	Computer Horizons	(800) 321-2421	NJ	2
	DataWright, Inc.	(800) 377-3191	IL	7
	Deloitte & Touche	(203) 761-3361	CT	16
	ICCA/Chicago	(800) 779-8911	IL	8
	ISA Consultants	(800) 462-6301	IL	8
	MICS Applied Concepts, Inc.	(212) 732-7452	NY	7
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	Rocajam	(404) 612-0374	GA	7
	SHL Systemhouse	(312) 939-0099	IL	6
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Associations				
	ICCA	(800) 438-4222	NY	8
Automation and Control				
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	Price Waterhouse	(216) 781-3700	OH	18
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Banking				
	Intelligent Financial Perspectives, Inc.	(512) 343-7964	TX	9
	Origin Technology in Business	(614) 431-2345	OH	7
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	Decision Software Systems	(800) 682-0794	PA	9
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	Technisource, Inc.	(305) 493-8601	FL	12
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	Atlis Performance Resources, Inc.	(301) 770-3000	MD	7
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	Hewlett Packard Company	(800) 637-7740	CA	8
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	Keefer Consulting	(215) 462-1601	PA	8
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	Price Waterhouse	(310) 396-3844	CA	18
	Seer Technologies	(919) 380-5000	NC	8
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Client Server				
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	Decision Software Systems	(800) 682-0794	PA	9
	Howard Systems Int'l.	(800) 736-0204	NY	Pg. 12
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	Condor Consulting Ltd.	(312) 751-8654	IL	15
	DataWright, Inc.	(800) 377-3191	IL	12
	Origin Technology in Business	(614) 431-2345	OH	7
DBMS				
	Alliance Consulting Group, Inc.	(703) 243-6979	VA	9
	Business Application Developers, Inc.	(907) 562-5646	AK	12
	Decision Software Systems	(800) 682-0794	PA	9
	Hewlett Packard Company	(800) 637-7740	CA	12
	Price Waterhouse	(215) 575-5000	PA	18
	OMNItech Consulting Services, Inc.	(908) 225-5577	NJ	7
	On-Line Systems Group	(800) 322-5265	FL	12
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	Q-M Consulting Group, Inc.	(212) 995-5287	NY	12
	Technisource, Inc.	(305) 493-8601	FL	12
DEC				
	Fredrickson Consulting Services	(206) 938-0482	WA	12
	ISA Consultants	(800) 462-6301	IL	12
	TechniSource, Inc.	(305) 493-8601	FL	12
Disaster Recovery				
	Booz Allen & Hamilton	(212) 697-1900	NY	10/11
	Dataguard	(800) 325-3977	KY	12
	Hewlett Packard Company	(800) 637-7740	CA	12
	Raymond Professional Mgmt, Inc.	(404) 587-4090	GA	12
EDI				
	S. Hess & Associates	(215) 857-5196	PA	12
	Origin Technology in Business	(614) 431-2345	OH	7
	Integrated Software	(708) 240-5070	IL	15
ESA/SMS				
	Pro-Cubed Corporation	(800) 289-2238	NJ	7
Education/Training				
	Berard Software Engineering, Inc.	(301) 417-9884	MD	12
	Carl A. Argila	(800) 347-6903	CA	12
	Computer Horizons	(800) 321-2421	NJ	2
	Dublin Group	(415) 227-4777	CA	12
	Epcom Corporation	(313) 583-4760	MI	12
	Esprit Systems Consulting, Inc.	(215) 436-8290	PA	12
	Hewlett Packard Company	(800) 637-7740	CA	12
	ISA Consultants	(800) 462-6301	IL	17
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	James Martin Insight, Inc.	(800) 526-0452	IL	12
	Origin Technology in Business	(614) 431-2345	OH	7
	SHL Systemhouse	(312) 939-0099	IL	6
Expert Systems				
	Booz Allen & Hamilton	(212) 697-1900	NY	10/11
	Integrated Software Specialists	(708) 240-5070	IL	15
Facilitation/Moderation: Training & Performance				
	Pacific Management Institute	(800) 879-9879	CA	14
	The Ultimate Corporation	(201) 887-1000	NJ	14
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Government				
	John Dorsey & Associates	(313) 642-2420	MI	12
	MMA Consulting	(617) 426-8049	MA	12
	Price Waterhouse	(202) 256-0800	DC	18
	Pacific Management Institute	(800) 879-9879	CA	14
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	Condor Consulting Ltd.	(312) 751-8654	IL	15
	Hewlett Packard Company	(800) 637-7740	CA	12
	Intelligent Financial Perspectives, Inc.	(512) 343-7964	TX	9
	Integrated Software Specialists	(708) 240-5070	IL	15
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	Technisource, Inc.	(305) 493-8601	FL	12
HP				
	Hewlett Packard Company	(800) 637-7740	CA	13
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	Dohnalk Consulting, Ltd.	(212) 460-8686	NY	13
	Origin Technology in Business	(614) 431-2345	OH	7
	Technisource, Inc.	(305) 493-8601	FL	12
	Technology Consulting Corporation	(414) 792-1111	WI	13
Imaging				
	Integrated Software Specialists	(708) 240-5070	IL	15
	Price Waterhouse	(214) 386-9922	TX	18
	Origin Technology in Business	(614) 431-2345	OH	7
Information Engineering				
	Atlis Performance Resources, Inc.	(301) 770-3000	MD	7
	Booz Allen & Hamilton	(212) 697-1900	NY	10/11
	Computer Horizons	(800) 321-2421	NJ	2
	Data Architects	(404) 233-5667	GA	13
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	EDS	(214) 490-2000	TX	20
	Performance Development Corporation	(800) 554-9131	NJ	13
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Information Resource Management				
	Data Architects	(404) 233-5667	GA	13
	EDS	(214) 490-2000	TX	20
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	Bradley Company	(216) 292-7220	OH	13
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	Atlis Performance Resources, Inc.	(301) 770-3000	MD	7
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The Electronic Cottage	(313) 732-0605	MI	Pg. 16
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Deloitte & Touche	(203) 761-3361	CT	16
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Management of Change			
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Management Methodologies (TQM, etc.)			
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Management Teams			
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Hewlett Packard Company	(800) 637-7740	CA	14
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Market Research			
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Network Management			
Hewlett Packard	(800) 637-7740	CA	14
SHL Systemhouse	(312) 939-0099	IL	6
The Ultimate Corporation	(201) 887-1000	NJ	14
Networking			
Adia Information Services	(800) 626-8082	MD	7
Computer Horizons	(800) 321-2421	NJ	2
DGS Electronics	(518) 869-1305	NY	15
Hewlett Packard Company	(800) 637-7740	CA	15
IBM	(708) 573-7217	IL	15
Networking & Comm. Solutions, Inc.	(203) 795-7239	CT	14
Origin Technology in Business	(614) 431-2345	OH	7
Price Waterhouse	(713) 654-4100	TX	18
SHL Systemhouse	(312) 939-0099	IL	6
Technisource, Inc.	(305) 493-8601	FL	12
The Ultimate Corp	(201) 887-1000	NJ	14
Novell			
Logic Plus Open Systems, Inc.	(708) 559-9697	IL	9
NETLAN, Inc.	(212) 768-2273	NY	15
Object Oriented Programming			
Adia Information Services	(800) 626-8082	MD	7
Booz Allen & Hamilton	(212) 697-1900	NY	10/11
Condor Consulting Ltd.	(312) 751-8654	IL	15
Hewlett Packard Company	(800) 637-7740	CA	15
Integrated Software Specialists	(708) 240-5070	IL	15
Origin Technology in Business	(614) 431-2345	OH	7
SHL Systemhouse	(312) 939-0099	IL	6
ORACLE			
Executive-Technologies	(813) 732-5242	FL	15
Prior Computer Service	(312) 589-0507	IL	15
OS2			
Origin Technology in Business	(614) 431-2345	OH	7
Price Waterhouse	(214) 386-9922	TX	18
Technisource, Inc.	(305) 493-8601	FL	12
Operating Systems Support			
Comp Science & System Eng Cons	(719) 590-8418	CO	15
Outsourcing			
Alicomp, Inc.	(800) 274-5556	NY	16
Computer Horizons	(800) 321-2421	NJ	2
EDS	(214) 490-2000	TX	20
PRC, Inc.	(800) 531-5489	VA	15
SHL Systemhouse	(312) 939-0099	IL	6
The Ultimate Corp	(201) 887-1000	NJ	14
Pen-Based Computing			
Linkpro, Inc.	(714) 854-3322	CA	15
Performance Analysis/Tuning			
ADA/NAT, INC.	(206) 927-1219	WA	7
Booz Allen & Hamilton	(212) 697-1900	NY	10/11
The Electronic Cottage	(313) 732-0605	MI	16
Hewlett Packard Company	(800) 637-7740	CA	16
NBH Systems	(215) 269-0660	PA	16
Planning Sessions			
Pacific Management Institute	(800) 879-9879	CA	14
Project Management			
Adia Information Services	(800) 626-8082	MD	7
Bates Project Management, Inc.	(800) 263-9985	CN	16
Booz Allen & Hamilton	(212) 697-1900	NY	10/11
Delphi International, Inc.	(201) 861-7164	NJ	16
EDS	(214) 490-2000	TX	20
Hewlett Packard Company	(800) 637-7740	CA	16
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Quality Management/Continuous Improvement			
Pacific Management Institute	(800) 879-9879	CA	14
Reengineering			
D. Appleton Company, Inc.	(800) 322-8614	CA	16
Booz Allen & Hamilton	(212) 697-1900	NY	10/11
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Price Waterhouse	(214) 386-9922	TX	18
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SHL Systemhouse	(312) 939-0099	IL	6
Recruitment, Selection & Assimilation			
Pacific Management Institute	(800) 879-9879	CA	14
Repositories			
Database Design Solutions	(908) 439-3727	NJ	16
Rightsizing			
Booz Allen & Hamilton	(212) 697-1900	NY	10/11
Computer Horizons	(800) 321-2421	NJ	2
DGS Electronics	(518) 869-1305	NY	15
EDS	(214) 490-2000	TX	20
Hewlett Packard Company	(800) 637-7740	CA	16
The Ultimate Corp	(210) 877-9222	NJ	14
SAS			
Spring City Software	(215) 469-4600	PA	16
Security			
Deloitte & Touche	(203) 761-3361	CT	16
Phase 2 Consulting, Inc.	(800) 853-4536	RI	7
System 613, Inc.	(914) 425-7758	NY	18
Trusted Information Systems, Inc.	(301) 854-6889	MD	18
SGML/Text Management Systems			
Synergy Group, Inc.	(703) 827-5544	VA	16
Software Process Maturity Improvement			
Hughes Aircraft	(714) 732-2922	CA	17
Software Testing			
Decision Software Systems	(800) 682-0794	PA	9
Rice Consulting Services	(405) 945-2978	OK	16
Usability Sciences	(800) 243-5647	TX	16
SQL			
DGS Electronics	(518) 869-1305	NY	15
Technisource, Inc.	(305) 493-8601	FL	12
Staffing/Employment			
Central Technical Services	(904) 264-4251	FL	17
Robert Half International Inc.	(800) 458-5700	CA	13
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Strategic Planning			
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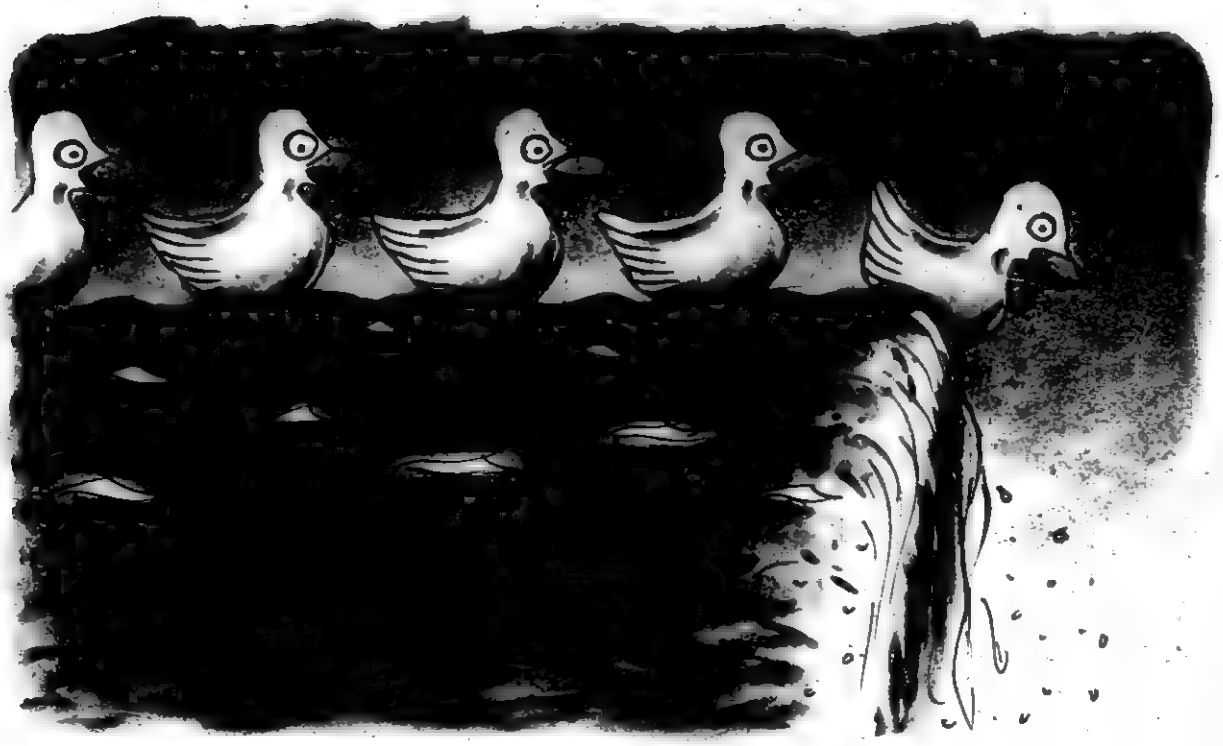

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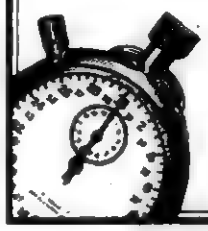

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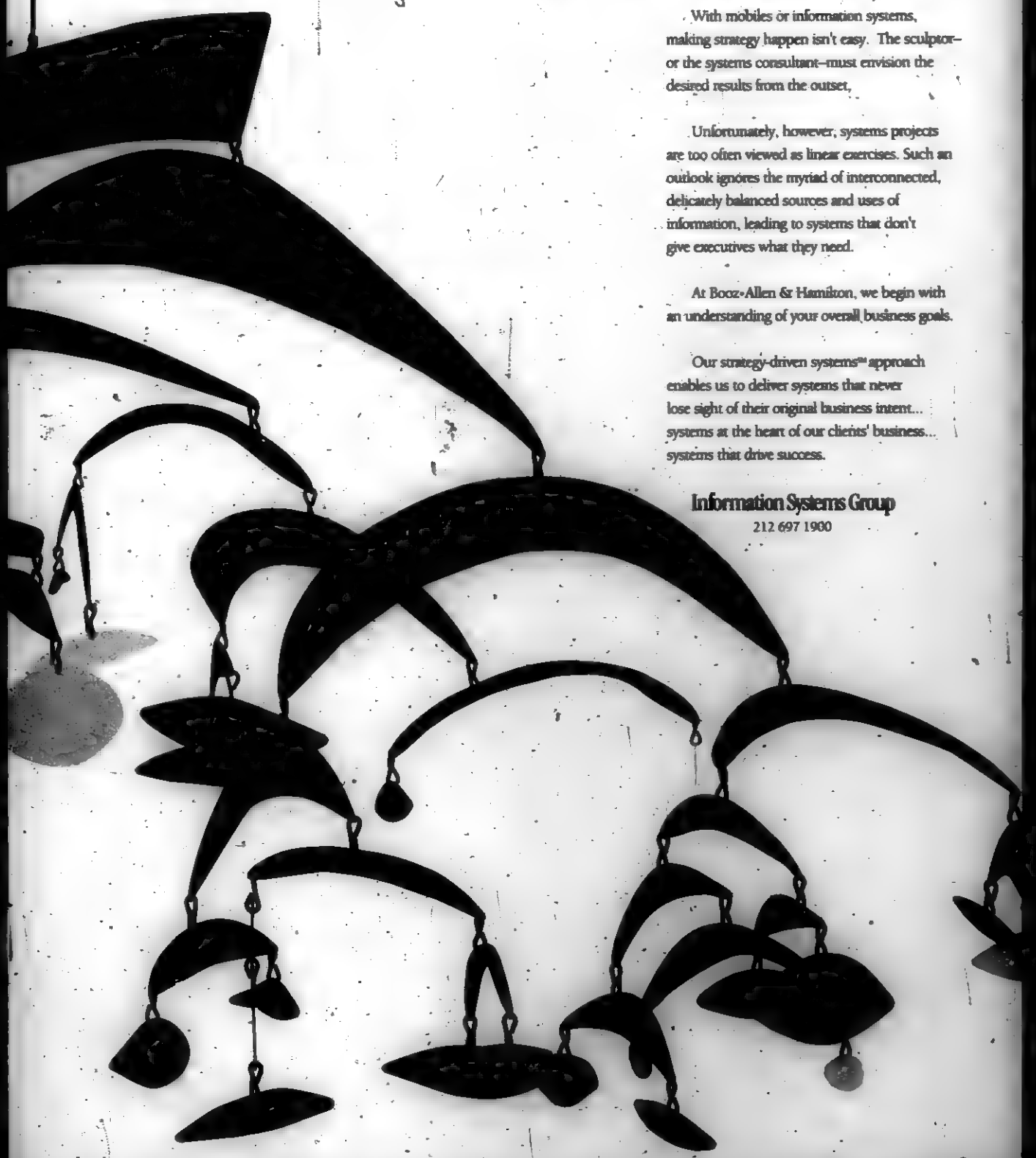

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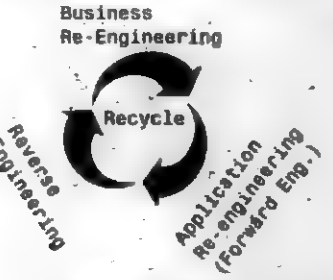

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Changing Industry

Proving ground

The clock is ticking for vendors in the computer industry. Lip service will no longer be tolerated as customers lose patience with expensive licensing options, buggy software and service personnel who know less than they do. For vendors sporting the scars of '92, '93 will be a tough proving ground. *Computerworld* took a look at vendor challenges:

AMDAHL CORP.

■ **BIGGEST CHALLENGE**
To cope with a recession-wracked economy that faces an oversupply of big-iron capacity and a lack of demand for large machines.

■ **STRATEGY**
Play up eight-way processor (which started shipping in October) against IBM's, which will ship in limited quantities this year.

■ **PRODUCT ROLLOUTS**
Unix processors based on Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC) chip. Cluster these SPARC-based machines and position them as application and file servers. Continue to enhance disk controllers to catch up with IBM's offerings.

■ **OUTLOOK**
"Once IBM makes its eight-way announcement in the first quarter, Amdahl will have a significant opportunity before IBM begins to ship in volume." — *Mark Hess, vice president, Gartner Group, Inc.*

APPLE COMPUTER, INC.

■ **BIGGEST CHALLENGES**
To keep the Macintosh line competitive and affordable in era of IBM PC clone price-slashing. Continue on schedule with IBM/Motorola, Inc. alliance to ship small volumes of PowerPC chip, the 601 RISC.

■ **STRATEGIES**
Continue shifting cost structure strategy from one of selling expensive machines with high profit margins to pushing high volumes of low-cost Macintoshes. Beef up high end with Macintosh server and reduced instruction set computing (RISC)-based Macintoshes.

■ **PRODUCT ROLLOUTS**
Sample volumes of the 601 RISC low-cost processor (first quarter); Macintosh server (first half); RISC-based Macintosh (perhaps late in year).

■ **OUTLOOK**
"Apple is once again an intriguing company." — *Andrew Zimmerman, partner, management consulting group, Coopers & Lybrand.*

BANYAN SYSTEMS, INC.

■ **BIGGEST CHALLENGE**
To improve market share and broaden product line.

■ **STRATEGIES**
Leverage large local-area network expertise into additional products by offering Enterprise Network Services (ENS) on competing LAN operating systems. Port Vines to other platforms, including Intel Corp.-based Unix, RISC and (possibly) Microsoft Corp.'s Windows NT.

■ **PRODUCT ROLLOUTS**
ENS for other platforms, including Microsoft's LAN Manager. New version of Vines, in which it hopes to merge the best features of Vines 4.1 and 5.0 into one product.

■ **OUTLOOK**
"Banyan's challenge in the next year will be to transform itself from a company focused on competing with Novell into one that supports the huge NetWare installed base as a market for its network services products." — *Jamie Lewis, senior analyst, The Burton Group.*

BORLAND INTERNATIONAL, INC.

■ **BIGGEST CHALLENGES**
To get its suite of Windows applications, particularly its database, out the door in working order, and to keep pace with price cuts stemming from a software price war. The company also needs to seek closer ties with information systems through service and support.

■ **STRATEGIES**
Continue to press its technology-driven products as "best of breed," but take more care to hit delivery deadlines. Work to closely integrate Interbase database server engine with its other desktop products.

■ **PRODUCT ROLLOUTS**
Windows versions of dBase and Paradox. C++ compiler for OS/2 2.0

■ **OUTLOOK**
"1993 is the year that Borland really recasts their business in a fundamental way. It's the first time they'll have to deal with real assaults on their database empire and think of their software portfolio as a total corporate offering." — *Neal Hill, senior software analyst, Forrester Research, Inc.*

COMPAQ COMPUTER CORP.

■ **BIGGEST CHALLENGE**
To continue to lure back corporate customers who deserted to lower priced clones during Compaq's high-margin heyday.

■ **STRATEGIES**
Continue to hold the clones at bay — pricewise and technologically — and push one-stop-shopping strategy. Diminish bloated product backlog, keep product cycles short.

■ **PRODUCT ROLLOUTS**
Full line of printers from new printing division. Pentium-based servers should arrive in the first quarter, with high-end four- to eight-processor multiprocessors in mid-'93. On the desktop side, expect refreshed ProLinea and DeskPro/I lines mid-year and new high-end desktops.

On the portable side, more 486SL-based notebooks are probable in the first quarter. New features such as wireless communications will likely appear in Compaq notebooks in the late second/early third quarters.

■ **OUTLOOK**
"They aren't out of the woods yet." — *Kimball Brown, former analyst, International Data Corp.*

COMPUTER ASSOCIATES INTERNATIONAL, INC.

■ **BIGGEST CHALLENGES**
To leverage existing mainframe software client base with expanded cache of PC software products; manage new licensing initiatives as customers look to distribute processing off a mainframe; and meet projection that PC revenue will equal mainframe revenue by mid-1990s.

■ **STRATEGY**
Expand presence in PC, Unix and application development markets while maintaining strength in mainframe software, which accounts for more than 70% of the company's annual revenue.

■ **PRODUCT ROLLOUTS**
CA-Unicenter for Unix systems management packages for Hewlett-Packard Co. and Sun Microsystems, Inc. platforms. Aspen, an object-oriented, graphical user interface-based compiler for CA-Clipper, CA-dBFast and other Xbase languages. Additional mainframe ports to Microsoft's Windows environment and IBM's OS/2 2.0.

■ **OUTLOOK**
"It's important for them to leverage their expertise and provide cross-

Changing Industry

UP and COMERS

Continued from page 66

Interconnections (an Emulex Corp. subsidiary) bought back marketing rights to VMS for NetWare, which it originally developed for Novell, Inc. Now debugged, updated and renamed Interrupt for NetWare, the product is getting a big response from companies that would like their NetWare users to access VAX print-and-file services and vice versa — but don't want to buy a whole client/server system to do it.

Tandem Corp., Pittsburgh

Transarc is on a roll on the distributed computing front, providing the foundation for a range of de facto industry standards. The company's Encina transaction-processing monitor has already been adopted by IBM, HP, Hitachi Data Systems Corp., NEC Corp. and Stratus Computer, Inc. as the basis for managing distributed transaction processing. Now, the Open Systems Foundation is contemplating using Transarc's transactional RPC and has already bought into the company's Andrew File System for the file management portion of the OSF's Distributed Computing Environment.

Workflow Corp., Trevose, Pa.

This collaborative computing software supplier is starting to gain notice for GroupSystems, a set of software tools that

Continued on page 69

platform products for their mainframe clients into open systems areas such as Unix." — *Ed Acly, director of software research, Technology Investment Strategies Corp.*

DIGITAL EQUIPMENT CORP.

■ BIGGEST CHALLENGES
To stem losses and regain profitability; complete managerial restructuring and transition to streamlined organization; market Alpha 64-bit RISC-based systems on Open VMS, Microsoft's Windows NT and Open Software Foundation's OSF/1; and push into commercial Unix and follow up on strong (but very tardy) start in PC arena.

■ STRATEGIES
Get a jump on other open systems vendors by taking advantage of high-performance 64-bit Alpha technology on Windows NT, OSF/1 and Open VMS. Cut hardware costs and production time through modular manufacturing. Combine hardware and Network Applications Support software in system integration business. Institute commission-based sales and greater use of indirect channels.

■ PRODUCT ROLLOUTS
New version of OSF/1 targeting commercial users. Mips Technologies, Inc.- and Alpha-based systems running OSF/1. Software to support Alpha. More Alpha-based PCs and Open VMS platforms. Continued price cuts, release of traditional VAXs.

■ OUTLOOK
"They have to pull off the Alpha transition but at the same time find markets where they will grow. Unless you generate revenue, you have to keep cutting costs." — *Bill Bluestein, senior analyst, Forrester Research.*

HEWLETT-PACKARD CO.

■ BIGGEST CHALLENGES
To capture Digital Equipment Corp.'s long-held position as second-largest computer vendor in the U.S.; manage smooth transition under new chief executive officer; sell more effectively to accounts that plan to downsize to multiuser computers; promote Unix without threatening MPE accounts; deliver on "Open MPE" promise; and improve PC sales and presence.

■ STRATEGIES
Continue all-out effort to replace hosts with its high-end minicomputers, making it easier to sell workstations, PCs and printers. Continue upgrading HP/UX and Precision Architecture-RISC (PA-RISC) to stay ahead in that arena.

■ PRODUCT ROLLOUT
High-speed workstations based on 100-MHz versions of PA-RISC.

■ OUTLOOK
HP's workstation business will turn more profitable now that users have almost completely made the transition to HP's RISC. HP will sell more Unix systems than proprietary MPE versions. As for a potential threat from IBM's Unix multiuser business, "IBM's vacuum is a large one." — *Robert Herwick, analyst, Hambrecht & Quist, Inc.*

IBM

■ BIGGEST CHALLENGE
To capitalize on reorganization plan put into effect last year.

■ STRATEGIES
Woo customers more effectively with its more autonomous lines of business, especially in the PC area, where it's taking a beating on margins because of low-end price wars. Continue to build momentum with OS/2. Deepen RISC System/6000 penetration in commercial sites.

■ PRODUCT ROLLOUTS
High-end, eight-way processor will take advantage of data center consolidation. Expected to unveil a database system common to both OS/2 and AIX platforms.

■ OUTLOOK
"I'm looking for modest revenue growth on the order of 2% to 4%. They have to attract new orders and maintain the existing revenue stream on both the high end and low end." — *Philip Reuppel, analyst, Sanford C. Bernstein.*

KNOWLEDGEWARE, INC.

■ BIGGEST CHALLENGE
To refocus on improving existing products rather than branching out to new areas.

■ STRATEGIES
Proselytize for IBM's AD/Cycle. Ramp up consulting services.

■ PRODUCT ROLLOUTS
LAN-based repository co-built with IBM. Existing tools tweaked to talk to Unix.

■ OUTLOOK
"We struggled with some modules released too early, but KnowledgeWare is working with us well." — *Ray Speight, systems development manager, North Carolina Department of Administration in Raleigh.*

LEGENT CORP.

■ BIGGEST CHALLENGES
To migrate products and service to LANs and desktops and assimilate Goal Systems International, Inc., acquired last year.

■ STRATEGIES
Establish a major position in systems management products for heterogeneous environments. Migrate mainframe products to client/server architecture that lets end-user desktop functions interface with mainframes, departmental servers.

■ PRODUCT ROLLOUTS
XCOM/SDS, a software distribution system. A disk backup product for distributed environments. Unix versions of Endevor software management tools. Data Center Workbench, which will allow users to combine, display and analyze output from other Legent mainframe and network management products.

■ OUTLOOK
"About 20% of their revenues come from non-MVS sources, but they need to move that up as quickly as possible to 40% to 50%. That will take about two years." — *Charles Phillips, vice president, SoundView Financial Group, Inc.*

LOTUS DEVELOPMENT CORP.

■ BIGGEST CHALLENGES
To exploit workgroup computing lead by increasing Notes sales; combat fierce competition in spreadsheet market and convince users it can lead in spreadsheet innovations.

■ STRATEGIES
Evolve from provider of personal productivity tools to organizational productivity tools. Reposition itself as a "communications-centric" firm that offers network tools as well as mail-enabled applications.

■ PRODUCT ROLLOUTS
Notes Version 3 (expected in early '93) with Apple Macintosh support, a text-and-retrieval engine from Verity, Inc. and improvements to its replication technology. Initial Unix support for Notes, starting with Sun Microsystems Solaris and IBM AIX operating systems, later in 1993. 1-2-3 for Windows Release 2, in early 1993, which will include the initial workgroup technology Chronicle.

■ OUTLOOK
"Lotus has a two-year lead and a powerful story in Notes and mail-enabling [applications]. But spreadsheets [account for] over 50% of its revenues. Any sharp disruption in this operation will have serious consequences on its business overall." — *Will Fastie, vice president, PC software analyst, Alex. Brown and Sons, Inc.*

MICRO FOCUS, INC.

■ BIGGEST CHALLENGE
To maintain huge success with Cobol (it owns nearly 80% of PC-based Cobol development market) in face of end-user programming and movement toward C++.

■ STRATEGIES
Emphasize the ability of its tools to bring mainframe Cobol development environments to PCs and Unix workstations. Continue reshaping public profile by moving away from private-labeling its compilers to other vendors (notably, IBM and HP). Exploit leadership on ANSI Object-Oriented Cobol committee and efforts to give experimental versions of OO-Cobol to customers

■ PRODUCT ROLLOUTS
Continue to introduce products that migrate all aspects of Cobol development to smaller platforms. Introduce preliminary version of OO-Cobol after ANSI committee releases draft recommendation in April.

■ OUTLOOK
"They're positioning Cobol as a client/server tool. That's a little [tough]. They will play in that market, but it's not the cash cow of Cobol for Unix. They have the programmers' ears, they know what's real and what's fake. They can't lose." — *Andrew Mahon, senior analyst, New Science Associates, Inc.*

MICROSOFT CORP.

■ BIGGEST CHALLENGES
To gain acceptance with customers as a credible enterprise system software vendor and get Windows NT into big firms before OS/2 2.0 locks the doors.

■ STRATEGIES
Increase customer service to attract and keep big corporations. Work with value-added resellers, OEMs and consultants to strength-

Changing Industry

en areas of weakness, such as networking and vertical markets. Make applications more network- and workgroup-enabled with advent of Windows NT and increased presence of Windows for Workgroups.

■ PRODUCT ROLLOUTS
Windows NT and LAN Manager for Windows NT, both in early 1993.

■ OUTLOOK
"The sole threat to [Microsoft's] success is that they are trying to proceed on so many critical fronts simultaneously. Even as a $2.5 billion software company . . . they have to decide what their core competencies are and focus on those. At some point, they need to recognize they need to be a software products company." — *Neal Hill, senior software analyst, Forrester Research.*

NCR CORP., AT&T'S NETWORKED COMPUTING RESOURCE

■ BIGGEST CHALLENGE
To convince a cautious market that a massively parallel processing architecture is a viable solution for commercial applications.

■ STRATEGIES
Continue to leverage its talents and products with those of AT&T, AT&T Bell Laboratories and parallel processing leader Teradata Corp.

■ PRODUCT ROLLOUTS
The System 3700, a massively parallel processor platform developed jointly with Teradata. Continued refinements and customer sales of Cooperation, its 50-module software environment for distributed client/server computing. More notebook and pen-based systems and further integration with its wireless LAN product, WaveLAN. Multimedia systems using voice and data.

■ OUTLOOK
"The marriage [between AT&T and NCR] has taken place. It's been consummated and you're going to love the kids." — *George E. Lindamood, vice president and director, high performance computing, Gartner Group.*

NOVELL, INC.

■ BIGGEST CHALLENGE
To move NetWare from its current department/workgroup LAN base to a mission-critical corporate platform for the Fortune 1,000.

■ STRATEGIES
Form alliances with companies (such as IBM and HP) that are already well-established in corporate accounts. Beef up NetWare and work with third parties to fulfill corporate needs. Improve NetWare/Unix integration and establish Unix as a corporate productivity platform through Univel, Novell's joint venture with Unix System Laboratories, Inc.

■ PRODUCT ROLLOUTS
NetWare 4.0, a major change in architecture from the previous version that is aimed squarely at the corporate market scheduled for release in first-quarter '93, with enhancements to be added throughout the year. Upgrades to Network Management Services, NetWare for SAA and NetWare Global Messaging.

■ OUTLOOK
"The phenomenal growth of LANs will flatten over the next five years, so Novell must extend its business into other areas, move users to more sophisticated products and broaden their product base to include routing, hubs and network management products." — *Susan Frankel, LAN analyst, International Data Corp.*

ORACLE CORP.

■ BIGGEST CHALLENGE
To make new Oracle 7 relational database a technical and commercial success.

■ STRATEGIES
Prevent erosion in its installed base — the largest installed base for any independent relational database management system supplier — while creating new opportunities. Use new business-development unit to promote new niches for database use in telecommunications and electronic publishing.

■ PRODUCT ROLLOUTS
Oracle 7 relational database for distributed database applications. SQL*Forms application development tool. SQL*Net networking software to link multiple Oracle databases. Computer-aided software engineering tools and Oracle Financials and Manufacturing application suites.

■ OUTLOOK
"Until Oracle 7 is proven to be industrial strength, people may not be willing to migrate their applications to it. Oracle's other challenge is retaining their best and brightest developers as they grow into a major systems vendor with more than $1 billion in sales." — *Michael Corey, president, International Oracle Users Group and vice president, Database Technologies, Inc.*

SUN MICROSYSTEMS, INC.

■ BIGGEST CHALLENGES
To manage user transition to Solaris 2.1 and new hardware lines based on Texas Instruments, Inc.'s SuperSPARC Viking chip; introduce true symmetric multiprocessing (in Solaris 2.1) for large-scale commercial applications; and fight off anticipated competition from high-end PCs based on Intel Corp.'s P5 chip.

■ STRATEGIES
Ramp up commercial push with high-end multiprocessing servers. Hold onto leading market position with high-volume, low-end workstations based on TI's Tsunami microSPARC processor.

■ PRODUCT ROLLOUTS
New operating system (Solaris 2.1) and new hardware such as SPARCClassic color workstations, high-end SPARCCenter 2000 servers.

■ OUTLOOK
"If Sun continues to follow the same management philosophy about open computing and gives good deals to the marketplace, they can't help but be successful. They realize they're dealing with a customer community that's a lot more intelligent on what we're looking for." — *Roy Camblin, senior vice president of wholesale services, operations and systems, Wells Fargo Bank.*

SYMANTEC CORP.

■ BIGGEST CHALLENGES
To overcome huge revenue loss in '92, spurred by sudden downturn in DOS software market; make good use of recent purchases, including object-oriented language vendor The Whitewater Group and Multiscope, a seller of program debuggers; and continue legal battle with rival Borland over hiring of Borland executive Eugene Wang.

■ STRATEGIES
Continue to maintain and focus interest in development tools and utility programs. Revive Q&A database program (the company's first product) by introducing Apple Macintosh and Microsoft's Windows versions. Press the release of tools supporting cross-platform development on DOS, Macintosh and Unix.

■ PRODUCT ROLLOUTS
Upgrades of products, along with new releases for Microsoft's Windows NT. Cross-platform development library "Bedrock," which may also be distributed by Apple.

■ OUTLOOK
"They made a few mistakes [in '92] and came up short. I want to see them demonstrate the competence to deliver new products." — *Thomas J. Erickson, partner, Wessels, Arnold & Henderson.*

WANG LABORATORIES, INC.

■ BIGGEST CHALLENGE
To overcome bankruptcy stigma and remake itself from minicomputer maker to a software/services company.

■ STRATEGY
Exploit Office 2000, an office-automation scheme anchored by Wang imaging software and IBM's RS/6000.

■ PRODUCT ROLLOUT
Unix-based imaging software.

■ OUTLOOK
"We just don't know what we're going to do. Unix is interesting but so are local-area networks." — *Ing. Jorge Boijseauneau Cardenas, IS director, National Bank of Interior Commerce in Mexico.*

UP and COMERS

Continued from page 68
provide "anytime, anyplace" electronic meetings and support for teams. IBM has been reselling its GroupSystems product as TeamFocus for OS/2 and now has about 90 customers.

Vizix Software, Inc.
Reston, Va.

Vizix is tapping into the need for client/server application development tools with its GeoAny environment, which analysts consider to be the first true client/server application builder. It is platform- and operating system-independent and was designed specifically for creating large-scale commercial applications.

PeopleSoft
Walnut Creek, Calif.

The 5-year-old provider of human resource and financial packages did about $32 million worth of business in its fiscal 1992, reportedly up 186% from last year. PeopleSoft is making life difficult for the likes of Dun & Bradstreet Software, The Dodge Group, Computer Associates International, Inc., Tesseract and Integral.

If we knew the key to flourishing in '93, we'd be rich. But there are clues, such as HP's attention to open systems, IBM's bid to get closer to its customers and its admission that it can't continue serving all its traditional markets. The end of '93 should see new faces on older companies; the alternative means not surviving to the

end of the decade.

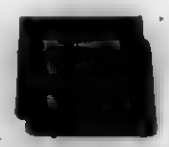
WE HAVE LAURELS AT TOSHIBA, WE JUST DON'T

PRESENTING THE T44

REST ON THEM.

PC MAGAZINE EDITORS' CHOICE
August 1992
Toshiba T4400SXC

The PC Magazine's Editors' Choice Award is just one of the many awards our highly acclaimed T4400SXC has captured.



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1992: The poem

I think a minute here's well spent,
Looking at the year just went
And paying tribute most becoming
To they who kept our keyboards humming.

IBM bids t'rse'adieu
To God-awful '92;
It's bad, that's true, but all this pales
To a future without mainframe sales.

O'er at DEC, Bob Palmer's hip
To find someone to buy his chip;
But in the meantime, let's face facts—
No one wants to buy a VAX.

Price cutting was in the air,
As vendors vied for market share;
Can it be long before we pocket
A Compaq in the supermarket?

Client/server's real hot,
And it's a snap to get there—NOT!
The products there are really great,
'Cept most still can't communicate.

Software firms trace hurtin' tummies
To gobs of low-cost suite sale yummies;
Users snapped up deals galore,
While margins went right through the floor.

Borland's own Achilles' heel
Appears to be in look and feel;
And database is quite a mess,
Since 99 buckaseth buy Access.

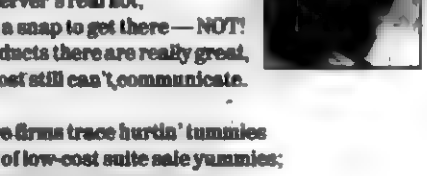
Microsoft, on t'other hand,
Hopes NT's gonna beat the band;
But Unix won't yet say farewell—
It's got a new friend named Novell.

CA launched a pricing play
To keep its user base at bay;
But CA's license recompense
Is still made up in maintenance.

CIOs still ran for cover
When EDS began to hover
Around their bosses' office doors,
Whisp'ring that dreaded word: "Outsource."

Kohler, John and Charlie Feld
Quit CIO jobs they once held;
But never fear, they'll have few wants
In new careers as con-sul-tants.

Hey, don't you worry, please don't whine,
Cause '93 will be just fine;
Recession's easing, worst is past,
And '92 is gone—at last!



Paul Gillin, *Executive editor*

Safe and secure?

Your publication had an article on toll fraud and one that was bullish on wireless on the same page [Enterprise Networking, CW, Dec. 7]. Interesting combination.

In the first, you advise us to use all the PBX security features, limit calling permissions and so on. In the second, you say that users prefer wireless in most situations and that the distinction between wireline and wireless will soon disappear.

I wonder if you know how incredibly easy it is to monitor *all* wireless transmissions. A scanner can easily be used to pick up transmissions regardless of the mode used. And with a high-speed computer, recorded transmissions can easily be dissected to yield logon identifications, passwords, encryption techniques and so on.

Security has one thing going for it: *You* can't hook into *my* phone wires. Put it all on wireless, and I predict a level of toll fraud and other hacking practices the likes of which we've yet to see.

I trust that those who are implementing the whole wireless computer picture will be extremely diligent when the security issues arise.

George A. Lesch Jr.
Staten Island, N.Y.

Some things never change

In the commentary "A winning client/server formula" [CW, Dec. 7], the columnist states that using senior developers plus developing from scratch is the winning formula. This is an old formula dressed up in the new clothes of PC-based development. When will management methods ever change? For 20 years now I've heard the argument: "Use your best and most senior programmers/developers."

The author is certainly not the first nor regrettably the last to offer such advice. What do these consultants advise for how we should use everyone else? How else do junior people become senior? What kind of advice is this?

Gregory H. Boone
Bellingham, Wash.

Holding the key

Your article "Encrypted data a risk?" [CW, Dec. 14] raises interesting issues about the strength of the RC2 and RC4 encryption algorithms. A 40-bit key space is relatively easy to search because it only contains about one billion keys. Whether it is as easy as Stephen Walker says — a Sun Sparc with 100 MIPS performance — remains to be seen.

RC2 and RC4 are symmetrical encryption algorithms, much as DES. They lack the [illegible] function (their invention) of the RSA public-key cryptosystem. Concerns about short keys have no impact on RSA, despite what the "All keys up" chart in the middle of the article might suggest.

Burton S. Kaliski Jr.
Redwood City, Calif.

Missing the point

Your front-page article "Some users are wary of encrypted software keys" [CW, Nov. 30] overlooks some important implications of the software vendors' practices.

The term "encrypted keys" is a euphemism. What we are really talking about is copy protection. Many of the problems that made copy protection a failure in PC software also exist on the mainframe.

Codes that restrict which CPU the software can run on present a serious problem for disaster recovery. If you have to move your operation to a backup site or a recovery center, you must get a patch from the vendor to allow the copy-protected programs to run.

Some software vendors will provide a key in advance for a backup system, but with a commercial recovery-center contract, you could be switched to a different CPU at the time of a disaster.

The article also mentions keys that contain an expiration date. Most software licenses are perpetual. If you paid for a perpetual license but the software contains an expiration date, you are not getting what you contracted for.

You quote unnamed vendors as saying that it is impossible for the keys to be used to shut down the software. That's ridiculous. Their very purpose is to shut down the software if a customer tries to use it in a way the vendor does not approve of.

Robert J. Sandler
Wayne, N.J.

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Hold out for the database of your dreams

George Roukas

A man once told me that you only really get to know people when you marry them or rent to them. (He was in real estate.) Over the years, I've given that little pearl of wisdom much more thought than it deserves, but I think I'm now qualified to extend it to a third situation. My version is: You get to know people when you marry them, rent to them or buy a database from them.

Oh, go ahead, flirt with multiple spreadsheets — who can resist an old flame? — and date as many word processors and project managers as you like. But when it comes time to pick a database, be ready to settle down. Databases mean commitment. Databases mean the "M" word — you marry your database.

I'm not talking about that bimbo of a database you used to develop phone book applications and the like. I mean that hot little client/server-based number that makes you melt whenever you look at it. The one that gets you thinking about putting down roots and developing all those little applications that look like you.

In keeping with the idea, I've come up with some caveats to consider when you're searching for your perfect match.

• **"Ya better shop around."** A song worth heeding because if you make a mistake choosing your database, you get to sing another one: "Breaking up is hard to do."

The costs of switching from one database to another are staggering. It will make any other port you've ever done seem like child's play. Database vendors know this and will put enormous effort into courting you. Stand fast. Expect to personally verify every assertion the vendor makes regarding features that are important to you.

• **Pick one that will be faithful to you.** Make sure your vendor won't throw you over for the next purchaser/conquest once the knot is tied. How do you find out what your vendor will do? Ask other companies that have made the leap.

• **Performance isn't everything.** Nowadays, everybody's into benchmarking, and you can bet there's one on which your intended will take the top score. Forget it. Benchmarks are fine as far as they go, but that's not very far. The only way to tell what your database will do in the clinch is to test it extensively with the kinds of applications you intend to use.

Different databases are designed and tuned for different kinds of operations. You should know what you'll need yours to do and which products excel at those tasks.

• **Check the pedigree.** Database development is an extremely complicated task. It takes years to develop the basic package and tool sets you'll need for your applications. It takes a vendor with a serious and long-standing commitment to databases (and very deep pockets) to make it work. It also takes a company with a narrow focus, one where databases aren't just another application category on a list of 20.

• **Do you get along with the in-laws?** Your database vendor will not be able to provide you with absolutely everything you need, so be sure there is an adequate following of third-party products. Besides, a large third-party base means that companies in the know approve of your intended. It's a nice security blanket.

Sound crazy? Maybe. But, if you *table* your other work and take the time *to project* into the future of your *union* when you're searching for a new *relation* to *join* with, the effort will be repaid many times.

Had enough? Pray there's no *SQL*.

Roukas is director of systems at a Fortune 50 financial services company.

Help your users help themselves

COUNTER-INFORMATION *by* Michael Schrage

Just where is the dividing line between being genuinely sensitive and being stupidly masochistic? "Responding rapidly to user requests" led the field of critical issues identified by big-budget North American systems developers, according to a recent survey by CSC Index.

Besides themselves, who are these people kidding? The dirty large secret of systems development is that the overwhelming majority of users don't really know what they want, or worse, have grossly unrealistic expectations.

"Responding rapidly" is a surefire recipe for mutual frustration. Sure, it sounds great when you're responding to a survey, but anyone who works in the real world knows that any IS organization in "rapid response" mode probably confuses motion with action.

Precisely because a little knowledge is a dangerous thing, most user requests can be lethal. The real value of rapid prototyping, for example, isn't that we can quickly respond to user requests — it's that users can now explicitly see just what they've asked. *Thank you so much for giving us what we wanted, but now that we've seen it, we realize that's not what we actually need....* Rapid prototyping doesn't solve problems; it is a medium that enables systems developers to help users rearticulate their specs.

The problem is that far too many users operate on the "Obscenity Principle of Software Development." Perhaps you recall Supreme Court Justice Potter Stewart's response when asked to define obscenity: "I know it when I see it." That's how most users identify adequate systems. Only a fool or a masochist invests valuable human resources to respond rapidly to people who don't know what they want or how to articulate it.

Smart developers know that their real challenge is not "rapid response" but "rapid facilitation." They understand that their job is to encourage, chide, chivvy, push and collaborate with users to define the systems opportunity in terms that meaningfully translate into both code and business operations.

Unfortunately, too many development groups are so corporately inept or organizationally embittered that they see themselves as software contractors: *Just shut up, hand us the specs, and we'll give you exactly what you want. You got a problem with that?* Contractors punish their users by "just following orders."

Still other developers go into the Frank Lloyd Wright/Charles-Edouard LeCorbusier "famous architect" mode: *We can do that, but here are the trade-offs you'll have to make because our architecture only permits these sorts of transactions.* In other words, the architecture has been allowed to define the business options, rather than the other way around. One of Wright's clients was furious that a leak in the roof of his new house left rain dripping on his desk. "Move your desk," Wright replied. How's that for "rapid response?"

Obviously, there are contractors with the souls of architects. They care deeply about overarching design issues. Similarly, there are detail-oriented architects who understand materials and structural engineering as well as any contractor.

Alas, there are far too few systems developers who have the courage to take the time to really understand user requests and the dynamics that underlie them.

My father was fond of saying that there are always two reasons for anything: the good reason and the real reason. Developers who make "rapid response" the critical priority are doomed to be only half right.

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990).

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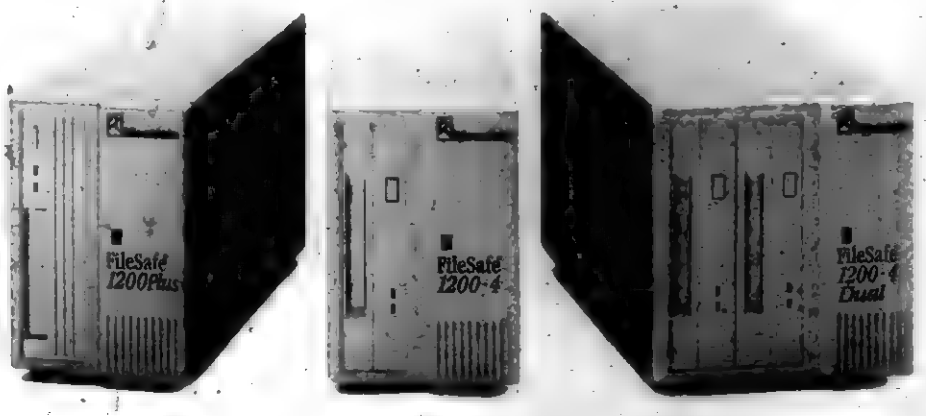

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Charles Babcock

Software tar pits

Not since Frederick Brooks wrote *The Mythical Man Month* in 1975 has there been so much gnashing of teeth over the software business.

Brooks compared software development to a tar pit — an analogy that still fits — and concluded that no matter how you blunder into it, you will only get further enmeshed by your struggles.

Much of what he said might apply to Oracle, Microsoft, Borland or any number of other candidates. Running any software company today is fraught with difficulties, but PC software companies have a particularly tough task.

Part of the difficulty is that software is a constantly changing product rather than a discrete one like stove bolts. Development engineers want to squeeze more functionality into the latest release; marketing wants to launch the product campaign and curtail development; and the sales force wants a flashier user interface.

Brooks concluded that the numerous translations a concept undergoes on the way to becoming a software system each carry risks of failure. Ideas expressed in English must be transformed into specifications, flow charts and designs, which in turn must be converted into a programming language and machine code. When the project falters, management typically throws more programmers at the task.

Today's software companies, particularly PC software companies, have found ways to advance the hex. Often, the financial people are talking expense reduction while the engineers are talking more research and development; technical support is talking greater ease of use; and the sales force is asking why the engineers won't deliver something they can sell.

Meanwhile, development costs have doubled or tripled for firms that serve more than one platform.

Moreover, PC software companies today must constantly revise their projection of who the PC user is. The profile has proceeded down the curve toward a user who is less technically skilled but who has high expectations of functionality and changing design requirements, points out Stephen Kahn, senior vice president of products at Borland.

The tension between supporting the existing product line vs. creating a new one is especially acute in the PC sector. The mainframe and minicomputer software suppliers charged for support. The PC market has become accustomed to free support and pays modest $80 or $90 charges for upgrades.

Given the potential customer base, there is ample opportunity in desktop software, but a PC software company must still juggle a set of conflicting tensions to come out at the right place. A PC user is less understanding than his large system counterpart when the supplier fails to deliver a product on time.

Large system users were frequently engaged in software development and were familiar with the temptations to fall behind schedule. They also knew that a vendor focused only on the schedule might be offering them a bug-riddled product.

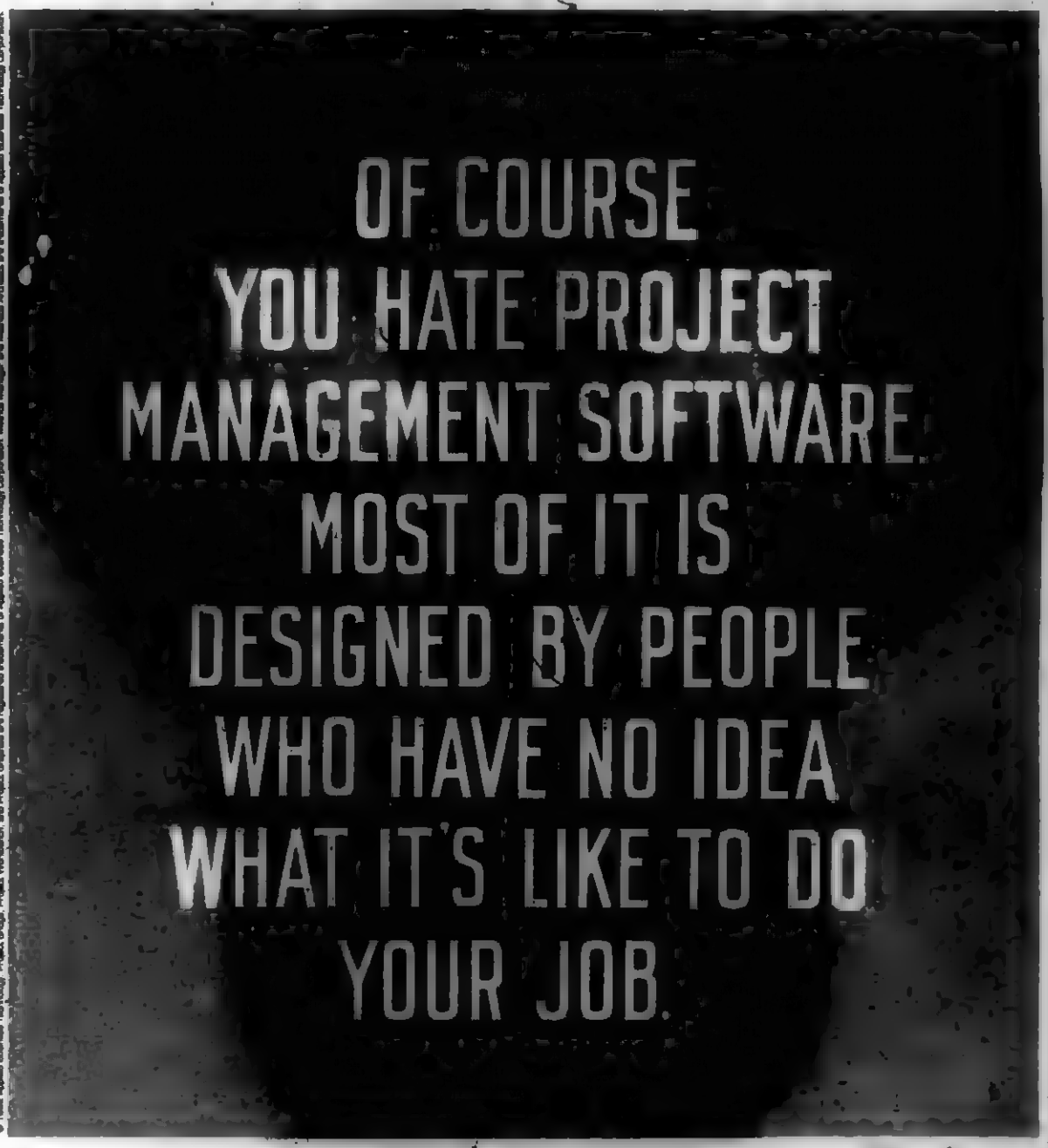
And when something came out unexpectedly ahead of schedule, large system users ran for cover on the grounds that the supplier was most likely looking to customers to help pay testing expenses.

Ambitious PC software firms must cope with different expectations and a different level of competition. Many live in fear of a competitor's stealing a march on them.

Given the inherent ambiguities, software companies need as many no-nonsense, rigorous business thinkers who can execute plans and schedules as they can find. But by nature they attract more than their share of brilliant dreamers, schemers, would-be artists and tinkerers.

The best results may stem from the lone, inspired individual or small, flexible team, but someone has to keep an eye on the path. Too many missteps still lead straight to the tar pit.

Babcock is *Computerworld*'s technical editor.



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Desktop Computing

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Paul Gillin

Don't be fooled by hype of multimedia

Imagine being able to watch Peter Jennings in a window on your PC screen, videoconference with your friends, attach moving pictures of yourself to your documents and integrate newsreels into your memos.

It's multimedia: the future of computing, the toast of Comdex, the next killer app, the big kahuna that's going to transform us from a nation of memo-spewing desk jockeys into wizards of media-empowered communications.

Not.

Multimedia may be a big deal someday, but it's not an explosive market, a paradigm shift or something that should make you send your application developers back to the drawing board.

It is, however, a straw of hope for a vendor community that's seen its hardware business disintegrate into a bloody price war and the mainstream software market devolve into one-upmanship over features that nobody uses.

Vendors absolutely love multimedia. And why not? Multimedia requires state-of-the-art processors, scads of storage, fat network bandwidths with which to transmit all this stuff and pricey accessories such as video cameras and $1,500 add-in boards. What's not to love?

The problem is, multimedia is about as important as mouse pads on the list of pressing corporate buying concerns. That's because the promise of multimedia to materially impact productivity or give anyone but video producers a competitive advantage is highly suspect. It's certainly not yet worth the structural investment users will have to make.

Consider this: If you want to multimedia-empower a single user, you will have to buy roughly $8,000 worth of equipment. That includes a 486 PC with at least 8M bytes of memory, about a half-gigabyte of disk space, graphical user interface software, video and sound boards, speakers and a camera or scanner.

If you want to network this user (and what good is stand-alone multimedia, except as a demo tool?), multiply that by the number of users you've got and then triple it to take into account a server, cabling and the time required to install and test all that stuff and train people on it.

So now what have you got? A user who can send a picture of himself to other people on the network (now that's strategic!) or attach a voice annotation to a memo. (You can do that with voice mail for one-tenth of the cost.)

Flashes of practicality

Yes, there are practical uses for multimedia, and yes, it will play a role, perhaps a major one in the future. You can see why a claims adjuster would like to capture photos of a damaged car and incorporate them into an accident report. And there are some great applications emerging in the real estate business that let shoppers take a virtual tour of available properties without having to go on site.

In the future, multimedia has tremendous potential to link people visually across long distances, cut travel costs and create the virtual workgroup.

But there are too many standards battles to be resolved first. The communications infrastructure needs to be vastly improved. Fifty million desktop computers need to be upgraded or replaced. And millions of users will have to overcome their aversion to making videos of themselves.

No, for now, at least, multimedia is a marketing concept designed to extract big money from you for little benefit. Don't be fooled by it.

Gillin is Computerworld's executive editor.

Upgrades in abundance at this week's Macworld

By James Daly
SAN FRANCISCO

More than 50,000 Apple Computer, Inc. Macintosh zealots are expected to gather at the biannual Macworld Expo/San Francisco this week to sample the latest and greatest wares of more than 500 hardware and software vendors.

This month's Macworld is coming off one of Apple's best years ever. In 1992, Apple sold more than 2.5 million Macintosh computers, a unit sales growth of 20% compared with 1991.

Apple is expected to announce a newly refreshed printer line on Wednesday during the first morning of the four-day gathering. However, the remainder of the show is expected to yield little in the way of breakthrough technological introductions or new applications. Instead, many third-party companies will be showcasing newly revved versions of existing products.

In the kickoff keynote, Apple Executive Vice President Ian Diery will take the wraps off a 600- and 300-dot/in. Laserwriter, a color ink-jet printer, a new Stylewriter using bubble-jet technology and a color scanner.

A look ahead

The following morning, Senior Vice President Roger Heinen will discuss Apple's plans for future operating system add-ons — ranging from QuickTime multimedia improvements to new toolboxes and network enhancements — as well as the company's plan to sell them separately to users who are interested in customizing their systems.

The integrated packages market will get a boost when WordPerfect Corp. rolls out WordPerfect Works 1.2 for Macintosh. The package is a revamped version of Beagleworks 1.0.1, which WordPerfect acquired in October from software maker Beagle Brothers, Inc.

The $249 WordPerfect Works will feature six modules: word processor, database, draw, paint, communications and spreadsheet with charting. The application will also include in-context editing, which allows users to edit material linked from documents that were created in another module.

No Hands Software in Palo Alto, Calif., is slated to announce Common Ground, a software program designed to give users access to a wide range of electronic documents. It will use the company's DigitalPaper technology, a new cross-platform file format that is built into the application.

A company spokesperson said that DigitalPaper-based programs may include executable code that makes them self-launching, which means that in order to view a document the user need not have purchased DigitalPaper-based software from No Hands.

No Hands plans to ship Common Ground 1.0 this month. A version for the Microsoft Corp. Windows platform will be available later this year.

New hard drive

SyQuest Technology in Fremont, Calif., will announce the SyQuest SQ5110C, its first 88M-byte removable hard drive with the ability to read and write to either 44M- or 88M-byte SyQuest cartridges. Until now, SyQuest's original 88M-byte hard drive, the SQ5110, was equipped to read data only from a 44M-byte cartridge. The SQ5110C is expected to be available for approximately $600.

Enviso, Inc., a St. Paul, Minn.-based provider of video presentation and storage products, will introduce SmartStack, a modular storage system and Small Computer Systems Interface (SCSI) expansion system that automatically connects multiple hard drives using only one SCSI and power cable. Prices start at $699.

Two vendors also plan to demonstrate upgrades to their graphics packages. Fractal Design Corp. will exhibit a major revision of Painter, its natural-media graphics package.

The Aldus Corp. consumer division, formerly Silicon Beach Software, Inc., will show SuperPaint 3.5, an update that makes the program System 7-savvy and offers a new color clarity filter. Aldus is also adding templates for memos, brochures and fax cover sheets.

Software Publishing heats up Windows database battle with Superbase 2.0 debut

By Christopher Lindquist

The recent addition of Microsoft Corp.'s Access to the Windows database market has changed the landscape considerably. But Software Publishing Corp., an early entrant into the Windows database market, is not ready to concede, yet.

Software Publishing recently announced the shipment of Superbase 2.0, the latest version of its Windows-based database development package. And while Software Publishing Chief Executive Officer Fred Gibbons said his company cannot compete in a price war with Microsoft, it can compete by providing superior tools. "Superbase is not a $99 product," Gibbons said, referring to Microsoft's promotional pricing for Access. He said Superbase is aimed at professional developers who need to develop serious databases.

Enhancements

As a result, the new Superbase includes several improvements, including a more Windows-compliant user interface, enhanced graphical design tools, extensions to the Super Basic Language and better connectivity.

The first thing beta-test users said they were impressed with was the improved user interface. "Some of their conventions [in previous releases] were a little weird, to say the least," said an information systems analyst at a large oil

Superbase, *page 79*

Dell's formula defies rules in competitive PC market

Michael S. Dell, 27, has come a long way in the eight years since he became a dormitory room entrepreneur of legendary proportions at the University of Texas. The journey has included a flirtation with bankruptcy when his company was still known as PCs Limited, spitting wars with cross-Texas rival Compaq Computer Corp. and a track record that managers many years his senior would envy. While no company can continue triple-digit growth rates unabated, Dell's company continues to race along. He spoke recently with Computerworld *senior writer Michael Fitzgerald.*

Q: As Dell has moved into the first tier of vendors, how has the company changed?
A: Our strategy, while it has evolved, hasn't changed that much. We still want to service customers and run an efficient operation. I think a lot of people underestimate the strength of [our] channel and the power of our business model. We talk to customers every single day, vs. somebody whose biggest customer is an Intelligent Electronics or JWP. We had 149% growth in the U.S. market in the third quarter, so it's pretty obvious we're doing something right.

Q: How is what you do so different from other direct sales companies?
A: It's not hard to imitate pieces of it, but to duplicate our entire process is much harder than it looks, and I don't think anyone's done it. When you look at our market, people have made runs at us — two years ago it was Northgate, last year it was Zeos, this year it's Gateway — and they've followed the same pattern. Growth has shot up, then flattened and then gone down. Now, Gateway hasn't started going down, but they have flattened.

The difference is around the system and product side of the business. We have a significant investment in product development.

Q: Now that you're in the top tier of vendors, how do you keep the hunger from waning?
A: I don't think you'll see any signs of hunger disappearing here. We still view ourselves as David fighting Goliath. We're still the hunter, even though we too are being hunted. We see it as eight down, two to go [in terms of larger PC companies].

Q: One knock against Dell's success has been that you don't sell well into corporate accounts. How much of your growth is coming from there?
A: It's just not true that we don't sell to large accounts. Half our sales for the last three to four years have been to corporate accounts.

If you look at our business today, our fastest growing area is large accounts, meaning the Fortune 500 and government. That grew at 175% on a year-to-year basis in the last quarter, and that's the first time it's been our fastest growing area.

Will Van Overbeke

Michael Dell: *'The world is not IBM and Compaq and Dell'*

Q: How is it that you survived and even thrived in the face of the low-end attack of Compaq and later IBM, which many thought would damage you?
A: The world is not IBM and Compaq and Dell. Together, we make up only 25% of the PC market. If you launch a missile at the market, you'll wipe out a lot of companies before you wipe out Dell.

Q: Your company operates on a lean return on investment of about 5% as part of its business model. How do you keep investors from demanding higher short-term profits?
A: We could earn 8% or 9% in a quarter for a couple of quarters, but that would leave such an umbrella for us in the market for competition to come in. So what we've done is to articulate a strategy and say to investors, 'Look, this is how we run our business; you either like it or you don't.'

Q: Well, certainly you didn't seem that calm in the wake of this flap over your currency trading in the second quarter.
A: I view it as a pretty serious matter when somebody [implies] we broke [Generally Accepted Accounting Principles]. That's a very damaging statement, and when it's not true I don't know how else to react to it. How would you feel if I came out and said your newspaper prints lies?

Q: What do you see as your biggest challenge in the marketplace in 1993?
A: To continue executing our plan [rather] than necessarily reacting to the market.

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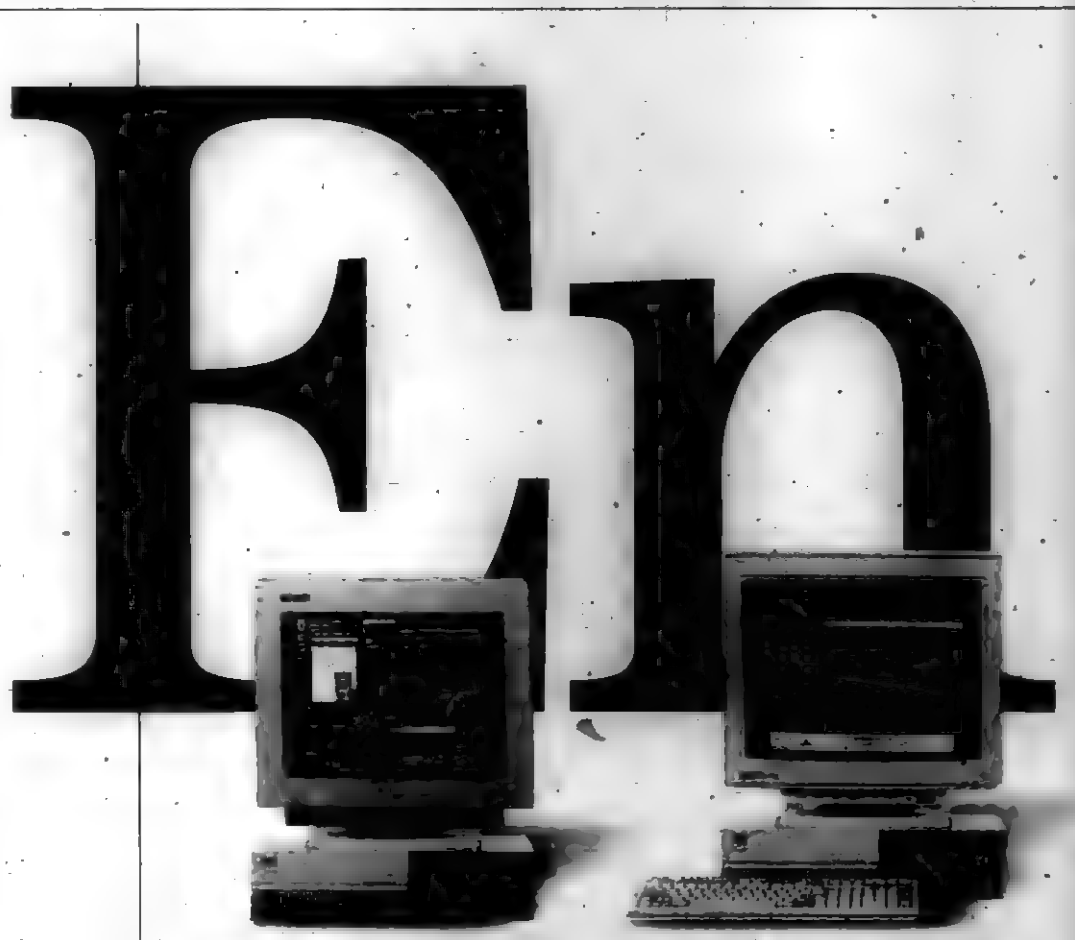
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Viruses ringing in the new year

By James Daly

The holidays are over, the tree is out by the curb and the weather outside is frightful. What is there to look forward to? Virus fighting, for one thing. It may not be as exciting as shredding wrapping paper, but it may keep your data clean and secure.

In addition to the fall's usual rogues' gallery of malicious codes [CW, Aug. 31], this month's virus watch features a well-known and toxic trio that infects DOS machines: Joshi, Casino and a strain of the Jerusalem virus called January 25th.

All of these unwelcome guests are theoretically categorized as nondestructive nuisances. But so was the iceberg that sank the Titanic. Virus writers are not known for reliable code, so any of these infectors may cause a loss of data, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La.-based developer of data security software.

As with all viruses, the following occurrence dates are given for general awareness and are not exclusive. Talented programmers can easily change a few lines of code and make the virus go off whenever they desire. The old advice still holds true: Scan any new disk before it is used and back up, back up, back up.

• **Joshi** is a memory-resident boot-sector infector of disks and the hard drive partition table that activates on Jan. 5. Joshi will hang the system while displaying the message: "Type Happy Birthday Joshi." If the system user types that command, the system will be usable again.

To determine if a hard disk is infected with Joshi, look at the disk's partition table. If the first two bytes of the partition table are hex "EB1F," the hard disk is infected. The Joshi virus can be manually removed from an infected system by powering off the system, then booting from a known clean, write-protected master DOS disk. If the system has a hard disk, the hard disk should have data and program files backed up, and the disk must be low-level formatted.

• **Casino** is a memory-resident infector of .COM files including COMMAND.COM. It activates on Jan. 15, April 15 and Aug. 15. Casino challenges the user to a slot machine game. If the user loses, it will trash the file allocation table.

Programs infected with Casino will have a file length increase of 2,332 to 2,346 bytes. The increase, however, is mostly hidden if the virus is memory-resident. When it is memory-resident, infected files will usually have a file length increase of 1 to 16 bytes.

• The **January 25th** virus is a strain of the well-known Jerusalem virus that activates on Jan. 25, not Friday the 13th as is common to most Jerusalem variants. It is a memory-resident, generic file infector that attacks .COM, .EXE, .SYS, .BIN, .PIF and overlay fields when they are activated. The virus will delete any programs the user attempts to execute.

The first virus was written in 1983 by a University of Southern California student to demonstrate the need for computer security. In 1986, only four viruses were known to exist. Today, the unofficial DOS virus count is approximately 1,500.

Software Publishing heats up Windows database battle

CONTINUED FROM PAGE 77

company. Version 2.0 is more like other Windows programs, however, the analyst said, and the product's speed has improved as well.

Whether the enhancements are enough to stem the Access flow remains to be seen. "The thing that distinguishes Superbase here is experience in how to design database development tools under Windows," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago.

Challengers on the horizon

Superbase faces a tough road ahead, however, with Access along the route now and Borland International, Inc.'s Paradox for Windows due in January. Gibbons said he realized the dilemma, but if users give Superbase a "fair crack at the evaluation process," they might find that Software Publishing can meet their needs better than other companies.

The updated Superbase now includes support for Binary Large Objects such as graphics. It also contains support for Microsoft's Object Linking and Embedding, the Media Control Interface and Windows Pen.

Superbase 2.0 is available now for a list price of $495.

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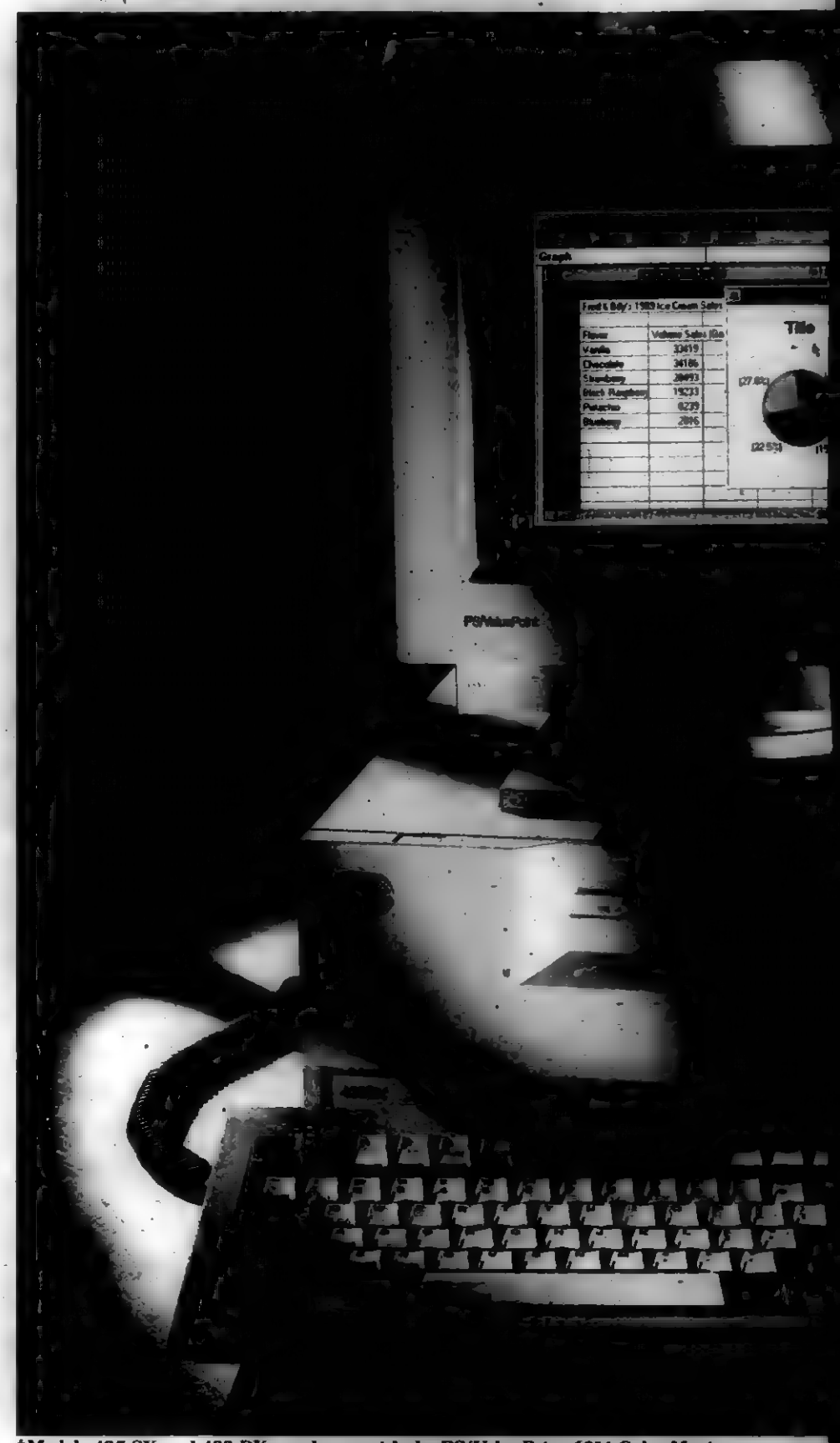

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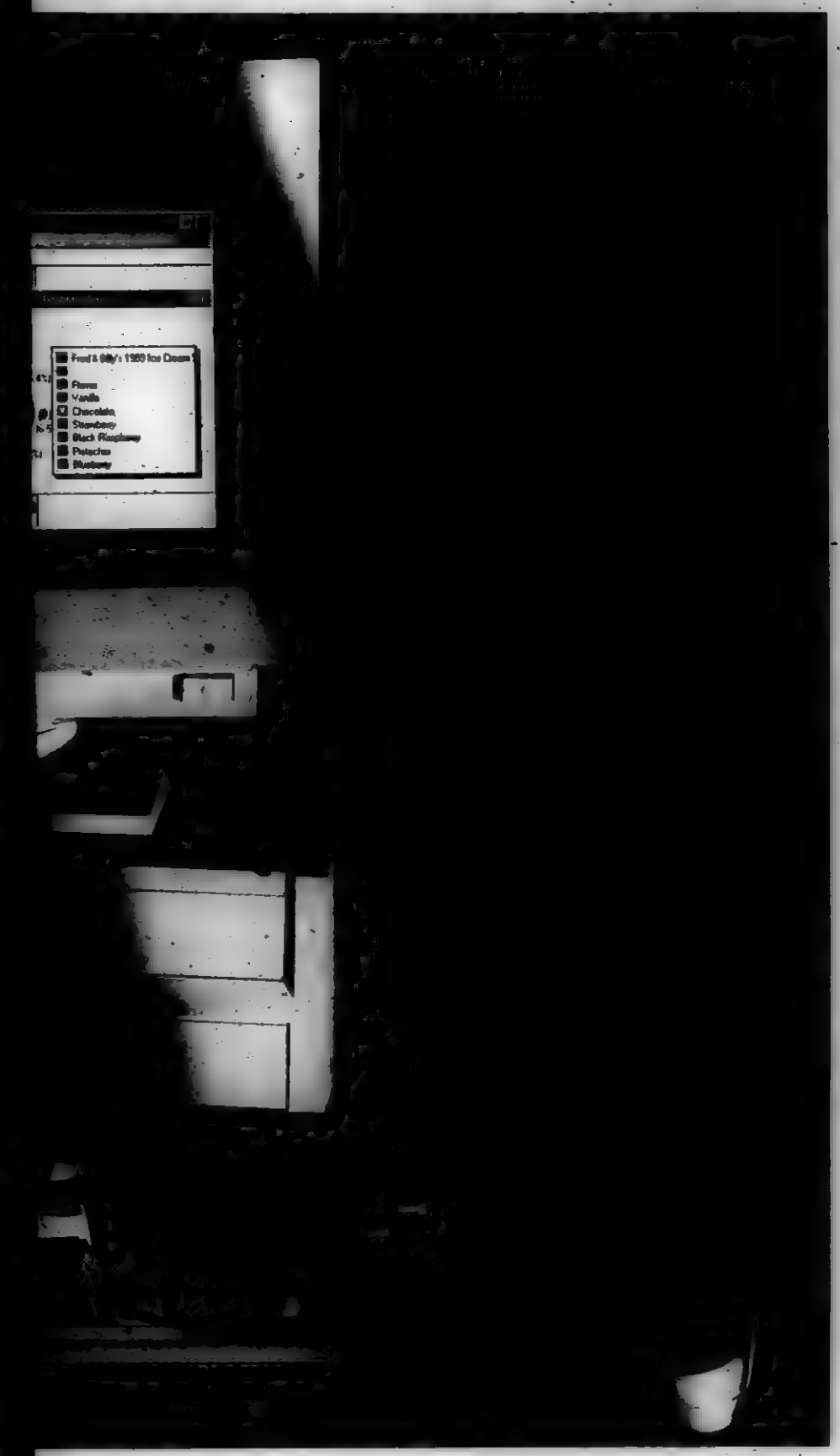

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HELP LINE

Quattro Pro for Windows

Part of a series of user tips provided by vendors and drawn from their customer support lines. This week's topic is Borland International, Inc.'s Quattro Pro for Windows.

Q: How do I create an ASCII file in Quattro Pro for Windows?
A: There are two ways to do this: Copy your selected text into the Windows clipboard, paste into the Windows notepad and save the notepad file. Or activate the Quattro Pro for DOS slash menu from the application menu and select /Print/Destination/File/<name the file>/Spreadsheet Print.

Q: How do I import Quattro Pro WQ1 files into Quattro Pro for Windows notebook pages?
A: To import your WQ1 files into separate pages of a Quattro Pro for Windows notebook, simply select the page tab to make the page active and choose Block/Insert/File from the top menu. The spreadsheet name will become the name of the page. Any linking syntax will need to be changed.

Q: How do I print multiple graphs?
A: To produce one graph per page, simply go to the graphs page and select the graph icons of the graphs you wish to print and then choose File/Print.

If you desire more than one graph per page, you will need to insert the graphs into a blank area of the spreadsheet, block out the spreadsheet print area and choose File/Print.

Q: What can I do in the Database Desktop that I cannot do in Quattro Pro for Windows or Quattro Pro for DOS?
A: The Database Desktop has the ability to query multiple tables, work with more than 8,192 records and edit, add, delete or change values in external database tables. These abilities are not available in Quattro Pro for Windows or any version of Quattro Pro for DOS.

> The Database Desktop has the ability to query multiple tables, work with more than 8,192 records and edit, add, delete or change values in external database tables. These abilities are not available in Quattro Pro for Windows or any version of Quattro Pro for DOS.

Q: How do I get my 1-2-3/Quattro Pro for DOS macros (menu equivalent/keystroke) to run?
A: Choose Property/Application/Macro/Key Reader/Yes for 1-2-3 macros. For Quattro Pro DOS macros, set the Key Reader to "No" and set Property/Application/Macro/Slash key to "Quattro Pro-DOS."

Q: How do I copy using group mode?
A: There are two ways, depending on whether you are currently doing data entry or you want to copy existing data to other pages. On data entry, use <CTRL><ENTER> instead of <ENTER> to drill an entry through to all pages in a group. To copy from one page to a group of pages, you must copy to clipboard, create group and paste in that order.

Q: How do I enter a date?
A: Either perform <CTRL><SHIFT>D followed by a valid date format or set Property/Current Object/Block/Data Entry Input/Dates Only and then input into a cell with a valid date format.

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Macintosh products

Trend Micro Devices, Inc. has introduced SafeLock for the Apple Computer, Inc. Macintosh.

The combination of password protection, data security and virus scanning and removal capabilities are incorporated into the product.

SafeLock was designed for PowerBooks, portables and any Macintosh environment, and it restricts unauthorized access to all data on an unlimited number of Macintosh hard drives. For instant security, a Lock Now feature can be activated.

An unattended lock can also be used; it starts working after a manually set or preset period of idle time.

SafeLock costs $49.

➤*Trend Micro Devices*
Suite D-100
2421 W. 205th St.
Torrance, Calif. 90501
(310) 782-8190

Peripherals

Lexmark International, Inc., a former IBM division, has introduced the IBM Color Jetprinter PS 4079.

The product includes an advanced version of Adobe Systems, Inc. PostScript-compatible software and has a new 16-MHz, full 32-bit reduced instruction set computing processor from Advanced Micro Devices, Inc.

Simultaneous connection is provided to IBM and Apple Computer, Inc. Macintosh computers. The printer offers 360 by 360 dot/in. resolution, which, combined with an advanced screening technique called ColorGrade, allows the printer to generate true halftone quality, something usually identified with 600 dot/in. printers.

The product costs $3,495.

➤*Lexmark International*
740 New Circle Road NW
Lexington, Ky. 40511
(606) 232-2000

Toshiba America Information Systems, Inc. Disk Products Division has introduced the XM-3401 Series CD-ROM disk drives.

The double-speed drives provide a 330K-byte/sec. data transfer rate and a 200m/sec random-access time.

A Small Computer Systems Interface (SCSI)-2 interface is provided to ensure compatibility and simplify integration. Digital audio transfer over the SCSI bus is also possible. A mean time between failures of 50,000 hours and a contamination-free design are offered for reliability. The drives require 6W maximum and 4W average power consumption. Four models are available.

Prices start at $695.

➤*Toshiba America Information Systems*
Disk Products Division
9740 Irvine Blvd.
Irvine, Calif. 92718
(714) 583-3000

Mass Optical Storage Technology, Inc. has introduced the RMD-5200-S drive.

The product is the first to put 256M bytes of data on a 3½-in. disk drive, according to the company. Full backward compatibility and dual-mode operation are provided to the 128M-byte International Organization for Standardization DIS10090 standard.

The RMD-5200-S can shift into different capacity modes by using Automatic Media Sensing for on-the-fly media identification. Users can access any track in a 128-track bank within 12 msec by using a scanning/short seek function.

The RMD-5200-S costs $1,585.

➤*Mass Optical Storage Technology*
11205 Knott Ave.
Cypress, Calif. 90630
(714) 898-9400

Polaroid Corp. has announced a Microsoft Corp. Windows-based version of its CI-700 Digital PhotoPrinter.

The product is a desktop printer that was designed for capturing and archiving hard-copy images of computer graphics and digital video files. The CI-700 Digital PhotoPrinter can also be used for previewing and documenting works in progress and generating video storyboards. Images are exposed using LED technology, and instant 24-bit color photographs are output from digital sources in 40 seconds.

The introductory price is $1,495.

➤*Polaroid*
575 Technology Square
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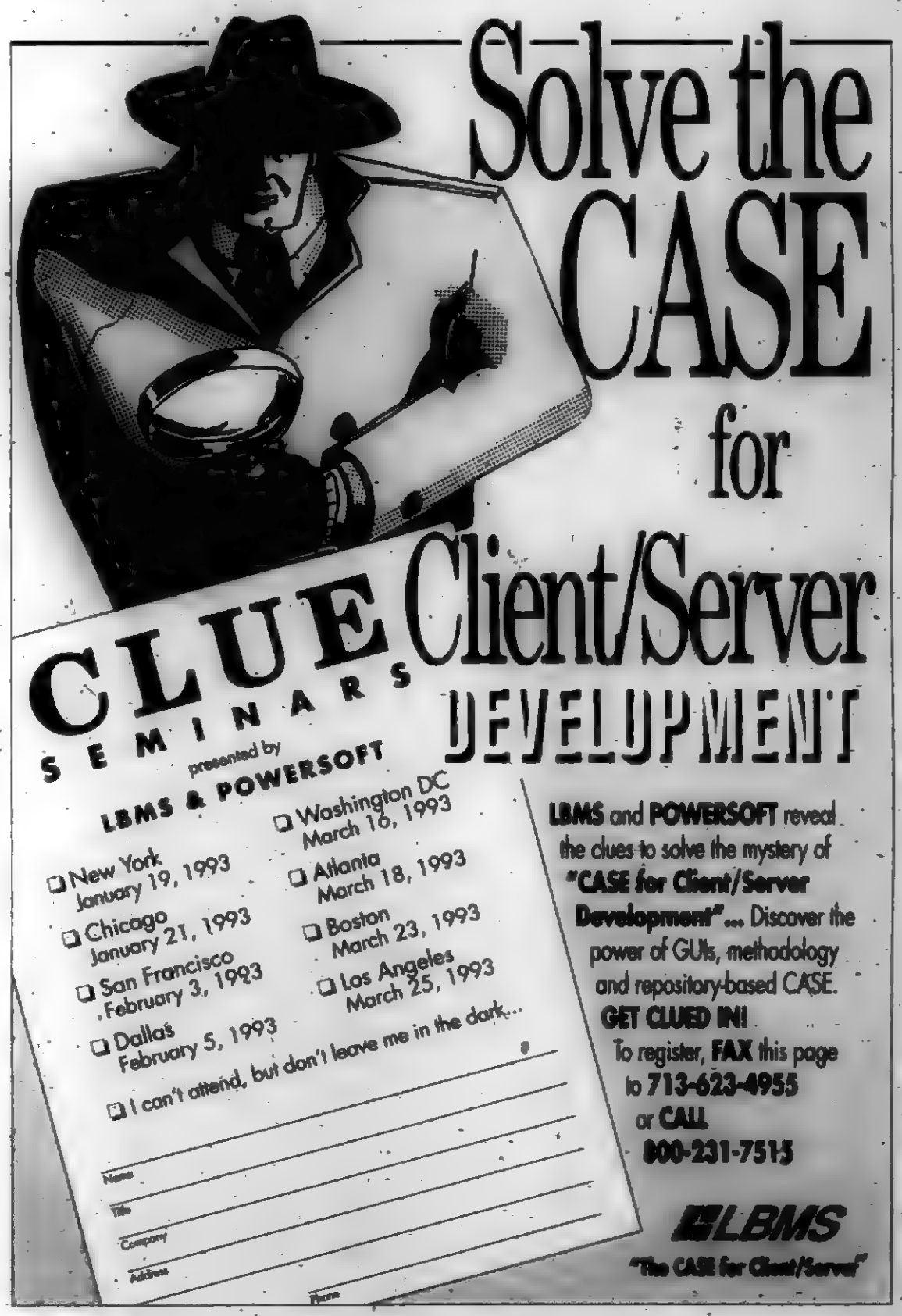
(617) 577-2000



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On the presidential PC trail

Gearing up for Clinton/Gore inauguration no easy task

By Rosemary Cafasso
WASHINGTON, D.C.

The information systems team of the Presidential Inaugural Committee just lived every IS executive's nightmare and dream.

In November, they were called on to network more than 400 staff members and deliver an assortment of applications to them. And they were given about six weeks to do it.

But before they could even begin to panic, the team was flooded with donated PCs and software packages from a host of computer companies that were more than willing to be associated with this prestigious group.

In fact, the Inaugural Committee was lent so much equipment — well over $1 million worth — that it actually had to turn down some vendors' offers made in late November, said Dunkin Ritchie, director of office automation for the committee. He would not name those vendors who were politely refused. But most of the big-name vendors, from IBM and Compaq Computer Corp. to Microsoft Corp. and Borland International, Inc., are on the roster.

President-elect Bill Clinton *has an IS team of seven coordinating his inauguration with PCs donated by major hardware vendors*

Even with such assistance, the IS team of seven has been working seven-day weeks and typically 12- or 14-hour days, Ritchie said. In short, there is simply no margin for any IS delay.

With only a few weeks to spare, Ritchie's staff now has more than 300 users on IBM PCs and compatibles linked via Artisoft, Inc.'s Lantastic local-area networks and another 50 users running Apple Computer, Inc. Macintoshes. In early January, a few hundred more users will be added.

The committee is responsible for organizing the dozens of events — from parades and galas

Clinton, *page 88*

32-bit card fits MCA

IBM tries to break adapter mold

By Lynda Radosevich

■ IBM confirmed reports that it plans to enter the high-performance adapter card market soon by announcing a 32-bit Token Ring adapter for Micro Channel Architecture (MCA)-based Personal System/2 workstations.

The 32-bit card could be useful in certain server applications, said Tom Nolle, president of CIMI Corp., a consulting company in Voorhees, N.J. For example, a server using a Small Computer Systems Interface (SCSI) adapter to control high-performance peripheral devices such as optical disc storage can become performance-bound by an 8- or 16-bit network adapter. A 32-bit adapter could help break that bottleneck, he said.

An IBM official named multimedia applications as one of the forces driving the need for the new card. But "this is not a demand-driven market," Nolle said. "The tendency is to announce high-performance products because they differentiate a company in a market dominated by $200 adapters."

For Jim Queen, local-area network manager at Enron Gas Services Corp. in Houston, the added muscle of a 32-bit Token Ring adapter card is attractive, whether or not the need for high throughput is there. "We get good performance out of the 8-bit card, but if we can get faster performance for the same price, we'll do it," he said.

No small shakes

Although IBM has not disclosed pricing for the new cards, other high-performance adapter cards cost seven to 10 times more than commodity-priced 8- and 16-bit Token Ring adapter cards. For example, Token Ring competitor Madge Networks, Inc. in San Jose, Calif., offers

Adapter, *page 88*

Unix portables still too costly

By Maryfran Johnson

Hobbled by high prices and a limited number of suppliers, the market for portable Unix workstations is still struggling to find its place in the booming business of mobile computing.

Yet a steadily growing number of users — especially field technicians, software developers and engineers — are lugging along Scalable Processor Architecture (SPARC)-based notebooks and laptop systems to remote offices and off-site meetings. Their common ground is a need to access applications on Sun Microsystems, Inc. client/server networks.

"The ability to send a workstation home with an engineer is a nice fit for a lot of companies," said Jesse Charfauros, a senior systems administrator at San Diego-based Brooktree Corp., which runs a network of 100 Sun machines. While Brooktree is not using any SPARC portables now, Charfauros said he watches that segment of the market more carefully these days.

With internal disk drive space of up to nearly 500M bytes for the leading SPARC portables and plenty of SPARC applications to run, the most serious drawback is prices in the $6,000 to $15,000 range.

"They are way overpriced, and they need to start driving prices down below $5,000 to get some real volume," said Nancy Battey, an analyst at International Data Corp. in Mountain View, Calif.

"There is a lot of growth potential out there," Battey added. "In the next three years I think we'll see a real takeoff. It's where the world is moving."

The DOS-based portable market has become the fastest growing segment of the PC business — one key reason being rapidly shrinking prices. Analysts at Technology Investment Strategies Corp. in Framingham, Mass., said the number of portables sold this year is expected to more than double — from 3.2 million sold in 1991 to 7.2 million in 1992.

The Unix slice of that market, however, has been too minuscule to count until now. Analysts estimate that fewer than 10,000 SPARC portables are in circulation now.

Yet the advent of smaller, cheaper microprocessors such as the 50-MHz MicroSPARC chip from Sun and Texas Instruments, Inc. is already giving the SPARC portables market a boost. RDI Computer Corp. in San Diego, for example, is planning to ship its new BriteLite LX portable, based on the MicroSPARC chip, this month.

SPARC portables

A new round of on-the-road workstations will appear in Q1 '93

Tadpole Technology, Inc.
Austin, Texas
SPARCbook 2 notebook, 40-MHz processor, 500M bytes disk storage, Solaris 2.1, pricing from $11,000.

EOS Technologies, Inc.
Santa Clara, Calif.
EOSportable 130N "transportable" workstation, choice of 40-MHz or 36-MHz processor, 424M bytes disk storage, Solaris 2.1, pricing from $7,000.

RDI Computer Corp.
San Diego, Calif.
Britelite LX, 50-MHz SPARCengine LX processor, 450M bytes disk storage, Solaris 2.1, priced from $16,000.

CW Chart: Michael Siggins

Portable Unix workstation users fall in a distinctly different category from DOS users. Rather than using personal productivity applications such as spreadsheets or text editors, the Unix users need on-the-road access to network-based applications. Some of the more common uses for SPARC portables include real-time data collection, satellite equipment testing or network troubleshooting from remote sites.

Among the half-dozen SPARC vendors that offer some form of portable system, the two most prominent U.S. vendors are Tadpole Technology, Inc. with its SPARCbook notebook computer and RDI with its BriteLite line of portables.

At the U.S. Department of Defense, some senior executives take RDI's BriteLite portables to off-site meetings, RDI officials said.

Another U.S. contender, EOS Technologies, Inc., plans to start shipping its "transportable," 18-pound SPARCstation-compatible in February. In Japan, SPARC portables are now shipping from Toshiba Corp., Matsushita Electric Industrial Co., Fujitsu Ltd. and Sony Corp.

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Denver, CO	February 17, 1993
Detroit, MI	February 11, 1993
Harrisburg, PA	February 16, 1993
Houston, TX.	February 5, 1993
Indianapolis, IN	March 11, 1993
Los Angeles, CA	February 3, 1993
Minneapolis, MN	March 4, 1993
New Orleans, LA	February 25, 1993
New York, NY	February 9, 1993
Orlando, FL	February 11, 1993
Philadelphia, PA	March 11, 1993
Phoenix, AZ	February 24, 1993
Pittsburgh, PA	February 24, 1993
Portland, OR	February 23, 1993
Richmond, VA	February 25, 1993
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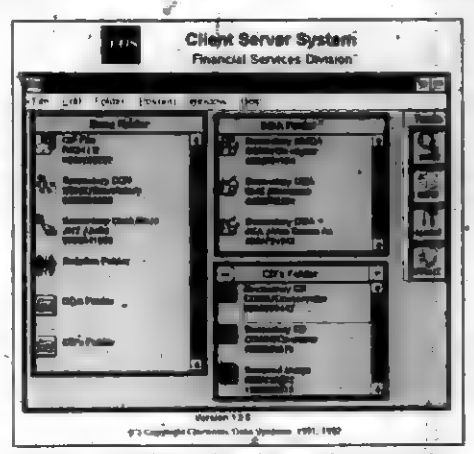
St. Louis, MO	March 9, 1993
Tulsa, OK	February 9, 1993
Washington, DC	March 3, 1993

Client/server can be fun and games

By Mark Halper
HOUSTON

A recent client/server conversion at Tanglewood Bank involved many of the usual ingredients: a systems integrator, a local-area network, a relational database, some terminal emulation products, a 486 server and, oh yes, a card game.

Some 50 PC users at the $170 million commercial bank discovered that one way to adjust to working in Microsoft Corp.'s Windows after 10 years of mainframe computing was to fiddle around with the Windows solitaire game, recalled Jerome Simon, Tanglewood's executive vice president.



Houston's Tanglewood Bank *went from a mainframe-based system to a client/server system that uses the Windows environment*

Games aside, the client/server project has streamlined the bank's operating efficiency. Before the conversion, implemented by integrator Electronic Data Systems Corp. last summer, some 50 PC-equipped loan officers and other staff members had to access a customer's records one at a time. A user had to make separate requests, for instance, for a customer's loan status and direct deposit and checking account information.

To call records down from the remote IBM 3090 mainframe — also operated by EDS — users worked with a rigid menu system that was part of EDS' Bank Management Information System (BMIS), an integrated CICS-based banking software program.

But EDS' installation of Microsoft's SQL Server software and client side Windows changed all that. EDS loaded SQL Server onto a Dell Computer Corp. 486 server for downloading customer files from its Dallas-based 3090 over a 3270 LAN gateway.

The result: The 50 PC users can now call up all of a customer's records with one command. SQL Server delivers those records via a Banyan Systems, Inc. Vines LAN, which was already in use. To open a new record or file, the user simply opens a new window and requests the information.

The new system "puts all of your customer information at your fingertips," Simon said.

Mum on costs

Neither Simon nor Charles Manning, EDS' financial services product manager for micro technology, would say how much the project cost EDS or what EDS charged the bank. Manning said three EDS developers took three months to write code for the project, and EDS began laying the foundation for the project about one year ago.

But in addition to providing development and implementation, EDS also acted as product middleman, selling and leasing hardware to the bank.

Among the new hardware requirements for the system are roughly 25 new 486 PCs to replace client PCs. Tanglewood leases the new PCs from EDS.

Although EDS brought Windows and SQL up in one weekend in early July, the user shift was gradual. Prior to the conversion, EDS provided all 50 users with four hours of Windows training.

And until mid-September, while the bank used Windows for applications such as spreadsheets and office automation, it continued to access customer records through BMIS. The bank has been using the SQL Server software and the file folder customer record system for about three months now.

The bank has also not completely forsaken the BMIS system. It continues to leave what Manning called "account detail" information on BMIS and calls it down when necessary.

BMIS records include information such as customer history, clerical data and other information that a loan officer would not need as often as the "customer information" stored on SQL Server, according to Simon.

Imaging ahead

Meanwhile, the system is still evolving. EDS is developing imaging technology that the bank hopes to bring on-line by March 1993. The imaging system will allow the bank to scan customer documents such as signature cards and account applications into its records and will require an optical storage device.

Meanwhile, the bank's users have had little problem letting go of their old hierarchical habits. According to Simon, EDS designed client PC connections so that users could choose to remain on BMIS if they wanted.

But, Simon said, "they just haven't done it." They grew into Windows proficiency about 10 days after EDS loaded the software, he noted.

So have the users stopped playing solitaire?

"I hope so," Simon said.

In Brief

AST RAID debuts

AST Research, Inc. recently introduced multichannel redundant arrays of inexpensive disks (RAID) subsystems for its Premium SE server and Manhattan SMP multiprocessor lines. The arrays, which support RAID Levels 0, 1, 5 and a proprietary level called AST RAID 6, come in three- and five-channel versions, priced at $2,995 and $3,995, respectively.

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On the presidential PC trail

CONTINUED FROM PAGE 85

to prayer services that will accompany the inauguration of Bill Clinton as the 52nd president of the U.S. The staff members are required to perfectly orchestrate the events of the inauguration, down to the last seating arrangements, before the festivities begin Jan. 17.

Resume screening

To handle the load of thousands of resumes streaming into the Clinton/Gore transition team headquarters, the staff is using more than 30 Sun Microsystems, Inc. SPARCstation workstations running Resumix, Inc.'s artificial intelligence software. The ResumixSun system allows the team to retrieve and review more than 2,000 resumes received daily. Each resume is scanned in just three seconds while key information is extracted and stored in the database for later access from desktop PCs.

To cope with this pressure, Ritchie's team took a no-fuss approach.

There were no significant planning sessions or product evaluations. Instead, the team identified what the most basic user needs were and then filled them with the readily available software.

IS had plenty to work with. IBM, for instance, sent along more than 200 Personal System/2s, and Apple dispatched 50 Macintoshes to the committee's Washington headquarters.

WordPerfect Corp. lent a 200-node license for its word processing software, and Borland provided spreadsheets and database software.

By virtue of being there first, these products became platforms and applications of choice for the committee.

For more specific needs, Ritchie placed telephone calls to vendors "at random" and "those that stepped up quickly, we went with," he said.

The goal was to be keep things as simple as possible. Ritchie's team requested MS-DOS applications to minimize any training time users might require on Microsoft's Windows platform.

IS was able to get basic tools delivered in November and December.

"We have to make sure they can write letters, memos, plans and recommendations," Ritchie said. "It's all the paper communication that is necessary to pull off an event like this."

Hundreds of full-time workers, along with thousands of volunteers, are now churning out correspondence and managing guest lists, entertainment and personnel from the committee's headquarters, which takes up 94,000 sq ft of office space.

IS worked with a "building blocks" approach, Ritchie said. As the staff became functional, IS began installing LANs. First, teams were linked. Then electronic mail was installed.

Ritchie's team is now linking the many LANs together so larger groups of staff members can communicate.

IBM tries to break adapter mold

CONTINUED FROM PAGE 85

32-bit Token Ring Extended Industry Standard Architecture and MCA cards for around $1,300. The 32-bit Ethernet cards are available from many vendors, and they range in price from $700 to $1,000.

IBM said its 32-bit Busmaster 16/4 Token Ring adapter will support 32-bit addressing and data streaming — its fast data-transfer technology that doubles the MCA data-transfer rate to 40M byte/sec.

It will support shielded and unshielded twisted-pair cabling and is expected to be available in the first half of next year.

IBM is also working on client/server software that will run under LAN Server 3.0. The software will monitor the network and limit the number of concurrent multimedia sessions running on a 16M bit/sec. Token Ring local-area network to make certain that available bandwidth is not exceeded.

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[redacted]

Workgroup software applications

Keyfile Corp. has introduced Version 2.0 of Keyfile, an enhancement to the company's integrated document management software.

More than 50 product enhancements have been added to this version, including TIFF-it technology and Typematic comments designed to offer more powerful handling of electronic documents and forms, improved document indexing and faster document handling, the company reported.

Three configurations of Version 2.0 are offered: the Keyfile Personal Edition for single users; Keyfile Workgroup Edition for workgroups of up to five people; and the original Keyfile Enterprise Products for large departments.

Pricing for the product enhancement begins at $595.

➤*Keyfile*
22 Cotton Road
Nashua, N.H. 03063
(603) 883-3800

Apexx Technology, Inc. has announced the WinLAN network adapter.

The adapter was designed for Version 3.1 of Microsoft Corp.'s Windows for Workgroups operating environment. Users can build a full-function workgroup local-area network with features such as electronic mail, file sharing, printer sharing and group scheduling when the adapter is combined with software from Windows for Workgroups.

Peer-to-peer networking is available for a workgroup of PC users because the WinLAN adapter can be installed in any IBM-compatible PC. WinLAN adapter operates at 500K bytes.

A two-PC network starter kit is priced at $199.

➤*Apexx Technology*
958 E. Braemere Drive
Boise, Idaho 83702
(208) 338-9632

Above Software, Inc. has introduced a special edition of Golden Retriever that was designed for workgroups.

Golden Retriever is an information navigator for Microsoft Corp.'s Windows 3.1 that assists users in managing documents, spreadsheets, database records and other logical relationships, the company reported.

Electronic file drawers and file folders are provided, and file names of up to 255 characters long can be used.

Until Feb. 15, Golden Retriever is available directly from Above Software for $59.

➤*Above Software*
#200
2698 White Road
Irvine, Calif. 92714
(714) 851-2283

Unix

Pacific Software Group has introduced Version 1.0 of TaskMaster for Unix.

TaskMaster is a visual file manager and personal productivity tool. A point-and-shoot interface is offered for controlling system functions and utilities and managing files.

Users are able to build menus as well as run applications, create backups, find and browse files and directories and control print jobs.

The ability to read and send mail as well as delete and undelete files is also provided. Personal and group reminders can be scheduled that notify users even when they are not in TaskMaster, according to the company.

A 10-user license costs $295. An unlimited user license costs $595.

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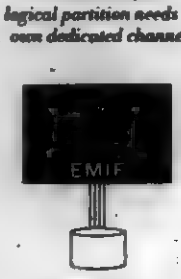

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2025-213

Printing eased

Protocol promises to greatly simplify networked printing

By Elisabeth Horwitt
BOSTON

Twenty months after its formation, the Network Printing Alliance (NPA) is launching the first release of a protocol that promises users greater ease in operating printers over networks.

The alliance was formed in April 1991 by Insight Development, Intel Corp., Lexmark International and Texas Instruments, Inc. to develop the following:

•A standardized, bidirectional interface that allows printers and computers to interact at speeds of up to 1G-byte/sec.

•A protocol that would enable printers to return status and other data to computers independent of the computer's operating system and the printer's datastream type.

Scheduled for general release at NetWorld '93 here next week, the protocol should ease some long-standing user printing problems, such as the difficulty of finding out whether a job is getting done and what is holding it up without traveling bodily to the printer with an instruction manual, according to Rob Auster, vice president of electronic printing at Norwell, Mass., research firm BIS Strategic Decisions.

Despite their increased capacity and bells and whistles, printers have stayed well behind PCs when it comes to ease of use, particularly when a diverse body of PCs, applications and printers are communicating over a local-area network, Auster said. "The last thing you want to do is walk down to the printer and figure out what state it's in — whether the paper is in" and what type of fonts and printer definition languages are being used, he added.

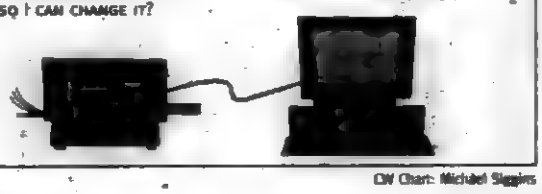
Some users at BIS, for example, came to grief because they were given a printer that used Adobe Systems, Inc.'s PostScript when their applications were set to Hewlett-Packard Co.'s Printer Control Language, Auster said. "It took us a day and a half of sitting at the front panel, book in hand, to turn on the HP emulation" on the printer, he added.

The NPA Protocol should help

Printing, *page 95*

The joys of communicating

The Network Printing Alliance's high-speed interface should support the following types of interaction between a printer and a system sending a job:



CW Chart: Michael Siggins

Cabletron fine-tunes ATM migration scheme

By Joanie M. Wexler
ROCHESTER, N.H.

Cabletron Systems, Inc. has nailed down the details of a plan it outlined in November for migrating its local-area network customers to the scalable bandwidth and predictable-delay benefits of Asynchronous Transfer Mode (ATM) networking.

The vendor's four-phase scheme stretches from the upcoming NetWorld show to mid-1994 (see box at right). Cabletron said it intends to kick off the first phase at NetWorld '93 Boston, Jan. 12-14. The vendor, which has teamed with Fore Systems, Inc. in Pittsburgh, will show its Multi Media Access Center (MMAC) hubs linking into Fore Systems' ASX-100 ATM switch.

The demo will provide Ethernet, Token Ring and Fiber Distributed Data Interface LANs with the nonblocking 2.5G bit/sec. backbone bandwidth of the ASX-100's backplane. A nonblocking architecture means traffic communicating over the backplane does not contend for bandwidth.

Channels of top LAN speeds are nailed up to ensure native LAN speed networking. Router vendors Coral Networks, Inc. and Network Systems Corp. incorporate nonblocking schemes in their routers.

In this first phase, MMAC-connected networks will remain shared-medium LANs, but their packets will be converted to and from nonblocked ATM cells when traveling through the ASX-100.

Fore Systems, like its competitor Adaptive Corp. in Redwood City, Calif., makes stand-alone LAN switches based on ATM cell technology. Users of shared-medium LANs, such as Ethernet, have expressed interest in migrating to ATM for multimedia and other high-bandwidth, delay-sensitive applications.

But how much mainstream ATM networking will be going on in the near future may not match the hype the technology has received.

For example, the city of Milwaukee, an MMAC site, is "tired of being on the bleeding edge," said Joe Giljohann, microcomputer specialist. He said he is looking first to accommodate higher speed applications in his wide-area network rather than on his LANs.

Giljohann said it is "too early" for him to know what kind of LAN ATM applications he might have. He currently relies on his 100M bit/sec. multiplexer/router PremNet network from Racal-Datacom, Inc., which carries mainframe sessions and multiple protocols on one wire.

"I don't think a majority of Cabletron's [37,000] MMAC sites will need ATM by 1994, but Cabletron has to have a story," noted Paul Callahan, senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Callahan applauded Cabletron's frankness about some limits of ATM technology, such as its currently being Transmission Control Protocol/Internet Protocol-specific.

Cabletron's Phase 2 will add support of Novell, Inc. IPX, DECnet Phase IV, AppleTalk, Open Systems Interconnect and Xerox Network Services protocols so users can link to servers speaking these protocols through the ATM switch.

Strategies such as Cabletron's blur the lines between bridge/router firms such as Cisco Systems, Inc. and Wellfleet Communications, Inc. and hub vendors. Cabletron's Phase 3, for example, calls for each LAN interface module in Cabletron's next-generation ATM hub to handle routing and bridging.

"If these guys can cost-effectively build in routing at the hub level, they could really start to pressure the router vendors," Callahan said.

Medical center builds critical LAN

By Michele Dostert

The applications that are the most mission-critical are the ones on which people's lives depend. St. Agnes Medical Center in Fresno, Calif., has built a 600-user local-area network that supports both mission-critical patient-care applications and office productivity applications and has an uptime record of 99.6%.

The St. Agnes information systems staff credits its success in building such a stable LAN to the foresight and support of management and to a penchant for careful planning and testing. "Our CFO in 1988, and our CEO today, are very

Medical center, *page 98*

At St. Agnes Medical Center, *Harry Kalebjian, systems analyst (left) and Wayne Robertson, network administrator, contribute to mission-critical LAN strategy to keep hospital on cutting edge of patient care*

Networking boost for message queuing

By Elisabeth Horwitt

Systems Strategies, Inc. will help IBM implement its message and queuing technology for distributing applications across multivendor, networked environments.

Introduced by IBM in September, Message Queue Interface (MQI) "is one of three interprocess communications paradigms that we see as fundamental to the IBM Blueprint strategy" for building distributed, networked applications across multivendor environments, IBM spokesman Graham Tuttle said.

The other two paradigms, Remote Procedure Call (RPC) and IBM's LU6.2, also enable distributed systems to exchange data, queries and tasks as they cooperate on an application, Tuttle said. Their drawback is that such transactions cannot take place unless the two systems involved are up and available to each other at the same time, according to Systems Strategies spokesman Les Yeaman.

In addition, the RPC and LU6.2 interfaces do not entirely screen application developers from the technicalities of the underlying network protocols, Tuttle said.

In contrast, an MQI-based application enables one system to send queries or data without assuming that "there's always a connection between it and its partner," Tuttle said. If the receiving partner is busy or down, or the link fails, messages wait in a queue until the connection can be established, he added.

This means two or more systems cooperating on a job can work on their tasks without waiting to hear from the other systems. This is important when systems are working on several jobs at once or reside at different sites that cannot always establish long-term links, Tuttle said.

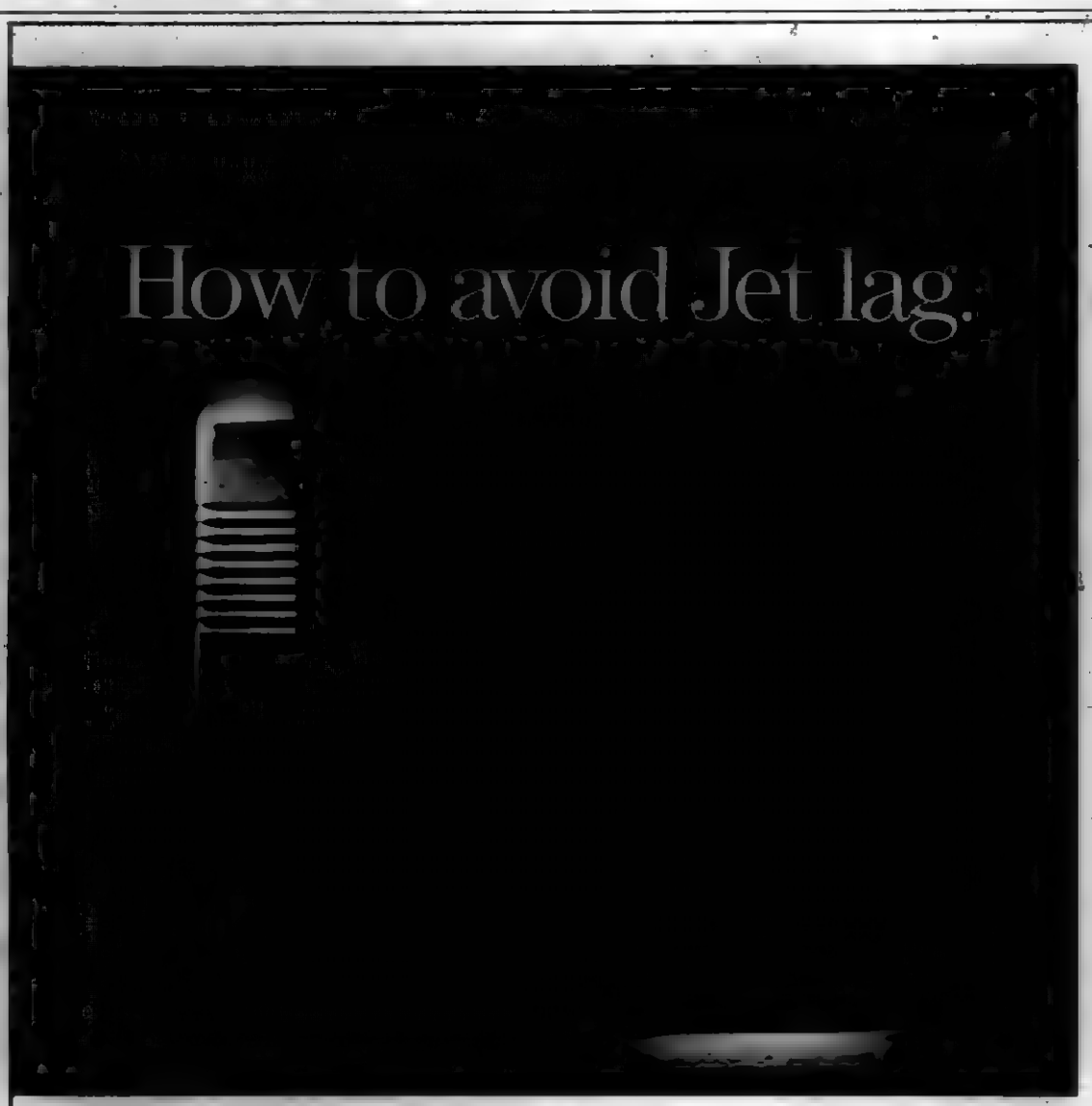
MQI also enables application developers to hide the differences in operating systems and byte-storing methods when building applications on a multiplatform environment, Yeaman said.

Part of the family

Systems Strategies said it will offer MQI on its EZbridge Transact product family, which is said to provide message-based distributed processing across Digital Equipment Corp. VMS, Tandem Computers, Inc. and Stratus Computer, Inc. System/88 systems.

MQI support for EZbridge products will be rolled out in early summer through early fall 1993, Yeaman said. Users meanwhile can begin building applications on the existing EZbridge and migrate easily to MQI, he added.

IBM plans to roll out MQI for its major plaforms, including CICS, Application System/400 and OS/2 by mid-1993, Tuttle said.



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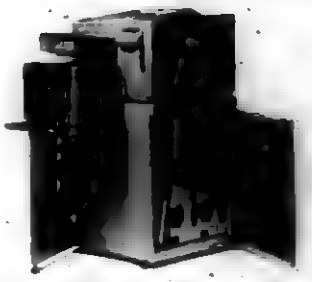

Enhance the high-capacity HP LaserJet IIISi printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

In Brief

Secure testing facility

Verdix Corp.'s Secure Products Division has opened the Verdix Application Center, a test bed facility for the secure networking community to test interoperability among different vendors' secure products. The test bed, in Chantilly, Va., will use a range of secure and nonsecure computers, operating systems and networking environments, Verdix said.

BT crosses the globe

BT extended its ExpressLane frame-relay service to Sydney, Australia; Brussels; Toronto; Frankfurt; Hong Kong; Tokyo; Amsterdam; Singapore; Stockholm; and several sites in the UK. BT now provides local frame-relay access to more than 380 cities, the firm said.

Vendors advance desktop video

By Lynda Radosevich

Your average PC user may not have much use for desktop video yet, but that is not going to stop vendors from forging ahead with new products, particularly ones with a focus on communications technology.

Technologies such as desktop videoconferencing will not build broad market appeal until at least 1995, said Paul Callahan, senior analyst for the network strategy service at Forrester Research, Inc. in Cambridge, Mass. "But vendors want people to go to the desktop right away."

Evidence of this abounds in recent announcements from several companies.

Workstation Technologies, Inc. in Irvine, Calif., introduced a television tuner that brings live broadcast TV signals to the computer desktop. Targeted to system integrators and resellers, the product receives UHF and VHF signals and provides video output to video digitizing cards, which are sold separately.

Scientific-Atlanta, Inc. in Norcross, Ga., announced a business video system that allows companies to transmit videoconferences to users at their desktops. Users can employ the system's multimedia capabilities to ask questions of presenters and exchange documents. The system comes with a wireless transmitter that broadcasts signals to receivers that relay the signals to participants' desktops.

Software that adds multimedia mail capabilities to Microsoft Corp.'s Windows for Workgroups was announced last month by Lenel Systems International, Inc. in Pittsford, N.Y. The product enables users to create, transmit and play electronic-mail messages that combine text, audio, graphics, images and video.

Dow Jones & Co. and Nynex Corp. have signed on VSS, Inc. in Manassas, Va., to develop software that will provide users of the News Manager information service access to live and taped TV and audio reports as well as financial reports, *The Wall Street Journal* and press release wires.

Networked printing eased

CONTINUED FROM PAGE 93

users in several ways, Auster said. First, it defines a bidirectional, high-speed interface so printers can interact with PCs, hosts and printer servers while continuing to take jobs. Secondly, it defines how the printer can send useful data to a system, including status information such as available fonts, memory and paper and whether the printer is going to be busy for a while.

The protocol was designed to be independent of LAN, operating system and workstation environment.

Key 1993 goal

A major goal for the NPA in 1993 is to encourage industry support of the standard. Lexmark and TI are pushing to bring out printers based on the NPA Protocol next year, an NPA spokesman said. Also, some 50 firms have voiced an interest in the protocol, including IBM, Xerox Corp., Microsoft Corp. and Compaq Computer Corp.

"The group needs to work with operating system vendors like Microsoft to make them aware that they can now develop drivers to talk to the printer," Auster said.

Indeed, the protocol can be used to set up a job allocation service that "knows what printers are out there, so if I try to print and the printer is not available, it comes up with a list of printers with similar options," an Intel spokesman said.

The protocol may also enable the printer to recognize when an application is using an incompatible printer definition language, find out what language it is and then change its own language to match, he said.

One important holdout from the NPA group is HP, which has been developing its own high-speed bidirectional protocol, the Intel spokesman said. Indeed, NPA originally got together to "put themselves on a common ground with HP by developing a protocol as good as or better than HP's," an NPA spokeswoman said.

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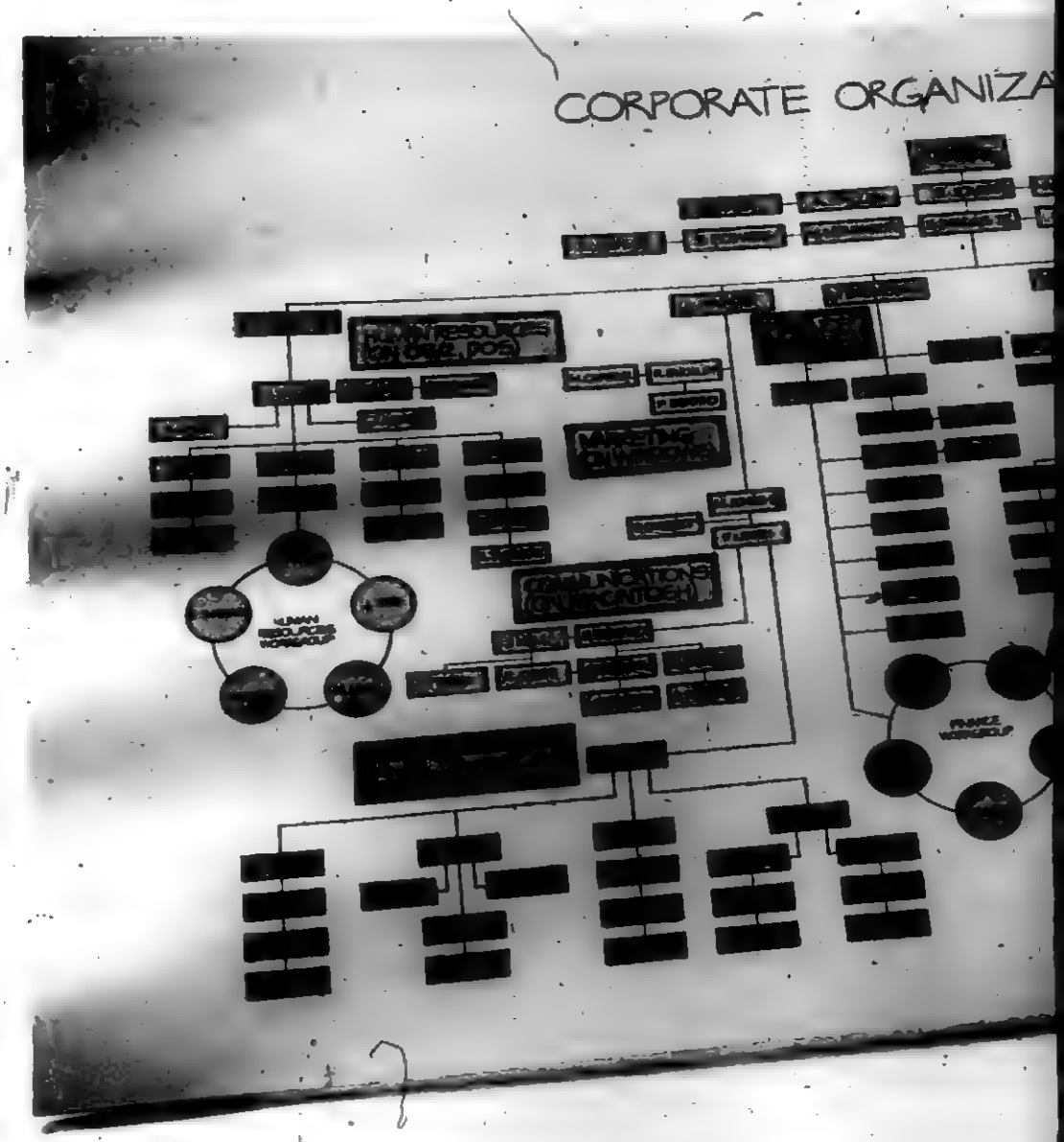

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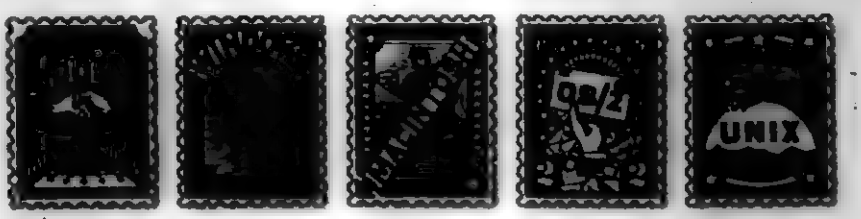

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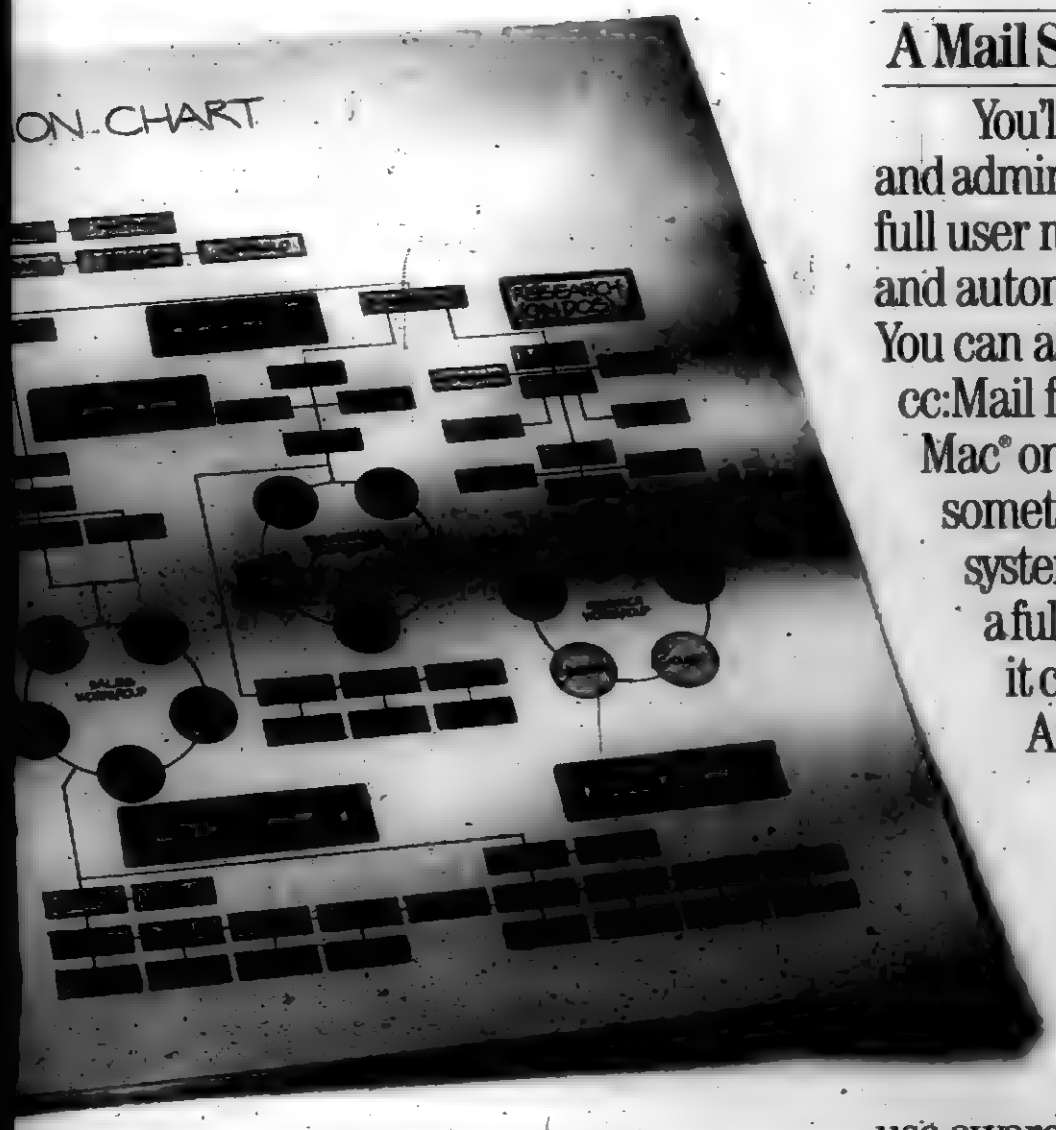

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Medical center builds critical LAN

CONTINUED FROM PAGE 93

progressive people who had an early understanding of how information technology could improve patient care and help hold down costs. When we put in a 72-channel fiber backbone in 1988, people thought we were just wasting money on all that bandwidth. Now, of course, we look like prophets," noted Kevin Shimoto, director of information technology at St. Agnes.

Wayne Robertson, network administrator at St. Agnes, added, "In 1989, when they only had two print servers, St. Agnes' management decided if they were going to use LANs, they were going to do it right. So I've been really lucky; I got to plan it right, test it before I installed it and ensure standardization of hardware and software."

At St. Agnes, any LAN user can log on from any PC on campus. All PCs are connected over 10Base-T Ethernet into one of more than 20 wiring closets. The wiring closets are connected to St. Agnes' 72-strand fiber-optic backbone.

All users log onto one central Novell, Inc. NetWare server, which then assigns the users to their proper groups and provides automatic access and attachments to the proper application servers. "We've been lucky to not have more than about 200 logged in at one time because our NetWare won't handle more than 256 users," Robertson said.

To ensure data integrity, all LAN servers are kept in a locked room in the data center. LAN users are confined to a set of menu screens from which they choose the application they wish to run. "It sounds fascist, I know, but all the users can reach their applications, and I don't have to worry about anyone using DOS to change or delete files in mission-critical applications," Robertson said.

Providing 24-hour LAN uptime was his most difficult challenge. "Our disaster planning wasn't so hard; we keep a hot spare of our log-in server, keep our backups organized so we could set up an up-to-date replacement for any server within a few minutes and standardized on Compaq Computer Corp. servers and desktops that could be switched in and out. The hard part was scheduling routine maintenance."

> "To ensure" data integrity, LAN servers are kept in a locked room in the data center. Users are confined to menu screens from which they choose the application they want.

Robertson said LAN vendors just do not understand the 24-hour problem. "They kept sending us directions to take down our servers after 5 p.m. for maintenance and backup, when 5 p.m. means nothing to us."

For example, some of the LAN applications use Novell's Btrieve database. To ensure data integrity, the files must be marked as nonsharable. This means that if a user is accessing an application, automatic backup software will not back it up.

St. Agnes' IS team solved the problem by putting a 20-minute "lockout window" on the application, usually between 2 a.m. and 3 a.m., when the application data is archived to another server.

Permanent solution planned

Robertson said he plans to implement Novell's System Fault Tolerant III NetWare LAN operating system, which would eliminate the need for lockout windows. He is also planning to migrate to NetWare 4.0.

Robertson's priority, though, is finding a network management system that will allow him to correct problems before they impact the LAN. "We need a system that will beep us and tell us about events and error conditions, not just one that calls us to tell us the LAN has crashed," he said.

Besides the LAN, St. Agnes uses Data General Corp. minicomputers for some patient care applications, which are connected via gateways to the PC LAN. It also uses a Hewlett-Packard Co. HP 3000/950 for its financial system. St. Agnes plans to migrate the DG mini-based applications to a networked Unix system over Transmission Control Protocol/Internet Protocol within the next 12 months. It also plans to build a bridge to connect the HP computer to both Unix and PC networks.

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[redacted]

Links

Photonics Corp. has introduced Collaborative PC, a wireless networking product designed for transmitting data from portable to desktop computers.

Collaborative PC allows a desktop computer to serve as a link to the wired network and as a docking station for portable computers, the firm said. The product comprises an internal half-card for an XT/AT bus or Extended Industry Standard Architecture bus plus an external tethered transceiver. Through an aperture in the tethered transceiver data is transmitted at 1M bit/sec.

Collaborative PC costs $250.

➤*Photonics*
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Gateways, bridges, routers

Chipcom Corp. has introduced the Online Token Ring Bridge Module.

The product was designed for the company's Online System Concentrator family of intelligent switching hubs. The module integrates a two-port Token Ring-to-Token Ring bridge, utilizing one slot in either a six-slot or 17-Slot Online System Concentrator, the company reported. From a single 17-slot hub, two redundant, parallel Token Ring backbones can be accessed by up to 100 Token Ring users. Because the module is integrated with the Online System, features such as fault-tolerant controller modules, backup links, redundant power supplies and Chipcom's Ondemand network Control System are provided.

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Network Systems and Vitalink Communications Corp. have announced enhancements to their 6600 line of high-performance bridge/routers.

The enhancements consist of new 4/16M bit/sec. Token Ring platforms and support for Switched Multimegabit Data Service, frame relay and X.25 link protocol. The enhancement includes new Token Ring models that will initially support IBM source routing, translation bridging between Token Ring, Point-to-Point Protocol, Vitalink communication protocol, Ethernet and Fiber Distributed Data Interface, among others. Concurrent reduced instruction set computing-based bridging and multiprotocol routing are available on a per-port basis in a variety of fixed-configuration options, the company reported.

Pricing for the Token Ring models starts at $9,000.

➤*Vitalink*
6607 Kaiser Drive
Fremont, Calif. 94555
(415) 794-1100

Compatible Systems has started shipping the RISC Router 3000E, a reduced instruction set computing-based Ethernet-to-Ethernet multiprotocol gateway/router.

According to the company, the RISC Router 3000E was designed primarily for use on local-area networks that include Apple Computer, Inc. Macintosh computers. Initially, the router will route AppleTalk, Digital Equipment Corp.'s DECnet, Transmission Control Protocol/Internet Protocol and networking protocols. Features include management software that contains extensive network diagnostics and configuration features and Advanced Network Security Protocol, a password protection feature that is used for individual AppleTalk-compatible network devices.

The product costs $2,995.

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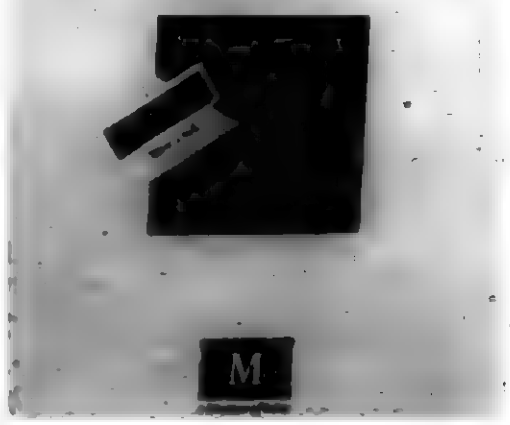

*Software Spectrum Prices**

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cc:Mail V4.0 (10 user pack)	$249
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DEC shifts strategy

By Melinda-Carol Ballou

■ Digital Equipment Corp.'s resolution of a long-standing lawsuit with Micro Technology, Inc. last month indicates a shift in strategy that is likely to bode well for users of both firms' storage products, industry observers said.

DEC had sued Micro Technology for infringement of its Standard Disk Interconnect/Standard Tape Interconnect (SDI/STI) patents in both the U.S. and Germany. The companies resolved the dispute via a joint licensing agreement and a planned phaseout of Micro Technology's SDI/STI products by the end of 1993.

The resolution of what is the last of a slew of suits against third-party storage providers indicates a shift in stance for DEC.

Historically, DEC has focused on a series of proprietary interconnect protocols for storage products that it refused to license to third parties. When third parties reverse-engineered and implemented those protocols for use in competitive products, DEC filed suit against them [CW, July 6, 1992]. During the past year, DEC began offering licensing programs for its Digital Standard Systems Interconnect, Computer Interconnect and SDI/STI protocols and began resolving conflicts with third parties.

This change in policy toward third-party storage providers, as well as the expected release of standard Small Computer Systems Interface (SCSI)-2-based storage subsystems for end users next month, indicate the emergence of a more open DEC, users and industry analysts said.

"We see this as a big plus for users — to be able to deal jointly with DEC and third parties like MTI," said Peter Coriasco, vice president of technical services at Bankers Trust Co. in New York. And DEC's support of standard SCSI offers users flexibility, he added. SCSI products can be interchanged so that if you purchase a modular cabinet from one vendor, you can interchange with another vendor's SCSI-based solution.

Industry analysts agreed on the advantages of "coopetition."

"The company will be spending less time fighting with small subsystems suppliers and more time trying to make their products easily accessible to end users," said Crawford DelPrete, a manager at International Data Corp., a market research firm based in Framingham, Mass. "I can't emphasize enough that those will not necessarily be DEC end users."

The nonproprietary nature of DEC's strategy is already obvious in DEC's push into the OEM market, which is already reaping success, according to DelPrete. "It's not necessarily MIS managers who are buying anymore — you might open up a PC and it would have a DEC disk drive in it, for instance," he said.

DEC has been pushing ahead in its OEM business. In November, it released a customizable data center storage subsystem and packaged deskside storage subsystems with redundant arrays of inexpensive disks (RAID) Level 0, 1, 3 and 5 capabilities. It also released SCSI-2 interconnects that target OEMs.

Total cabinet capacity for the modular data center storage product can include up to 168 3½-in. or 48 5¼-in. SCSI-2-based disk or tape devices, or a mixture of the two, DEC officials said. Also announced was a RAID deskside subsystem that can include up to 35 SCSI-2 disks in seven ranks within a pedestal enclosure.

Storage Tek ships AS/400 RAID system

By Kim S. Nash
WILKES-BARRE, PA

While Storage Technology Corp.'s iceberg mainframe-level storage system remains frozen in place, the company's midrange RAID product is out the door — just missing a self-imposed third-quarter shipping deadline.

Alpine 9600 Storage Manager, a redundant arrays of inexpensive disks (RAID) subsystem announced in April, recently shipped to select customers. General availability is planned for this month, according to a spokesman.

Kay Wholesale Drug Co., one of five sites running Alpine, rejected other Application System/400 RAID systems, including the Harmonix line from EMC Corp. and IBM's 9337 line, which just came out. Kay previously used only IBM-made storage devices for its three AS/400s.

"There were cheaper solutions, but they didn't measure up," said Brian Nichols, MIS manager.

For example, Nichols said he liked the ease of disk replacement that Alpine offered and added that the disk drives in IBM's and EMC's products were not as easily accessible. Plus, because Kay is open six days a week, 24 hours a day, time is of the essence during a failure.

IBM service was slow on Kay's older 9335 and 9332 traditional drives, Nichols explained, "and we didn't want that to become a major issue now." He said IBM field staff sometimes took "several hours" to resolve a problem, which resulted in order delivery delays to Kay's customers.

Up and running

Kay paid approximately $250,000 each for two Alpines, one of which has been running since early December. Nichols said the second system will be installed this week.

The company plans to replace its two AS/400 Model B70s, located here, and one AS/400 Model B35, located in a North Carolina office, with a more powerful Model E90 at the central office. Putting RAID in place is a key step in that consolidation. Alpine's RAID Level 5 protection ensures that "all our data is safe as we make the switch," Nichols said. The cutover is planned for early 1993.

Although Storage Tek developed the microcode for Alpine, Array Technologies, Inc. in Boulder, Colo., manufactures most of the hardware involved. Xlb Datacomp, which Storage Tek bought out in November 1991, resells the subsystem.

CompuServe database simplifies fish-tracking task

ON SITE

NPPC
Portland, Oregon

Challenge: To centralize disparate fish count data from four states and mitigate damage caused by hydroelectric dams to wildlife along the Columbia River.

Technology: System 1032 database from CompuServe running on a DEC VAX 4300 and the SAS Institute's SAS System for data analysis.

By Melinda-Carol Ballou

Engineers at the Northwest Power Planning Council (NPPC) needed to find a way to consolidate, manage and model hundreds of thousands of slippery, disparate records located across four states — records about migration patterns of salmon.

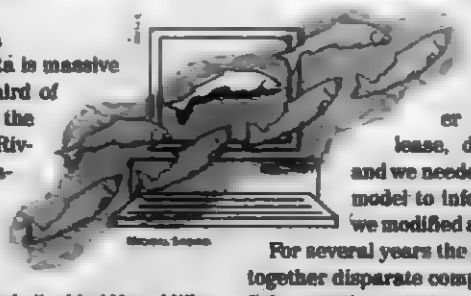
Back in the early 1980s, Congress established the NPPC and charged it with developing a program that would mitigate the damage done by hydroelectric dams to stocks of salmon and steelhead along the Columbia River. But Congress did not give the council an easy way to centralize the data on fish counts that existed in multiple formats and locations.

The NPPC needed to discover where the fish had gone, assess the quality of the wildlife habitat and track new hydroelectric development. The NPPC was also charged with examining the impact of other factors inhibiting wildlife in the area, such as irrigation and logging.

"We needed to develop data management systems to take information and track it up and down different rivers and cover a large number of variables — such as which species were on that river, or geological and archeological information — and then code it," said Peter Paquet, senior biological associate at the NPPC.

No shortage of data

The sheer amount of data is massive — approximately one-third of all free-flowing rivers in the U.S. are in the Columbia River drainage system, Paquet said.



"Covering information about every half mile in that area worked out to about 300,000 records," added Nora Miller, information systems manager. "And there are monstrous numbers of records on an engineering data set — about 7,500 characters per record with technical engineering information about hydroelectric penstocks and dam height, with over 4,000 records."

The council also needed to develop a model to examine the effects of changes in dam operations on the fish populations. The Endangered Species Act added to the complexity because it required the agency to trace specific species of endangered salmon.

"We needed to know where they were by river reach, by hatchery release, dam count information, and we needed to be able to tweak the model to infer what might happen if we modified a dam," Paquet said.

For several years the NPPC struggled to bring together disparate computerized data sets from fish counting stations and agencies located across Oregon, Idaho, Washington and Montana.

The NPPC had used a hodgepodge of solutions that were incapable of handling the required data volumes that ranged from plain ASCII files to a

Fish, *page 108*

Is 'downsize or scram' your mantra?

By John Kador
RENO, NEV.

To the 2,019 attendees of the recent Computer Measurement Group (CMG) '92 meeting, the increasing deployment of new client/server and Unix applications has created intense interest in the ability to measure, model and forecast the performance of local-area networks and other distributed systems.

Attendees caught CMG organizers by surprise as they consistently oversubscribed the technical sessions devoted to Unix and client/server topics. Traditional host-oriented capacity planners have been put on notice by their managers that they will now be responsible for deploying downsized and distributed systems.

"I have six months to learn this stuff or I'm out," said a longtime CMG attendee who asked not to be named.

Nor will the learning curve be easy. "Client/server computing requires tremendous network services and emphasizes measurement of cross-memory database servers like DB2. In short, client/server computing stresses everything we are worst at," said H. Pat Artis, president of Performance Associates in Palm Desert, Calif.

"Under Unix, people will have to rethink every paradigm of performance engineering," agreed Bernie Wong, senior systems engineer at Systemshouse Ltd. in Ottawa. One new paradigm, Wong said, is for application developers to test the performance of program designs before, not after, they write code.

> "In short, client/server computing stresses everything we are worst at."
> *H. Pat Artis, Performance Associates*

Giving up old paradigms will be hard, predicted Bernie Domanski at Domanski Sciences in Englishtown, N.J. "Many traditional capacity planners have little concept as to what cooperative processing means and how the split — where some work is done on the server and some on the host — is organized. The temptation will be to take the techniques they know and apply them to client/server systems," he said.

The risks are serious, Domanski added, because the results of traditional performance analyses cannot be relied on when applied to distributed systems. "The Fortune 1,000 is going to rely on traditional capacity planners when it approves procurements for client/server machinery."

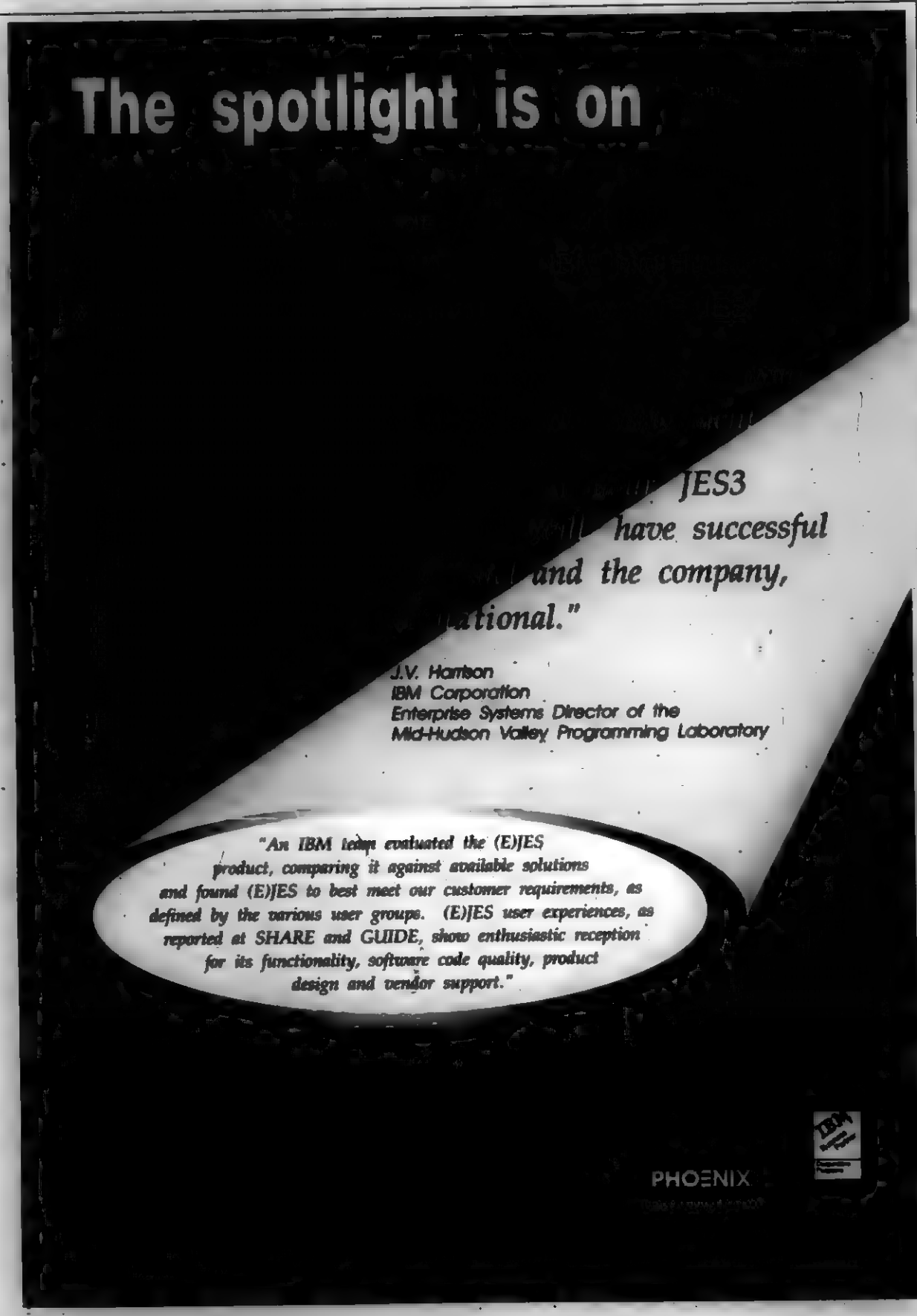
As organizations migrate applications to distributed, multivendor environments, they will need enterprisewide performance-monitoring tools that manage and control performance factors for hosts, clients, servers and networks from one location, according to attendees. These systems will need to control applications through a management-by-exception process that warns of potential problems and corrects them.

Most of all, these systems must encompass the hardware and software of different vendors and different operating systems. Hewlett-Packard Co.'s PerfView, for example, offers Unix users the opportunity to manage heterogeneous networked environments from a global perspective.

HP demonstrated how PerfView consolidates performance information from agents sitting on network nodes. Applying a management-by-exception strategy, the agents look for conditions that meet predefined thresholds.

Companies that wanted to be certain, for instance, that at least four users could always be added to a network without degradation could program the network to report when upgrades are indicated. The first release of PerfView runs on HP 9000 systems under HP/UX. Later releases will support Sun Microsystems, Inc. SPARCstations and IBM RISC System/6000s.

Kador is a free-lance writer in Geneva, Ill.



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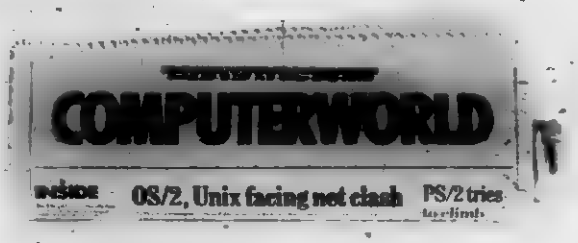

The Newspaper of IS

Database eases fish-tracking task

CONTINUED FROM PAGE 106

database from the University of Washington dubbed UWRim, which was oriented toward mathematical applications, according to Miller. The group finally opted to standardize on a 1032 database management system from CompuServe Data Technologies running on a Digital Equipment Corp. VAX 4300.

Paquet listed several reasons for the decision. System 1032 was able to read information provided in different formats by agencies counting the fish in other states. In some cases, the data had to be transformed by multipliers to determine feet per mile as opposed to feet per acre, for instance. System 1032 bridged the gap between the different data sets by mapping oddball data sets to standard data sets.

"One thing that made our lives miserable was that each state had already developed different numbering systems for coding their streams — System 1032 helped us to develop cross-referencing systems for the EPA code we were using," Paquet said.

System 1032 allowed the NPPC to incorporate very large records and multiple data sets, including engineering formats, and the programming language is straightforward and easy to use, which allows end users to create their own applications and saves Miller time.

Protected areas

In conjunction with the SAS System from SAS Institute, Inc., the agency can analyze the necessary information to help set up protected areas where hydroelectric dams cannot be built. While hydroelectric developers use the information to plan projects, biologists use it to repair damage to the fish habitat.

"We have been using this data to [find out] how many fish there are, where the real problems are and to try to come up with a classification of problems which damage fish runs," Miller said. "We cross-reference to data sets to determine where people have applied for or received licenses for dams and decide where to allow them."

Paquet said the new system will allow the NPPC to prescreen proposed dam projects to identify and help prevent major environmental problems in the future. She added that the NPPC has just completed a menu system for the database that will allow people who not are computer-literate to enter and access data easily.

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Software Partners offers Unix backup to VAXs

By Melinda-Carol Ballou
TOPSFIELD, MASS.

Software Partners/32, Inc. recently began shipping Thrunet, an automated tape backup and restore facility for Unix workstations. Thrunet can be combined with Software Partners' Tapesys VAX/VMS tape management system to provide joint management of Unix and VMS backup and library functions.

"You can schedule backup for Unix workstations and back them up to a VAX using local backup [facilities]," said Phil Jamieson, president of Software Partners. "Lots of people have asked us for this because they are running mixed environments."

The product also offers American National Standards Institute label control to more easily manage and control the backup tapes, he added.

No special knowledge of VMS is required because Thrunet is operated with standard Unix commands, according to the vendor. Thrunet features individual file and full-disk backup and restore, which offers greater security by eliminating local tape devices on workstations and directing backups to a central VAX, company officials said.

Thrunet supports VAX servers running TCPware or Multinet Transmission Control Protocol/Internet Protocol with client workstations running SunOS V.4.0.1 or Ultrix V.4.1. Prices range from $2,500 to $12,500, depending on configuration.

[redacted]

Software application packages

WorksRight Software, Inc. has announced Estimate Master and Work Diary, software systems designed for the IBM Application System/400.

According to the company, Estimate Master can classify expenses and produce the simplest or most complex estimates. Because the product is a multiuser system, it can be used to simultaneously work on up to 999 estimates. Work Diary keeps a daily diary of user activities. Up to 999 lines of text can be entered by individual users, and the number of users who can access the system is limitless. Work Diary also provides built-in security.

Estimate Master and Work Diary cost $199 each.

➤*WorksRight Software*
986 Madison Ave.
Madison, Miss. 39110
(601) 856-8337

Avtech Software, Inc. has released Version 2.0 of Sniper for Digital Equipment Corp. VAX/VMS.

Version 2.0 monitors available disk space and manages idle processes on VAX/VMS systems. An enhancement to the product is the ability to create multiple configuration files to modify Sniper's operation during various times of the day or week or different nodes within the VAXcluster, the company reported.

Sniper license pricing ranges from $495 to $2,195.

➤*Avtech Software*
Suite 500
19800 MacArthur Blvd.
Irvine, Calif. 92715
(714) 957-1978

Andersen Consulting has released DCS/Logistics Version 11.0 for the IBM mainframe.

The product is a modular software solution designed to help users better manage customer service and logistics activities. According to the company, this version features expanded multinational capabilities to improve competitiveness in global markets.

Through a Customer Returns module, DCS/Logistics Version 11.0 provides immediate on-line authorization and receipts and confirmation control steps. Fully integrated with the Warehouse Management, Order Processing and Promotions and Deals modules, the Customer Returns module also offers flexibility in returns policies, including returns pricing, maintenance and inspection.

Pricing for Version 11.0 begins at $200,000.

➤*Andersen Consulting*
69 West Washington St.
Chicago, Ill. 60602
(312) 580-0069

Security Dynamics, Inc. has introduced Version 2.0 of ACM/5100.

According to the company, ACM/5100 positively identifies Digital Equipment Corp. VAX/VMS system users, which allows only authorized personnel to access corporate information resources.

ACM/5100 Version 2.0 was designed to receive the benefits provided by the security procedures within DEC's VMS 5.5 operating system.

Different levels of authentication security can now be controlled for authorized users logging into the system. Users have the option of choosing several authentication and identification factors such as the VMS password, the VMS user identification or a personal identification number that is used with a random code on Security Dynamics' SecurID card.

Prices start at $7,500.

➤*Security Dynamics*
1 Alewife Center.
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New products, *page 110*

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CONTINUED FROM PAGE 109

Raxco, Inc. has released Version 4.0 of PerfectCache, its automatic data caching and virtual disk package for enhancing I/O performance on Digital Equipment Corp. VAX/VMS systems.

According to the company, new proprietary techniques enable PerfectCache Version 4.0 to extend beyond past versions by maximizing the percentage of disk I/O requests that can be fulfilled from memory as opposed to slower, physical disk access.

Features include "instant caching," "look-ahead caching" and "every I/O" memory-management techniques. All VAX/VMS applications are supported.

PerfectCache costs between $250 and $9,750, depending on VAX system type.

➤*Raxco*
Suite 2000
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Data storage

XL/Datacomp, Inc. has announced the XL/Datacomp 9637 Model 002 Disk Array Storage Subsystem.

The product was designed for the IBM Application System/400 and the System/38.

The 9637 offers four to eight physical drives and incorporates 3½-in. Head Disk Assemblies. The subsystem has a total capacity of 3.4G to 6.9G bytes and features a mean time between failure rate of 400,000 hours.

An optional outboard redundant arrays of inexpensive disks-1 architecture is offered for increased data availability and protection.

Prices start at $34,200.

➤*XL/Datacomp*
908 N. Elm St.
Hinsdale, Ill. 60521
(708) 323-1200

Acknowledge, Inc. has introduced the Alice family of optical storage subsystems.

The subsystems were designed for all IBM Application System/400 models. Because they are software-driven, users can implement image applications or innovative data for large quantities of on-line information such as point of sale, fax and database applications.

Coded and noncoded data can be handled by the high-end Alice 7995-160. Up to 2T bytes of rewritable media can be stored on the 7995-160. The entry-level 4995-032 can handle imaging applications and will store up to 20G bytes of write-once read-many data.

Prices range from $39,500 to $125,000.

➤*Acknowledge*
251 W. Central St.
Natick, Mass. 01760
(508) 650-3630

Exide Electronics Group, Inc. has announced New Powerware Plus 6 Rackmount Uninterruptible Power Systems.

According to the company, the system provides shield-sensitive electronics from power disturbances and offers clean, reliable power to critical applications such as telecommunications, modular data processing systems, mobile applications and laboratory and manufacturing equipment.

Customer-configurable, I/O voltage is offered as well as phase and frequency with simple keypad control. Other standard features include bypass plus, emergency power off, digital front panel display and an RS-232 serial port.

Pricing begins at $8,095.

➤*Exide Electronics Group*
8521 Six Forks Road
Raleigh, N.C. 27615
(919) 872-3020

Emerald Systems has released the Emerald Systems Digital Audio Tape (DAT) AutoLoader.

Up to 96G bytes of data in a desktop can be stored using a magazine of 12 DAT cartridges, the company reported. Complete unattended backup and storage management is also provided.

The 4mm DAT AutoLoader works with the company's Microsoft Corp.'s Windows-based Xpress Librarian 2.0 software by attaching to the network managers workstations where Xpress Librarian is installed.

Available Novell, Inc. NetWare servers can then be backed up to the AutoLoader's drive. When used with an optional software module, local hard disks can also be backed up.

The DAT AutoLoader costs $12,995.

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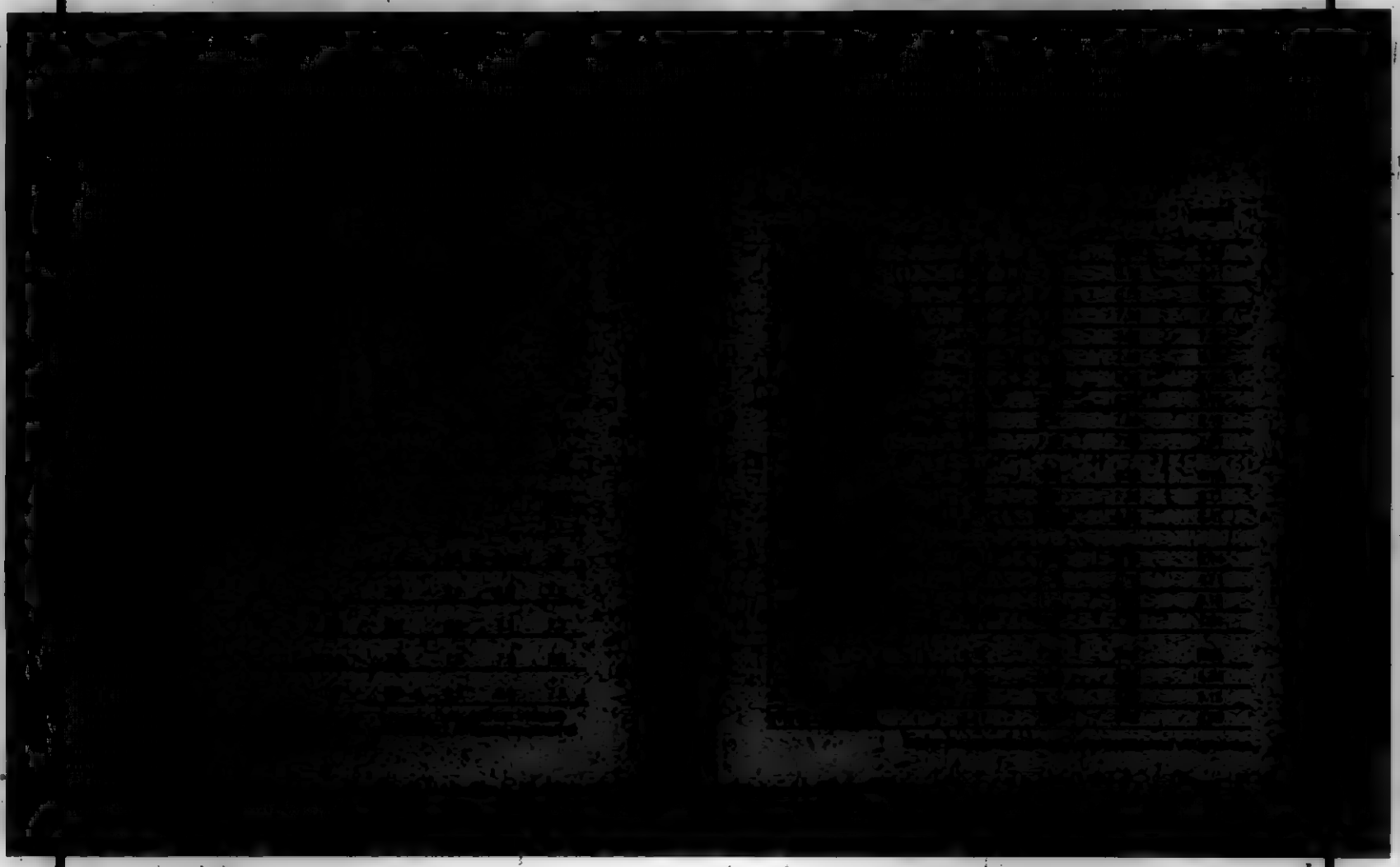

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CPWADV0104

Middleware eases app development

By Gary H. Anthes

If terms such as Transmission Control Protocol/Internet Protocol, Systems Network Architecture (SNA) LU6.2, NetBIOS and SPX leave you a bit dizzy — but you still have to get that new distributed application up on time — you may be a prime candidate for network "middleware," a relatively new kind of software that experts say can take much of the pain out of client/server and peer-to-peer computing.

Middleware is a layer of software that fits between the application and the network. It takes messages or requests from the application and transparently routes them wherever necessary on the network, doing the appropriate protocol translations and returning data or control information to the user.

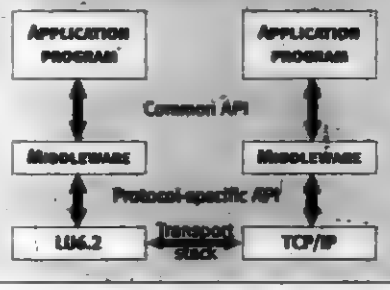
The more advanced products may also help the user with security, error recovery, directory services and a host of other functions.

According to middleware expert Max Dolgicer, director of enabling technologies at Tucker/DeBoever Technologies, Inc. in South Norwalk, Conn., the market for middleware products will skyrocket from $50 million this year to more than $1.2 billion by the year 2000.

Speaking the language

Middleware seeks to make sense of the mass of protocols that frustrate developers

Distributed computing with middleware



With middleware, application programmers write code in conformance with a relatively simple, unchanging application programming interface. They do not need to know about protocols or network topology, and they do not have to worry, for example, that today the accounts receivable database is on an IBM mainframe but next week it may be on a Unix server.

The Centers for Disease Control (CDC) in Atlanta recently installed a middleware product from Software AG of North America, Inc. called Entire Net-Work. It allows users on Novell, Inc. local-area networks to transparently access, via a standard graphical user interface developed by CDC, data from Software AG's Adabas, SAS Institute, Inc.'s SAS databases or flat files on an IBM Enterprise System/9000 series mainframe.

That used to be done by 3270 emulation and was time-consuming and error-prone, said Dan Rosen, programmer/analyst at CDC. Whenever anything was changed in the mainframe environment, the process quit working, he said.

Now, requests for data flow transparently over Novell's NetWare to the server, then over SNA

Middleware, *page 114*

At a glance

Experts say application developers may spend 30% to 40% more time writing distributed applications if they don't use middleware.

The market for middleware products will skyrocket from $50 million this year to more than $1.2 billion by the year 2000, according to Max Dolgicer, director of enabling technologies at Tucker/DeBoever Technologies.

Planning for the future

Object Management Group reaches consensus

The Object Management Group

Charter: To promote the theory and practice of object-oriented technology.

Membership: More than 250 vendors and users.

Major efforts: Object Management Architecture Guide; Design guidelines for OMG's distributed object computing environment; Common Object Request Broker Architecture; Mechanism through which objects make and receive requests and responses.

By Garry Ray

What is the truth behind object-oriented computing? To hear it from some quarters, objects will soon inherit the earth, and not a single line of procedural code will be left anywhere.

Even though the hype may be a bit dense, not to mention premature, the battle plan for an object-oriented future is beginning to come to light.

Led by the Object Management Group (OMG) — the Framingham, Mass.-based consortium of nearly 250 computer industry vendors and a smaller number of "end-user members" — object-oriented adherents are beginning to rally around a handful of specifications that are just now coming to fruition, and for good reason, according to OMG President Christopher Stone.

"If your business practice has something to do with globalization, the concept of object technology is going to cross your path," Stone said. "It's going to hit you in the face."

Grand plan

In recent months, the OMG released its Object Management Architecture Guide, which details the OMG's grand scheme for an object-oriented computing environment. In addition, two OMG members — HyperDesk Corp. in Westboro, Mass., and Petrotechnical Open Software Corp. in Houston — have announced products based on the OMG's Common Object Request Broker Architecture, which allows objects to communicate and interact over a variety of networks and computing platforms.

Stone, who founded the OMG nearly four years ago with members such as Data General Corp., Hewlett-Packard Co., American Airlines and Sun Microsystems, Inc., claimed that the standards-making activities of OMG are different from those of other standards groups, such as the American National Standards Institute.

> Object technology is "going to hit you in the face."
>
> *Christopher Stone*
>
> *OMG president*

"We've been concentrating on the application problem, not on the operating system and not on databases," he said. "We care about providing a higher level interface to write applications independent of the OS or the platform."

That, of course, appeals to the traditional joiners of standards organizations: the computer industry itself.

"Vendors believe they have to be members of any standards committee that comes along," said Hugh Bishop, a software analyst at the Aberdeen Group, an industry consultancy in Boston. The reason? "Like any commercial enterprise, we view the activities of the OMG on a prudent, commercial basis," said Lotus Development Corp. Senior Vice President K.C. Branscomb.

However, while the preponderance of vendors can lead to technical strides and market impact, "one of the things that happens is that the vendor gets focused on technology," said Jim Stikeleather, director of systems development at Kash-n-Karry Food Stores, Inc. in Tampa, Fla. "The business community wants to solve problems in business terms."

Stikeleather, an avid user of object-oriented technology, is a member of the Forum for Distributed Object Computing (FDOC), an informal, 25-member association represented by companies such as DHL Airways, Inc., Citibank NA, US West, American Airlines, The Boeing Co. and Electronic Data Systems Corp.

According to Stikeleather, the FDOC delivered to the OMG in early December the suggestion that OMG begin to focus on issues such as the definition of "object-oriented," the cultural and business implications of the technology and the role of object-oriented programming languages in the public domain. Stressing a cooperative role, Stikeleather said, "Having a lot of user input really will help the OMG."

Sharing their concerns

Other OMG "end-user members," a special category of OMG participants, agreed that informing the organization of their own concerns is as important as monitoring the state of the art.

"We joined so that we can take this into account in our long-range planning," said an attendee from one international company. However, "the second benefit is actually to effect the direction of OMG." He added that at a recent meeting "users set the direction on security."

"We want to provide our requirements and needs to the OMG," said Denise Lynch, a computer systems specialist at United Technologies Corp. in East Hartford, Conn. "And we want to stay abreast of the technology as it evolves," she added.

Middleware eases app development

CONTINUED FROM PAGE 113

LU6.2 to the mainframe and back again without the user being aware of the intermediate steps. "All they know is they send it off into the void and answers come back," Rosen said.

The middleware also does error-checking and generates return codes that can be used for automatic recovery. Rosen, a communications specialist, said he now gets fewer telephone calls from work in the middle of the night.

Mature middleware products have not been long on the market, and momentum to use them is just beginning to build, analysts said. "Most use of middleware so far has been for read-only access for decision support," said Tony Percy, vice president for software management strategies at Gartner Group, Inc. "It's the Type-A users that are really deploying it at the moment. It will become much more common as we see the distributed function model become the dominant one."

One Type-A middleware user is United Airlines, which uses Communications Integrator from Covia Technologies to allow users to navigate easily among a Unisys Corp. proprietary network, the Apollo reservation system's proprietary network, an IBM SNA network and a Digital Equipment Corp. DECnet. Users retrieve data and process transactions across this internet, according to Don Karmazin, vice president of MIS.

"If we didn't have [middleware], it would be terrible," Karmazin said. "It would be much more expensive from a programming standpoint. We wouldn't have the connectivity we have now, and in the Apollo environment, we would be very limited in how we can grow the system."

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Two choices

Network middleware usually employs one of two fundamental approaches — remote procedure calls (RPC) or message passing. RPCs act a lot like traditional third-generation language subroutine calls, except the calls go out over the net. The requesting application waits for a reply.

RPC-based middleware products include offerings from Hewlett-Packard Co., the Open Software Foundation, Netwise, Inc., Digital Equipment Corp., Sun Microsystems, Inc., Horizon Strategies, Inc. and IBM.

Messaging middleware operates asynchronously: It sends a message to another program but does not wait for a reply, if any. In addition to navigating diverse network protocols, messaging-based products also sometimes perform other functions for the user, such as guaranteed or deferred delivery of messages, error recovery, alternate path routing and automatic data translation.

Products from Software AG of North America, Covia Technologies, IBM, DEC and PeerLogic, Inc. employ message passing. Legent Corp. recently announced it will incorporate PeerLogic's Pipes technology in its products for distributed computing.

Each of the two approaches has advantages and disadvantages, said Max Dolgicer, director of enabling technologies at Tuxedo/DeBuever Technologies. RPCs are easy to use and are appropriate for most client/server applications, but their synchronous nature means the application halts until a request is completed, he said.

Messaging requires more communications expertise, Dolgicer said, but it is a better approach for peer-to-peer computing, in which multiple, loosely coupled applications exchange information. In addition, it is possible to implement RPC with a messaging product but not the reverse.

Dolgicer predicted that large, sophisticated users will move from the client/server model to peer-to-peer systems using messaging middleware. — *Gary H. Anthes*

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Tool puts logic back in older databases

By Kim S. Nash
CHICAGO

Database programs with only shreds of documentation can be heck to maintain, never mind incorporate into new computing schemes such as client/server systems. Popkin Software & Systems, Inc. recently joined the re-engineering fray with a tool to analyze and reconstruct the logic behind old database applications.

SA Reverse Data Engineer is an add-on module to Popkin's System Architect, a PC-based computer-aided software engineering (CASE) workbench. The product, due to ship in this year's first quarter, helps build entity-relationship diagrams and reusable data dictionary entries out of existing database schema.

That means a database administrator can import tables, macros and other database program functions into Popkin's tool and break that information down into discrete components. The tool then figures out how the parts fit together and what functions they are supposed to accomplish, according to Ron Scherma, Popkin's president.

Entity-relationship diagrams and other maps showing application logic are then captured in Popkin's System Architect workbench and can be incorporated into future CASE-based applications built with System Architect, Scherma said. System Architect runs under Microsoft Corp.'s Windows and IBM's OS/2.

Priced at $795, SA Reverse Data Engineer was designed to work with databases from Informix Corp. and Oracle Corp. and Microsoft's SQL Server and IBM's DB2.

Glossary

Entity-relationship diagram: a map showing the data structure of an application and how each element affects others.

Data dictionary: a set of definitions of data flows and elements, files, databases and processes used in an application.

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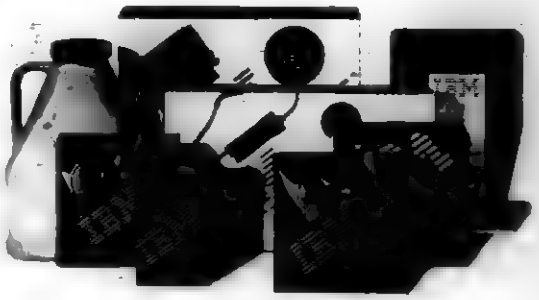

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Application development tools

Guidance Technologies, Inc. has introduced Choreographer 3.0, a new version of the company's corporate application development software.

Choreographer is a tool designed to develop cooperative computing, client/server applications and text to graphical user interface conversions, the company reported.

Support is provided for the full 32-bit architecture of IBM's OS/2 2.0 and for Microsoft Corp.'s Windows. IBM's Common User Access 91 widget control set consisting of notebook, sliders, container, drag and drop and spin button is also included, according to the company.

Choreographer costs $7,500.

➤*Guidance Technologies*
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(412) 231-1300

KnowledgeWare, Inc. has announced Release 2.7 of its Application Development Workbench (ADW).

The product is an integrated application development solution designed for client/server, midrange and mainframe environments, the company reported.

Integration enhancements have been added to ADW 2.7, along with more design facilities and more rapid application development capabilities. Enhanced code-generation products and industry-leading database analysis and design tools are also included.

ADW 2.7 prices range from $4,050 to $10,750.

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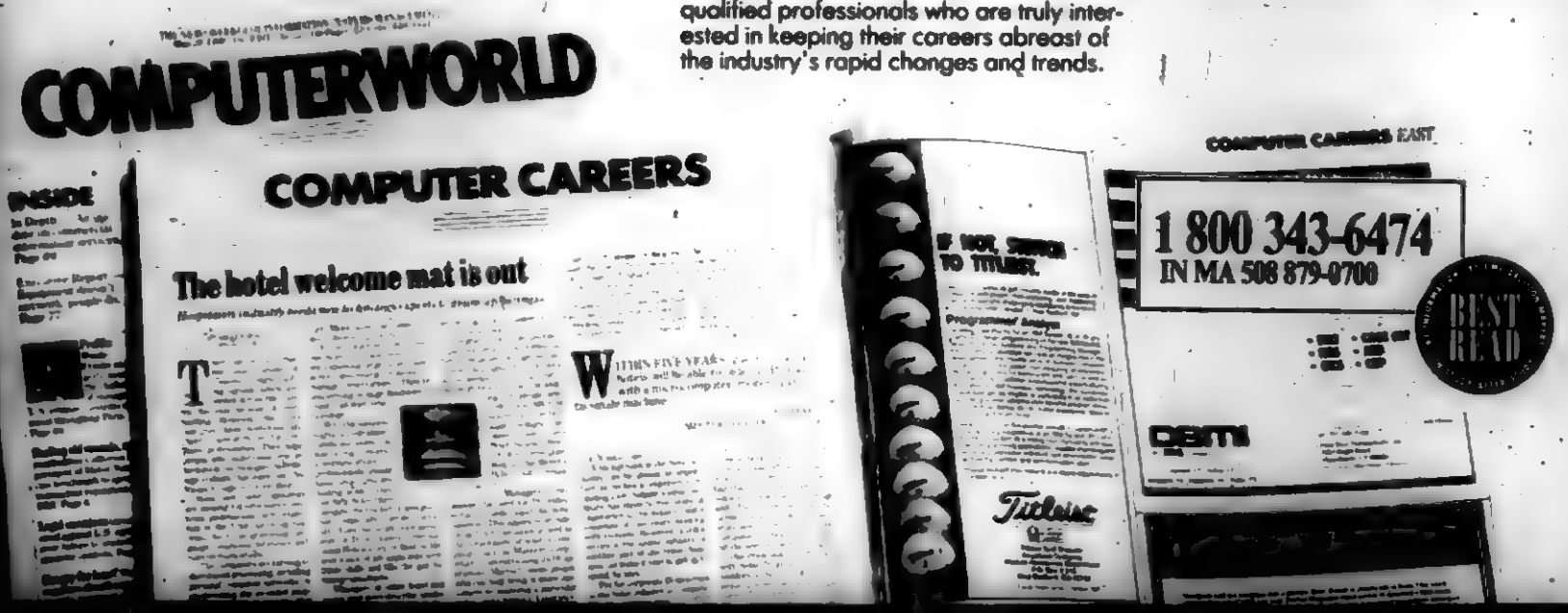


Job Outlook '93

Managers cautiously optimistic about hiring

By Kelly E. Sewall

IF YOU'RE A MEMBER of an information systems staff that's been overworked for the last year because your department has been downsized, help may be on the way. While there isn't a lot of new hiring taking place, the few companies that have lifted their hiring freezes are making room for programmers and systems analysts, according to interviews with 15 IS managers on their hiring plans for 1993.

But the greatest promise seems to be in contract programming. Companies aren't taking any risks these days by creating positions they might have to cut if things don't turn around; instead, they're easing into the hiring arena with contractors.

Training resurgence

In addition, a shift toward fulfilling support and training needs from the inside seems to be under way. As more and more responsibility is shifted to the end user, help desks are being inundated with calls.

"Help desk people get called for anything that's plugged in: PCs, mainframes and even the telephone system. We also use them to install the machines and do hardware and software support," says David E. Pinkus, manager of MIS at Fuller Co. in Bethlehem, Pa. Pinkus says the high volume of calls the help desk has been receiving since the firm began downsizing has created a need for more help desk operators.

IS managers such as Pinkus will also be hiring in-house trainers to keep up with the training needs that were put on hold in recent years.

"We lost [our trainer position] due to a general cutback, and we intend to bring it back," he says. "We'll be moving a lot of people from CRTs to PCs, and it's more economical to have that position in-house than to keep hiring from outside."

> Firms that are hiring are making room for new programmers and systems analysts.

The need seems to be growing as more PCs find their way onto users' desks. PC software and support skills will be in hot demand in 1993. And since these PCs will be networked, it follows that local- and wide-area networking specialists will also be in demand.

All managers interviewed emphasized that because IS professionals now work with the user community more than ever before, business knowledge is becoming a mandatory requirement in most shops.

"In our industry [wholesale auto parts], you could buy a turnkey system and virtually run with no data processing staff," says Jay Dahl, data processing manager at Hatch Grinding Co. in Denver. "Or you find someone like me. If a person like [me] is going to remain in existence, we've got to do a better job than the turnkey packages, and the turnkey packages are pretty damn good."

Dahl said he and his department maintain their value to the company by paying close attention to the auto parts business.

"Understanding the mission statement of the company is really important, as well as knowing how the data processing department fits into that," he says. "You need to produce something quantifiable to the bottom line, not just accumulate more junk in a computer room. You need to be able to talk to the user and solve problems without all the smoke and mirrors."

For shops that won't have jobs under their Christmas trees, the most oft cited reason was a continuation of downsizing and outsourcing.

Layoffs on some agendas

"We're in the process of laying people off now. I'm not sure how many more that will involve," says Steve Hicks, data center director at Clark Information Technology, a subsidiary of Clark Equipment Co. in South Bend, Ind. "We've laid off 15 or so over the last year and a half [out of 35 to 40], and I may be included in that, too, if things keep going the way they are." He says his firm is trying to land some outsourcing contracts to preserve its livelihood.

Several IS managers say they can't make any hiring decisions until the second half of the year, when Bill Clinton's impact on the economy will become clearer. But most hint that once they pass this mark, they plan to reevaluate their staffing needs. Hopefully, that will mean more IS jobs in the latter part of '93.

Sewell is an assistant editor, features.

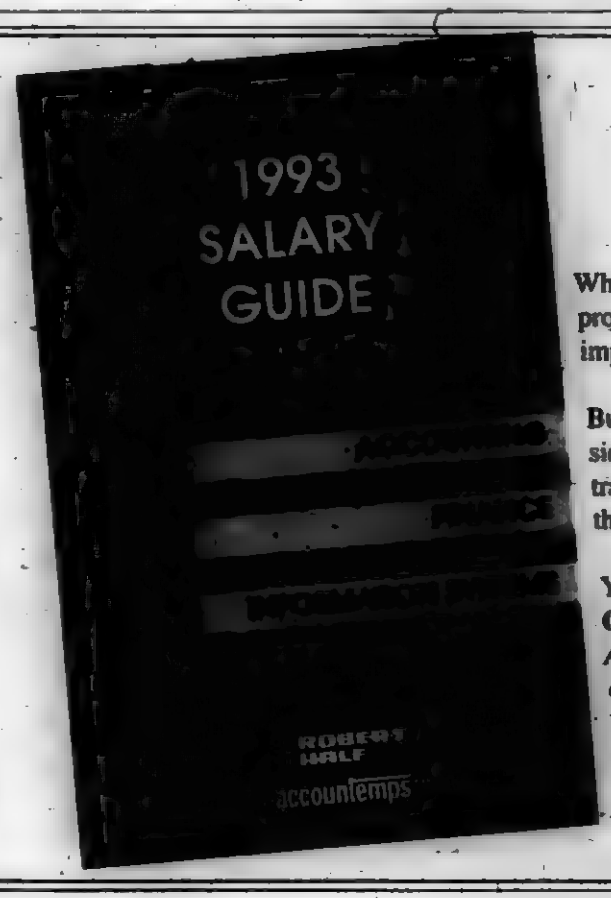
1993 IS job market

Top jobs:
- Contract programmer
- Programmer analyst
- Senior systems analyst
- Assistant database administrator
- Help desk technician
- Trainer
- Project leader
- LAN administrator
- Computer operator

Top technical skills:
- PC software
- PC support
- LAN/WAN
- SQL
- CASE
- Telecommunications

Top business skills:
- Business acumen
- Ability/flexibility to adapt to change
- Decision-making ability

Source: 15 IS managers interviewed by Computerworld



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Career advice for the '90s

Handling a new discrimination

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is R. Max Steiner, a marketing director at Contract Solutions, Inc. in Salem, N.H.

Q: In our information systems department, if you don't participate in company-sponsored events such as United Way drives, you're not promoted, given raises and treated fairly like the employees who do. How can I handle this?

A: It is illegal to discriminate against a person based on his participation or lack thereof in company-sponsored events. However, if these charities are worthy, a voluntary contribution may resolve your concerns.

If you choose to resist, you must keep thorough documentation. Keep notes on how you're approached, how you've been discriminated against, and how you've been affected. Write letters to your superiors outlining specific actions taken against you.

If you decide to take action against this alleged discrimination, be prepared for a long, hard fight.

Q: I am a technical services support specialist, which is similar to a systems analyst/programmer. It is a civil service job at a municipality. I am the only person in this position and have benefited from being exposed to a wide variety of computer technologies. But I feel I may be becoming out of touch competitively.

Should I move into the private sector before I become too stale?

A: It wouldn't hurt to look. You express a desire to stay competitive to ensure that your skills remain viable and marketable.

Never assume that a recession, or any other uncontrollable event, means there are no opportunities for you. While environmental factors should influence your decision to accept an offer, they should not deter you from exploring options.

Q: I'm a Unix systems administrator who has six years' experience at an insurance firm and a strong PC background. I've had little success in getting my employer to provide more Unix training, such as systems administration and programming.

How can I get into another firm that will offer me this training?

A: Back up and gather focus. First, assess your technical skills and your level of expertise. Then think of what you'd like to be doing five years down the road. This focus should help you target new opportunities or even get movement from your current employers.

Q: I recently lost a job offer because two agencies submitted my resume to a hiring manager, and both claimed to have authorization to represent me. Rather than be caught in the middle, the manager decided to hire someone else. How can I prevent this in the future?

A: Let no agency submit your resume to any prospective employee without getting your permission. Keep a journal on where you have allowed your resume to go. If another agency calls with the same job, clearly tell them not to send your resume. If they do, refuse to do any more business with them and tell them to make your file inactive.

If you control where your resume goes, you won't lose future jobs to double submittals.

Sure that you've being undervalued? Stressed out? Worried about skills stagnation? WE WANT TO HEAR ABOUT THESE AND OTHER ISSUES THAT AFFECT YOUR CAREER. CALL YOUR QUESTIONS IN USING THE FAST TRACK LINE AT (508) 820-8522 OR SEND THEM BY FAX TO KELLY E. SEWELL AT (508) 875-8931. IF WE USE YOUR QUESTION, WE'LL SEND YOU A GIFT.

How to explain your layoff in future interviews

■ Being laid off is no reflection on your technical skills or ability as a worker. It's more a reflection of a company's poor management. The fact that you've been laid off wouldn't affect my decision to hire you; it's how you *handle* the layoff. When you come into an interview, you have to set the layoff aside and look to the future, showing optimism and confidence in your abilities.

Dennis E. Love, information systems director
Acme Thread and Supply, Inc., Los Angeles

TIPS from the TIMES

■ Don't act like someone who's been fired, who did something wrong, who's not competent or who doesn't have the proper skill set. It's an unfortunate situation that put you out there, but there's nothing wrong with your skill set or your ability to perform the job. Be positive.

Jerry Lauer, vice president of information services
Handleman Co., Troy, Mich.

■ If you're not employed, you need to state it. But I'd wait for the interviewer to raise the question of how your job ended. Once it's raised, be brief and to the point.

Michael Jesko
VP and director, IS
The Rouse Co., Columbia, Md.

■ The only way you can mishandle a layoff in an interview is to be defensive, bitter or negative about it, or if you attempt to evade or hide it. Instead, you should be up front and positive about it.

Steve McMahan, managing director
Source EDP, Boston

Compiled by Kelly Sewell, assistant editor, features.

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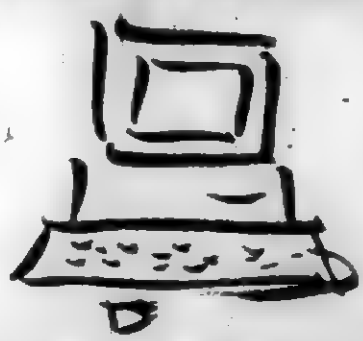

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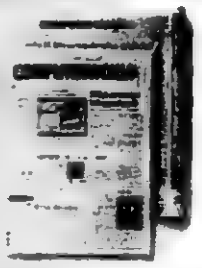

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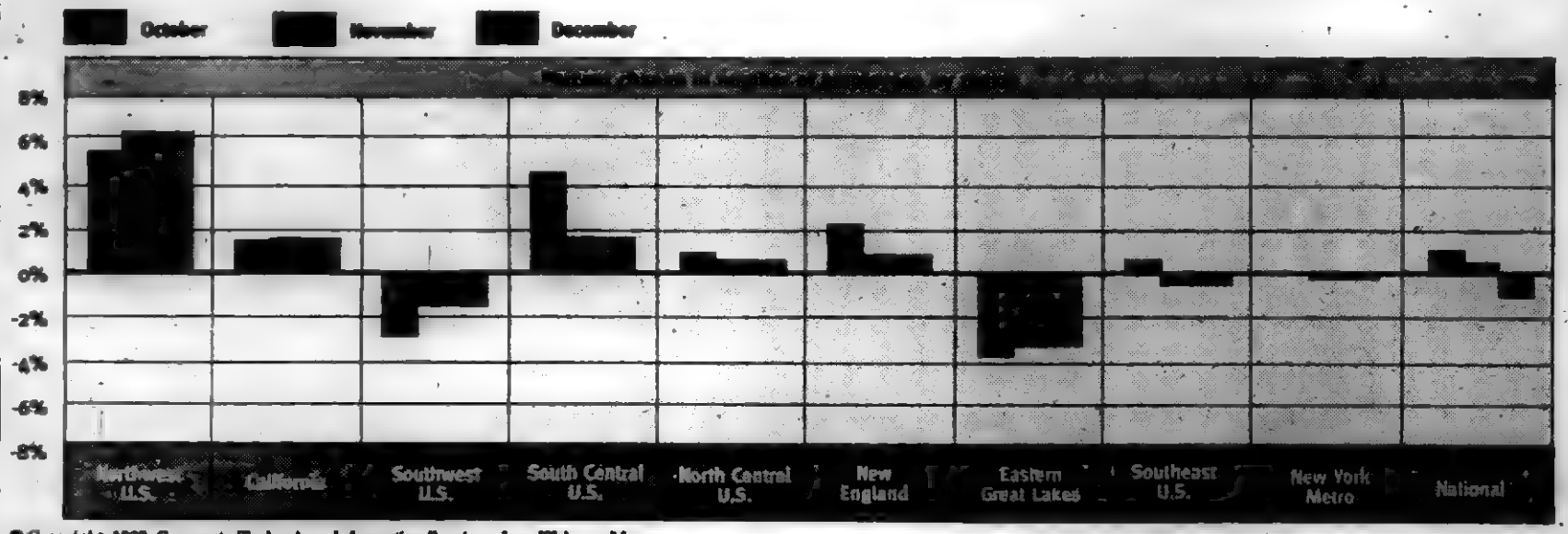

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Are you paying too much for PC repairs?

If you treat it right, a well-manufactured PC will give your company at least six years of hard service. Nevertheless, unscrupulous technicians may want you to think otherwise. Be wary when your technician says:

- "Your hard disk sounds worn-out."
- "Your floppy drive is noisy." (They are all noisy.)
- "Your hard disk cables look old."
- "Your power supply was overloaded."

By Todd Henschell

Have you noticed that every PC repair, no matter how small, avalanches into a system overhaul or requires your PC to disappear into the service shop indefinitely? If your answer is yes, take heed. Your service technician may be making more money off of you than you realize.

One of the more common ways to add profit to a job is through small, unnecessary repairs. If the technician says, "While I was in there, I saw X was getting a little X so I put in a new one," it's probably going to cost you.

It's usually something like a $10 cable, but I've even picked "faulty" floppy drives out of wastebaskets that only needed to be cleaned.

I've also seen hard drives replaced that only needed a fresh low-level format. This is especially true of the MFM and RLL drives inside most older machines.

A less expensive way to handle the hard disk problem is to use software utilities such as Gibson Research Corp.'s SpinRite II, which helps identify, diagnose and repair data and low-level format damage on standard hard disks. If your in-house staff doesn't have the time to run this type of utility, have your technician run it once a year on every machine — but not before backing up your hard drive. With disks costing $300, it makes good sense to spend a few bucks to prevent the drive from giving you any grief.

If you've been noticing that parts and service prices change radically from visit to visit, you'd better check into that, too. Some technicians don't have a set fee. I've seen $50 floppy drives billed from $75 (the usual end-user cost) to $175. Check the last invoice and see how much things used to cost. If inspection and cleaning was $80 last month and $120 this month, something's up, and it's probably the technician's bank balance.

If it ain't broke...

Another affliction that repairmen are prone to is upgradeitis. Most techies enjoy working on state-of-the-art systems with lots of random-access memory, fast hard disks and so on, but a lot of corporate machines have one foot in the digital grave. These are what techies like to call "boat anchors."

Technicians groan when they open these ancient boxes and see a bog-slow, 20M-byte Seagate hard disk, and they mumble how nice it would be if it had a fast, 100M-byte, integrated drive electronics hard disk instead.

Maybe they see a problem that isn't as bad as they think, but fixing it will get a faster disk in there, and that's good, right?

Wrong. If your system does what you need, resist the urge to upgrade it just because it's old. Remember, some technicians sell computers.

One final check is to ask if quality parts have been installed. This may be hard to detect, but you should ask anyway.

For instance, repairmen can buy Teac America, Inc.'s floppy drives for about $50. Mitsumi Electronics Corp.'s drives go for as low as $25 to $30. If they sell you a Mitsumi, which is of lesser quality, you'll still pay $75 for the drive. Of course, if the system is old and only under light duty, a cheaper part might be acceptable.

Henschell is a PC consultant, technician and free-lance writer in Burbank, Calif.

Components such as floppy drives and hard disks are prone to break because they have moving parts. On the other hand, controller cards, I/O cards and video boards rarely die. They'll last if they don't get too hot or aren't turned off and on all the time. So if your technician says the video board is no good but you're not having problems, be wary.

How to avoid excessive service bills

- Was anything repaired because it "looked bad?" Get a better explanation.
- Your technician won't explain things or show you what's wrong? Fire him.
- Are service prices changing more than the weather? Check your last invoice.
- Is the repair person doing work you didn't ask to be performed? Ask why.
- Are all repairs and parts itemized on the bill? Why not?
- Is your PC going to the repair shop a lot? It's probably costing you more money because you pay for the pickup, attempted repair, bench time and delivery reetup. Find someone who has a tool bag and knows how to use it. Most repairs can be done on the spot — even something as complex as putting in a new motherboard.

— Todd Henschell

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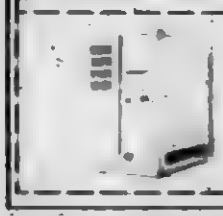

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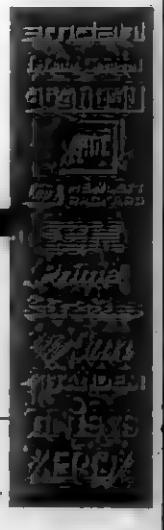

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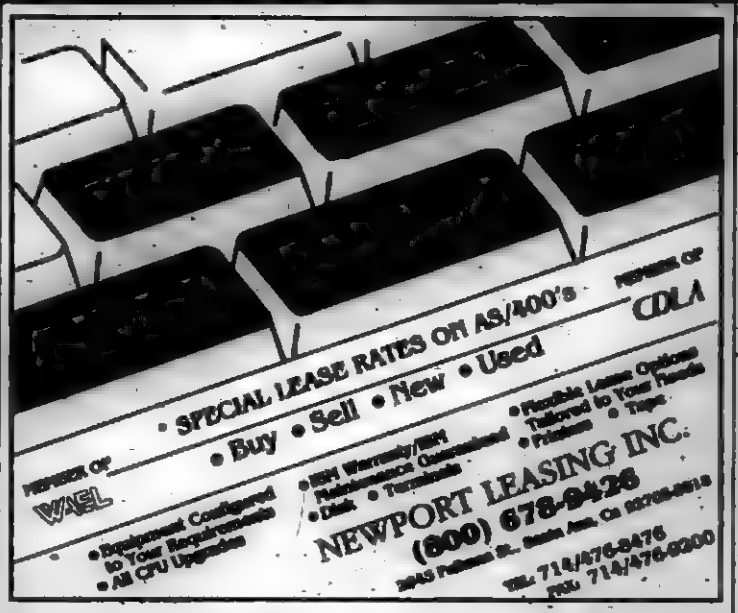

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Week ending December 18, 1992

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PS/2 Model L40SX	$1200	$1175
PS/2 Model 55SX	$4,050	$850
PS/2 Model 60	$600	$475
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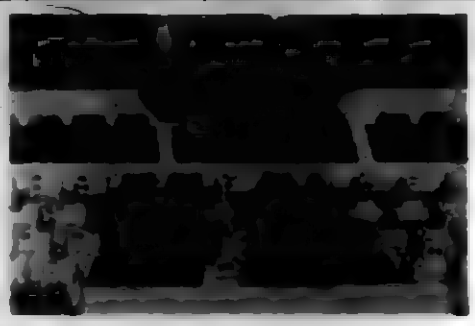

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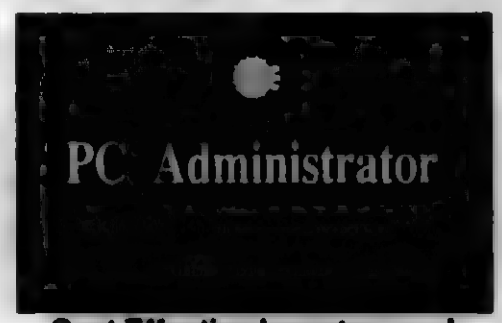

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News Shorts

DEC breaks out business units

As expected, Digital Equipment Corp. has established vertical-market business units and has named leaders for five of its nine organizations. The following vice presidents were appointed: Larry Cabrinety of components and peripherals; Charles Christ of storage; Frank McCabe of discrete manufacturing and defense; John Rando of multivendor customer services; and Willow Shire of health industries. Managers of the PC; financial, professional and public services; communications, education and entertainment; and consumer and process manufacturing business units will "be appointed shortly," a DEC spokesman said. DEC also gave a senior vice president responsibility for the company's newly created Office of Ethics & Business Practices.

SCO president steps down

The Santa Cruz Operation (SCO) President Larry Michels has resigned after facing mounting allegations that he sexually harassed five female employees. In a lawsuit and complaints to state authorities, the women charged they have been repeatedly groped, propositioned and forcibly kissed by Michels at work since 1991. Although Michels, 61, has maintained his innocence, he claimed the allegations were too serious to allow him to stay. Michels has been replaced by Jim Harris, a member of the SCO board.

ISSC racks up more deals

IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary has signed a 10-year outsourcing agreement with **Norrell Corp.**, an Atlanta health care and administrative services provider. ISSC will handle data processing, data center management, applications development, help desk, print operations and business recovery services. The Norrell deal came one week after ISSC disclosed a 10-year deal with retail chain owner HookSupeRx, Inc. ISSC is consolidating Hook's Indianapolis, Cincinnati and Pawtucket, R.I., data centers into an ISSC facility in Lexington, Ky. ISSC will also install and maintain point-of-sale systems. The value of the deals was not disclosed.

Court amends CA/Altai ruling

The U.S. Court of Appeals for the Second Circuit in New York has amended a June ruling in the ongoing **Computer Associates International, Inc./Altai, Inc.** legal battle [CW, June 29]. The court now says CA has a "viable trade-secret claim" against Altai, although the latter's software did not infringe upon CA's copyrights. CA had alleged that Altai used CA's trade secrets to create Oscar 3.5, a mainframe software scheduler.

SHORT TAKES **Wang Laboratories, Inc.** reported a first-quarter 1993 net loss of $86.6 million, including a $28 million onetime charge for layoffs and other items related to the firm's Chapter 11 restructuring. Sales for the period dropped 22%, to $360 million, from $461 million a year ago.... Federal arbitrators have voided the U.S. Air Force's twice-protested $740 million Desktop IV PC supply contract awarded to **Zenith Data Systems** in September.... DEC is planning to reassure customers during the week of Jan. 4 that its Pathworks for Novell, Inc.'s NetWare product is alive and well — if "not as far along [toward commercial availability] as we would like," a DEC spokeswoman said. Indeed, one prominent beverage maker is still waiting for a beta-test version of the product, which was expected last summer, a company spokesman said.... **Intel Corp.** acknowledged that it will be at least a year before it ships flash-memory devices announced in April.... **Digital Communications Associates, Inc.** in Alpharetta, Ga., has agreed to acquire **Avatar Corp.**, a Hopkinton, Mass., Macintosh-to-mainframe software vendor, for $6 million.

Novell takes Unix gambit

USL buy would ready company for battle with Windows NT

By Maryfran Johnson and Michele Dostert
PROVO, UTAH

Novell, Inc.'s $350 million bid to buy the Unix operating system from AT&T could dramatically alter the Unix landscape and strengthen Novell's challenge to Microsoft Corp.'s mid-1993 introduction of its Windows NT operating system, analysts and users agreed.

Ray Noorda: *The Novell/USL deal meets customers' needs*

The networking vendor's Dec. 21 announcement that it plans to acquire Unix System Laboratories, Inc. (USL) also has the potential to usher both Novell and Unix into more strategic roles in corporate information systems shops.

"We're in the process of putting together a Unix/Novell network ourselves, and this should make that a lot simpler," said Bob Musacchio, chief information officer at the American Medical Association in Chicago. The merger would also shore up Novell's historic weakness on the high-end server side, where Unix is particularly strong, Musacchio and others pointed out.

"What is at stake here is the enterprise computing environment," said Nina Lytton, an analyst and editor of the "Open Systems Advisor" newsletter, published in Boston. "Both Microsoft and Novell want very much to move beyond desktops and PC LANs into enterprise computing."

"This really says to Microsoft: 'OK, let's go head-to-head,'" added Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "Both of them will have 32-bit, scalable operating systems that go from the desktop to the server level."

What began last year as an amiable technology handshake between Novell and USL turned into a big ol' bear hug once Novell signed up to buy the Unix System V operating system. The courtship began in December 1991 with the formation of Univel, Inc., the Novell/USL joint venture that shipped its first version of Unixware three weeks ago. The new operating system will compete primarily against Windows NT, Sun Microsystems, Inc.'s Solaris and IBM's OS/2.

Working together

By accelerating the integration of Unix and NetWare, the two companies hope to leverage their areas of expertise to appeal to users who are "upsizing" PC networks or downsizing applications from large proprietary systems to Unix-based servers and workstations.

USL President Roel Pieper said they hope to stimulate development of more network-based Unix applications as well as provide customers with "a common management framework" that will reduce costs.

Novell President Ray Noorda added: "Customers have told me personally that it fits their ambitions; desires and expectations to [have NetWare] work more closely with the Unix environment."

Novell officials stressed that the company's deepening commitment to Unix will not interfere with its

Bethlehem Steel/EDS deal targets re-engineering

By Kim S. Nash
BETHLEHEM, PA.

Bethlehem Steel Corp.'s decision to outsource data processing to Electronic Data Systems Corp. marks the start of a huge business process re-engineering effort to better integrate plant floor automation with corporate-level systems.

The steel maker, which reported $180 million in losses for the first three quarters of 1992, claimed the decision to farm out information systems [CW, Dec. 21] is not "a slash and burn" fix designed to save money.

Most of any cost savings that Bethlehem Steel might see down the road will be "poured back into IT," said Walt Bargeron, vice president of information technology.

New business processes

Bethlehem Steel wants to overhaul the way it does business now that it has divested itself of most nonsteel business units. EDS' manufacturing experience was key for Bargeron. "They could handle the scope of the project, so we'll be able to get into new technologies faster," he said.

For example, setting up a fiber-optic data highway between manufacturing facilities is high on Bargeron's agenda, as is applying artificial intelligence to core engineering activities.

The impetus to outsource came from top executives who challenged IS in 1991 to "find better ways ... to manage," said Bargeron, who also oversees research and development and quality assurance, among other areas.

Most of any cost savings that Bethlehem Steel might see down the road will be poured back into IS.

The No. 2 steel maker, behind USX Corp., then dropped a white hankie in front of several outsourcing suitors last January. The final choice came down to the wire as Bethlehem Steel made EDS face off against arch-rival IBM subsidiary Integrated Systems Solutions Corp. (ISSC).

Twelve months of back-and-forth between Bethlehem Steel and EDS and ISSC meant "we got a good deal," Bargeron said.

The estimated $500 million, 10-year contract calls for EDS to start the following, as of Jan. 1:

- A six-month study of business processes with an eye toward re-engineering and downsizing from mainframe-based computing to a client/server setup.
- Evaluating the skills and talents of Bethlehem Steel's 450-member IS staff and training workers in EDS' proprietary application development and productivity tools.
- Consolidating two IBM mainframe-anchored data centers to one EDS site in Camp Hill, Pa.

The contract contains several parachutes that let Bethlehem Steel "retain a lot of control," said Howard Anderson, a consultant at The Yankee Group, which along with Price Waterhouse helped broker the deal.

For example, EDS did not buy Bethlehem Steel's data center. The steel maker plans to hold on to its $5.4 million worth of equipment and will own any upgraded systems EDS may buy in the future, noted Gary Anderson, vice president for manufacturing and distribution services at EDS.

Bethlehem Steel's IS staff will be offered positions at EDS, and most are expected to take them, Bargeron said.

continued support of other desktop systems from IBM, Apple Computer, Inc., Microsoft and other vendors.

Users said they expect Novell to handle the transition gracefully.

"Novell usually does a good job with companies they acquire," said Jim Queen, local-area network manager at Enron Gas Corp. in Houston, which has 600 users of Windows 3.1 and Novell NetWare. "Who knows? Maybe two years from now there will be a compelling reason, and I will rip out all those Windows desktops for Unix. Novell's purchase of USL makes that a lot more likely."

The highlights of the deal are the following:

- Novell will own the Unix System V operating system but will keep USL as a separate subsidiary company to license Unix source and binary code.
- All aspects of USL's early access and general availability programs for its Unix System V licensees will remain unchanged.
- Univel will continue marketing Unixware, the integrated version of Novell NetWare and the Unix System V, Release 4.2 "Destiny" operating system.

Among Unix software vendors, the potential merger was cause for celebration.

"This is a very savvy acquisition," said D. J. Long, vice president of marketing at Westboro, Mass.-based Applix, Inc., which develops Unix-based office integration software. "It puts an aggressive, highly successful software development company behind Unix."

Credibility boost

Along with improved marketing and expanded distribution channels, Novell might also lend Unix some much-needed credibility with the PC half of the computer industry, analysts said.

Unix System V is the dominant Unix "flavor" in a worldwide market valued at $18 billion in 1991. Sun, for example, has based its new Solaris 2 operating system on Unix System V, Release 4. Other USL licensees include Amdahl Corp., Toshiba Corp., Motorola, Inc. and The Santa Cruz Operation (SCO).

"We see Novell as a good shepherd for Unix technology in the future," said Scott McGregor, general manager of the products business unit at SCO, the largest USL licensee.

Not all roses

There is a definite downside, however, to having one large software company own the Unix operating system rather than a dozen shareholding companies that must achieve consensus on future development.

The acquisition is bound to cause competitive clashes for USL and licensees such as Sun. The workstation vendor buys core Unix technology from USL to build Solaris. However, it must now count Unixware among its enemies. Several analysts emphasized that Novell will be in the driver's seat for setting Unix priorities from now on.

"It would be naive to believe a company is going to spend $350 million and then not control the technology," said Steve Wendler, an analyst at Gartner Group, Inc. in Stamford, Conn.

Yet other analysts said Novell understands the power of partnerships — or what Noorda likes to call "coopetition" — better than AT&T or any of the large system vendors ever did.

"Novell has to maintain the momentum for Unix as a viable open systems environment," said Kevin O'Neill, an analyst at Business Research Group in Newton, Mass.

Without providing specific product plans, Novell officials indicated last week that the two operating systems will become more closely entwined over time. USL software such as the Tuxedo transaction processing system and other application services will be layered onto future versions of NetWare, they said.

Unix: an overview

Players in the Novell/USL merger include:

Novell: The $933 million networking software company, whose NetWare operating system commands two-thirds of the PC LAN market.

Unix System Laboratories: Develops and markets the Unix System V operating system. Majority-owned by AT&T and 11 other shareholders. Annual revenue: $80 million.

Univel: Joint venture formed in December 1991 by Novell and USL to market Unixware, a scalable operating system that integrates Unix System V Release 4.2 with Novell NetWare. Began shipping Dec. 8.

Unix International: A nonprofit organization of more than 300 Unix System V vendors and large users. Guides future evolution of Unix System V.

AT&T: Developer of the Unix operating system.

Upside, Downside

Novell

- ✚ **Plus:** Strengthens position in client/server enterprise computing; controls future development of Unix System V; provides more credible counterbalance to Microsoft's Windows NT.
- ▬ **Minus:** Probably overpaid for USL at $350 million.

Unix System Laboratories

- ✚ **Plus:** Broadens distribution channels; improves marketing expertise.
- ▬ **Minus:** Owned by single vendor instead of AT&T and 11 shareholder companies; can no longer claim "vendor-neutral" status.

System V licensees

- ✚ **Plus:** Improves credibility of Unix as strategic operating system for commercial markets.
- ▬ **Minus:** Loses influence in setting priorities for future Unix development.

Open Software Foundation

- ✚ **Plus:** Opportunity to win over disgruntled System V licensees to OSF/1 technologies.
- ▬ **Minus:** Novell NetWare competition flares against OSF's Distributed Computing Environment on client desktops.

Unix International

- ✚ **Plus:** Stronger Unix market benefits all member companies.
- ▬ **Minus:** Future role unclear in shaping Unix direction.

CW Chart: Tom Monahan

Corrections

A story in the Dec. 14 issue should have said Granite Computer Products, Inc. is affiliated with ComputerLand Corp., while Insight Distribution, Inc. is affiliated with MicroAge, Inc.

A news short in the Dec. 14 issue incorrectly cited the model number of the IBM mainframe for which Cambex Corp.'s memory is intended. The correct number is Enterprise System/9000 Model 9021.

Apertus Technology, Inc. in Eden Prairie, Minn., was accidentally deleted from a case study on Pacific Bell's new expert collection system in the Nov. 23 issue.

News Shorts

Fare fixing charged

The U.S. Department of Justice charged eight airlines with fixing prices by using secret codes in their electronic fare system. All of the airlines denied the charge, but **US Air** and **United Airlines** signed consent decrees agreeing to avoid electronic price signaling. The other six airlines, including **American Airlines** and **Delta Air Lines**, said they will fight the charges in court.

IBM taps former execs

IBM has hired two former senior executives as consultants to Chairman John Akers to help strengthen the company's fledgling business units. The two executives are Paul Rizzo, known by analysts as a finance and planning expert, and Kaspar Cassani, who headed IBM's world trade division before retiring in 1989.

Oracle profits rise

Citing strong sales in both Unix and desktop software, **Oracle Corp.** posted second-quarter earnings of $83 million, up 54% from the same period a year ago. Revenue was $353 million, up 24% from the same period last year. "It's [a] far stronger [report] than anyone anticipated, and the accounting was very conservative," said Terence Quinn, a senior vice president at **Kidder, Peabody & Co.** in New York. While Unix sales were 56% higher than they were a year ago, Oracle reported declining sales of its database management system and tools for proprietary systems, including IBM mainframes and minicomputers.

3Com to acquire hub vendor

3Com Corp. has agreed to acquire **Star-Tek, Inc.**, a $20 million Northboro, Mass.-based Token Ring wiring hub vendor. 3Com said it expects the deal to be completed before the end of this month. Separately, 3Com posted third-quarter profits of $7.8 million, an increase of 185% from the same period last year. Revenue was $147.3 million, up 34% from the year-earlier period.

Integrator bolsters management

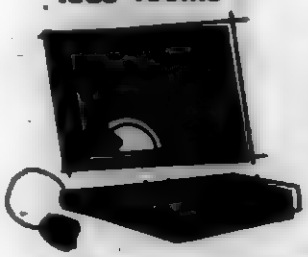
Technology Solutions Co. scored a coup by bringing another **Andersen Consulting** alumnus into its senior management ranks. The Chicago-based systems integrator named Paul J. Cosgrave, 42, a member of its board and executive vice president in charge of its New York office. For the past 11 months, Cosgrave was chief executive officer at **AGS Computers, Inc.**, **Nynex Corp.**'s systems integration subsidiary. He joins ex-Andersen partner Melvyn E. Bergstein, who is Technology Solutions' co-CEO. Replacing Cosgrave at AGS Computers is Matthew Stover, who was vice president of corporate communications.

Cellular data dispute persists

Networking company **Microcom, Inc.** in Norwood, Mass., has filed an answer and counterclaims to a patent litigation brought against it by cellular data technology patent holder **Spectrum Information Technologies, Inc.** Spectrum's technology allows data to travel over analog cellular networks [CW, Dec. 14], a function inherent in Microcom's cellular modems. While Spectrum has sued Microcom for patent infringement and nonpayment of licensing fees and royalties, Microcom seeks to have the patent invalidated on the grounds that the technology was in use before Spectrum's filing of a patent application.

SHORT TAKES **Eastman Kodak Co.** agreed to sell Chicago-based **Interactive Systems Corp.**, a Unix systems consultancy, to Ottawa integrator **SHL Systemhouse, Inc.**... To avoid confusion with **Information Builders, Inc.**'s Focus, IBM has renamed its LANFocus Management/2 family of local-area network systems management products "LAN NetView."... IBM beefed up its recently formed retail and store systems group with the purchase of former business partner **Worldwide Chain Store Systems, Inc.** in Chicago for an undisclosed amount. The company develops retail and wholesale distribution software for IBM's Application System/400, RISC System/6000 and System/9000 computers.... Beta-test versions of OS/2 Version 2.1 are available to interested users. The new version of OS/2 reportedly contains support for **Microsoft Corp.**'s Windows 3.1, a 32-bit graphics engine and enhanced driver support.

Gee, maybe we can get Ronald McDonald wallpaper for the kids' rooms

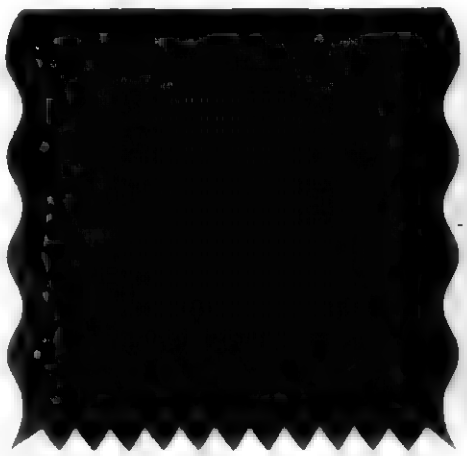


In case you don't get enough ads on TV, now you can get the Energizer Bunny to cavort across your computer screen.

The package — the brainchild of a company called PC Dynamics — even comes with fully digitized sound clips, just in case you wanted to hear that drum keep going and going and going . . .

Gives a whole new meaning to the term strap-on

▲ Lap Strap, a sort of thigh tourniquet that can act as an impromptu desktop-on-your-leg for PC zealots.



The best of the worst from 1992. Compiled by Carol Hildebrand. Illustrations and design by Janell Genovese.

Aren't programmers childlike enough?

Anzoid in Stow, Mass., is offering a toy called Objects essentially a set of building blocks for bored programmers who want to rediscover their inner child. The brochure that accompanies it says, "When they fall down, you can say OOPS." On-site support is provided "anywhere that's fun to visit."

Hey! What do they use the farm subsidies for, then?

Congressional auditors reported last summer that the Farmers Home Administration had spent $200 million since 1985 to automate its field office operations but still managed its $57 billion loan portfolio by thumbing through boxes of color-coded index cards.

What's next? Point-of-sale zucchini?

Intermec Corp., in conjunction with the Washington State Department of Fisheries, has helped develop a bar-code pattern that is being "naturally" encoded in the earbone of fish.

Business as usual?

Sen. John Glenn (D-Ohio): This fee "will most likely be pointless, and ultimately embarrassing, because it simply will not work." (Speaking on the U.S. Congress' decision to assess a whopping 46 cents/min. on-line charge for users of a federal database of shipping tariffs. That's twice the cost of similar services from the private sector.)

Paul predicts

A wacky look at the events ahead in 1993 by Executive Editor Paul Gillin.

The new, more honest IBM will declare 1993 "The year of saving our precious rear end." Struggling counterparts over at DEC will dub '93 "The year of rear-ending some dead-weight products," while a weakened Wang will assert "The year we sell off what's left of our rear end."

➤The spreadsheet wars will escalate with Borland's declaration that Version 2 of Quattro Pro for Windows will have a mean item that guarantees world peace. Lotus will angrily retort that it was going to put the exact same feature in 1-2-3. And it will be discovered that Microsoft had quietly put the same feature in Excel but had "forgotten" to tell independent software vendors.

➤IBM will claim that 1,500 applications have been written for OS/2. However, further analysis will reveal that 1,200 of them are screen savers.

➤Computer Associates will shake up the software industry with a revamped licensing deal that makes it possible for large customers to purchase the entire suite of CA data center products for $19.99, plus tax. However, annual maintenance fees will run in excess of $2.5 million.

➤A prominent CIO will quit to join a consultancy, denying that the complete elimination of his department and budget played any role in his decision.

➤Storage Tek will say that it still has a few tiny problems with its Iceberg disk array — like it doesn't work — and that it can't forecast a ship date until the Sears repairman shows up.

➤Microsoft will continue to complain that it doesn't understand why its competitors hate it, even though it takes about 80% of every market it enters.

➤The Federal Trade Commission will determine that Microsoft does compete unfairly, but it will drop charges after it receives a free site license for Microsoft Golf.

➤The PC software price wars will reach a fever pitch, with Microsoft offering to bundle a free support technician with each Microsoft Office pack.

➤IBM will be reduced to holding its annual AD/Cycle user-group meeting at booth 12 in a Chinese restaurant in New York.

➤Saying that it no longer considers its parent company "a strategic asset," EDS will outsource General Motors.

➤With mainframe sales stalled, IBM will introduce to a lukewarm reception a credit card that makes a contribution equaling 5% of each customer's payments toward the purchase price of an ES/9000.

➤CA will introduce a database product that its users can employ to keep track of the number of database products CA now sells.

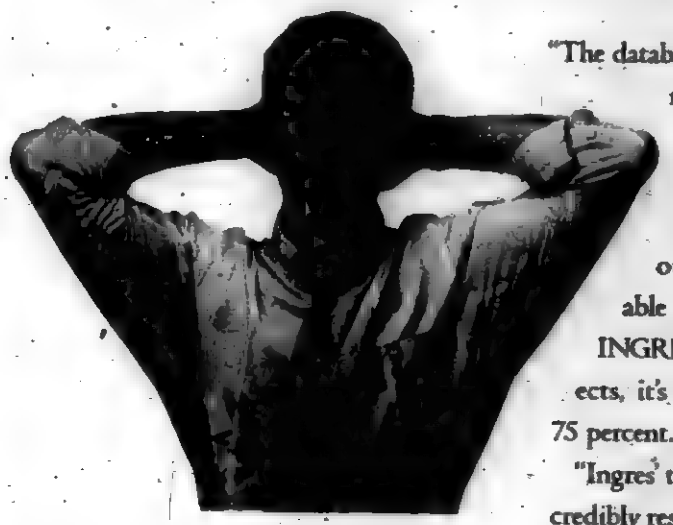
➤Toshiba will proudly announce that it has developed a portable computer so small that nobody can use it.

➤Nearly every product upgrade during the year will make the product object-oriented, standards-based, SQL-compliant, completely open, GUI-capable and customer-driven and will enable a paradigm shift. Most of those products will be bug fixes.

Why Ingres can cut your applications development time by 60%.

Imagine an application that took two years just to prototype. Now imagine creating the fully functional version in only three months. That's what one of our customers did using Ingres' extraordinary development tools.

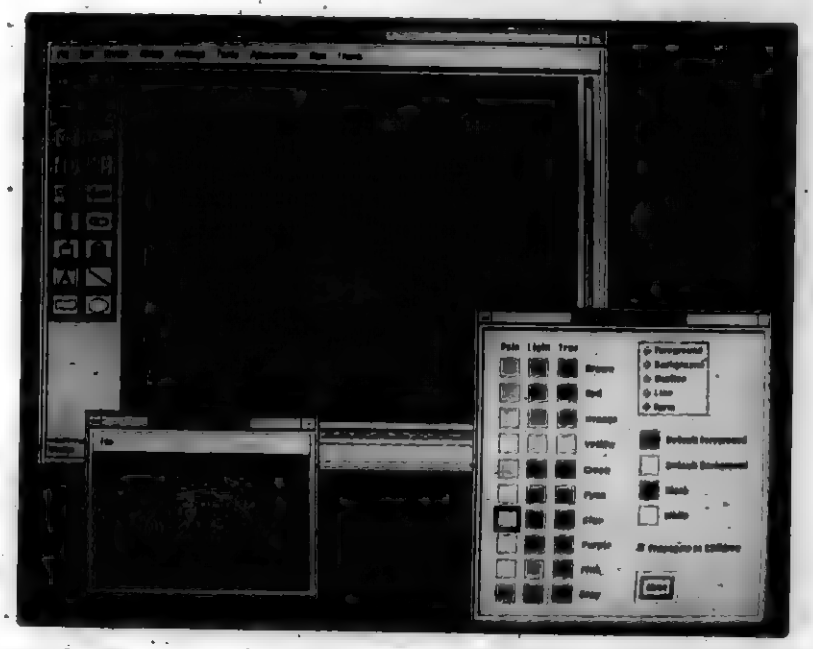
First, there's INGRES/Vision.™ It gives you a visual interface and 4GL code-generating technology that actually writes code for you. Next, there's INGRES/Windows4GL,™ which lets you create graphical client-server applications by simply pointing and clicking. That cuts development time by an average of 60%.



"The database we collect, massage, and manipulate to generate reports for clients *is* our business. The demand for new applications obviously is intense. I've been able to meet that demand with INGRES/Vision. On many projects, it's cut development time by 75 percent.

"Ingres' technical support is also incredibly responsive. No matter when I call, their support engineers always call back right away."

Anders Nicolausson, National Systems Manager, Construction Market Data, Inc., 250 employees in 15 U.S. offices.



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"By focusing on the underlying architecture of the database and how to achieve optimal connectivity to it, Ingres is able to maximize the power and performance of

Technological Innovation
1983 First client-server RDBMS
1985 First RDBMS-4GL integration
1986 First database gateway
1987 First transparent distributed RDBMS
1988 First UNIX DBMS to break 100 TPS
1989 First intelligent database, object support
1990 First RDBMS with automatic two-phase commit
1990 First RDBMS-graphical, OO 4GL integration
1991 First production-quality 4GL generator
1991 First SQL-based event alerters

open systems, and to provide the best possible framework for your move toward client-server computing. The result is a system architecture that mirrors the way your business works, and solves business problems."

If you'd like to know more about the effect Ingres can have on your productivity, call **1-800-4-INGRES**. Within Latin America, call **1-305-789-6685**.

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Test results (*InfoWorld*, September 1992) prove that new Paradox® 4.0 is the world's fastest relational database! Thanks to Borland's new WarpSpeed™ performance, Paradox 4.0 sets a new standard for both network and standalone performance. For you this means faster answers to queries, faster data access, and faster multiuser applications.†

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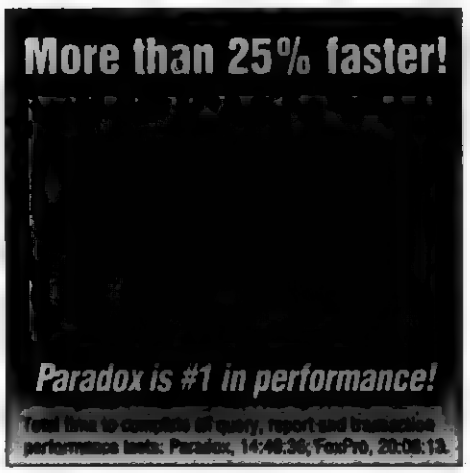
Paradox 4.0 comes with new, all-purpose memo fields that allow you to add virtually unlimited text anywhere in your application. Plus you can store anything you want in the new binary field—documents, bit-mapped graphics, multimedia data—and manipulate it under program control.



"Tuned-up Paradox 4.0 speeds past FoxPro 2.0."

InfoWorld product comparison, September 28, 1992.

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COMPUTERWORLD

A guiding light

Don't miss our revamped products section in this issue. Tailored to the needs of IS professionals, The CW Guide, which begins on page 81, combines user ratings, product reviews, lab results and articles by technology experts. This week's subject is network storage: The CW Guide details what's here, what's not and what's needed to manage all the pieces. Buyers' Scorecard reports how users rate their RAID-equipped LAN servers. Firing Line provides a critique of NCR's 6298 RAID subsystem.

Users question 'fast' Ethernet migration plan

Proposals undercut current standard

By Lynda Radosevich and Joanie M. Wexler

Users are worried about just how much fiddling it will take to integrate emerging "fast" Ethernet local-area networks with their 10Base-T LANs.

While vendors have implied that moving to 100M bit/sec. Ethernet from today's 10M bit/sec. networks will be straightforward, upgrades may actually entail more equipment and cabling exchanges than users are bargaining for. In particular, a technology proposal on the Ethernet standards committee table from Hewlett-Packard Co. and AT&T describes an entirely new network "posing" as Ethernet, according to observers.

The committee will tackle the user implications of such a network later this month at its meet-

Ethernet, *page 12*

Net kings link up

Novell, AT&T to merge NetWare servers, telephone switches

By Joanie M. Wexler

■ The tip of a potential network integration iceberg emerged last week in the form of a subtle joint move by the respective leaders of the data and voice networking dominions: Novell, Inc. and AT&T.

The two communications giants said they will team up to merge the capabilities of telephone switches with Novell's NetWare servers, an announcement that was received with only a modicum of enthusiasm by users and industry observers.

However, some observers said they envision the union as a potential turning point in the industry's long-term goal to blend local- and wide-area networks into seamless, enterprise communications highways.

"With the coming of ATM networks, there would be an ability for a telephone switch to become another server on your corporate network," said Bill Conley, manager of information system services at Loral Aerospace Corp. in Newport Beach, Calif.

Asynchronous Transfer Mode is an emerging high-speed switched network that speaks the same protocols as a LAN or a WAN. It is targeted at handling voice, data and video equally well and at someday breaking down the boundaries between LANs and WANs.

Bringing the phone system onto the computer network is "appealing because it integrates everything for me. It consolidates equipment, protocols, databases and management. When you think of the marriage of two companies that could make this happen, Novell and AT&T would be the ones I'd pick," Conley said.

Coming soon

Novell and AT&T said they will ship a NetWare Loadable Module that links NetWare users and AT&T Definity private branch exchanges during the second half of the year. Applications would allow users to combine phone features such as conference calling and voice-mail management with data

Net kings, *page 16*

NETWORLD

For coverage of this biannual networking fair, turn to the following pages:

12 Attachmate gets into E-mail.

14 NetWare gets reinforced links with DEC's Pathworks, IBM mainframes.

15 Banyan delivers next release of Vines, Enterprise Network Services.

16 Lotus displays the remote version of CC:Mail for Macintosh.

Rightsizing

United taps Unix again

By Ellis Booker
SAN FRANCISCO

■ United Airlines, the No. 2 U.S. carrier, next month will bet for the second time on the value of Unix and client/server computing in a mission-critical application.

The airline, which nine months ago deployed its first large-scale Unix system, is readying a network of 32 IBM RISC System/6000s that will run a relational database management system designed to process data residing on a 20-year-old mainframe-based aircraft maintenance system.

Deployment comes as United, like its airline industry brethren, undertakes a series of severe cost-cutting measures, including

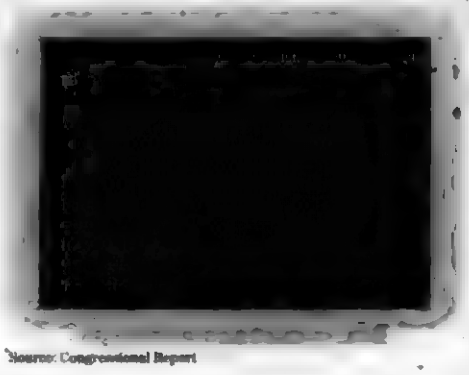
United, *page 8*

Newspaper

Ruling forces government to save electronic messages

By Mitch Betts
WASHINGTON, D.C.

The ghosts of the Watergate and Iran-Contra scandals returned last week when a federal judge prohibited the White House from purging computer backup tapes that hold electronic-mail messages from the Reagan and Bush administrations.



Source: Congressional Report

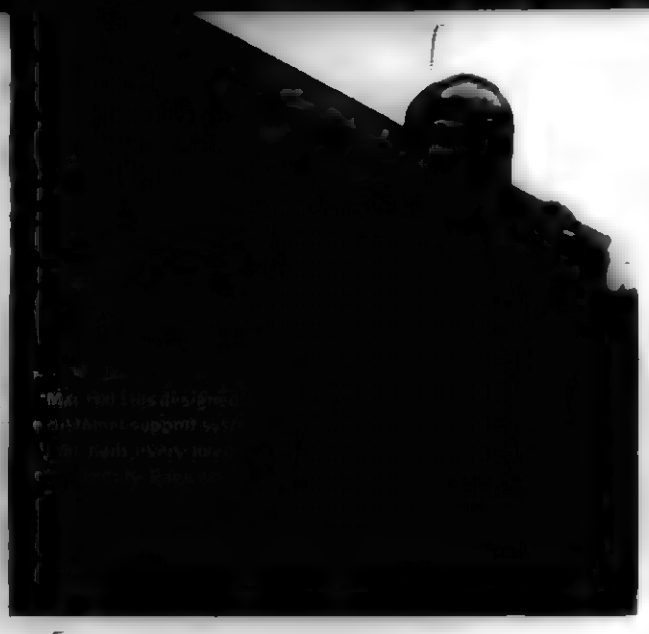
At least some of the E-mail messages — which proved invaluable in the 1987 investigation of the Iran-Contra scandal — are historically significant federal records that should be retained, according to U.S. District Judge Charles R. Richey. He said the E-mail answers the question immortalized in the Watergate hearings: "What did he know, and when did he know it?"

U.S. Sen. John Glenn (D-Ohio) said he was pleased "the electronic shredders have been stopped. To destroy this information would have meant destroying history."

"In a single step, Judge Richey has ordered that 12 years of the real history of the Reagan/Bush era cannot be destroyed and has brought the federal government into the 20th century by recognizing that information in electronic form is every bit as official as information on paper," said Scott Armstrong, a journalist and plaintiff in the suit.

However, one source familiar with White House operations called the ruling "frightening" because of the high costs of storing large volumes of backup tapes. This source also predicted that White House staff members will simply stop using E-mail because of the likelihood that their messages will be disclosed to the press, critics and prosecutors under the

Ruling, *page 8*



NEWS

Executive shuffling continues at DEC, where Jack Smith, once considered the most likely successor to Ken Olsen, retires unexpectedly. Meanwhile, Microsoft lures a top Apple executive to run its database operation. *Page 4*

Networld '93: Microsoft is expected to reveal plans to add TCP/IP and IBM mainframe communications support to Windows for Workgroups in announcements this week. DEC will preview new members of its Pathworks client/server family, and Novell is updating its communication server to improve remote communications today between NetWare-based LANs and the asynchronous world. *Pages 12-16*

Novell's proposed acquisition of the Unix System V operating system bodes well for users who need smoother integration between Unix-based servers and PC LANs. *Page 47*

The office of the future will feature high-speed networks, multimedia, lightweight portable computers and intelligent "agent" software to cope with an overabundance of digital information, according to information technology professionals looking ahead to the year 2001. *Page 28*

COMMENTARY

Lack of product information isn't a problem for most IS managers. What is needed are facts on how products work with one another. Columnist Elaine Bond says vendors can provide the interoperability information users need — there may even be some profit in it. *Page 33*

THE CW GUIDE: NETWORK STORAGE MANAGEMENT

You probably can't build the "perfect" network storage management system today. But you can piece together one that is "effective" — after a lot of integration and political maneuvering. *Page 81*

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A PUBLICATION OF IDG

AD/Cycle

Bachman spurns IBM

By Kim S. Nash

BURLINGTON, MASS.

■ Bachman Information Systems, Inc. quit IBM's AD/Cycle alliance last week, citing pressure from IBM to cater to IBM products. IBM countered that Bachman, which has long focused on mainframe DB2 shops, was unwilling to commit to AD/Cycle's recently restated client/server direction.

Bachman also withdrew from its partnerships with IBM for SystemView and Information Warehouse.

IBM's AD/Cycle-related actions during the past year — one in which Bachman's financial situation became increasingly turbulent — were "damaging to Bachman," according to Ed Acly, analyst at International Data Corp. Figures for fiscal first-quarter 1993 showed that sales slipped 12% compared with 1992, from $9.2 million to $8.1 million. Bachman posted a $3.6 million loss for the quarter and plans to lay off 15% of its 340-member staff.

In August, IBM agreed to buy $25 million worth of tools from KnowledgeWare, Inc., a Bachman rival and AD/Cycle partner. IBM also named Atlanta-based KnowledgeWare the vendor of choice for front-end application development tasks such as software analysis and design.

Bachman is the second partner to exit AD/Cycle recently. Intersolv, Inc. pulled out five months ago, citing the "enormous" expense of AD/Cycle, which requires member companies to split profits with IBM on all products sold under the banner [CW, Aug. 31].

Bachman withdrew from the alliance for technological reasons, Bachman Chairman Charles Bachman said. "We need to take AD/Cycle, which is basically for IBM platforms, and extend it to other databases," he said.

Analysts have called Bachman's Model Driven Development product line, introduced in early 1992, a good start, saying that the object-oriented approach to re-engineering and software reuse is on target but that Bachman needs to address client/server development more fully. The company wants to amend that strategy to encompass platforms other than IBM's DB2 and IDMS and announced products for Sybase, Inc. in November.

By leaving AD/Cycle, "we won't have IBM complaining about our supporting Sybase" or other database vendors, Bachman said.

"IBM does not complain," said Mark Elliott, assistant general manager/marketing at IBM's Programming Systems line of business. "We understand that most customers have multiple vendors' products and have announced application development products to support non-IBM platforms," he said, referring to compilers and testing tools announced last summer for Sun Microsystems, Inc. workstations.

Today's AD/Cycle no longer resembles the Utopian development framework IBM laid out three years ago. Frustratingly late and technologically less-than-promised, the AD/Cycle products IBM managed to deliver were not well-received. Few large shops have embraced the framework wholeheartedly, "mainly because there's little product there," Acly said.

The AD/Cycle focus has been redirected to local-area network-based development, primarily at IBM's Toronto facility, in an effort to stay current with demand for Unix workstations and servers, which are being used in many cases to replace IBM's bread and butter mainframes. However, progress has been slow, with a repository that lets these tools communicate on an advanced level not expected until 1995 or later, according to some observers.

Elliott said that a repository that allows data integration will not appear until 1994, which is "slightly later than anticipated" when AD/Cycle was formed.

IBM retains a 10% equity stake in Bachman and a seat on the firm's eight-member board.

Late Breaking News Briefs

ISSC changes seen

IBM this week is expected to raise the stature of its Integrated Systems Solutions Corp. (ISSC) by shifting vertical market staff members into the outsourcing subsidiary and fortifying management.

The company is expected to promote President Denny Welsh to the newly minted position of chairman and chief executive officer, while naming Sam Palmisano, currently general manager in IBM's Asia/Pacific organization, as ISSC president, a source said.

An IBM spokesman declined comment on any of the moves.

It is not clear how many industry-specific marketers will make the move from IBM's national vertical markets group into ISSC. One source said ISSC will also pick up responsibility for international deals.

The moves are part of an effort to give ISSC a more prominent role at IBM as Big Blue implements a services-driven strategy to offset declining product revenue that has led to losses and layoffs.

The changes would establish ISSC as a more bona fide subsidiary, and some industry observers said they believe they set the stage for an ISSC public stock offering.

Chase plan proceeds

The Chase Manhattan Bank NA late last week confirmed that it is going ahead with a project to develop a common computing environment for its 350 regional retail branches in metropolitan New York and Maryland [CW, Oct. 26, 1992]. The project includes a four-year contract with ISSC to provide up to 4,000 IBM Personal System/2s, OS/2 2.0 LAN software and Hogan Systems, Inc.'s banking applications. Chase would not discuss the cost of the project, but sources close to the $97 billion bank placed the cost of the multiyear deal at roughly $85 million. Sources also projected cost savings in improved efficiencies, software maintenance and retail staff cuts.

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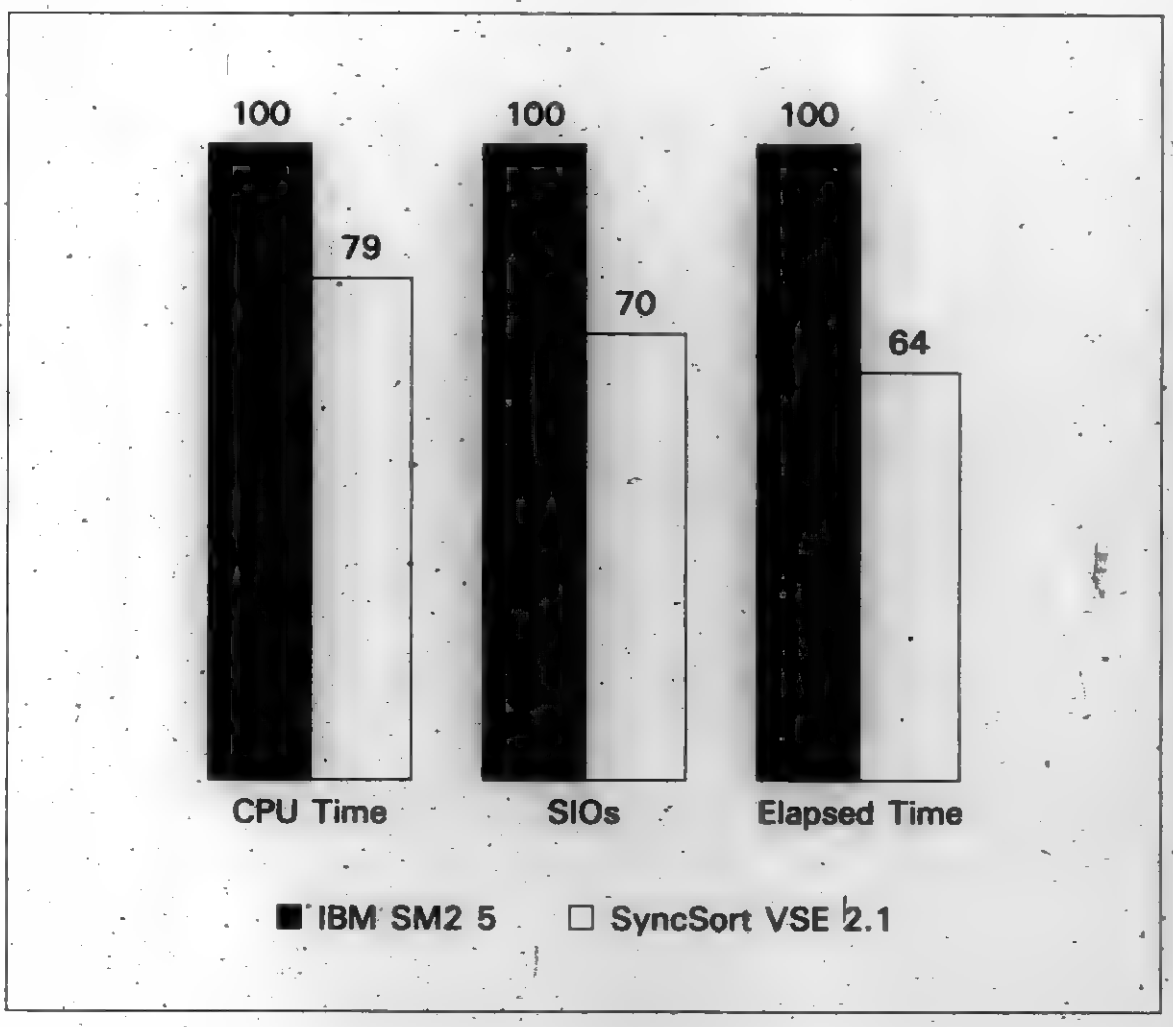

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Financial forecast

DEC losses narrowing

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. will kick off 1993 on a less-dismal note. Already midway through its fiscal year, the company will announce a quarterly loss this week, but one that analysts expect to be less than half of the previous quarter's and somewhat less than the loss for the comparable period last year.

Losses are expected to range from roughly 85 cents to 95 cents per share, or about $120 million, vs. losses of $2.04 per share, or $280 million, during the previous quarter and $1.25 per share a year ago.

Analysts attributed the modest improvement in DEC's situation to cuts in costs and expenses because of head count reductions, stabilization of VAX sales and a traditionally strong quarter last month.

"I think they're reducing their costs more aggressively than people were expecting," said John Jones, a senior analyst at Salomon Brothers, Inc. in San Francisco.

DEC moved from an employee count of 108,500 on Oct. 1 to a current total of about 100,000, according to Jack Smith, the senior vice president of operations, who announced his retirement from the company last week. He added that DEC is likely to downsize even further — to between 85,000 and 90,000 employees — by the end of the fiscal year in July.

DEC's Jack Smith, *senior VP of operations, retires voluntarily after a 38-year career at DEC*

At one time considered a possible successor to DEC Chairman Kenneth H. Olsen, Smith said he is ready to retire after 38 years at the company. His position will not be filled, the company said.

"I feel very confident in what has been achieved over the last few quarters, though I cannot go into specifics because of the quiet period, and that the company is well-positioned for the future," he said.

Not overly optimistic

Despite the modest decrease in losses, analysts were less sanguine in their assessment of DEC's financial position.

"DEC's primary issue is the transition to Alpha, and two [related concerns] will tend to depress revenues and margins," said Bob Herwick, a managing director at Hambrecht & Quist, Inc., a San Francisco-based investment firm. Users are waiting to make the move to Alpha, and DEC's offering discounts as an incentive, he said. "Another big variable is how badly DEC has been affected by the slowdown in Europe."

Revenue from DEC's Alpha AXP line is not expected to kick in until the next fiscal year, analysts said. Two more quarters of losses are likely before DEC moves out of the red, according to Jones.

Apple shows color at Macworld Expo

By James Daly
SAN FRANCISCO

There is nothing like a little splash of color to liven things up. And if last week's Macworld Expo is any indication, it's going to be a very lively year for Apple Computer, Inc.

Despite the sudden departure of Senior Vice President Roger Heinen (see story at left), Apple made its long-anticipated move into color publishing with a palette that includes its first color scanner, a color ink-jet printer and a color management system called ColorSync, as well as three other gray-scale printers (see chart below).

The color introductions are the opening notes in what is expected to be a symphony of color products from Apple this year. At next month's Macworld Expo in Japan, for instance, analysts say Apple will introduce its first color portable, the PowerBook 165C. February is also expected to see the rollout of a color version of its entry-level Macintosh Classic that will be priced at roughly $1,400.

The jump into color is seen as long overdue. "Apple really needs to play catch-up in the color arena," said Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif. If successful, Apple could also benefit handsomely.

International Data Corp., a research firm in Framingham, Mass., predicted that in 1993 the notebook market will grow 17%, and color notebooks should increase to 15% of the market, from approximately 8% in 1992 (see storypage 10).

It is an opportunity Apple does not plan to miss. "In the coming year, you're going to see color everywhere," said Ian Diery, Apple's executive vice president of worldwide sales and marketing. "In the next few years, we're going to pour enormous energies into cross-platform imaging solutions," he said.

At the core of Apple's strategy will be ColorSync, a color calibration system designed to ensure accurate, device-independent color reproduction among all components in a Macintosh publishing system.

Many companies had already jumped on the ColorSync bandwagon at the four-day show. Among the firms displaying ColorSync-aware products were Eastman Kodak Co., software manufacturer Savitar, Inc., Radius, Inc., printer maker Tektronix, Inc. and Light Source, Inc.

A kaleidoscope of Macintosh-related products are on the way

Product	Description	Retail Price
Color OneScanner	300-DPI flatbed device; available in February	$2,349
Apple Color Printer	300-DPI, large format printer	$2,349
ColorSync	QuickDraw extension for color calibration	**NA
*PowerBook 165C	33-MHz system with 9-in. passive-matrix display; expected in February	Expected to start around $3,500
*Color Classic	16-MHz color version of Classic; expected in February	About $1,500
[illegible]	[illegible]	[illegible]
LaserWriter Pro 600	300-DPI resolution	$2,499
LaserWriter Pro 630	600-DPI resolution	$2,529

*To be announced ** Not available

Source: *Computerworld* CW Chart: Stephanie Faucher

Apple exec jumps to Microsoft

Competitor gains insider's view of Macintosh system strategies

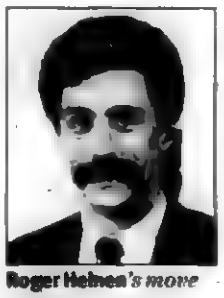
By James Daly

■ A funny thing happened on the way to last week's Macworld Expo. Roger Heinen, who heads Apple Computer, Inc.'s system software division and was scheduled to address the assembled Expo masses on the future of Macintosh system software, resigned suddenly and without explanation. And he joined archrival Microsoft Corp.

Heinen will assume the newly created post of vice president of database and development tools at Microsoft, which is currently involved in a bruising slugfest with Borland International, Inc. and others for the hearts and wallets of Windows database users. Microsoft released its first database ever, which is also the first Windows database, at Comdex.

The departure of someone whom *Macworld* literature described as "an exceptionally knowledgeable insider" worried some Apple employees, who said they fear it could have a demoralizing effect on the co-workers he leaves behind.

Some said they worry about the knowledge of the Macintosh system software strategy that Heinen will bring to Microsoft.



Roger Heinen's *move to Microsoft may demoralize Apple staff*

Apple and Microsoft released only short announcements about the resignation, adding grist to the rumor mill and causing many to speculate on the suddenness of the departure.

While some sources said Apple's top managers had been somewhat critical of Heinen's performance, others noted that the move is more likely to indicate how much help Microsoft needs in getting its database market off the ground.

"Microsoft is admitting that their database strategy is not nearly as far along as they had hoped and that they needed a world-class software manager with vision to come in and shake things up," said Peter Kastner, a vice president at the Aberdeen Group in Boston.

Heinen came to Apple in 1990 after 17 years at Digital Equipment Corp. He quickly became one of Chairman John Sculley's top lieutenants, overseeing the development of System 7.0 operating system software and leading the team that developed QuickTime, a program that allows Macintosh users to work easily with video and sound.

Senior West Coast editor Jean Bozman also contributed to this report.

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News Shorts

IBM slims down

IBM last week kicked off the first stage of a plan announced last month to reduce its worldwide work force by 25,000 in 1993. Specifically, IBM's chip making Technology Products and host-oriented Enterprise Systems businesses announced a series of "voluntary incentive" programs designed to reduce their work forces by 3,000 to 3,500 during the next several months. Enterprise Systems is expected to contribute 600 to 800 of that number. Employees will have until March 31 to sign up. Participation is at the discretion of managers, who may reject applicants with "essential skills." Both units are also considering OEM opportunities.

Frame relay due for tests

The National Institute of Standards and Technology will conduct a multivendor trial and interoperability demonstration of networks based on Open Systems Interconnect (OSI) and frame relay. Frame relay-based wide-area links will be used to interconnect Ethernet and Token Ring local-area networks running higher level OSI protocols such as the X.400 electronic-mail standard. The purpose is to demonstrate how frame relay can be integrated into existing OSI networks with an eye to making it part of the emerging Industry/Government Open Systems Specification. Thirteen companies will participate.

Group to tout NetWare messaging

After a year of listening to Lotus Development Corp. and Microsoft Corp. spar about their proposed E-mail standards, 26 vendors of E-mail-based products are joining forces with Novell, Inc. this week to remind customers that Novell's NetWare Global Message Handling System (MHS) — formerly NetWare Global Messaging — is a seasoned pro in the E-mail world. The MHS Alliance will demonstrate its products' interoperability at Networld '93 this week.

Court kills LCD tariff

A federal appeals court handed U.S. computer companies an interim victory by ruling that the U.S. International Trade Commission (ITC) erred last year in imposing a 63% tariff on the import of Japanese-made active-matrix LCDs. Apple Computer, Inc., IBM and Compaq Computer Corp. appealed the ITC ruling, which must now be reconsidered. The ITC action was much criticized because it caused U.S. PC makers to move production offshore to escape the duties.

Banyan/Microsoft deal

Banyan Systems, Inc. and Microsoft Corp. announced Banyan support for Microsoft's Windows for Workgroups desktop operating system. The new driver, available from both Banyan and Microsoft, allows Windows for Workgroups users to access their Vines network by pointing and clicking on an icon. Banyan also announced a new Value Investment Protection plan for users of its Vines, Vines for Unix and Enterprise Network Services for NetWare products. Customers who buy the protection receive free releases of the product for 12 months.

SHORT TAKES Unisys Corp. has named Craig J. Mento vice president of its newly formed Communications Systems Division of Unisys' U.S. Information Systems (USIS). He will report to William B. Patton Jr., senior vice president and president of USIS.... NCR Corp. has entered into an alliance with CKI, Inc., an Arlington, Va., software developer, to market an image-based system designed to speed the processing of credit card chargebacks.

News shorts, *page 16*

Client/server cures AMA's computing ills

By Maryfran Johnson
CHICAGO

The American Medical Association (AMA) is giving a high-tech twist to the old admonition "physician, heal thyself," as the 147-year-old organization reaches the midpoint of a massive conversion from proprietary systems to open client/server computing.

"All the battles aren't won yet, and probably some of them haven't even been fought," said Chief Information Officer Bob Musacchio. "The whole goal of this is to allow our people to get their own data, to give them access to it."

> Another goal for '93 is to harness an expanding network of about 1,000 PCs and Macintoshes onto Novell LANs. Only half of the machines are now networked.

The diagnosis may be straightforward enough, but the treatment stirred up challenges beyond the technical ones, he noted. During the past two years, Musacchio found himself working just as hard at uniting a "highly fractionalized" user community and information systems staff at as consolidating several small data centers.

"The main way we've done this is by getting the users to sit at the table with IS," he explained. "We interview the users, get their views on application packages and then look it over from the IS point of view. We also put system and programming people into the users' area — outsourcing them, in a sense."

As the world's largest publisher of medical and scientific information, the AMA is more than a professional trade association for doctors.

"The AMA resembles an industrial conglomerate," said John Demetra, a principal at the management consulting firm Deloitte & Touche in Chicago, which is helping the AMA draft its first strategic IS plan. "It's really a professional association, a publishing company and a retailer all in one. The organization runs on information on virtually every front."

Among the AMA's major lines of business is a $60 million publishing operation that includes the monthly *Journal of the American Medical Association* and the weekly *American Medical News*.

The not-for-profit organization's budget was $187 million last year, with $22 million earmarked for an IS operation serving 1,100 users. Last year, Musacchio spent $1.3 million adding and upgrading personal computers throughout the organization and this year has $3.3 million allocated for capital expenditures associated with the client/server conversion.

Now at the halfway mark of the two-year migration effort, the AMA is writing a strategic IS plan. "The whole impetus behind the plan is to increase the value added to our membership, expand our revenue base and, basically, to help manage expenditures through better data processing and cutting administrative costs," Musacchio said.

James Rappel, the AMA's senior vice president for administration, said developing such a plan is as important "in convincing us that we're spending the right amount" as it is in trimming costs.

At a glance

The American Medical Association:
Founded in 1847, the AMA is a voluntary service organization of more than 290,000 physicians. The AMA acts as a kind of census bureau and repository of information on every licensed U.S. physician, living or dead. The organization also participates in national health policy-making and medical education. It has access to worldwide medical and scientific information through more than 150 computer databases.

CIO Bob Musacchio *and the AMA are at the halfway mark of a two-year open systems migration*

Out with the old

Heading out the AMA door in 1993 is all equipment from Wang Laboratories, Inc. as well as Atex, Inc.'s publishing software system. The AMA is replacing the Atex system with Xyvision, Inc.'s publishing software running on a Digital Equipment Corp. Unix-based server. Six IBM RISC System/6000 servers are used for other publishing and marketing applications.

Another goal for '93 is to harness an expanding network of approximately 1,000 IBM PCs and Apple Computer, Inc. Macintoshes onto Novell, Inc. local-area networks. Only about half of the machines are networked now, Musacchio said.

The linchpin of Musacchio's strategy, however, is the installation of a Unix-based Sequent Computer Systems, Inc. multiprocessor as a file and database server. It will act as a pivotal stepping-stone between a pair of IBM 3090 400E mainframes, the Novell PC LANs and several IBM Personal System/2 and Netframe Systems, Inc. servers.

Doctors' records

In its role as a record-keeping organization for every licensed physician in the U.S. since the mid-1800s, the AMA has nurtured a master database file that now includes more than 600,000 practitioners. That file gobbles up nearly 1 million megabytes of disk drive space on the IBM mainframes.

Finding new ways to slice and dice that master file — by far the largest of the AMA's 300 in-house databases — prompted the purchase of the Sequent multiprocessor and the addition of IBM's DB2 relational database management system to the mainframe's old IMS database system.

Rather than rewriting old applications, the IS staff will pull data out of IMS or DB2 and work with it under a Sybase, Inc. RDBMS on the Sequent.

"One of our driving forces is to stay mobile and flexible," Musacchio said. "Our new rule for building application systems is that if it takes more than three months, forget about it."

DISTRIBUTED QUERY COMPARISON

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
se
wh
be
    CREATE PROCEDURE la_qty
    /* for use on WESTCOAST server */

    /* returns count for one part only */
    @partno char(6),
    @la_count int output
    AS
/*  SELECT @la_count =
    (SELECT qty FROM la_parts
/*  WHERE partno = @partno)

    DECLARE @cnt int
    DECLARE @counter int
/*  DECLARE @la_count int
    DECLARE @partno char(6)
    SELECT @cnt = COUNT(partno) FROM ny_parts
en
    /* ny_parts is the parts master; need count
/*  for sequential-comparison with la_parts
*/  to simulate a distributed join */
DE
DE
pr
se
wh
be
se
se
EX
@l
@l
up

    SELECT @counter = 0

    /* create temporary table for part numbers
    and quantities from ny_parts */
    CREATE TABLE #allparts1
       (partno char(6) NULL,
       ny_qty int null)

    /* create temporary table for row numbers
    for sequential call of la stored procedure */
    CREATE TABLE #allparts2
       (seq int)

    /* create temporary table for
    sequential build from first two temp tables */
    CREATE TABLE #allparts3
       (partno char(6) NULL,
       ny_qty int null,
       la_qty int null,
       seq int)

    /* build sequence numbers for each ny row */
    while @counter 1> @cnt
    begin
       select @counter = @counter + 1
        insert into # all parts 2 (seq) values ( @ counter )
    end

    /* populate temp table with ny parts and quantities */
    insert into #allparts1 (partno, ny_qty)
    select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

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United taps Unix again

CONTINUED FROM PAGE 1

layoffs, salary cuts and flight reductions, designed to reduce operating expenses by $400 million a year.

The No. 2 carrier's financial woes did not drive this particular Unix project, stressed United officials connected to the project. But United clearly has an incentive to use lower cost computing architectures as a way to reduce its overall expenses, analysts said.

"Our move to open systems is driven by a lot of pressures, both technical and economic," said Don Karmazin, vice president of MIS at United. He said the effort minimizing the growth of mainframes and maximizing the use of client/server technology existed before last week's announced expense cuts and would not be accelerated.

Regarding those cuts, Karmazin could not say how the job reductions and expense-reduction goals would impact his information systems organization or its projects.

United's second major Unix client/server initiative is targeted at a labor- and resource-intensive function: aircraft maintenance. The company hopes the lower cost Unix system will save time and money and create new maintenance efficiencies. In fact, the project is expected to pay for itself in a year.

United's System Aircraft Maintenance Control (SAMC) department — located at San Francisco International Airport — operates on a 24-hour, 7-day schedule. Its 100 operators are responsible for advising pilots and line mechanics about the repair history of each of the 536 planes in the United fleet.

The current Unisys Corp. mainframe application required dozens of keystrokes to accomplish the most routine inquiries, according to Ted James, a senior maintenance controller at United's SAMC department. "All the data elements are on the host; the problem has been mixing, matching and presenting them," James said.

The networked workstations, for example, will reduce the number of keystrokes needed to perform a task from 37 to four, James pointed out.

Meanwhile, the new architecture means connectivity to other hosts and applications that was not possible before. For instance, newer United aircraft transmit engine statistics 20 seconds after the nose gear leaves the runway. But this data is stored on an IBM 3090 mainframe complex in Chicago. SAMC operators will now be able to review and compare these records quickly in one of the 20 or so Open Software Foundation Motif windows that will be active on their two 19-in. color monitors.

United's Unix application goes beyond creating a pleasing graphical interface into mainframes. "Straight terminal emulation would not have given us what we required," said James, who noted that gathering "little pieces of information by hand" is not an ideal tool for troubleshooting a commercial jetliner.

Thus, a key part of the application is an RDBMS from Sybase, Inc. that processes data locally on two RS/6000s. These servers will automate what were once labor-intensive duties, such as tracking a daily report on delays and maintenance problems.

Another innovation is the integration between the RS/6000s and AT&T's newest Definity Generic 3R phone switch, a combination that manages calls from technicians and pilots in the air more intelligently (see story below).

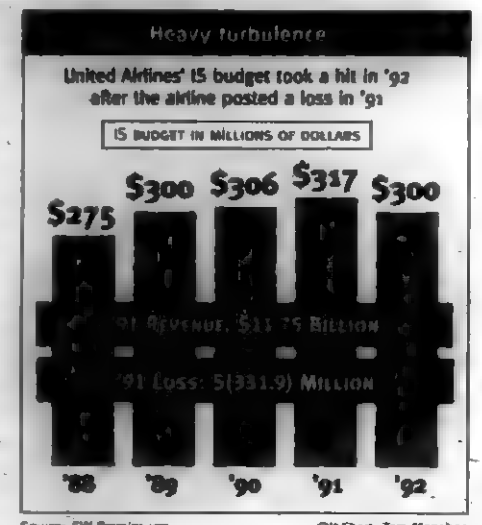
If James is pleased with the functional benefits of the new system, members of United's IS department are likewise happy the project did not involve a programming effort on the mainframe.

"We avoided interruptions to these users," said Sandy Kingery, project manager at United.

But some observers said the United project should not be heralded as a victory for Unix.

"Putting a front end on a mainframe is as old as mainframes themselves," said Omri Serlin, president of ITOM International Co., a consultancy in Los Altos, Calif. "The fact that these [systems] happen to run Unix is not terribly significant," he said, arguing that the watershed will come when United or another airline decides to decentralize its reservation system.

Yet even with one project under way and another due to start, United remains coy about how far it intends to fly with open systems and Unix. Its first Unix project consists of a network of Silicon Graphics, Inc. Unix workstations and IBM RS/6000 servers at its Chicago headquarters, which took over scheduling United's flight crews.



Integrated phone/IS system rings true for United

A tightly integrated computer and phone system was one of the key reasons United Airlines elected to install some 32 IBM RS/6000s in its SAMC department.

Fielding telephone calls occupies most of SAMC operators' time. Each receives an average of 40 calls per hour from technicians in hangars or pilots in the air.

Using an industry standard called Adjunct Switch Application Interface, the RS/6000s link for the first time with and control an AT&T Definity Generic 3R phone switch over an Integrated Services Digital Network Basic Rate Interface.

Incoming calls, based on a two-digit code, can be routed to the proper operators, who see the calls and their origin on their screens. The operators can also redirect calls much more easily than before and review, in real time, phone logs stored in a Sybase RDBMS.

In fact, IBM adjusted to United's open systems demands when it came to integrating the phone system with the RS/6000s. IBM's usual solution for intelligent host-to-switch applications is CallPath, which today supports only OS/2 or Application System/400 servers.

—Ellis Booker

Saving electronic messages

CONTINUED FROM PAGE 1

Freedom of Information Act.

The ruling applies only to the White House, but experts in the field of records management said it also raises the question of how much E-mail should be saved in the private sector.

Most companies simply let users save or delete E-mail at their own whim, but they should have a formal policy for distinguishing between "the garbage and the good stuff," according to Michael F. O'Shea, president of Arenburg Consultants in Toronto.

"Contracts, reports and speeches get printed out, but the [interim] messages that would help you trace the reasoning behind the documents are lost because the electronic mail is purged indiscriminately," O'Shea said.

However, the thought of keeping millions of E-mail messages gives most information systems managers a big headache, in part because the majority are of the ephemeral "let's do lunch" variety.

"As an IS manager, I would not want to invest limited resources on E-mail archives for 3,000 users, for very little return," said Richard M. Kesner, chief information officer at Babson College in Wellesley, Mass. However, he added that the court ruling makes sense for government agencies, where accountability and tracing the decision-making process are more important.

Mark Langemo, professor of information management at the University of North Dakota, said corporate policies governing E-mail and other electronic records should be hammered out by a team that includes the IS manager, the records manager and the legal and finance departments. Then, the rules should be communicated to end users.

However, keeping huge volumes of useless records for too long can also land companies in hot water, Langemo cautioned. Lawyers suing companies in trade secrets and product liability cases are beginning to scour the company's E-mail records in hopes of finding incriminating statements, he said.

Langemo said if a company has a systematic records management program, it can destroy records in the regular course of business without any legal repercussions [CW, March 2].

Like sweeping and dusting

Attorneys for the White House argued that purging the computer tapes is a mere housekeeping chore necessary for a smooth transition to a new administration. They said that any important documents qualifying as "federal records" were printed out on paper, so keeping the electronic backups and minor messages was an unnecessary storage burden.

"The government's position is that you hit the Print button" to create an official record, U.S. Attorney Jason Baron said at a Dec. 21 hearing. Michael E. Tankersley, attorney for the plaintiffs, argued that the electronic versions of documents are not just extra copies, as the government had alleged, but are the ones used in real work. "If anything, the paper copy is the one that is the extra copy," Tankersley said.

The lawsuit to block erasure of the magnetic tapes was filed in 1989 by a group of researchers and historians led by Armstrong. The plaintiffs pointed out that although presidential aide Oliver North had deleted and shredded many embarassing memos related to the Iran-contra scandal, the computer backup tapes provided investigators with a gold mine of information.

In last week's ruling, Judge Richey said some of the information on the tapes meets the definition of a federal record, and the White House policy of erasing all electronic records is arbitrary and capricious. He said the electronic records and logs contain details not on the printout about who received the information and when.

Some of the records will be available under the Freedom of Information Act; the remainder will be available in five or 12 years as presidential records, Richey said.

REFERENTIAL INTEGRITY COMPARISON

SYBASE

200 LINES OF PROPRIETARY CODE

```
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted)
    CREATE TABLE dept
            (deptno int not null,
            dname char(14) not null)

    CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

    CREATE TABLE emp
            (empno int not null,
            mgr int null,
            deptno int null)

    CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

    CREATE TABLE proj
            (projno int not null,
            budget float null,
            deptno int null)

    CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
        key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "Emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

These two programs do exactly the same thing: direct the server to enforce business rules to ensure data integrity. Oracle does it in 12 lines of Industry Standard SQL. Sybase requires 200 lines of their vendor proprietary language, Transact-SQL™. If productivity is important to you, call 1-800-633-1071 Ext. 8186.

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Notebooks

Color expected to make splash in '93

By Michael Fitzgerald

Color notebooks will bring vendors a lot of green in 1993, according to most vendors and analysts, though high prices may keep some users seeing red.

"1993 will be a very strong year for color notebooks," predicted Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass.

Several major notebook vendors contacted suggested that in dollar amount, color notebooks may outsell monochrome notebooks this year.

"I'd say they approached 50% of our revenues in notebooks in '92 and will exceed 50% in '93," said Grant Johnson, director of product marketing at Toshiba America Information Systems, Inc.

"Dollarwise, we expect our PowerExec Color notebooks to come close to being our No. 1 seller [in 1993]," said Marcy Puhnaty, product marketing manager/worldwide portable systems marketing at AST Research, Inc.

Users contacted said they wanted color notebooks.

"We want color for presentation quality when we go to a client," said Chad Pearce, MIS manager at the Philadelphia office of Godwins, Inc., a benefits consulting firm in Chicago. Pearce said he expects to purchase mostly 486SL-based color notebooks this year.

What keeps many users from opening their wallets is the high cost of color notebooks. For instance, the GM Motor Sports Technology Group in Warren, Mich., recently looked at upgrading the screens on its Zenith Data Systems Z-Notes from monochrome to color but decided against the upgrade.

"The screen performance was very good, but the price/utility trade-off was still not satisfactory to us," said Richard Amacher, MIS director at GM Motor Sports. "It is something we'd like to have, but until they get the cost differential down to, say, under $500, we're willing to take the notebook back to a trailer and plug it into a color monitor."

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Everex files for Chapter 11

By Michael Fitzgerald

FREMONT, CALIF.

The PC price war has claimed its biggest victim to date: Everex Systems, Inc. hastily filed for Chapter 11 protection from its creditors last week, just after Steve Hui, its co-founder and chairman, was forced out.

Sources close to the once-thriving $500 million company said Everex was forced into bankruptcy court after one of several major suppliers to which it owes millions of dollars decided to file suit against it.

A company spokesman confirmed the report, saying supplier pressure was among the factors that forced the company to seek protection. It is unclear when the court will rule on the case.

Everex may be able to scale down and survive. The company now employs 875, down from 2,100 in December 1991. The company is also trying to sell pieces of itself, such as its low-end desktop line and its scanner and printer groups, the spokesman confirmed.

Some observers said they think a buyer might take all of Everex. It has some major assets, including a large Air Force contract. "They have a big backlog of orders and some very large government contracts," said Samuel Adicoff, president of Edge Information Systems, Inc., a value-added reseller in San Jose, Calif.

Jack Kenney was named Everex's chief executive officer last week, and co-founder John K. Lee became chairman.

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GSA Contract Number GS00K90AGS5251-PS02.

Users questioning 'fast' Ethernet migration plan

CONTINUED FROM PAGE 1

ing in Santa Clara, Calif.

The HP/AT&T proposal is "no more Ethernet than a baseball bat is a waffle iron," committee member Joe Skorupa said. "I wouldn't even compare it to apples and oranges because at least they are both fruits" (see chart).

Users wary

New, unfamiliar technology does not sit well with users. "If I have several choices, and one is going to cause me to recreate the wheel and rediscover fire, I'm not too crazy about it," said Ray Parcell, computer operations specialist at Port Hueneme, an engineering agent for surface weapons in Yorktown, Va.

Adding to the skepticism is the fact that users already have options among more mature high-speed technologies such as Fiber Distributed Data Interface (FDDI) and Asynchronous Transfer Mode (ATM).

"If I can replace an Ethernet board with a relatively inexpensive one and use the same cabling, [fast Ethernet] has great possibilities. But if it's more like putting in a whole new network, my gut feeling is that FDDI and ATM hold more promise for the future" because they are inherently more efficient networks, said Edwin Riddle, head of the communications and network systems branch at NASA-Langley Research Center in Hampton, Va.

A "whole new network" is the way committee member Paul Nikolich describes the HP/AT&T technology. "Nothing stays the same; the physical layer, the media access . . . it's all new," he said.

How much of a headache moving to fast Ethernet will be depends on which vendor's technology the committee chooses and what type of cabling users already run. This is because any of the upgraded Ethernets will at least require additional pairs of Category 3 or new, higher grade Category 5 unshielded twisted-pair wiring, unless users are already running high-quality shielded twisted-pair, coaxial cable or fiber.

Whether Category 3 or 5 becomes standard, "there are going to be some users who don't already have the proper cabling," said Jack Moses, vice president of start-up Grand Junction Networks, Inc. in Union City, Calif., developer of a fast Ethernet competing with the HP/AT&T proposal.

Familiarity key

But while Parcell runs compatible, shielded wiring, he said he still would not want his Ethernet staff to have to start over in developing LAN expertise. "I'd consider FDDI first because I'd be looking at something that at least has a familiar shape to it," he said.

Brice Clark, HP's strategic planning manager, countered that the advantage of HP/AT&T's proposal over FDDI — like other fast Ethernets — is that it "retains Ethernet's frame definition, which allows users to easily integrate [to traditional Ethernet networks] through [faster] bridging rather than routing."

In addition to new adapter cards and hub modules, HP/AT&T and other 100M bit/sec. Ethernets will require companies to install new software drivers in their computers and bridges to access 10M bit/sec. Ethernet networks, HP and Grand Junction said.

Fast EtherNOT?

Migration to Hewlett-Packard/AT&T's souped-up "Ethernet" from 10Base-T would require a near-forklift upgrade

10Base-T	HP/AT&T	Grand Junction	MicroAccess
Speed: 10M bit/sec.	100M bit/sec.	100M bit/sec.	100M bit/sec.
Access method: CSMA/CD	Transmissions prioritized in order of request	CSMA/CD	CSMA/CD
Cabling: Two pairs Category 3	Four pairs Category 3 or two pairs Category 5	Two pairs Category 5	Six pairs Category 3
Distance: Network diameter: 2,500 meters	200 meters for Category 3 or 400 meters for Category 5	250 meters	100 meters
Topology: Hub-based	Hub-based	Hub-based	Optional hub
Bandwidth rationing: Shared	Isochronous	Shared	Shared
Packet length: Maximum of 1,500 bytes	Maximum of 2,500 bytes	Maximum of 1,500 bytes	4,500 bits

Source: Computerworld

CW Chart: Michael Siggins

Vendors spar over fast Ethernet standard

The 100M bit/sec. Ethernet world is splitting into enemy camps: those lining up behind an HP/AT&T technology proposal and those teaming up behind proposals by start-ups Grand Junction Networks and MicroAccess, Inc.

At issue is Ethernet's carrier-sense multiple access with collision detection (CSMA/CD) media access layer, a defining component of the Ethernet standard. The HP/AT&T contingent is proposing a whole new media access layer.

"We consider CSMA/CD as a back-looking approach because it does not have advanced functionality that people may want in a few years," said Brice Clark, a strategic planning manager at HP. In addition, "we're concerned whether CSMA/CD will even operate well" at 100M bit/sec. speeds, he said.

HP proposes an access method that prioritizes transmissions in order of request. This eliminates the need for collision detection, which eats up network bandwidth and could cause problems at higher speeds, Clark said.

"There is no reason to think that the Ethernet protocol cannot be scaled up with respect to speed," said Jack Moses, vice president of Grand Junction. "What matters is how long it takes to standardize a new network. If you preserve the media access layer, you leave a good piece of the Ethernet standard intact, and standardization can happen quickly."

"Clearly, this is all a marketing ploy," said Paul Nikolich, member of the Institute of Electrical and Electronics Engineers 802.3 committee that is reviewing the proposed standards. Neither camp's proposals are truly Ethernet, but "people are jumping on the Ethernet bandwagon" because users are so familiar with Ethernet, he said.

—Lynda Radosevich

Network-to-mainframe connectivity

Attachmate segues in E-mail mart

By Elisabeth Horwitt

BOSTON

■ Attachmate Corp. will attempt to leverage its leadership in microcomputer and local-area network-to-mainframe connectivity as it plunges into the LAN-based electronic-mail market at Networld '93 this week.

Attachmate's Zip:Office, a LAN-based E-mail and scheduling system that is slated to debut at the show, will offer tight integration with IBM host-based E-mail systems, spokesmen for the Bellevue, Wash., vendor said last week.

Zip:Office allows users to exchange mail with IBM's Professional Office System (Profs) and OfficeVision, as well as any host-based E-mail systems supporting IBM Systems Network Architecture Distributed Services, an Attachmate spokesman said. And unlike competing LAN E-mail products, Zip:Office requires no special mainframe software or E-mail gateways to link up with host E-mail, he added.

Even Lotus Development Corp.'s CC:Mail, which IBM is referencing as a LAN-based E-mail system, requires a gateway from a company such as Soft-Switch, Inc., "or at least additional software on the host site," before it can talk to Profs, said Bob Graves, assistant director of university computing at Florida State University in Tallahassee.

The university chose Zip:Office and its E-mail component, Zip:Mail, to support E-mail exchange among a growing installation of Novell, Inc. NetWare LAN users and a large base of Distributed Office Support System and OfficeVision systems, Graves said.

Zip:Mail also supports 3270 links for users who want to access CICS host applications, Graves said.

Multiple host scheduling

In addition, Zip:Office is the only LAN-based office system that can coordinate scheduling with users on multiple hosts and LAN servers using IBM's Cross System Calendar Support utility, the vendor said.

"Calendaring is one of the big bonuses. We hope to have enterprisewide calendaring across our LANs within six months," Graves said.

Pricing for Zip:Office depends on configuration, according to Attachmate. Available immediately, the product will support a wide range of E-mail standards, including Novell's Message Handling System, Microsoft Corp.'s Microsoft Application Programming Interface and Vendor Independent Messaging, the company said.

Corrections

•Because of a reporting error, a story in the Dec. 28/Jan. 4 issue incorrectly stated that Bethlehem Steel Corp. will own any upgraded equipment that Electronic Data Systems Corp. may buy to run the steel company's operations. In fact, EDS will own any new equipment, but Bethlehem Steel will continue to own its existing data centers.

•Because of incorrect information supplied by the company, an item in the Dec. 21 issue incorrectly reported Reseller Software Spectrum, Inc.'s fiscal 1992 financial revenue. The company earned revenue of $159 million in fiscal 1992.

The Editors were unbiased, objective, impartial, and impressed.

PC MAGAZINE ▶ EDITORS' CHOICE

• Sybase SQL Server for NetWare

For its state-of-the-art feature set and blinding speed, Sybase SQL Server for NetWare wins our Editors' Choice. The product supports on-line back-

up, stored procedures with control logic, server-based referential integrity through triggers, and more.

support is relatively light, SQLBase is a good choice for companies without an existing database.

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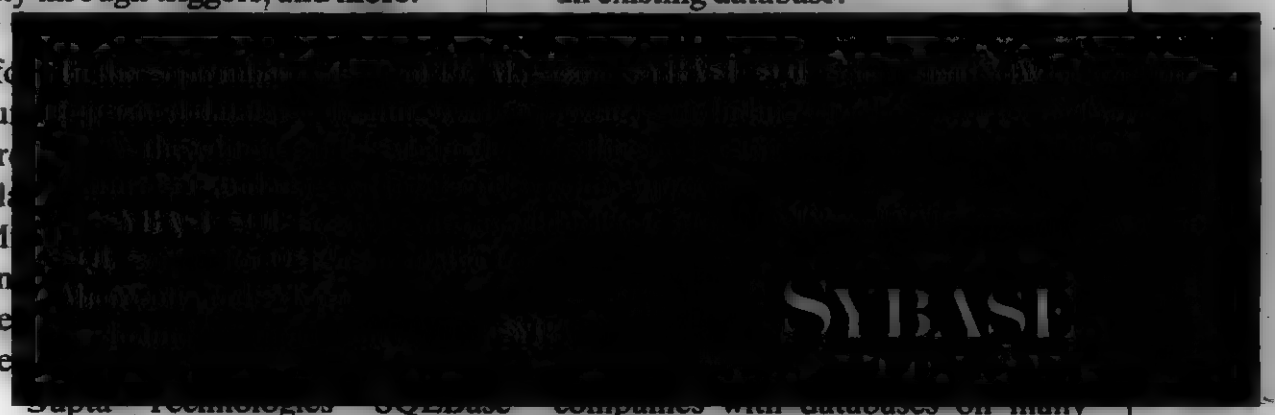

Server NLM earns an honorable mention. Though it lacks some of SQL

platforms, and Novell's NetWare SQL is especially well suited for companies

Client/server strategies

DEC's Pathworks put on track

By Elisabeth Horwitt
BOSTON

Digital Equipment Corp. will showcase beta versions of its Pathworks for Microsoft Corp. Windows NT and Novell, Inc. NetWare products at this week's Networld '93 in an effort to persuade attendees to make VAX and Alpha systems key components of their client/server strategies.

DEC's gradual Pathworks rollout is aimed at enabling a broad range of client systems to share files and access services transparently across DEC, Microsoft, Apple Computer, Inc. and Novell servers, a company spokeswoman said.

The future fate of DEC systems at S. G. Warburg & Co. will depend, to some extent, on the vendor's ability to provide cost-effective, functional integration with NetWare via Pathworks, according to David Wu, a computer analyst at the New York investment firm. "But they'd better hurry up."

A former all-DEC shop that now uses the original Microsoft LAN Manager-based Pathworks, S. G. Warburg is now thinking of phasing out both DEC and Pathworks in favor of a mixture of Sun Microsystems, Inc. and NetWare servers and Microsoft Windows clients, Wu added.

The NetWare version of Pathworks is due out in the second quarter, or about six months late, DEC said. It will finally enable users to use Novell's IPX transport protocol to access file and printer services on both NetWare and VAX OpenVMS servers, a DEC spokeswoman said.

"Users have been begging for this for years," said Joanne Correia, a program manager at International Data Corp. and a former DEC office systems product manager. DEC's current NetWare Coexistence product requires users to load DECnet to access VAX services and load IPX to access NetWare services — overloading the PC's memory in the process, she added.

The level of integration provided by Pathworks for NetWare will ultimately determine whether many users retain their DEC hosts as they move down to local-area networks, Correia and users indicated.

Ed Honko, a VAX systems manager at Dr Pepper Co./The Seven-Up Co., spoke for a number of users when he questioned whether Pathworks will provide enough value-added functionality to justify both its price and memory overhead. The beverage firm now uses Interconnections, Inc. software, which "makes a VAX look like a NetWare file and printer server" without using up much memory, he said.

DEC's enterprisewide electronic-mail system is the kind of value-added service that could help convince users that DEC hosts bring something worthwhile to NetWare LAN installations, Correia said.

However, Pathworks for NetWare clients will not be able to use their native IPX protocols to access DEC host enterprise applications such as E-mail, multihost SQL database access and IBM host gateways, a DEC spokeswoman said. Instead, they must risk PC memory overload by adding either DECnet or Transmission Control Protocol/Internet Protocol.

In addition, NetWare Message Handling System users must still install a special gateway in order to exchange mail with DECmail users, the DEC spokeswoman said.

One issue for Dr Pepper/Seven-Up is DEC's insistence on charging for Pathworks on a per-client basis, "which makes it harder for us to sell additional PCs" to management, Honko said. Interconnections, like Novell, charges according to server functions, "and clients are basically free," he added.

Pathworks 5.0
DEC is expected to preview Pathworks 5.0, which will provide integrated file- and resource-sharing and integrated management functions across a mixed network operating system environment. Users will also gain ease-of-use features such as a Windows-based GUI and "intuitive management of installation and operation" across the different types of Pathworks servers, DEC said.

LAN/Mainframe connectivity

Microsoft widens WFW links

By Michael Vizard
BOSTON

Microsoft Corp. will announce plans at this week's Networld '93 to expand the networking infrastructure for Windows for Workgroups by adding support for Transmission Control Protocol/Internet Protocol (TCP/IP) and MS-Data Link Connection (MS-DLC) transports.

The additional network support is intended to give applications that are compatible with Windows for Workgroups software transport mechanisms that will link those applications with services running on Unix and IBM mainframe systems, respectively.

In addition to TCP/IP and MS-DLC transports, Microsoft last week announced support for Banyan Systems, Inc.'s Vines network operating system.

Growing product line

The addition of these three transports brings the number of network protocols supported by Windows for Workgroups to six. It already supports Novell, Inc.'s NetWare, Microsoft's LAN Manager and Pathworks, a derivative of LAN Manager offered by Digital Equipment Corp.

Windows for Workgroups is a set of application utilities bundled with Windows 3.1 that was designed to make it easier to create network applications. It includes support for electronic mail and group scheduling and is described by Microsoft as a platform for building future applications.

Patrick Fox, Microsoft's product manager for Windows for Workgroups, said additional network protocol support for the product is consistent with the company's plans to provide Windows users with a network protocol-independent environment.

According to Fox, Windows for Workgroups is groupware in that it provides mail and scheduling software, but it is not a groupware application like Lotus Development Corp.'s Notes, which includes a database and forms routing capabilities.

"Microsoft has created a lot of confusion with Windows for Workgroups. It's essentially a peer-to-peer communications platform," said Neil Hill, a senior industry analyst at Forrester Research, Inc. in Cambridge, Mass. "But as far as we can tell, no application is using it yet," he added.

For that reason, Microsoft may be a little premature in terms of extending network protocol support, Hill said.

Fox, however, countered that the company expects users to deploy applications for Windows for Workgroups in a variety of environments, as opposed to limiting Windows for Workgroups to sites with LAN Manager or NetWare servers.

In the short term, though, Hill suggested that Microsoft still has several compatibility issues to address with Windows for Workgroups. "It doesn't run over the same Ethernet drivers as NetWare. It also presents a problem because you are running a peer-to-peer network over a NetWare file server network," he said.

At Microsoft, Fox responded that the company is currently satisfied with its support for NetWare. "We ran Windows for Workgroups successfully at 1,200 beta-test sites, and many of these sites were active NetWare sites," Fox said.

NetWare for SAA sets expanded net support

By Elisabeth Horwitt
SUNNYVALE, CALIF.

■ With the latest release of NetWare for SAA last week, Novell, Inc. has significantly broadened the local-area network-to-mainframe software's already strong appeal for IBM/NetWare shops, according to Cindy Santisario, International Data Corp. senior analyst.

A NetWare Loadable Module announced in 1990, NetWare for SAA garnered more than half of the NetWare-to-host gateway market in 1991 and is still a clear market leader, Santisario said. A major advantage of the product was its ability to support 508 concurrent sessions, enabling users to consolidate stand-alone coaxial connections as well as cluster controllers and gateways that handled far fewer sessions, she added.

With the introduction of NetWare for SAA Version 1.3, Novell is significantly expanding the range of LAN protocols, LAN-to-host connections and micro-to-mainframe applications it supports.

Types of features

Key components of the product include the following:

- Support of LU0, an older IBM protocol used primarily by banks. This capability will support banks that are moving their branch offices to NetWare but want to maintain the old applications, a Novell spokesman said.
- Support for any network board that supports the latest version of Novell's Open Data Link Interface.
- Ability to download configurations automatically to NetWare for SAA servers from a host.
- Support from leading micro-to-mainframe software vendors Attachmate Corp. and Eicon Technology Corp. Synchronous Data Link Control drivers from Eicon and Microdyne Corp. will be bundled with the new release.
- An Open NetView Application Programming Interface, now available for NetWare for SAA, allows programmers to develop applications that enable NetWare-compatible network devices to be managed by NetView without having to deal with either NetView or IBM Systems Network Architecture commands.

Available now, NetWare for SAA Version 1.3 prices start at $1,995 for a server supporting 16 sessions.

Systems Center, Inc. announced Solve:LAN for NetWare, software built on NetWare for SAA that allows the vendor's host-based Net/Master product to manage NetWare LANs, Systems Center said. A Solve:LAN package is priced at $20,000.

New Vines, ENS for NetWare ship

By Michele Dostert
BOSTON

Banyan Systems, Inc. hopes to upstage the competition at the Networld '92 show this week with a spine-tingling stunt. The Westboro, Mass., network software firm will announce that it has shipped two major products on time and with all promised features — a feat almost unheard of these days in the vaporware-prone local-area network marketplace.

Banyan's on-time shipment of both Vines 5.50 and the first release of its Enterprise Network Services (ENS) for Novell, Inc.'s NetWare will surely be noticed by users who are still waiting for Novell's overdue NetWare 4.0 and Microsoft Corp.'s long-promised 32-bit version of LAN Manager.

"Banyan surprised me, and probably everybody else, by getting these two products out the door so quickly," said John Krick, a senior analyst at Datapro Information Services Group, a Delran, N.J.-based market research firm.

Vines versions combined

Vines 5.50 is the "merge release" of Vines 4.11 and Vines 5.0 that Vines users have been demanding ever since the release of the latter in late 1991. The new release combines the broad third-party product support found in Vines 4.11 with the improved file system, file naming and full Apple Computer, Inc. Macintosh support found in Vines 5.0.

Vines 5.50 is more than just a merge release, however. It also includes new support for Integrated Services Digital Network and T1 high-speed wide-area network links as well as a new generation of Banyan's acclaimed StreetTalk directory services.

StreetTalk III has been modified to allow users to attach an unlimited number of attributes to objects stored in the StreetTalk directory. "The new attributes will let you look up, for example, an engineer in your Dallas office who speaks German or a laser printer on the third floor that has a certain font loaded," said William Ifrah, product manager for StreetTalk.

The new version also includes application programming interfaces that third-party vendors can use to integrate their own directory structures with StreetTalk, as well as new management utilities that make it easier to add and delete users across the network.

Beta-test users of Vines 5.50 were enthusiastic. Jeff Kozman, a computer coordinator at Ensearch Exploration, a Dallas-based oil and gas exploration company, said, "I'm definitely going to migrate to it. It has great Windows support; you can now log in and out of the network without exiting Windows." He also expressed interest in the T1 support for accessing remote sites.

ENS for NetWare will provide enterprisewide directory (StreetTalk), messaging, network management, security and administration services currently unavailable in NetWare environments.

Novell has promised to deliver these same services in NetWare 4.0, which was promised for year-end 1992 and is now expected by the end of the quarter. Many large NetWare sites will wait for Novell rather than add another vendor to their network. But some NetWare sites that are either unwilling to wait or unwilling to upgrade are looking at ENS.

"Two years ago we almost switched everybody to Banyan just so we could get StreetTalk. That's how bad we need distributed directory," said Patrick Carney, information systems director at ASEA, Brown, Boveri's North Brunswick, N.J., power engineering division. "But I spent the last year getting my NetWare 3.11 LANs up to 99.8% reliability, and we don't want to mess that up by upgrading to NetWare 4.0."

Carney said he is eager to look at ENS because a distributed directory on NetWare v3.11 would be the best of both worlds for him.

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News Shorts

WordPerfect gains Grammatik

WordPerfect Corp. has purchased a controlling interest in **Reference Software International**, a San Francisco-based developer of software writing tools and electronic reference works. Through the acquisition, WordPerfect acquires Grammatik, a grammar-checking software program currently bundled with Lotus Development Corp.'s Ami Pro, Microsoft Corp.'s Word for Windows and WordPerfect 5.2 for Windows, as well as proprietary computer linguistics expertise.

CA upgrades accounting software

Computer Associates International, Inc. has released CA-BPI Accounting II, an accounting package for small to medium-size businesses. In addition, in an attempt to reduce piracy, CA is allowing unregistered BPI users to upgrade to the new package for $200. Registered BPI ValuePak clients with SupportPlus can upgrade to the new module for $99. ValuePak clients without SupportPlus pay $149, and SupportPlus without ValuePak customers pay $119. All other registered clients pay $169.

Workers hurt in DEC accident

Eighteen construction workers at the building site for **Digital Equipment Corp.**'s new semiconductor plant were accidentally injured last week when a floor collapsed while concrete was being poured. Most of the injuries were minor, and none were life-threatening, according to a DEC spokeswoman. The Hudson, Mass., building is slated to become a major manufacturing site for DEC's Alpha AXP reduced instruction set computing chips when the facility becomes operational in 1996.

Network manager on ice

MTI Technology, Inc. in Anaheim, Calif., is freezing development of its Lexcel division's Lance+, a Simple Network Management Protocol-based network management software product. MTI said Lance+ will be frozen at Version 3.1.2, scheduled to ship this month, while the company refocuses on the network-attached system storage market.

Interactive reborn

Interactive Systems Corp.'s system software and networking business last week returned to its original owners when Ronald D. Lachman, developer of the Unix networking products, bought the line from **SHL Systemhouse, Inc.** SHL had acquired the Interactive products from **Eastman Kodak Co.** last month. The software includes the code base for Sun Microsystems, Inc.'s Network File System for Unix System V.

SHORT TAKES **Intel Corp.** promoted Craig R. Barrett from executive vice president to chief operating officer in a move that appeared to solidify Barrett, 53, as the heir apparent to Andrew S. Grove, Intel's president and chief executive officer.... **AT&T** signed an agreement to provide the National Science Foundation with directory and database services for the NSFnet data network.... **Computer Sciences Corp.** and partner **Coral Systems, Inc.** will provide Coral's FraudBuster antifraud software to **LM Ericsson**, a leading maker of cellular switching systems.... **Mead Data Central, Inc.**, the Dayton, Ohio, provider of the Lexis and Nexis research services, last week acquired **Folio Corp.**, a Provo, Utah-based information management local-area network and PC software firm.... **Network General Corp.** and **Hewlett-Packard Co.** announced a program for certifying network managers to perform network protocol analysis and troubleshooting with either Network General's Sniffer or HP's Network Advisor.

Net kings link switches, servers

CONTINUED FROM PAGE 1

stored in computer networks. Other PBX links are slated to follow.

The firms indicated that the move is only the beginning of a series of ongoing LAN-to-WAN integration efforts between the two companies. For example, "both companies are anxious to get on with network management and directory services integration," said Barry Karafin, vice president of marketing and strategic planning at AT&T. "There's a big payoff for users there."

"Synchronizing directories on PBXs and LANs would be useful because users are currently maintaining two sets of resources," said Jodi Mardesich, an analyst at The Burton Group in Salt Lake City. "But today, the LAN and telecommunications worlds are (technically and organizationally) very far apart. For example, who would end up buying and maintaining networks: the LAN or the phone people?"

LAN and WAN unite

- NetWare server to function as a data/voice integration platform for Novell and AT&T's collective 40 million network nodes.
- Initial Telephony Services NLM will include AT&T Passageway application, which allows users to speed-dial and store notes about phone calls. Upcoming applications are slated to integrate E-mail, fax and voice mail.
- APIs will be available in Novell's software developer's kit and from AT&T under as-yet undetermined conditions to allow third parties to develop voice-enabled NetWare applications. They will be revealed at Novell's developer's conference in March.

No big deal?

For the near term, though, most users interviewed did not appear any more excited about putting a voice module on their LAN servers than they have historically been about linking PBXs with host computers via such products as IBM's CallPath.

"I haven't heard one user say they want telephony services on their Novell servers," said Gordon Craig, vice president of the Austin NetWare Users Group in Austin, Texas.

"I'm absolutely not interested in combining voice and data networks," asserted Bob Michna, vice president of enterprise utilities at Aetna Life & Casualty Co. in Hartford, Conn., who oversees both LANs and telecommunications at the insurer. The reason, he said, is that voice users are accustomed to a high level of reliability that cannot yet be matched in the LAN world.

Mark Brooks, president of NetWare Users International, however, noted that host-based computer-integrated telephony options have traditionally been very expensive and that the pending Telephony Services NLM could represent an opportunity for users to economically downsize their voice applications as they have their data. The vendors, however, offered no ballpark pricing figures.

"I can see a potential battle down the road, with LANs trying to become your voice mechanism and PBXs trying to become your data network," said Frank J. Rezac, project manager in the office of telecommunications control for the city of New York. "With the vendors getting together, it's like the two enemies are signing the treaty before the war."

Remote NetWare access upped

As AT&T and Novell prepare to forge a brave new world in voice and data communications, Novell is updating its communications server to improve remote communications between NetWare-based LANs and the asynchronous world.

Novell has announced NetWare Access Services v1.3, a remote access program that allows up to 16 remote users to dial into a NetWare network and run multiple DOS and Microsoft Corp. Windows applications concurrently, sending only screen information, keystrokes and mouse signals over the phone line.

The release adds Windows applications support and enhanced memory management to allow multiple applications to run efficiently. NetWare Access Services also allows customers to consolidate modem access onto one NetWare Asynchronous Communications Services v3.0 server. — *Michele Doucett*

Remote CC:Mail reaches out to PowerBook users

By Lynda Radosevich
CAMBRIDGE, MASS.

■ Lotus Development Corp. announced last week that it is shipping the long-awaited remote version of its CC:Mail for Macintosh electronic-mail program. The DOS version has been available for eight years.

The move allows corporate users of Apple Computer, Inc.'s portable PowerBook computer to remotely exchange mail with their office's CC:Mail systems. The product will be on display at Networld '93 in Boston this week.

"We wanted a secure interface that allowed our traveling executives to easily communicate with the office from around the globe," said Hans Mueller, a project manager at US West Advanced Technologies in Boulder, Colo.

Initially, the company tried supplying its executives with software that let them remotely access the desktop computers in their offices. They had to log on to the office network, then open up the E-mail application before exchanging mail.

Direct access

With CC:Mail Remote for Macintosh, Mueller said, the executives can exchange messages directly through the mail server, reducing complexity and the amount of time they spend on long-distance lines.

CC:Mail Remote for Macintosh, which lists for $295, lets users create messages off-line and store them in an "out box" for later transmission. It minimizes connection time by using a batch transmission mode to retrieve messages while sending them, Lotus said. An automatic directory exchange feature lets remote users synchronize their directory with the directory on the office network, and message delivery can be scheduled to occur at a preselected time.

Jeff Francis, associate director of information services at Harvard Medical School in Boston, evaluated CC:Mail Remote for Macintosh for the school's faculty and researchers, who are located in hospitals throughout the city. More than 1,000 PowerBook and remote Macintosh users had no access to the school's CC:Mail-based E-mail system except by using CC:Mail Remote for DOS and a PC emulation program that did not work well, he said.

The Macintosh product "fills a hole in our E-mail strategy," Francis said.

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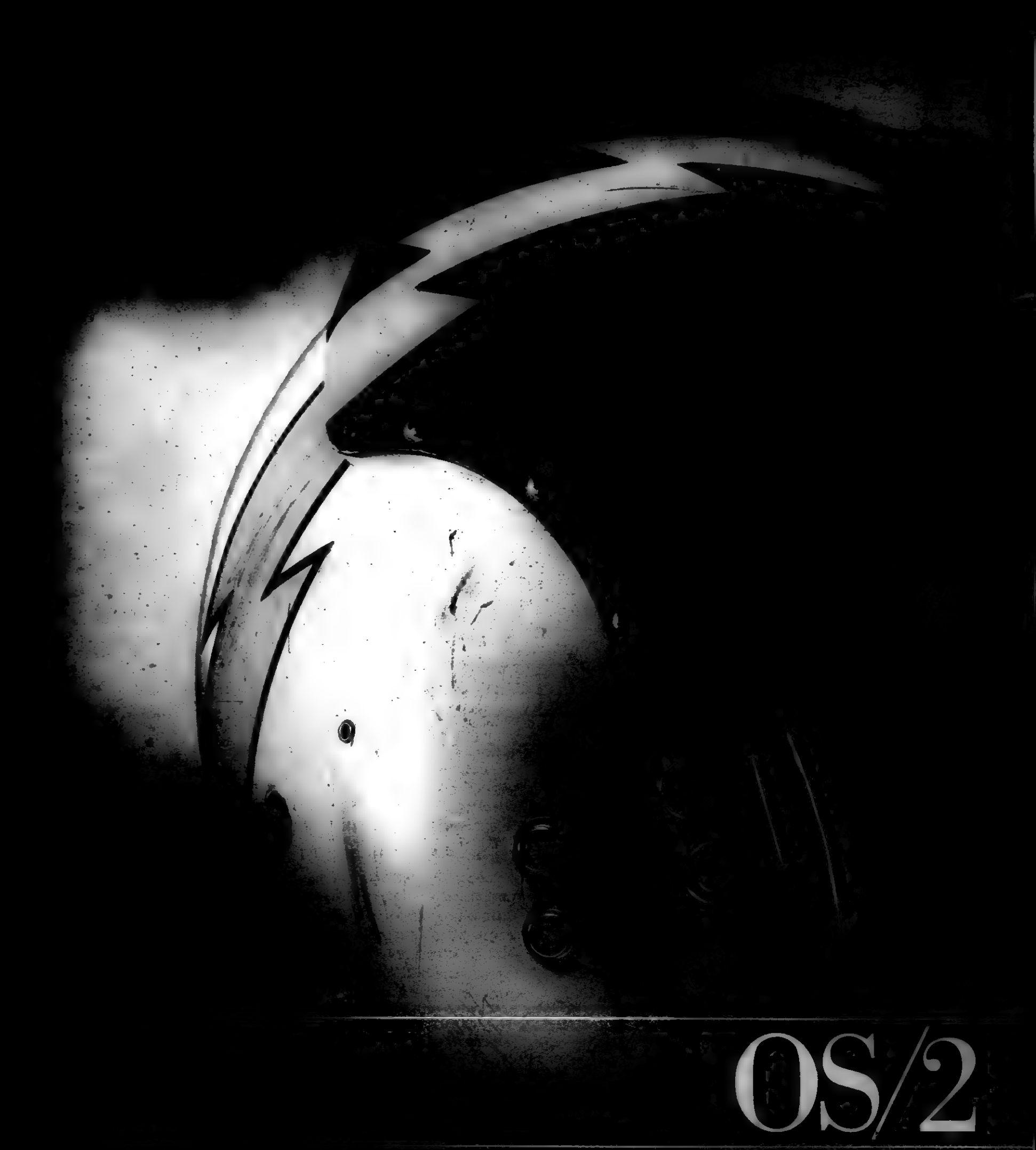
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IBM

Feds overhaul national weather system

By Gary H. Anthes
WASHINGTON, D.C.

PRC, Inc. has won an 11-year, $227 million contract to build the computer and communications system that will form the heart of the nation's new weather forecasting service.

McLean, Va.-based PRC, a subsidiary of Black & Decker Corp., will deliver the Advanced Weather Interactive Processing System (AWIPS), which is one of four cornerstones of the National Weather Service's 15-year, $4 billion modernization effort (see story below).

AWIPS combines and graphically displays weather observations from several sources and is the chief automated tool to be used by meteorologists at local forecast offices. It is key to the weather service's effort to reduce labor costs by automating much of what forecasters now do manually.

Joe Friday, assistant administrator at the National Weather Service, said the cost of the system's overhaul will be recouped many times over in crop- and property-loss savings from better forecasts. He said already-installed super-accurate Doppler radars have increased the accuracy of severe storm forecasts from 60% to more than 85%, and a prototype of AWIPS running in Colorado has reduced by two-thirds the number of false alarms for severe storms.

AWIPS will replace a 1970s-era system that required weather forecasters to scurry around local forecast offices — from radar screen to teletype to clipboard — to gather the data required to prepare a forecast. With AWIPS, from two to 10 times as much data will be integrated automatically for display and analysis on a single, high-end Hewlett-Packard Co. workstation.

Other major input to AWIPS will come from new weather satellites, automated surface weather sensors and computer-generated forecast model information from the weather service's central computers near Washington, D.C.

Aided by software from HP and Atmospheric and Environmental Research, Inc. in Cambridge, Mass., meteorologists will be able to overlay and animate images and graphics in order to get a better understanding, in near-real-time, of what is going on in their forecast areas and to perform the computations needed to generate a forecast.

Under the new system, forecasters will be able to try different forecast models on recent weather data, see which model fits best and then use that model to prepare the next forecast, said Harold G. Wilson, a PRC vice president. "This kind of capability has never been put in the field before," he added.

Not in vane

Components of the $4 billion forecasting service include:

- **Nexrad:** Next Generation Weather Radar is replacing 1950s-era radar with sophisticated Doppler units, which measure precipitation and detect the rotational patterns of violent storms.
- **ASOS:** Automated Surface Observation Systems is automating the manual collection of surface weather data though a nationwide network of smart sensors.
- **GOES Next:** The next generation of Geostationary Operational Environmental Satellites will offer several times greater resolution than existing satellites for precise tracking of severe weather.
- **AWIPS:** The nerve center of the forecasting offices, the Advanced Weather Interactive Processing System integrates and displays data from Nexrad, ASOS and GOES Next.

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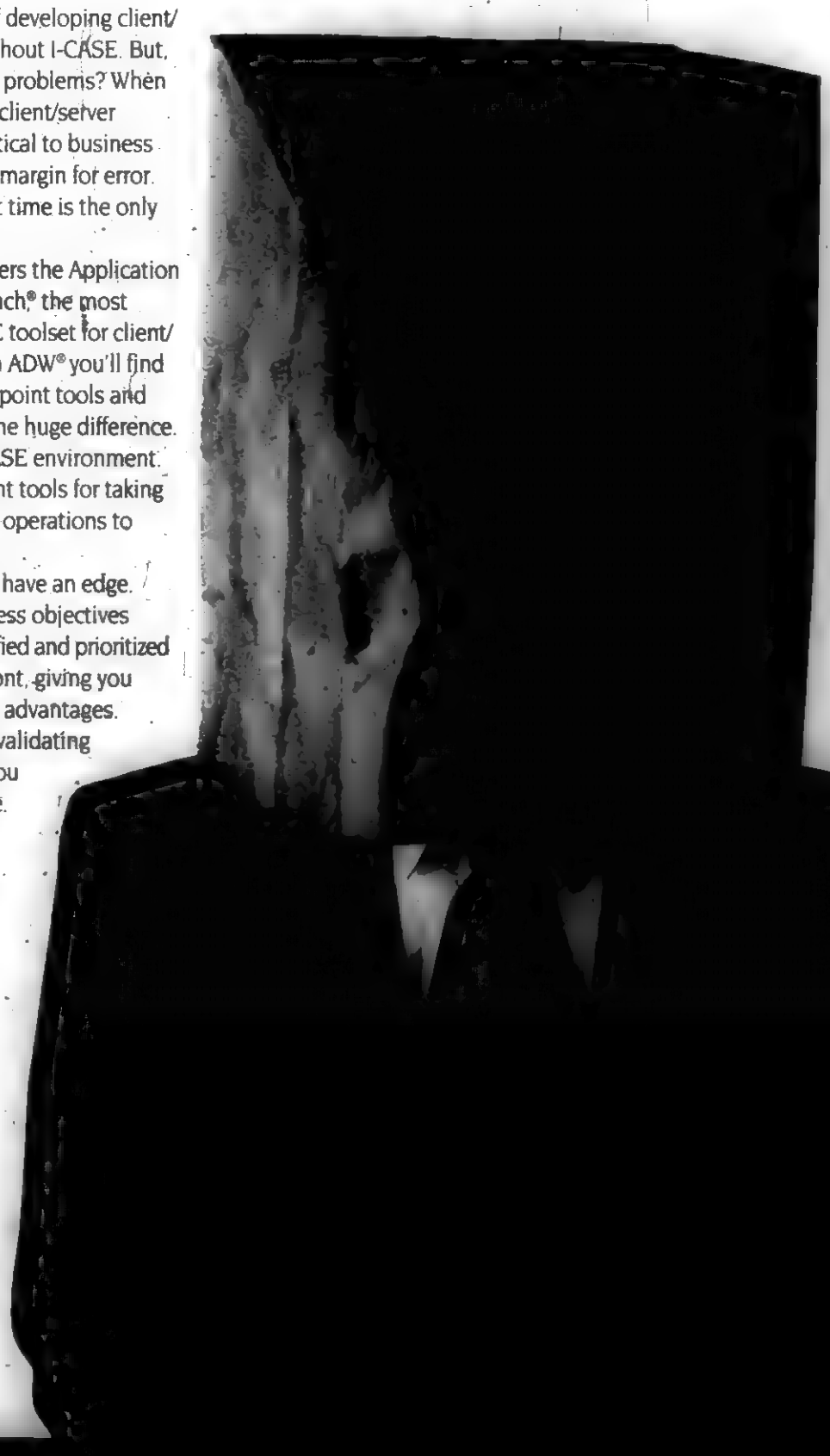

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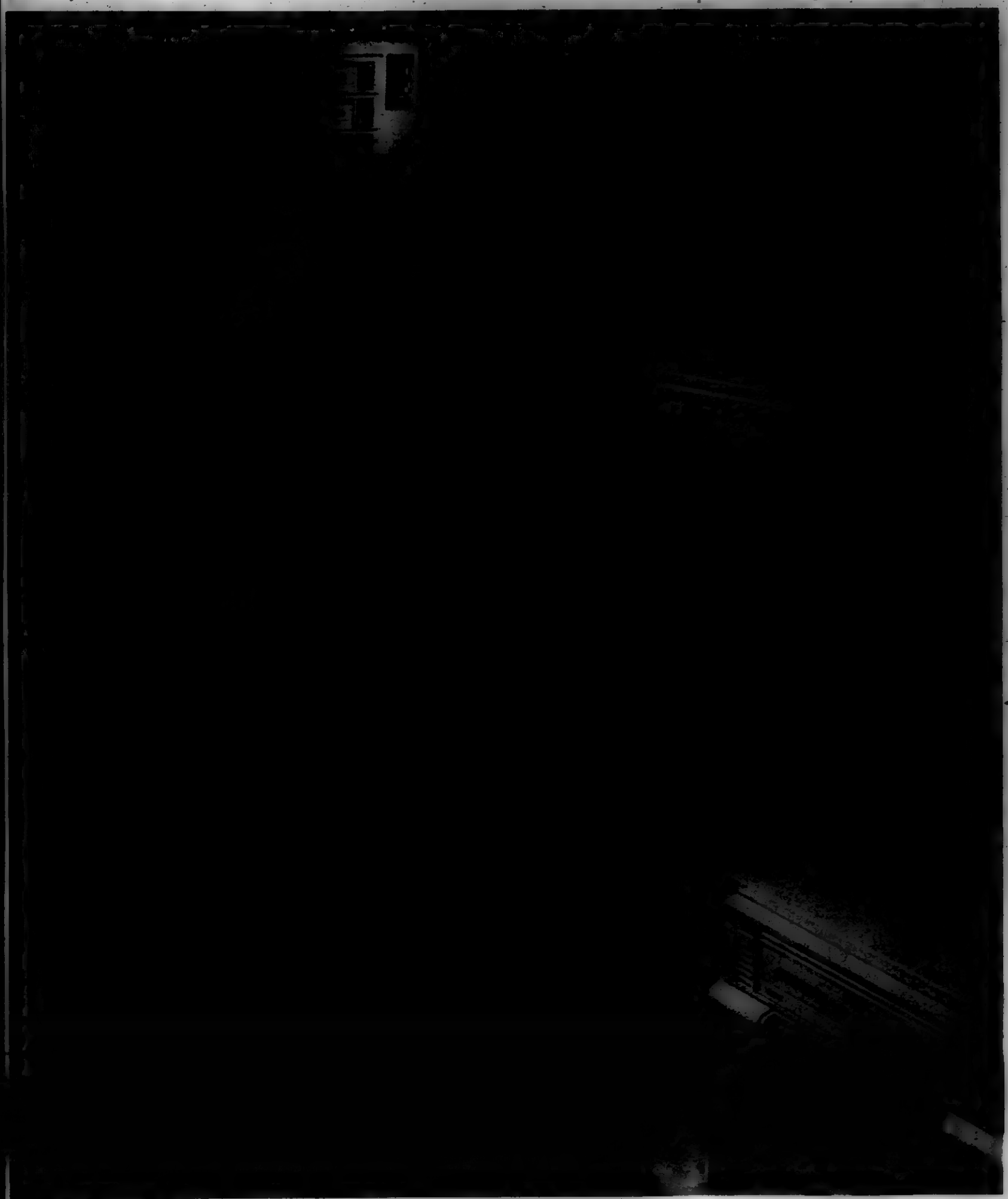

IBM AND AS/400 ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES CORPORATION

Father of Basic leaves legacy

By Kim S. Nash
HANOVER, N.H.

A memorial service was held last week for John Kemeny, co-creator of the Basic computer language, who died unexpectedly of heart failure.

Kemeny, 66, worked with fellow Dartmouth College professor Thomas Kurtz to author Basic, which is among the most widely used computer languages worldwide, in 1964. Kemeny also developed the Dartmouth Time-Sharing System to split CPU time between educational and research tasks at Dartmouth.

"John Kemeny pushed the fields of mathematics and computing to new heights, just as he raised the stature of Dartmouth during... the 1970s," said Dartmouth President James Freedman.

Survived by his wife and two children, Kemeny was instrumental in bringing female students into the formerly all-male college in 1972, a college spokesman said. In 1979, Jimmy Carter named Kemeny to head a 12-member presidential commission to investigate the Three Mile Island nuclear power plant accident. The Kemeny Commission's report was highly critical of the nuclear power industry and federal regulators.

John Kemeny's Basic *is one of the most popular computer languages in the world*

After a childhood spent in Budapest, Kemeny and his family moved to New York in 1940. With a Ph.D. in math from Princeton University in his pocket, the 23-year-old Kemeny taught at his alma mater before taking a professorship at Dartmouth four years later.

He later became mathematics chairman and was college president from 1970 to 1981, when he returned to teaching. He taught until 1990 and continued an active involvement with the college until his death.

He received more than 70 honorary degrees and awards, including the Institute of Electrical and Electronic Engineers Computer Pioneer Medal in 1986 and the IBM Louis Robinson Award in 1990.

Kemeny wrote *A Philosopher Looks at Science* and *Man and the Computer: A New Symbiosis*. He co-authored 13 books, including *Basic Programming*.

A scholarship fund has been established in his name at Dartmouth.

Basically

Some developers have decried Basic's relatively simple English-like syntax as inflexible and inefficient. Others have criticized it for promoting bad code. Despite the outcry, developers — particularly of microcomputer software — have embraced it in droves. More than 5 million developers program PCs in Basic, according to market estimates. That does not include programmers of Digital Equipment Corp., IBM and Hewlett-Packard Co. equipment, which still offer versions of Basic for their minicomputer and instrument-control systems.

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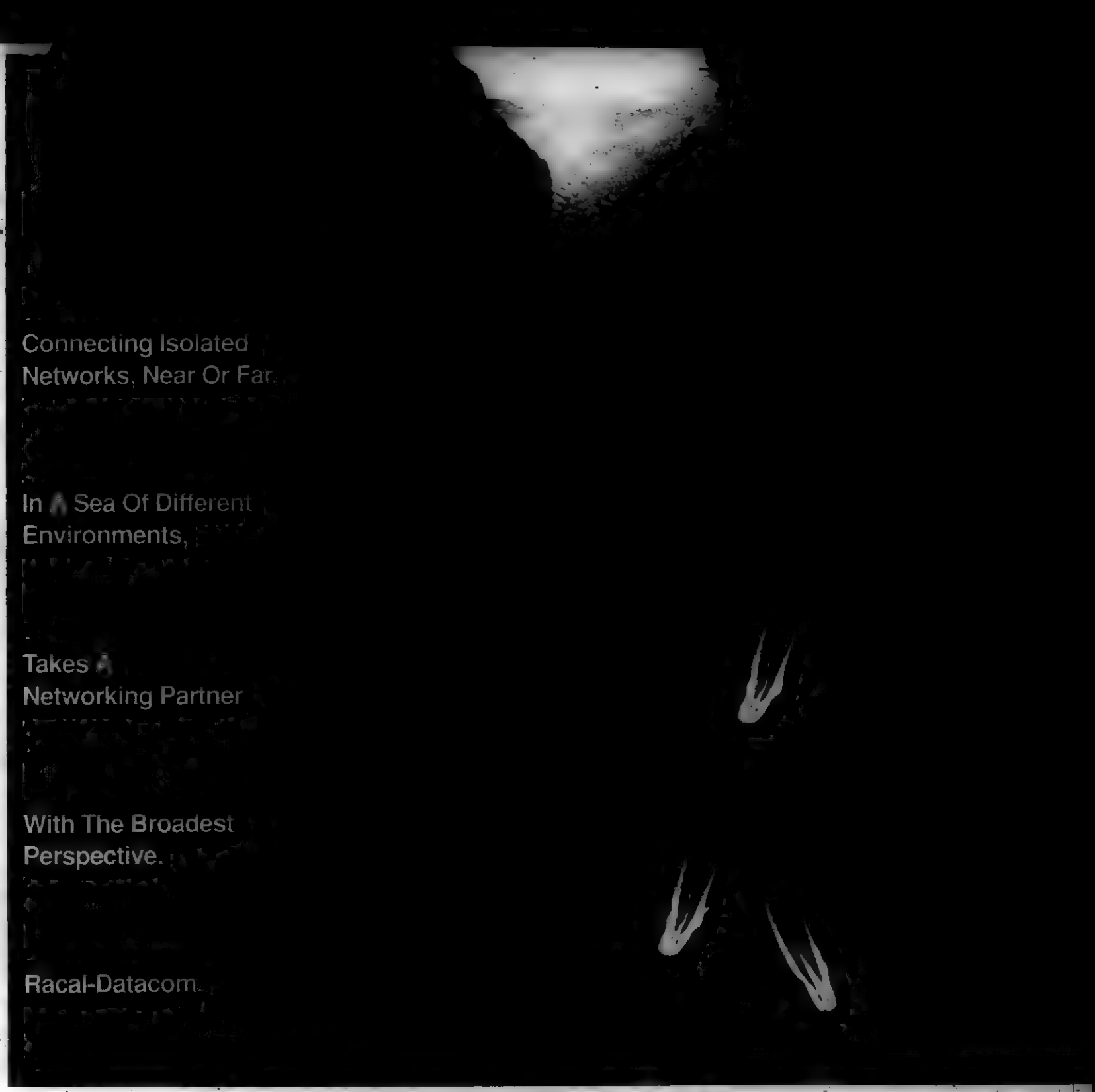
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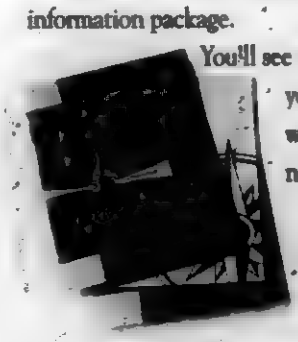

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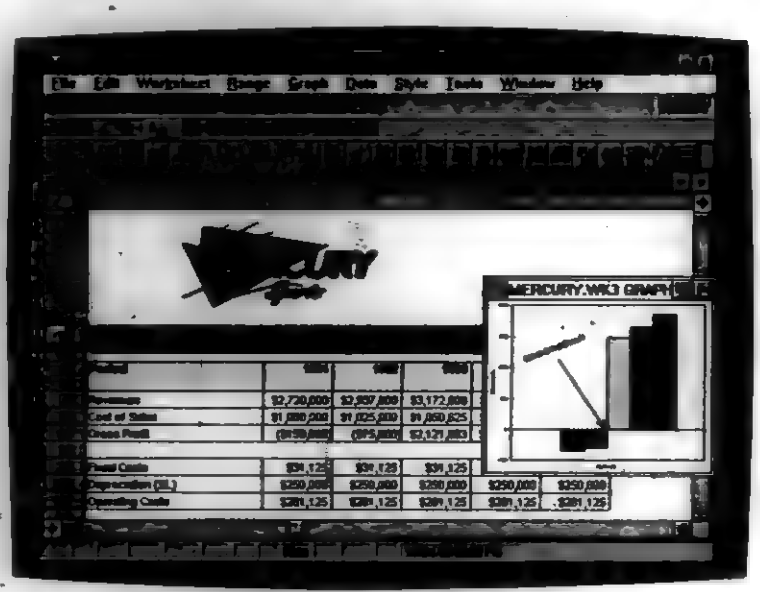

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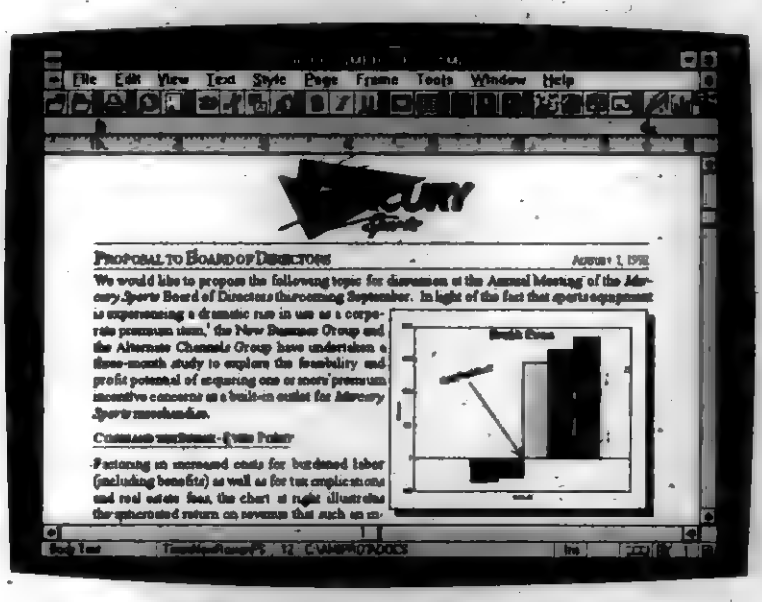

Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

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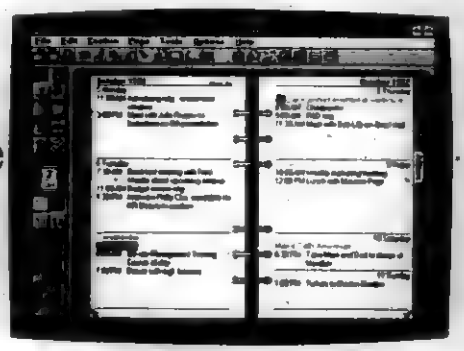

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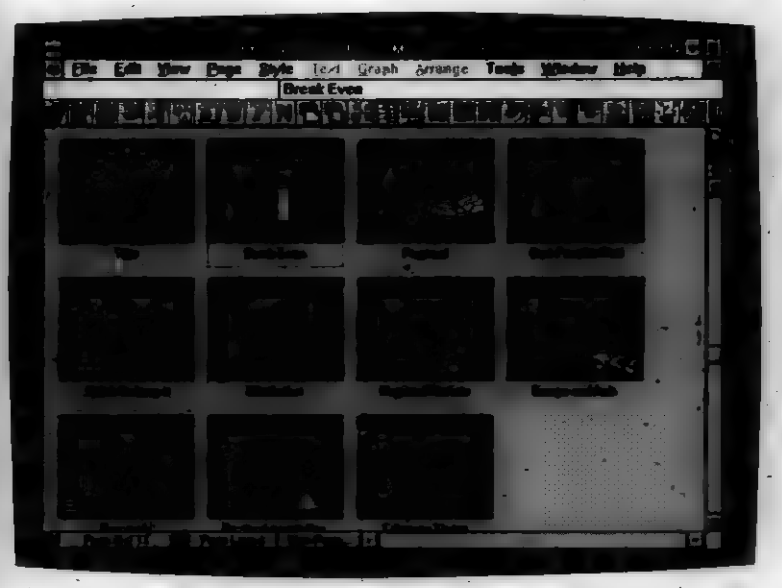

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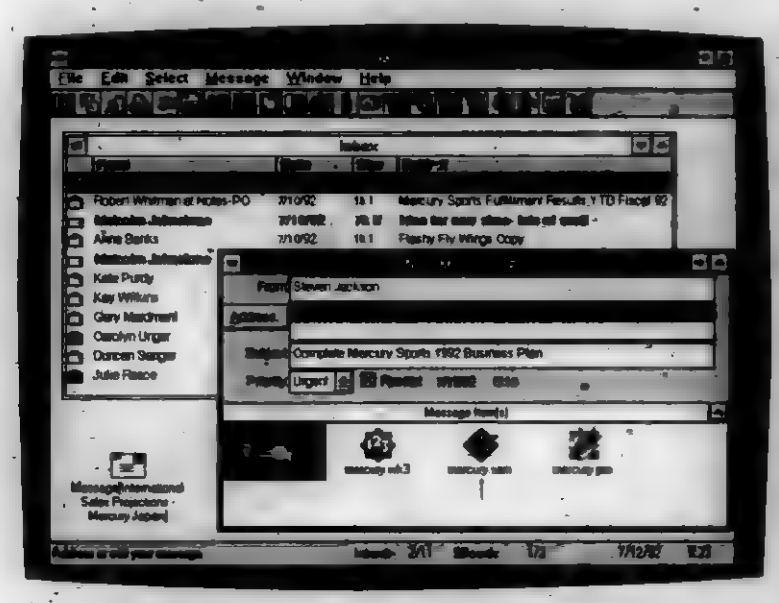

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Looking forward to Office 2001

Multimedia, collaborative technologies will find their niche in the office of the future

Ringing in the new year, four professionals well-acquainted with information technology predict how working life will be different in the year 2001.

WORKERS WILL NEED ELECtronic "filters" to cope with the volumes of electronic mail, voice mail and extensive databases that will be at their disposal 10 years hence, said Paul Saffo.

Paul Saffo *is a senior fellow at the Institute for the Future*

"We will have very powerful new information tools, and they will have to become tools of convenience and empowerment, rather than electronic dog leashes," he said during a recent phone interview from India. Travel will cause around-the-clock interruptions if users are not careful, undercutting productivity gains.

"The line between the business day and home life will continue to blur," he said, speaking at 7:30 a.m. Bombay time.

The key to handling time-zone differences will be new office etiquette. "We're going to develop new social rules," Saffo said. "The single most critical skill for office workers in the next decade will be context-switching. We will find polite ways to switch context quickly and to respond to interrupt-driven pressures." That might change expectations for how quickly a phone call is returned or when E-mail gets an immediate answer.

At the same time, electronic data interchange between corporations will blur the lines between global enterprises, Saffo said.

"We will end up with organizational structures that are very fluid," Saffo predicted, "because companies will be making and breaking alliances based on constantly changing market conditions." —*Jean S. Bozman*

BY THE END OF THE CENTURY, ubiquitous PCs, workstations and computer networks will be marshaled to automate group tasks using sophisticated workflow software, said Ann Palermo.

Ann Palermo *is the director of workgroup and messaging research at International Data Corp.*

Already, she noted, the first application on this local-area network infrastructure — electronic mail — is being enhanced with calendaring and scheduling systems. "The most significant difference we'll see in the way people work 10 years from now will be the greater use of collaborative technologies," Palermo said.

Different types of information will also come together, which will make multimedia and compound documents at the desktop commonplace. Likewise, she said, the distinction between the computer system and the phone system in an office will fade away.

Naturally, integrating these ways of communicating will require building a network infrastructure, which Palermo said will be a major challenge.

Automation of routine business processes will also serve to sweep a clear path for users, many of whom complain about the glut of information and E-mail on their desktops.

For this reason, Palermo was optimistic about office productivity. "We're going to see a huge jump in productivity by 2001," she predicted. "We're getting smart and starting to automate business processes instead of just tasks." —*Ellis Booker*

MULTIMEDIA WILL PROVIDE AN enormously rich and flexible environment in which corporations and their customers interact, said Colin Crook.

Colin Crook *is chairman of the corporate technology committee at Citibank NA*

"It'll be a very rich environment that lets us construct solutions by getting a group of like-minded people together quickly. At the moment, we compromise to solve problems," he said.

Crook is realistic, however, about how quickly this platform will be adopted. "We'll go through a fairly torturous learning curve, I'm afraid," he said.

What will companies use to judge the efficacy of these environments? "We'll try and get a series of technological processes that give [work teams] the minimum things necessary to work as a team," he said. "I think this will be a fairly harsh filter."

Crook also said he anticipates some built-in systems to monitor the success of different forms of working and virtual teams. "The things that work are the ones you go back to; the ones that don't, you stay away from. It will be sort of Darwinian. Likewise, the teams that work well will stay together in this dynamic organizational structure."

Flexibility is the key and will be the hallmark of business by 2001, according to Crook. Productivity in the service sector did not increase despite substantial investments in technology during the past 15 years, he said, because "we poured cement over the service industry with a lot of [data processing]." —*Ellis Booker*

COMPUTERS WILL BLEND WITH the furniture in the office of the year 2001 as they evolve into consumer-electronic devices that can be tossed around like calculators or attached to the wall.

That is the vision of Mark Weiser, who advocates ubiquitous computing. "Using a computer should be like a walk in the woods," said Weiser, who works with psychologists and anthropologists at Xerox Corp.'s Palo Alto Research Center (PARC) to fashion a work style for the year 2001.

Mark Weiser *directs the computer science lab at Xerox's PARC*

At first glance, a walk in the woods may appear to be an uneventful activity, but the woods contain layers and layers of information if one pauses to inspect things more closely, he said.

In much the same way, computers will not demand a user's attention all day by the year 2001, Weiser said. Rather, computer use will become more casual, as desktop PCs give way to mobile computers. New input devices will replace keyboards, encouraging people to walk around with them. "The whole idea of having a box on your desk is completely wrong," Weiser said. "We've got to learn how to get the computer out of the way."

Weiser has advocated — and tested — computer "badges" at PARC that signal the wearer's location to others. This allows people on the East Coast to "sense" if a phone call would disturb a West Coast worker. Electronic notes will be attached to pictures or coffee cups.

While he can imagine drawbacks to this and other mobile technologies, Weiser predicted that productivity will increase once users no longer feel tethered to deskbound PCs. "People are more productive when they feel that they're in a community," Weiser said. —*Jean S. Bozman*

The office space circa 2001

- High-speed local- and wide-area networks will connect teams of workers whose actions are coordinated by work-flow software.
- Multimedia will consolidate text, sound, image and video on the desktop; visualization systems make massive databases comprehensible.
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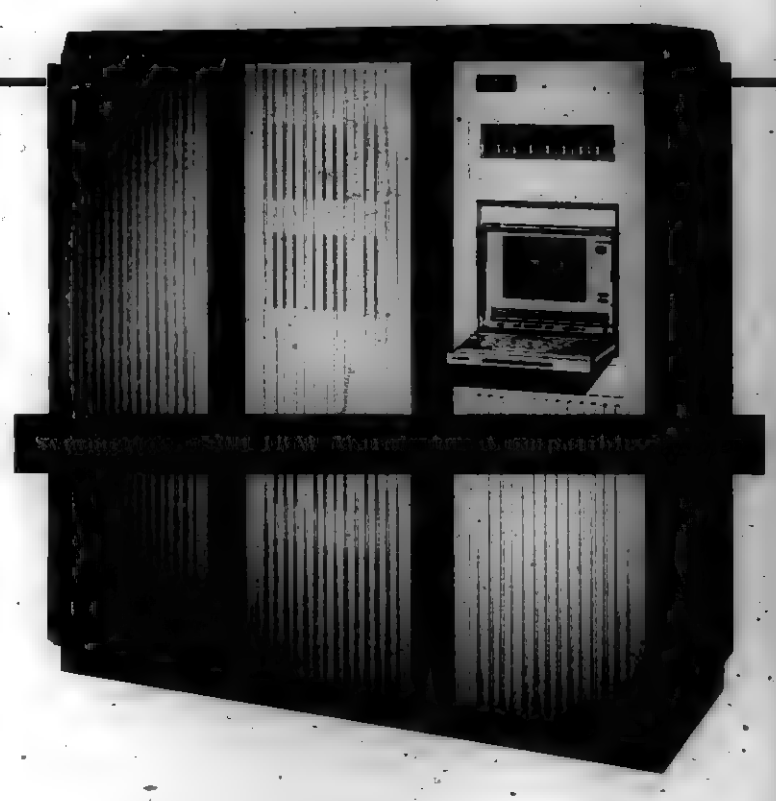

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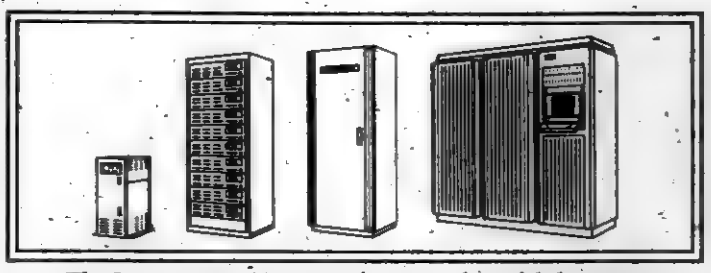

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To: Bill Clinton

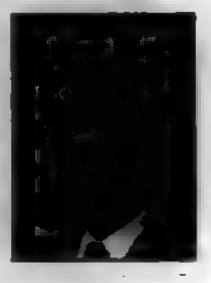
From: Bill Laberis

Re: National high-tech policy

Dear Bill,

You'll soon be terribly busy setting our nation's course on a variety of vital matters, so I thought I'd quickly help you resolve the nagging issue of determining the country's high-tech industrial policy.

Simply put, there can be no one viable policy action or statement. Rather, you should embark on a series of consistent actions to ensure that our readers — corporate consumers of high-tech products — will have a steady stream of innovative, productivity-enhancing tools that will keep their companies competitive in the global market. A lack of consistency in past administrations has given the country the look and feel of having no high-tech policy.



For example, a few years ago one of our Asian competitors and an alleged ally sold sophisticated weapons technology to the Soviets. We should have retaliated with sanctions but we didn't, mainly because the same company was a key supplier of chips to U.S. computer companies. When you want it both ways, you end up without any recognizable policy.

So here's what to do and what not to do.

Don't mess with the current means of access to capital by emerging high-tech companies. The U.S. has a well-defined venture capital environment that is fully capable of sorting out the winners and losers. They don't need public funds, or more specifically, the politically tainted means by which public funds are dispersed.

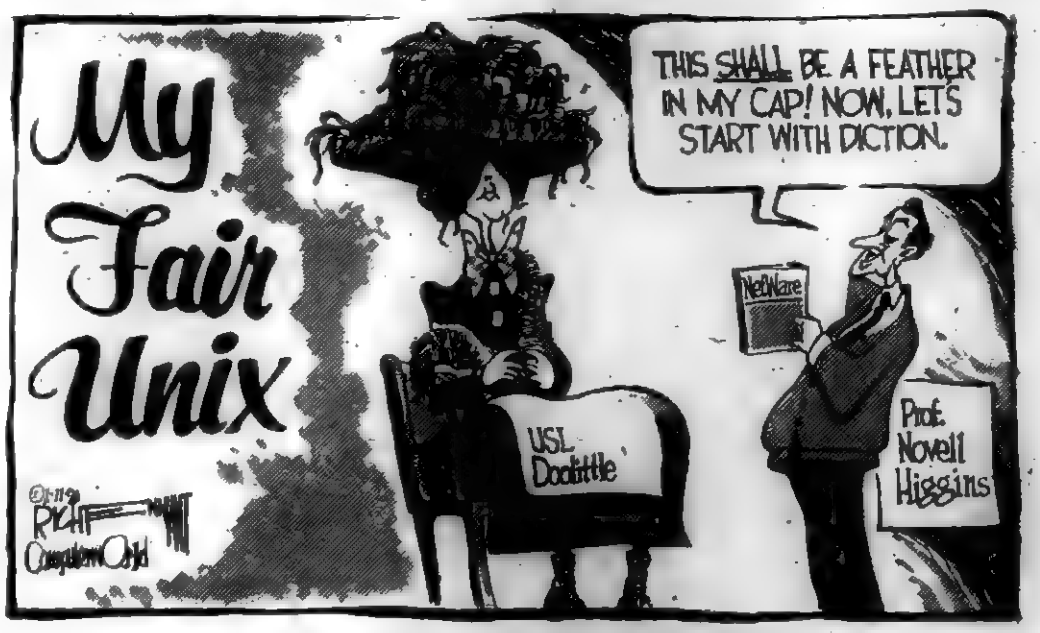
Some of our competitors have willfully dumped high-tech products, such as chips, to force U.S. companies out of the market (successfully in some cases, I might add). Dumping should be considered a hostile assault on our economic bulwarks and therefore dealt with in a similarly hostile manner. Given a free market, chip companies such as Intel and Motorola have shown that U.S. firms can out-compete the world, but not if others are allowed to play dirty.

Rigorously enforce our patent and copyright system in the international community. As with the matter of dumping, retaliation is an economic matter. We are, after all, still the biggest discrete marketplace in the world for the goods of other nations. No one wants to be shut out of this market, not even for a little while.

And, by far the most important aspect of a high-tech policy, do something definitive to ensure that U.S. companies will have an educated and skilled work force in the future. You can start right in your new neighborhood in Washington, D.C., where you've deemed the public schools so inadequate that you won't even send your daughter to them.

Bill Laberis

Bill Laberis, *Editor in chief*



Risky business

Ask Forrester Research, Inc.'s Janet Hyland "At triple the price of SNA, are large LANs worth it?" [CW, Dec. 7] if she would feel safer taking a Trans-Pacific flight in a single-engine or multi-engine aircraft. Ask her if she's had a flat tire and found that she had no spare.

One of the perspectives shared by more experienced information systems professionals is that of seeing the single superserver (then called a mainframe) crash badly, bringing the entire organization to a standstill.

It was this kind of occurrence that led to distributed computing and created the environment for the proliferation of minis and micros.

Although Hyland's approach to reducing costs is commendable, she should realize that a balance must be struck between operational efficiency, support personnel and the disastrous costs of being unable to do business when the single high-capacity superserver goes down.

S. W. Holland
Richmond, Va.

Not picture perfect

Things do look a bit grim for Philippe Kahn and Borland International as noted on the front page of the Dec. 14 issue. Even if things are grim, isn't there a less grim photograph that could have been used of Mr. Kahn?

It certainly didn't look like one he would feel good about sending to his mother.

Stuart Sabel
Snohomish, Wash.

Change is good

After reading the letters to the editor regarding your redesign [CW, Dec. 14], I've come to the conclusion that even information systems professionals don't like change. The way I look at it, the content (as always) is good. . .nothing's changed. Keep up the good work.

Blair Jensen
Utah State Developmental Center

Right chip, wrong team

Y column on Comdex exhibitors, "Reporter's Notebook," [CW, Nov. 23] aptly included the PowerPC family of reduced instruction set computing microprocessors among its list of predicted "chip survivors" of the 1990s. However, the piece went on to refer to the chips as "IBM/Apple" parts.

Though PowerPC microprocessors will be incorporated into future systems from both IBM and Apple, design efforts for the chips are being spearheaded by Motorola and IBM at the Austin, Texas-based Somerset design center, which was dedicated last spring.

The facility will employ a project team made up of 300 engineers, primarily from Motorola and IBM, with a small contingent of Apple employees. Moreover, Somerset engineers are implementing a design process that combines Motorola and IBM methodologies.

In addition to integrating design resources, Motorola and IBM will also manufacture and market the chips directly to OEMs. Apple will not be an OEM supplier for these parts.

Phil Pompa
Motorola, Inc.

Words to live by

My fondest wish is that people considering using client/server for bread and butter applications read "Is client/server a lot of hot air?" by John Gantz [CW, Dec. 21] before proceeding. On second thought, all the hacks, numskulls and information systems amateurs who grew up in the PC — not microcomputer — world should adopt Mr. Gantz's philosophy.

That philosophy should include an admission that measured business results are secondary, while empowering users, moving computers closer to decision makers and all the other buzzworded zero-talk is primary. Or more exactly, downsizing, rightsizing, distributed data and all the information industry manifestations of these trends have only one real objective: Keep all the folks peddling these unproven, risky, sometimes silly, populist practices earning a really good living.

Marshall J. Huntenburg
Parsippany, N.J.

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IS benefits don't always go where intended

Michael Sullivan-Trainor

Stop right where you are! You may be giving away your company's money!

In fact, if you're in IS, it's more than likely that you've already helped someone else besides the company's stockholders reap the benefits of your company's IS investments.

How is this possible when every ounce of your effort goes to making your company's use of systems more effective? Well, if you stop and think for a minute, you'll see that the value of IS often goes to customers, suppliers and sometimes even competitors rather than staying inside the company.

Take banking, for example. Before the advent of the automated teller machine (ATM), banks controlled customers' money. They held it to lend or invest for extensive periods between customer visits to make a transfer or withdrawal.

Now, with an ATM on every corner, customers have taken charge, transferring and withdrawing their money at will seven days a week, 24 hours a day. The value of the multimillion dollar ATM investment rests with the customer.

The bank may have gained some indirect benefits — such as customer loyalty — but the bottom line is that thanks to ATMs, the customer, not the bank executive, has greater control over the funds in that checking, savings or money market account.

Look at manufacturing, where the investment in electronic data interchange is placing a company's information at the disposal of suppliers and business partners. Who reaps the greatest value from this exchange?

The manufacturers get greater responsiveness from the supplier and partners. But the partners gain greater control over the information about their transactions. The ultimate beneficiary may again be the customers, who have greater access to information about their orders instantaneously.

Airlines, manufacturers and banks have all experienced the shock of inventing a new technology application, investing in it and even reorienting the company to accommodate it, only to find that the technology has been copied by competitors who assimilate it much more quickly and cheaply without the growing pains.

The value gained from competitive advantage systems is temporary at best for the inventor company. The ultimate beneficiary may be the industry, or once again, probably the customer, who gains greater control of travel, purchasing or banking transactions.

So now you know. You're not creating value for your company. It's going out the door or across the network to the customer, partner or competitor.

Don't let this realization throw you, though. After all, everyone's in the same boat. Applying technology this way is the cost of staying in business.

What's more, recognizing and understanding this reality can help you. The next time your CEO, CFO, COO or the marketing VP down the hall asks you if they are getting their money's worth from IS, you can say: "Of course not. But the customer is."

Sullivan-Trainor is *Computerworld*'s research manager.

Lots of information, but few answers

LISTEN UP! *by* Elaine Bond

I'm reminded of the remark, "I have a closet full of clothing, but nothing to wear for the occasion." Most of us are nearly smothered in written material about computing products and services, yet many of us have great difficulty trying to discover the answer to a very obvious question: Which products and services work together?

We get product-specific information from lots of vendors. We get catalogs from lots of suppliers. We hear presentations at many of the meetings and conferences we attend. But in these times, information that is product and/or single-vendor specific isn't sufficient.

> We need more than just vendor-specific or product-specific information. We need information about how products from different vendors will work together.

We not only need to know about the availability and virtues of a single product or service, we need to know where that product or service fits within the context of other such offerings. Simply stated, we need to know what works with what. And the sad truth is that we often can't get that sort of information, even when all the products are from the same vendor.

Evidence that the need is real can be found in user organizations where individuals and sometimes groups are devoted to working on this interoperability puzzle.

The architectures of our computing capabilities have changed. We no longer have to be — nor do we want to be — captives of a single vendor. We want choice, but the price for choice is getting more expensive than it needs to be.

Highly skilled personnel at many different levels of an organization spend much of their valuable time doing research to discover what works with what. And even if they do find an answer, it is seldom clear-cut because there is still the question of whether one can completely believe the vendors' claims. What are the limitations? What are the hidden dependencies? What are the resource requirements?

The need for better information is real enough for something to be done about it. And as professionals in the information business, we know we can and should do something about it. We can build a database or an information system with the appropriate user interface characteristics and make it available to planners, architects, resellers, technicians and just plain users. The idea has merit. It may even have business potential.

There is now a very small group of people — members of Open User Recommended Solutions, or OURS — representing a few major vendors, users and service providers who are attempting to define the requirements for just such a facility and develop a paper mock-up. With notions of vendor cooperation, defined user requirements, well-designed user requirements and a bunch of willing people, perhaps something will come of this.

In addition to making life easier for users, resellers and service providers, this information would also help any major vendor keep its own marketing and customer service personnel up to date. It would also offer entrepreneurs a chance to gain visibility for their products. It doesn't take a lot of imagination to envision additional types of information that could be included — configuration planning information, lists of required components, ordering help, sources of assistance and so on.

For now — and back to reality — the first step is being taken. Let's wish the explorers well.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank N.A., where she previously served as senior vice president, corporate systems executive, for 11 years. Bond is a founder of the recently formed user advocacy group, Open User Recommended Solutions.

Charles Babcock

Novell's long shot

Novell's acquisition of Unix System Laboratories (USL) is a bold and desperate move to protect its desktop networking turf against Microsoft's Windows NT.

In taking this step, Novell has gained some ammunition to counter the NT threat. On paper, it has obtained Destiny, a desktop Unix operating system, along with ownership of server-level Unix to work with its already established NetWare LAN operating system. What this adds up to is a chance to step into the breach if Windows NT falters.

From the start, Novell has been willing to work with other vendors and has positioned itself as the integration-minded supplier of an existing network. With these components, Novell can tell the marketplace that it is in a strong position to integrate the key technologies that desktop users need to continue growing: an industry-standard operating system and a network operating system that has become a de facto standard.

Microsoft owns an industry standard in MS-DOS and is still working at establishing Windows as the follow-up standard. But its roots are more clearly in the stand-alone desktop. Microsoft is more used to other vendors integrating their technology with its products than it is working with other vendors to integrate their technology.

Thus a sort of open systems mantle is still up for grabs at the desktop level, and Novell is trying it on for size. But this is putting the best face on Novell's USL acquisition.

Saying this deal has the technical potential to counter Windows NT is very different from predicting that it will do so.

There are a number of obstacles, including the following:

•Timing. Commenting on the deal, Novell Chairman Ray Noorda said, "The time is right to unify Unix." He is correct in that the threat of NT probably makes it politically possible to bring together Solaris, AIX, SCO Open Desktop and other factions of Unix. But the right time to do this was five years ago, before Windows NT was a gleam in the Gatesian eye.

•The transition problem. PC users are hungry for a more powerful operating system, but it's not clear that Unix is the answer. Thus far, users of Intel-based PCs have not warmed up to Unix; as Novell well knows as the seller of something called UnixWare. If PC users were eager to upgrade from MS-DOS to Unix, the numbers of those doing so would be visible to the naked eye — and they are not.

•Credibility. Who is more credible as an operating system vendor? Novell spokesmen would ask, "Do you want to buy your networking from an operating system company?" Unfortunately, the question can be reversed.

Waiting in the wings

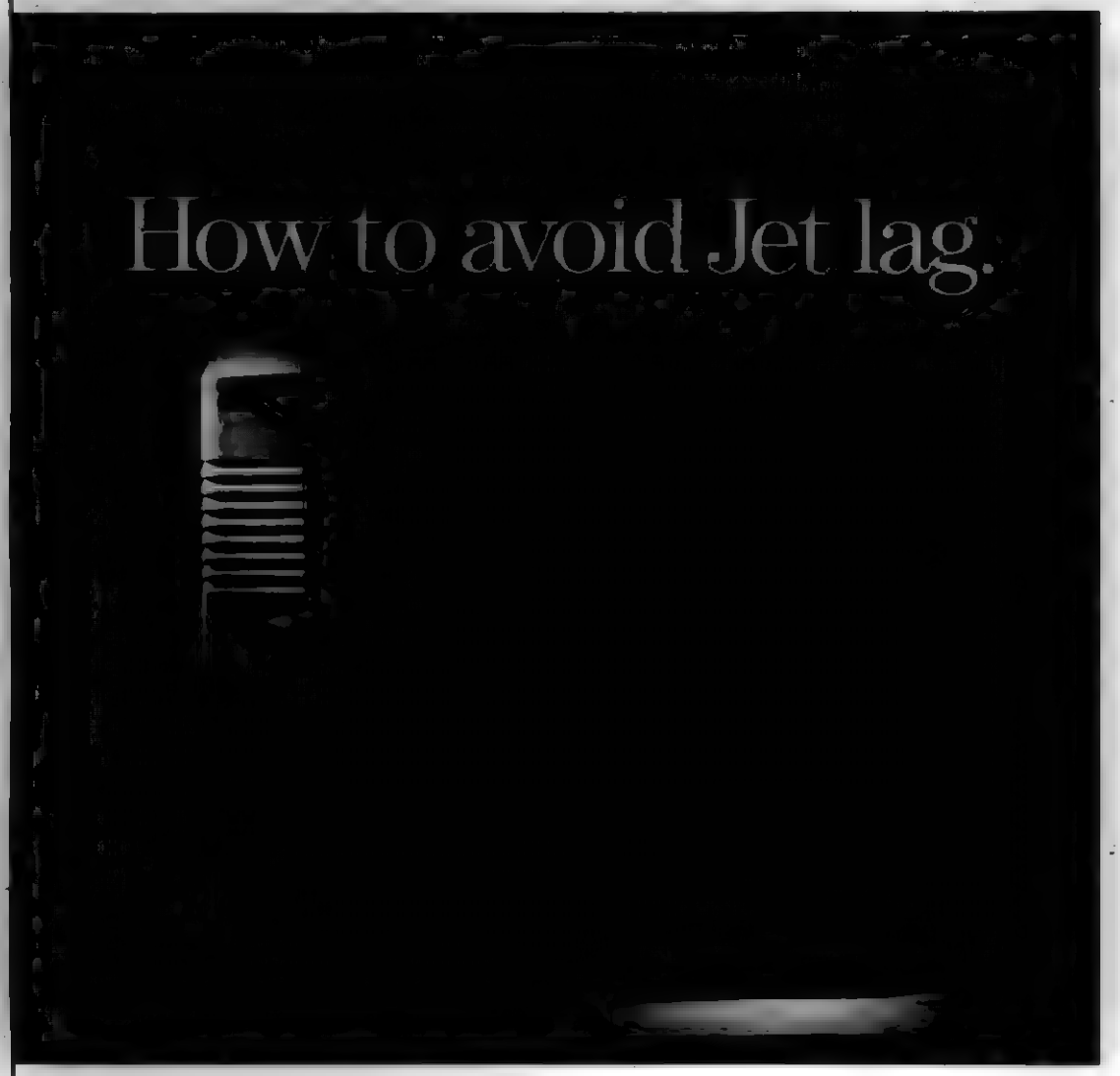
A product as complicated as Windows NT is, likely to need some fixing as it comes out the door, and it remains possible that it will get off to a slow start. Even so, Novell and Destiny are unlikely to find an opening.

For years, PC and Unix users have represented two distinct communities, regardless of the technical merits of Unix. MS-DOS may be unsophisticated and rudimentary, but it continues to serve many people's needs while more sophisticated alternatives such as OS/2 and Unix win converts slowly.

There are no technical barriers to Unix becoming an excellent, Windows-driven desktop operating system. But PC users, reasonably or not, are simply looking elsewhere for leadership.

Whether Microsoft is worthy of the hopes invested in it remains to be seen. But in the meantime, NT is a much more likely recipient of those hopes than Novell's Unix.

Babcock is *Computerworld*'s technical editor.



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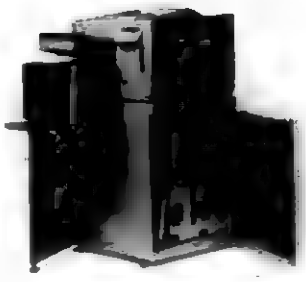

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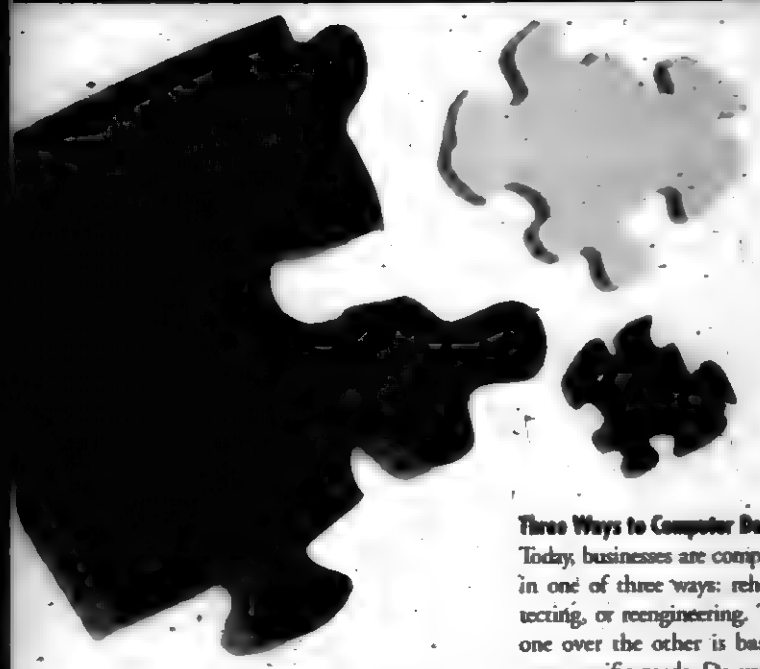


PUZZLED BY COMPUTER DOWNSIZING?

Look to Digital Solutions to Bring All the Pieces Together

By Rick Whitmer, Marketing Director
Computer Downsizing and Reengineering

Computer engineering downsizing — a fad? The terminology itself may be fleeting, but the idea behind it is here to stay. With the continuing advances in desktop technology in terms of price and performance, and with the increasing acceptance of standards-based operating systems and software environments, computer downsizing is almost an inevitable conclusion — especially for any business that wants to significantly cut costs, increase productivity, and improve its quality of service. And what business doesn't want to accomplish all three?

For all these reasons, a majority of computing industry analysts believe that downsizing represents a major paradigm shift in the way computing will be delivered in the future. And, if such is the wave of the future, a clear definition of "computer downsizing" is the first order of business.

The Meaning of Computer Downsizing

At Digital, we don't believe that businesses can or even want to "throw out" their mainframes. Rather, they want to solve their business problems using new technology — technology that will better utilize these legacy systems.

Therefore, we define computer downsizing as a movement to less-expensive computing platforms or environments. A movement that, to be successful, must:

- Address the business issues of cost, productivity, and quality.
- Enable the exploitation of new technologies such as open standards, client/server computing, and distributed network systems.
- Allow your business to leverage its existing technology investments.
- Speak to "people" issues through consulting, training, and open business practices.

Digital's computer downsizing solutions are unique in the industry in that they offer you not just one of the pieces to the downsizing puzzle — but all of them.

Three Ways to Computer Downsize

Today, businesses are computer downsizing in one of three ways: rehosting, rearchitecting, or reengineering. The selection of one over the other is based entirely on your specific needs. Do you want to move your applications to a different platform? Or, do you need to reengineer your core business processes? Do you need to cut costs as quickly as possible? Or, are you looking for value over the long term?

Rehosting

Both technology- and cost-driven, rehosting is the easiest method of computer downsizing. You're moving applications to more cost-effective hardware platforms. The application environment and core business processes are fundamentally unaffected.

Rearchitecting

Rearchitecting means changing your applications to take advantage of new hardware and software technologies. It may be as simple as implementing a graphical user interface (GUI), or you could rewrite the entire application to take advantage of client/server technology.

Reengineering

Perhaps you need to fundamentally change your core business processes. The decision to reengineer your business processes and redesign your applications takes more time and may involve the help of outside parties, such as systems integrators. Yet, it offers you more value over the long term.

Who Should Think About Computer Downsizing?

Computer downsizing embraces all the information systems in your organization — from the data center to the desktop. It is a style of computing that revolves around smaller platforms such as the midrange, workstations, PCs, LANs, hardware, software, and networking standards. The major benefits?

- Faster application development through the use of new, high-level languages, automated tools, and application programming interfaces.
- Greater ease-of-use and productivity through the use of a GUI.
- Greater flexibility and improved performance through the use of client/server architecture.
- Hardware and software portability and interoperability resulting from the standards-based open environment.
- Lower costs resulting from the ability to shop the competitive market — mixing and matching hardware and software from multiple vendors.

Digital has an unmatched understanding of the business, people, and technology issues involved in computer engineering downsizing. And, we have a clear strategy for helping companies plan, implement, and manage a downsized, open, multivendor computing environment.

This is all well and good — but you may still be asking the question: Is downsizing the right direction for my business?

Take a look at the following scenarios. If you recognize your business in one of them, computer downsizing will most likely garner you significant cost and productivity benefits.

Do You Utilize Applications That Run on Both IBM and VAX Systems?

If you do, downsizing can save you money quickly — with no change of code, no user retraining, and no operator training. Perhaps you're running SAS, or a general ledger application like Dun & Bradstreet's Millennium. Moving these kinds of applications to a more cost-effective platform can save you one-third to one-half of what it takes to run them on your mainframe — and you're still able to maintain the same performance.

Are You Stuck Running an Obsolete Operating System?

Perhaps you're running MVS/SP, VSE/SP, or even MVS/XA. If so, you're computing equipment has you trapped. You have no support, no upgrade path, no alternative — unless you consider computer downsizing.

Are Older Model IBM Systems Running Your Business?

If you're using 3090, 308x, or 43xx model systems, you know just how expensive it is to run your applications. Today, the cost of software licenses as well as applications are high and will only increase in cost in the future. Plus, your need for greater CPU capacity continues to grow. You have two choices. Spend money on a CPU upgrade or off-load larger applications to a smaller, more powerful system. Ultimately, your decision to computer downsize enables you to lower costs and better serve your user community.

Are You Considering the Advantages of UNIX?

You have no intention of getting rid of your mainframe. You still rely on it to run some of your critical business applications. However, you do want to add new applications using UNIX and/or client/server computing. This style of computing is open and distributed, integrates all of your PC users, and offers rapid application development.

Each of these business scenarios would benefit from computer downsizing. By utilizing Digital's computer downsizing solutions — a variety of hardware, software, and comprehensive consulting services — your organization can achieve significant benefits without abandoning your investment in existing systems.

Take Advantage of Our Experience

In one sense, Digital pioneered the computer downsizing movement. From early on in our history, we've moved information from the mainframe to minicomputers — and we've been helping other organizations take advantage of our experience in distributed computing ever since.

continued ▶

[redacted] we haven't stopped there. We recognize technology as an enabler to bridge old systems to a style of flexible, distributed, integrated, standards-based computing. This new computing style is characterized by smaller systems, open systems, client/server architecture, faster application delivery, and lower costs. It embraces all the information systems in the organization, from the data center to the desktop.

We understand how you want to run your business. You want to reduce the cost of information technology. And you want to use state-of-the-art technology to drive your business more effectively. Digital's computer downsizing solutions lower the downsizing risk while improving your bottom line.

All the Right Pieces

At the outset and all the way through the computer downsizing process, our comprehensive consulting services and technical training programs will help you analyze, design, architect, and reengineer your information systems infrastructure — and perhaps your core business practices, as well.

In terms of hardware, we offer the openness and the power of VAX OpenVMS systems. What's more, our Alpha AXP family of open midrange, server, and desktop systems provides processing power that rivals the mainframe — at a fraction of the cost.

In the area of networking, we've taken the lead in supporting the full range of both industry-wide and proprietary networking and telecommunications standards. Plus, our Network Application Support (NAS) family of products and services, including PATHWORKS and DEC ACCESSWORKS, provides communications and application integration and interoperability across local and wide area networks.

To prevent computing chaos, a distributed computing environment needs to be effectively managed. Digital's POLYCENTER solution puts you in control by providing integrated management of the network, systems, storage, and application, including software distribution, system backup, and more.

Computer Downsizing Solutions That Are Truly 'Open'

We can make a statement that very few vendors — if any — can make: Whatever the operating system, database system, network, or desktop systems you currently have installed in your computing environment, Digital's computer downsizing solutions can tie them all together. We can complete your computer downsizing picture and make it work better than anyone else in the business.

For more information on Digital's computer downsizing solutions, call 800-332-8228.

For Success in DOWNSIZING, Scott Paper Uses the Team Approach: Digital and Unidata

IN the late 1980s, Scott Paper — the world's leading supplier of tissue paper products — decided to downsize operations. In fact, company management issued a downsizing directive to every division of its organization, including MIS.

Since the actual downsizing process was left to division managers, MIS at Scott's Everett, Washington mill focused on improving its computing system as a way to help the Philadelphia-based company cut costs.

With a critical mission at hand, Scott Paper turned to Digital and Unidata for assistance.

The Problem

Operations at the Everett mill were dependent on a multi-system environment — one database system to manage the business applications, and various other computers from different vendors to manage all aspects of production and manufacturing. As a result, MIS had to maintain diverse computing environments, and users had to learn to use several computing systems.

The mill needed a single vendor to provide systems for both business applications and shop floor production. After a thorough evaluation, Scott Paper chose Digital to provide a uniform, integrated computing environment via a VAXcluster system.

Power, Flexibility, and Openness

The Digital hardware implemented at Scott Paper included two VAX 6000 Model 410 systems and three VAX 3000 systems. The VAX 6000 — chosen for its industry-leading technology, price/performance, and flexible upgrade path — also provides Scott Paper with:

- A powerful CPU
- Expanded memory and storage capacity
- High-speed networking capabilities.

In addition, the clustering feature of OpenVMS has given the paper manufacturer an efficient, economical way to share data resources.

Unidata Serves as Critical Link

Once Scott decided to standardize using Digital hardware, one challenge remained: how to continue using its older non-Digital database system in the new OpenVMS environment. Careful research led the company to Unidata, a Digital independent software vendor headquartered in Denver, and Creative Computing Solutions (CCS), a Unidata value-added reseller based in Fremont, California.

By moving to the OpenVMS environment, Scott Paper has maintained its original database system and reduced its IS costs by 20 percent — a significant contribution to the company's overall downsizing efforts.

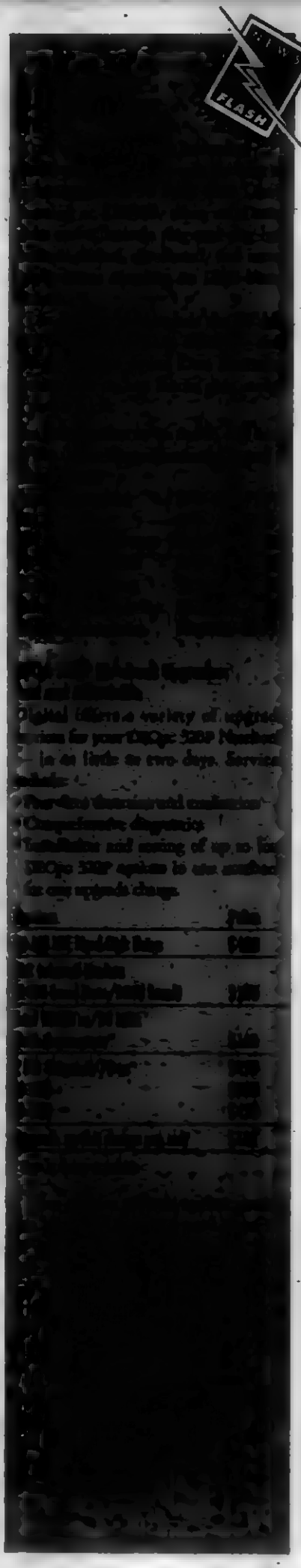
Unidata provides small, medium, and Fortune 1000 companies with a relational database management system (RDBMS) that supports relations and multidimensional arrays. Unidata's RDBMS operates under OpenVMS and UNIX, is compatible with Scott Paper's previous computing environment, and has enabled Scott Paper to run its main business applications with improved response time.

Plus, Unidata's compatibility with Scott Paper's previous database system allowed this system to be converted to OpenVMS — while retaining the same look and feel for users.

After six weeks of duplicating, testing, and tuning 100 programs and 20 files, CCS converted Scott Paper's old database system to Unidata software and then ported it to the OpenVMS environment. "The conversion went fairly smoothly without any major upsets," stated Wendell Harris, IS Manager, Scott Paper. "And we met all project timelines."

The major benefits resulting from Scott Paper's decision to team Digital and Unidata include investment protection, no downtime, no retraining — and, most important, no hassle.

For information on Digital/Unidata solutions, call Terry Truman, Unidata's Director of Channel Marketing, at 303-294-0800.



A Briefing on Benchmarks

You're planning to purchase a new workstation and you need some vital information to help you make the right choice. You need to find out whether System X can handle your particular application well enough to satisfy your business requirements, and whether it's a better value than System Y. Ideally, this information would come from a direct comparison of the competing systems running your application under exactly the same conditions — a situation that's costly and not likely to occur.

When you can't do side-by-side comparisons of actual applications, the next best information provider is the benchmark. Benchmarks measure everything from CPU to memory to I/O subsystems, and more. That's why it's up to you to choose the particular benchmarks that relate directly to your system's applications. Choosing the wrong benchmarks can be a waste of time and money. You may be misled into selecting a system that cannot do the job according to your requirements.

Major Benchmarks: What They Measure

Of the major industry-standard benchmarks, the following are likely to be your best sources of information prior to a system purchase. Most vendors will provide you with specific results of these on their own platforms.

SPECint92 and SPECfp92 (System Performance Evaluation Cooperative)
Having replaced the original SPECmark, these measure processor speed, memory bandwidth, and compiler effectiveness. SPECint92 is a set of 6 Integer C programs. SPECfp92 is a set of 9 dp floating-point FORTRAN, 3 sp floating-point FORTRAN, and 2 sp C programs.

SPECrate_fp92 and SPECrate_int92 (System Performance Evaluation Cooperative)
These benchmarks are capacity metrics. Instead of measuring "how fast" a system can perform any task, these SPECrate benchmarks measure how many tasks a system completes within an arbitrary time interval. SPECrate_int92 and SPECrate_fp92 use the same set of tests in the SPECint92 and SPECfp92 suites. However, one or more concurrent invocations of each benchmark in the suite are run to determine the maximum throughput a system can produce for a given benchmark. Ultimately, the SPECrate benchmarks provide the capability of comparing uniprocessors and multiprocessors.

AIM II
This benchmark measures integer and floating point, I/O transfers, O/S function and system calls, disk access, and data transfer over a UNIX pipe.

AIM III
Measuring CPU, floating point, I/O, memory, integer, and some system functions, AIM III can be used to compare relative performance of multiuser UNIX systems, and can be customized for capacity planning. (Metrics: AIM Performance Rating, Maximum User Loads)

AIM Milestone
AIM Milestone is functionally representative of real user loads in a multiuser environment. It measures system utilities' speed and capacity for UNIX systems. (Metric: Utilities Index)

SPEC SDM
Measuring CPU, memory, compiler effectiveness, and I/O subsystems, SPEC SDM is representative of a UNIX software development multitasking environment. It also has a multi-stream metric for multiprocessor systems. (Metric: Peak Throughput in scripts/hour)

TPC-A
This benchmark measures CPU, memory, I/O subsystems, terminal handling, and database performance. TPC-A is an online transaction processing benchmark and is database dependent. Some vendors use client/server or front- end/back-end configurations. (Metrics: TPS-A, $K/TPS-A)

Choosing a new workstation can be difficult. There are so many on the market these days. What you need is a brief lesson on benchmarks to help you make better, more informed system purchasing decisions.

TPC-B
Measuring CPU, memory, and I/O subsystem and database performance, TPC-B should be used to compare relative performance of database managers. It does not, however, contain representative user interaction via terminal handling or think time. (Metrics: TPS-B, $K/TPS-B)

TPC-C
An online order-entry benchmark that is database dependent, TPC-C measures CPU, memory, I/O subsystems, terminal handling, database performance, and forms processing. This benchmark offers a transaction profile that is more realistic and more complex than TPC-A or TPC-B. (Metrics: TPM-C, $K/TPM-C)

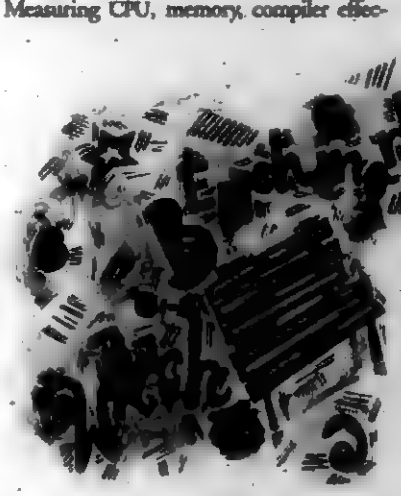
Dhrystone
Dhrystone measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. (Metric: Integer MIPS)

Linpack
This benchmark measures single- and double-precision floating point using FORTRAN, and is representative of mathematical and scientific applications. (Metrics: Sp MFLOPS, Dp MFLOPS)

CPU2
CPU2 measures CPU, memory, integer, and single-precision floating point. This benchmark is FORTRAN and fp intensive. (Metric: MVUPS)

X11PERF and GPC/PLB (For Workstation Graphics)
X11PERF tests aspects of X server performance from simple 2D vectors to complex 3D polygons. GPC/PLB is a set of picture-level benchmarks designed to measure relative performance of CRT-based displays.

NHFstone
Measuring NFS server performance, NHFstone is one of the very few network environment benchmarks in existence. It measures average response time for NFS transfers as the load on the server is increased.



Benchmarks: Which Are Right for Your Application?

To find out, establish which components are used in your application. Then, choose the benchmark that measures that component. Or, use this chart — listing specific applications, their components, and appropriate benchmarks — to help you decide.

Application	Components	Benchmarks
CASE Applications	Integer performance, 2D graphics, Disk I/O, Interactivity	SPEC SDM, SPECint92, AIM Milestone, AIM III, Dhrystone, X11PERF
Electronic CAD	Integer and floating-point math, Cache, 2D graphics, Disk I/O	Linpack, X11PERF, SPECint92, SPECfp92
Mechanical CAD	Floating point, 3D graphics, Memory, Disk I/O	SPECfp92, X11PERF, GPC/PLB, Linpack, CPU2
Database Applications	I/O, Database performance	TPC-A, TPC-B, AIM, TPC-C
Multipurpose Servers	Multitasking, Multiuser, I/O, CPU, Memory, Network interface	AIM III, SPEC SDM, NHFstone, AIM Milestone
Scientific Applications	CPU, Floating point, Integer	SPECint92, SPECfp92, Dhrystone, Linpack, CPU2
Multiprocessor Systems	Capacity	SPECrate_int92, SPECrate_fp92

Choosing the Ideal Lessor: We'll Help You Count the Ways

You've decided that leasing is the best method of acquiring computing equipment. Now you have to decide on a lessor. Should you base your decision solely on who has the lowest lease rate? Or, should you consider a combination of critical factors?

Because of the need to work so closely together, you and your lessor become "partners" in a sense. That's why your choice of lessor should go beyond merely finding the company who has the lowest lease rate. We offer 11 key characteristics to consider when choosing the "best" lessor to meet your business needs.

1. Level of Experience

The greater the lessor's experience, the greater their overall market perspective — a perspective that translates into benefits for you. Your lease company should have experience in several areas, including finance, accounting, legal issues, the computer equipment market, and taxation.

2. Knowledge of Computer Equipment

A lessor's computer knowledge can be tapped when you're choosing the system that best meets your needs.

3. Administrative Support

Efficiency in documentation, invoicing, sales/use/property tax collection and remittance, asset tracking, and end-of-lease notification and negotiations is critical to a successful leasing relationship.

4. Firmness of Commitment

A firm commitment to a rate, for a specified time period, protects you against upward revisions once the competition has been eliminated.

5. Flexibility

Your lessor should be willing to creatively meet your equipment needs.

6. Speed of Transaction Completion

When you need computer equipment, you usually need it quickly.

7. Ability to Offer Upgrades, Takeouts, Rollovers

The "best" lessor will not only give you adequate options to meet future needs, but also provide the financing alternatives to implement those options.

8. Financial Strength

In the best interests of your company's future, make sure your lessor will be around long enough to see it.

9. Lease Rate

One piece of advice. If a lease rate seems too good to be true, it probably is.

10. Full Range of Finance Products

Choose a lessor that can continue to satisfy your many different lease product requirements.

11. Reasonable Documentation

Your leasing documentation should be reasonable, flexible, and, most important, it should protect the interests of both parties.

Digital's leasing programs offer you all these features and more. For information, call 800-343-3451, or 800-322-3239 inside Massachusetts, and we'll put you in touch with one of our leasing experts.

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Paul Gillin

Easy as 1-OS/2-3

Today I'm going to tell you how to install and use the OS/2 operating system. Actually, I won't tell you much about using it because I've never really been able to get past installing it myself.

OS/2 is a powerful multitasking, multithreaded, multigrain, multicultural operating system (the "traffic cop" that tells a computer when to crash). Users who have worked with DOS for a long time will love OS/2 because it frees them from the chore of choosing which applications to use. That is because there *are* no applications for OS/2, or at least none that I've been able to find. If anyone has an OS/2 application, please send it to me because I've never seen one and have only heard about them from stories my grandfather used to tell.

The first thing you will notice when you install OS/2 is that it comes on 20 convenient floppy disks. But don't be frightened by that number because chances are you won't have to use more than 17 of them. Open your manual to the installation section and read it carefully. Become very familiar with it. Sleep with it. You are going to have to use it again and again and again.

That is because for the average user, OS/2 is about as intuitive to install as a gyroscopic navigation system on a Boeing 757. In fact, OS/2 support professionals frequently spend three or four months as Boeing 757 mechanics in order to "ease into" OS/2 support.

I recommend using OS/2's "dual boot" option, which allows you to "boot" either "DOS" or "OS/2" at start-up. The dual boot requires "repartitioning" your hard disk, resulting in "total loss" of all "data" on it. Remember that you read it here because OS/2 doesn't tell you about this until it's almost too late and you're one keystroke

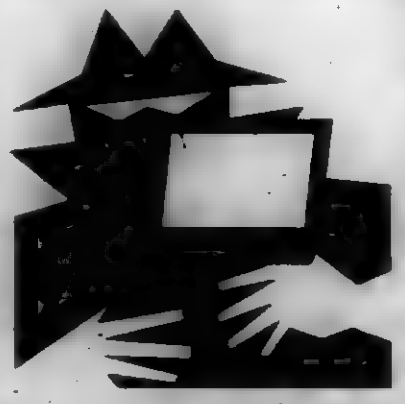
Gillin, *page 44*

Portables theft rises

By James Daly

Better keep a sharp eye on your laptop. Last year, the theft of portable computers quadrupled over 1991 levels, according to a nationwide clearinghouse of security information.

"We're talking about hundreds and hundreds of thousands of computers being stolen," said Robert Zises, a spokesman for the New York-based Stolen Computer Registry.



The latest culprits in the thievery game are employees who walk off with unsecured laptop and notebook-size machines. "The level of internal theft has been incredible; that's where we're seeing the most growth," said Zises, who also serves as president of Nacomex, the National Computer Exchange, Inc. in New York.

But thieves do not appear only from within, Zises warned. The incredible miniaturization and proliferation of portable computers in the past few years has wreaked havoc on the minds of many information systems managers who must equip traveling employees. With 120M-byte hard disks running upwards of 25 MHz on 5-pound laptops, portables are a frequent repository for mission-critical tasks and can often carry sensitive inside data.

Because they allow field access to central computers, they are also a perfect way to steal information from a corporate database. Thieves take laptops not only to get at the data stored in the disk drive but also to dial into company mainframes.

Laptop theft has already affected national figures such as Compaq Computer Corp. Chairman Ben Rosen.

"Laptops and notebook computers are God's gift to thieves," said Fuller O'Connor, president of computer security firm IDX Technologies, Inc. and head of International Computer Recovery Center (ICRC), a centralized data bank for the identification of stolen or lost computers based in Setauket, N.Y. "They're portable, powerful and very easily stolen."

Battening the hatches

Security experts suggested a number of ways to secure vulnerable portable computers: using physical tie-down devices that bolt a machine to a table or cabinet; enforcing rigid sign-out methods for portable computer use; and encrypting data so that if a portable is stolen, the information on it will be useless.

Both the Stolen Computer Registry and ICRC assist recovery by maintaining a database containing the serial numbers, makes, models and configurations of stolen computers.

The information is made available to sales channels and law enforcement authorities, among others, in an effort to intercept the sale of stolen gear and return it to the rightful owner.

Many users of portable computers are unaware of their vulnerability. In a recent survey by International Data Corp., only 5% of the respondents said they perceive security as a limitation of portable computers.

Cancer society battling disease with technology

By Michael Fitzgerald
AUSTIN, TEXAS

Take one package of IBM's OS/2 and a healthy dose of the Micro Channel Architecture (MCA) to cure cancer? Sounds unlikely, but the information systems group at the American Cancer Society (ACS) data center is serious about its role in the battle against the disease.

"We're part of the team here, and our ultimate goal is to end cancer," said Jerald S. Noble, director of telecommunications and PC support at the ACS. "That is our mission."

To achieve this through IS, about two years ago the ACS began moving its field offices to a client/server environment that operated under OS/2. The project, called Maxx, moved donor, volunteer and crusade information from an IBM mainframe to a client/server environment run over OS/2 servers connected via a wide-area network. Currently, ACS has 59 sites installed, including 19 of its 57 division offices.

The entire operation runs off of OS/2 1.3 Extended Edition. In a unique twist, the ACS handles the communications through OS/2's built-in communications manager and Advanced Peer-to-Peer Communications (APPC), and the database function built into OS/2 acts as the database manager.

"Because everything we do [in a distributed environment] is tightly coupled around OS/2, we want to keep things tight because it's an environment that gets extremely complicated to manage," said Kyle Cooper, senior technical analyst at the ACS.

Information still gets fed into an IBM DB2 database on the mainframe, where a mirror image of the current database is kept. However, because the database runs off a server, queries can now be handled much more quickly and without downloading from the mainframe, Noble said.

Besides gaining more flexible data transfers, Noble said, using the hooks built into OS/2 for communications and data management saved the ACS "a tremendous amount of money."

The ACS does maintain a number of Novell, Inc. networks for a variety of other purposes. In its field offices, local users run software from WordPerfect Corp., Lotus Development Corp. and Data-Ease, Inc.

Its choice of hardware was MCA-

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On Site

American Cancer Society
Austin, Texas

Challenge: To move to a distributed environment, better manage growth and increase flexibility.

Technology: The communications and database manager extensions for OS/2, a satellite-based WAN and MCA-based hardware.

Status: More than one-third of the way through the rollout of a successful implementation of client/server-based network with true distributed data management.

Board offers free access to U.S. data

By Gary H. Anthes
WASHINGTON, D.C.

■ The U.S. Department of Commerce has established the mother of all computer bulletin boards — an electronic octopus offering access to data, software and people at more than 50 federal agencies. These include the Library of Congress, the Government Printing Office, the Internal Revenue Service, the National Science Foundation, the National Institute of Standards and Technology (NIST) and the U.S. departments of Defense, Agriculture, Justice, Labor, Treasury, Energy and Commerce.

Using a publicly available telephone number, users can dial into the National Technical Information Service's FedWorld and at no charge pass through a gateway to any of 61 government bulletin boards, and that number is growing. In addition, users can exchange electronic mail with other global FedWorld users or with specialized constituencies on the individual boards. They can even hold live teleconferences with other users.

In a few minutes — for at most the cost of a long-distance telephone call — a user can hopscotch around a virtual Washington, D.C., downloading consumer information from the Agriculture Department, information from the Export-Import Bank of the U.S., economic data from the Commerce Department, news of the latest computer viruses from NIST and high-resolution images from weather satellites.

Users can also see who else is making a similar journey by entering the "Who" command and can fire off a message to the FedWorld "Sysop" if any problems are encountered.

In addition to serving as a gateway to other government bulletin boards, FedWorld offers access to files maintained by the National Technical Information Service, a unit of the Commerce Department whose mission is the collection and dissemination of technical information produced by the U.S. government.

Popular requests

The most common requests pertain to information about the Computer-aided Acquisition and Logistics Support program of the Defense and Commerce departments. Files can be read on-line, downloaded or searched by entering key words or program names.

At the heart of FedWorld is an Intel Corp. 1486 PC running at 50 MHz with four multiplexers attached. Software is a standard, off-the-shelf bulletin board package, said Thomas Walker, FedWorld project director.

Walker said FedWorld was set up in part to satisfy a mandate from Congress to demonstrate the feasibility of a public gateway to government data.

"It's obvious gateways exist; we wanted to do it at a reasonable cost," he said, adding that the gateway was set up in 78 days for less than $20,000.

Walker said it is possible but not likely that a toll-free number will be obtained for FedWorld. However, to make it more accessible to the public, he said FedWorld may be offered as an option on one or more commercial networks or may be connected to Internet, the quasi-public network partly funded by the federal government.

FedWorld can be accessed at up to 9.6K bit/sec. by dialing (703) 321-8020. Set parity to NONE, data bits to 8 and stop bit to 1. Terminal emulation should be set to ANSI or to VT100.

Few hitches or glitches

A *Computerworld* reporter tried FedWorld and found it easy to use and nearly glitch-free.

He bypassed an option to download 100,000 bytes of user documentation but found the service's prompts and menus were so clear that no documentation was needed to do most things.

Response time was nearly instantaneous, but use of the "Who" command showed just three other users logged on at the time.

Only one request went awry. An attempt to download satellite images of Hurricane Andrew failed with no explanation.

It turned out that the user must first download special software to receive satellite images.

Scanning a table of registered users, the reporter found a potpourri of people including a "soon to be retired military physicist," someone from IBM Federal Systems Co., a "computer-literate logistics engineer," an "Oracle, Sybase RDBMS consultant," a C and Clipper programmer and an "experienced government information policy consultant."

Iomega adds to removable storage line

Introduces new drives for Macintosh and IBM PCs

By Michael Vizard
ROY, UTAH

With the widespread arrival of powerful, low-cost PCs capable of manipulating gigabytes of data, some users have begun to find that traditional removable devices such as floppy disks are no longer up to the task.

Looking to provide PC users with a high-capacity alternative medium for removable storage, Iomega Corp. has unveiled two offerings for the Apple Computer, Inc. Macintosh that provide 21M bytes and 150M bytes of removable storage, respectively. The company has also moved to give PC users a 250M-byte, ¼-inch tape drive aimed primarily at IBM and compatible, portable PCs that attach directly to the parallel printer port.

Leading Iomega's push into the Macintosh space is a 21M-byte, 3½-in. Floptical drive that is being touted as a replacement for the standard floppy disk drive.

"In today's PCs, main memory can be as much as 16M bytes, which is a lot more than you put on a 1.44M-byte floppy disk drive. With our 21M-byte Floptical technology we're trying to get the ratios between main memory and flexible media back in sync," said Jim Jonez, product manager for Iomega's Floptical line.

According to Jonez, Floptical drives are flexible media that make use of laser Holographic Optical Tracking Technology combined with a digital servo actuator. The actuator helps make this implementation of Iomega's Floptical drives 15% faster than Iomega's previous generation of drives for IBM PCs. Included with the drive, which has a suggested retail price of $399, is a 21M-byte disk, System 7 drivers, Small Computer Systems Interface (SCSI) cable and manuals.

Also aimed at the Macintosh market is a 150M-byte implementation of an Iomega Bernoulli drive, which Jonez said offers the lowest cost per megabyte for a Bernoulli drive available today. Priced at $799, the Bernoulli Multidisk 150 MacTransportable comes with the drive, SCSI cable, Macintosh driver software, utilities and a 150M-byte disk.

Sizable storage

The Bernoulli drives were designed to give users access to large amounts of external storage, rather than requiring them to purchase a hard disk upgrade when they run out of disk space. "Bernoulli drives are a good place to store infrequently accessed applications," Jonez said.

The 150M-byte drive can also read and write to 35M-, 65M- and 105M-byte media.

Meanwhile, in the IBM PC market, Iomega has unveiled a tape drive aimed primarily at notebook and laptop computer systems that need to store data off-line. Designed to plug into a parallel port, the Tape250 family of QIC-80 drives provide 120M bytes of storage, which can be expanded to up to 250M bytes using data compression software.

The tape drive was designed to give users a backup storage device that does not require them to have specific interface and controller cards for the bus on their PCs. The suggested retail price of the Tape250 is $548.

Battery life

Symantec unveils PowerBook utilities

By James Daly
CUPERTINO, CALIF.

Has the limited battery life of your Apple Computer, Inc. PowerBook portable got you down? Not to fear. Symantec Corp. has announced a utility package specifically designed to increase a laptop's precious battery life by four hours or more.

Norton Essentials for PowerBook Version 1.0 is a control panel that works by curtailing some of the popular portable's most energy-depleting functions. These include dimming the backlighting, spinning down the hard disk and disabling AppleTalk.

Constrained battery life is a frequent gripe among users of portable computers. Despite vendor promises that their machines typically offer four to six hours of battery life, the "low battery" warning is more likely to illuminate after two or three hours of use.

The application was actually unveiled this summer by After Hours Software, but it has since been purchased by Symantec. Initially, it was announced under the name of Guy's Utilities for Macintosh-PowerBook Edition, Symantec officials said.

Users customize their Norton Essentials for PowerBook application by choosing among several indicator icons that appear on a menu bar.

Features include the following:

- A Battery Saver component allows users to customize power settings based on the characteristics of the running application.
- A Backlight Dimmer feature allows users to dim backlighting after a specified length of time. The Battery Gauge offers many display options for viewing battery status, including a reading of remaining battery time.
- Instant Access for AppleTalk conserves memory and battery power by disabling AppleTalk when users disconnect from a network and automatically restarting it when reconnected to the network.

Norton Essentials for PowerBook also includes such tidbits as an instant on/off function that simplifies startup and shutdown when going through airport security. Also provided is Quick Notes, an electronic list pad that provides single-keystroke access to frequently needed information such as telephone, frequent-flyer and credit-card numbers.

Norton Essentials for PowerBook Version 1.0 is available for $129, according to Symantec officials.

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IBM LASERPRINTERS. PAGES AHEAD.

Orlando connects with volunteers

Vendors join with computer professionals to boost community service

By Christopher Lindquist
ORLANDO, FLA.

An orphanage needs some extra rooms to house its residents. The director knows there must be organizations and people willing to donate labor and effort, but how does he recruit them without expending limited time and money?

At the same time, a local business has some computers it would like to donate, but who needs them? And who will volunteer to deliver and support them?

Situations like these happen every day when those who need assistance, and those who want to give it, find they have no means of making a connection.

On the air
Initial computer training for volunteer coordinators at the Orlando Community Connection will have a high-tech twist: The first classes are slated to be broadcast on public television.

But Orlando is using technology and volunteerism to try to fix this problem.

A group of computer professionals from information systems organizations and vendor firms is working with other members of the community to create a system that will connect thousands of volunteers with needs in the Orlando area.

The system, called the Orlando Community Connection, will integrate distributed computing, voice recognition and synthesis and artificial intelligence to allow an expected 250,000 volunteers to match their skills with the requirements of 5,000 agencies at a rate of some 25,000 matches per month.

It is a project of massive scale and with tremendous potential to benefit the community, its founders said. Best of all, it has cost nearly nothing in terms of dollars because the resources, both human and material, have been donated.

First ray of light

The connection is the brainchild of Ed Schrank, vice president of Welbro Constructors, Inc. in Altamonte Springs, Fla. He came to the project as an "executive on loan" to assist with Orlando's City of Light program.

That program came into being approximately 1½ years ago, when Orlando's then-mayor Bill Frederick asked President George Bush if Orlando could be the first "City of Light" as an extension of the president's "Thousand Points of Light" program. Bush agreed.

Shortly thereafter, Orlando established the Executive on Loan program, which allows business leaders to put their skills to work developing service programs for the community.

When Schrank became an executive on loan, he said he immediately saw the need for an infrastructure through which available resources could be matched to agency needs.

That infrastructure would be built around a database, but not just any database. This one would have to be easy for members of the community to use. "The goal was to have every citizen participate," Schrank said.

Last January, a team of volunteers from AT&T, IBM and the University of Central Florida came together to design the database. They designed a system that would allow basic PCs to be placed around the community in locations such as churches, businesses and schools. Coordinators at those workstations would then input information about volunteers, such as what skills they were offering, what time they had available and how to contact them. That information would then be transmitted to volunteer-managed database servers containing data from around the Orlando area.

Next, the information would be matched to needs in the community via an artificial intelligence program. From there, the volunteers would be contacted with information about what was needed, when and where.

Getting the goods

It looked good on paper, but how would it be implemented? Where would the hardware, software and developers come from?

The answer, of course, was volunteers.

"The process and the product are really the same," Schrank said. "Every time I've needed something, someone has stepped forward to fill the gap." Here are some examples:

- **AT&T** volunteered to donate hardware, programming talent and Conversance, a system that allows volunteers to be called by a synthesized voice that gives them information about volunteer opportunities and also lets them change their personal information via voice recognition.
- **Information Builders, Inc.** provided the AI system for making the matches.
- **Computer Associates International, Inc.** donated DBFast for the creation of the workstation user interface.
- **Ciber** donated a technical writer and Rich Woods, former New York Jets linebacker and Oracle programmer, to the cause.
- Local computer clubs offered to help install the volunteer workstations.

Eric Singleton, director of IS at the Orange County Property Appraisers Office, also stepped forward. Singleton, technical director for the project, said the scale of the effort and the advancement technology being used make it a great challenge and an enjoyable one. It is a "very, very innovative, cost-effective means of mass distribution of data," he said.

Who'll be next?

Organizers in Orlando hope other cities will be interested in establishing systems along the lines of the Orlando Community Connection.

In Orlando, once all the hardware and software is installed, trained volunteers will operate the workstations, which will be connected to several database servers via low-cost modems. The servers will also be maintained by volunteers.

The system was slated to be installed last month, with beta testing starting this month. It is slated to roll out in March. And in the summer, representatives from some 200 cities will come to Orlando for a conference at which the system will be demonstrated.

In fact, said Ed Schrank, the system's designer, the Atlanta Olympic Committee and the Rebuild L.A. organizations are already investigating the system for coordinating their own volunteer efforts.

The potential benefit of the Community Connection is huge, and it is technology that is making it possible. Technology, Schrank said, will allow people to view problems from atop a mountain of resources that will make the pile of needs a less daunting challenge. —*Christopher Lindquist*

Borland reprices Quattro Pro for DOS

By Christopher Lindquist

Borland International, Inc. has announced new pricing for the recently unbundled Quattro Pro for DOS.

For the past several months, Quattro Pro for DOS has been available only as a competitive upgrade and as part of the Win/DOS bundle that includes both DOS and Microsoft Corp. Windows versions of the spreadsheet.

However, the Win/DOS combination was a marketing failure that had "confused" some buyers and resellers, according to company President and Chief Executive Officer Philippe Kahn.

Under the new arrangement, Win/DOS will be phased out, and separate Windows and DOS versions will be available.

Additionally, for a limited time, resellers of the DOS version of Quattro Pro are being offered "dramatically lower" prices for the product, according to a company spokesman.

The result should be significantly lower end-user prices once the product reaches the channel, which should occur by the middle of this month.

No end date has been set for the promotion, although it will last at least 90 days, according to the Borland spokesman.

Cancer society

CONTINUED FROM PAGE 39

based IBM Personal System/2s because they seem to run distributed databases faster than AT bus. Noble said the organization used MCA over Extended Industry Standard Architecture (EISA) hardware because it already had IBM PS/2s installed and wanted to maintain a standard.

"We've tested AT-bus machines against the Micro Channel, and they work faster for small networks or conventional Novell LANs. But when you get into a true distributed database environment, our PS/2s blow them away, and the only thing I can figure is it's the Micro Channel," Noble said.

Most field offices use a Model 95 with 10M bytes of random-access memory. Larger offices may have machines with 16M bytes of RAM. Noble said the ACS is looking at the Server 295, a superserver made by Parallan Computer, Inc. and marketed by IBM, for eight of its largest sites.

Despite using OS/2, with its graphical user interface, the ACS runs largely character-based applications, and its Maxx system is entirely character-based.

"GUI's nice, but not in our day-to-day needs," Noble said. "We didn't want the training costs or the hardware costs. Most of our terminals don't use mice." The ACS, in part to protect itself from matter-of-course operating system upgrades, did not write to the Presentation Manager interface when it created its application and shielded the applications from the operating system as much as possible.

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THE IBM COLOR JETPRINTER PS. COLOR MADE BRILLIANTLY CLEAR.

Bank puts bucks on optical storage

By Thomas Hoffman
NEW YORK

■ Call Bankers Trust Co. a Windows shop. During the past few years, the financial services giant has replaced the bulk of its computer terminals with Microsoft Corp. Windows-ready PCs and is integrating most of its spreadsheets and other applications with Windows.

So it should come as no surprise that Bankers Trust recently decided to replace a microfiche-based archival storage system with a Windows-based software package, giving users access to historical report data with a Windows graphical user interface.

In the third quarter of 1992, the bank decided on StorFiche/2, a Windows-based software storage system from Microbank Software, Inc., also based in New York. According to Jeremy Keisman, vice president of global assets technology at Bankers Trust, the firm opted for StorFiche/2 over image-based systems because the software allows users not only to view and analyze report data but also to integrate it with existing applications. Other systems that Bankers Trust explored allowed users only to view images of archived reports.

"At the time we looked at it, StorFiche/2 was the only package with free-form text and character searches on reports. This was necessary for the kind of work we do, with multiple searches required often for dollar amounts," he said.

He added that the bank was ready to replace its microfiche and printed reports because these forms of record-keeping were expensive to maintain and space-consuming. By replacing these storage mediums with Storfiche/2, Keisman said, the bank expects to save money on the costs of producing microfiche, as well as on paper and research costs passed on to customers.

Bankers Trust plans to roll out the system to 90 users in its global assets division early this year. Eventually, StorFiche/2 will be used throughout the firm.

StorFiche/2, according to Keisman, can be integrated with other applications, which he said was a strong selling point. For example, Keisman said, the company can use StorFiche/2 to search a 200-page report for a specific dollar amount and find that figure within five seconds. That search had been considerably more time-consuming in the past using microfiche or printed reports.

Bankers Trust is using StorFiche/2 with a FileNet Corp. optical server. Historical reports are downloaded each day from an IBM 3090 Model 720 mainframe to the FileNet server, which stores reports on optical discs. The reports can be accessed through StorFiche/2 by Novell, Inc. NetWare local-area network users attached to the systems locally over an IBM Token Ring network and through wide-area network connections using Cisco Systems, Inc. routers over an Ethernet backbone.

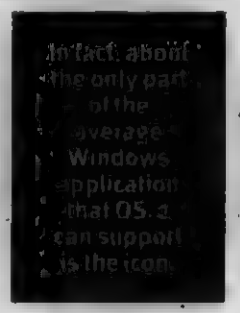
Keisman would not elaborate on anticipated cost savings from StorFiche/2 but said he expects the system to help Bankers Trust better serve its customers. "There will be tremendous efficiencies gained. By getting answers back to questions within seconds, it will help us support our customers that much better."

Gillin

CONTINUED FROM PAGE 39

away from making data on your hard disk about as plentiful as lake trout in the Gobi desert.

Installation of OS/2 is actually pretty straightforward and only takes about 45 minutes. By the time you've done it six or seven times, you should be an old hand at it. This is where OS/2 becomes a real "value." Most operating systems are installed only once and then put away for good. Not OS/2! Keep those floppies handy because you're going to need them again.



OK, now you've got OS/2 installed. Let's get to work enhancing your productivity. To demonstrate OS/2's multitasking, put a disk in drive A, click on "format" and then press Control-Escape to jump to another task.

Notice how the drive keeps formatting even as you work on something else! You can do this all day if you want. In fact, you'll probably have to while you wait for an OS/2 application to arrive.

Once you've got OS/2 up and running, you'll probably want to migrate your existing applications (helpful hint: first check to see if the "repartitioning" left a "shred" of data on your hard drive). You will find that OS/2 does a magnificent job of running your old character mode applications, even in a window. Move those suckers over and start multitasking.

You'll also notice that OS/2 has a little more difficulty migrating your Windows applications to its Workplace Shell.

In fact, about the only part of the average Windows application that OS/2 can support is the icon. Click on the icon and open your eyes to a wonderful new world of error messages with helpful suggestions such as "Cannot find AD-EXE.DLL" and "GPF at address 09872:10239487."

This is all part of OS/2's user-friendly interface and should not be confused with a really serious error message, which is preceded by a low gurgling sound and a dark black screen that advises you that "Your computer has stopped," a fact that would be obvious to the average garden slug.

Congratulations! You have discovered why IBM offers three months of free support with each $49 copy of OS/2. The first time OS/2 crashed, I quickly called IBM support, who assigned me a "problem number." I described the sequence leading my system to hang. He listened carefully, analyzed my problem and then offered this helpful piece of advice: "Hmmm?"

This is why IBM is the envy of the corporate world.

Gillin, who is executive editor of *Computerworld*, now has OS/2 up and running and actually likes it quite a lot.

[redacted]

Fax

BIT Software Corp. has announced BitFax/OCR for Windows.

The product has incorporated Caere Corp.'s Anyfont optical character recognition technology. According to the company, a PC can receive a fax, store it and convert it to text. When Microsoft Corp.'s Windows is started, a "receive fax" program is automatically loaded, enabling faxes to continue to be received while a spreadsheet application or word processor is in progress.

BitFax/OCR for Windows operates with 386 IBM PC or Personal System/2 compatibles and requires 4M bytes of memory and Windows 3.0 or higher.

The product costs $190.

➤*BIT Software*
47897 Fremont Blvd.
Fremont, Calif. 94538
(510) 490-9288

Ibex Technologies, Inc. has announced FactsLine for Windows.

The product is a full-featured interactive voice/fax solution and, according to the company, is the first and only Microsoft Corp. Windows-based product of its kind.

New features include a pop-up scripting feature and a simulation feature that gives users the ability to test an application using a mouse and screen, eliminating the need for a telephone.

Additional features include dated documents that automatically become inactive; full management reporting capabilities with a database-driven report generator; on-line reconfiguration and updating of applications, fax documents and voice announcements; and a visual voice editor.

FactsLine for Windows is priced at $6,500.

➤*Ibex Technologies*
550 Main St.
Placerville, Calif. 95667
(916) 621-4342

Peripherals

Disk Technologies Corp. has announced a new version of its RoadRunner series of external portable hard drives.

The RoadRunner Express takes advantage of the Enhanced Parallel Port located in many notebook computers, which allows the product to operate at approximately the same speed as an internal hard drive.

It has an average seek time of less than 17 msec, an 8M-bit/sec. data transfer rate and up to eight hours of battery life for portable applications, the company reported. RoadRunner Express weighs less than two pounds and is available in 60M-, 80M-, 120M-, 180M- and 210M-byte capacities.

Prices start at $795.

➤*Disk Technologies*
Suite 114
925 S. Semoran Blvd.
Winter Park, Fla. 32792
(407) 671-5500

Software application packages

Follow-Up Software Co. has introduced Version 6.0 of Follow-Up.

The tool was designed for users involved in sales who need to maximize productivity and require information to be readily available. Follow-Up gives laptops or PCs the ability to store and organize notes, contact names and files and perform calculations and word processing.

New leads and other types of information can be updated and then transferred to the field whenever needed, the company reported.

The standard version of Follow-Up costs $399.95, and the network version costs $995.

➤*Follow-Up Software*
2456 Lakeside Ave.
Cleveland, Ohio 44114
(216) 689-5788

Manzanita Software Systems has released BusinessWorks Accounting Systems for Microsoft Corp.'s Windows.

Features for the accounting software include multidepartment consolidations, multicompany consolidations, network capabilities, real-time processing and a three-year budget history.

Parameter-driven reporting as well as a sample chart of accounts for 17 different types of businesses are also included in the package.

All modules are available for $295 except for the System Manager, which costs $95, and the $395 Job Cost module.

➤*Manzanita Software Systems*
Suite 230
2130 Professional Drive
Roseville, Calif. 95661
(916) 781-2880

"If Lexmark is an indicator of the kind of innovation we can expect from an IBM spin-off, OS/2 users have much to look forward to...."

OS/2 Professional Magazine,
November 1992

"The LaserPrinter 10 is appropriately named. It is close to a perfect 10...."

Computer Reseller News,
February 3, 1992

"Lexmark offers the best combination of price and performance for printers used for desktop publishing."

Windows Magazine,
February 1992

"With the IBM LaserPrinter 6, Lexmark proudly comes into its own on the laser printer turf by paying special attention to paper handling and resolution quality. This workhorse prints on both delicate stationery and card stocks, and can deliver a jaw-dropping 600-by-600 dpi resolution."

ComputerLand Magazine,
April 1992

"The 4079 is a watershed color printer. The list of features, low pricing, solid warranty... all combine to make this a color inkjet printer against which others will be measured."

BIS Strategic Decisions,
October 1992

Now that you know what inspired our competition, here's what inspires us.

"The low prices and numerous features of these printers for the Mac make for an unbeatable deal, indeed."

BYTE Magazine,
July 1992

The response to IBM® desktop printers by Lexmark has been gratifying. Like the most recent "Editors' Choice" award from *PC Magazine* (11/24/92).

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David Coursey

Novell could learn from Apple

Why isn't Novell's NetWare easier to use? And, as long as I'm not making friends here, why doesn't Novell get out front in making networks significantly easier to build and administer? More specifically, if the folks in Utah are so smart, why isn't NetWare as easy to work with as AppleShare?

Yes, Big Red makes incremental changes all the time. But most are aimed at making NetWare more powerful rather than more easy, especially for part-time network administrators. And that's where the answer lies, I think.

Novell is a supporter of full employment for network administrators. That explains why even the simplest requests under NetWare — such as, "Where did you say those spreadsheets are stored?" — sometimes require an emergency call to the NetWare Gods. Adding users or setting up their machines? Not something I can do on NetWare, although it's something I do almost every day on a Macintosh network at my office.

Not a concern

Ease of use doesn't seem to matter much to Novell: While Macintosh is the computer for the rest of us, Novell has created its own secret order of Certified NetWare Engineers (CNE) and is doing everything possible not only to keep them working but to expand their ranks wherever possible. These CNEs are, in a sense, double agents inside Novell customer organizations. This is a page stolen from the *IBM Big Book of Account Control*, which not only created its own techie priesthood but managed to keep white-shirted IBMers employed at customer sites as well.

Because they are almost always NetWare-specific, CNEs have a strong interest in adding more NetWare servers. And because they often don't know anything else, it's hard to accuse them of deliberately working against their "real" — i.e., not Novell — employers' best interests.

Nevertheless, CNEs pose a threat to the advance of networked computing — at least if you're Microsoft, Apple, Banyan or anyone else with an arguably better idea. And lacking their own in-house proselytizers, other vendors are going to have a hard time breaking Novell's dominance.

Yet Novell obviously feels the warm breath of competition breathing down its neck. The company's supposed role in the Federal Trade Commission investigation of Microsoft and the

Coursey, *page 48*

System V gets a boost

A smoother road for Unix

By Maryfran Johnson and Michele Doetert

Out with Ma Bell. In with Novell.

There you have the New Year's resolution of Novell, Inc., with its proposed $350 million purchase of Unix System Laboratories, Inc. (USL) from AT&T — a simple change of ownership that is bound to have complex repercussions.

It is still too early to predict how control of the most widely used variant of Unix by an independent software company — instead of the telephone company — will shift the industry power base. But users anticipate a welcome boost in the corporate fortunes of the Unix System V operating system and Novell's NetWare.

> Novell's proposed acquisition of the Unix System V operating system bodes well for users who need smoother integration between Unix-based servers and PC LANs.

They also see the pair positioned now to present a credible alternative to Microsoft Corp.'s Windows NT operating system when it makes its midyear debut. Indeed, without the marketing savvy and distribution channel expertise of Novell, users and analysts agreed, Unix stood little chance as a serious competitor to NT on the desktop.

"The two major Unix companies — Hewlett-Packard and Sun Microsystems — aren't interested in selling software," said Jamie Lewis, an analyst at The Burton Group, a local-area network research firm in Salt Lake City. "The channel ubiquity of DOS and Windows is enormous, and Sun, HP, SCO [The Santa Cruz Operation] and USL were not pushing Unix in the channel so it could effectively compete for the desktop."

Changing that scenario and leveraging Unix's strengths as a server-based operating system will be up to Novell, with its roughly 65% share of the PC LAN marketplace. An estimated 12 million PCs were on LANs in 1991, with a projected 28 million expected by 1995, according to Forrester Research, Inc.

"The Novell channel can put together NetWare/Unix systems for businesses, and that just makes Unix much more accessible," said Lorie Mauklas, project leader at Hoechst Celanese Corp. in Bridgewater, N.J., which runs NetWare for more than 1,000 users in one division. "In large NetWare/Unix sites like ours, if Novell has control over USL, we can roll stuff together in purchasing contracts and work out better pricing structures for our business."

But users will also be watching Novell's treatment of the entire range of desktop operating systems it now serves. "They'll have to be vigorous in supporting Windows NT and OS/2 and all the other client types that are out there, or they'll worry a lot of people," Mauklas said.

Even before the merger is approved by USL shareholders and various regulatory agencies, USL and Novell already have their act together in the shape of UnixWare. This scalable 32-bit operating system, which integrates Unix System V Release 4.2 with Novell NetWare, began shipping Dec. 8 from Univel, Inc., the Novell/USL joint venture company formed in late 1991.

Unix, *page 48*

NCR regroups, makes plans for Cooperation

What's OS/2 server version coming to a quick end and its Unix implementation behind schedule, NCR's Cooperation environment now faces impatient customers and a marketing challenge from impressive workgroup packages from the likes of Lotus and Microsoft.

By Ellis Booker
DAYTON, OHIO

With 20/20 hindsight, NCR Corp. executives recently admitted that the company probably would have been better to back Unix rather than OS/2 servers when it introduced its strategic Cooperation software platform in January 1990.

"At the time, we believed OS/2 would be one of the two winners in the server [operating system] wars," said Keith Vozel, NCR's director of network and strategic product marketing. "We now believe that is no longer the case.... Unix is the clear winner."

Cooperation is the software glue behind NCR's ambitious Open Cooperative Computing Architecture. An object-oriented, networked computing environment, Cooperation is billed as a platform for bringing the robustness, security and consistency typically associated with centralized, host-based systems to a distributed, client/server environment.

But early backing of OS/2 delayed the implementation of a Unix server product, which was expected in April. Meanwhile, the patience of enthusiastic early Cooperation customers was stretched to the breaking point.

"It got to the point where my rollout to additional offices looked like it would have to be with OS/2," said Raymond L. Howell, assistant vice president of information management/commercial market segment at ITT Harford in Hartford, Conn.

Howell is pleased to report, however, that he has the beta-test Unix code in hand, and he said he thinks he can bring up two "Unix style" offices in February and March.

"I'm not really discouraged with the base product... only with getting this port in place," Howell said.

Sensitive to this reaction, NCR issued a second release of the OS/2 server software last month and said all future enhancements to Cooperation would be under the Unix implementation — dubbed Cooperation 2.1 — due out next month. In addition, during the past two months, NCR has made changes in the Cooperation marketing and development team.

"If they had to do it over again, obviously they would have gone with Unix first," said John Donovan, director of Groupware Services at WorkGroup Technologies, Inc. in Hampton, N.H.

A more serious problem, according to Donovan, is that Cooperation is now competing in a far wider market for groupware products that includes Lotus Development Corp.'s Notes and Microsoft Corp.'s Windows for Workgroups.

Unlike these packages, of course, Cooperation aims to tackle

Cooperation, *page 48*

From truck to customer in 20 minutes

Furniture retailer makes inventory available quicker with bar-coding system

By David A. Kelly
AVON, MASS.

Jordan's Furniture has succeeded where others have failed.

In the midst of a recessionary economy that has dealt heavy blows to the furniture industry — 1,500 furniture retailers have gone out of business in the U.S. during the last year alone — Jordan's has grown, in part because of its innovative use of new technology.

"Our computer system has allowed us to expand and grow in a controlled way. It has given us a real competitive advantage over other furniture stores," said Eliot Jordan, co-owner of the $70 million company.

Ready fast

For example, a computerized receiving system allows Jordan's three stores to make inventory available to customers just 20 minutes after it has been unloaded from delivery trucks. The system has reduced inventory errors by 90%, according to Patrick Malloy, Jordan's computer systems manager. In addition, Jordan's has gained an edge in customer service by maintaining five years of customer data on-line, Malloy said.

The center of Jordan's computing strategy is a Data General Corp. Aviion 6240 running Unix System V Release 4. About 200 DG terminals are sprinkled throughout Jordan's main store and warehouse and at its two sister stores in Waltham, Mass., and Nashua, N.H. The three stores are connected by Codex Corp. multiplexers and 56K bit dedicated lines with a backup line. Each department has its own direct line to the computer, which minimizes the risk of companywide problems.

The company's major software package is an Oracle Corp.-based furniture retail system from GE Retail in San Diego. Jordan's has been using the software since 1977.

ON SITE

Jordan's Furniture
Avon, Mass.

Challenge: To develop a system that will support controlled growth of the company.

Technology: DG Aviion 6240 running Unix and a retail furniture package based on an Oracle DBMS.

Benefits: Reduction in inventory errors, increased productivity, happier customers.

With more than 14 trucks and 1,200 pieces of furniture coming in each day, Jordan's needs a heavy-duty tracking system. Bar-coding the receiving system has enabled Jordan's to reduce human error dramatically and make inventory available more quickly.

Ready to move

The night before a truck comes in, the receiving staff prints out bar codes for the incoming merchandise. When the truck arrives, bar-code stickers are immediately placed on the furniture.

The codes are then scanned as furniture is received, stacked and stored in the warehouse, and the scanned information is uploaded to the DG host.

Salespeople can check the availability of stock by using terminals throughout the store. "We can tell [customers] exactly what we have in stock or when an item is coming in, and they can also see the price," Malloy said. "It gives them more confidence in us."

Using the new computer system, Jordan's can count inventory about 30 times a year. The process of counting and verifying inventory used to take a month and could shut down the warehouse for as long as five days. Now it is done in a week with no downtime.

While he could not chalk up a specific cost-saving figure to Jordan's computer investment, Chief Executive Officer Steven J. Gaskins said the company's early leap into high technology gave it a crucial edge. "When we put computers in in 1977, none of our competitors knew what a computer was."

Jordan's plans more changes for the coming year. By mid-1993 it hopes to install new radio frequency scanners to cut response time and mistakes, Malloy said.

Kelly is a free-lance writer based in Waltham, Mass.

Coursey

CONTINUED FROM PAGE 47

wave of nasty Windows for Workgroups rumors that no one seems able to track down point toward Novell's concern. The company's proposed $350 million bailout of Unix System Laboratories suggests that Big Red realizes DOS-based NetWare is nearing the end of its useful life enough to significantly overspend.

At the same time, Novell's appearance as "Guardian of Unix" is a mixed blessing. Known for cobbling together high-performance, if nonstandard, software, Novell is likely to drive open systems advocates to apoplexy.

One correspondent on a Unix forum wrote, "I can just see the new product. Windows for Workgroups on top of Unix using IPX/SPX instead of [LAN Manager]. There will be some initial confusion in the network standards area that will be ironed out by [Microsoft], making code for LAN Manager public domain and turning the lower network layers into a commodity item included with almost any product."

Is that what we have to look forward to? Perhaps, especially if Novell sees Unix as a shield against the onslaught of Windows NT.

Me, I'm telling friends to take a renewed look at Apple, especially later this spring when its Open Collaborative Environment (OCE) is scheduled to begin shipping.

The demonstrations I've seen look much the way networks operate in my dreams. Whether Apple can make those dreams come true is another story, but a head-to-head comparison of electronic mail on NetWare vs. OCE is enough to show where nightmares come from.

Coursey is editor of "P.C. Letter," a San Mateo, Calif.-based industry newsletter. He can be reached as PCLETTER on MCI Mail, DCOURSEY on AppleLink and 76711,23 on CompuServe.

A smoother Unix road

CONTINUED FROM PAGE 47

Unlike most newly minted operating systems, however, UnixWare has been getting high marks from early users and independent software vendors.

"Our development experience with UnixWare has been very good. It's a stable environment with a small kernel, so we can optimize our performance," said D. J. Loog, vice president of marketing at Applix, Inc., a Westboro, Mass., vendor of Unix office automation software. Applix plans to have its Asterx software available on UnixWare this month.

"It's a nice, very solid piece of work — not riddled with bugs," said Kevin Reilly, director of operations and technology at Hyatt Hotels Corp.'s technical center in Oakbrook Terrace, Ill., which uses high-end Unix servers to run applications accessed from terminals, PCs under DOS or Windows and other Unix servers.

The potential of a Novell/USL merger was good news in Reilly's view.

"Open systems usually means Unix to me, but more and more it has come to mean Novell as well," Reilly explained. "I see all of Hyatt's office automation running on Novell LANs, and suddenly I'm getting what I want: a wealth of software. My hope is that Novell provides a simple, inexpensive upgrade path for its existing NetWare servers."

Seamlessness

At Enron Gas Corp. in Houston, beta testing of UnixWare did prove its "seamless integration between NetWare and Unix," said LAN manager Jim Queen. "But I'm not interested in putting Unix on the desktop because the productivity applications are missing," he added. "Where can you find a good graphical word processor for Unix, for example?"

Answers to such questions must come from software developers motivated to write Unix applications for the desktop. Several analysts said Novell's ownership of Unix should lend it greater charm to the PC world, but virtually no one believes Microsoft is in danger of losing significant market-share there.

Yet other industry players are rooting for Novell as a counterbalance to Microsoft's domination.

"If there's one company that can convince all these companies to rally around and converge, it's Novell. That's what they've done for years: get everybody to connect," said Philippe Kahn, chief executive officer of Borland International, Inc. "In '93, I think Unix could become the server platform of choice on networked Intel machines."

NCR regroups Cooperation

CONTINUED FROM PAGE 47

enterprisewide, mission-critical applications formerly run on mainframes.

But even this apparent strength poses a marketing challenge because it means a Cooperation sale is more expensive, both in terms of up-front capital and organizational commitment from the buyer. And NCR is probably aware of the challenges that Lotus faced when customers objected to its initial Notes offering with a 200-node minimum for $62,000. Lotus eventually relented and allowed third parties to sell smaller, cheaper Notes packages.

These other products "have the advantage of allowing a bottom-up, pay-as-you-go implementation," Donovan said.

But Citibank NA, currently the largest of the handful of known Cooperation user sites, said it is still happy with its choice.

"I think Lotus' Notes and Windows for Workgroups are much more focused on communicating between people," said Gail Port, head of application development, adding that Cooperation "lends itself more to building mission-critical applications."

Citibank has 400 Cooperation users in six cities in production today and will add another 200 or so by the time its deployment is complete, the company said.

Port said she has been anxious to see the Unix server version of Cooperation appear and will migrate to it when it arrives.

"But frankly," she said, "if it had been available six months ago, we probably wouldn't have been able to take advantage of it."

Intel ships visual net manager

By Michele Dostert
SANTA CLARA, CALIF.

■ Intel Corp. has begun shipping LANDesk Manager, an integrated set of tools designed to provide a single, Windows-based visual interface for the administration and management of local-area networks running Novell, Inc.'s NetWare.

"The LANDesk Manager is the Veg-O-Matic of network management: a dozen tools in one package. It gets us a lot closer to the ideal of single-screen management of networks," said David Strom, a LAN consultant in Port Washington, N.Y.

Intel's new product, which is shipping now at a price of $995 per server, lets the operator remotely view, diagnose and troubleshoot a file server, query for system information and make changes to the system. An application monitoring component provides specific information useful for server load balancing, performance tuning, capacity planning and accounting management.

LANDesk Manager also contains a traffic monitoring tool that enables performance tuning and fault resolution by graphically displaying a workstation-specific and network-wide summary of packet traffic and error rates, utilization and protocol statistics. Inventory management and virus protection are also included.

"We designed LANDesk Manager for the person who actually has to administer all those servers, users and applications on all those LANs out there and needs to do it from one screen — not five different ones," said Ed Ekstrom, business unit manager at Intel's Network Products Division in Provo, Utah.

> "The LANDesk Manager is the Veg-O-Matic of network management: a dozen tools in one package."
> — *David Strom, LAN consultant*

Beta-test users said they were impressed by the LANDesk Manager. Kelly Russell, a state consultant at the Louisiana Office of Public Health in New Orleans, said, "Consolidating all these tools under one interface makes the network so much easier to manage. We support 137 LANs around the state, and LANDesk Manager's automatic inventory tool can make our help desk much more efficient. We can discover the user's environment just by pointing and clicking."

Intel's LANDesk Manager can currently report, via Intel's SNMP Services product, to Simple Network Management Protocol (SNMP)-based network management systems. Intel said it will add support for emerging network management standards, such as the Open Systems Interconnect Common Management Information Protocol, the Desktop Management Task Force's Desktop Management Interface and the Open Software Foundation's Distributed Management Environment.

According to Ekstrom, Intel also plans to support other LAN operating systems besides NetWare. "We'll probably develop for [Microsoft Corp.'s] LAN Manager/NT platform next and then for [Banyan Systems, Inc.'s] Vines; it will depend on customer demand."

Separately, Intel also announced two new Ethernet LAN adapter cards: the EtherExpress FlashC LAN Adapter, with on-board Intel flash memory, and the EtherExpress 16C LAN Adapter, which can be upgraded with flash memory.

The new cards, which will be available next month, automatically poll the host PC for hardware component information and store it in flash memory.

The information can then be read by the LANDesk Manager, other network management products and (via Intel's SNMP Services software) SNMP consoles.

Grass Valley, Calif. 95949
(916) 268-3691

Storage

Maximum Storage, Inc. has announced Cachet, a caching optical disc subsystem.

Cachet is compatible with PCs running DOS. The product unites a fast Small Computer Systems Interface (SCSI)-2 interface, an International Organization for Standardization 128M-byte optical disc drive and proprietary caching operating software.

Cachet's caching operating software, OptoCache, is a least recently used caching system that is automatically configured during installation. However, options such as real or extended memory and a "write through" option for power-failure tolerant systems are provided for customization.

The internal-mount Cachet System 6-INT costs $2,065; the external-mount Cachet System 6-EXT costs $2,195.

➤ *Maximum Storage*
5026 Centennial Blvd.
Colorado Springs, Colo. 80919
(719) 531-8888

Unison Information Systems Ltd. has introduced the Opti/Max Jukebox Series.

According to the company, the series consists of a high-performance rewritable optical disc library that offers storage capacities from 10.4G bytes to 100G bytes.

Unison's proprietary memory cache technology is incorporated within the series, producing 5.5-msec access time. The series operates over any network running Network File System.

The 10.4G-byte version of the Opti/Max Jukebox Series is priced from $15,000.

➤ *Unison Information Systems*
21 Walsh Way
Framingham, Mass. 01701
(508) 879-3200

Storage Dimensions has introduced LANStor 2Fast, a high-capacity fast Small Computer Systems Interface-2 storage subsystem.

The product is based on a 5 ¼-in. form factor 2.8G-byte disk drive.

LANStor 2Fast was designed for Versions 3.11 and 4.0 of Novell, Inc.'s NetWare and is available in external configurations that include single, dual and four-drive subsystems, producing from 2.85G to 11.4G bytes of high-performance storage in a single enclosure and up to almost 80G bytes on a server, the company reported.

Prices range from $11,080 to $41,610.

➤ *Storage Dimensions*
1656 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 954-0710

Unix

Demax Software has announced SecureMax 3.0 for the Unix environment.

SecureMax 3.0 is a distributed application that supports centralized security administration of an enterprisewide Unix security environment, according to the company.

This release features a new console designed for Hewlett-Packard Co.'s HP/UX operating system that offers users enhanced flexibility in executing security policies across the network and providing more management options. A new data collecting agent for the IBM AIX environment is also included.

Prices for Unix clients range from $6,000 to $20,000, while agent prices range from $125 to $1,500.

➤ *Demax Software*
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Workgroup software applications

The August Corp. has released FrontLine 3.0 sales and marketing automation software.

A revamped common user access interface with mouse support, improved connectivity with client/server SQL databases and improved query speed and indexing are among FrontLine 3.0's features, the company reported.

Prices start at $1,295 for a single-user system and range to $50,000 for a multinetwork corporate development license.

➤ *August*
10593 Oak Drive

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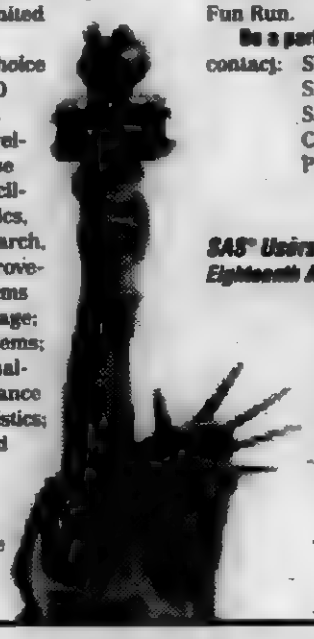

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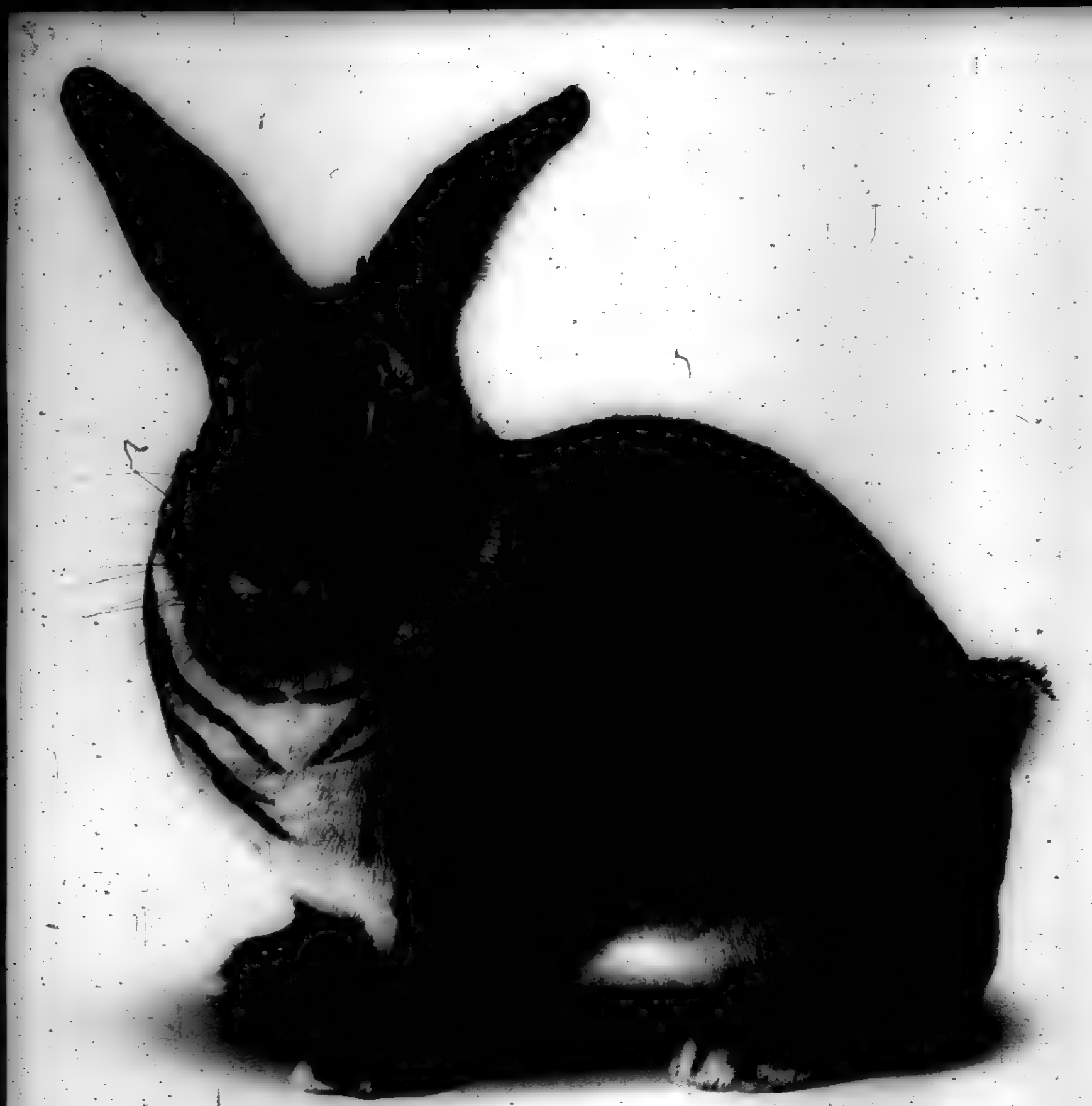

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VisiSoft aims for NT management

By Elisabeth Horwitt
ATLANTA

Armed with its first round of venture capital funding, VisiSoft, Inc. is preparing to mount an aggressive assault on the market for managing Microsoft Corp. networked computing environments. A key introduction slated for the second quarter is a Microsoft Windows NT-based network management system.

VisiSoft's current product, VisiNet, is a Windows 3.0-based system for monitoring usage levels on local-area network systems.

Priced between $1,995 and $2,495, VisiNet is said to manage client/server systems that are based on NetBIOS, Microsoft's LAN Manager, Novell, Inc.'s NetWare and Digital Equipment Corp.'s Pathworks, as well as devices that support Simple Network Management Protocol.

The product monitors networks in real time and collects information about CPU and disk use levels, traffic levels, and software, hardware and file configurations, VisiSoft spokesman Albert McCabe said.

Multiple monitors

One of VisiNet's more unusual features is the ability to periodically monitor different aspects of the same device — for example, a workstation's CPU, network port, power supply and operating system, McCabe added.

VisiNet can be programmed to check the status of each component at different intervals. For instance, it can monitor the power supply once a day and CPU use levels every few minutes.

An inventory module makes use of an autodiscovery feature to automatically update the configurations on various networked systems, McCabe said.

VisiSoft has had a copy of Windows NT in-house for about a year, McCabe said. One of the advantages the upcoming NT-based VisiNet will have is the ability to support multitasking, multithreading applications, he added.

VisiNet stacks

Release date: Around second quarter.

Systems supported: NetWare, Pathworks, NetBIOS, SNMP, LAN Manager, Mips machines.

Key features: Simultaneous polling of multiple systems, types of statistics.

VisiNet development for apps: NT-based network management; LAN-based software distribution; OS/2 Presentation Manager-based GUI.

One at a time

Right now, the network management system must query each device in turn and wait for a reply before going on to the next one, McCabe said.

"Even on NetWare or Windows, your whole system freezes up when it's talking to the network; that's not true of NT," which can handle multiple conversations with the network at once, a VisiSoft spokesman said.

The NT-based VisiNet will be able to manage all of the systems currently supported by the Windows-based VisiNet, in addition to Mips Technologies, Inc. machines, according to McCabe.

VisiSoft envisions smaller user sites using the Windows-based VisiNet system, which could report key information about their sites to a central, NT-based system that will be designed "for power users," he added.

Claris swaps routers

Replaces Mac IICX with high-end device from Coral

By Joanie M. Wexler
SANTA CLARA, CALIF.

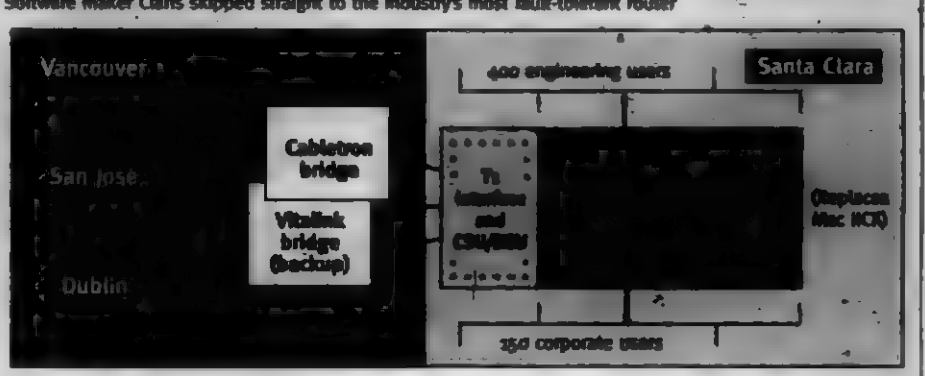
■ The lightning-fast communication afforded by today's local- and wide-area networks is now at the core of many companies' ability to deliver products to market quickly and fend off competition.

Recognizing this growing reliance on networks, information systems professionals at firms such as Claris Corp. are investing in heavy-duty, redundant internetworking equipment to make sure IS never becomes the organization's Achilles' heel.

The reason for the Claris leap: "It would be the kiss of death for the business if the network were unavailable — or even for the engineers to perceive that IS is the problem," said Ken Roux, telecommunications/network manager at Claris. "If they can't hit their schedules, you don't want it to be because of IS."

Roux said he anticipates the Coral switch to safeguard against this scenario because he purchased redundancy on every component and because of the device's nonblocking architecture. The nonblocking nature of the Coral backplane, across which multiple networks exchange information, means that attached networks do not contend for bandwidth.

Software maker Claris skipped straight to the industry's most fault-tolerant router



Clif Grant: Stephanie Faucher

Claris, the software subsidiary of Apple Computer, Inc., two months ago made a drastic shift from using Macintosh IICXs as AppleTalk routers between Ethernet backbones to installing a high-end Coral Network Corp. Backbone Xpress.

The gear from Coral, a start-up in Marlboro, Mass., is to date the industry's most fault-tolerant internetworking device and the most expensive, costing $55,000 to $65,000 for an average configuration.

Rather, native LAN-speed circuits are nailed up to guarantee, say, a full 10M bit/sec. Ethernet link in either direction.

The Macintosh IICXs routed AppleTalk packets at just 1.2M bit/sec., and "we were starting to lose packets. The router would just blow out, and we would have to reboot," Roux explained.

Until recently, Claris routed AppleTalk packets only between two Ethernet backbones: one supporting engineering and the other running corporate applications. However, when engineering developed a need to tap into corporate's Digital Equipment Corp. VAXcluster 8530 and some new Novell, Inc. servers for electronic mail and access to common databases, the Macintosh IICX routers started to run out of gas.

Not only were the speeds no longer sufficient, but the only protocols the Macintosh routes are AppleTalk, and Claris now needed DECnet and IPX support.

Today, the Coral switch in Claris' headquarters moves multiple protocols at native LAN speeds between backbones. The device's combined T1 interface and channel service unit/data service unit links headquarters to engineering sites in Dublin; Vancouver, Wash.; and San Jose, Calif.; at 56K and 64K bit/sec. Claris recycled its Cabletron Systems, Inc. bridges

Claris, *page 58*

ON SITE

Mobil Oil
Dallas

Challenge: To share information among far-flung staff members.

Technology: WANs and Unix-based minicomputers.

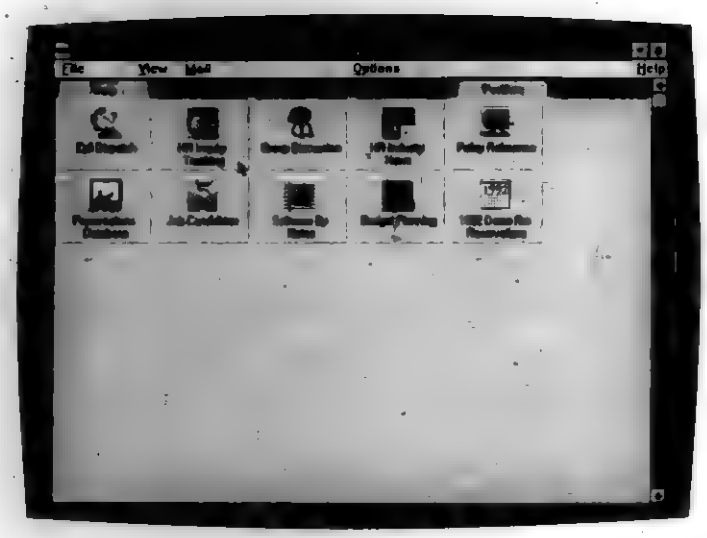
Mobil nets unite staff

By Mark Halper
DALLAS

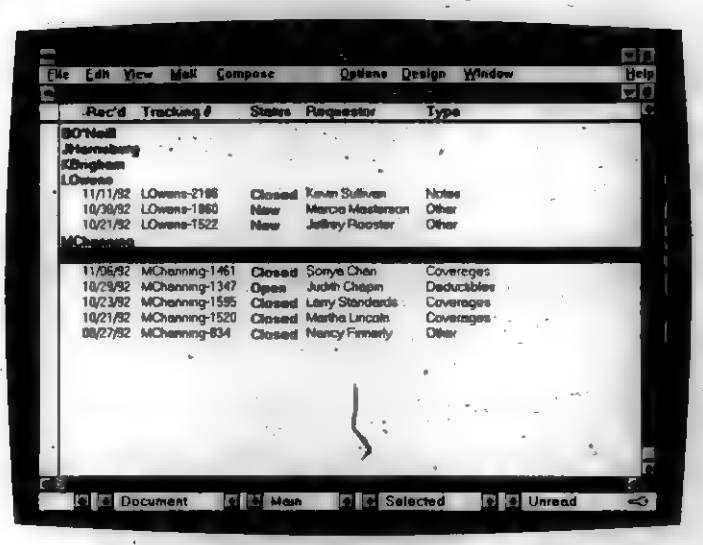
If Mobil Oil Corp. wanted to determine whether a sandstone deposit off the coast of Nigeria merited drilling oil wells, it just might call on some of its engineers in Canada, Australia, Dallas or Singapore.

Having implemented sweeping staff reductions during the last decade, Mobil has installed a series of minicomputer-based local- and wide-area networks that permit its staff in one corner of the world to share research and analysis with another that may not have available personnel or resources to do the job.

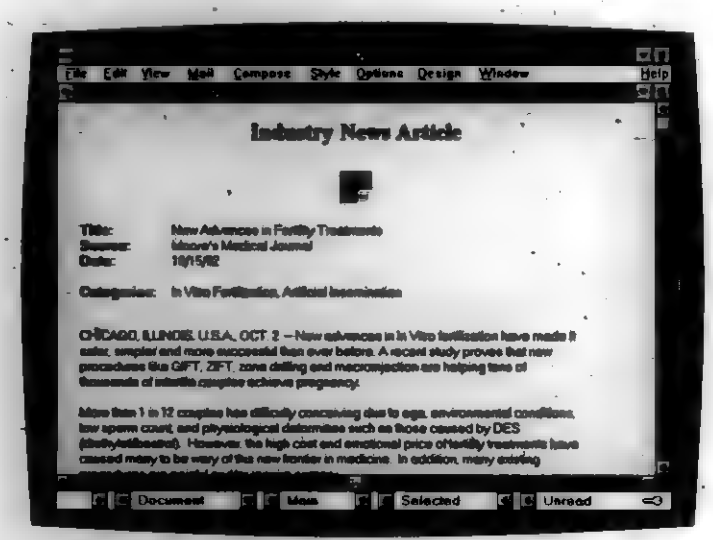
Mobil, *page 54*



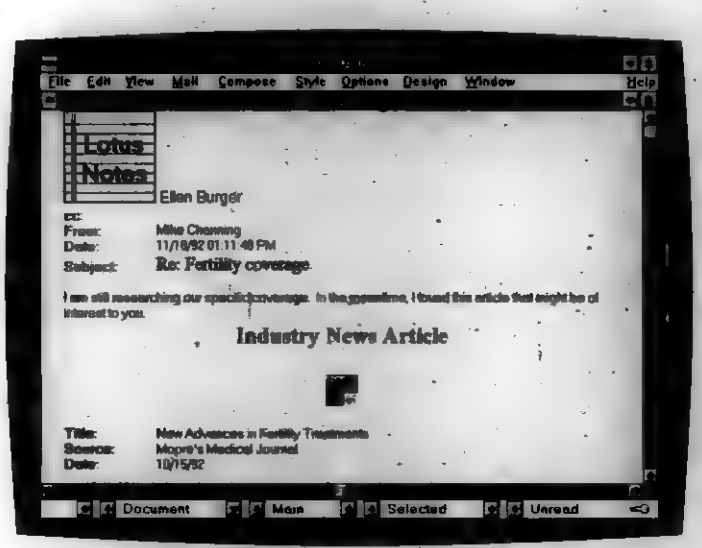
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, these are the ones he uses most frequently. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the HR INQUIRY TRACKING icon.



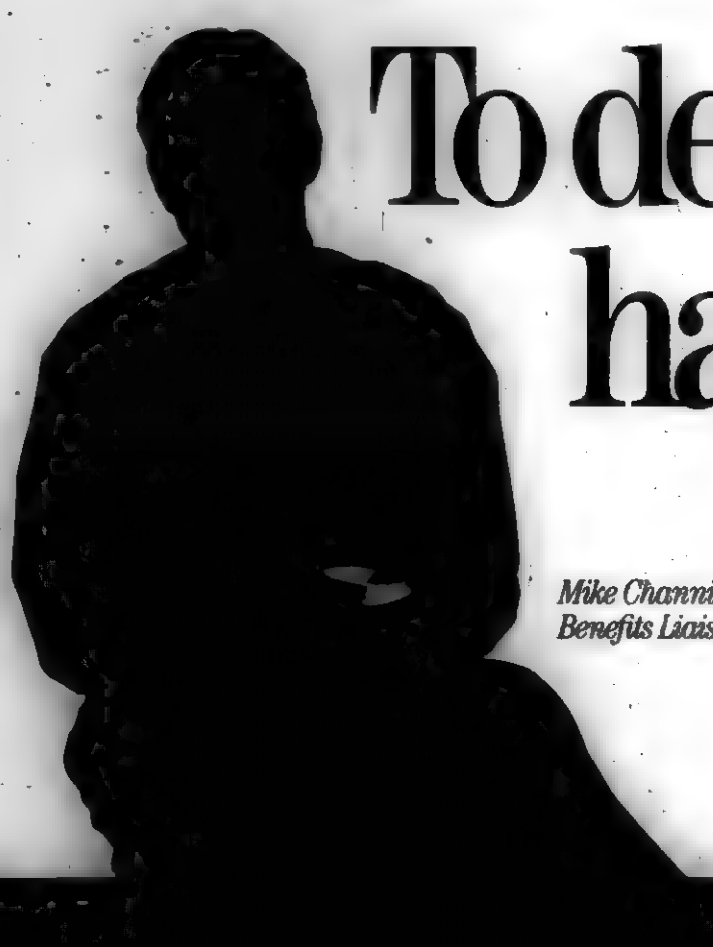
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note and forwards this document directly to Ellen. That done, he gets himself a cup of coffee.



To demonstrate th had to make an

Mike Channing
Benefits Liaison

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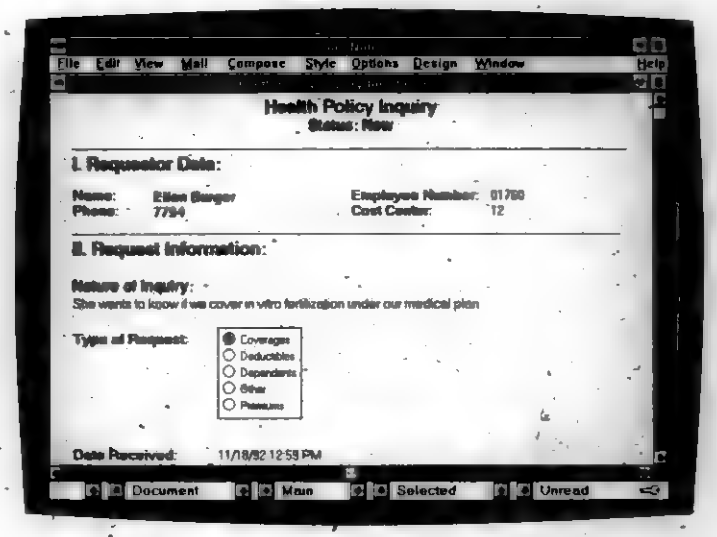
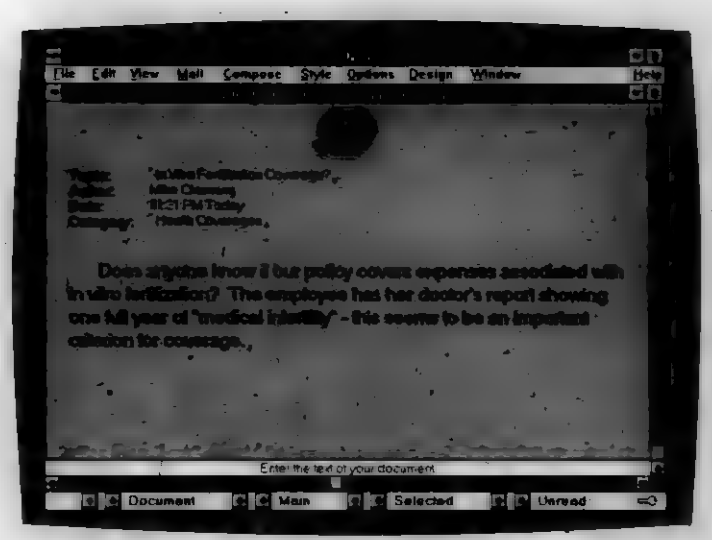
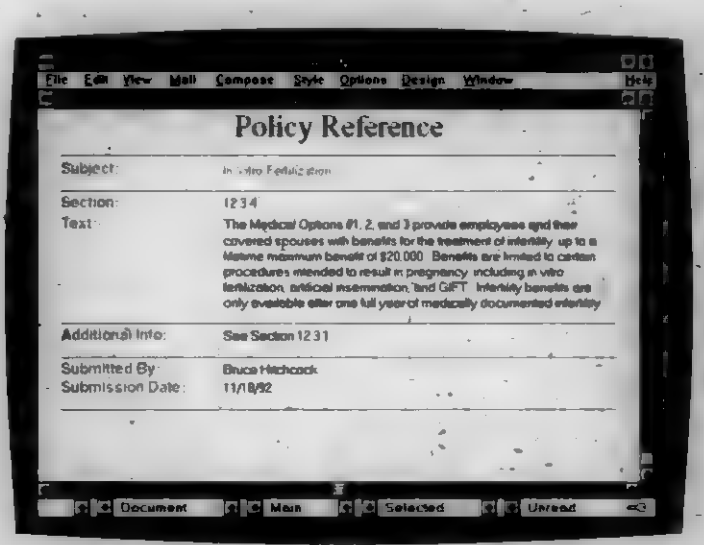


3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.

7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

Watch how Notes organizes information so it's easy for Mike to get the answers he needs. How effortlessly he taps his workgroup's knowledge. How quickly he accesses conventional references. Now you can see why people who have Notes build their work around it. And why the companies that have installed Notes have seen as much as a 400% return on their investment.*

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Lotus Notes

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Mobil unites staff

CONTINUED FROM PAGE 51

"We can't always afford to move people to a problem," noted Eric Dion, technical team leader at Mobil's exploration operations. "We need to be able to bring technical expertise to solve a problem irrespective of where people and problems are located."

The cornerstone of the $5 million Mobil system is Hewlett-Packard Co.'s HP 9000 minicomputer.

Mobil is in the process of installing the Unix multiuser systems as servers at 11 sites around the globe. The servers feed nearly 1,000 PC and workstation users engaged in operations ranging from word processing and spreadsheet accounting to seismic and chemical analysis.

The HP system alters Mobil's technology landscape twice: It replaces an IBM mainframe-based Professional Office System (Profs) electronic-mail system with HP Open Mail, and it supplants a series of Digital Equipment Corp. VAX systems that the company had used for sharing technical information in a more rigid manner than the open HP system permits.

The VAX phaseout is a corporatewide effort that parallels Mobil's move from the VMS operating system to open systems, and it affects several operations in addition to the exploration group, Dion said.

The company is phasing out the VAX system that has been serving its geophysicists, geologists and other technical staff members but is keeping its IBM mainframe for other company operations outside the exploration unit, according to Dion.

Dion recalled that in the IBM and DEC environments, "We did not have the computing tools necessary to allow our exploration team to work together closely. We could not depend on peer-to-peer communications."

Although the VAXs permitted intercontinental users to swap technical data and diagrams, the operations were not taking place in real time, he explained.

With the HP system, a Mobil scientist drawing a diagram or performing an analysis in say, Indonesia, can send real-time renderings to his or her counterpart in Norway, Dion said.

Many of the PCs are already installed, as Mobil purchased them in recent years for uses other than for the HP system. Mobil is outfitting them with HP's New Wave operating environment sitting on top of Microsoft Corp.'s Windows operating environment. Mobil decided to add a New Wave layer for enhanced object orientation and file folder capabilities, Dion said.

The company is upgrading any sub-386 level PCs to 486s, a process that affects fewer than 20% of the division's PCs, he noted.

Users' choice

Mobil gave its users a choice of PCs or workstations or both. According to Dion, about 80% chose PCs and fewer than 10% chose both. The workstation users have jobs that are heavily technically oriented, while PC users perform a combination of office automation and scientific tasks, he said.

With assistance from HP, Mobil is tying together PCs through a Novell, Inc. LAN and linking workstations via Transmission Control Protocol/Internet Protocol.

According to Dion, Mobil has selected a number of applications that have been ported to both systems, and users are able to swap data across PC and workstation platforms.

Mobil is installing the systems in two phases. It expects to have 380 PCs and workstations tied into the HP servers by March. It will hook the remaining 500 within two years after that, Dion said.

The Key to Business

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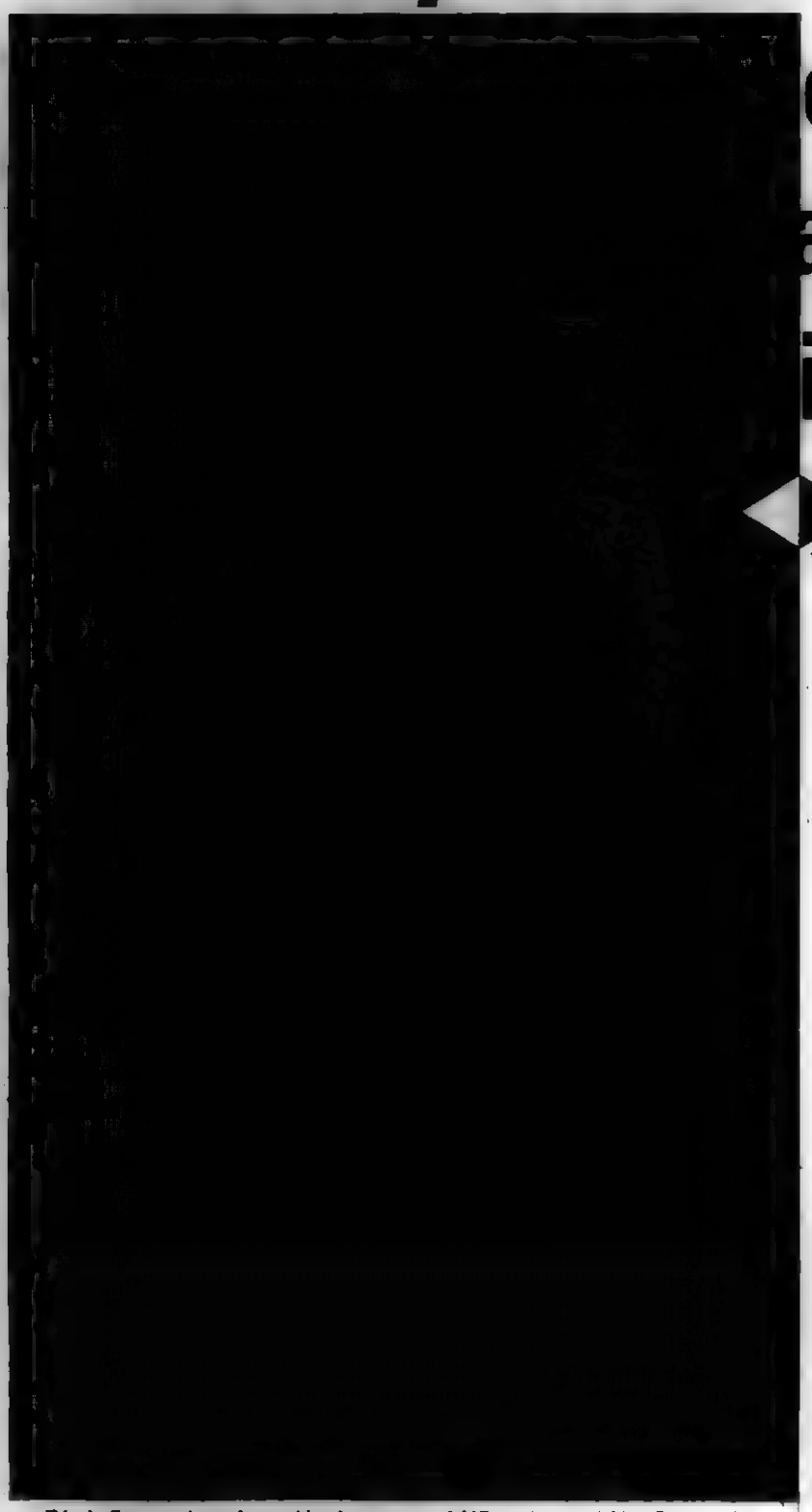

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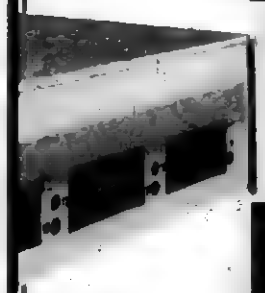

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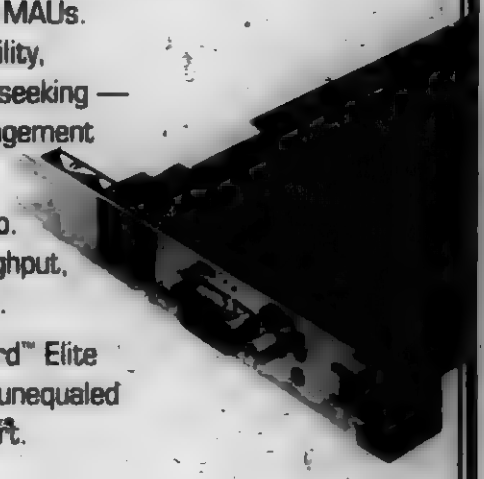

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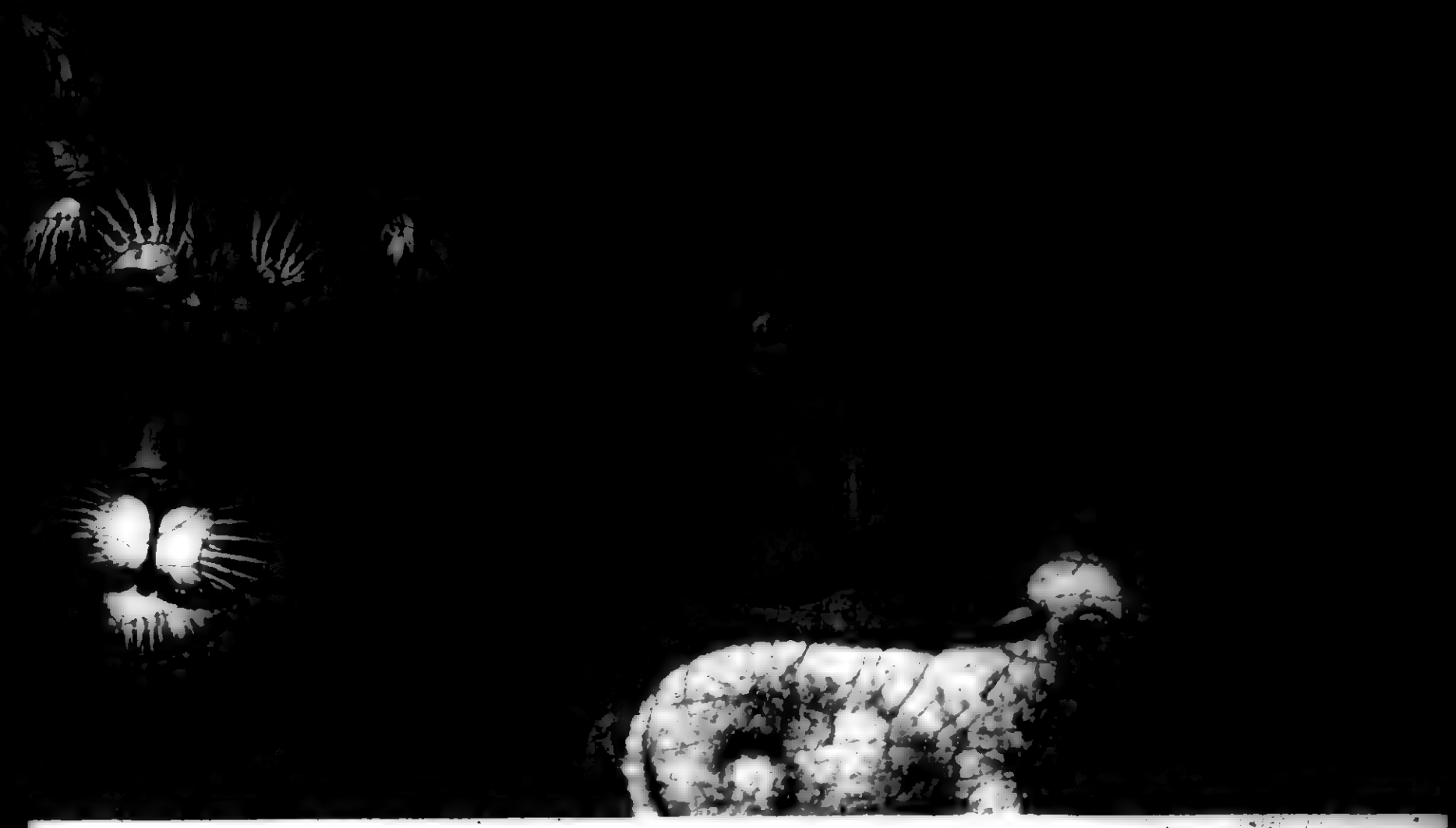

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IBM

Software AG extends VTAM dial-up access

By Gary H. Anthes
RESTON, VA.

Software AG of North America, Inc. announced that it will ship this quarter a version of its Net-Pass software, which allows remote PCs with dial-up connections to open mainframe VTAM sessions.

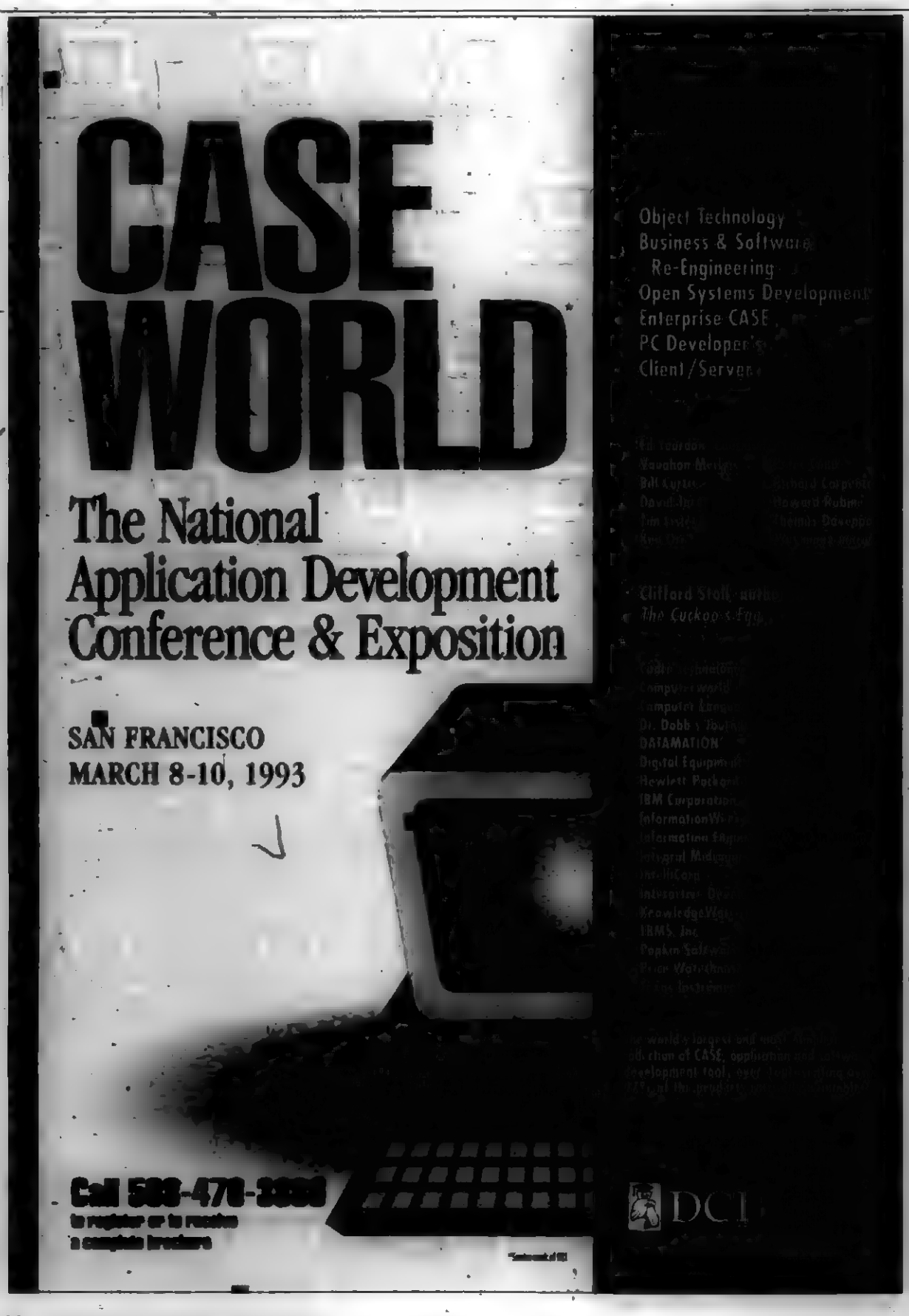
The tool allows users to toggle between mainframe applications without logging off and back on.

Version 3.1 of Net-Pass, or Network Parallel Application Sessions System, provides access to applications developed in a number of major programming languages running under teleprocessing systems in VTAM environments such as CICS, TSO, IMS/DC and COM-PLETE. The product can "hot key" between applications running in separate partitions or on separate machines, according to Joe Abusamra, product marketing manager.

Abusamra said the product will be used by systems and applications programmers and operations personnel as a productivity enhancer. For example, he said end users can also use it to move easily between an order-entry system, an inventory application and electronic mail. "If you have enterprisewide computing and you have systems around the world, as long as they are tied together you can hot key between them, share data and so forth," he said.

Mainframe-based Net-Pass provides asynchronous 3270 support and requires the use of Software AG's Entire Connection terminal emulation and file transfer software running on a PC.

Net-Pass will be available for MVS, MVS/XA and MVS/ESA this quarter and for VSE, VM/CCS and ACF/VTAM sometime in the future, the company said. Pricing begins at $12,600.



Claris swaps routers

CONTINUED FROM PAGE 54

out to the remote sites as primary internetworking devices in those locations, backed up by some recycled Vitalink bridges for redundancy (see diagram page 51).

While Roux said the Claris network previously experienced just 2% to 3% downtime — "below the industry average" — even that became unacceptable "as we found ourselves relying on the network to develop our product."

The firm feared remote engineers being isolated from those at headquarters, which would slow down development time, he said. "The faster you can get tested, proven product out there, that's direct income into your coffers," and the network has become a major vehicle for that, Roux said.

In a time of economic uncertainty for many companies and their computer products vendors, Roux shrugged off the fact that Coral is a relatively new player that experienced a couple of rocky years with management shifts, product redesigns and scramblings for refinancing.

"I'm not sure you can go by the longevity or bigness of the vendor anymore," Roux said. "Coral seems to have solved its problems. I look at what they're doing today, and they're doing the right things. I mean, IBM is going to lay off 24,000 people."

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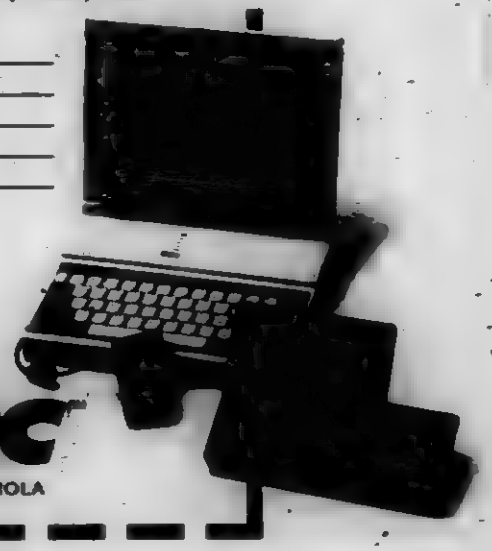

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In Brief

Networld to change hands

The biannual Networld show — playing in Boston this week — is due to change hands in 1994 when **Bruno Blenheim, Inc.**'s exclusive license agreement with **Novell, Inc.** lapses. However, the ultimate owner of the highly popular local-area network conference remains unclear. Bruno Blenheim said it will continue to operate essentially the same show in 1994 under the name Networks Expo. The firm emphasized it still owns the essential property, including "the venue contracts, the database of attendees compiled over the years" and the goodwill attached.

Meanwhile, Novell has licensed the rights to Networld to **Interop, Inc.**, which said it plans to put on a combined Interop/Networld show.

LAN technician test debuts

Lanop Corp. has introduced a Certified Network Technician Program that is said to test whether LAN technicians can implement the correct procedures for installing and configuring Novell LANs. In order to be certified by the program, a manager must perform a series of hands-on network procedures, such as installing NetWare 2.1x and 3.1x, installing and configuring a Token Ring LAN, setting up a mirrored drive configuration and debugging a complex LAN that has been "bugged" with an assortment of hardware and software, LAN and PC problems, Lanop said.

Longest LAN link announced

Cray Research, Inc. and **Network Systems Corp.** recently announced that they put together the world's longest distance LAN link: a 1G bit/sec. connection over a distance of 26.9 miles. The link, which was made via a 1.2G bit/sec. fiber-optic service provided by **US West**, made use of a Network Systems PS-32 High Performance Parallel Interface (HIPPI) switch and HIPPI extenders from **Broadband Communications Products, Inc.** in Melbourne, Fla. HIPPI is a standardized channel that can carry up to 800M bit/sec.

ISDN compatibility update

Fujitsu Network Switching of America, Inc. is making available cartridges that update its digital telephone sets and terminal adapters to National Integrated Services Digital Network (ISDN)-1 compatibility. The cartridges are being offered free to Fujitsu's ISDN terminal customers until June 30. National ISDN-1 is a recently completed standard for ensuring interoperability across multivendor, ISDN-based switches and equipment.

Ultra joins HP program

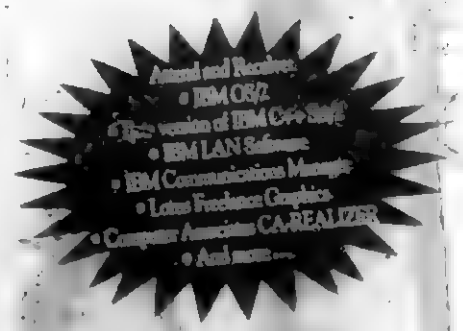
Ultra Network Technologies, Inc. has joined **Hewlett-Packard Co.**'s Workstation Interface Program in order to work jointly with HP on high-speed connections for HP Apollo 9000 Series 700 workstations.

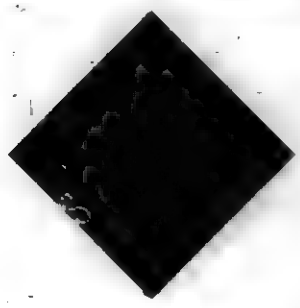
ISDN implementation aid

Network managers looking for tips on how or whether to implement ISDN might take a look at *Sensible ISDN Data Applications*, by Jeff Neil Fritz, West Virginia University Press, 1992. Fritz is a data communications analyst at the university, and he has had extensive hands-on experience implementing ISDN. The book is priced at $29.95. To order, call (304) 293-5267.

24-hour support center debuts

Syntrex Technologies, Inc. has established a network management and support center through which it will provide remote management of customers' networks 24 hours a day, the **Phoenix Technologies, Inc.** subsidiary said.





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But then, nobody else can back up more than 3MB per minute on an AT. Or up to 10MB per minute on a 386.

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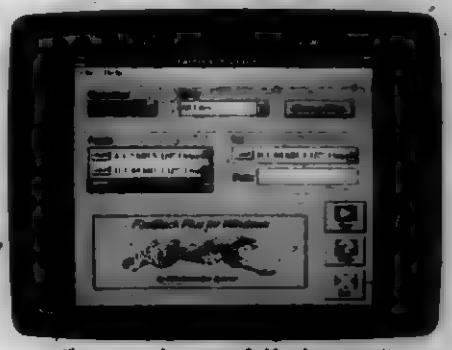

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And tell everyone to stand back.

*Scheduling templates included in DOS, Windows and Network versions.

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The Power Of Information Is At Hand.

Distributed app reduces customer response time

By Johanna Ambrosio

Customer service has been re-energized at Wisconsin Power & Light Co. by a distributed application that has cut response time to customers from minutes down to seconds.

"Our goal was to answer 80% of the calls in three rings, which is about 20 seconds," said Dennis Vickers, director of information planning and operations at the Madison, Wis.-based concern. "Before, in some cases, customers were hanging on for 15 minutes. That doesn't happen anymore."

For the month of October, the latest for which statistics are available, customer service representatives achieved the 20-second goal 79% of the time, Vickers said.

Along the way, the utility also implemented a local-area network backup system for its mainframe-based customer information application.

The customer service center, opened last December, is in Janesville, 40 miles away from the corporate data center in Madison, where an IBM 3090-300E mainframe is housed. Employees, mostly part-timers, use IBM Personal System/2s connected to the mainframe via IBM's LAN Server software to access an application residing on the host's 40G-byte IMS database management system. An automatic call distribution system parcels out phone calls to available operators.

Dennis Vickers: *Response time critical*

ON SITE

Wisconsin Power & Light Co.
Madison, Wis.

Challenge: To speed response time for customer calls.

Technology: A LAN works in concert with a mainframe to help distribute the call load.

Customers call in with problems ranging from emergency power outages to billing questions and change-of-address requests. Employees can access a customer file on the mainframe, answer questions, issue a work order and update the host file.

The center handles about a half-million

Distributed, *page 64*

Server arena crowded

PCs, minicomputers take aim at superserver market

By Kim S. Nash

As multiprocessing chips increasingly enable PCs to elbow into superserver turf, minicomputer makers are at the same time repositioning their proprietary machines as servers. Choices abound, but prices for such high-performance boxes are still a sticking point.

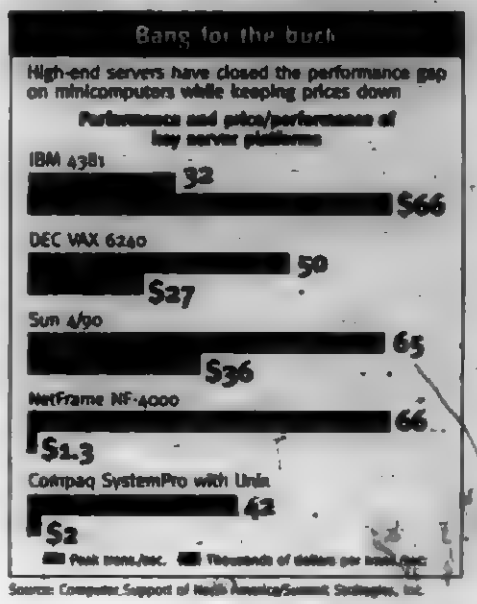
For now, users have to balance cost with needs such as fault tolerance and high availability of data, according to a recent report from Summit Strategies, Inc., a consulting firm in Boston. The report, "Capitalizing on the Collision of Supermicros and Proprietary Minis," outlined the positioning of several vendors and how their products overlap.

For example, companies such as NetFrame Systems, Inc. and Tricord Systems, Inc. have so far targeted users who want to consolidate the functions of a handful of PCs. Meanwhile, PC players including Dell Computer Corp., IBM and Compaq Computer Corp. have taken a chunk out of that pie with high-end PC servers.

A key challenge for PC companies, however, is providing the network and client/server support users now demand, said Tom Kucharvy, president of Summit Strategies.

Service and price are dictating the pace of Montana Power Co.'s migration off Prime Computer, Inc. minicomputers. The Butte, Mont., utility is slowly moving applications from two of six proprietary Prime boxes to a combination of Unix machines and PC servers. Superservers were considered but "were just too pricey for us," according to Dan Olsen, lead system programmer.

Montana Power has moved some database and spreadsheet applications from a Prime 6450 minicomputer to local-area networks centered around IBM Personal System/2s. A standard server cost the company about $10,000 while an entry-level superserver was approximately $65,000, Olsen said. "It has more performance, but we weren't able to justify that expense," he explained.



Source: Computer Support of North America/Summit Strategies, Inc.

The company is also shunting off engineering and other compute-intensive programs from a Prime 6450 to a DECstation 5000 from Digital Equipment Corp., while generic applications such as databases and spreadsheets are destined for IBM RISC System/6000s.

Bob Griffin, a vice president at Bank of New York, said he is "interested" in multiprocessing servers but that he will not make a move from the IBM 3090 mainframe world while the software to run on multiprocessing servers remains elusive. "We're not really doing production processing on LANs or PCs right now, and that probably won't change for the next year or so," Griffin said.

TransAmerica Corp. bought an entry-level superserver from NetFrame because of its "guaranteed data integrity and high reliability," according to Cathy Daley, information systems manager.

The San Francisco-based bank runs a mission-critical human resources application on NetFrame's NF200ES, a 486DX-based multiprocessing box with built-in fault-tolerance features designed for small networks. The machine has a combination of power and reliability that "you can't get anywhere else [and] for less than the price of a PC server," Daley said.

Chevron Canada Ltd., a Vancouver, B.C.-based sales and distribution arm of Chevron Corp., tested several servers before settling on two Model 290s from Parallan Computer, Inc. Among the contenders were Compaq's SystemPro, a NetFrame server, Tricord's PowerFrame and systems from IBM and DEC.

Security Toolkit/Unix Version 2.0 debuts

By Melinda-Carol Ballou
ROCKVILLE, MD.

Raxco Software, Inc. released a new version of a security assessment tool designed to run simultaneously on multiple Unix systems while maintaining a database of file attributes to gain security information about the systems.

Security Toolkit/Unix (STK) Version 2.0 automates security checks and helps ensure proper administration across platforms by assessing changes that occur to the system and how it is configured, officials said.

"The most significant thing about the new release is that it is client/server. For us this means that you can run STK from one machine and have it run on other machines on the network," said Doug Conorich, Unix product manager at Raxco. "You can centralize all the reports on one machine and update baselines, for instance."

Raxco plans to offer support for STK security across VMS and Unix platforms by the end of 1993, Conorich said.

Version 2.0 also features a command line interface that enables users to run STK from a script file as opposed to merely via a graphical user interface.

"We started out with ease of use, but there are a lot of people out there who wanted the command line and the ability to run the program automatically at certain times, for instance," Conorich said.

Expanded reports

Reporting improvements include sorted output, extended data and three report formats: short, medium and long. The longer reports explain detected problems — why they are a security concern and how the user should correct the problem, company officials said.

Version 2.0 also offers "Summary" options that let users view the problems found by each security test and the time of each test on a single screen, the officials added. Test results can thereby be consolidated into one summary from an entire network, they said. The results can also be formatted and sorted when viewing the test results, not during runtime, for easier analysis, the officials added.

STK Version 2.0 is shipping now and is priced from $582 to $11,842 on Unix workstations.

Users gain benefits of parallel processing

By Elisabeth Horwitt
BROOKLINE, MASS.

VXM Technologies, Inc.'s PowerTools, released last month, promises to bring the performance benefits of network parallel processing to reusable, specialized tasks that users have to do on a regular basis. This broadens the scope of parallel processing beyond the "monster" financial analysis or physics applications that are its traditional bailiwick, according to Franco Vitaliano, VXM president.

PowerTools is a set of library routines that handle process synchronization across a cluster of multivendor Unix machines. However, while traditional parallel processing applications typically eat up all the CPU resources of a parallel processing network, PowerTools was designed to develop smaller subroutines that groups of users can be running simultaneously on a "cluster" of Unix systems, VXM said.

For example, instead of having each Wall Street trader run the complicated, computer-intensive calculations needed to figure bond yield, "why not have one trader incorporate the calculations formulae into a subroutine?" Vitaliano said. The subroutine could then be called up by a whole group of traders, and the CPU-intensive calculations could be parceled out among a cluster of networked parallel processing systems whose resources are shared by the group, he added.

Remote vs. parallel
Remote procedure call technology enables applications to be parceled out across multivendor networked systems, such systems are sequential — each system waits for the previous one to finish its allotted task before beginning its work. With parallel processing, a group of machines are all working on different chunks of the same job in tandem.

PowerTools supports parallel processing across a mixture of Sun Microsystems, Inc., Hewlett-Packard Co., IBM, Silicon Graphics, Inc. and Digital Equipment Corp. Unix systems, the company said. And VXM's existing Balans technology is said to automatically balance processing loads across such clusters.

Virtually the same

The use of Parallel Virtual Machine (PVM), a parallel processing technology developed by Oak Ridge National Laboratory, enables a group of such networked systems to match or surpass the power of a Cray Research, Inc. supercomputer, VXM said.

VXM has differentiated itself from other PVM supporters, such as Cray and Convex Computer Corp. by integrating PowerTools with Sun's ToolTalk, which allows reusable subroutines to be encapsulated as objects that can be called up by any application that supports ToolTalk, Vitaliano said. Lotus Development Corp. is one leading software company that has announced support for ToolTalk.

PowerTools is available now, priced at $2,500 for 10 nodes. Support for Microsoft Corp.'s Windows NT and Windows is in the works for next year, Vitaliano said.

Application reduces customer response time

CONTINUED FROM PAGE 63

calls each year.

"Response time from the PCs to the host was a critical issue," Vickers said. However, "we didn't want to locate the customer service center in downtown Madison because of space costs." But so far, access time has not been a problem, he said. The LAN is connected to a 3174 controller that is channel-attached to the mainframe.

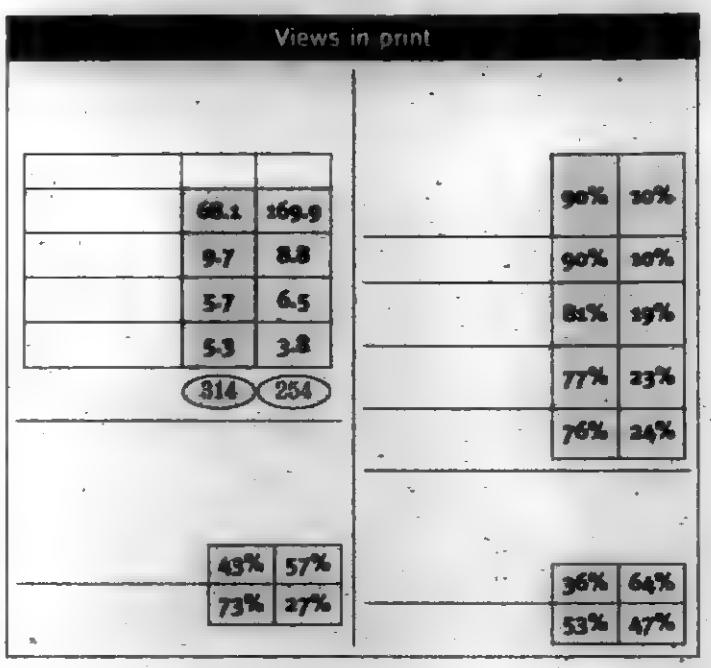
There is a small subset of the mainframe data residing on a server in Janesville, about 1.5M bytes' worth. It includes only the name and address and some other very limited information about each customer. However, it has been useful when storms or other causes have knocked out the network that connects the service center to the mainframe. The server-resident minidatabase is updated every night by the mainframe, so its data is no more than a day old.

Still, that approach has some shortcomings, Vickers said. "If the network or mainframe goes down, there's no way to print out work orders remotely in the field offices. So we have to fax things." Also, he said, if employees use the server database, they must re-enter transactions on the mainframe when the link is reestablished.

"We don't like having systems that have rework built in," Vickers said, "but if the rework is cheaper than upgrading the system, it's probably what you want to do. We're not using the backup database enough so that it's a real problem."

The utility is planning to change parts of its application. It will move from the OS/2 Extended Edition DBMS on the server to Oracle Corp.'s Oracle and move from IBM's LAN Server software to Novell, Inc.'s version. "We're making both moves for the same reason. We adopted both Oracle and Novell as corporate standards because of the number of platforms they can support," Vickers said.

"We're bringing in Unix platforms for some new applications, including work management and an inventory of gas and network components," Vickers said. "I don't see the mainframe going away anytime soon."



Study finds disaster vulnerability outside the glass house

By Thomas Hoffman
NORTH BERGEN, N.J.

Although most organizations have adopted adequate disaster recovery strategies to protect their data centers, they are overlooking PC local-area networks and other operations outside of the glass house, according to a study released recently.

The study, commissioned by Comdisco Disaster Recovery Services, was based on a telephone survey of 300 information systems executives at large corporations. The results, audited by ICR Survey Research Group in Media, Pa., were used to develop a "vulnerability index" ranging from 0 (minimum vulnerability) to 100 (maximum vulnerability) for major computer system disruptions.

According to the results, only 59% of the respondents have a formal plan to follow if business is disrupted. But the study assigned a vulnerability score of 67 to the average corporation's LAN preparedness.

"I don't think people have paid enough attention to protecting their PC LANs. It's like a ticking time bomb," said Paul Polishuk, president of IGI Consulting, Inc. in Boston.

Banks most prepared

Of the industries surveyed, financial services companies make the most extensive preparations for disruptions to their data centers and LAN work areas. That is largely the result of stiff federal regulations that the Federal Deposit Insurance Corporation (FDIC) and other regulatory agencies impose on the banking industry, according to David A. Moore, senior vice president at Mellon Bank Corp. in Pittsburgh.

Moore said the FDIC and other regulatory concerns have been tightening the disaster recovery guidelines for banks since 1984.

Annual updates

In addition, Moore explained that Mellon's IS group is required by the company to present its disaster recovery strategies to the bank's board of directors annually.

"We've spent an awful lot of time planning for these contingencies," he added.

Manufacturing and services firms fared worst on the study's index, with manufacturers receiving a score of 82 for PC LAN vulnerability.

Users "still have to come to grips with recovering technology outside of the data center," noted Anish Mathai, vice president of technology/strategic planning at Bankers Trust Co. in New York.

One of the biggest hurdles in developing an effective PC LAN disaster recovery plan, Mathai said, is the complexity of replicating the interfaces and workstations that connect to LANs outside the data center.

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County gets Bullish on tracking child support evaders

By Christopher Lindquist

It may be hard to imagine a parent who chooses to avoid child support payments, but the truth is that thousands of children each year are the victims of parents who fail to meet child support obligations after a divorce.

The tracking of these delinquent parents is a time-consuming task, especially for already overburdened case workers. In San Bernadino County, Calif., each child support officer used to carry an average caseload of 1,000 delinquent parents. To ease the load, the county decided to automate as much of the tracking process as possible.

A poor California economy has led to 70,000 new cases of delinquent parents in San Bernadino County, up from 40,000 last year.

After a several-year evaluation process, a software product was found that seemed to fit the bill—Troy, N.Y.-based CSE Resources, Inc.'s Support Enforcement Tracking System. CSE then joined with Bull HN Information Systems, Inc. to port the software to a Bull DPS 6000 minicomputer. The software and minicomputer were then attached to some 200 terminals and PCs around San Bernadino County.

Ease the burden

The system's goal was to eliminate the manual system of filing and searching for information on delinquent parents and replace it with an automated system that would allow easier tracking.

"We were an entirely manual operation and were simply getting inundated with case work," said Michael J. Kewin, chief deputy district attorney for special operations.

Under normal circumstances, a new case is created when the Welfare Department informs the Child Support Enforcement Division that a single parent is filing for welfare coverage. At that point, the officer in charge of the case can begin to search for information on the delinquent parent by automatically performing tasks such as sending letters to post offices and employers requesting address and salary information. All the data is then stored in a database for future attempts to find the parent. Once the parent is located, the legal workings can be put in motion to generate a court order for him to start paying.

The officers use the system to speed filing and searching procedures. Where officers once had to sort through thousands of paper files, they can now sit at a Bull terminal and search through and retrieve on-line information from the minicomputer. That information can then be used to electronically create letters and fill out required forms, thus saving time that the officers normally spend performing the tasks manually.

One always hopes for a happy ending to these types of stories, but unfortunately there is not one this time. While the new system has made the lives of the case officers easier on a per-case basis, recent changes in federal regulations make it harder to close cases, and a staggered California economy is resulting in more than 70,000 new cases each year.

And that, Kewin said, is too much, though without the new system things would probably be even more unbearable. "I think that we would be in worse shape than we are now," he said.

But he added that ideas are being implemented that may help turn even this high a tide. For example, an imaging system would allow paper to be eliminated entirely. Kewin said his ultimate goal is this: "Automate as much as possible so we can devote as much of the resources as we can into those parts of the process that require individual thought." That may help at least a few more kids.

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Power supplies

Computer Power, Inc. has announced the Computersave Mark II uninterruptible power supply (UPS) with the company's new First Alert Remote (FAR) System.

The product is an on-line, single-phase UPS from 900VA to 10000VA, the company reported.

Up to 8 hours of emergency runtime is featured. Line interactive ferroresonant technology is used, and complete isolation is provided from outages and power disturbances.

The FAR System is an optional microprocessor-based device that provides 24-hour unattended monitoring of the Computersave Mark II UPS.

Prices begin at $1,319.

➤*Computer Power*
124 W. Main St.
High Bridge, N.J. 08829
(908) 638-8000

Perma Power Electronics, Inc. has announced a series of standby power systems. According to the company, the systems can back up computers and peripherals if a power failure occurs.

When the power has been rejuvenated, the products have the ability to save, shut down and restore the program.

A "Hibernate" software utility program is included in each full-featured, battery backup uninterruptible power supply system of the new WatchDOG product line. The software detects a signal from the backup power supply when there is an AC line power failure.

Conventional, expanded and extended memory and data to the hard drive is transferred, and then the software shuts the computer down. Three models are available.

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5601 W. Howard Ave.
Niles, Ill. 60714
(708) 647-9414

Software application packages

Computer Information Systems, Inc. has added Forms Accounting and enhanced Capacity Planning to Version 3.1 of RoboCharge for VMS Data Center Management.

RoboCharge can now track the forms used for various print jobs with support for Forms Accounting. The Capacity Planning capabilities enable RoboCharge to automatically analyze storage, batch, establish usage patterns and project future needs, the company reported.

Pricing is on a per-CPU basis and ranges from $500 to $12,000.

➤*Computer Information Systems*
120 Wells Ave.
Newton, Mass. 02159
(617) 527-1550

SuperWylbur Systems, Inc. has released Version 4.2 of SuperWylbur software for mainframe MVS-based systems.

On-line user manuals and a "hypertext" style access to documentation are provided for easy index of key word access to on-line manuals or tables of contents. Improvements have been made in the Sort command processing for multiple column specifications to operate in ascending and/or descending order and in the Full Screen Panel Support of 3270 terminals, the company reported.

SuperWylbur's base product costs $47,500.

➤*SuperWylbur Systems*
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Utilities

USM Corp. has introduced Version 3.0 of Magnifile.

According to the company, Magnifile is the only application maintenance utility for the IBM Application System/400 that offers simultaneous manipulation of two files on screen.

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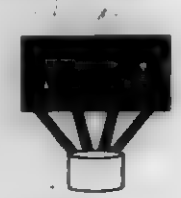

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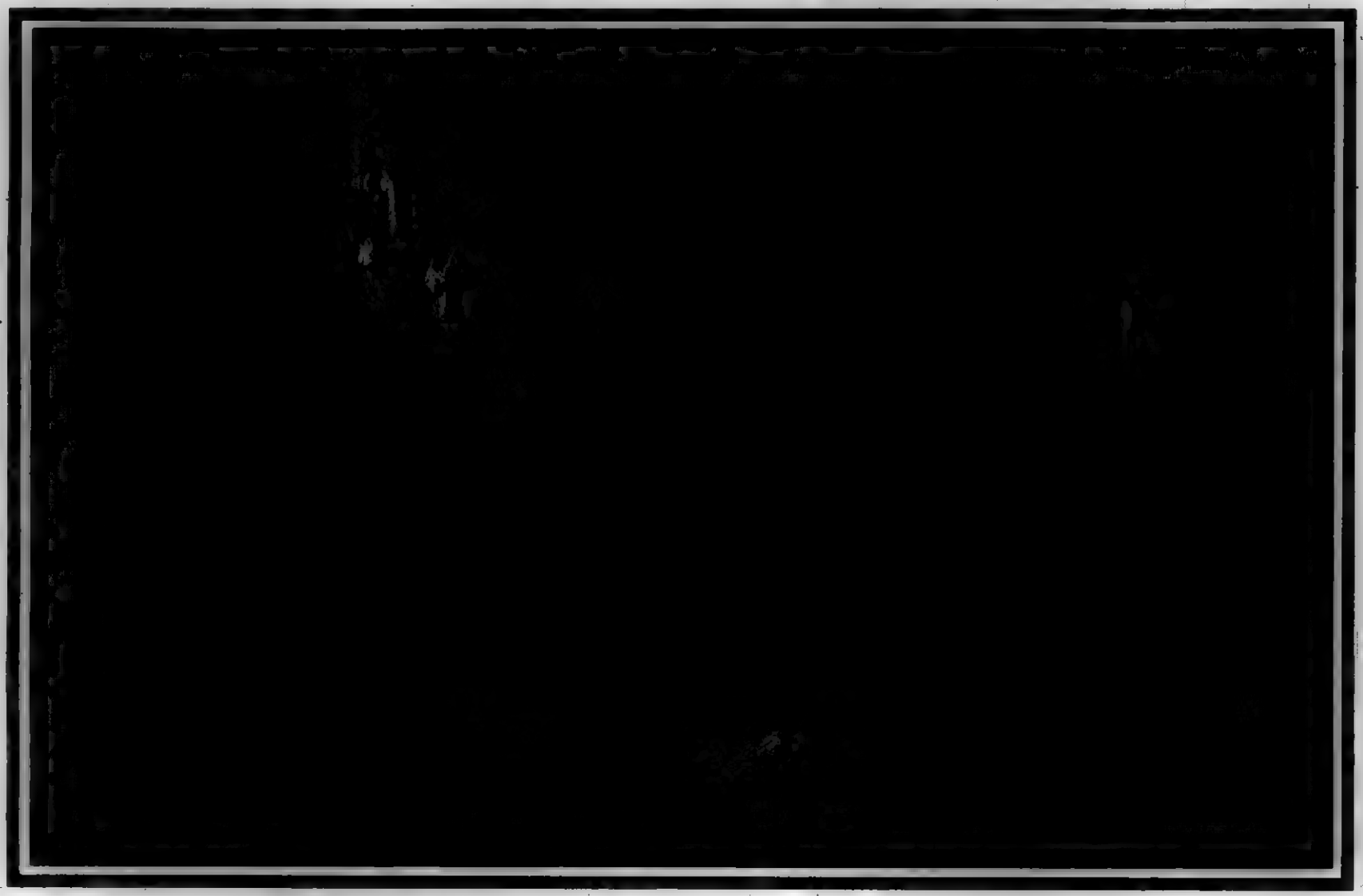

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Richard Harter

Change control: not just deltas

Perhaps it's because we live in a throwaway society. Perhaps it's because most developers would rather create software than keep track of it. Perhaps it's because most people think of software configuration management (SCM) as another word for maintenance — if they think of it at all.

Whatever the reason, it's fair to say that SCM does not get talked about as much as other areas of the software life cycle, such as design, engineering or code generation. Let's be honest: SCM may be good for you, but like a lot of things that are good for you, it can also be dreadfully boring. And it's hard to advocate good SCM practices without sounding, well, just a bit tedious.

The reaction is partly deserved: For years there wasn't anything new in the way of SCM technology to talk about. SCM was just version control — an automated Rolodex, really. Software releases were files. The trick was to know which version of which file went into which release. That's it. No big deal. To differentiate their products, vendors added pizzazz in different ways — usually by adding a colorful, three-dimensional-looking GUI — and by making the SCM compatible with popular CASE backplanes. When you cut through the wrapping paper, though, what you were left with was still the thrilling process of version control — keeping track of files.

Different kind of control

What's really exciting (and different) is change control. Genuine change control provides a number of nifty features, such as the ability to:

- Move software changes from one development path to another (say, from VAX to Alpha, or from a maintenance path to a new product release path).
- Bundle a number of code changes scattered among various files and operate on them as a unit — for example, moving them (perhaps as a new product feature) across development paths.
- Create, or re-create, any state of the software as a selection of changes, rather than as named versions of files.

You can't do this stuff as long as you are only managing the artifacts of change, rather than the changes themselves. For years, SCM gurus have talked about change as the difference (delta) between two versions of a file.

Deltas are not really changes — at least not

Harter, *page 72*

AI: New name, better game

By Garry Ray

If you are on the fast track with an information systems career, don't breathe a word about expert systems or artificial intelligence. The hot topic of the mid-1980s, AI is now one of the smartest ways imaginable to send your reputation into a tailspin.

But according to users and analysts, a new and improved generation of that same technology — sold under the guise of "business process automation" or "knowledge-based systems" — is accruing gains where nothing else will work.

"People think AI died years ago," said Neena Buck, vice president and director of applied intelligent systems at New Science Associates, Inc., a Westport, Conn., consultancy. Rumors of AI's death are bolstered by "the very negative reactions of people who haven't been exposed to the new technology," Buck added.

But for those who have examined and implemented the revamped development tools and languages, AI — by any name — is paying off.

A six-month development effort at General Mills Restaurants, Inc. in Orlando, Fla., helped reduce food costs by $2 million to $3 million per year, said programmer/analyst Kurt Navratil. Responsible for the operations of more than 600 Red Lobster restaurants in the U.S. and Canada, the firm brought in Knowledge Base Management System (KBMS), a development tool from Palo Alto, Calif.-based Trinzic Corp.

Called the Waste and Inventory Control System, the General Mills application is run monthly to determine whether each restaurant is meeting general guidelines for efficient use of its food inventory. If the amount of "waste" — food lost to spoilage or preparation inefficiencies — exceeds guidelines, the application performs additional inventory analysis to determine which food item might be the source of the problem. Then it generates a set of suggestions from its database for use by the local restaurant manager. The suggestions are forwarded to the local back-office computer at each restaurant. Managers are free to improve on or reject the suggestions made by the application. "You don't want to clamp down so tight that you're adversely affecting your managers," Navratil said.

Yet some applications were designed specifically to adversely affect their subjects.

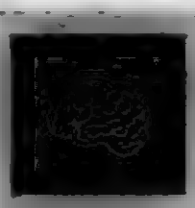
At Toronto's Royal Bank of Canada, a KBMS-based "fraud detection system" now in place for more than a year has reduced credit-card fraud. Although reticent to discuss the specific fraud reductions or the means by which they are achieved, Elo Laugesen, manager of technology products said the application "gives us tools to detect fraud faster and earlier."

Like other developers, Laugesen said knowledge-based applications are easier than more conventional applications to modify and improve, which is important for adjusting to new criminal tactics. "There are always new techniques for defrauding banks," he said. With a knowledge-based system, "we can add changes very rapidly," Laugesen said.

Change is also a keynote at St. Luke's Episcopal Hospital in Houston. The hospital's cardiac catheter laboratory serves more than 50 patients a day, as well as 70 support staff members and 80 cardiologists.

According to Robert Marsh, the hospital's manager of decision support, scheduling the patients, staff and physicians to use equipment, diagnostic rooms and lab facilities had become a nightmare. "We were desperate to alleviate the situation," which required the full-time attention of two managers. "It was difficult recruiting for the position," Marsh added.

After using the KBMS development tools on a research and development basis during a six-month period, Bruce Boley, St. Luke's senior analyst, said the scheduling managers "now spend 15% to 20% of their day answering questions that are managerial in nature."



Knowledge-based application development

Bandwagon: Departmental business problems currently being solved by company experts and mission-critical problems that require repetitive decision-making.

Roadblocks: According to analysts, bias from the failures and hype of the mid-1980s are the greatest impediments to implementation.

Dominant tool supplier: Trinzic Corp., a Palo Alto, Calif.-based company formed by the 1992 merger of AICorp. and Alon Corp. Estimated by analysts to serve 80% of the knowledge-based tools market with its KBMS, Intellect and Alon DS.

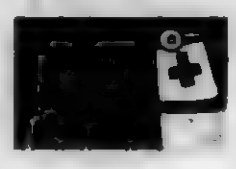
Hospital robots have the Rx for efficiency

By Thomas Hoffman

PITTSBURGH

Automated Healthcare, Inc., a task-automation technology provider to the health-care industry, has developed a robot designed to distribute patient medications within hospitals. Though the technology is among the first of its kind, the robot would not be of much use if the company had not developed its own software and application programming interface (API) for links with hospital information systems.

The software driving the robot — called the Automated Pharmacy Station (APS) — is a proprietary package developed by Automated Healthcare and written in C.



The firm also wrote an API that links the robot's software to a hospital's information system using Computer Associates International, Inc.'s CA-Clipper database engine, according to Aldo Zini, vice president of sales and marketing at Automated Healthcare.

Zini said the APS system comprises robotics components used widely in other industries such as the automotive and textile sectors.

Automated Healthcare developed the three-axis robot with a gripper arm that picks up patients' medications from storage cells and delivers them to bar-coded patient bins. The bins are then brought by hospital technicians to the nursing floors, where nurses administer

APS was developed at University of Pittsburgh's School of Pharmacy, funded in part by the Benjamin Franklin Technology Grant, a fund for Pennsylvania high-tech firms.

Robot, *page 72*

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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Hospital robots

CONTINUED FROM PAGE 69

the medications to patients.

Zini claimed the robots will help hospitals to substantially reduce — if not completely eliminate — the human error rate of medication distribution. "APS will never dispense a wrong medication. A large hospital might dispense 12,000 doses per day. For a human to do that — even if your error rate is 1% — that's still 120 errors a day, which could potentially kill a patient," Zini said.

The robot keeps track of dispensed drugs through an inventory control system built into its software cache. In addition, APS calculates the shortest paths for medication pickup and delivery.

APS has been used for six months at Pittsburgh's St. Claire's Hospital, a 350-bed acute care facility that is also planning to pilot Automated Healthcare's Point-of-Care (POC) systems starting in the first quarter of this year. Zini said Automated Healthcare has also signed contracts to deliver APS to several other health care facilities, including the University of Wisconsin hospital and the Ceton Medical Center in Austin, Texas.

The POC systems, Zini said, use Intel Corp.-based handheld scanning devices from Telxon Corp. in Akron, Ohio, and Nippon Denso, a Japanese handheld manufacturer. Because all of the medications can be bar-coded, Zini said, hospitals could use the POC systems to track and monitor the distribution of medications for administrative purposes.

Zini said Automated Healthcare is developing hardware-independent POC application software that may eventually be used with Grid Systems Corp.'s GridPads and other emerging desktop technologies. Eventually, Zini said, the company will port the APS system to a client/server distributed database, which he said the company plans to develop with CA.

Harter

CONTINUED FROM PAGE 69

in the way most people think about change. Most people think of change as something you do to make a product different — add a new feature, fix a bug, make the product run on a new operating system. A delta doesn't mean any of these things. Specifically, it's the change made to one file that creates a new version of that file. But who cares? Cutting files up into deltas only saves the disk space required to store complete copies.

A delta is only a change to a file; it may result from several changes to the product, some partial changes or no changes.

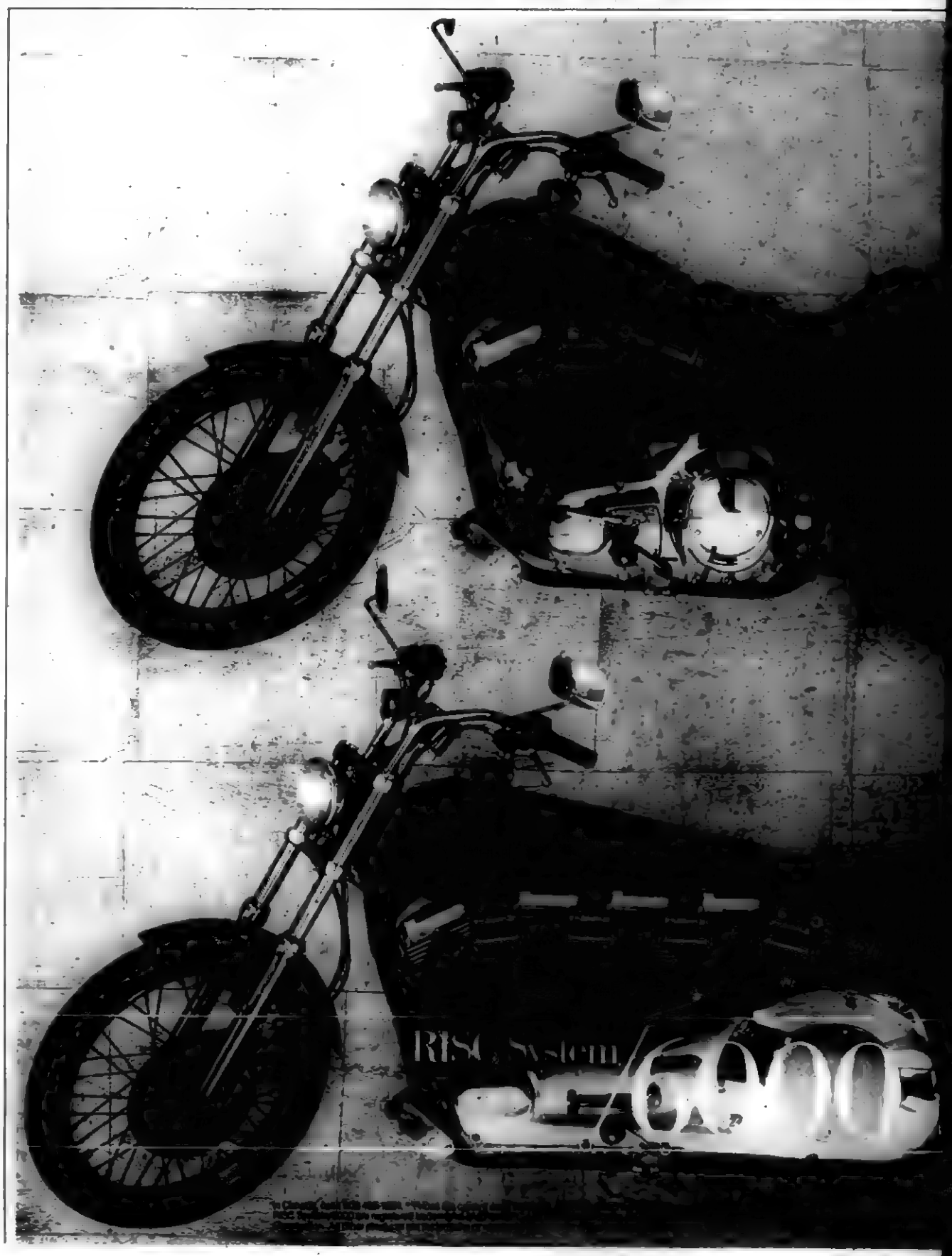
If change isn't deltas, neither is it versions. The only reason to track versions is that versions result from changes. The purpose of version control is to build a release from file versions containing the relevant changes. With change control, the changes are identified and manipulated directly. The fact that an enhancement or a bug fix results in several code changes to one file (and perhaps others as well) is a by-product of the logical change — the enhancement or bug fix.

With true change control, we can apply a change to a development path and not drag along irrelevant code just because it is physically adjacent to the altered code. If we want, we can call up a listing of any version of a file, with new or edited lines displayed in bold. We can even call up the name of the change, say NT port, and see all the files, modules, source lines and other physical artifacts affected. Or we can ask the system to build a release with the NT change applied.

Change control is not the same old technology repackaged in a prettier box. Of course, there's nothing wrong with a fine looking GUI, or with an SCM product that attaches to industry backplanes. These are features of virtually every SCM product. There's not even anything wrong with deltas. That's just not where the magic is anymore.

What really sizzles is the ability to replace a collection of physical objects that demonstrate a change with a logical object that defines the change. Now that's something worth talking about!

Harter is founder and chief technology officer of Software Maintenance and Development Systems, Inc., a Concord, Mass.-based maker of software configuration management systems.



Application development tools

Crystal Computer Services, Inc. has introduced Version 2.0 of Crystal Reports.

Crystal Reports is a Microsoft Corp. Windows-based data access and reporting tool designed for Paradox, dBase and Btrieve database analysis.

Crystal Reports 2.0 can now access Foxpro 2.0 indices. The two components in the product are an intuitive Report Designer and a Reporting Engine Dynamic Link Library. Version 2.0 offers an enhanced user interface, new data manipulation and report creation features. It also provides access to more corporate data sources. Key features include two-pass reporting, extended user-defined functions and an improved user interface.

Crystal Reports Version 2.0 costs $195.

➤*Crystal Computer Services*
Suite 2200
1050 W. Pender St.
Vancouver, B.C. V6E 3S7
(604) 681-3435

ProtoView Development Corp. has introduced DataTable and ProtoView Screen Management, two Microsoft Corp. Windows-based development tools.

DataTable is a Windows spreadsheet control that offers users both ease of use and advanced data formatting. User-friendly interfaces with data validation for Windows applications are created with ProtoView Screen Management. A library of 12 custom controls is included. Both products require a 286 PC or higher processor running Windows in protected mode. They were designed for Boriand International, Inc. Pascal Windows users using object-oriented techniques, the company reported.

The DataTable costs $249.95 or $495 for DataTable with source code. ProtoView costs $395 and/or an additional $199 for the source to the 12 custom controls.

➤*ProtoView Development*
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588

IQ Software Corp. has started shipping IQ Access, a database retrieval and reformatting tool.

Designed for DOS end users, IQ Access selectively retrieves and automatically reformats data stored in application databases for use with Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3, among others, the company said. The tool works with a variety of hardware platforms, file systems and databases.

Pricing begins at $2,500 for a pack of five. Networked versions start at $1,500.

➤*IQ Software*
Suite 550
3295 River Exchange Drive
Norcross, Ga. 30092
(404) 446-8880

Empress Software, Inc. released Version 4.8 of its Empress Relational Database Management System for DOS.

The product is a single-user program that can compile sharable fourth-generation language code. Applications can then be migrated to Unix machines and seamlessly perform in networked, multiplatform environments, the company reported. By screen painting in a what-you-see-is-what-you-get format, a forms generator develops screens or forms with associated data fields.

A series of scripts that control the operations preformed within fields, the display of forms and the assignment of operations to the function keys are contained in an applications generator.

Version 4.8 of the Empress RDBMS for DOS costs $945.

➤*Empress Software*
6401 Golden Triangle Drive
Greenbelt, Md. 20770
(301) 220-1919

Kansmen Corp. announced VBToolsKan Version 1.0, a development tool kit for Microsoft Corp. Windows in Visual Basic.

VBToolsKan consists of seven custom controls: Status bar, Toolbox, 3D Chart, Ribbon/IconBar, Table, Field Validation and Meter Control.

The product is available for an introductory price of $99.

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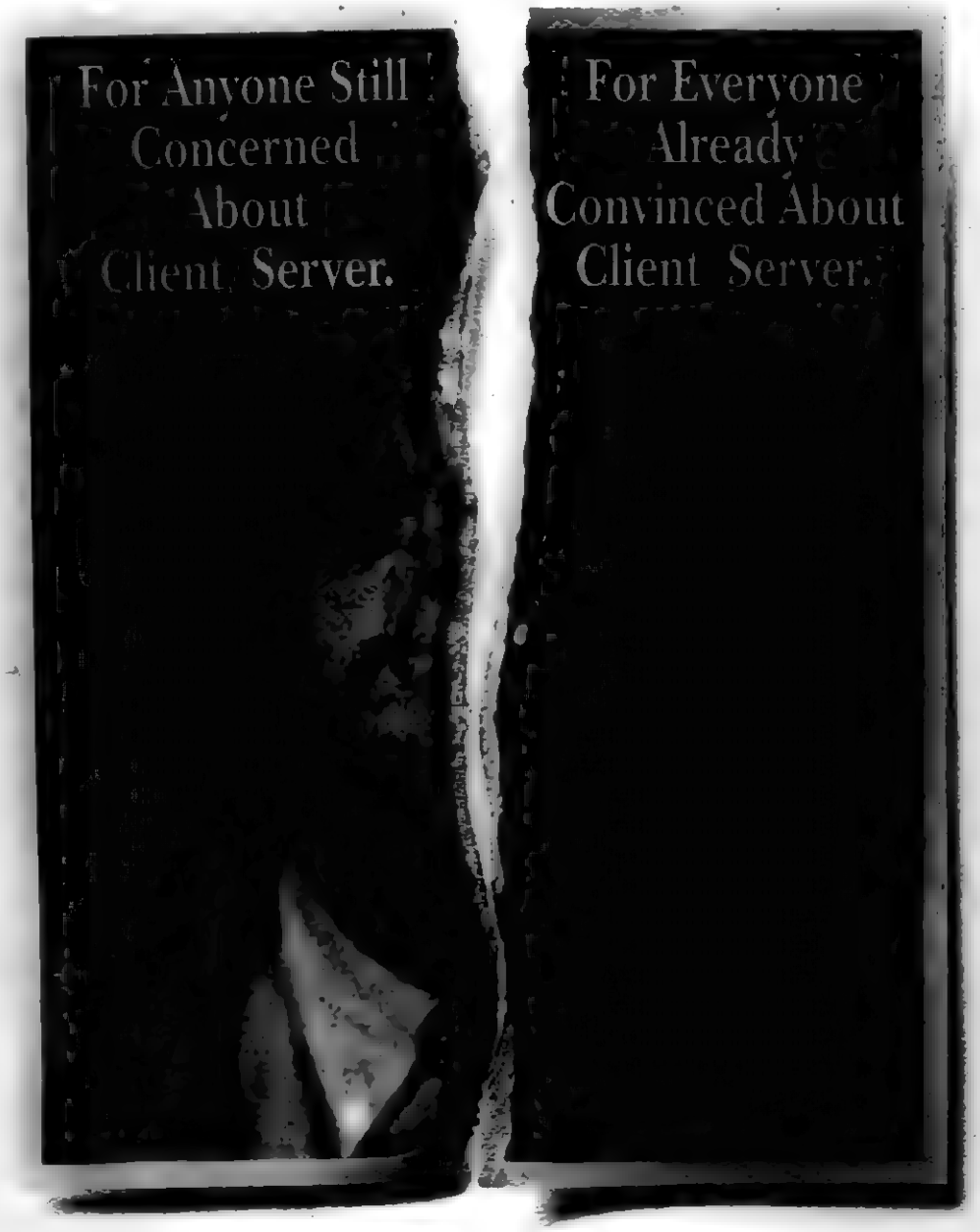

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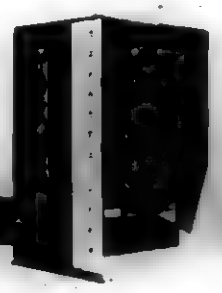

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Basic instinct

Air Force Materiel Command puts the 'user' into user support — one logical step at a time

By Elisabeth Horwitt

About to launch a planned revamp of its communications-computer support organization and systems, Air Force Materiel Command decided to drop in on its bases around the country to get a sense of what users' support priorities really were.

The results of the survey knocked the 14 communications/computer directors back on their heels, according to Maj. Hal Ellis, who is in charge of the customer support project.

MICHAEL WILSON

Maj. Hal Ellis: *'We thought we knew what users wanted'*

"We thought we knew what users wanted," Ellis says. "We had good intentions, but we were all focusing on the internal processes, on buying the right product to make it easier for IS managers to do the job," such as sophisticated network management software with a graphical user interface.

Users had a different agenda:

"They wanted an instant connection to the data; and when there was a problem, they wanted one source, one phone call, to get it solved," Ellis says.

Users interviewed during the survey made it clear that the information systems group was not meeting those needs, Ellis reports.

For example, users at one parts warehouse were finding that sometimes a crucial part is missing even when the computer says it is on the shelves. "I asked the guy, 'Do you call the help desk [when this happens], and he said, 'Hell no, I need a part, not a trouble ticket,'", Ellis says.

Users said they prefer to call a local programmer rather than the help desk, which they perceive as being out of touch with what is really going on with their systems, Ellis says.

The overall message the surveyors took back to communications/computer directors was clear, according to Ellis: "We have help desks that are very good at tracking and logging problems, but they were not getting the parts out any faster."

Led by Ellis, the project team put together a strategy for flipping these priorities around: to focus on serving the command's "core business functions — which is procuring, deploying and maintaining weapons systems for the Air Force," Ellis says.

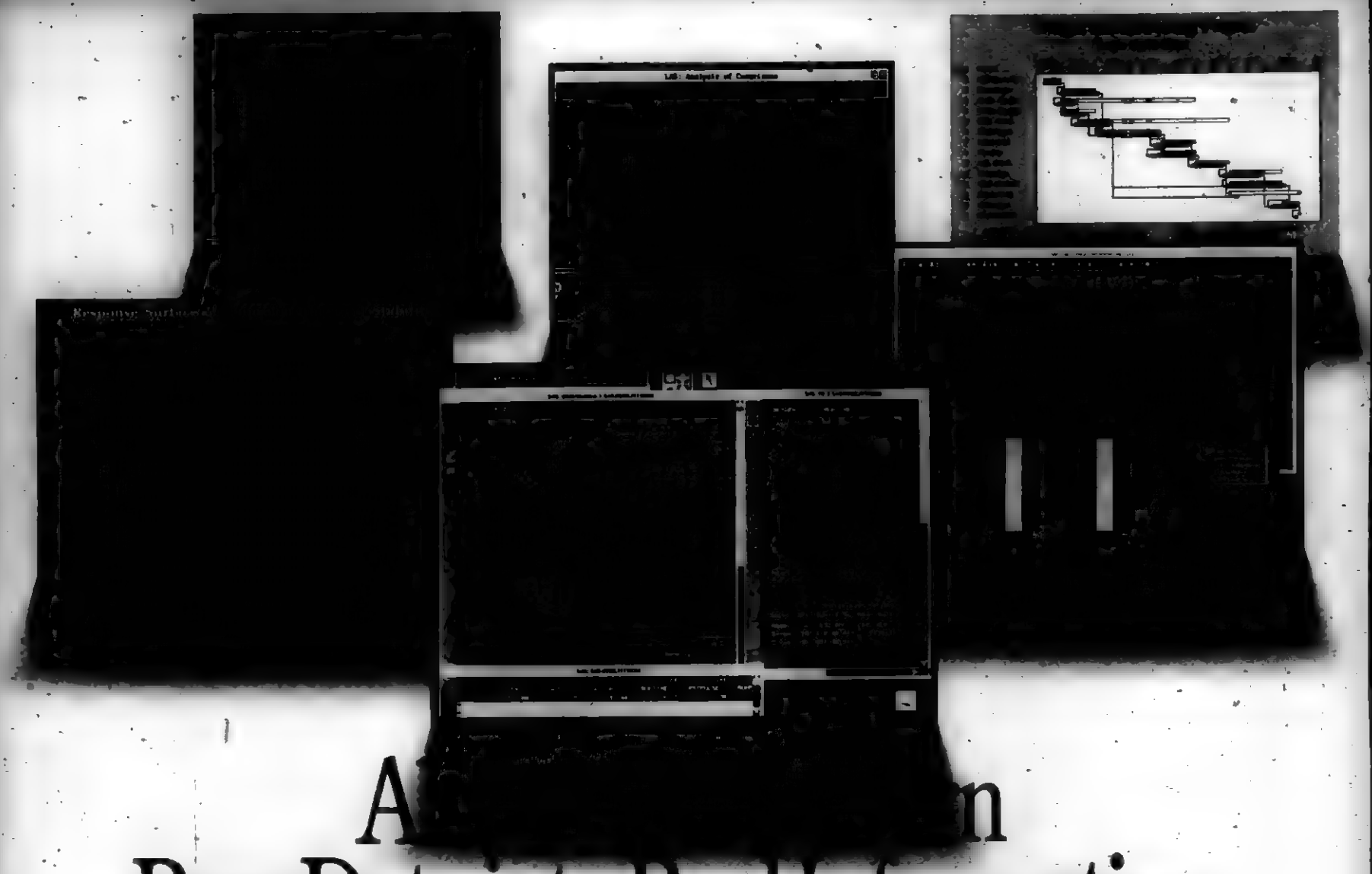
Plotting a solution

After the survey results were presented at a Network Management Summit held at Tinker Air Force Base last April, directors and their entourages broke up into workgroups and hammered out what Ellis described as a "Rubik's cube." It laid out network management tasks, such as performance and problem management, on one axis; network management

User support, *page 77*

Inside

The limits of IS/business 'team:' Uh oh, does this mean there are some? IS organizational consultant N. Dean Meyer suggests entrepreneurship as a better model for IS professionals. Page 79.



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Air Force puts 'user' into user support

CONTINUED FROM PAGE 75

facilities, such as the help desk, and a network monitoring system, on a second axis; and various command business functions that need to be supported along a third.

"We didn't look at specific products; we just said, 'This is what we need to do to support our users' " in the basic areas of accounting, configuration, performance and fault management, says Dirschl Lacy, general manager in charge of Air Force accounts at SSDS, Inc., a systems integrator based in Englewood, Colo., and a primary contractor for the customer service center project.

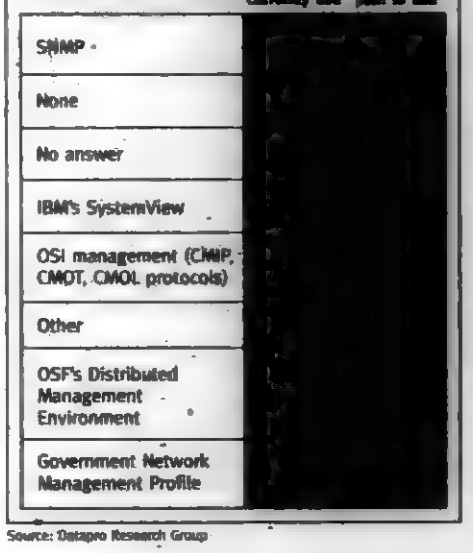
"The goal was to get a common mechanism of user support to apply across all sites," Lacy says.

The six-month survey uncovered plenty of room for improvement, Lacy says. For example, "We found it was not uncommon for people to do without a printer for a couple of weeks" because the standard Air Force contract requires a vendor to initially respond to a trouble call within two hours but places no time limit on actually fixing a problem, Lacy says.

Materiel Command hopes to have its "generic customer service center" in place at each base by October 1993, Ellis says. The centers will work to incorporate the following goals, which were arrived at during the conference:

Users have spoken: It's SNMP

A recent survey of 438 network managers at companies with annual sales of more than $100 million showed that the Simple Network Management Protocol (SNMP) has displaced IBM's SystemView as the most popular choice for network management



Source: Datapro Research Group

- A centralized network support center whose staff has access to all the expertise, tools and systems needed for effective user support. Currently, these resources tend to be scattered around each base, Ellis says.
- A methodology for the help desk to use in responding to user trouble calls. Keeping users apprised of actions taken to correct a problem.
- More active troubleshooting. "Right now, we do postmortem network management," finding out about a problem only when the complaints start coming in, Ellis says.
- Some degree of product commonality of systems, with the long-term goal of migrating to Open Systems Interconnect-based network management.

The ball is now in the court of the various bases' communications/computer directors, some of whom have already begun to implement more customer-oriented communications/computer support, Ellis says.

So far, so good, according to one of the folks in charge of spearheading the next step. The summit "did bring the idea of customer support to the forefront," said Paul Lucena, chief of the data communications support branch at McClellan Air Force Base.

"It got a commandwide consensus that this is the way to do business," Lucena says.

By the book

Maj. Hal Ellis is heading up Air Force Materiel Command's computer support revamping project, and he is doing it by the book. Ellis said he got one of his pivotal strategic tips primarily from reading Eliyah Goldratt's *The Goal*. Goldratt's thesis is that an organization should focus on its throughput, "whatever that is," Ellis says. "For a for-profit company, that would be profit." Ellis' group defined throughput for IS customer services as client connectivity. "At the same time, we want to decrease operating expense and inventory."

McClellan A. F. Base : The first to fly

Materiel Command's support help staff of 20 personnel is responsible for keeping about 13,000 users smiling, with a goal of resolving 75% of the calls immediately.

Last April, when Air Force Materiel Command's communications/computer directors officially decided to put the "user" back into its user support systems, McClellan Air Force Base's IS department was already several months into a project to do just that, according to Paul Lucena, the Sacramento, Calif., base's chief of data communications support branch.

As a result, McClellan has been one of the first bases of the Materiel Command to come up with "a true, merged customer support help desk [organization] that provides a single point [for users who] come to us with a problem, a question, a requirement" related to computers or networking, Lucena says.

The goal for the 20-person staff, which supports a user population of 13,000, is to have 75% of all telephone calls resolved as they come in, Lucena says. That goal is still a ways off. However, the group has gotten significantly better at "tracking the problem and getting the right people out there" to solve it, he adds.

Instead of calling a succession of contractors, each of whom would say "it's not my equipment," support people now go to the site, fix basic problems such as a broken wire or an unplugged terminal and direct the more specialized problems to the right contractor, Lucena says.

At least as important from a customer satisfaction perspective, support personnel do not leave users guessing what, if anything, is being done to fix a problem, Lucena says. "Just knowing what steps are being taken gives users that warm fuzzy that someone is working on the problem."

Early this month, Lucena's staff got direct proof that they are moving in the right direction, from the results of a survey that so far has pulled in 374 responses from the user community, he reports.

Results so far appear encouraging:

- 93.5% of the survey respondents said the problem was resolved to their satisfaction.
- Of those whose problems were not resolved immediately, 93.2% said they were told what to expect.
- 95% reported that support people responded in a day or less.

"Our ultimate goal is response — not necessarily resolution — within two hours," Lucena says.

Prior to the customer support revamp, "I'd estimate that we were looking at 30% customer dissatisfaction because before, there was no way to monitor and track problems or know where to take problems we couldn't solve," Lucena said.

And especially, there was little ongoing communication with users. "We find most users can live with problems if they know someone's working on them. The malcontents and bad vibes come when they think nobody cares," Lucena said. — *Elisabeth Horwitt*

?

A recent survey of their clients revealed that user confidence is on the uptick: 93% reported that support staff responded within a day or less.

Executive Track

Mark A. Pugliese has been named information systems manager at the National Newspaper Association's wholly owned advertising subsidiary, American Newspaper Representatives, Inc. (ANR). Before joining Minneapolis-based ANR, IS veteran Pugliese, who earlier served as business systems manager at Radisson Hotels, spent a year as an independent consultant.

Former Coopers & Lybrand IS consulting partners **James W. Kunz** and **John K. Leigh** are trying a partnership of a different kind these days: The two have started their own systems integration and IS consulting firm — Kunz, Leigh & Associates — in Lathrup Village, Mich. Kunz previously headed up Coopers & Lybrand's IS consulting practice in Minneapolis. Leigh served in the same capacity at the accounting and consulting firm's Cleveland office. Their new venture will focus on systems integration and software development in distributed and networked environments.

Stan Lippian is the new director of MIS at the Cleveland-based law firm of **Hahn Loeser & Parks**. In his new role, Lippian will be responsible for the management and development of systems applications.

George E. Coe has been named senior vice president in charge of the Automation Services Department at the **Federal Reserve Bank of Chicago**. Coe, a 32-year veteran of the Federal Reserve System, will continue to serve as senior officer in charge of the System's Network Management Control Center, also located at the Chicago Fed.

Have you or a colleague in IS recently been promoted, changed jobs or done something else that's worthy of note? Then please drop us a line. Write to Executive Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701-9171, or call (508) 879-0700, ext. 5474, to share the news with your colleagues.

N. Dean Meyer

Business in a business?

For years, I've seen IS as a "business within a business." So I was shocked to meet users who thought that was a bad idea.

In their company, it seems, IS has historically not been customer-focused. For them, the business-within-a-business (BWB) culture evoked images of a staff department living in its own world, not aligned with their strategies and not part of their management team. As they saw it, the BWB concept was a view of IS as an end unto itself, rather than as a means to help the users do their business.

Instead, these users felt that IS should consider itself merely a part of their business team. Indeed, they were tempted to recommend decentralization of the corporate IS department to ensure that the IS staff understood they must serve the needs of their users.

This attitude demonstrates a deep misunderstanding of the BWB concept. Customer focus, business-driven innovation, commitment to clients' success and effective partnerships — the makings of strategic alignment — are exactly the reasons for pursuing a BWB culture.

Two key objectives may seem paradoxical at first blush: Client partnership and strategic alignment seem to require decentralization. High quality, low cost, integrated architecture and professionalism seem to require centralization.

Getting it all

But you can have the best of both. Note that you don't need to own your own grocery store to control what you eat. Your control is as absolute as a customer in an entrepreneurial market. And you get the benefit of professional shopkeepers buying goods, tracking inventories and managing the store. Similarly, in a BWB culture, clients have control over business decisions — what gets done, for whom and when — without having to manage their own IS groups.

Thinking of yourself as a business within a business means thinking like an entrepreneur. In contrast, members of somebody else's team leave the entrepreneurship to the boss. Decentralized staff may be entrepreneurial about the users' business, but this is doing the users' jobs for them and not adding unique value to the team.

Successful entrepreneurs know that the only way to earn market share is to satisfy their clients. Entrepreneurs don't tell people what to buy or force generic solutions on them; they listen to their clients and tailor solutions to satisfy their most pressing strategic needs. They don't antagonize their clients by claiming monopolistic power; they earn market share by being "best of breed."

Entrepreneurs don't attempt to restrict or police their clients. They don't spend a lot of money building systems because they think they know what's best for their clients. They say, "No customer, no work!"

Entrepreneurs are creative; they continually seek new ways to better serve their clients. On the other hand, "team members" just do what they're told.

Entrepreneurs are professional; they understand the IS business and produce high-quality solutions because IS is their livelihood.

"Team members" are likely to see their career paths as out into the business. They typically seek to replicate the skills of their clients, rather than complement them with ideas that spring uniquely from the IS perspective.

Entrepreneurs are competitive. They keep up with developments in their field to stay ahead of the competition.

In contrast, decentralization leads to many small IS groups that are by necessity generalists — "jacks of all trades, masters of none." As such, they cannot keep up with the whirlwind pace of technological change, and the pace of innovation slows accordingly.

Quality suffers as generalists muddle their way through new technological frontiers. Lucrative opportunities may be lost when generalists are unaware of emerging technologies. Costs rise as efforts are replicated and architecture becomes fragmented. The bottom line: In my experience, decentralized IS head count may be as much as 50% above the norm.

Finding the problem

The moral of the story: if you have a problem with culture (e.g., a lack of customer focus), don't seek a quick fix in a restructuring. Get to the root cause: Fix the culture by cultivating a BWB perspective.

True, decentralization may be easier in the short term. To build an effective BWB culture takes more than executive rhetoric. It may require adjustments to the IS department's structure, budgeting and priority-setting processes, methods and rewards. And it will take time. But it can be done.

Meyer is president of NDMA, Inc., an IS consultancy in Ridgefield, Conn.

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Calendar

JAN. 24 - JAN. 30

Marketing the IS Organization Internally. Atlanta, Jan. 26-27 — Contact: Oullette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Connect. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Document and Image Management Systems Conference. Lake Buena Vista, Fla., Feb. 7-10 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Silver Spring, Md. (301) 445-4405.

Compcon Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706.

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7208.

"Doing Business in the Pacific Rim" International Conference. Sydney, Australia, Feb. 25-26 — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

FEB. 28 - MARCH 6

Advanced Object-Oriented Analysis and Design: The State of the Art. San Diego, March 1-4 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Sensors Expo West 1993. San Jose, Calif., March 2-4 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

MARCH 7 - MARCH 13

Geographic Information Systems in Business '93 Conference (GIS). Boston, March 7-10 — Contact: GIS World, Fort Collins, Colo. (303) 223-4848.

First Workshop on Object-Oriented Design '93. Snowbird, Utah, March 8-10 — Contact: Object-Oriented Software Engineering, Brookfield, Wis. (414) 789-5258.

MARCH 14 - MARCH 20

National Automated Clearing House Association Conference (NACHA). San Diego, March 14-17 — Contact: NACHA, Herndon, Va. (703) 742-9190.

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LAN "The Raidion array had the most thorough documentation of the tested drives. The Raidion software was the most robust, as well." June, 1992

PC WEEK "PC Week Labs found that the array performed admirably - successfully backing up data and easily restoring it upon drive failure." May 25, 1992

BYTE "The Raidion's low price alone makes it worth considering." August, 1992

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It's a puzzle with

MISSING PIECES

Nevertheless, you can start piecing together an effective system

By Lee Elizer

Ask anyone who has begun the task of controlling storage on distributed local-area networks — it's likely one of the most involved projects you will undertake in your information systems career.

Consider: How many different tape technologies are currently in use within your company? How many on the same network? Often, the answer is more than one, and quite often, it's as many as three. Does the same software manage all three tape technologies in use? Usually not.

The fact is, most network storage management strategies are based on such a piecemeal approach. This is, in part, because of the stand-alone nature of storage management components that have been developed and sold by a variety of companies. But what's really missing in most companies' network storage management strategies is the strategy.

Because of the way LANs have grown up in most companies, network storage management is accomplished department by department rather than in a centralized fashion. Now that mission-critical data is on those LANs, many large companies are starting to feel that centralized control is the best way to guarantee corporate data security and data integrity.

Not to mention that decentralized control requires a huge amount of manual effort. According to Sterling Software, Inc., which supplies large-system storage management software, one major U.S. corporation with more than 35,000 PCs estimates that the equivalent of 600 full-time people is required just to manage distributed storage resources.

Missing pieces, *page 85*

INSIDE

RAID ratings page 82.

Backup vendors page 86.

User view page 86.

NCR's RAID page 89.

Network Storage

Buyers' Scorecard: Compaq, Dell share top scores in PC-LAN server survey

By Derek Slater

Redundant arrays of inexpensive disks (RAID) storage technology is seeping onto users' local-area networks. In a Buyers' Scorecard satisfaction poll of PC LAN sites using servers with RAID support, Compaq Computer Corp. and Dell Computer Corp. finished neck and neck.

Compaq's SystemPro and Dell's PowerLine servers earned overall scores of 83. Tricord Systems, Inc.'s PowerFrame superserver followed closely at 81.

RAID is not for those with thin wallets. Because of the relative newness of the technology, RAID systems generally carry a premium price tag. However, users who have implemented RAID on PC LANs rated cost issues as the least of their concerns. Their key concern is to purchase a reliable, fault-tolerant system with no compatibility glitches.

In general, users said that their RAID-equipped servers were suitably reliable but too proprietary and hindered by poor availability of parts and compatible disk drives. Increased storage capacity was also cited as a commonly desired improvement for the systems.

The response base reflects the relatively low penetration of RAID units into the LAN server market. SystemPro has been available the longest and leads in market share. As with the Dell PowerLine, the built-in RAID subsystem is an option for the SystemPro. The latest SystemPro/XL array is based on Small Computer Systems Interface-2 (SCSI-2) technology and supports RAID Level 1 (disk mirroring), Level 4 and Level 5 (which both protect data through the use of parity drives).

Users indicated compatibility with installed hardware and software as a key strength of the SystemPro and also gave it the highest rating in quality of vendor support. It lagged behind in overall performance.

Users also noted some difficulties in obtaining replacement parts for the Compaq system, although it still rated above the Tricord server in that area.

Compaq and Dell have announced a stream of product upgrades in their efforts to outdo each other in storage capacity and performance. Dell's latest subsystem, based on SCSI-2 technology, offers up to 8.4G bytes of internal storage. The Dell SCSI Array supports RAID Level 0 (data striping across multiple disks) and Level 1, with support for additional levels of RAID planned for this year. In the survey, Dell's servers earned the highest score in responsiveness of vendor service but lagged behind in reliability and fault tolerance.

The Tricord system supports RAID storage configurations through its PowerRAID option (a capability that can be added to its I/O processor), but it does not include a built-in RAID subsystem. PowerFrame supports RAID Levels 0 and 1 or a combination of the two, plus "hot sparing" (replacing a disk drive while leaving the system up and running).

LAN servers with RAID

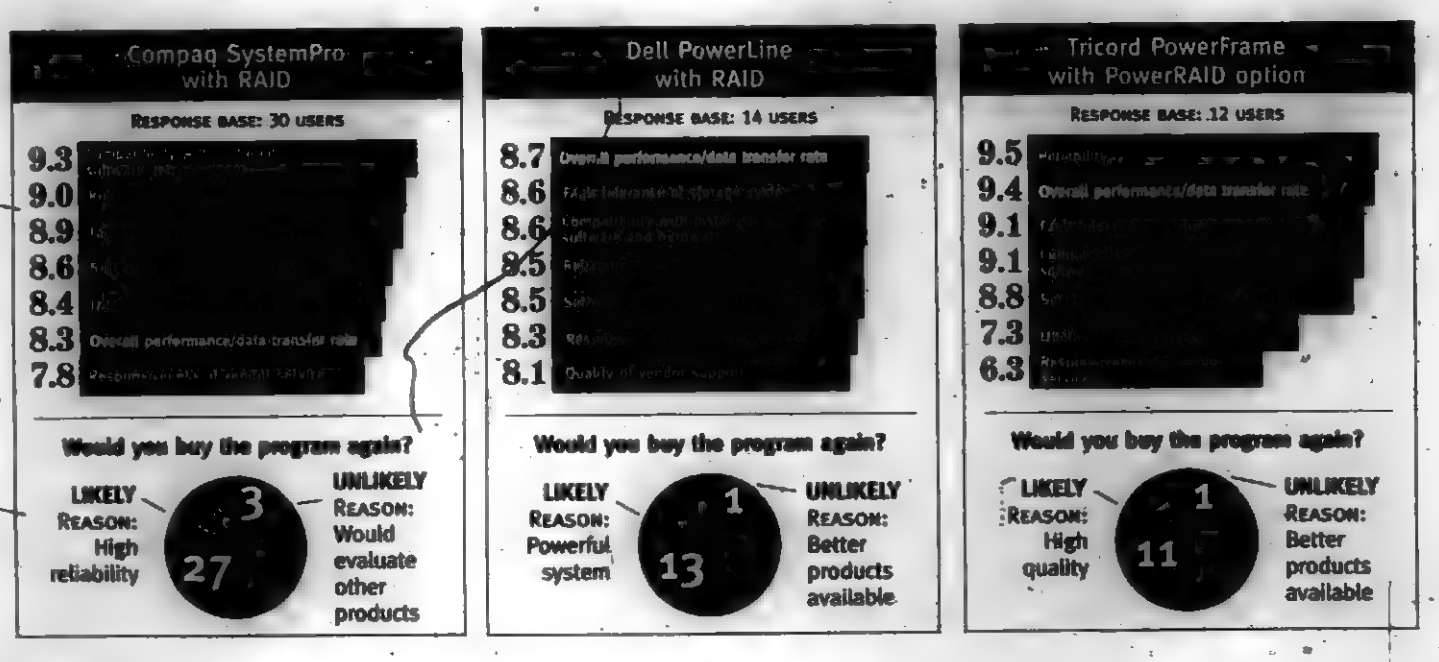
Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users for Compaq, 14 users for Dell and 12 users for Tricord.

TOTAL POSSIBLE SCORE 100 MEAN SCORE 82

PRODUCT	PROS	CONS
Compaq's SystemPro with RAID — SCORE 83	"IT RUNS RELATIVELY SMOOTH AND FAST, WITH HARDLY ANY DOWNTIME."	"HAVE TO USE PROPRIETARY DRIVE-MOUNTING TECHNIQUES."
Dell's PowerLine with RAID — SCORE 83	"THE PRICE/PERFORMANCE RATIO IS PRETTY OUTSTANDING."	"MANY PARTS CAN'T BE PURCHASED FROM ANY OTHER VENDORS."
Tricord's PowerFrame with RAID — SCORE 81	"PERFORMANCE — THE DISK CONTROLLER IS ON A SEPARATE HIGH-SPEED BUS."	"IT'S VERY EXPENSIVE." "SPARE PARTS AVAILABILITY."

Because of its higher processing power and cost, the PowerFrame superserver is best suited for larger networks. However, the PowerFrame does support a number of PC platform standards, such as Extended Industry Standard Architecture connections, SCSI drives and Intel Corp.-compatible software. The PowerFrame supports Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Vines LAN operating systems, in addition to Novell, Inc.'s NetWare.

Users of Tricord's PowerFrame gave it higher satisfaction ratings than the Dell and Compaq products earned in many of the key areas.



Network Storage

METHODOLOGY

User names were obtained from vendor and nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey. The response base was 30 users for Compaq Computer Corp., 14 users for Dell Computer Corp. and 12 users for Tricord Systems, Inc.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, perform the following steps:

1) Multiply the product's score in the first category by the user importance rating to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

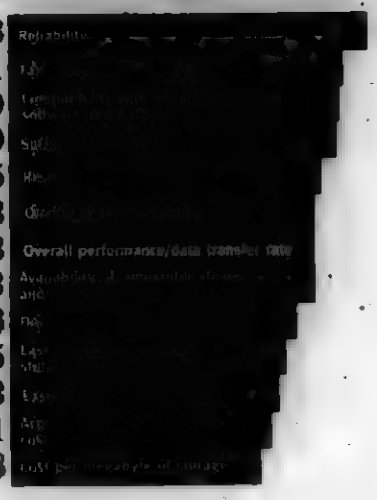
4) Convert the average weighted score to base 100.

The ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

ACKNOWLEDGMENTS

Computerworld thanks the following for their assistance with this Buyers' Scorecard: *Computerworld* Database Division; Lee Eltzer, Data Storage Concepts.

Ratings in order of importance



Vital statistics

What is your position?	
CIO/VP/IS director	6
IS manager	12
Network/LAN administrator	13
Operations manager	1
Systems analyst	4
Other	20

What is your responsibility for LAN servers with RAID?	
Evaluate or recommend vendors	50
Determine need	47
Select vendors	44
Set standards for your organization	42

RESPONSE BASE: 56

Storage specs

Compaq's RAID subsystem is strictly internal; Tricord supports only external arrays; and Dell allows either configuration

	RAID levels	Maximum capacity	Price
Compaq IDA-2	1, 4, 5	4G bytes (internal)	$2,030 for controller
Dell DSA	0, 1	8.4G bytes (internal) 58.8G bytes (with multiple controllers)	$3,255 for controller
Tricord PowerRAID	0, 1	45G bytes	RAID support bundled with all systems as of Jan. 11

What RAID is — and what it is not

By Lee Eltzer

RAID certainly has its place in storage management, but it's not the cure-all that some vendors crack it up to be.

RAID, or redundant arrays of inexpensive disks, describes a group of 5- or 3-in. disks linked to provide the following:

•A faster transfer rate by transferring data from all disks simultaneously.

•A faster average access time to individual data files because they are spread under more read/write actuators than a single, large-capacity disk.

Because RAID subsystems are, by definition, faster than single, fixed-disk subsystems, they should be used as a primary storage device. Also, most RAIDs are implemented transparently to application systems, reinforcing them as a primary storage device.

Here are some reasons why RAID subsystems will never substantially replace tape drives and tape libraries:

•Tape is used for high-capacity interchange. You can move data from one system to another by physically interchanging the recorded media. This is also true for automated data libraries (ADL).

Data interchange is not feasible with the recorded disks in a RAID system.

•Tape is used as an off-site backup medium because it's portable and inexpensive. In case of a disaster, data and system software must be recreated on either the same site or a different one. But RAID must recreate its data based on what remains in the RAID subsystem.

All RAIDs require tape backup because of disaster protection requirements.

•Compared with RAID disks, tape is a substantially less expensive medium on a per-megabyte basis. Tape ADLs provide huge, economical capacities for online storage. RAID cannot match these capacities on a cost-effective basis.

RAIDs are capacity-limited on an absolute basis and not cost-effective on a relative basis, compared with tape drives and ADLs.

•Technology improvements continue to occur in a variety of tape media. Some individual tape media may lag technologically, but others tend to make them obsolete. RAID, on the other hand, is limited to improvements in basic, disk-drive-capacity technologies. Because of technology factors, the rate of potential, absolute-capacity improvement is greater on tape than disk.

Tape should always retain an edge in capacity growth vs. RAIDs.

Quick. Think of a company with a much broader line of business UNIX computers than IBM.

Network Storage

The piecemeal approach

By Lee Elser

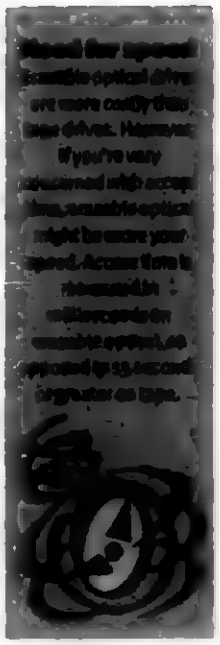
Network storage management has always existed — just not as efficiently as one would like, and while mainframe concepts are rapidly being transported to the local-area network level, products still operate in piecemeal fashion.

In its earliest and most basic form, storage management consists of data backup software running on a stand-alone PC. At the next level, many PCs are attached to the network, and data backup software runs on the server with the network operating system software.

In a configuration that some say is more sophisticated, you can put backup packages not on the server but on a dedicated tape station. The software collects data throughout the network and backs it up on the dedicated tape station.

A separate concern from backup is keeping data optimally accessible to users without just purchasing more primary storage hardware. This is known as "hierarchical storage management," where software residing on a dedicated network station scans all the disks on the network and automatically migrates needed data to those disks.

But what we'd really like is an umbrella system that controls all those things. This is likely to occur through vendor alliances and new product developments on LAN-based products. In the meantime, here's a closer look at the techniques companies are using to effectively manage storage on the network.



Add disk storage devices The simple option to increase capacity is to buy more primary storage in various sizes, transfer rates and access times, including disks, automated data libraries and tape or optical drives. All are well-known, well-accepted and priced relatively inexpensively. This, of course, is a band-aid approach because it adds more mass storage capacity without necessarily improving overall network storage management.

A way to improve performance is to buy and integrate a redundant arrays of inexpensive disks (RAID) subsystem for the server (see story page 82). Of course, slow response time may also be because of the CPU speed of the server, network transmission speed, access time of the primary disk, software overhead, etc., which RAID cannot cure.

Automated data libraries (tape or optical) allow you to automatically fetch and restore data without manual intervention. Optical versions are available from a variety of sources, such as MTI, Inc., Aquidneck Systems International, Inc., Hewlett-Packard Co. and Sony Corp.

Storage Technology Corp. Odetics, Cambridge On-Line Storage, Exabyte Corp., Archive Technology, Inc. and Cipher Data Products, Inc. offer tape versions.

Centralize data archiving Archival storage software places files on tape or optical devices, to be stored and racked off-line, removed from direct control by the system. Palindrome Corp. is one of the leaders in this area.

The biggest purchase issue with archival storage software is how well it allows you to manage and track the data that's been stored off-line and how well the tape library logs data by individual pieces of medium and by files.

Consider how many pieces of medium you are trying to track — maybe you've got 100,000 pieces of data sitting off-line. Does the software know exactly where every file is, which room it's in, which medium it's on? To complicate things, what you really want is a database that will tell you where a file is and on which medium at different times of the year. So instead of 100,000 pieces of data, you've got 20 million! In general, such large tape libraries have not been developed for large network systems — at least not yet.

Centralize data backup Data backup and restore software places files on tape and optical devices. This software is the most competitive area of network storage management software. All the leading

What's missing

Here are some areas in which products fall to meet the requirements of the "perfect" network storage system.

Universal platform attachment capability. Many software products are limited in the number of platforms they support.

Cross-operating system operation. Many software products can manage data only on a single network operating system.

Common data format for all medium types. If all products supported a single logical data format, data could be transferred among networks, assuming the attached physical peripherals were all the same.

Cost-effective drives with faster data access. Although peripherals are relatively cost-effective, there is room for faster access times at reduced prices, particularly for tape drives.

Cost-effective operational techniques for instantaneous data backup. You can have instantaneous backup through disk mirroring, but that's an expensive technique because primary disk drives are duplicated on a one-for-one basis. An effective software approach that provides this capability is not yet available.

Quick. Think of a company with better business UNIX price/performance than IBM.

Network Storage

packages work reliably.

In Unix, leaders include Raxco Software, Inc., General Atomics DISCOS Division, Software Partners/32, Inc., Delta Microsystems, Inc. and Legato Systems, Inc. Legato actually claims it can attach to both NetWare and Unix networks. (For leaders in Novell, Inc. NetWare environments, see page 86.)

The major areas of vendor differentiation include the following:

• **Operating system attachment capability.** Although all vendors are driving toward multiple station support, many only attach to one operating system. Emerald Systems Corp. is a standout in its ability to attach to NetWare networks via a Microsoft Corp. Windows interface.

• **Device attachment capability.** Not all software vendors attach to as many of the tape and optical drives that you may wish to use for backup. But many vendors, such as Cheyenne Software, Inc. and Sytron Corp., have a breadth of attachment options that allow for all popular tape technologies and numerous vendors' drives to be utilized.

• **Point-of-network attachment.** You can purchase either a workstation-, server- or tape station-based backup package. Most vendors have migrated to a server-based configuration to allow for higher performance tape operation.

You can run into trouble with server-based packages, though, when you have multiple servers with large amounts of data. That's because you need fast operation to back up the network within one eight-hour shift, and you may be limited to only one backup operation at a time with server-based products.

To solve that problem, GigaTrend, Inc. and Intel Corp. offer tape station-based packages that scan the network concurrently.

• **Network stations supported.** Not many of the backup software products can simultaneously back up data to a wide variety of workstations. With the acceptance of Univel (the Novell Unix attachment strategy), the capability to integrate multiple pieces of storage on a single network increases.

• **Speed of database creation for backup histories.** Backup packages are traditionally pretty slow at creating backup histories, so the time required to create a file history database may take as long as or longer than the actual backup. GigaTrend has developed a high-speed approach to the database creation problem, which is included in their MasterSafe software package for Novell NetWare networks.

Automate data migration Hierarchical storage management software automatically migrates data to a primary storage device from a secondary storage device and vice versa. In effect, it creates the image that the amount of data space on the network is infinite, thereby relieving individual users from the chore of managing primary disk space.

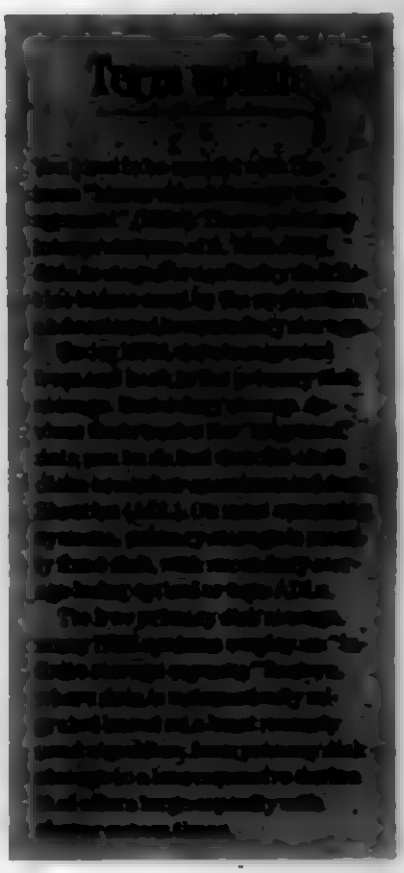
With hierarchical storage management, you never get a DISK FULL message. Files that are migrated leave a tag on the primary disk so that if you want the data file, the software will signal the secondary storage.

So far, hierarchical storage management software is available only on Unix networks, although it's just a question of time before it appears for Novell networks. Legato is working on a product, for instance. Other NetWare hierarchical storage management packages will likely come from the backup vendors or leaders in Unix hierarchical storage management software, such as Epoch Systems, Inc. in Westboro, Mass., Software Partners/32 in Topsfield, Mass., and QStar Technologies, Inc. in Rockville, Md.

One of the major issues with hierarchical storage management systems is how to migrate active databases to the secondary storage device or library. The higher the capacity (above 20G bytes), the more unmanageable the active database becomes.

Hierarchical storage management software also does not necessarily replace backup software. All the hierarchical storage management packages can back up data from an automated data library, but not all the data on the network is always under control of the hierarchical storage management package.

Efforts to better integrate hierarchical storage management and backup are under way, mainly through alliances and OEM agreements. GigaTrend, for instance, is marketing software on an OEM basis, as is Cheyenne. •



Missing pieces

CONTINUED FROM PAGE 81

Keep in mind that storage management is not just backup. Two other aspects of data management are important: how quickly data moves through the network and how available it is.

The "perfect" network storage world would require minimal management and would provide the following:

• Virtually infinite storage capacity for each use.

• Transparent data access time.

• Almost instant recovery or graceful degradation when experiencing operational disasters.

• Automatic, instantaneous backup of all network data.

• Automatic tracking of all data regardless of whether it's on-line or off-line.

To a certain extent, available products can help you put these components in place, but no single system fully integrates them all. The network manager or IS group must chart its own path.

How easy is that to accomplish? Not easy at all. There are political issues, disorganization and chaos. Not to mention that corporate management doesn't want to get involved, given that data storage is hardly a revenue-producing function.

But high-level management *should* get involved: The only way to get beyond politics is through a well-defined storage strategy, backed by dollars and personnel. After all, if you aren't spending enough to back up data in an efficient, automated fashion during off-hours, you're bound to be taking the network down during crucial work time.

Because of the bounds of corporate strategic and operational objectives, the "perfect" network storage environment may not be attainable. However, the technology for "effective" management can, in large part, be implemented with the help of four basic categories of products: new types of storage media, archiving software, backup/restore software and hierarchical storage management software. Despite the fact that changes are under way, it's still a good idea to get something in place now. •

Elizer is president of Data Storage Concepts, a consulting firm in Boulder, Colo.

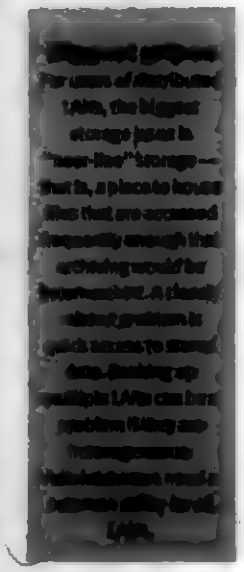
Quick. Think of a company with a better business UNIX environment than IBM.

User view

The quicker, the better

By Robert M. Knight

For Valerie Gill, business analyst at Chicago's Northern Trust, quick access to data is a big problem. The bank operates as many as 40 Novell, Inc. NetWare PC local-area networks. There's plenty of off-the-shelf software for on-line storage and plenty for archival storage, but virtually nothing for what is called "near-line" storage — that is, a place to house files that don't necessarily need to be on-line but are accessed frequently enough that archiving would be inconvenient.



"Right now, we back up the file to a tape. If someone needs the file, you put the tape back on the drive, search through the tape for your file and then copy the file back on the LAN's main storage drive," Gill says.

The search time required "is usually a very expensive amount of time," she continues. "If you can't find a file and restore it within two minutes, it gets cumbersome."

Two years ago, the bank was dealing with only 60M-byte tapes. Now "we have LANs with a gigabyte of storage [each]," Gill says. "The technical backup solutions and the speed have become very big issues."

What Gill says she would like to do is centralize backup facilities. Several departments might use the same backup unit, "as opposed to 40 LANs doing their own thing," Gill says. "But if you combine three LANs with 1 gig each into one backup solution, we're now talking about backing up 3 gigs, and you need a very reliable, large-capacity backup solution to handle that.

"You're also beginning to need a better solution to search for a file on those tapes, if you need to restore a file," Gill says. "And then there's a political issue: people saying, 'I don't want my LAN to be on the same backup system as that department.'"

There are a couple of areas where Gill sees room for improvement with backup software. One of these is reliability. She says a high percentage of backups don't have great data integrity. "You couldn't restore the files if you had to," she says, "and, of course, the vendors say you must have done something wrong. We're looking for vendor products to be more compatible with other industry products."

Additionally, Gill says, she'd like backup reports to include details such as where the problem happened so you can troubleshoot it.

And third, she would like to be able to back up all kinds of files with the same utility instead of putting all MS-DOS files in one place and Apple Computer, Inc. Macintosh files in another.

As for whether Northern Trust will eventually centralize storage, "we'll just have to wait and see," Gill says. "It could be under IS control, or it could be departmentally controlled or divisionally controlled." •

Knight is a free-lance writer in Chicago.

Software sampling

THE FOLLOWING ARE AMONG THE LEADING VENDORS IN THE BACKUP AND DATA MANAGEMENT MARKETS FOR PC LANs.

	Network backup	Network data management	Server-based network data management
Cheyenne Software, Inc. (516) 484-5110	Solo	ARCServe	
Colorado Memory Systems, Inc. (303) 635-6477	Jumbo		
Digital Equipment Corp. (508) 493-5111	Pathworks Desktop BU		
Emerald Systems Corp. (619) 673-2161	EMSave/ EMQ	Xpress Librarian 2.0	
Emeritus Technologies (209) 292-8888	Tapeware		
Enterprise Data, Inc. (202) 316-0500			UpStream
GigaTrend, Inc. (619) 931-9122	ServerDAT		MasterStation
IBM Contact local representative			DFDSM
Intel Corp. (503) 696-8080			Storage Express
Legato Systems, Inc. (415) 329-7880		Networker NLM	
Maynard Electronics (407) 263-3500		MaynStream	LANStream
Mountain Network Solutions, Inc. (408) 379-4300	FileSafe/Talk FileSafe/ Wizard		
Network Systems Corp. (612) 424-4888			User-Access
Palindrome Corp. (708) 505-3300		Network Archivist	
Sytron Corp. (508) 898-0100	Sytos+		
Tallgrass Technologies Corp. (913) 492-6002	FileSecure Enterprize		
Tecmar (216) 349-0060	QTOS	ProServe	

Source: Peripheral Strategies, Inc.

Tape stations: The new performance alternative

By Lee Elmer

There is a relatively new school of thought that says you can achieve greater performance by putting tape activity on a dedicated network station rather than using it as a shared activity on a server. So far, two companies — GigaTrend, Inc. and Intel Corp. — have broken out of the crowd and developed tape station-based backup and restore network products for Novell, Inc. NetWare environments.

What puts this strategy ahead for Novell networks? The tape station approach provides several attributes not found or needed in server-based backup software:

• **Network protocols that move data more rapidly across the backbone of the network.** The objective is to improve average data rates for the backup operation. Faster tape drives do not necessarily speed up the backup process if data cannot be fed more rapidly from throughout the network.

GigaTrend is achieving 50M-byte/min. sustained transfer rates on an Ethernet network backbone and 80M byte/min. on a fiber-optic network backbone.

• **Improved database history creation** because of significant data traffic to the tape station. This is key for improved performance, as some database history creation algorithms may take an additional three hours to create when the backup took only three hours itself. GigaTrend currently claims to build a global file history in four to five minutes.

• **Backup in parallel** allows two, three or more backup operations to be performed simultaneously, thereby increasing total data throughput. This parallel operation should be flexible in allowing multiple backups to be mixed on a single tape drive or to be split, concurrently, to multiple tape drives.

Backup in parallel also increases the aggregate data rate to a level where streaming tape drives can maintain constant streaming, a definite performance advantage. •

Software characteristics

NETWORK DATA MANAGEMENT-CLASS SOFTWARE IS THE MOST ADVANCED AVAILABLE IN THE PC LAN MARKET TODAY

	Network backup	Network data management	Network storage management
Backup/Restore multiple servers	●	●	●
Backup/Restore multiple clients	●	●	●
Tape catalog	●	●	●
Disk base database/librarian		●	●
File migration		●	●
Library/Loader/Jukebox support		●	●
Media management		●	●
Support for multiple operating systems		●	●
Application server-based		●	●
Continuous on-line operation		●	●
Distributed processing, concurrent operation		●	●
Appears as a network storage resource			●
Librarian appears as a network resource			●
Hierarchical storage			●
Disk grooming			●
Remote vaulting			●
Reports to network management			●
Disaster protection features			●

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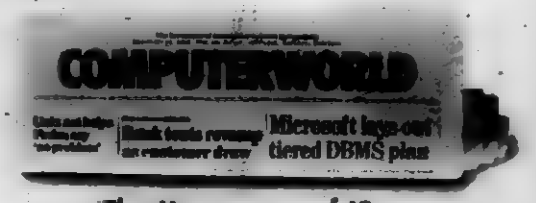


The Newspaper of IS

Network Storage

NCR 6298 RAID subsystem: Fast and reliable, but users say costs are higher than they expected

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- **Early adopters of the NCR 6298 Disk Array subsystem say the system is a strong and highly reliable storage alternative, but they are concerned about the cost compared with other RAID configurations on the market.**
- **Evaluators report extremes in ease of installation from difficult to very easy. Differences may depend on complexity of your configuration and ability to use system defaults.**

NCR Corp.'s 6298 disk array subsystem is the flagship product in the company's random arrays of inexpensive disks (RAID) storage line, which ranges from high-capacity subsystems to RAID-enabled servers and software.

Introduced in September, the 6298 currently supports NCR's multiprocessor servers, such as the 3550 running Unix V Release 4. In the first quarter of 1993, the company said, it plans to provide support for IBM's RISC System/6000, Personal System/2 and other PC servers.

Unique features of the product include the ability to adjust the drives in the system to various RAID levels to match work load and redundant controllers, which allow greater reliability. Optimizing the subsystems with flexible RAID levels does entail a learning curve for users. NCR said that next year, it plans to introduce automated tools to help users better tune their systems.

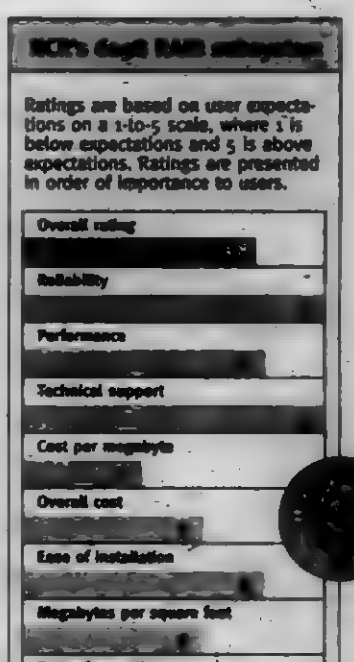
Varying RAID levels

RAID levels range from 0 to 5, with the following components at each level:

- **Level 0:** Offers high data-transfer rates because data is striped across several disks.
- **Level 1:** Duplicate data is stored on separate disk drives. This disk mirroring ensures that critical files will be available in the event of an individual drive failure. This is the most expensive form of RAID.
- **Level 2:** Hamming code is stored on additional disk drives and is used for error detection and correction.
- **Level 3:** Data is striped in parallel across several disks, and error correction data is stored on dedicated parity disks. This is considered best for high data-transfer rates for writing and reading large files.
- **Level 4:** Data is stored and retrieved using independent writes and reads to several data drives. Error correction is on the dedicated parity disk drive. Write performance is less on this level because each write operation to a data drive must also write to a parity drive. This makes RAID-4 better for read-intensive applications.
- **Level 5:** User data and parity data is interleaved and striped across several disks. There is no dedicated parity drive. Data is written simultaneously to two or three separate drives to reduce the performance penalty. This level is best for high I/O operations that involve writing and reading large numbers of small data blocks at random disk locations.

This evaluation of the NCR 6298 is based on a teleconference with four users operating the product in corporate environments. Two of the four were using the systems in extensive production mode, while the other two had evaluated the system and were still in the pre-implementation phase.

The questionnaire and methodology for Firing Line were developed with the help of Howard Rubin Associates, Inc. and Technology Investment Strategies Corp.



Reliability

The 6298 has the advantage of allowing replacement of drives or boards when problems occur without requiring a system shutdown. Redundant drives and controllers can bear the work load when another system fails.

Users found this to be a great advantage over RAID storage installed directly in the server. They also reported very few equipment failures.

Utility: "The system has never failed."

Petroleum evaluator: "We found a bad board when we changed RAID levels. NCR replaced it, and it works fine. There was no downtime because of the redundant features."

NCR 6298, *page 90*

Installation descriptions for users who evaluated NCR's 6298 RAID subsystem

	Distributor	Utility	Petroleum company	Manufacturer
Server used with subsystem	NCR 3550	NCR 3550	NCR 3550 NCR 3445	NCR 3450
Amount of storage	6G BYTES	3.2G BYTES	8G BYTES	5.2G BYTES
Application work load	RDBMS FINANCIAL AND DISTRIBUTION	TESTING ORACLE RDBMS	BUSINESS SYSTEMS	ORACLE RDBMS
Number of users	50	NO COMMENT	74	VARIES
Overall cost	$75,330	NO COMMENT	NO COMMENT	NO COMMENT
Cost per megabyte	$9.33	$14	NO COMMENT	$6.63
Previous system	NCR 8565 WITH 1G BYTE STORAGE	NO COMMENT	NCR 9800	NONE
Comparison system	IBM RS/6000 WITH CAMBEX CERTAINTY/6000	PYRAMID WITH 1G BYTE SCSI DISK	NCR 9800	INTERNAL NCR 3450 RAID

Users of NCR 6298 say they want lower cost, proactive service and easier customization

CONTINUED FROM PAGE 89

Performance

The speed of the 6298 ranged from "as expected" to "more than anticipated" for the four evaluators. Only two of the users optimize the system, varying RAID levels to match work load.

According to NCR, RAID-1 is best for applications with a high percentage of writes. RAID-3 works best for large block sizes, and RAID-5 works most efficiently with small block sizes.

Petroleum evaluator: "We are using RAID-3 and RAID-5 with the Informix Corp. relational database management system. It runs 40% to 50% faster than it runs on our previous system [an NCR 9800]. I wasn't quite ready to optimize for the different RAID levels, but NCR provided brochures and benchmark information, and that helped."

Distributor: "The performance was faster than I expected with a fourth-generation language. We are staying with the RAID-5 default at this point."

Utility: "We have done some work with the different RAID levels — just setting them up and ensuring that we can backup on all the differing levels and the homegrown application packages. We expect that most of [our] users will be on the Oracle database, and they will need RAID-5. It appears that 5 gives you the parity to prevent data loss, and 5 does the striping by blocks instead of by character or by word, which Level 3 does. So we expect 5 to be the most efficient in that environment."

Technical support

The users were all satisfied with NCR's responsiveness to technical problems. But they said they also felt the company could be more aggressive in checking to find out what was needed.

Distributor: "I have an inventory of parts at my disposal right at my own site and that's unusual. It was NCR's idea."

Utility: "We have not had any failures, but I don't feel that the vendor is being very proactive in working with us."

Petroleum evaluator: "Support is fine. We've had fast response for when we had a problem. We also have the disks here. The operators can replace them themselves."

Cost per megabyte

The evaluators reported that the costs were higher than they expected, and they said NCR should lower its prices.

While NCR said the cost per megabyte should be about $5 for a fully configured system, the users' figures ranged from $6.63 to $14 per megabyte.

Manufacturer: "On the whole, NCR prices are high, and the 6298 was about 25% higher than what we expected. I think their maintenance costs are also high."

Utility: "The cost is about 25% higher than expected. I'm benchmarking it against our Pyramid machines, which use mirroring and complete duplicating of disks. I expected the RAID system to be a lot less than the Pyramid and it costs more."

Ease of installation

The evaluators were divided on this category. The ones that stuck with the default configurations of the installation and operation reported very easy implementations. But the users who tried to customize the subsystem for more complex configurations had trouble.

Facts about NCR's 6298 RAID subsystem

FACTS FACTS

- Provides up to 5.46 bytes RAID storage in separate cabinet.
- Uses both low- and high-end SCSI RAID chip sets.
- Adjustable RAID Levels 0-5.
- Includes hot spare, hot pluggability and redundant power supply.
- Includes redundant duplexed controllers as options.

Utility: "The physical installation of the box went very smoothly, very efficiently. But the configuration was much more difficult than conventional storage systems. Administration and operation of the machine are a little confusing.

"Even though there is a menu-driven tool for the logical partitioning, it was confusing because they are using a new disk device name scheme instead of the standard Unix scheme. Also, as part of the partitioning, the tool has to set up some type of internal tables, and I'm not exactly sure what it does, but that took quite a long time.

"It currently takes about half an hour to go through. So in the middle of the partitioning process, you have to stop and walk away from your terminal for half an hour and then come back later and finish it."

On the opposite side was the petroleum evaluator: "I finished everything — all the partitioning and everything — in about 30 minutes, maybe 40, but I didn't see it as slow."

The distributor evaluator also found installation and operation easy. "It was a piece of cake," the user said. But the user plans to implement an image processing system that will require tuning the subsystem further.

The manufacturer was in the middle: "If you just accept the defaults, it's pretty simple. But if you want to set up — if you want to do anything that is not default — you have problems. We had similar problems adding a drive internally to the 3450, so I don't think it's a 6298 problem."

Megabytes per square foot

The evaluators' response to this category depended on what the 6298 was replacing.

Petroleum evaluator: "It was what I expected. We had a small mainframe, and it was taking all up all the computer room. Now we have a 3550 and the two 6298 RAID subsystems. It's like there is almost nothing in the room compared to the mainframe. And we have more megabytes."

Distributor: "It takes up about 1/20th of the space of the NCR 6565."

Written and compiled by Michael Sullivan-Trainor, CW research manager

NCR responds

Here are NCR's responses to some of the issues raised in this evaluation.

Q: Why is the price on the 6298 higher than the prices of competing products?

A: The 6298 is very competitively priced when compared with subsystems with equivalent features and functions. In October 1992, NCR released a 1G-byte drive version of the 6298 that increased the product's cost-effectiveness. The fully configured 6298 costs about $5 per megabyte.

Q: Why is it difficult to customize the 6298?

A: The additional time and effort required to take advantage of the extensive customization opportunities on the 6298 are primarily a result of drive formatting. The average installation time on customized systems can range from 30 minutes to three hours, depending on drive capacity, number of drives and type of configuration changes being made. Some changes, such as opting for RAID-3 over the RAID-5 default, require drive formatting. Because many of our users have RAID-5 applications, they opt to use the default settings and do not experience the delays in formatting drives. Also, NCR offers an installation service for $1,225.

Q: While there were no complaints about technical support responsiveness, some users said NCR is not proactive. What is your response to this?

A: At the Peripheral Products Division, we have created a customer survey program. Senior staff managers and the general manager participate directly in the program. In 1992, our surveys yielded a 96% satisfaction rate.

Q: How is NCR addressing the learning curve required for users to optimize RAID levels to match their processing demands?

A: At first, NCR concentrated on educating the industry. We are now shifting gears to accommodate "tuning" issues. In 1993, we will issue a white paper on performance tuning.

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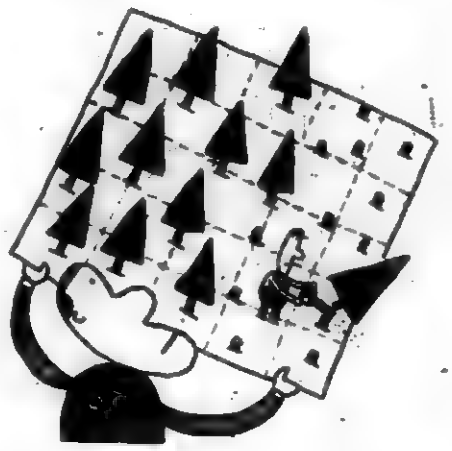

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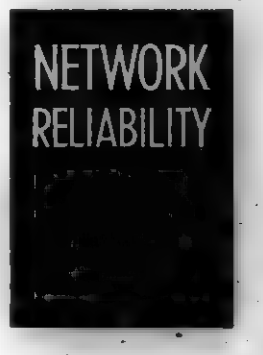

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Computer Careers

Industry Currents

Automotive opportunities still in high gear

By Stefanie McCann

The automotive industry may have been adversely affected by the recession, but information systems jobs in the industry were left unscathed.

The Big Three automakers have been layoff-resistant in IS, according to Chuck Muller, a partner at Andersen, Jones & Muller Associates in Southfield, Mich. "Ford and Chrysler have cut back, but not in the IS area because they are key to the business," he says.

Should you go with a European import or a Japanese import or stick with a domestic producer? That question may cross your mind when buying a car, but it could also be relevant if you are considering an IS career in the automotive industry.

European importers place a great deal of emphasis on business experience, while Japanese importers look for heavy technical experience.

Domestic manufacturers, on the other hand, prefer to breed their own IS professionals; they do most of their hiring straight from graduate schools (or top undergraduate programs) and teach candidates from scratch.

"We are sensitive to people with previous automotive experience," says Kenneth Barile, manager of MIS at BMW of North America, Inc. in Westwood, N.J.

Volkswagen of America, Inc. in Lanham, Md., looks at "the actual user process and maps that into a business process over a computer process," explains Stephen Pickett, director of IS at Volkswagen.

Japanese auto distributors, such as Toyota, are more interested in technical training, says Robert Best, group vice president of finance and administration at Toyota Motor Sales USA, Inc. in Torrance, Calif. IS responsibilities range from office functions for purchasing and finance to maintaining, training and supporting the Toyota Dealer Network, the company's proprietary network.

IS expansion likely

Best reveals that Toyota's IS department may continue to expand thanks to a major project involving North American parts. "Japan will be transferring parts and ordering functions to the U.S., so we'll be ordering parts direct from American suppliers. This will be a very large effort," he says.

Japanese distributor Isuzu Motors of America in Whittier, Calif., looks for Cobol, CICS, IMS or DB2 experience, says Gary Cray, vice president of MIS at Isuzu.

Recently, Isuzu has been pushing for skills in computer-aided software engineering (CASE) and CASE methodologies. The need for PC skills is also on the rise there. The firm is heavily involved in electronic data interchange (EDI).

Job opportunities: Detroit. Also pockets of opportunity in Southern California and the Northeast.

Salaries: $35,000 to $55,000 for programmers with three to five years experience.

Hottest job titles: With the distribution of the LAN and the increasing complexity of managing data, the role of a database administrator has become critical. Also, analysts with strong CASE or expert system skills.

Technical skills: EDI, Cobol, CICS, IMS, DB2, PC skills, CASE tools.

"All of our suppliers have to be on EDI, and we also use it for our service/parts business and domestic suppliers. It's used in the parts-ordering functions," Cray says. "We weigh automotive and distribution skills heavily. We are largely a distributor and are looking for people who can understand the concepts of this business."

Nissan Motor Corp. favors professionals with a strong technical background. Additionally, Nissan looks for people who have been involved in leadership roles in different IS or user groups in a production or manufacturing environment, according to Tony Lucente, manager of IS department dealer services at Nissan.

"We also have some jobs here that are very dealer-oriented, so we've been hiring people from dealer shops in more of an analytical capacity to help with business planning," Lucente says. "And since we're a distributor, we need IS people that have had specific experience with retail and point-of-sale systems."

Nissan also wants people with CASE backgrounds, as well as a strict discipline in systems development methodology and DB2.

And there is plenty of opportunity at the Big Three automakers, as long as you're prepared to start right out of school and work your way up. If you want a job at Ford Motor Corp. in Dearborn, Mich., for instance, you need a degree from a school that Ford calls "best in class" universities, such as Stanford University and MIT, explains Chuck Feltner, director of manufacturing planning and IS in the parts components group.

There is an exception: Candidates with EDI skills. Because this technology isn't taught in universities, companies expect candidates to have actual work experience in EDI.

Chrysler Corp. in Highland Park, Mich., exclusively wants people with advanced degrees, such as MBAs, to work in its IS departments. Such candidates are recruited into Chrysler's Advanced Development Degree Program, a 1½-year initiation consisting of three, six-month assignments, says Kenneth Quint, manager of manufacturing and assembly process at Chrysler.

One thing that domestic, European and Japanese car makers all agree on is the amount and variety of opportunity the automotive industry has to offer.

"This is an industry that is very much computerized, from manufacturing to dealing to distribution," Best says.

McCann is assistant researcher.

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Career advice for the '90s

Proper self-marketing key to job move

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Max Messmer, chairman and chief executive officer of Menlo Park, Calif.-based Robert Half International, Inc., an information systems placement firm.

Q: With a bachelor's in computer science and a master's in library science from a U.S. university, I am working as a corporate librarian but would like to work as a programmer or systems analyst. I have many years of applications experience in China and am familiar with Cobol, Pascal, Fortran, Lotus' 1-2-3, dBase, the IBM PC, Hewlett-Packard 3000 and VAX. How can someone with my background move back into the computer field?

A: Your background includes extensive academic credentials and very marketable skills in many types of hardware, software applications and languages.

The best plan of action is to prepare a resume highlighting your IS skills and to research the types of companies and industries that interest you. Of course, if you have specific expertise, that is where your background will be most marketable.

Because you appear to have some of the skills that are in demand today, the key to finding a job may lie in marketing yourself effectively. To help you with this task, there are many resources available, ranging from books and periodicals to courses at a nearby community college.

Q: I am a project manager responsible for managing payroll and financial systems in a large IBM mainframe environment. Every year my responsibilities increase, and my staff decreases. How can I protect my future at my current employer?

A: Companies value employees who contribute, are loyal and exhibit a solid work ethic. If your unit is outsourced, however, and your firm is adequately staffed, your fears may be realized. To improve your longevity, analyze your organization and evaluate key departments. See if you can begin a transfer process to move into one of them.

Additionally, keep in step with your organization's technology direction and learn new skills that your company is planning to implement. Also, share your concern with your manager to see how secure your position is.

Q: I am a mainframe Cobol programmer with 10 years of experience. My employer is reluctant to train me or provide me with a PC. What other ways can I learn?

A: Learning additional technical skills, such as working on a microcomputer, is important to your professional growth and job marketability. Don't be discouraged by your employer's reluctance.

There are many other ways to achieve your goal. For example, training is widely available and often at a limited cost through adult education classes or computer clubs.

If you decide to buy a PC and need software, I suggest starting with basic spreadsheet, word processing and relational database software. In addition, some computers come with bundled software. An excellent way to try out programs is through computer clubs that offer shared and public domain software.

Burned out? Grappling with work/family issues? Worried about skills stagnation? WE WANT TO HEAR FROM YOU ABOUT THESE AND OTHER ISSUES THAT AFFECT YOUR CAREER. CALL YOUR QUESTIONS IN USING THE FAST TRACK LINE AT (508) 820-8522 OR SEND THEM BY FAX TO KELLY E. SEWELL AT (508) 875-8931. LETTERS MAY BE EDITED FOR BREVITY AND CLARITY. IF WE USE YOUR QUESTION, WE'LL SEND YOU A GIFT.

How programmers can acquire analysis experience

■When a new system request comes in, volunteer to do the front-end analysis. We allow programmers to get involved from the beginning because we believe we'll get better code if they understand the system. Bringing that benefit to the department's attention can help. Or, just do it on your own and see how it varies from what the systems analyst finds.

Karen French, manager of programming
Ingersoll-Rand Corp., Westwood, N.J.

TIPS from the TIMES

■A standard logic class might be the way to start, then look at some case studies. There's no substitute for practical experience. We're starting to go over our programs in some reasonable depth, and we're having sessions for all the programmers, which gets them involved in this analysis.

John Norman, director of MIS
Long Beach Bank, Orange, Calif.

■If you're going to be in a business or scientific environment, work with a broad base of platforms. You will get more opportunities to look at the unique problems associated with each platform or technology that you're using, and that will prove your problem-solving/analytical skills.

Ron Krauss, manager, MIS programming
Nevada Power Co., Las Vegas

■We try to have programmers work with someone with experience in that area, typically on a small project. Then they gradually take on more responsibility.

Randy Winkelman, systems development manager
Black Hills Corp., Rapid City, S.D.

Compiled by Derek Slater, product research coordinator.

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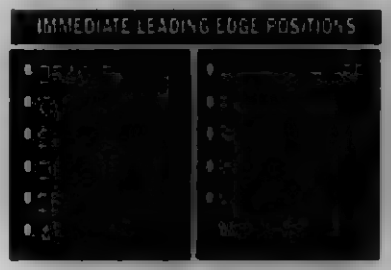

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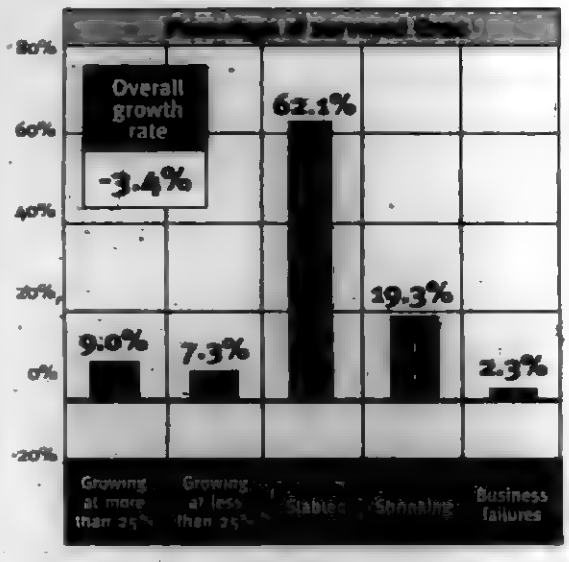

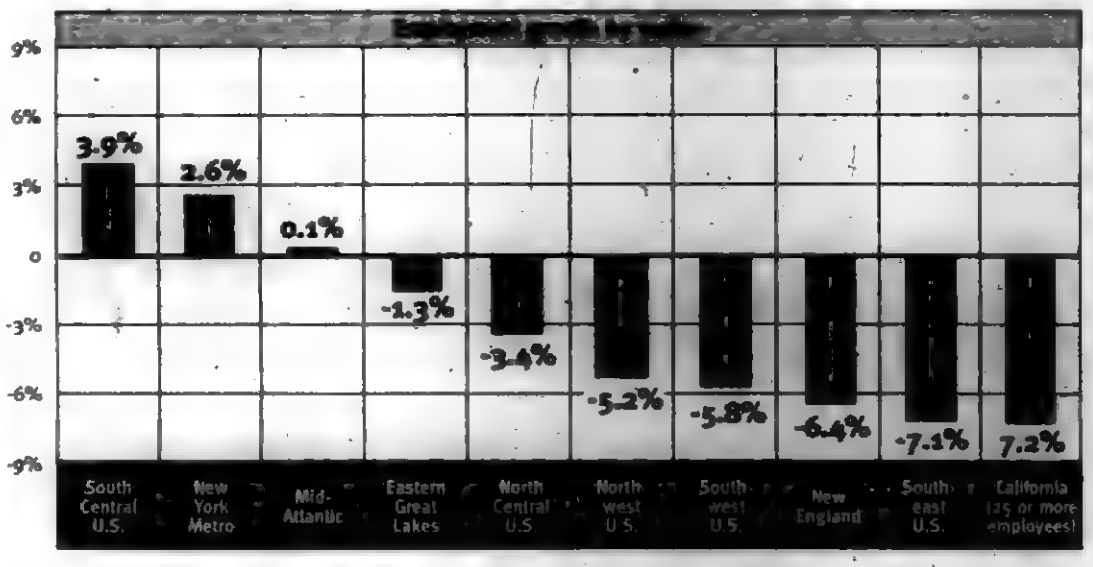

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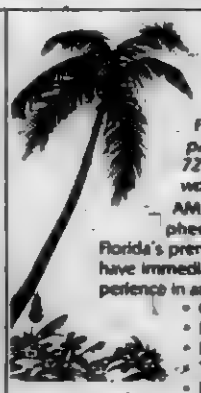

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Marketplace

Making mail-order choices

By Alan Radding

How do you choose a mail-order vendor? While we can't decide this for you, we can prepare you for the experience by giving you a dose of reality.

Early in December, *Computerworld* asked three mail-order vendors to respond to a request for proposal (RFP) that specified a purchase of 10 486SX-based PCs for a workgroup that was upgrading to Microsoft Corp.'s Windows.

The RFP specified the following:

- A desktop, full-cabinet, 25-MHz 486SX with 4M bytes of memory.
- Approximately 200M bytes of storage.
- Both 5¼- and 3½-in. floppy drives.
- A 250M-byte, ¼-in. tape drive.
- A 2.4K bit/sec. modem.
- A noninterlaced color monitor.
- DOS and Windows software.
- A minimum one-year warranty with on-site service.
- Payment terms: net 30 days, on approval of credit.

The following vendors were chosen:

- **Dell Computer Corp.**, a leader in the computer mail-order industry.
- **Northgate Computer Systems, Inc.**, a widely advertised brand.
- **PC-USA**, a small, little-known vendor.

Initially, Gateway 2000 was also chosen, but it could not be reached. It is reported to be installing more phone lines.

Here is what we found:

Dell, in Austin, Texas, offered a system with 170M bytes of storage for $2,832 per unit, including shipping and handling. A discount is available for orders over $25,000, but a Dell sales representative failed to get back with the discounted price.

Several days later, another Dell representative called with the price for a newly introduced, equivalent model that was several hundred dollars less. The new model was upgradable to Intel Corp.'s Pentium chip, offered better diagnostics and came with the local bus built into the motherboard. A slim-line model would be $250 less but would come with only three expansion slots rather than six.

Northgate Computer Systems in Minneapolis responded with a $2,556 price, which included shipping. The machine came with seven expansion slots, a 200M-byte hard drive and a combination fax/data modem running at 9.6K bit/sec. for fax and 2.4K bit/sec. for data. Also offered was a one-year limited warranty on parts and labor.

PC-USA in Walnut, Calif., came in with the best price for a 12-quantity order: $1,830 per machine configured with a 170M-byte hard disk. The company also offered a two-year warranty with one year of on-site service.

Radding is a free-lance writer based in Newton, Mass.

System quotations

[illegible]	Dell Computer (800) 426-5150	Northgate Computer Systems (800) 548-1993	PC-USA (800) 354-5566
System	[illegible]	Northgate ZXP with 486SX 25-MHz processor	[illegible]
Price	[illegible]	$2,556	[illegible]
Shipping/Handling	[illegible]	Free	[illegible]
4M bytes RAM	[illegible]	[illegible]	[illegible]
3½- and 5¼-in. floppy drives	[illegible]	[illegible]	[illegible]
Hard drive	[illegible]	200M-byte	[illegible]
250M-byte tape drive	[illegible]	[illegible]	[illegible]
2.4K bit/sec. modem	[illegible]	Combination 9.6K bit/sec. fax/2.4K bit/sec. data modem	[illegible]
Noninterlaced color monitor	[illegible]	[illegible]	[illegible]
DOS 5.0, Microsoft Windows 3.1	[illegible]	[illegible]	[illegible]
Warranty, on-site service	One-year limited warranty, one-year on-site service	One-year limited warranty on parts and labor, unlimited phone technical assistance, one-year on-site service	Two years parts and labor, one-year on-site service
Other	Keyboard, carrying case, random software	Keyboard, carrying case, 250M-byte tape backup unit, Zero Insertion Force processor, integrated I/O, IDE hard and floppy drive interface	[illegible]

CW Chart: Stephanie Faucher

ANALYSIS

Dell	Northgate	PC-USA
[illegible]	[illegible]	**PROS** • Best price. • Best warranty. **CONS** • Although individual components are brand name, the vendor is not well-known.

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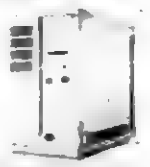

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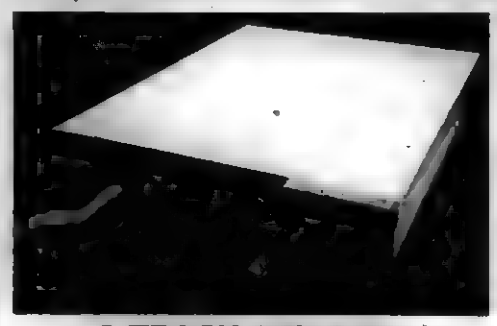

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Gainers

Percent

Pyramid Technology	61.0
Applied Communication Corp.	31.9
Bolt, Beranek & Newman	26.3
Intelligent Info. Systems (H)	22.2
Radnet Inc.	20.0
State of the Art	20.0
Datapoint Corp.	17.1
Texas Instruments	16.4

Losers

Percent

Fibronix Corp.	-36.3
Everex Systems Inc. (L)	-33.3
Data Switch Corp.	-23.9
Xicor Inc.	-18.5
Cambex Corp.	-14.1
Spinnaker Software	-13.1
Wyse	-13.0
Visicorp	-12.8

Dollar

Intelligent Info. Systems (H)	11.25
Intel Corp. (H)	11.25
Texas Instruments	7.63
Motorola Inc. (H)	5.50
CompuUSA Inc.	4.69
Xerox Corp.	4.25
Pyramid Technology	4.00
Peoplesoft	3.75

Dollar

Fibronix Corp.	-8.25
Policy Management Sys. (H)	-5.50
IBM (L)	-4.13
Parametric Technology*	-4.00
Sybase Inc. (H)	-3.63
Matsushita Electronics	-3.13
Computer Sciences	-2.63
Synoptics Communications (H)	-2.50

Networking stocks up in 1992

Investors who sank their money into networking stocks made out like bandits in 1992. Nearly half of the year's top technology dollar gainers were involved in networking hardware or software. The bulk of the falling stocks came from the desktop software and big iron sectors.

—Derek Slater

TOP 20 GAINERS 1992		TOP 20 LOSERS 1992	
SynOptics Communications, Inc.	60.25	Borland International, Inc.	-60.00
Cisco Systems, Inc.*	45.50	IBM	-38.63
Motorola, Inc.	39.25	Adobe Systems, Inc.	-34.00
Intel Corp.	38.00	Symantec Corp.	-30.88
Newbridge Networks Corp.	33.63	Excel Corp.	-26.25
Intelligent Information Services, Inc.	32.63	Aldus Corp.	-24.00
Dell Computer Corp.*	30.92	Matsushita Electronics	-23.50
Cabletron Systems, Inc.	30.25	Picturetel Corp.	-22.13
Informix Corp.*	29.38	Digital Equipment Corp.	-21.50
Sybase, Inc.	28.50	Storage Technology Corp.	-19.13
Parametric Technology*	22.88	Quarterdeck Office Systems	-19.13
Compaq Computer Corp.	22.38	Structural Dynamics Research Corp.	-18.50
Wellfleet Communications, Inc.*	19.88	Bachman Information Systems, Inc.	-14.50
Standard Microsystems Corp.	19.38	Stratus Computer, Inc.	-13.88
Chevenne Software, Inc.*	18.54	Cray Research, Inc.	-13.75
3Com Corp.	18.38	Zeos International Ltd.	-13.25
DSC Communications	18.13	Exabyte Corp.	-13.25
Policy Management Systems Corp.	17.25	Sequoia Systems, Inc.	-13.00
Progress Software Corp.	16.63	Compression Labs, Inc.	-12.38
Texas Instruments, Inc.	15.88	SPL Systems, Inc.	-9.50

Stock splits are taken into account. Companies marked with an asterisk (*) underwent splits in 1992.

Exch	52-Week High	52-Week Low		Jan. 08 '93 Price	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORKING SERVICES						
OTC	30.00	9.63	3 COM Corp. (H)	28.50	-1.13	-3.8
NYS	74.50	56.25	American Info Techs Corp.	73.13	-0.13	-0.2
NYS	53.13	36.63	AT&T (H)	50.75	-0.38	-0.7
OTC	4.25	0.75	Abtel Communication Corp.	1.81	0.44	31.9
OTC	22.75	10.25	Banyan Systems Inc.	21.00	0.00	0.0
NYS	53.88	40.25	Bell Atlantic Corp.	49.75	-1.50	-2.9
NYS	56.50	43.38	BellSouth Corp.	52.13	0.75	1.5
NYS	6.75	3.63	Bolt, Beranek & Newman	6.00	1.25	26.3
OTC	17.25	10.00	Brooktrout Technology	14.75	0.13	0.9
NYS	85.25	42.13	Cabletron Systems (H)	82.00	-2.00	-2.4
OTC	30.50	17.75	Compcom Corp.	26.00	-1.25	-4.6
OTC	80.75	33.00	Cisco Systems Inc. (H)	79.50	0.88	1.1
OTC	34.88	5.50	Compression Labs Inc.	11.50	-1.00	-8.0
OTC	3.38	0.88	Data Switch Corp.	2.19	-0.69	-23.9
NYS	23.63	13.75	Digital Comm. Assoc.	10.88	0.63	3.6
OTC	15.25	7.50	Digital Systems Int'l. Inc.	11.00	-0.25	-2.2
OTC	23.00	6.00	DSC Communications	22.88	0.88	4.0
OTC	10.88	4.75	Fibronix Int'l. Inc.	7.50	0.75	11.1
OTC	37.50	10.50	Filenet Corp.	14.50	-8.25	-36.3
OTC	3.38	1.50	Gandalf Technologies Inc.	3.38	0.19	5.9
OTC	2.25	0.69	Gateway Communications	1.31	0.06	5.0
NYS	6.88	2.88	General Datacomm Inds. (H)	6.75	0.38	5.9
ASE	5.88	1.25	Go Video	3.13	0.00	0.0
NYS	35.75	28.88	GTE Corp.	34.38	-0.38	-1.1
NYS	72.13	55.50	ITT Corp. (H)	70.00	-2.00	-2.8
OTC	40.88	29.50	MCI Communications Corp.	40.50	0.88	2.2
OTC	14.25	2.25	Microcom Inc.	6.00	-0.13	-2.0
OTC	20.50	12.00	Netpin Corp.	18.75	-1.25	-6.3
OTC	16.75	9.63	Network Computing Devices	14.88	-0.13	-0.8
NYS	18.25	8.88	Network Equipment Tech.	9.63	-0.38	-3.8
OTC	25.50	8.00	Network General	18.00	-1.00	-5.3
OTC	20.00	8.50	Network Systems Corp.	12.75	-0.63	-4.7
OTC	47.25	10.38	Newbridge Networks Corp. (H)	40.63	-0.63	-1.5
NYS	49.25	30.50	Northern Telecom Ltd.	41.25	-1.75	-4.1
OTC	33.50	22.50	Novell Inc.	29.50	1.00	3.5
NYS	88.50	69.13	Nynex Corp.	84.13	0.25	0.3
OTC	37.50	14.50	Octel Communications Corp.	22.50	1.50	7.1
OTC	9.88	3.38	Perrill Data Comm Networks	4.63	-0.63	-11.9
OTC	53.00	10.25	Picturetel Corp.	23.50	-1.75	-6.9
OTC	18.75	7.00	Proteon Inc.	9.75	0.63	6.8
NYS	27.50	10.16	Scientific Atlanta Inc.	24.25	-0.75	-3.0
NYS	74.75	56.63	Southwestern Bell Corp. (H)	72.75	-1.25	-1.7
NYS	26.75	20.75	Sprint Corp.	25.75	0.25	1.0
OTC	26.25	7.25	Standard Microsystems Corp	25.25	-0.75	-2.9
OTC	15.75	6.88	Stratacom Inc.	13.25	0.63	5.0
OTC	83.50	18.75	Synoptics Communications (H)	78.88	-2.50	-3.1
OTC	7.13	4.38	Telebit Corp.	5.63	0.13	2.3
OTC	24.25	13.38	US Robotics	20.25	-0.50	-2.4
NYS	40.00	32.88	U S West Inc.	37.88	-0.50	-1.3
OTC	39.25	12.00	Wellfleet Communications	36.25	-1.38	-3.7
OTC	22.00	2.00	Xircom	8.75	-0.50	-5.4
PCS AND WORKSTATIONS						
OTC	10.00	3.13	Advanced Logic Research	3.63	0.00	0.0
OTC	78.00	41.50	Apple Computer Inc.	67.25	2.50	4.2
OTC	24.50	11.25	AST Research Inc.	21.75	0.75	3.6
NYS	19.25	6.25	Commodore Int'l.	6.25	-0.88	-12.3
NYS	49.88	22.25	Compaq Computer Corp. (H)	47.50	-1.25	-2.6
OTC	46.38	15.00	Dell Computer Corp. (H)	45.88	-2.13	-4.4
OTC	7.75	0.13	Everex Systems Inc. (L)	0.25	-0.13	-33.3
NYS	35.50	26.63	Harris Corp.	35.25	1.75	5.2
NYS	85.00	50.25	Hewlett Packard Co.	69.38	-0.50	-0.7
NYS	29.75	14.13	Silicon Graphics	28.00	-0.63	-2.2
OTC	36.50	22.50	Sun Microsystems Inc. (H)	35.88	2.25	6.7
NYS	31.75	22.25	Tandy Corp.	30.13	0.38	1.3
NYS	11.13	5.00	Zenith Electronics	6.13	0.25	4.3
OTC	25.50	2.75	Zeos International Ltd.	4.13	0.38	10.0
LARGE SYSTEMS						
ASE	20.63	6.63	Ardent Corp.	6.88	-0.38	-5.2
NYS	16.38	4.75	Convex Computer	8.00	0.00	0.0
OTC	9.50	1.88	Cray Computer	4.38	0.50	12.9
NYS	49.50	19.00	Cray Research Inc.	33.00	0.00	0.0
NYS	18.13	7.13	Data General Corp.	11.88	0.25	2.2
NYS	65.50	30.38	Digital Equipment Corp.	34.88	1.13	3.3
NYS	100.38	46.25	IBM (L)	46.25	-4.13	-8.2
OTC	29.50	5.50	Kendall Square Research	18.00	-0.63	-3.4
NYS	118.00	83.00	Matsushita Electronics	89.88	-3.13	-3.4
OTC	17.50	6.00	Pyramid Technology	13.75	4.00	41.0
OTC	22.00	11.13	Sequent Computer Sys.	21.25	0.38	1.8
OTC	17.25	1.38	Sequoia Systems Inc.	2.16	0.03	1.5
NYS	50.25	29.50	Stratus Computer Inc.	34.13	0.25	0.7
NYS	15.88	9.88	Tandem Computers Inc.	15.75	0.75	5.0
NYS	11.75	4.50	Unisys Corp.	10.63	0.38	3.7
ASE	7.50	0.06	Wang Labs Inc. (n)	0.38	0.00	0.0
SOFTWARE						
OTC	65.75	25.25	Adobe Systems Inc.	33.13	1.63	5.2
OTC	44.25	10.25	Aldus Corp.	15.50	0.75	5.1
OTC	19.75	7.00	American Software Inc.	8.88	-0.13	-1.4
OTC	24.38	9.75	ASK Computer Systems	21.75	-1.63	-7.0
OTC	56.50	23.25	Autodesk Inc.	47.75	1.50	3.2
OTC	37.75	3.75	Bachman Info. Systems	5.38	0.25	4.9
OTC	43.00	34.00	BGS Systems Inc	47.00	0.50	1.2
OTC	79.00	37.25	BMC Software Inc.	74.25	1.75	2.4
OTC	25.50	13.75	Biddle & Babbage	23.25	1.25	5.7
OTC	83.00	19.75	Borland Int'l. Inc.	20.75	-1.50	-6.7
OTC	10.50	3.63	CE Software	3.88	-0.13	-3.1
ASE	32.75	9.38	Cheyenne Software Inc.	30.75	0.63	2.1
OTC	17.75	8.25	ChipSoft (H)	17.25	1.00	6.2
OTC	12.50	5.63	Cognos Inc.	7.50	0.75	11.1
NYS	20.75	10.88	Computer Associates (H)	20.63	-0.38	1.9
NYS	12.38	4.00	Computervision Corp.	5.50	-0.25	-4.3
OTC	20.00	6.75	Cosmare Inc.	12.75	-0.50	-3.8
OTC	47.88	6.00	Easel Corp.	13.00	0.25	2.0
OTC	26.50	11.75	Frame Technology	15.50	0.25	1.6
OTC	25.00	12.50	Group I Software	14.00	-1.25	-8.2
OTC	6.63	3.50	Hogan Systems Inc.	6.38	0.75	13.3
OTC	25.50	13.75	IMRS (H)	24.50	-0.25	-1.0
OTC	36.25	18.50	Information Resources	30.88	-0.63	-2.0
OTC	37.75	8.81	Informix Corp. (H)	34.13	-2.13	-5.9
OTC	22.38	11.80	Intergraph Corp.	12.75	-0.50	-3.8
OTC	15.80	7.75	Interleaf Inc.	12.50	0.25	2.0
OTC	20.25	10.25	Intersolv Inc.	15.00	0.75	5.3
OTC	31.38	9.50	Knowledgeware Inc.	14.88	-0.13	-0.8
OTC	52.75	28.75	Legent Corp.	48.50	0.50	1.0
OTC	38.75	14.75	Lotus Development	19.00	-0.63	-3.2
OTC	23.25	13.00	McAfee Associates	15.25	-1.75	-10.3
OTC	7.38	1.88	MeCa Software	6.00	0.50	9.1
OTC	22.25	5.25	Mentor Graphics	8.88	0.75	9.2
OTC	42.75	27.25	Micro Focus	42.25	0.25	0.6
OTC	20.50	6.50	Micrografx Inc.	11.00	0.63	6.0
OTC	95.00	65.50	Microsoft Corp.	86.63	1.29	1.5
OTC	29.75	12.00	Oracle Corp. (H)	29.63	1.25	4.4
OTC	56.25	25.25	Parametric Technology	49.00	-4.00	-7.5
OTC	32.00	22.50	Peoplesoft	32.00	3.75	13.3
OTC	11.00	3.50	Phoenix Technologies	6.25	0.50	8.7
OTC	24.50	11.25	Platinum Technology	19.25	-1.00	-4.9
OTC	61.50	29.00	Progress Software Corp.	58.75	1.13	2.0
OTC	26.63	3.63	Quarterdeck Office Sys.	4.00	-0.13	-3.0
OTC	32.75	11.75	Rainbow Technologies Inc.	17.50	-0.50	-2.8
OTC	22.75	4.00	Rasterops	7.13	-0.75	-9.5
OTC	17.25	3.63	Ross Systems	8.50	-0.63	-6.8
OTC	26.00	8.50	Sapiens USA Inc.	25.75	-0.25	-1.0
OTC	26.25	6.75	Software Publishing Corp.	9.00	0.25	2.9
OTC	8.38	2.00	Software Toolworks Inc.	7.50	0.00	0.0
OTC	7.25	0.75	Spinnaker Software	1.25	-0.19	-13.1
OTC	16.50	3.25	State of the Art	9.00	1.50	20.0
NYS	25.25	13.75	Sterling Software Inc.	19.88	-1.13	-5.4
OTC	30.00	8.00	Struct. Dynamics Research	12.25	1.25	11.4
OTC	69.75	21.00	Sybase Inc. (H)	65.63	-3.63	-7.4
OTC	51.00	5.88	Symantec Corp.	12.75	-0.88	-6.4
NYS	13.75	5.25	Systems Center Inc.	7.75	-0.25	-3.1
OTC	25.50	11.84	System Software Assoc. (H)	24.00	0.50	2.1
OTC	13.25	2.50	Tomcat Corp.	5.13	-0.75	-12.8
OTC	23.75	14.50	Walker Interactive Systems	20.75	-1.25	-5.7
OTC	5.38	1.38	Wordstar	2.69	-0.06	-2.3
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	19.38	1.25	6.9
NYS	16.25	8.63	Analog Devices Inc. (H)	16.00	-0.25	-1.5
OTC	17.00	7.63	Atmel Corp.	16.38	0.00	0.0
OTC	14.13	3.25	Chips and Technologies	4.63	0.13	2.8
NYS	16.38	7.38	Cypress Semiconductor Corp	10.38	1.13	12.2
NYS	14.50	7.00	Dallas Semiconductor	14.38	1.00	7.5
OTC	98.25	46.50	Intel Corp. (H)	98.25	11.25	12.9
NYS	11.13	4.88	LSI Logic Corp.	10.75	0.00	0.0
NYS	22.38	12.88	Micron Technology	20.50	1.63	8.6
NYS	109.00	68.50	Motorola Inc. (H)	109.00	5.50	5.3
NYS	14.13	7.38	National Semiconductor	11.38	0.75	7.1
OTC	27.00	8.25	Sierra Semiconductor	12.00	-1.50	-11.1
OTC	37.00	22.25	SynOptys	37.00	2.38	6.9
NYS	54.25	31.50	Texas Instruments	54.25	7.63	16.4
OTC	10.50	6.00	VLSI Technology	8.38	0.25	3.1
OTC	7.63	2.13	Weitek	5.88	-0.88	-13.0
ASE	9.13	3.00	Western Digital Corp. (H)	9.13	0.50	5.8
OTC	31.00	14.50	Xilinx	23.75	-1.50	-5.9
OTC	38.00	17.50	Zilog Inc. (H)	38.00	3.75	10.9
PERIPHERALS AND SUBSYSTEMS						
OTC	29.75	16.75	Banctec Inc. (H)	27.75	-1.25	-4.3
OTC	23.50	9.25	Cambex Corp.	13.75	-3.25	-14.1
ASE	17.75	6.00	Cognitronics Corp. (H)	16.13	-1.25	-7.2
NYS	23.88	16.75	Conner Peripherals	21.63	0.88	4.2
OTC	22.75	10.75	Creative Technologies Inc.	18.25	-1.25	-6.4
OTC	27.50	14.25	Data Race Inc.	24.50	0.75	3.2
ASE	19.66	4.75	Dataram Corp.	11.13	1.63	17.1
NYS	24.25	7.25	EMC Corp. (H)	22.63	-1.13	-4.7
OTC	10.50	5.38	Emulex Corp. (H)	9.63	-0.25	-2.5
OTC	23.00	13.25	Evans & Sutherland	18.25	0.00	0.0
OTC	40.63	12.00	Exabyte	16.38	-1.88	-10.3
OTC	62.00	19.00	Intelligent Info. Systems (H)	62.00	11.25	22.2
OTC	11.25	6.75	Iomega Corp.	7.38	0.00	0.0
OTC	34.75	10.25	IPL Systems Inc.	12.00	0.25	2.1
OTC	23.25	10.75	Komag Inc.	17.25	-0.25	-1.4
OTC	19.63	6.63	Maxtor Corp.	13.75	-0.63	-4.3
OTC	12.63	7.13	Micropolis Corp.	9.50	0.63	7.0
NYS	107.00	85.50	3M Corp.	90.38	-1.75	1.2
OTC	6.75	4.00	Printronix Inc.	4.75	0.25	5.6
NYS	15.50	6.88	QMS Inc.	13.25	0.00	0.0
OTC	18.00	12.13	Quantum Corp.	16.13	0.88	5.7
OTC	12.75	3.75	Radius Inc.	5.25	0.88	20.0
NYS	14.75	7.50	Recognition Equipment	14.25	0.38	2.7
OTC	13.88	7.88	Reson Inc.	8.25	-1.88	-18.5
OTC	22.38	10.75	Seagate Technology	20.38	0.75	3.8
NYS	78.00	18.38	Storage Technology	20.38	-0.38	-1.8
NYS	22.50	16.50	Tektronix Inc.	21.50	1.38	6.8
NYS	83.50	63.63	Xerox Corp.	83.50	4.25	5.4
SERVICES						
OTC	23.50	12.16	American Mgmt. Systems	21.88	-0.38	-1.7
NYS	5.38	3.00	Analogic Inc.	4.25	-0.13	-2.9
OTC	26.00	15.50	Analytics Int'l. (H)	23.50	-1.75	-6.9
NYS	55.63	38.75	Auto Data Processing	51.75	-1.38	-2.6
NYS	17.25	7.81	Ceridian Corp.	15.00	-0.25	-1.6
NYS	29.22	12.50	Comdisco Inc.	14.00	-0.38	-2.6
OTC	13.50	6.75	Computer Horizons	9.75	-0.13	-1.9
NYS	84.88	57.00	Computer Sciences	75.63	-2.63	-3.4
NYS	10.13	7.13	Computer Task Group	8.25	-0.13	-1.5
NYS	48.50	22.00	CompuUSA Inc.	33.13	4.63	16.2
OTC	19.25	6.00	Corporate Software	11.75	0.25	2.2
OTC	30.75	7.75	Egghead Discount Software	10.25	0.38	3.8
NYS	34.00	25.25	General Motors E (EDS)	31.13	-1.75	-5.9
OTC	14.75	9.25	Imacom Corp.	14.00	-0.50	-3.4
OTC	30.38	6.25	Intelligent Electronics	14.13	1.25	9.7
OTC	14.88	6.63	Merisel	10.88	0.75	7.4
OTC	15.75	5.75	Microage Inc.	8.38	0.38	4.7
OTC	60.50	21.66	Paychex	54.75	-0.50	-1.4
NYS	83.50	59.75	Policy Management Sys. (H)	78.00	-5.50	-6.6
NYS	25.56	16.81	Reynolds and Reynolds	25.00	0.63	2.6
OTC	32.00	22.00	SEI Corp.	30.75	-1.00	-3.1
OTC	24.38	16.88	Shared Medical Systems	20.75	-1.63	-7.3
OTC	14.38	5.75	SHL Systemhouse	7.00	-0.13	-1.8
OTC	29.75	16.25	Software Spectrum Inc.	23.25	0.50	2.2
OTC	31.25	18.75	Sungard Data Systems (H)	29.50	-0.25	-0.8
NYS	3.63	1.13	Ultimate Corp.	1.88	-0.75	-11.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
Note: Archive was acquired by Conner Peripherals. Wellfleet Comm. completed a 2-for-1 stock split.
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In Brief

Cray expects loss

Cray Research, Inc. last week said it would post its first-ever loss, citing a federal customer's delay in accepting a supercomputer and a previously disclosed $40 million restructuring charge. Although a $32 million Cray Y-MP C90 had been delivered before year's end, it was not certified for use by the unidentified customer until Jan. 2. Cray does not count revenue until its systems are in use by customers, a spokesman said.

The $40 million charge covers expenses associated with the closure of a Wisconsin plant, which eliminated some 650 positions. For the nine months ended Sept. 30, the Eagan, Minn., company earned $11.7 million on revenue of $570.2 million.

SHORT TAKES **WordPerfect Corp.** has acquired a controlling interest in **Reference Software International**, a San Francisco developer of software development tools.... **IMSL, Inc.**, a Houston-based application tools vendor, and **Precision Visuals, Inc.**, a Boulder, Colo., provider of data analysis software, have merged. The name of the new firm is **Visual Numerics, Inc.**.... **Fiserve, Inc.** in Milwaukee has agreed to acquire **Basis Information Technologies**, an information services subsidiary of **First Financial Management Corp.** in Atlanta, in a stock and cash deal valued at $96.5 million.... **Fore Systems, Inc.**, a Pittsburgh developer of Asynchronous Transfer Mode local-area network products, has received $5 million in equity financing from a group of investors led by **Patricof & Co. Ventures** in New York.... **James McCormick**, co-founder of **McCormick & Dodge**, has resurfaced as vice chairman of **U.S. LAN Systems Corp.**

IBM/McDonnell Douglas deal questioned

By Mark Halper
ST. LOUIS

While IBM's recent outsourcing megadeal with McDonnell Douglas Corp. marks a case of troubled spirits joining forces, industry observers are wondering about IBM's profit and revenue potential from what the two parties said is a $3 billion accord.

Both companies are shrinking behemoths jarred by the concussions of change shaking their respective industries.

McDonnell Douglas, the $18.4 billion aerospace giant, faces a host of uncertainties in commercial as well as military markets. It decided to unload its data processing operations in order to concentrate on its core business of building and developing aircraft and missiles.

IBM, meanwhile, is trying to reinvent itself as a holding company for 13 autonomous operating units, of which its Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary is one.

Staff faces cuts

McDonnell Douglas' decision to outsource comes amid personnel cutbacks that have reduced its work force by more than 20%, from 113,000 in September 1991 to 93,000 a year later. The ISSC deal will enable McDonnell Douglas to cut its payroll by another 1,450 information systems employees, who will be offered jobs by IBM or by its partners in the deal, including Digital Equipment Corp. and Unisys Corp.

The aerospace company has yet to release financial results for the year ending Dec. 31, but in its third quarter, it lost $15 million owing to a write-off for the failure of its C-17, a military transport that literally snapped under development pressure during stress testing last fall.

Moreover, business potential in its traditional endeavors is diminishing. The company derives some 60% of its revenue from military customers worldwide. The foreign scene seems healthy — the company closed the year with a large sale of F-15 fighter planes to Saudi Arabia — but domestic opportunities are questionable.

Given this iffy tableau, industry observers questioned the $3 billion figure attached to the IBM contract, although they said they do not doubt that the deal is, by some measure, large.

Chuck Phillips, vice president at Soundview Financial Corp. in Stamford, Conn., predicted the deal will reach that level "only if all the individual options are exercised."

Mum's the word

Neither McDonnell Douglas nor IBM would elaborate on the deal's various contingencies. But as IBM and other outsourcers have discovered in earlier contracts, a client's business can fluctuate during the course of a contract. ISSC had to restructure an outsourcing contract with Bank South Corp. last year, for instance.

Outsourcers are writing more flexible contracts to accommodate change these days, making estimated contractual value speculative, observers said.

Also unknown is how much margin IBM built into its price tag.

The lack of potential margin is believed to be what drove Electronic Data Systems Corp. away. After some two years of posturing for the job — which led to the November 1991 purchase of McDonnell Douglas Systems Integration Co. — EDS decided not to respond to the aerospace company's request for proposals.

Merrill Lynch analyst Steve McClellan said EDS was unwilling to spring for as much of an up-front investment as the deal required for equipment purchases. "EDS dropped out because it didn't want to pay more than $150 million," McClellan said. "Who knows how much IBM is paying."

While EDS' trademark strategy has been to invest money at the front end of a deal, it has been getting more selective with the clients it pursues, McClellan claimed. "EDS wants to make sure they're getting a return on their investment," he explained.

Phillips estimated that IBM will make less than the 8% to 12% margin he considers customary in an outsourcing deal. "But relative to what IBM is experiencing in other parts of its business, this is attractive to them," he said.

In control

The contract calls for ISSC to take over data and voice operations, maintenance and support. IBM is tapping DEC as a subcontractor to maintain the large stable of VAX equipment that now belongs to IBM. IBM essentially acquired McDonnell Douglas Aerospace Information Services (MDAIS), which had provided data processing and voice communications to most of McDonnell Douglas. ISSC will not provide service to McDonnell Douglas Helicopter Co., which did not use MDAIS. The operation will continue to provide its own data processing.

FileNet restructures after quarter loss

By Ellis Booker
COSTA MESA, CALIF.

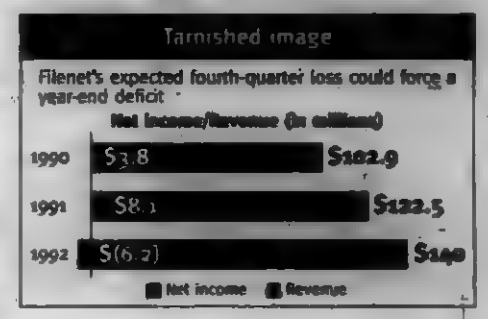
After eight consecutive profitable quarters, document imaging pioneer FileNet Corp. disclosed last week that it would report a fourth-quarter pretax loss of roughly $7 million.

The company reacted swiftly to its first losing quarter in years, enacting a restructuring plan designed to accelerate a move away from manufacturing to open systems software and services. Officials meanwhile blamed the unexpected result on the sluggish U.S. economic recovery and last-minute purchasing delays by European customers.

"The U.S. fell below expectations as did Western Europe [in the quarter]," said Jordan M. Libit, vice president of marketing.

FileNet's board of directors approved a pretax restructuring charge of $6.8 million for the quarter, which will cause a net loss of approximately $6.2 million for the year, in order to accelerate plans to move away from manufacturing jukeboxes and image servers.

While FileNet continues to make a line of Unix servers and optical disc jukeboxes, in recent years it has deliberately sought to open its imaging system to other platforms. Last May, for example, FileNet began shipping its Series 6000 Unix servers, which use IBM's RISC System/6000 hardware platform. Unisys Corp. remarkets FileNet's imaging software, and FileNet is porting its software to Unix hardware from Ing. C. Olivetti & Co.



The restructuring is expected to increase revenue from open systems sales, said Pam Bliss, a senior industry analyst at the Document Imaging Service of Dataquest, Inc. in San Jose, Calif. Yet open systems sales account for only about 10% of the 100 or so systems FileNet shipped in 1992, Bliss estimated, adding that FileNet apparently wishes to avoid the fate of another imaging pioneer: Wang Laboratories, Inc. "Wang suffered the pain of not making the tough choices fast enough," she said.

The restructuring plan will include a 10% to 15% reduction in FileNet's 1,000-person worldwide work force but will not involve diluting the company's research and development budget, Libit said.

For the year ended Jan. 3, 1993, FileNet said it expects to post revenue of $140 million, a 14% increase over its 1991 revenue of $122.5 million. Net income in 1991 was $8.1 million.

Trends Consultant usage

According to a recent survey, 46% of respondents employed external IS consultants for advice in the past two years. They didn't come cheap, either. The average fee: approximately $125 per hour.

Top 5 most common consultation projects

1. RE-ENGINEERING
2. DOWNSIZING
3. OUTSOURCING
4. OPEN SYSTEMS
5. APPLICATION DEVELOPMENT

Biggest time consumers

	Hours worked	Median cost*
APPLICATION DEVELOPMENT	1,500	$225
OUTSOURCING	1,000	$150
RE-ENGINEERING	900	$147
DOWNSIZING	750	$110

*In thousands

Bottom line:
Consultation isn't cheap

Median cost for all consultants: **$125** per hour — roughly **$900** per day.

Median number of consultant hours required for all projects: **300 hours.**

Median cost per project: **$50,000.**

'Big name' consultants tend to cost about **$25** to **$125** more per hour.

"Would you hire the same consultants again for similar assignments?"

Hidden agendas
In **46%** of the cases, consultants' advice led to more work for themselves.

Base: 539 U.S. sites, 277 international sites

Source: Xephon/WPWS, Oviedo, Fla.

The Fifth Wave

Inside Lines

Sad tidings

After signing a letter of intent for a 10-year outsourcing contract with Computer Sciences Corp., Qualex, Inc., a Durham, N.C.-based photo processing company, delivered CSC some bad news on New Year's Eve. After a month of due diligence, the company decided to negotiate instead with IBM's Integrated Systems Solutions Corp. (ISSC). Two different sources offered varying explanations for the last-minute shift: Either ISSC offered a better cash up-front deal or it simply offered a more cost-effective deal. CSC's bid was believed to be around $130 million, high for a company the size of Qualex, a roughly $700 million company that has about 80 people in its IS shop. Perhaps IBM was able to leverage its outsourcing presence at Eastman Kodak, which owns 49% of Qualex.

Flaring NOS

Although Novell spokesmen will say only that the company is "on target" for its planned first-quarter release of NetWare 4.0, analysts and users close to Novell are predicting a March 1 ship date. Beta testers who have tested the most recent beta-test release, such as Dan Kohner, network director at Houston's M.D. Anderson Cancer Research Center, say it has all the functionality Novell promised, including global directory service, data compression algorithms and protected-memory application space. Kohner says he considers the product "ready to go."

Switching gears

Cell-relay telecommunications vendor StrataCom and router giant Cisco Systems will team in New York this week on Asynchronous Transfer Mode (ATM) networking efforts. StrataCom reportedly will announce a new, "pure" ATM platform — separate from its IPX frame-relay switch — that will accept traffic from IPXs and other types of devices and convert it to ATM cells, initially at T3, then at Sonet speeds. Cisco's role will likely be the rollout of an ATM data service unit, which will segment frames into standard ATM cells and transport them to the StrataCom box.

OK, this time we really mean it

Lotus will unveil yet another strategy for bringing together its Notes groupware and CC:Mail E-mail packages at Networld '93 in Boston this week, according to an industry source. Expected to be added are shared administration tools and an option to choose CC:Mail as the mail package in Notes. Lotus also said it will unveil an upgraded CC:Mail for Windows, demonstrate its Notes 3.0 Microsoft Windows and Macintosh-based clients, demonstrate new work-flow technology in Notes 3.0 and announce a messaging service based on Notes and CC:Mail.

All charged up

The surging problem of electrical disturbances clobbering LANs may get some relief at this week's Networld '93 show in Boston. Best Power Technology will demonstrate its Logic Voltage Monitor, which sits on a LAN file server or workstation expansion slot and periodically monitors DC voltage levels. This in turn lets network managers determine which network errors are caused by electrical glitches, and they get early warning of power supply failure. Best's rival, Network Security Systems, says it will also show software that analyzes voltage trends on the LAN.

Not too long ago, California's highways were outfitted with a series of roadside cellular phones so stranded drivers could call for help. Each phone broadcasts a unique Electronic ID number (EIN) for billing purposes. One problem: EIN readers are available from a number of electronic suppliers, ostensibly for repair, programming and maintenance. You can guess what happened next. The EINs were illegally detected, and California found itself with an extra 11,000 calls — and one whopper of a phone bill. Phone, fax or CompuServe News Editor Alan Alper, with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

IBM ups parallel pace

By Johanna Ambrosio and Rosemary Cafasso
ARMONK, N.Y.

■ IBM is readying its first parallel processing machine for the commercial world: a database engine that, an IBM spokeswoman confirmed last week, will be announced in the second quarter. The first customer shipments should begin very late this year, she added.

IBM is taking the wraps off the computer about a year earlier than planned, analysts said, in order to invigorate its moribund mainframe business with a high-end alternative that is much cheaper than what it now has available.

Initial price points are expected to be about $15,000 per million instructions per second, compared with a list price of about $100,000 per MIPS (discounted to $55,000 per MIPS) for a traditional mainframe.

Still little need

The low price notwithstanding, some users said they see no immediate need for such a machine.

Where a mainframe uses a single, very powerful processor to crunch through a problem as quickly as possible, a parallel machine splits up an application's logic among several processors that work on different pieces of the problem at the same time. Not every business application, however, can use parallel processing because some require data from one process to be available before another process can begin.

IBM's initial foray into the parallel market will be a machine based on a version of a System/390 on a chip. The computer will initially be a database machine designed to handle DB2 inquiries, and as such will compete with the database machine from the Teradata division of NCR Corp.

The IBM version will still require a host processor for tasks such as

IBM, *page 6*

More the merrier

IBM's parallel processing plan includes the following:

Phase	Time frame	Number of CPUs
Clusters	1991	4-100
Entry level	1993	8-64
Highly parallel	1995-1996	Up to 500
Massively parallel	1997-2000	Unknown

Source: International Data Corp.

Outsourcing

Reinventing Big Blue

By Mark Halper
TARRYTOWN, N.Y.

With its famous blue hue darkening into a somber tone, IBM is turning to its outsourcing subsidiary, Integrated Systems Solutions Corp., in search of a brighter financial picture. The shrinking giant last week demonstrated that its hopes for the future lie in services by making ISSC the main IBM point of contact for IS shops. The moves included:

- Elevating ISSC President Dennie Welsh to the newly created position of chairman and chief executive, giving the operation more credence as a subsidiary.
- Naming a top executive from IBM's Asia Pacific operations as ISSC president. Industry observers said the appointment of Sam Palmisano indicates a strengthening of ISSC's international role.
- Expanding the scope of ISSC's vertical market reach from 11 to 15

ISSC, *page 16*

Cisco to finally reveal plan for faster router

Added features will bring platform in line with corporate requirements

By Joanie M. Wexler
MENLO PARK, CALIF.

Internetworking giant Cisco Systems, Inc. this week will finally reveal its blueprint for a revved-up router that embraces corporate demands for faster, more reliable data highways that can be trusted to carry core business applications.

Amid a flurry of related announcements that will include a broadened Asynchronous Transfer Mode strategy, the vendor will roll out its Cisco 7000 platform, according to sources close to the company.

The new router will beef up performance, offer redundant power supplies and allow users to replace components while the device continues to run. Industry sources indicated that the Cisco 7000 will ship in 60 days.

Clarifying the long-awaited Cisco direction should help Cisco shops plot their network courses and even out some of the disparities between Cisco's 6-year-old

Cisco, *page 14*

Ripping router

The Cisco 7000 improves on Cisco's current high-end AGS+ in the following ways:

Performance over the router's 533M bit/sec. CBus backplane will jump from about 65,000 to 100,000 packet/sec.

The seven-slot box will have space for an additional LAN interface module, which could accommodate as many as all more networks.

LANs will reportedly not contend for bandwidth over the CBus, guaranteeing native LAN speed throughput.

A walk through

NetWare 4.0's directory features:

- Common rights and configuration "templates."
- Users "inherit" rights.
- Users reside in logical groups.

Users laud directory of beta NetWare 4.0

By Michele Dostert
BOSTON

Networld '93 demonstrations of Novell, Inc.'s upcoming enterprise-oriented NetWare 4.0 drew kudos from users for its directory services and Windows-based management tools. But it also elicited concerns that implementing the new services will require a commitment to retraining local-area network personnel and rethinking network design.

"The NetWare 4.0 directory services, because they force users into logical rather than server-based groups, will force network managers to sit down and really think about who belongs where and who needs what services," said Edward Cocks, a technical analyst at CoBank in Englewood, Colo.

He predicted the up-front investment in training and planning required by NetWare 4.0, which is expected in March, will yield large dividends in simplified NetWare LAN management.

Novell is targeting NetWare 4.0 squarely at Fortune 1,000 users and has added a host of features designed to reassure corporate information systems managers who are skittish about trusting their computing future to PC LANs. These features include support for up to 1,000 users, data compression to save memory, packet-burst mode to speed data transmission and protected application space to shield the network from application crashes.

It is the directory services, which are based on the directory structure laid out in the CCITT X.500 specification, that are attractive to users. Rather than reentering user information at each server, network managers can lump users into logical groups, whose members can share the

NetWare 4.0, *page 12*

For additional coverage of Networld '93 see pages 4, 12, 14 and 15

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NEWS

IBM continues its efforts to remold the company into a more profitable venture. A revamp of its Integrated Systems Solutions Corp. outsourcing subsidiary elevates both the unit's stature within the company and the importance of its success to IBM. The vendor is also gearing up for next month's announcement of its first commercial parallel processing machine. *Pages 1 and 16*

Networld '93: Attendees mostly gave a thumbs-up to NetWare 4.0's directory services and collected updates on competing options and standards activity in the E-mail, ATM and LAN analysis arenas. Meanwhile, Cisco this week will finally detail how it plans to transition its 6-year-old router architecture to accommodate proliferating internetworks. *Pages 1, 12-15*

DEC was a three-time winner last week, announcing a smaller loss than expected, the appointment of former Zenith Data Systems President Enrico Pesatori to head up its newly independent PC unit and plans to reposition Pathworks as the glue for multiple network operating systems. *Pages 7 and 14*

IS directors trying to regain some control over PC desktops are standardizing by buying suites of PC application software. They'll have a shot at cutting costs as both Borland and Lotus prepare aggressive pricing plans for forthcoming Windows applications. *Pages 4 and 37*

COMMENTARY

Columnist Esther Dyson says we will have to get used to the idea of computer fallibility if we hope to use technology for intuitive tasks. *Page 33*

IN DEPTH

You can avoid making mistakes implementing client/server applications by picking the right server for the job, installing client PCs with enough power, creating an appropriately sized defined database and overhauling IS skills. *Page 73*

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Airline hacking case reveals CRS' security shortcomings

By Elizabeth Heichler
LONDON

Last week's settlement of a case in which Virgin Atlantic Airways accused British Airways of hacking its computer files to steal passenger lists underscores the vulnerability of supposedly confidential flight information.

Airline analysts said the reservation systems of most major carriers are very open — and hence more vulnerable — because they are designed to share information in order to facilitate passenger travel. "All the airlines have access to each others' reservation system," said Tamir Rankow, chairman of the national automation committee of the American Society of Travel Agents in Washington, D.C. But, he cautioned, "that doesn't give them free access to the passenger name record. But I suppose a person just has to be at the right place at the right time to get anything they want."

Rankow added that the competitive battles now bloodying the airline industry could encourage the use of such espionage. "As they stumble over each other trying to get each other's first-class and business traffic, I suspect anything is possible," he said.

In the London lawsuit, the charges came as part of a bitter libel feud in which British Airways admitted making improper attempts to undermine its rival and agreed to pay Virgin Chairman Richard Branson and his company approximately $835,000 (610,000 pounds) in damages and an estimated more than $3 million in court costs. Had the libel case gone to trial, former British Airways employee Sadiq Khalifa was prepared to testify to the illegal use of Virgin's computer information, according to Virgin's counsel, Colin Howes of the London law firm Harbottle & Lewis.

According to Khalifa, he and other British Airways staff were shown how to tap into a segment of the British Airways Booking System computer that Virgin rented. Eventually, British Airways was allegedly able to obtain home telephone numbers of first-class passengers and other information on bookings and departure times. According to Virgin's lawyers, passengers were then called by British Airways staff who tried to get them to change their tickets to British Airways flights.

Security consultants said the type of corporate espionage British Airways was allegedly involved in is typical and quite simple. "This is a very, very easy procedure, requiring only a trip to Radio Shack to buy a couple hundred dollars worth of electronics," said Charles Cresson Wood, an independent security consultant in Sausalito, Calif.

Wood added that such wiretap cases do not frequently come up in the news because "a lot of people don't know they're being wiretapped. These taps can go on for years before — or if — they are ever discovered."

Heichler is IDG News Service's London correspondent. Computerworld *West Coast senior correspondent James Daly contributed to this report.*

Ounce of precaution

Some suggestions for protecting data:

- Keep wiring boxes and junction closets locked up.
- Invest in an electrical characteristic change detection device, which can detect line tapping.
- Make sure all data is encrypted.
- Compress data, making it more difficult to read — and steal.
- Establish a security policy that defines sensitive data that should not be transmitted.

Sequent to offer Windows NT line

By Mark Halper
BEAVERTON, ORE.

Sequent Computer Systems, Inc., a longtime Unix devotee, this week will reveal plans to offer a line of machines for enterprisewide computing that run Microsoft Corp.'s forthcoming Windows NT operating system.

Sequent will offer a top-to-bottom line of NT servers called the WinServer series, with PC server specialist Tricord Systems, Inc. supplying the machines for the lower end of the series.

Sequent Chief Executive Officer Casey Powell said his company remains committed to Unix but he sees room for two open operating systems on the enterprise. "To be an open systems provider, it will be necessary to offer both Unix and NT," Powell observed.

The Sequent executive said the company will formally announce the line shortly after Microsoft introduces NT, which is slated for May.

Users are interested in NT systems as downsizing platforms. Information systems officials at Taco Bell Corp. in Irvine, Calif., and at Houston-based Lyondell Petrochemical Co., a $5.7 billion chemicals processor, said NT could be a more comfortable choice than Unix. That is because the Microsoft operating system would almost certainly run more seamlessly with the many Microsoft programs they now operate.

"We are concerned that when you put a box out there that everyone needs to talk to, how well does it integrate into our environment?" said Rick Smith, manager of systems development at Taco Bell.

Weighing options

Smith said Taco Bell expects to receive a Sequent beta-test system sometime next month. It is also considering an NT platform from Compaq Computer Corp. Smith said he is weighing the scalability of the Sequent system against the price/performance of the Compaq box.

Tom Kilbourne, information services evaluation manager at Lyondell, said he is confident Microsoft will deliver a robust operating system that would at least make it easy for users to add functionality if it is not already built in.

The high-end WinServer hardware will incorporate the same design Sequent uses for its Symmetry Unix line, which currently scales up to 16 Intel Corp.-type processors.

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Notes gets open, modular structure

By Michael Vizard
BOSTON

Hoping to convince information systems directors that Notes is a viable platform for building a peer-to-peer communications infrastructure across their organizations, Lotus Development Corp. last week outlined an open, modular architecture for its groupware offering at Networld '93.

Dubbed the Lotus Communication Architecture (LCA), this new strategy could help Lotus combat assertions by rivals Microsoft Corp. and Borland International, Inc. that Notes is a closed architecture and handle requests from users who want to more easily integrate other vendors' packages into the Notes environment.

For Lotus, the outlining of LCA is the beginning of a drive to bring Notes into a variety of environments. "Lotus is trying to position Notes as a corporate solution. As they try to position themselves alongside IBM and DEC, you're going to see more architecture announcements," said John Donovan, director of groupware services at WorkGroup Technologies, Inc. in Hampton, N.H.

"If Notes is going to be broadly accepted, it absolutely needs people other than Lotus developing applications for it," he added. Internal sources said Feb. 24 is the launch date for Notes Version 3.0.

LCA also helps deflect criticism that Notes is a closed architecture. "There's a tremendous competitive focus on Microsoft at Lotus. They're running the risk of being too focused on anything Microsoft says; they're like a deer in headlights," Donovan said.

Modular separation

Under LCA, Notes is separated into modules that consist of an interface to electronic-mail messaging services, application programming interfaces (API) for linking third-party applications to the object database in Notes and support for Open Database Connectivity (ODBC), which is Microsoft's implementation of the SQL Access Group standard.

An interface to E-mail messaging services will allow users to choose between Lotus' CC:Mail or the native mail transports within Notes, said Cliff Conneighton, director of marketing for communication products at Lotus.

The first products to comply with LCA guidelines are Version 4.0 of CC:Mail Router, which sends mail over wide-area networks, and the Lotus High Fidelity Mail Exchange, which sends mail messages between CC:Mail and Notes users. CC:Mail Router 4.0 ships this month. Lotus may also use the interface to support other E-mail systems, Conneighton said.

Also part of LCA is an API called the Document Management Interface (DMI), which Lotus expects will promote development of applications that are integrated with the object database in Notes. Developers can also use Microsoft's Object Linking and Embedding facility instead of DMI to link applications to Notes.

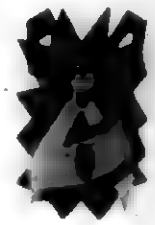
And in the same vein, Lotus has opted to support ODBC under its DataLens offering to give Notes applications access to data stored in a SQL format.

Borland promo hits back

By Christopher Lindquist
SCOTTS VALLEY, CALIF.

The software pricing balloon deflated a little more last week as Borland International, Inc. lowered the cost threshold even more with its announcement of new pricing promotions for key products.

For example, users will be able to purchase the soon-to-be released Paradox for Windows for $139.95 and Quattro Pro for Windows for $99.95. This compares with current pricing of $795 and $495, respectively.



The discounted pricing may appear to some as a response to Microsoft Corp.'s recent release of its Access database for $99. Last month, after announcing plans to lay off 15% of his work force, Borland founder Philippe Kahn accused Microsoft and Lotus Development Corp. of being behind an ongoing software price war that he blamed in part for his company's woes [CW, Dec. 14, 1992].

However, both Borland and analysts indicated the promotion is more complex than simply lobbing another volley in the software price war.

"Going to this $139 [promotion] allows them to do a jump-start [for Paradox]," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. He indicated that while Access is selling well, it appears to be moving into low-end, user markets instead of the high-end business market dominated by Paradox and dBase.

As a result, Barjarin said, Borland may be acting to prime the Paradox for Windows pump rather than responding to Access. "I don't think it's a desperation thing," he said.

Indeed, Borland claims the move is more of an attempt to guarantee sales than to compete with Microsoft. "We have seen companies that have come into the Windows market assuming that because they were successful under DOS they would be successful under Windows. And they got a rude awakening," said David Watkins, vice president of product marketing at Borland.

He pointed to Lotus' 1-2-3 for Windows and Software Publishing Corp.'s Harvard Graphics for Windows as examples of dominant DOS products that stumbled in the Windows arena.

However, pricing pressure is certainly part of the equation that went into the promotion, Watkins added. As with hardware pricing, users now expect more product for less money, he noted, and Borland is ready to offer that.

The users making those demands include corporate customers. Bajarin said Borland may have been feeling pressure from large corporations using Access as a lever to get better Paradox pricing. "I suspect that part of the problem is that IS guys may be beating up on them by saying 'Hey, I can go buy Access,'" he said.

Dan Atkins, manager of line operations planning and analysis at Northwest Airlines in Minneapolis, said such levers are appealing to customers who expect lower prices in today's software market. "We've become accustomed to expecting attractive pricing like this," he said, adding that the software market is similar to the airline arena in that users expect cut rates or they will not buy.

The pricing promotion for Quattro Pro for Windows starts immediately. The Paradox for Windows promotion will begin upon shipment of the product, which is slated for Feb. 1. Both promotions are scheduled to last 90 days.

Lotus ups Windows ante

Improv spreadsheet to cost same as 1-2-3

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. intends next month to kick off an aggressive campaign to increase share in the Windows spreadsheet market after delivering its multidimensional, next-generation Improv spreadsheet, which will be offered at the same $495 price as its 1-2-3 for Windows offerings.

Lotus Senior Vice President Robert Weiler said the company also plans to launch Improv with a discounted introductory offer, which he declined to specify.

And while it remains unclear even within Lotus as to what the ultimate relationship will be between Improv and 1-2-3, the company's decision to price a more advanced Improv spreadsheet on the same level as 1-2-3 is likely to entice large numbers of users away from 1-2-3 in favor of the superior analytical capabilities of Improv, Weiler said.

Despite such optimism, Improv for Windows faces an uphill climb just to achieve the same market share that 1-2-3 for Windows currently holds. Currently, Lotus claims to have roughly a 30% share of the Windows spreadsheet market, compared with its 90% share of the DOS market.

Unlike its sales effort behind 1-2-3, Lotus will not be able to count on much of an installed base to push Improv. The only platform Improv is currently available on is Next, Inc.'s NextStation.

'Three evils'

But Improv has already caught the eye of some. "Improv takes care of what I call the three evils of spreadsheets when it comes to analytical modeling," said Sam Savage, a consulting associate professor in the department of operations research at Stanford University, which is beta testing Improv.

The first evil, Savage said, is that traditional spreadsheets are not scalable in that users cannot add data and rows. The second evil: Users cannot add another dimension to an existing model; and the third evil is that there is no way to audit the spreadsheets.

"Accounting firms must all have ulcers every time a spreadsheet goes out because they can never audit the logic that was used to build a particular spreadsheet. I think these types of firms will be among the first to adopt Improv," he added.

Improv allows users to dynamically manipulate data on the fly. Users can analyze up to 32 columns of data in the same spreadsheet. Formulas used in the Improv model are displayed in English logic, which allows users to see the logic behind cell values.

Critical point

Managing the potential enthusiasm for Improv could prove to be troublesome for Lotus because the next major upgrade of 1-2-3 is not due until the second quarter, while Improv is scheduled to begin arriving on user desktops next month.

"Lotus' challenge is not to confuse the market with Improv," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

According to Weiler, the decision to price Improv on a par with 1-2-3 was driven by competition from Microsoft Corp.'s Excel spreadsheet for Windows, which currently dominates the Windows spreadsheet market.

Meanwhile, Version 2.0 of 1-2-3 for Windows is expected to enter beta testing shortly. It will be a 32-bit implementation and will include support for version control over spreadsheets shared among multiple users, in-cell editing and the ability to use 256 colors to create charts, said Nina Primm McIntyre, Lotus director of spreadsheet product management.

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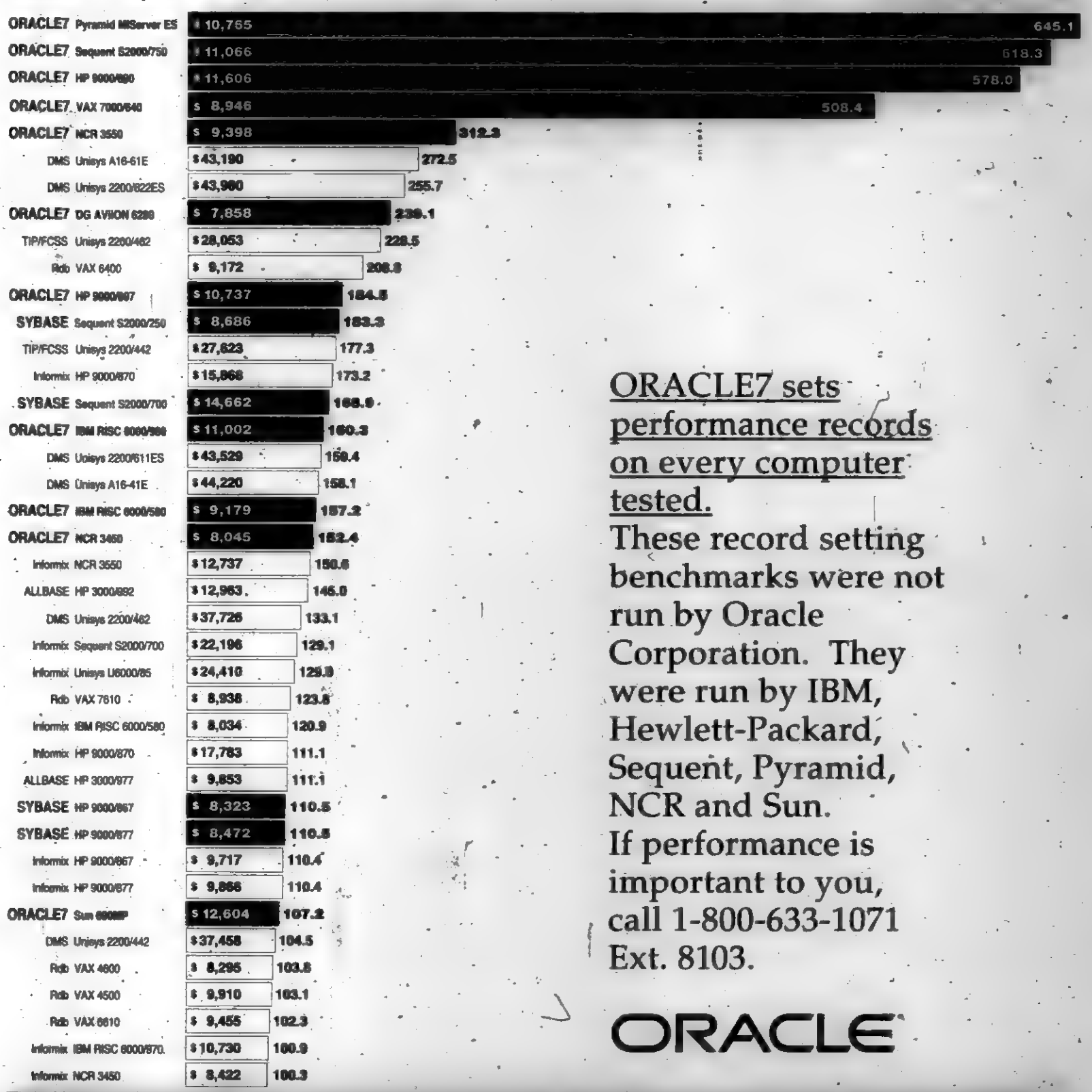

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News Shorts

Microsoft sales soar

Microsoft Corp. once again demonstrated its ability to sail smoothly in rough economic waters by posting a 38% increase in revenue for its second fiscal 1993 quarter over the same period in 1992. Microsoft's revenue increased from $682 million to $938 million, and income grew from $175 million to $236 million.

Sales up, profits slip at Apple

Shortages of key products coupled with a new financial model of higher product sales and lower gross margins took a bite out of the pocketbook of **Apple Computer, Inc.**, as the company brought in more money but less profit compared with the year-earlier quarter. Net revenue for the first quarter of fiscal 1993 was $2 billion — its first revenue quarter to clear the $2 billion hurdle — which represented a 7.4% increase from the $1.86 billion reported in the first quarter of the previous year. Net income was $161.3 million, a slight slip from 1992's first-quarter net income of $166 million. Total Macintosh unit growth was up more than 31% from the same quarter in fiscal 1992, but gross margin slipped to 40.5% from the year-earlier level of 43.7%.

Apple names successor to Heinen

Apple was quick to find a replacement for Roger Heinen, the software chief who recently defected to archrival **Microsoft.** Taking Heinen's old post will be David Nagel, 47, a respected leading scientist at Apple and senior vice president of the firm's advanced technology group. Nagel will report to Chief Executive Officer Michael Spindler in his position as senior vice president of the Macintosh Software Architecture Division.

Inacom buys Sears centers

Sears, Roebuck and Co. last week sold its Sears Business Centers (SBC) division to **InaCom**, an Omaha-based computer and communications systems provider. Financial details of the transaction, which is expected to be completed within 90 days, were not disclosed. The 49 SBC branch offices, with their 750 employees, sell computer and communications gear to large businesses. They are distinct from the 174 departments within Sears stores that sell home office computers. InaCom said some SBC locations would remain stand-alone offices, while others would be merged into InaCom's 1,200 locations nationwide. Sears said SBC offices not included in last week's agreement would be closed.

Feds to purchase 'green' PCs

The **U.S. Department of Energy**, the **Environmental Protection Agency** (EPA) and the **General Services Administration** announced they will purchase energy-efficient PCs when they become available in June. In cooperation with the EPA's "Energy Star" program, vendors are introducing desktop PCs with power management features that shift to "sleep" mode when idle. The EPA alone expects to save $450,000 in utility costs per year.

SHORT TAKES On Feb. 2, **IBM** will introduce a new set of RISC System/6000 workstations and servers, including a RISC-based scalable parallel processing system and a data server.... U.S. Sen. Conrad Burns (R-Mont.) said he plans to introduce a bill overturning the **U.S. Supreme Court** ruling that limits home-office tax deductions because it discourages telecommuting.... **Oracle Corp.** and **Sun Microsystems, Inc.** last week announced a strategic alliance to peddle their wares to the pharmaceutical industry.

News shorts, *page 16*

Times alter Comdisco

Firm hopes to grow software as mainframe market shrinks

By Johanna Ambrosio
ROSEMONT, Ill.

In a bid to lighten its dependence on the now-shrinking mainframe leasing business, Comdisco, Inc. has for the first time begun selling software and is playing up its service offerings in a big way.

While Comdisco's total leasing revenue has grown roughly 14% during the past five years, mainframes as a percentage of that revenue have shrunk from 60% to 30%.

To help make up the difference, the company has introduced a PC-based asset management tool called Class. Under development for four years, Class has only recently been sold on the open market, said Comdisco President and Chairman Ken Pontikes.

Another recent initiative is an agreement with Bull HN Information Systems, Inc. systems integration affililiate Integris to jointly develop software that will help IBM mainframe users migrate to or coexist with Unix systems. Products from this alliance are due early this year.

The software initiatives, Pontikes said, are intended to lead the company's charge into the asset-management market and to help sell consulting services.

"We want to help customers purchase, control and migrate, their assets," which can include everything from computers to typewriter ribbons, Pontikes said.

About half the customers that buy Class, which runs under Microsoft Corp.'s Windows and starts at about $8,000, will also sign up for consulting services, he estimated.

Eventually, Pontikes said, Comdisco hopes to derive about one-third of its revenue from consulting or services, up from about 10% today. The consulting organization has been shored up with more than 100 new hires, even as the company as a whole has cut 200 administrative positions.

Aiming for flexibility

Along with this focus comes a change in how Comdisco approaches business with its customers. "We have to be much more flexible, provide new leasing terms and help customers with just-in-time computing," Pontikes said. "It's not just one-off transactions anymore."

Some customers have noticed the change in philosophy. "I've seen the marketing people becoming more involved with trying to understand my direction in hardware," said John Callahan, manager of systems planning at Borden, Inc. in Columbus, Ohio.

"I think the strategy is a sound one," said Shao Wang, an analyst at Smith Barney, Harris Upham & Co. in New York. "At this point, it's more of an embellishment rather than a complete change in direction: a nurturing of the customer relationship rather than a hunt-and-kill mentality."

The difference, Wang said, is that in the latter, the company would go in, lease a piece of equipment and then come back when the lease was almost up to try to renew it.

Now, he said, the focus is on trying to understand the customer's total needs, so Comdisco can also lease some disk drives or sell disaster recovery services.

Still, Comdisco is not abandoning its traditional leasing or disaster recovery markets. In fact, the company recently purchased the UK leasing assets of Meridien Computers Ltd., as well as some of McDonnell-Douglas Capital Corp.'s computer leasing assets.

In addition, the company has expanded its leasing portfolio to include PCs, networking gear, medical devices and point-of-sale terminals.

IBM ups parallel pace

CONTINUED FROM PAGE 1

storage management, industry watchers said.

Probably by 1995, however, this machine will become the basis for a more general-purpose parallel processor. It will be able to link up various computers via IBM's Sysplex architecture, which provides a central point of control for multiple MVS-based mainframes, and thus can handle all of an information systems shop's processing load, analysts said.

It will take that long for IBM to develop parallel-type versions of other software that many commercial customers use.

Even then, IBM will not position the parallel machine as a replacement for the traditional System/390 mainframe, the spokeswoman said. "We will continue to enhance and develop the 390 for as long as our customers ask us to. Any replacement will be many years down the road."

In the meantime, this first parallel computer will be architected to handle up to 100 processors. IBM will include with the machine more highly parallel versions of its DB2 database management system, CICS transaction processing software and MVS operating system, analysts said.

Users, meanwhile, are treading carefully. Joseph Vincent, director of technical services at Humana, Inc. in Louisville, Ky., said, "We've looked at the Teradata machine for the past seven or eight years and still haven't found a subset of our database processing that makes sense to split out."

> **IBM will not position the parallel machine as a replacement for the System/390 mainframe.**

Tom Braswell, vice president at Genuine Parts Co. in Atlanta, echoed that sentiment. "I don't think we'll have any need for parallel processing for at least four or five years," he said.

Still other users were confused about what transition would be needed to get to parallel processing. "We've got 25 years built on the old transaction systems," said David Barany, chief information officer at Household International. "The question is if we have to redo existing code."

Despite what may be a slow-growing market, analysts said IBM's hand was essentially forced. "They could not ignore the price differential between the 390 and the alternative mainframes," including those from Hewlett-Packard Co., NCR Corp. and Unisys Corp., said Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "Eventually, if IBM and the rest of the traditional vendors don't react, no new applications will go onto the traditional mainframes."

Added Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.: "The future of large systems is taking relatively low-cost components and building scalable multiprocessing systems."

Pesatori to head DEC PC unit while . . .

By Melinda-Carol Ballou

Digital Equipment Corp. Chief Executive Officer Robert Palmer last week made good on his promise to bring in new blood by persuading Zenith Data Systems President Enrico Pesatori to take on a new post as vice president of DEC's newly independent PC unit.

Pesatori is credited with revamping Zenith Data's PC business, in part by instituting telemarketing and opening up new channels to the company. He is expected to spearhead efforts to wring more revenue out of one of DEC's few bright spots — ironically, its PC business.

"He has a lot of challenges; getting the business clearly structured as an independent unit [is one of them]," said John Rose, former head of DEC's PC operations and now a principal at Robert W. Duggan and Associates, a Santa Barbara, Calif., investment group.

DEC will need Pesatori's experience because its bid to return to the black rests at least in part on increasing the revenue of its PC business.

Although DEC is likely to double its PC market share from 1%, on revenue of about $500 million, to 2% this fiscal year, the company's late entry into the market is still a hindrance.

For example, persuading non-DEC customers to embrace DEC PCs will be a challenge, as will be efforts to obtain reasonable margins, said Randy Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Toward that end, DEC is expected to launch two new lines of Extended Industry Standard Architecture and AT bus 486-based servers during the third quarter. They are likely to be priced competitively and will come stacked with features, according to internal DEC and industry sources.

The new family of entry-level servers is code-named Tiger III and is expected to be bundled with 120M- or 240M-byte hard drives, S3 local bus video, Personal Computer Memory Card International Association slots, integrated fast Small Computer Systems Interface support and diagnostics on CD-ROM, the sources said.

"The ability to support multiple systems has been a plus for them, in addition to their success with DECdirect," Giusto said.

The price points for the new systems are likely to range from slightly under $3,000 to about $6,000, sources said.

Senior writer Michael Fitzgerald contributed to this story.

. . . Zenith Data suffers his loss

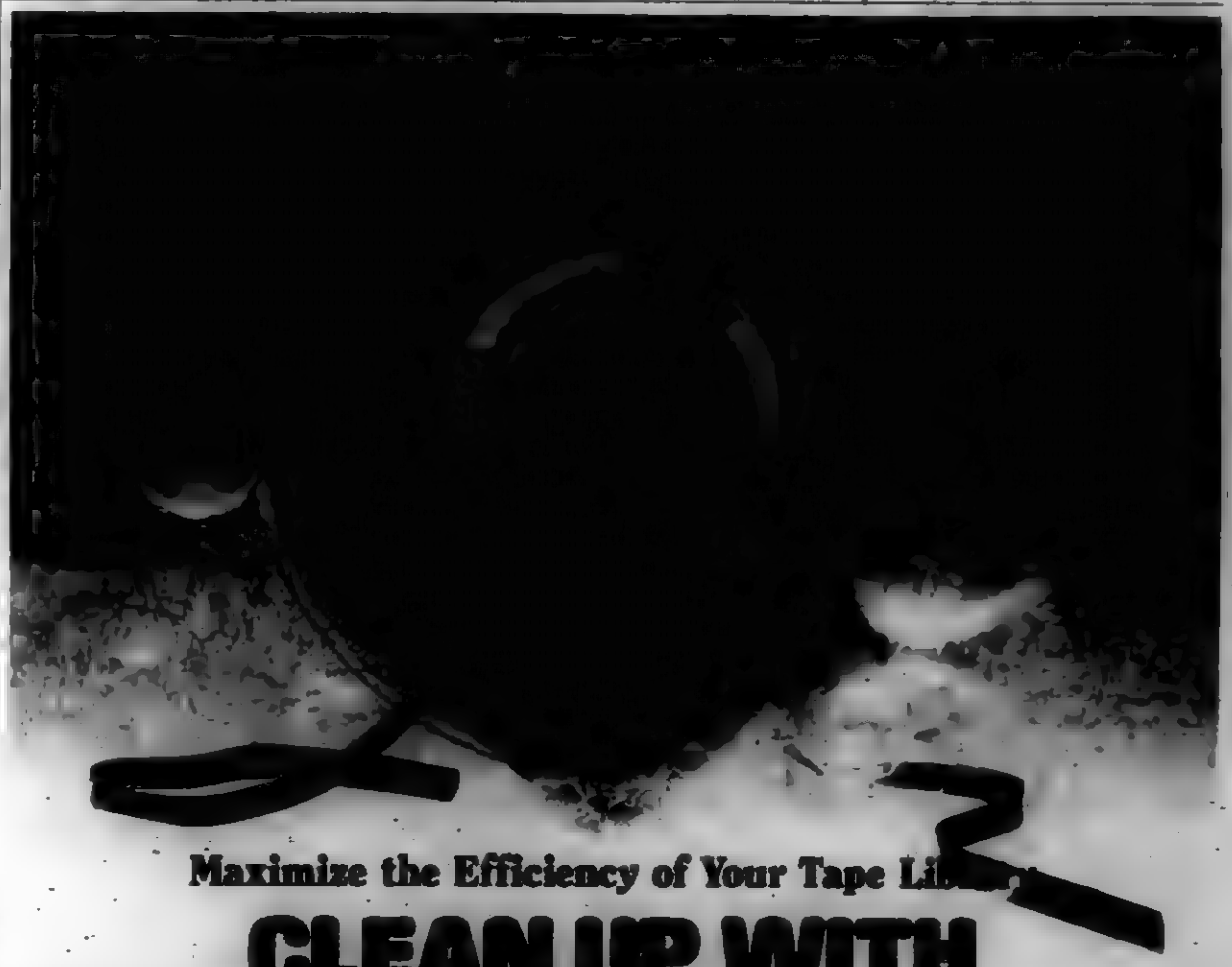
After a two-year stint at the helm, Enrico Pesatori appears to have steered Zenith Data Systems past the numerous rocks that threatened to sink it. But it is unclear whether Zenith Data can gather more wind in its sales.

Pesatori, who arrived in January 1991, reversed a sales and profits free-fall at Zenith Data. The $1 billion company is expected to break even for 1992, after losing money in 1991.

International Data Corp. analyst Richard Zwetchkenbaum said Pesatori spearheaded the introduction of innovative new products and a channel expansion that helped Zenith Data ship 233,000 PCs in the U.S. last year. That is a 15% uptick from 1991 but far short of the 386,000 PCs it shipped in 1989.

Zenith Data recently suffered the loss of Desktop IV, a $740.3 million Air Force contract that has twice been awarded and revoked. Still, most analysts said Pesatori's leaving the company should not stem its small surge of momentum because of the management team he assembled.

Zenith Data parent Groupe Bull moved quickly to name Jacques Noels president and chief executive officer. Noels was president of Nokia Consumer Electronics, Inc. — *Michael Fitzgerald*



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Distributed systems

HP, Tivoli team up on Unix management

By Maryfran Johnson
AUSTIN, TEXAS

Tivoli Systems, Inc. and Hewlett-Packard Co. last week declared themselves partners in the thorny task of simplifying the management of distributed Unix networks.

Tivoli, which makes object-oriented software for managing distributed computers, will port its Tivoli Management Environment (TME) to the HP 9000 line of Unix-based workstations and servers. HP will jointly market the TME product suite alongside its own OpenView software for network management.

The pairing of HP and Tivoli is "an attractive combination," said Gordon Kerr, senior vice president of MIS at Hyatt Hotels Corp. in Chicago, a large user of HP Unix servers. "I like the way HP encourages [other vendors] to plug into a framework, rather than tying Tivoli or some other software directly into the HP/UX operating system," Kerr said. "Users want that layer of insulation so, as many other tools become available, they can be plugged in as well."

Tivoli's software runs only on Sun Microsystems, Inc. machines now, but the company has been emerging as a key player in the distributed systems management game.

Both the Open Software Foundation (OSF) and Unix System Laboratories, Inc. have settled on Tivoli software as a core technology for their own industry-standard offerings in this area.

HP's OpenView technology and Tivoli's underlying framework form the majority of the OSF's Distributed Management Environment (DME), noted David Smith, an analyst at International Data Corp. in Framingham, Mass.

Compatibility concerns

Still unclear, however, is how easily OpenView or Tivoli's software will mesh with DME once it becomes generally available in late 1994 or early 1995. No company has offered specific plans or promises to handle whatever integration efforts lie ahead for customers.

"A lot of users are concerned about whether products such as these will really play together," said Dave Eaton, an official at InterWorks, the HP workstations user group. "Nobody wants to turn down the early efforts from the vendors because something that helps today is money in the bank. But nobody wants to go through a horrendous migration effort once the OSF technologies are deliverable."

Many users are still skeptical about using off-the-shelf system management software. "We have a number of different Unix platforms in-house, and it's really hard to use one management tool on all the platforms," said Hong Huie, a development engineer at Honeywell Commercial Flight Systems/Minneapolis Operation in Minnesota.

In the meantime, the availability of Tivoli software for HP users will fill in some of the gaps in OpenView — particularly in security functions and user account management.

For its high-end customers, HP has another key alliance in systems management with Computer Associates International, Inc. CA is now bundling its CA-Unicenter software with HP 9000 servers. That partnership should not conflict with the Tivoli one, analysts said, because CA's approach is a data center one for companies downsizing to large Unix servers, while Tivoli's focus is on distributed workstation environments.

The current version of TME Release 1.5 will be available on HP 9000 workstations and servers in March but will only manage HP machines. TME 2.0 is scheduled to ship in the third quarter and will manage Sun and HP workstation networks. Pricing for TME Release 1.5 starts at $37,500 for a 50-node network.

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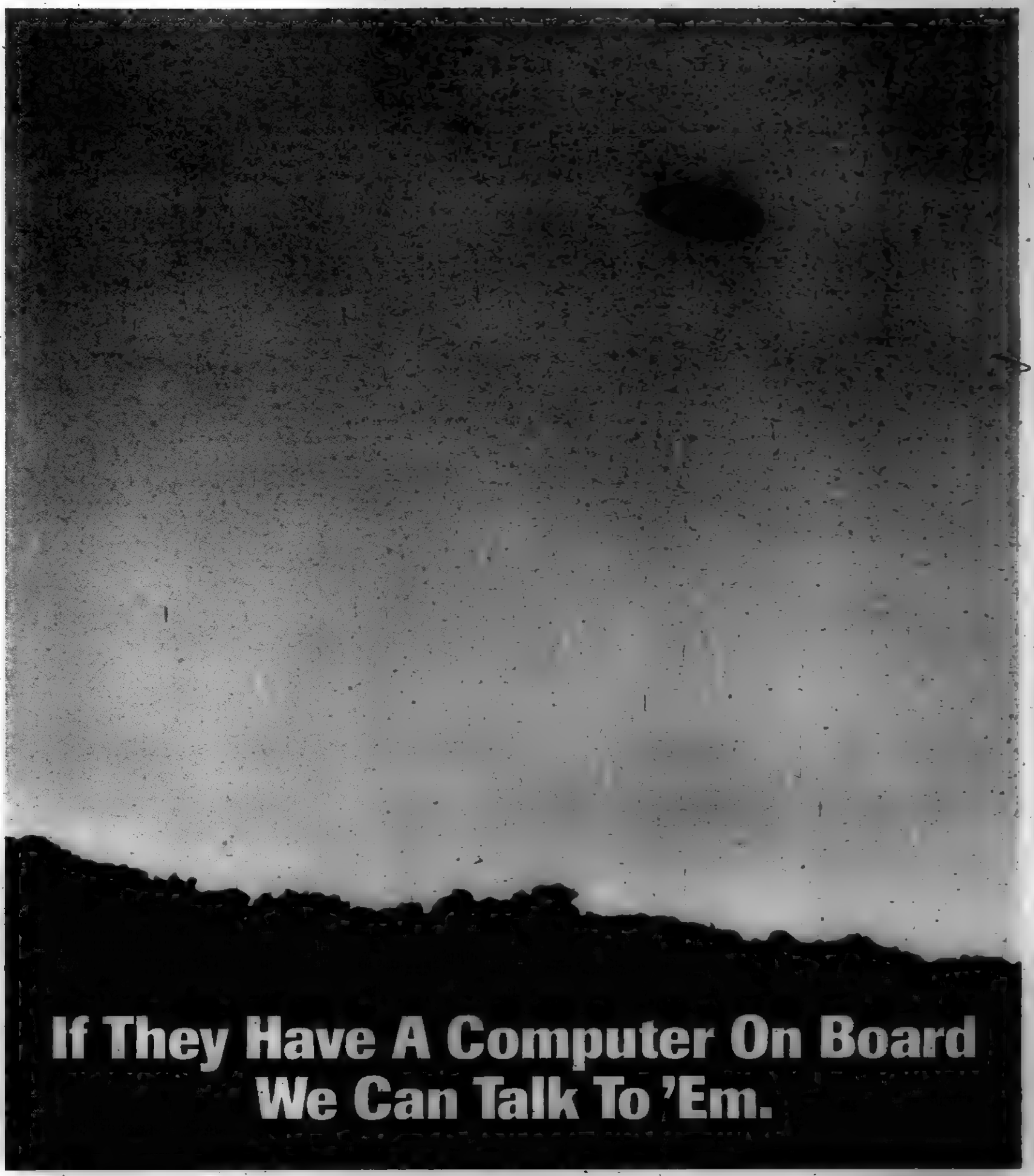

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CA users like 'open' approach

Firm plans to enhance connectivity to multivendor database environments

By Thomas Hoffman
SAN DIEGO

Attendees at Computer Associates International, Inc.'s Information Management Conference here last week warmly greeted several open systems initiatives, including plans to provide increased interoperability between CA's database environments and further data sharing between IBM mainframes and client/server architectures.

Many users were decidedly upbeat about CA's plans to support Microsoft Corp.'s Open Database Connectivity (ODBC) initiative. Also welcomed were CA's plans to offer its CA-Datacom and CA-IDMS database clients the opportunity to share data between legacy mainframe systems and client/server environments. That capability was bolstered by CA's decision to extend its CA-Visual Objects object-oriented application development environment to database customers via standard SQL calls.

The developments were welcome in part because many user organizations are either currently downsizing or planning to downsize the bulk of their mainframe applications into less expensive and easier-to-use client/server environments.

"We're excited about CA's support for ODBC because we're looking to improve data sharing between 110 state agencies while protecting our mainframe application investments," said Karl Heckart, data resources manager for the Arizona Department of Administration.

Analysts reached last week said they had not been briefed and therefore could not comment on CA's announcements.

Microsoft's ODBC is a vendor-neutral programming interface for database connectivity among PC, minicomputer and mainframe systems. Windows applications with the ODBC application programming interface calls will be able to directly access CA-IDMS, CA-Datacom and CA-DB databases on multiple platforms through new database drivers that will become available in the second quarter.

Industry pundits said they understand CA's motivation to support Microsoft's ODBC initiative ahead of Integrated Database Application Programming Interface (IDAPI) and IBM's Distributed Relational Database Architecture (DRDA). "The potential of Windows NT is most likely encouraging [CA Windows] users to demand ODBC support from CA," said Tina Forsker-Blackwell, an analyst at New Science Associates, Inc. in Westport, Conn. Besides, "it's become increasingly important for vendors to support different data formats and communications platforms," she added.

Clients with SQL access on their databases will receive ODBC support at no extra charge, according to Marc Sokol, CA's director of product strategy.

Pledge of support

Sokol said CA will continue to support the IDAPI and DRDA initiatives. CA pledged its support for both last year but has not yet announced delivery timetables for product integration. However, Sokol said CA users are requesting ODBC compliance before IDAPI or DRDA compliance, having demonstrated more interest in Windows-based products than OS/2 2.0 products to date. He said CA will likely offer IDAPI compliance with six IBM OS/2 2.0 products it will begin shipping in March, including CA-Compete.

CA-Visual Objects, CA's next-generation, object-oriented application development environment for Windows, will allow CA-Datacom and CA-IDMS users to access legacy data through a SQL interface.

That decision was warmly greeted by Doug Walker, a senior programming analyst at Brigham Young University in Provo, Utah. The university has been trying to develop a "true graphical user interface environment, but Microsoft's Visual Basic tool kit will only support Windows," Walker said, adding that Brigham Young is interested in CA-Visual Objects because it also supports IBM's OS/2 2.0 operating environment.

More to come

In addition to its database connectivity initiatives, CA also detailed several new application development products and strategies. For example, the company announced plans for CA-Ramis and CA-Easytrieve servers, which were designed to give users access to mainframe development systems through Windows. The products, scheduled to ship in the second quarter, are priced from $15,000. CA also introduced CA-Realia II Workbench, designed to off-load Cobol development and maintenance and to downsize Cobol systems and applications. The Windows-based development facility is slated to go into beta testing in the second quarter and to ship by summer, with pricing at $2,500 per copy.

Client/server applications

Gupta offers tool kit for enterprise apps

By Jean S. Bozman
MENLO PARK, CALIF.

Gupta Corp. last week tried to broaden the appeal of its 4-year-old SQLWindows database query tool set beyond the departmental managers who are using it to build client/server applications.

In a bid to ignite information systems-level interest, the database maker offered up a software repository and version-control features said to allow teams of programmers to design enterprisewide applications.

Combined with collaborative programming features, the SQLWindows 4.0 repository is seen as the key to wider use of Gupta products in large IS shops. It was developed by Jarrah Technologies Ltd., a Gupta value-added reseller in Balgowlah, Australia.

"A year ago, we started to focus on downsizing and enterprisewide development," said Gupta Chief Executive Officer Umang Gupta. Noting Gupta's base of 21,000 licenses in corporate departments, he said that "Now, 20 or more programmers can collaborate on a massive project that would formerly have been done on a mainframe system."

Reacting to user complaints that SQLWindows' proprietary SQLWindows Application Language, or SAL, is difficult to learn, Gupta revised its 2-year-old Quest end-user tool and tied it directly to SQLWindows. Now, a pop-up window can be used to pass users' Quest queries to SQLWindows developers for refinement. Quest's link to target database servers allows developers to "page" through database tables during design.

"That's the right response to what Microsoft's Access [database query builder] is doing," said Tony Percy, a senior software analyst at Gartner Group, Inc. in Stamford, Conn.

Beta-test sites reported that SQLWindows 4.0 had several bugs. "We've tried it, and it's blown up on us," said Rob Lee, a programmer/analyst at Illinois Power in Decatur, Ill., who has had his copy since last month.

Lee noted that several features promised previously were absent in his beta-test copy, including some kinds of object-oriented functionality.

However, Lee said he is looking forward to the production version because it would allow 20 programmers to update his department's Gupta SQLBase database server; now only two programmers have "write" privileges.

Industry analysts said Gupta has to push hard to stay ahead of strong competitors such as PowerSoft Corp., Easel Corp. and Microsoft Corp., each of which sells database development tools that run in a Windows environment. One potential competitor, Oracle Corp., is expected to field an array of Windows database-query tools by June (see story at right).

Gupta may be trying to leapfrog its strongest competitor, PowerSoft. "PowerBuilder and SQLWindows are far out at the head of the pack, and the two vendors are slugging it out," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Oracle tools will finally include Windows support

By Jean S. Bozman
REDWOOD CITY, CALIF.

Oracle Corp. has lagged behind vendors such as Gupta Corp. and PowerSoft Corp. in the Microsoft Corp. Windows market because its flagship tool set does not support Windows directly. But an Oracle announcement of a new generation of graphical development tools sporting built-in Windows support is expected by spring, with shipments planned for midyear.

Currently, Oracle users can write icon-based Windows applications with the desktop Oracle Card product. But the new and improved Oracle tool set will generate database-query programs for Windows in a multilayered software environment that includes Oracle computer-aided software engineering tools.

Farzad Dibachi, senior director of product marketing at Oracle, conceded that Oracle is trailing in the Windows application development market. "With Oracle Card, you can do pretty much everything you can do with [Gupta] SQLWindows, but it's not necessarily as fast," Dibachi said. Gupta also sells the SQLBase relational database server and the Quest end-user query tool (see story at left).

The new Oracle tools were originally expected to debut in 1992, industry analysts said, but development problems cropped up. To succeed in the Windows arena, applications written with Oracle's new tool set must be able to run against other vendors' databases, analysts said. That could be accomplished either through Oracle gateways to other databases or through a Microsoft Open Database Connectivity driver, which Microsoft and Oracle are developing.

The new tool set includes Oracle's SQL Forms 4.0, SQL ReportWriter 2.0 and the Oracle Toolkit utility.

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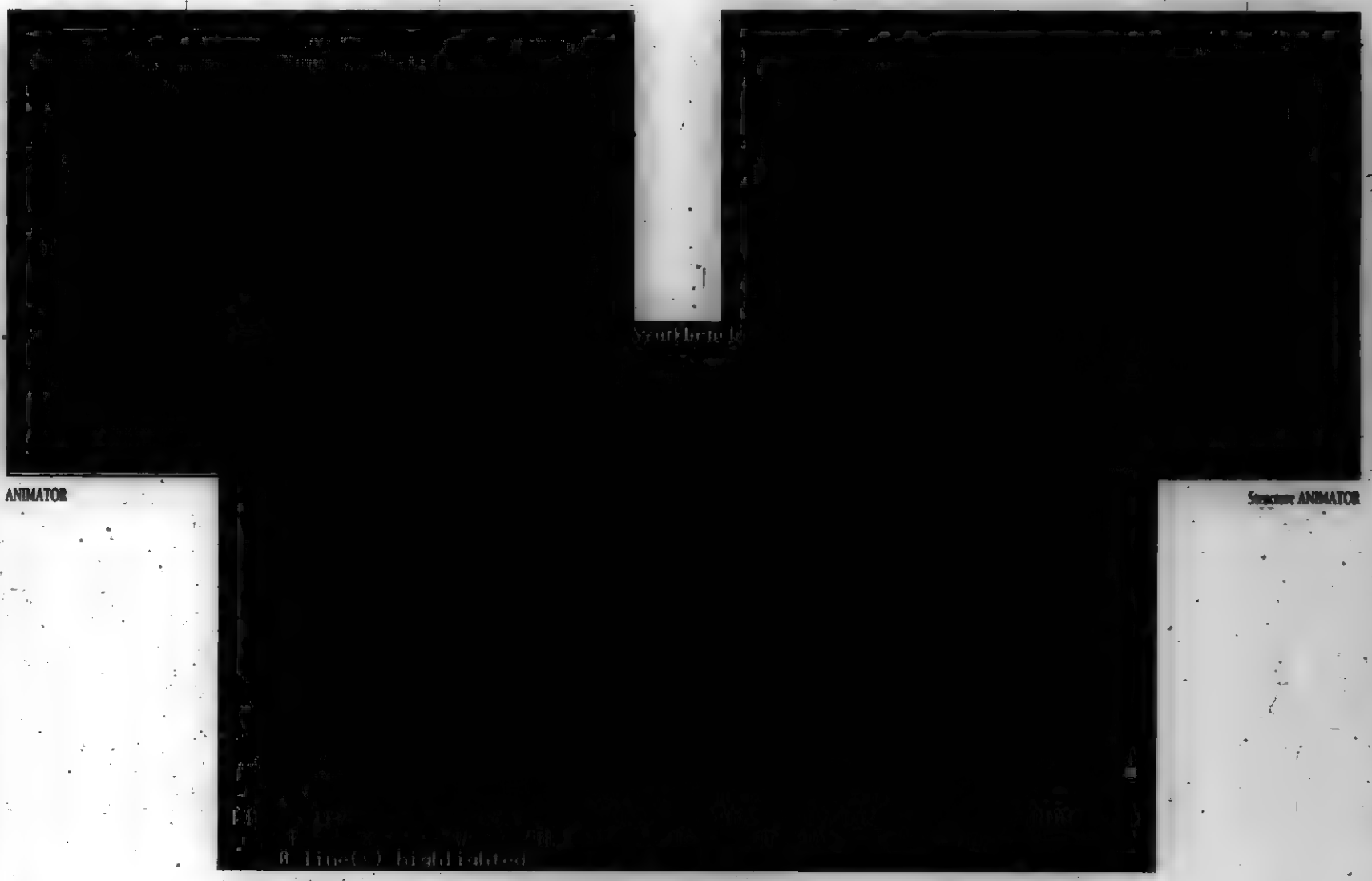

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Networld's focus: Applied tech

Show gives users opportunity to explore latest in ongoing technology barrage

By Joanie M. Wexler
BOSTON

It was not a show marked by sweeping vendor announcements or networking milestones. Instead, many attendees at last week's Networld '93 simply rolled up their sleeves, attempted to digest 1992's barrage of new technologies and settled down to solve specific communications-oriented problems.

For example, Frank B. Mantha, a financial systems analyst at Niagara Mohawk Power Corp. in Syracuse, N.Y., was looking to bump up response times of field utility representatives who must be dispatched to emergency sites.

To solve the problem, he appeared ready to jump on the wireless messaging bandwagon at a booth demonstration of Fourth Wave Technologies, Inc.'s WinBeep software. That recently announced product allows users of Microsoft Corp.'s Windows applications to "beep" roving users carrying pagers and send them alphanumeric messages.

Mantha said it looked like WinBeep could "clean up the whole kit and caboodle" of hodgepodge wireless products currently not cutting the mustard at Niagara because they either require users to make a phone call, are too heavy to constantly carry around or do not allow users to acknowledge receipt of a message.

Low-cost links

The issue of cost-effectively linking remote sites into the corporate network was the biggest theme at Networld '93. To that end, Proteon, Inc. introduced a combination hub/router for sparsely staffed sites based on its low-end DNX 300 router and Series 90 wiring hub. 3Com Corp. demonstrated its remote Boundary Routing architecture, announced last month, and introduced two products in the Boundary Routing family. Boundary Routing aims to shift most of the complexity in remote routers to centralized backbone routers to simplify network configuration and management and lower per-port costs.

Alternative technology

Investigating a different kind of wireless technology — radio-based local-area networks — was Ken Kuehl, research and development project manager at Ohmeda, a maker of a patient information management systems for the medical industry.

Much real-time patient data is captured in the operating room during surgery via touch-screen computers and other venues, and "there is so much spaghetti [wiring] in the operating room, you need to be heavily insured to walk into the room," he said.

However, Kuehl said he has not yet solved the issue of electrical noise from a wireless LAN interfering with medical equipment, which has strict federal emissions requirements.

Joe E. Crick, vice president of information systems at the National Board of Medical Examiners in Philadelphia, had a simple quest on the show floor: "I'm looking for bandwidth and plenty of it," he said.

Crick, whose organization writes and administers tests to license physicians, was investigating technologies such as Asynchronous Transfer Mode (ATM) for high-bandwidth applications such as computer-based simulation testing, where prospective physicians would be tested on their application of clinical knowledge rather than their memories on paper.

However, Crick has discovered that "none of today's operating systems can deal with the virtual circuit" nature of ATM, which, unlike today's LANs, dedicates partitioned bandwidth to certain types of traffic to ensure predictable delays.

Advice on how to implement corporatewide electronic mail was what Craig Iskowitz, a senior technical staff member at Automatic Data Processing, Inc. in Mount Laurel, N.J., said he was trying to glean. The main reason: He wants to mail-enable a labor-cost tracking system he is currently building.

CW Chart: Stephanie Faucher

However, Iskowitz's problem is that different departments use different word processors, mail systems and spreadsheets, and the formats do not translate.

"I haven't solved this yet," Iskowitz said.

Users laud NetWare 4.0 directory

CONTINUED FROM PAGE 1

same basic rights and configuration templates. This can save a network manager countless hours of adding, changing and deleting users and network resources.

However, NetWare 4.0 directory services force network managers to learn the concepts of directory "trees" and "leafs," as well as "inheritance of rights" and "inheritance filters." These abstractions are a far cry from the previous NetWare user management paradigm of adding a user or a device to a physical server.

Training needed

"We recommend that companies send a couple of network managers to be trained on the new directory service; there is definitely a learning curve," said Bob Young, Novell's product marketing manager for NetWare 4.0.

NetWare 4.0 training will be available as a two- to three-day course at Certified Novell Education Centers shortly after the software's release.

Novell plans to ease the transition between NetWare 2.x or 3.x and NetWare 4.0 by making 4.0 directory services backward-compatible with the 2.x and 3.x server-based binderies that store user information.

"The backward-compatibility will let me upgrade one server at a time, which will make the move much easier," said Tabi Freedman, a network manager at a large securities firm who is planning to move to NetWare 4.0.

These abstractions are a far cry from the previous NetWare user management paradigm of adding a user or a device to a physical server.

NetWare 4.0 directory services, while requiring some retraining and planning, will let firms save money in the future by employing fewer network managers and support personnel, she added.

Enterprisewide directory services have long been available to users of Banyan Systems, Inc.'s Vines operating system. Last month, Banyan released a version of its famed StreetTalk directory services for the NetWare platform, called Enterprise Network Services (ENS). Industry analysts expect ENS to do well on medium-size, multiserver LANs.

NetWare 4.0's Windows-based management utilities were also a big hit with attendees.

"Moving users around with a point and a click, instead of re-entering their files on several different servers, will save network managers countless hours of mindless labor," said Frederick Krug, a network consultant at Thermo Consulting Engineers.

"We have over 600 users on a lot of different servers, so the directory services are the main reason we're going to upgrade to NetWare 4.0," said Leonard Steinbach, assistant director of computing at the State University of New York Health Services center in New York. "We're willing to invest in the retraining and rethinking if it makes managing our LANs easier down the line."

Novell has not yet announced pricing for NetWare 4.0., but it claims to have presold 10,000 copies of the product through NetWare v3.11 upgrade promotions.

Novell stakes claim in HyperDesk

Novell last week said it has purchased a 20% stake in HyperDesk Corp. and will bundle the Westboro, Mass., vendor's object-oriented software with NetWare.

Novell and HyperDesk expect Hyperdesk's Distributed Object Management System (HD-DOMS) for NetWare to be available within six months.

HD-DOMS will be used to provide standardized access to services in the NetWare environment and thus speed application development, according to both companies.

"Because HD-DOMS will allow developers to treat NetWare system software and services as objects to be reused, it will promote efficient, modular application development," said John Edwards, Novell's vice president of desktop products.

"Novell has always been weakest as an application development environment; this announcement plugs that hole and makes NetWare much more attractive to write applications to," said Jamie Lewis, vice president of The Burton Group, a Salt Lake City-based LAN research firm.

The 20% stake cost Novell an undisclosed amount of cash and stock. Novell also gains a seat on HyperDesk's board.

—Michele Tinsert

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DEC repositions Pathworks

Moves from VAX-based client/server to multinet operating system glue

By Elisabeth Horwitt
BOSTON

Environments integrated in the upcoming generations of Pathworks include servers on DEC VAX and Alpha hosts running VMS, Ultrix or OSF/1, NetWare, LAN Manager, Appleshare and Windows NT; and clients: Macintosh, DOS, Windows, Unix, Windows NT and OS/2. Price is about $200 per client.

Digital Equipment Corp. last week said it plans to put a revamped Pathworks in the vanguard of its next assault on enterprise client/server systems integration.

Currently, Pathworks is Microsoft Corp. LAN Manager-based software that enables a range of local-area network client environments to access VAX servers. Ultrix- and OS/2-based services are also available in a limited fashion. Pathworks has been competing with LAN Manager, Novell, Inc.'s NetWare and other leading network operating systems for first-time LAN installations, said Vijay Thakur, group manager in charge of DEC's engineering group.

In the second quarter, DEC will start repositioning Pathworks as a "value-added server" that will provide "interoperability and transparent client access" across a mixture of VMS, OSF/1, Apple Computer, Inc. Appleshare, Novell NetWare and LAN Manager environments, Thakur said.

The forthcoming Pathworks 5.0, for example, will enable LAN Manager, Windows NT and Workgroup for Windows clients to store and share files on a DEC Alpha OpenVMS or OSF/1 host, using native Microsoft Netbeui connections, Thakur said. Pathworks for NetWare will do the same for Novell users via IPX.

The majority of DEC's big customers have mixed network operating system installations, Thakur said, explaining that "if a customer has 5,000 NetWare, 2,000 LAN Managers and 2,000 Unix clients, we [can] put it together."

The software glue will reside on DEC VAX and Alpha hosts, running VMS, Ultrix and OSF/1.

DEC is going after a fruitful but difficult market already targeted by the leading network operating system vendors, said Lee Doyle, director of LAN research at International Data Corp. Novell, for example, has already incorporated support for Apple and Unix environments into NetWare, and it will support Windows NT clients, if not servers, Doyle added.

Not right now, thanks

Aldon Hynes, a vice president in mortgage trading systems at the Union Bank of Switzerland in New York, said he would take a look at any future Pathworks announcements that promise to integrate his DEC VAX, Ultrix and NetWare installations. Right now, however, his company is leaning toward setting up peer-to-peer connections among these systems using the Transmission Control Protocol/Internet Protocol and Network File System, he added.

While DEC has the advantage of being a "neutral" player in the multinetwork operating system integration arena, Doyle questioned whether DEC — or any vendor — can provide the level of integration users want.

The next generation of Pathworks, slated to appear about midyear, will comprise Pathworks for NetWare [CW, Jan. 11] and Version 5.0 of the original, LAN Manager-based Pathworks. Both will let LAN Manager or NetWare clients access DEC host file- and printer-sharing services. DEC plans to add centralized backup of multivendor network operating systems at an undisclosed date.

Another key part of this upcoming Pathworks generation will be administration of multivendor server environments from a single PC running Microsoft Windows.

The user will be able to click on a server, call up client configurations and profiles and monitor network operating system operations, he added. The administrator will also be able to distribute software and configurations to multiple, remote multivendor client and server systems, Thakur said.

Later this year and into next year, Pathworks will provide concurrent file access for a mixture of LAN Manager, Appleshare and NetWare clients on the same DEC host, Thakur said.

AT&T, Cisco, StrataCom pool ATM efforts

By Joanie M. Wexler
NEW YORK

■ Three leading network vendors teamed up last week to fuel the progress of Asynchronous Transfer Mode (ATM), a move that could accelerate key interface and network management standards for the fledgling high-speed network.

AT&T, router market leader Cisco Systems, Inc. and frame-relay switch maker StrataCom, Inc. said they will cooperate with one another as well as with standards bodies to develop and implement ATM, a switched network for carrying data, voice, video and image traffic in both local- and wide-area networks [CW, Jan. 11].

Users were generally encouraged. "It is important to go to cell relay [the underlying ATM transport] to integrate voice, data and video and minimize bandwidth costs," said Paul Weekes, director of information technology management at Motorola, Inc. in Schaumburg, Ill. Motorola uses AT&T as its major carrier and StrataCom technology in the form of a Codex 6290 multiplexer.

Weekes said he is shooting for ATM pilots by the end of the year for engineering visualization and multimedia applications.

"If I used any or all of these vendors, I might really be excited," said Bill Reiss, a systems engineer at Swiss Bank Corp. in Chicago. "But sometimes these alliances can be a two-edged sword. They can speed deployment but can sometimes hurt other competing vendors."

Monumental move

But Todd Dagres, vice president of communications research at The Yankee Group, a Boston consultancy, said he found it significant that "the three major players in their respective areas are cooperating on interoperability" at all levels necessary for a seamless ATM network.

As part of the announcement, AT&T Network Systems and StrataCom announced ATM switches that will link to deliver AT&T's ATM network service. AT&T's GNCS-2000 will make up the AT&T ATM backbone, and the smaller scale StrataCom BPX will hook the backbone to dispersed sites. AT&T said it will announce ATM service availability in the coming weeks.

The first area of AT&T/Cisco/StrataCom collaboration will be ATM-to-frame-relay networking, which could fuel deployment of both technologies. Users questioning whether they should bypass frame relay and wait for ATM might gain peace of mind knowing they have an ATM migration path.

AT&T competitor Sprint Corp. plans to have ATM service available late this year or early 1994. Sprint has articulated a data platform migration plan through 1995 similar in concept to the Cisco/StrataCom/AT&T move, except Sprint has not teamed with a LAN vendor.

MCI Communications Corp. has an ATM-ready platform in place and will deploy service "when the demand is there," an MCI spokeswoman said.

Cisco to reveal plan

CONTINUED FROM PAGE 1

router architecture and those of competitors Wellfleet Communications, Inc. and Coral Network Corp. These vendors' newer architectures accommodate larger numbers of networks and are more expandable.

"We're anxious to get some of that technology," said John Kostakos, internetwork manager at Lehman Brothers, a Cisco shop in New York. He said he foresees emerging multimedia and scanning applications soon stressing the 65,000 packet/sec. throughput of his high-end Cisco AGS+ routers.

Sources close to Cisco said the Cisco 7000 will forward 100,000 packets per second, an increase that will be achieved through redirecting some local-area network attachments from a lower speed bus to Cisco's half-gigabit backplane and software enhancements.

Kostakos added, "Real estate is an issue. Getting more performance out of a single box [supporting more network connections] means we're better off in terms of space than buying multiple boxes."

The new router should allow up to 28 additional network connections.

Similarly, at Commonwealth Edison in Chicago, "there are several situations where we don't have enough ports and must buy more routers," said engineer Jon Castle.

The utility also anticipates a heavier traffic load, which would demand Cisco 7000 performance "in a year or two."

To date, Cisco has faced "performance and slot space limitation," added Coyne Gibson, manager of information technology at Convex Computer Corp. in Richardson, Texas, a Cisco and Coral shop.

While industry talk has surmised an architectural overhaul to address these shortcomings, a Cisco spokesman said the architecture will not change dramatically. The spokesman said, however, that the Cisco 7000 will require modification for hot-swap capabilities.

"The most important thing is hot-swapping," said Victor Duchovni, a senior systems analyst at Lehman Brothers. "Until now, one has had to schedule downtime for servicing Cisco routers. Ports have been difficult to install, add and control."

Scott Bradner, a consultant at Harvard University's Office of Technology, said the Cisco move should address "reluctance by corporate telecommunications managers to embrace the unreliability the current router generation tends to have."

Equipment in the telecom world has always been reliable and hot-swappable, he said, which has elevated network managers' expectations of network uptime.

Cisco will also build on last week's ATM-oriented alliance announcement with AT&T and StrataCom, Inc. by filling out an ATM strategy it outlined last fall.

While "Cisco does not have an ATM switch under development," according to the Cisco spokesman, Cisco "might partner to get it."

APIs crowd E-mail arena

By Lynda Radosevich
BOSTON

The long-simmering mail application programming interface (API) controversy resurfaced at Networld '93 last week with the unveiling of a new faction led by Novell, Inc.

Called the MHS Alliance, the group — which includes Beyond, Inc., Da Vinci Systems Corp. and Central Point Software, Inc. — trumpeted Standard Message Format, the little-known, file-based API that is layered on top of the Message Handling Service (MHS) delivery system.

Other APIs fighting for user mind share are Lotus Development Corp.'s Vendor Independent Messaging (VIM), Microsoft Corp.'s Messaging Application Programming Interface (MAPI) and the X.400 Application Programming Interface Association's (XAPIA) Common Mail Call (CMC). The APIs share the function of interfacing with applications but vary in their levels of capability.

While some users said they wished vendors would solve their differences and pick one API, others said particular APIs suited their needs.

"The issue is not choosing which API but choosing among them," said Joe Caruso, director of corporate information systems and technology at American Express Co. in New York. "The XAPIA has done excellent work with open APIs, which certainly offer benefits, but there may be some platform-specific applications where it will be fine to use other APIs as well."

Analysts agreed that the APIs offer different benefits:

•According to David Coursey, editor of "P.C. Letter," an industry newsletter in San Mateo, Calif., MAPI, which does not yet exist in a way usable to developers, is intended to mail-enable Microsoft Windows applications and provide links to Apple Computer, Inc.'s Open Collaborative Environment.

•VIM — which is available and is already being used in products by developers such as Jetform Corp. — offers to mail-enable applications across platforms other than Windows and Macintosh, such as DOS.

•The CMC interface will initially be a limited set of calls that transcend VIM and MAPI and allow message-enabling across all hardware platforms, including mainframe platforms.

MHS, which is used mainly by Novell NetWare customers, has the advantage of being a widely deployed "de facto standard," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif.

"I'm happy to see vendors getting on the MHS bandwagon," said Larry Chapin, systems support specialist at Golden Aluminum, a recycling company in Golden, Colo. "I don't have the extra dollars to put into leading-edge products that might disappear."

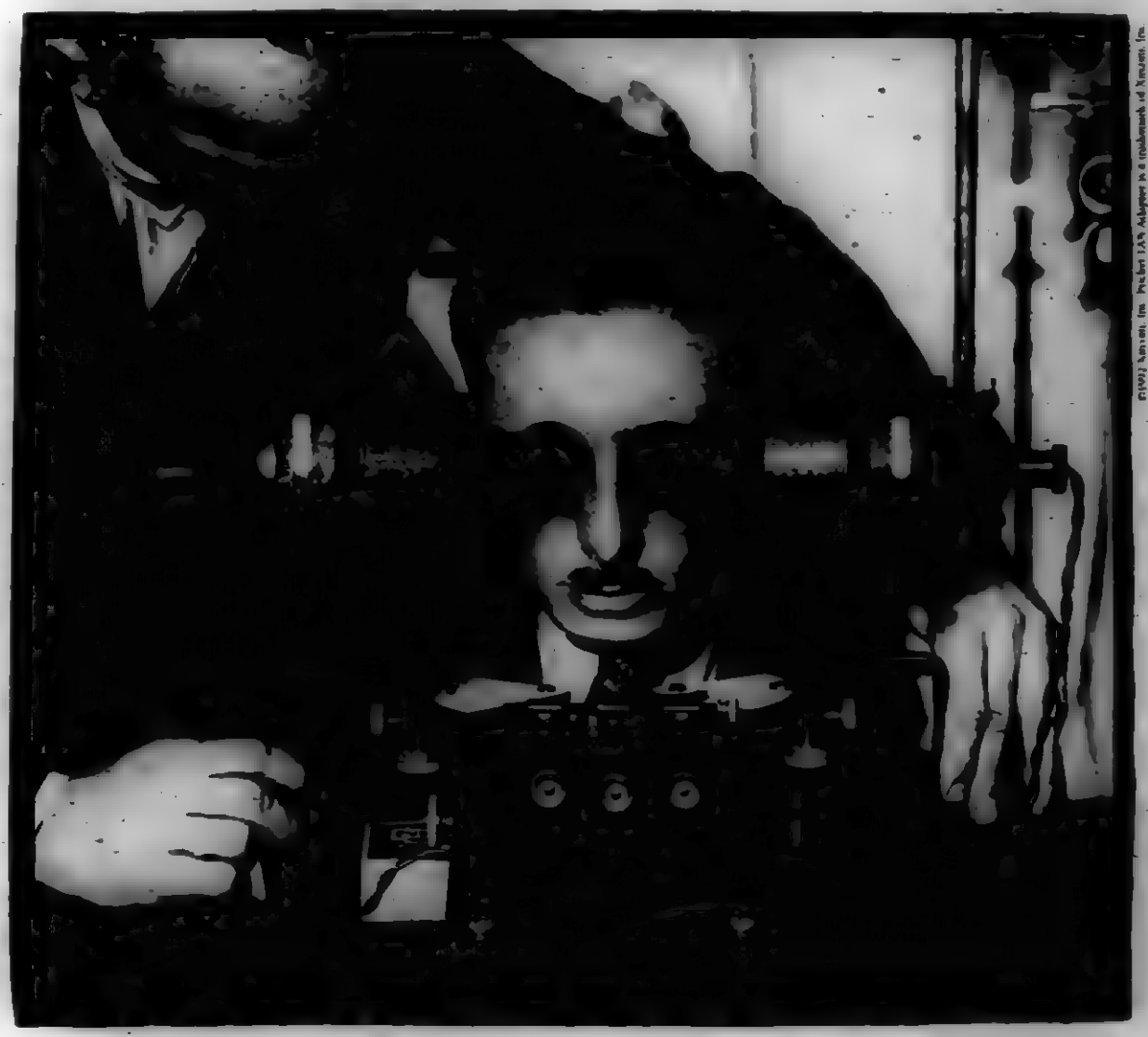
Pssst!

Networld '93's electronic-mail highlights include the following:

•WordPerfect Office 4.0, seven electronic messaging products from WordPerfect Corp. that will ship this spring. Office 4.0 includes E-mail, personal calendaring and group scheduling. It is priced at $495 for a five-license package.

•Sneak previews of CC:Mail for Windows 2.0, which Lotus said will ship in the first quarter. Version 2.0 adds automatic message routing using rules-based scripting, message previewing and the ability to drag addressees from a list and drop them into a message.

•Microsoft Mail Remote for Windows, the first remote E-mail client for Windows, according to Microsoft. The program, which is slated to be available next month for $195, has the ability to read and create messages off-line.



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News Shorts

Fault resilience new from NCR

NCR Corp. this week will introduce the first in a set of fault-resilient software products for its System 3000 midrange computer systems. The first product, called LifeKeeper FRS, provides NCR's 3400 and 3500 system users with increased availability, automatic failure detection and recovery from system, application and component failures. LifeKeeper FRS, which is compatible with communications interfaces such as Transmission Control Protocol/Internet Protocol and IBM's Systems Network Architecture, is priced starting at $8,000 per uniprocessor. Later this year, NCR will also begin shipping LifeKeeper FRS Clusters, a fault-resilient package designed to provide redundancy between clustered NCR System 3000 machines.

DEC loss less than expected

Digital Equipment Corp. last week announced financial results for the second quarter that were significantly better than those anticipated by analysts [CW, Jan. 11]. The firm reported a net loss of $73.8 million, compared with a net loss of $155.2 million in the same quarter a year ago. Revenue grew by 6% to $3.68 billion. DEC officials attributed the improved results to the stabilization of VAX sales, growth in sales for DEC PCs and workstations and cost slashing. The company now employs 102,500 people.

Oracle 7 delivered for VAX

Oracle Corp. said it has shipped the first production copies of its Oracle 7 relational database to users of DEC VAX/VMS systems. The shipments include production code, development tools and three optional packages for distributed database, PL/SQL programming and parallel-processing servers. Oracle 7 was announced in June 1992.

Microsoft, Intel gain on IBM

Nowhere is the industry's changing of the guard more apparent than on Wall Street. In the near future, securities analysts said they expect the value of **Microsoft Corp.**'s stock to bypass **IBM**'s. As of late last week, IBM held a slight edge: $27.83 billion vs. $27.78 billion. **Intel Corp.** is also gaining rapidly on IBM; a rally drove its shares up 14 points to 112.75 — giving its stock a $24.47 billion valuation.

Further pumping up the volume

Dwayne Walker, Microsoft's director of Windows NT and networking products, said the company last week upped its estimate for the number of Windows NT developers kits shipped from 30,000 to 45,000. Before NT ships in midyear, Microsoft will have placed copies of its 32-bit operating system at 20,000 to 25,000 beta-test sites, Walker predicted.

SHORT TAKES **Texas Instruments, Inc.** and **Zenith Data Systems** resolved pending litigation for a licensing agreement with Zenith Data agreeing to pay royalties to TI for use of its microcomputer patents.... **DuWayne J. Peterson**, a former executive vice president at **Merrill Lynch & Co.**, has been named to the board of directors at **AI Corp.**, an Alameda, Calif., integrator of document imaging applications.... **Borland International, Inc.** termed "baseless" allegations of securities laws violations contained in a class-action lawsuit. The suit was filed by a group of investors who purchased Borland stock between March 5, 1991, and April 27, 1992.... **Lotus Development Corp.** and **Isocor** demonstrated software at Networld '93 in Boston that allows Lotus' Notes users to transport Notes multimedia documents over public and private networks using X.400 messaging standards.

HMO outsources to ISSC

By Neil Margolis
OAKLAND, CALIF.

■ Kaiser Permanente, the nation's largest health maintenance organization (HMO), last week announced an approximately $70 million, 10-year data center management and technology development contract with IBM subsidiary Integrated Systems Solutions Corp. (ISSC).

The outsourcing deal, its first, is a big one for Kaiser, which has an estimated 6.6 million members. The huge HMO hopes to graft its new ally's technological clout and information systems strategic sophistication to its so-called "expansion regions," which represent 8.5% of its membership, said Kaiser Interregional Services Vice President Andy Dubill.

In addition, ISSC will give a systems and support booster to Kaiser's Portland, Ore.-based applications development group.

The five expansion regions now outsourced to ISSC are Georgia, North Carolina, Texas and the Hartford, Conn., and Kansas City, Mo., areas. Arming these relatively small but promising regional centers with a slew of IBM management, support and services — particularly in the disaster recovery area, which is so critical to medical organizations — could be key to exploiting their growth potential without depleting their budgets, Dubill added.

Under the agreement, these regions, whose IS operations will be consolidated and run out of ISSC's Lexington, Ky., data center, will get a communications bonus.

"We had already put in T1 links between the locations, and we don't need all the bandwidth we've got," Dubill explained. "So ISSC is going to install videoconferencing facilities."

Kaiser's remaining seven regions, including its approximately 5 million-member Northern California stronghold, have no plans to outsource, Dubill said — largely because they have IS outfits that sufficiently meet their needs.

Reinventing Big Blue

CONTINUED FROM PAGE 1

sectors. ISSC plucked sales stars out of other IBM divisions and named them vice presidents with industry-specific responsibilities. For the first time, ISSC also named a vice president in charge of client/server development.

•Punching up the ISSC board with high-visibility IBM executives, including PC chief James Cannavino and Networking Systems general manager Ellen Hancock.

More to choose from

The changes "deepen and broaden the resources that can be made available to an ISSC customer," said Jill Klein, senior vice president of technology, information and planning services at Riggs National Bank in Washington, D.C., an ISSC data processing client.

The infusion of management and corporate stature comes as ISSC emerges from a sluggish 1992. The subsidiary recently scored several long-term contracts, including pacts with faltering aerospace giant McDonnell Douglas Corp., a job that ISSC values at a questionable $3 billion [CW, Jan. 11]; Qualex, Inc. and Kaiser Permanente (see stories above and at right); Hook-SupeRx, Inc.; Norrell Corp.; and The Chase Manhattan Bank NA.

Last week, Welsh said he foresees triple revenue growth and at least $4 billion in sales for ISSC in 1993.

Welsh based his projections on what he perceives to be a surging interest in large corporations in outsourcing, a notion that runs contrary to the doomsayers who have been predicting the demise of the business. "Fifty percent of Fortune 500 companies are going to have a third party responsible for information technology on almost a 100% basis as we go forward over the next two or three years," Welsh predicted.

Welsh noted that the subsidiary's employee count grew almost twofold in 1992, from approximately 7,000 staff members to some 12,000. Welsh said he anticipates 20% to 25% personnel growth this year, depending on which contracts ISSC wins.

Still no sales force

ISSC has yet to form a sales and marketing staff, although a couple of its vice presidents, Charles Ansley and Towney Kennard, have marketing responsibilities. Some of ISSC's detractors have criticized the company for not fielding a sales and marketing force, and some outsourcers said ISSC's use of IBM's sales team violates antitrust regulations.

Welsh claimed marketing in the outsourcing business is often a matter of referrals, rather than traditional campaigning. He said deal-making is a key element to winning contracts and that last week's addition of four vice presidents to ISSC sharpens the subsidiary's deal-making acumen.

Julie Schwartz, associate director of professional services at San Jose, Calif.-based Dataquest, Inc., said ISSC's deal-making abilities were key to its recent success.

Just how well ISSC is performing should become clearer in March, when, according to Welsh, IBM plans to break out ISSC's financials in its annual report.

Observed Sam Albert, a consultant in Scarsdale, N.Y., "IBM is trying to make a transformation from International Business Machines to International Business Services."

Wheeling and dealing

While ISSC was announcing its organizational changes and its Kaiser Permanente deal last week, it was also busy signing its latest outsourcing deal: a 10-year pact with Qualex, Inc. in Durham, N.C.

Qualex, a film processing business, is 49% owned by ISSC client Eastman Kodak Co., which may have helped ISSC wrestle the deal away from Computer Sciences Corp. (CSC). CSC had won a letter of intent from Qualex late last fall but received a "Dear John" notification from the company Dec. 31 [CW, Jan. 11].

Meanwhile, ISSC is working its way through a good news/bad news scenario with Dallas-based jeweler Zale Corp. The good news is that Zale, which entered Chapter 11 proceedings shortly after signing an outsourcing contract with ISSC roughly a year ago, has decided to stick with the subsidiary. As part of a corporate reorganization, it had been considering giving ISSC the boot.

The bad news is that the deal will apparently be pared back in scope. ISSC and Zale are in the process of renegotiating the contract. — *Mark Halper*

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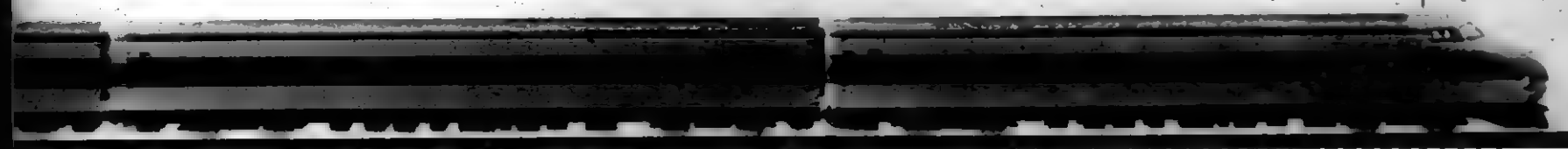

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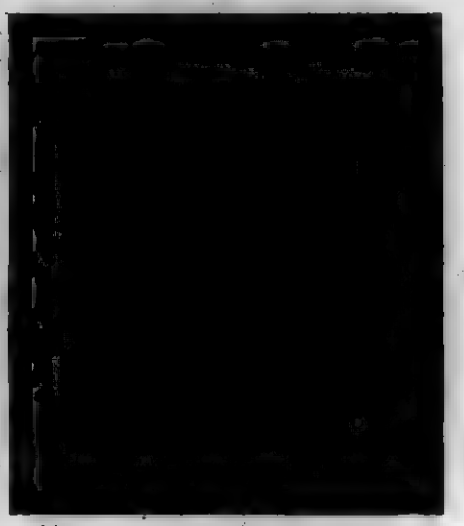

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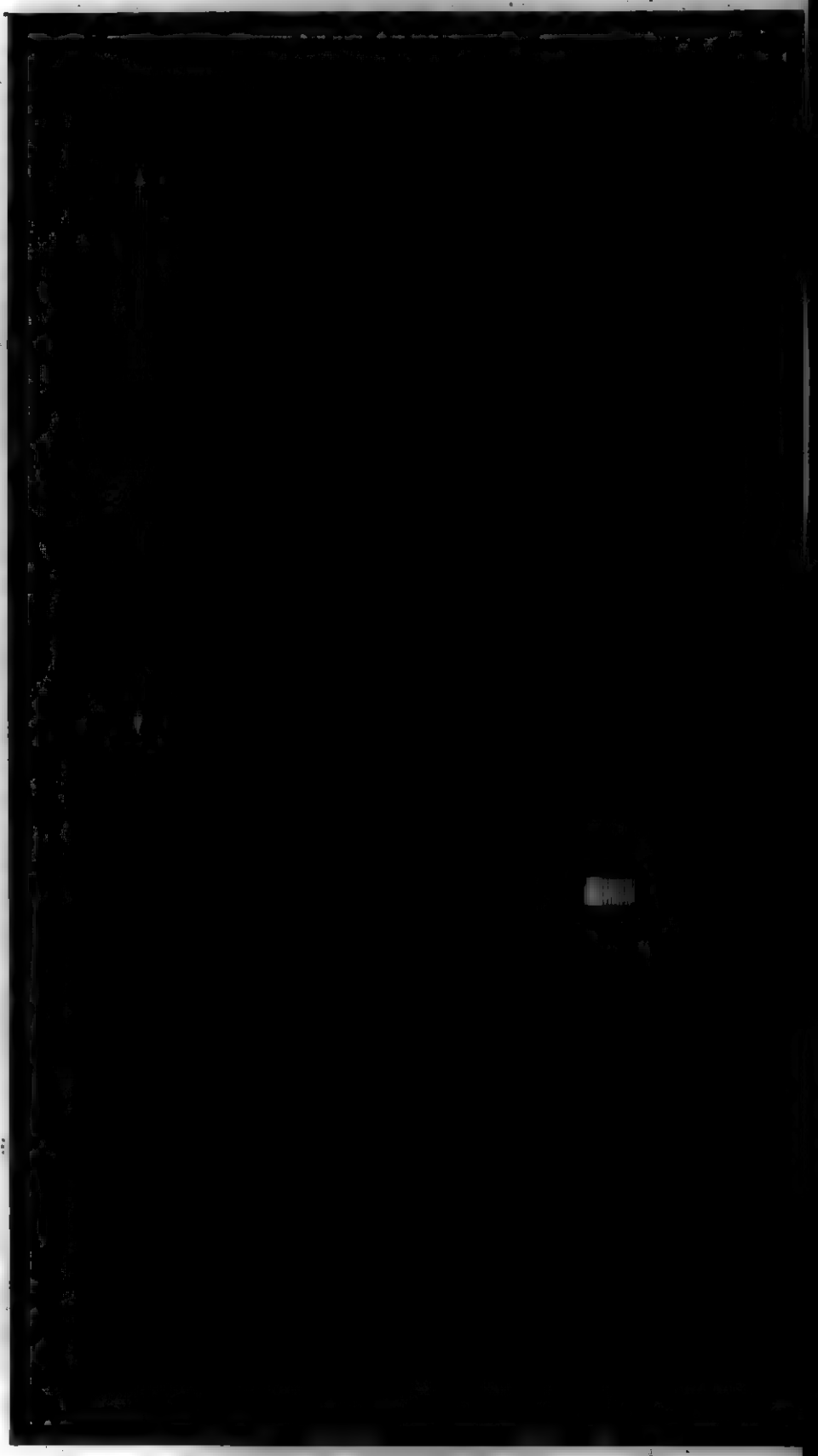

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FTC targets credit bureau mailing lists

By Mitch Betts
WASHINGTON, D.C.

The Federal Trade Commission (FTC) is trying to stop the nation's credit bureaus, which hold vast computer databases on nearly 200 million Americans, from using credit reports to create highly targeted marketing lists.

Last week, the FTC charged Trans Union Corp. with violating consumer privacy by mining its credit reports to sell mailing and telemarketing lists of consumers who fall into certain income ranges or "affluent lifestyles."

Trans Union, based in Chicago, said it has done nothing illegal and will fight the charges. The case is slated to go before an FTC administrative law judge on March 16.

The agency also reached a proposed settlement with TRW, Inc.'s Information Services Division in Orange, Calif., in which TRW agreed to discontinue the same practice. Atlanta-based Equifax, Inc. saw the regulatory backlash coming and escaped that business niche two years ago.

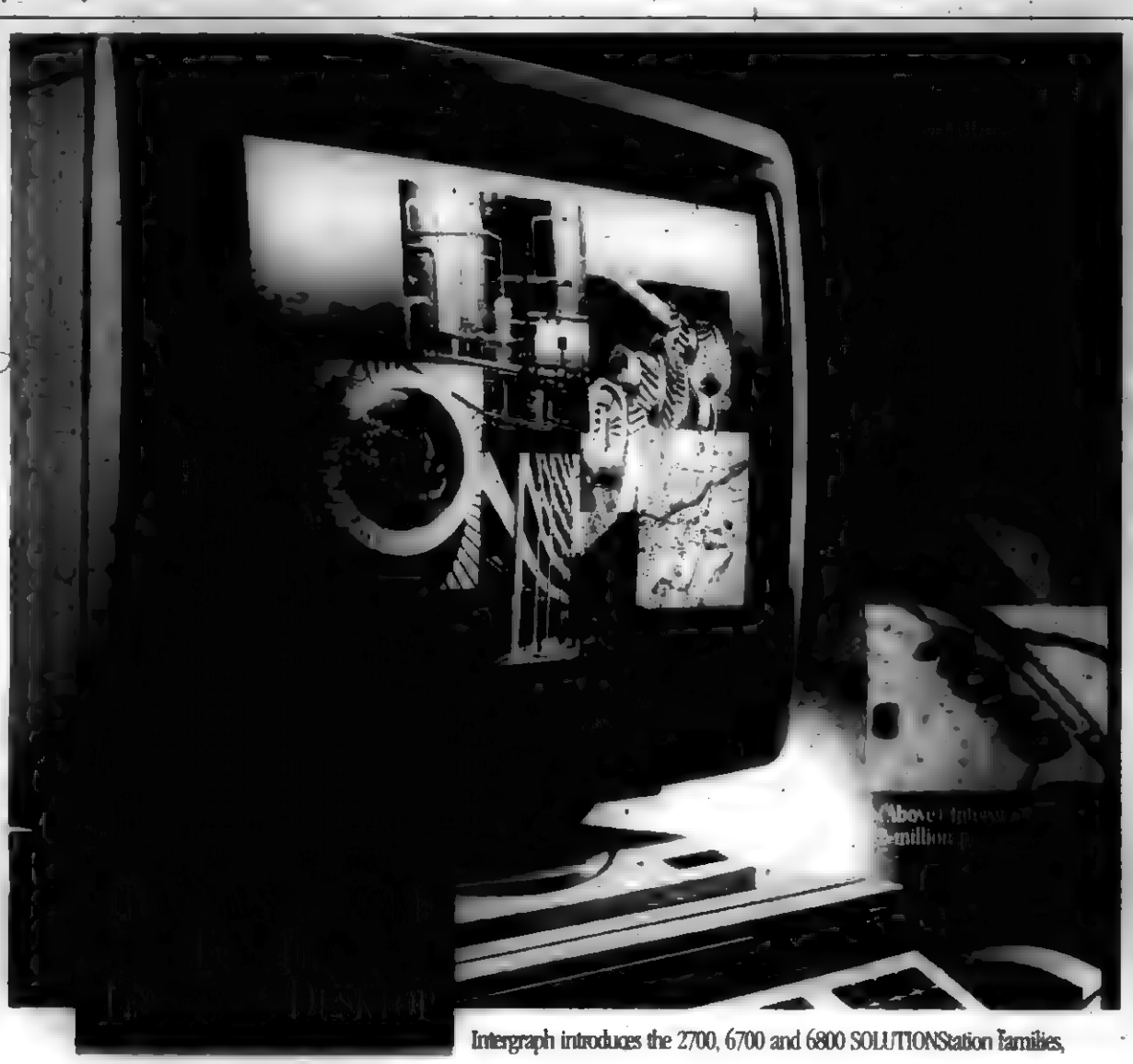
The FTC action comes at a time when many marketers are compiling databases on consumers, categorizing them by financial status and lifestyle. However, the FTC said credit reports may be used only for certain purposes—approving applications for loans, jobs and insurance — and not for marketing lists unrelated to credit.

Credit bureaus will be allowed to create lists from the name, address, telephone number and age listed at the top of credit reports, the FTC indicated, but they will be unable to draw from the financial data in the credit report.

Direct marketers can get the financial data from other sources, but the FTC action "is still positive news for consumers," said Mary J. Culnan, an associate professor and consumer privacy expert at Georgetown University. "Most people don't have a clue that their credit report is being used for marketing."

Credit bureaus have been besieged by criticism during the last few years over privacy issues and database errors and have reached settlements with federal and state regulators to correct the problems.

Last month, TRW agreed to pay restitution to 1,200 Vermont residents who were incorrectly listed as tax defaulters.



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Operating system show lacks business appeal

By Christopher Lindquist
SAN JOSE, CALIF.

Attendees at this week's Windows & OS/2 Conference will likely find an emphasis on consumer-oriented, Windows-based software vs. OS/2-based, line-of-business applications. However, show-goers will encounter demonstrations of software written for Microsoft Corp.'s Windows NT from a large number of companies.

Jeff Tarter, publisher of the "Soft Letter" newsletter in Watertown, Mass., said he finds these demos "fascinating," considering Windows NT is not due to debut until May — perhaps at Comdex/Spring '93.

For the most part, though, Tarter described the conference as "just another consumer show. What you got in the early days were true Windows pioneers."

Among the products that will be floated at the show are the following:

- GFA Software Technologies, Inc. will unveil a Compiler/Linker for GFA Basic that will allow the product to create stand-alone EXE, DLL and VBX files.
- Graphical Dynamics, Inc. will present Clock Manager for Windows, a Windows automation package.
- Caseworks, Inc. will demonstrate CASE:PM VIP and CASE:W VIP, prototyping tools for OS/2 and Windows.
- Softbridge, Inc. will release ATF Work Station, an unattended testing product for OS/2 applications.

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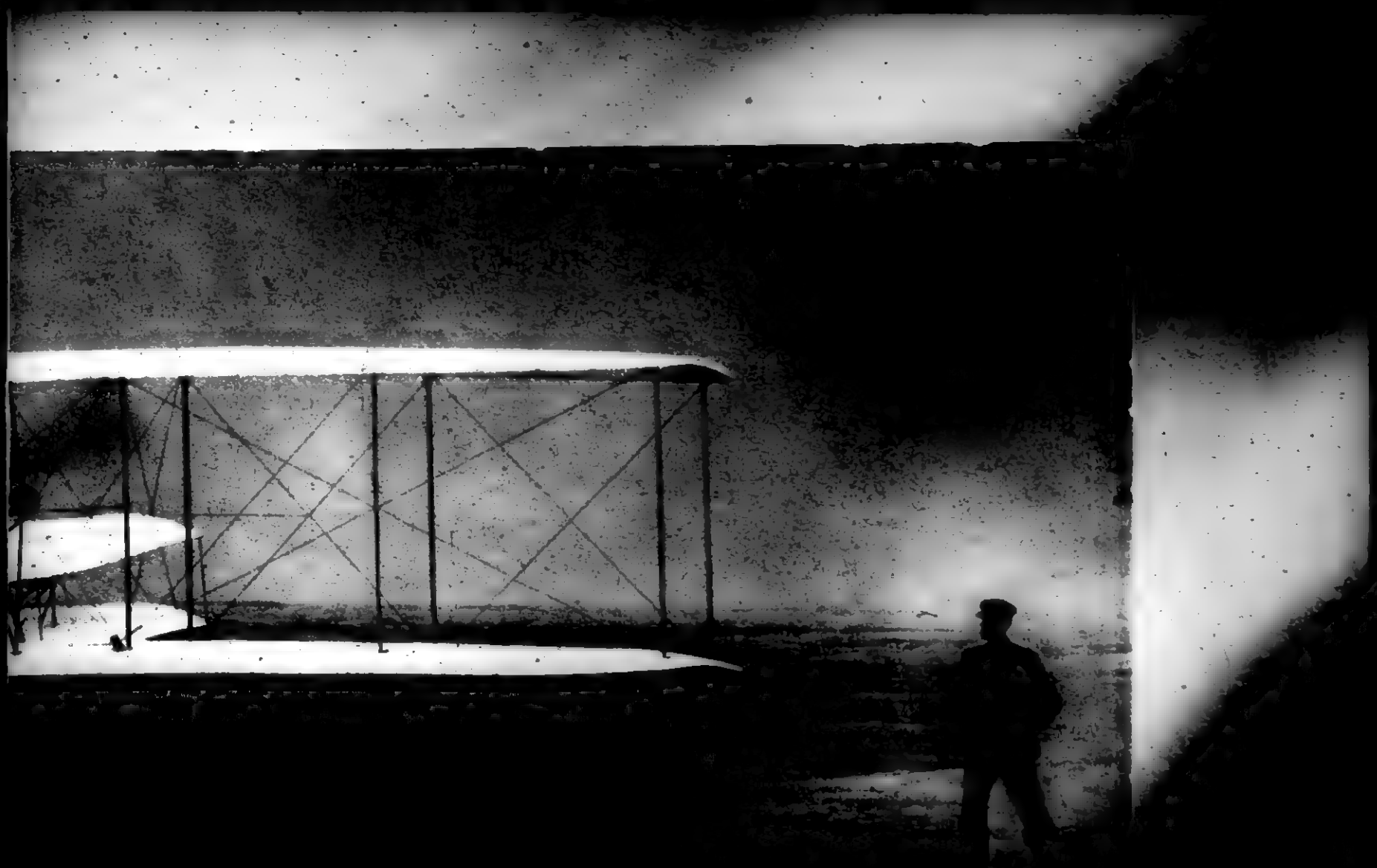

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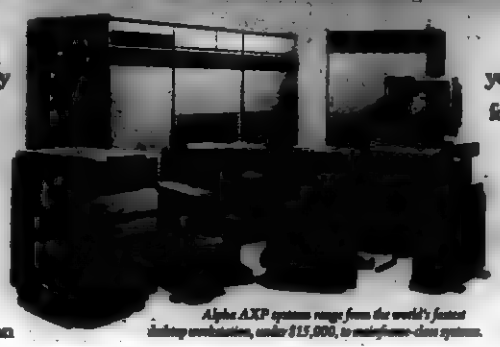

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Industry CEOs push national digital net

Commerce Secretary-designate Ronald H. Brown said to support the plan

By Gary H. Anthes
WASHINGTON, D.C.

Chief executive officers from 13 major U.S. computer companies met here last week with Commerce Secretary-designate Ronald H. Brown, saying he pledged to support their plan for a government/industry partnership to build a national digital information infrastructure.

The CEOs proposed building a National Information Infrastructure (NII), a broadband digital internetwork connecting computers and people to bring medical care, interactive training, advanced manufacturing techniques, government data and the like to broad sectors of the country.

"Ron Brown has quickly taken the initiative to build what I believe is going to be a very strong relationship with the high-technology community," said John Sculley, chairman of Apple Computer, Inc. and chairman of the Computer Systems Policy Project (CSPP), which met with Brown. "He made it very clear to us that he would consider [the infrastructure] a very major accomplishment during his tenure as secretary of commerce."

Reaching homes and offices

The CEOs were in town to announce and lobby for a new round of proposals that would extend the government's existing high-performance computing and communications program — largely initiated by Vice President-elect Albert Gore — beyond the realm of government and university laboratories into offices and homes across the country.

The centerpiece of that program is slated to be the National Research and Education Network (NREN), a digital network to link universities and government laboratories at G byte/sec. speeds.

The network proposed last week would have far greater reach and broader application than the NREN is intended to have.

In addition, the CSPP called on the Clinton administration to establish a NII Council — to be chaired by the vice president and to include the secretary of commerce, the president's science adviser, the chairman of the Federal Communications Commission and representatives of industry and user groups — to develop a vision for the NII and coordinate federal agencies in implementing the effort.

Private-sector funding

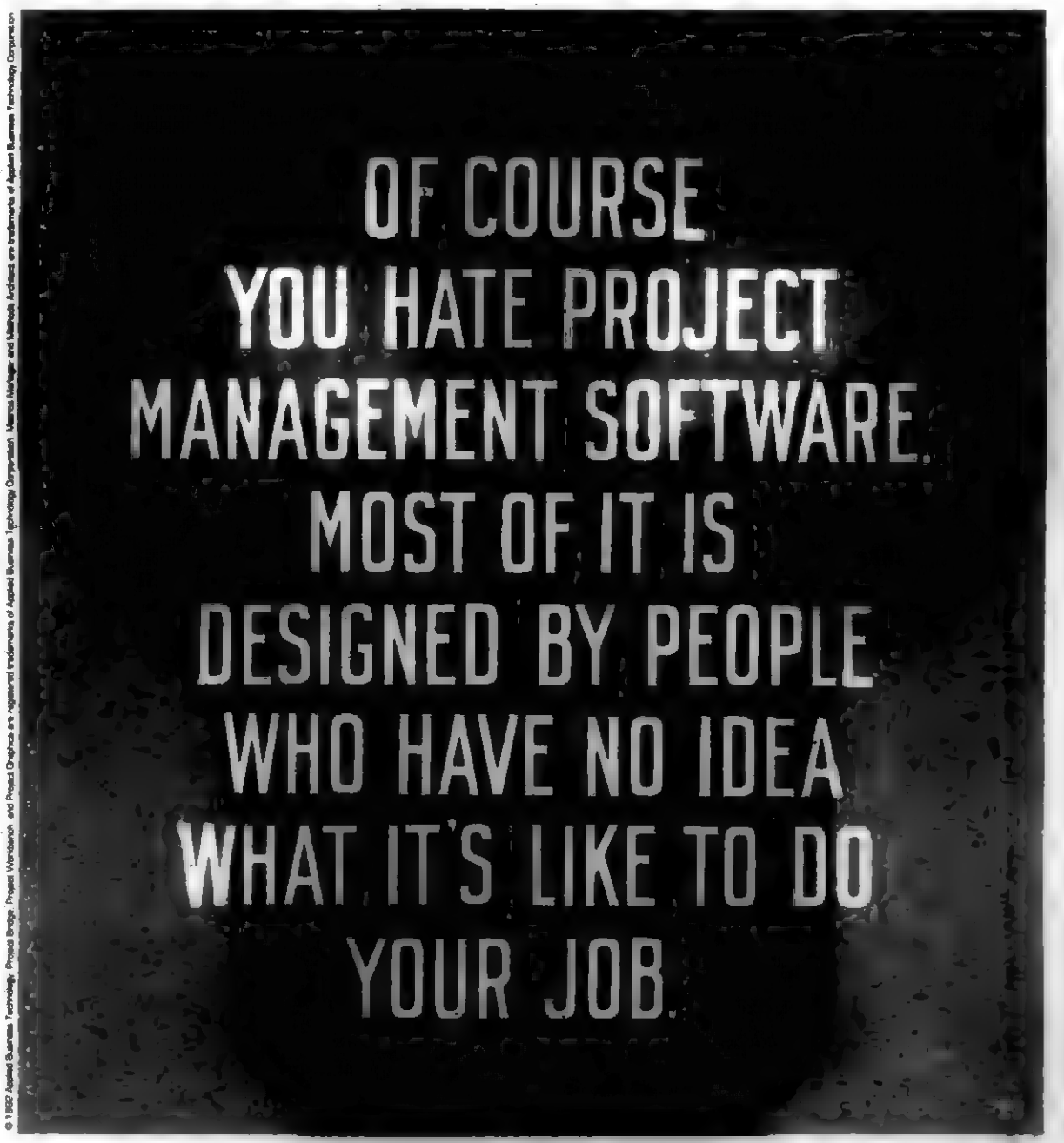
Sculley estimated that it would take 20 years and "multiple hundreds of millions of dollars" to build the infrastructure and said the private sector is willing to fund most of it. He said the government did not need to find new money for federal participation but should reallocate billions of dollars from defense research and development to civilian uses such as the NII, which is something Clinton has pledged to do.

Asked if the infrastructure required laying fiber-optic communication cables to every home, business and classroom, as the telephone companies and others favor, Sculley said the envisioned collection of interconnected networks could use a variety of technologies, including the copper-based Integrated Services Digital Network.

"Fiber to the home is not affordable right now," Sculley said.

The CSPP also recommended that the government do the following:

- Establish an entity, perhaps in the Commerce Department, to oversee and guide implementation of the vision developed by the NII Council.
- Fund pilot projects to demonstrate socially worthy applications of high-performance computing and communications.
- Develop a public information program for the NII.
- Make government data more accessible to the public.



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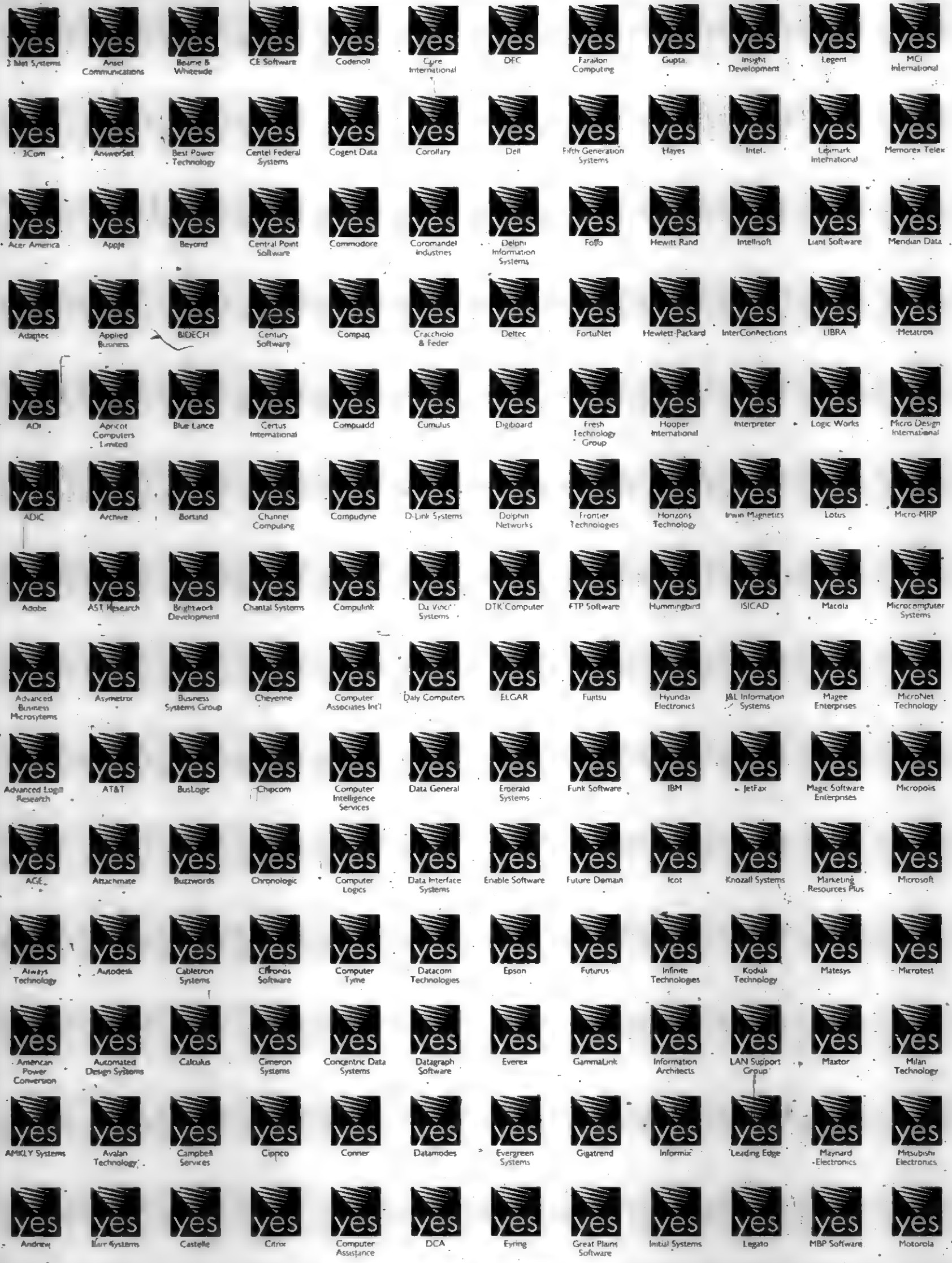
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yes Spry
yes Tandy
yes Trivium Computer Systems
yes Unisys
yes Word Jenny
yes Zenith Data Systems

yes NEC Technologies
yes Northgate
yes Oracle
yes Preferred Systems
yes Remote Control International
yes SMC
yes Star-Tek
yes Tatung
yes Tritcom
yes Verity
yes WordPerfect
yes Zylab

yes NetFRAME Systems
yes Norton-Lambert
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yes Presoft Architects
yes Retix
yes SMITHWARE
yes State of the Art
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yes Netlink
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yes Revelation Technologies
yes SOFTdata
yes Storage Dimensions
yes Tecmar

yes Netmagic Systems
yes Nu-Mega Technologies
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yes Rose Electronics
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yes Sybase
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yes Softshell Systems
yes Symantec
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yes Network Computing
yes Octus
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yes Network Peripherals
yes Okidata
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yes Quantum
yes Sanyo/Icon
yes Software Consulting Associates
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yes Tools and Techniques

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yes PC Quote
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The ubiquitous, omnipresent PC

By David Kellar

By the dawn of the next millennium, PCs will disappear from the desktop because they will *become* the desktop, a Japan-based research group studying future computer trends predicted.

The three-year study, scheduled to end in March, is being conducted by the Committee on Computer Systems in the Year 2001, a group of 18 researchers from major Japanese corporations, computer companies and universities.

By far the most intriguing prediction by the group is that PCs will vanish from the desktop in corporate offices and become an integrated part of the work space.

The components of a PC, rather than being packaged in a box, will be built into the desk, and a large plasma or electroluminescent flat-panel display hanging on a partition wall will act as both a monitor and video phone display.

A high-resolution, touch-sensitive LCD built into the desktop will allow pen-based pointing and data input. When faster performance is required, users will buy new computer modules to plug into their desks.

In the home, meanwhile, computers will become as ubiquitous as TVs and will allow users to shop, send and receive electronic mail, view incoming faxes and make visual telephone calls all from an easy chair, with input carried out using a handheld remote terminal or a separate portable computer.

Computer interfaces will be friendlier than today's point-and-click, mouse-driven GUIs.

Computer interfaces will be far friendlier than the point-and-click, mouse-driven graphical user interfaces of today, according to the group.

"Human interface technology will actually be more important than computer performance in 2001," said Hajime Iizuka, a professor at Seikei University's Department of Information Sciences and chairman of the 2001 study committee.

The group also predicted the following will occur:

- Japanese companies — in order to gain the flexibility and cost-effectiveness necessary to remain competitive in global markets — will give up their long-entrenched, proprietary computer systems and replace them with networked, Unix applications.
- Most corporate applications will be transplanted from mainframes to workstations.
- Downsizing from mainframes to distributed client/server systems will all but eliminate minicomputers and midsize mainframes from corporate computer rooms, and large mainframes will be relegated to the sole task of managing huge Unix databases.
- Workers will use high-performance handheld computers with wireless communications functions.
- Reduced instruction set computer microprocessors will finally obliterate the ever-thinning gap between workstations and PCs.
- Computers will use "human interfaces" based on multimedia.
- There will be widespread use of broadband Integrated Services Digital Network communication for high-speed transmission of multimedia data.
- Chip design and manufacturing techniques will continue to evolve to yield 256M-byte memory chips and experimental 1G-byte dynamic random-access memory.

Similar advances in nonvolatile flash memory will lead to the replacement of magnetic hard disks with electronic "silicon disks," that enable significant size and weight reductions in portable computers.

Kellar is the Tokyo correspondent for the IDG News Service.

Attention, Will Robinson!

The commercial use of robots has only just begun

By Ellis Booker

A broken fiber-optic cable prevented Dante, a six-eyed, eight-legged robot, from making its historic descent into the active Mount Erebus volcano in Antarctica last month.

But the Field Robotics Center at Carnegie Mellon University in Pittsburgh, a veritable beehive of activity on "self-propelled" robots, remains confident that Dante and systems like it will make their way into wide-scale commercial use in the future.

"We're just now reaching a threshold," said David Pahnos, assistant director of the center, who noted that field robots make possible totally new applications.

"But the bigger impact," he added, "will be the automation of a lot of existing lines of products ... in construction, earth moving, transportation and farming."

Described as a precursor for robots that will be sent on unmanned missions to other planets, Dante stands 8.2 feet tall, weighs 884 pounds and is controlled by two Sun Microsystems, Inc. SPARCstations. Dante is also chock-full of state-of-the-art sensors, ranging from a 350-degree, three-dimensional vision system and laser range finder to sensors that check pressure, temperature and electrical fields around each foot. (Fans of the 1960s adventure cartoon, *Jonny Quest*, take note: Dante is reminiscent of the lethal, black spider robot.)

The lab is also at work on less exotic uses of robotics. For instance, it will soon begin development of a robot snake able to inspect the interior of gas or diesel storage tanks.

Robots like Dante *may someday be sent on unmanned exploratory missions into space*

But will a homeowner ever go to the garage and turn on a robot lawnmower? "I think it's inevitable," Pahnos said, adding that the center today could build an "autonomous" lawnmower but would have to charge $250,000 to $500,000 for it.

Dante, having survived its brush with Mount Erebus, will return to Pittsburgh and rejoin the planetary rover research effort.

Just don't let them loose at a picnic ....

Instead of his 8-foot-tall spider, how about a robot smaller than a fingernail that looks like an ant?

Johannes Smits, an associate professor of electrical engineering at Boston University's College of Engineering, is working on just such a bug [CW, Jan. 6, 1992], although he admitted that he has been unable to get funding for his "silicon ant," which is already patented.

"If we had the right amount of funding, we could have this thing working in a couple of months," said Smits, who is also director of the engineering department's sensors, actuators and micromechanics laboratory.

Smits is currently testing his first-completed "leg." Composed of two tiny strips of piezoelectric film and a V-shaped piece of silicon as a foot, the leg moves up and down when exposed to a small amount of voltage. Plans call for six pairs of legs on the 5- to 7-mm ant, which might also be outfitted with tiny pincers, saws or image sensors.

Armies of silicon ants might locate and remove radioactive dust from laboratories or scurry between petri dishes in bioengineering labs.

"We envision many, many of them, on the order of hundreds or thousands, to do a particular job," Smits said.

—Ellis Booker

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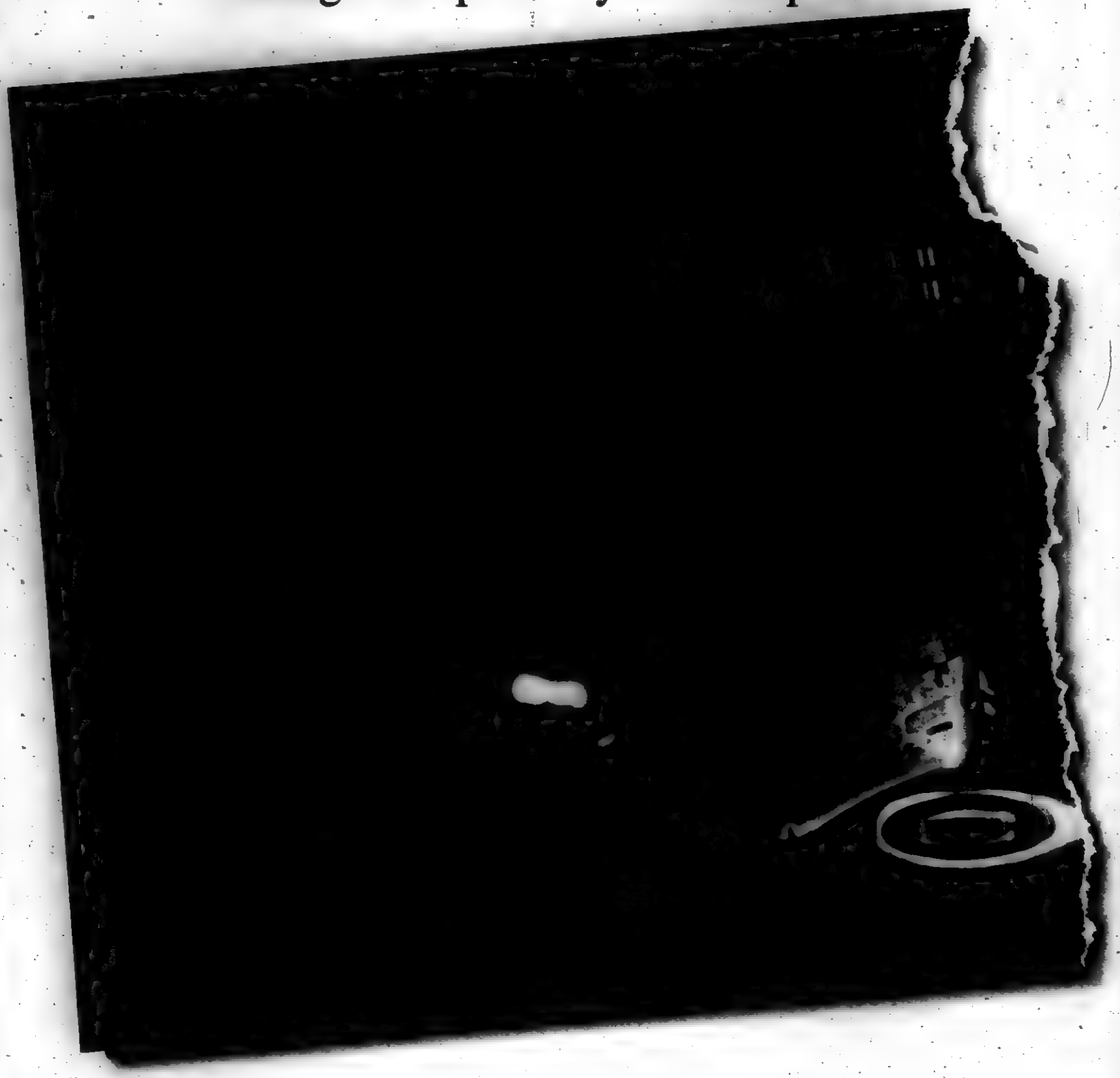

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NT promises

"We want IS people to be loved in their organizations. It's necessary to our success."

Is the speaker: a) an IBM vice president, b) an Oracle vice president or c) a Microsoft vice president?

Believe it or not, the correct answer is "c." Patty Stonesifer, Microsoft's vice president of support, nearly knocked me off my chair last week when she made that statement during a discussion of Microsoft's wide-ranging plans to improve its oft-maligned corporate support. Is this the same Microsoft that was practically the guerrilla leader of the PC end-user movement and the archenemy of corporate information systems?

Well, yes. Microsoft is becoming a very different company as it comes to grips with the reality that corporate IS now sees it as every bit as much a strategic partner as IBM or DEC. Microsoft seems a bit befuddled by this newfound coziness with the group it has so long opposed, but the company is rushing to capitalize on it as it prepares to release its most corporate of operating systems: Windows NT.

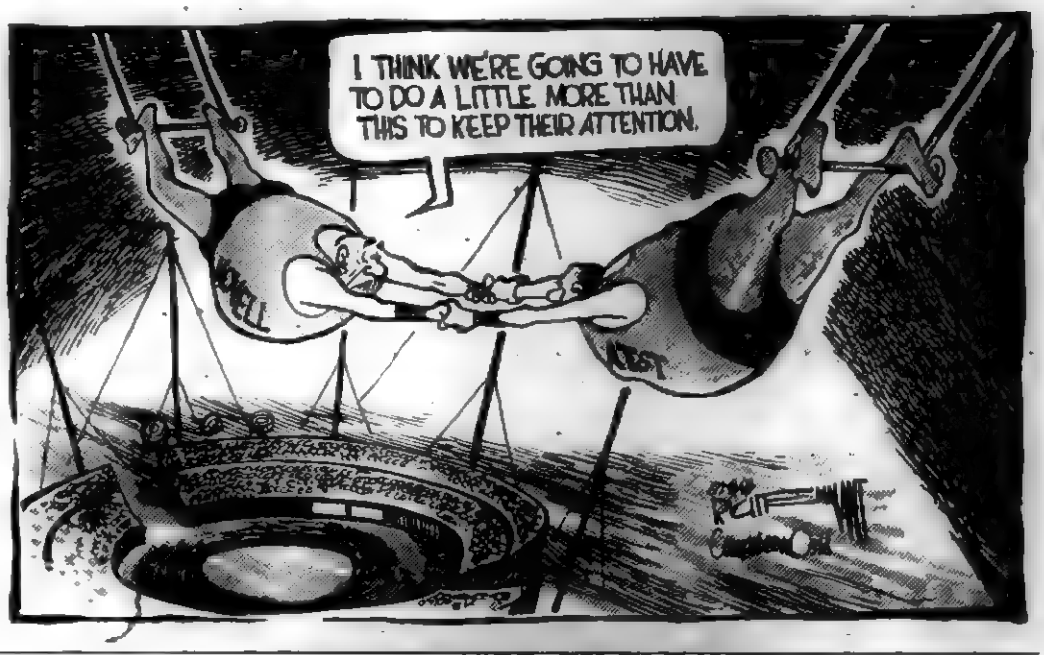
NT is an enormously ambitious product and is critical to Microsoft. Far from positioning it as just another PC platform, Microsoft is hoping to convince corporate America that NT will be appropriate for everything from high-end desktops to mainframe-class multiprocessors.

NT will be launched into a high-end market that is already overwhelmed with operating system choices. Microsoft has laden the product with a lot of impressive claims about security, maintainability and scalability that it will have to fulfill as NT rolls out this year. I think Microsoft knows that NT won't get beyond the desktop unless IS departments know that the company considers them a crucial link in the vision of information at your fingertips.

But if anyone can pull this magic show off, Microsoft can. The company claims to have shipped more than 45,000 NT software development kits already, and that's a truly incredible number. It boasts that high-end software developers are moving their applications in volume to the NT platform, a claim borne out by my own nonscientific poll of developers during the last few weeks. And NT will have the huge advantage of being compatible with most of the major Windows applications from Day 1.

The wild card in this game is corporate IS, which, after all, knows quite a lot about mission-critical platforms. For CIOs, spiffy technology and snazzy interfaces matter a lot less than software stability and a sense that their vendor has their interests at heart. That's why you're suddenly seeing Microsoft executives at SIM conferences and hearing about things like 24-hour support plans. It's not just lip service. If Microsoft can prove it really cares about making IS professionals loved in their organizations, it just might make NT the operating system of the next decade. It certainly wants to do that.

Paul Gillin, *Executive editor*



Why the change of heart?

I find the irony in your Forecast 1993 issue [CW, Dec. 28, 1992/Jan. 4, 1993] fascinating.

For 52 consecutive weeks, you have been writing and reporting stories pronouncing the death of the mainframe, implying the whole world is either downsizing or outsourcing and that client/server is the most incredible thing since sliced bread. Then in a whirlwind revelation, you report that these are for the most part "myths."

This leads me to one of two conclusions: For an entire year, your writers and analysts have been seriously misled. In a bizarre coincidence occurring at the exact time of your first issue of 1993, it has dawned on them that these subject matters are nothing more than "myths," much like Bigfoot and The Loch Ness Monster. Or, your writers feel an approach of sensationalism sets a foundation for an exciting crescendo at year's end.

Gregory M. Lorenz
Costa Mesa, Calif.

Saluting the pioneers of banking technology

It is somewhat (if belatedly) gratifying to see that your first-ever Excellence in Re-engineering Award was presented to Banc One Corp. for its work in revolutionizing the banking sales and service industry [CW, Dec. 14, 1992].

You aptly point out that the cooperative development partnership with EDS that brought forth the technology is so richly deserving of this lavish praise.

I'd just like to take a moment to acknowledge the contributions of Anacomp, Inc. and its 460+ employees who began this project in the late 1970s and early 1980s.

These pioneers not only originated these ideas but also provided the core systems and personnel that EDS purchased at a distress sale in the mid-1980s. The ill-fated CIS project has risen from its ashes like the mythical phoenix, and those who participated in that monumental project, now mostly scattered again to the four corners of the country, should stop and take a bow, too, wherever they are, as this elusive dream has finally become a reality.

My congratulations to the current team who brought forth this latest incarnation of totally integrated banking systems and to the insightful and brash band of Anacompians who originated the concept and gave so much of themselves to breathe life into it.

Frank J. Ingrassia
Sarasota, Fla.

Out with the old, in with the new

Change replaces old rules with new, old skills with the need for new ones, and competence with incompetence. Is it surprising that change hurts?

Both your editorial cartoon and Alice Bredin's article "Make yourself too valuable to lay off" [CW, Dec. 28, 1992/Jan. 4, 1993] point to a crisis in the information systems industry. IS professionals must change skills as fast as they have asked their clients to change systems in the past. If they don't, the unskilled labor force in the year 2000 will consist of hordes of mainframe programmers and analysts.

It has been my experience that IS professionals fear change more than their users. They have years of technical training and expertise invested in their careers. Giving up this investment is difficult, but yesterday's skills will neither build the systems of tomorrow nor make you "valuable to your employer."

Peter de Jager
Brampton, Ontario, Canada

Bad advice

I read with horror Michael Cohn's Viewpoint article "The 'ize' have it" [CW, Dec. 21, 1992]. It was very unprofessional and irresponsible for you to print such an article.

First Amendment rights aside, it is unacceptable for an information systems publication to print an article that encourages computer professionals to "terrorize, destroy a disk pack, create a crisis" in order to keep IS employment levels high.

Scott Steinberg
Alexandria, Va.

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Stop whining and leave Microsoft alone

John Chisholm

Unable to win in the marketplace, Microsoft's competitors have taken their case to the federal government. They want the Federal Trade Commission to stop Microsoft.

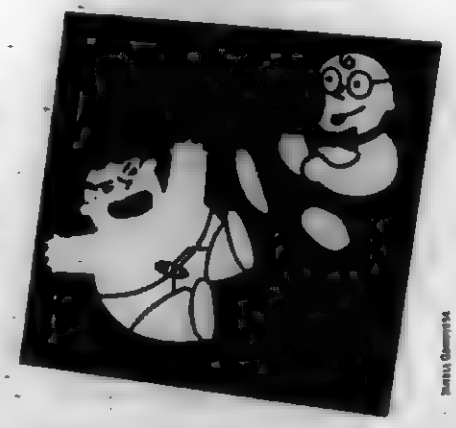
Microsoft is an easy company for competitors to envy. The firm's profits represent the lion's share of total profits among PC software companies. But the FTC's job is to protect consumers — not competitors — and end users keep voting pro-Microsoft with their pocketbooks.

Monopolistic behavior means withholding or slowing the pace of innovation. That hardly describes Microsoft, which at Comdex Fall '92 alone introduced support for workgroups, video and two new databases.

Although competitors resent Microsoft's hardball tactics in negotiations, virtually every software company in the world would like an alliance with them. Ironically, many of the firms most critical of Microsoft owe their existence to the large, homogeneous market that MS-DOS created.

Specifically, WordPerfect, Borland International and others have complained that Microsoft exploits its systems software technology to aid its applications business.

In the 1970s, Berkey Photo sued Kodak for introducing the Instamatic camera and Kodacolor II film cartridge, which initially only Kodak could produce, without predisclosing the technology to film developers such as Berkey. In the 1979 decision favoring Kodak, Judge Irving Kaufman wrote: "If a firm that has engaged in the risks and expenses of R&D were required in all circumstances to share with its rivals the benefits of those endeavors, incentives ... on which the proper functioning of our competitive economy rests ... would very likely be vitiated."



Forcing Microsoft to modify its practices of licensing MS-DOS to OEMs, as the FTC would like, will benefit no one — except perhaps Novell's lethargic Digital Research unit — and will mean higher administrative costs for OEMs. Splitting up Microsoft, as some go further to suggest, would force end users to deal with yet another set of salespeople, support staffs and release schedules.

Microsoft's success is due, in large part, to its consistently long-term view. The firm worked on Windows, which now sells with more than half of all new PCs (over 12 million copies per year), for eight years before it took off in 1990. Microsoft could have quit investing in Windows long ago, as IBM did with Top View, Digital Research with GEM and Visicorp with Vision, three now-defunct GUIs. Users can be grateful that Microsoft had the vision and persistence not to do so.

However, if you think Windows is a monopoly, don't blink. Software "monopolies" are short-lived. In the mid-1980s, Lotus had a similar franchise with 1-2-3; in the early '80s, it was Visicorp with VisiCalc. If history is a guide, we'll see Windows superceded by a new GUI from a different, perhaps as-yet-unknown, supplier before the year 2000.

Bureaucracy and inefficiencies usually appear as companies grow. If they take over Microsoft, as we have seen happen at IBM, General Motors and elsewhere, Microsoft will lose customers, revenue and market share, as it will deserve to. Until that happens, the company and its customers should not be penalized.

Monopolies that truly hamper progress are not hard to find. They are those with exclusive franchises granted by government: the U.S. Postal Service and the public school system are two examples. Let the FTC turn its attention to them.

Chisholm is president of John Chisholm Co. in Menlo Park, Calif. He consults with computer and software companies in marketing and strategy. Microsoft is not a client.

Biology is destiny in computers, too

OPEN MIND *by* Esther Dyson

Not long ago, I was waxing eloquent about the future of computing — message filters, personal agents, "knowledge navigators" and the like — to a group of *Computerworld* advertisers and readers, when a questioner (Jacob Stein from Versant Object Technology) brought me up short.

"Won't people be awfully disappointed when they find out this stuff isn't perfect?" he asked. "Won't there be a huge backlash?"

Indeed, all the advertising tells us computers are digital and binary; they don't make mistakes, they're reliable and precise, and they have specs, not personalities. No one talks of a computer as being mostly right, partially accurate or approximately anything. It either is or it isn't. No one considers that such tools need to be programmed or at least trained.

We compare computers with machines, not people. Yet as we expect computers to replace people — librarians, secretaries, traffic managers — we need to apply a different sort of measurement and different expectations.

The computer industry already hit this issue with expert systems, but we never reached a mass market (at least not visibly, as expert systems), perhaps for this very reason. But mail filters, personal agents and knowledge navigator devices *will* serve mass markets.

We need a new metaphor for computers, one that is closer to biology than to machinery, as we apply them to less mechanistic and more personal tasks. Just as you don't expect perfection from a secretary or a librarian, you should not expect perfection from your agent.

I'm not suggesting anthropomorphism for computers — the mistaken notion that computers are human — but something much more subtle. Yes, computers are machines, and they don't have human feelings. But as we apply them to human tasks, they will reveal human failings — ours or theirs — such as unclear instructions, conflicting priorities and inconsistent responses to similar situations.

In the past, technology changed more slowly and users had time to adjust. People had time to understand the limitations of new technologies such as airplanes and cars: You have to learn to drive, and they can be dangerous.

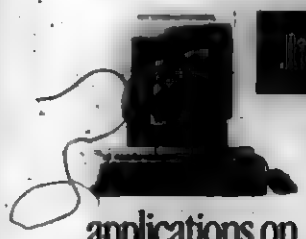
With computers, there are similar problems. With agents, filters and other personal tools, there will be a new job of defining better what you want. (Imagine giving your car a map beforehand instead of making the turns as you go; that's something like programming.) You think you know your own preferences until you discover exceptions ... in real time. I always want the cheapest hotel room ... except when I'm planning to have meetings in it all day. I always want to sit by the window ... unless I'm with my boss, who also prefers the window.

Training a personal device is an interactive process. You learn how to use it; it learns how to serve you. The need for training isn't a failing on the part of the manufacturer but rather the need and potential for customization. If you want it to be yours, you have to make it yours. *You're responsible!*

Of course, this issue reflects an even broader problem that computers aggravate: Our tendency to see the whole world as a potentially perfect machine and any problem as someone's fault. We expect things to run smoothly, and we want to blame something or someone if they don't.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets, respectively, in Eastern Europe.

"Why's Apple talking to me about UNIX?"



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Charles Babcock

A unified reality?

After his company moved to acquire Unix System Laboratories (USL), Novell President Ray Noorda announced it was time to unify Unix. There is room to question whether unification is a realistic hope or whether it would make a difference, but one shouldn't discount the possibility of surprises here.

Given Noorda's capacity to get industry competitors to work together, a new alignment of forces might emerge to renew Unix's growth.

This is not to say that Noorda, with a wave of his hand, can convert the masses to Unix. Barriers remain even if the Novell/USL deal lives up to its maximum potential. But much of the battle over the next-generation operating system will be fought at the server level above the PC end user. At that level, Novell is scrambling into the ring as a contender.

Possible saviors

There are a number of alignments that could materialize to strengthen Unix's prospects:

- System V might absorb design improvements from the Open Software Foundation's OSF/1.

If the OSF were freed of the burden of developing OSF/1, it could focus on supplying middleware for a distributed computing environment. Novell is a member of OSF and, with a stroke of the pen, can make USL a member as well.

- Unix development might also gain new impetus from Novell's strategic need to fend off the Microsoft Windows NT challenge. Some Unix proponents fear Novell will take control of Unix as a proprietary product, but Novell isn't likely to want to disrupt the "open system" value of its acquisition. At least some Unix licensees will understand the value of Novell as the engine driving Unix.
- Unix variants will remain, but they could achieve a higher degree of compatibility. A "unified" Unix might still have several names and graphical user interfaces, but it would also have common application programming interfaces, common security and common system management.

Roel Pieper, president of USL, says the current Unix versions are "90% to 95% compatible." Competitive marketing has created the impression that they vary widely, but IBM, HP, The Santa Cruz Operation and others will have a compelling reason to drop that pretense if Microsoft starts making headway with Windows NT. Some members of the Unix community even envision a Unix Summit next spring to support a unified Unix.

Would DEC and Sun Microsystems attend such a party?

DEC probably won't join in.

At this point, DEC appears to be the last true diehard in the OSF, continuing to invest in OSF/1 at face value. For DEC to drop OSF/1 at this point would mean writing off millions of its own development dollars in OSF/1. This isn't likely to happen.

Sun might come around, however. Sun's style is "to do it all themselves," in the words of Pieper. Sun officials have made noises about how only Sun remains as an open systems company now that Novell owns Unix.

However, Jim Billmaier, Sun's vice president of product marketing, sounded conciliatory when asked about Novell's acquisition. "We expect 95% to 99% of what Novell does with Unix will be the right thing."

Is it possible that, one day, developers will be able to write an application that runs without modification under Unix from IBM, HP, SCO and Sun? Might there come a time when IS directors can plan client/server systems that make use of commodity hardware but are still easy to cross-connect?

It's hard to say. Clearly, Noorda is ready to take a shot at making those visions real.

Babcock is *Computerworld*'s technical editor.

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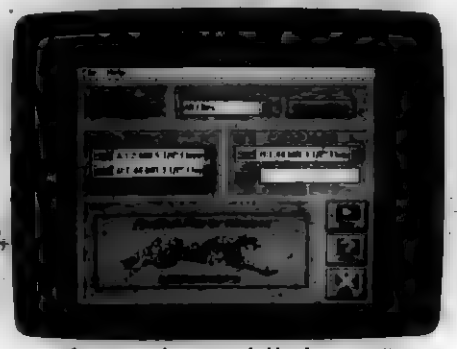

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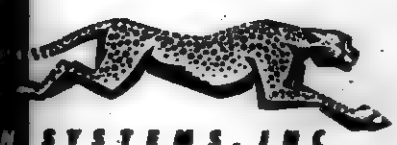

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Manual no more: Aetna unit gets PCs, results

New-business process is re-engineered

By Rosemary Cafasso

Just two years ago, the Aetna Health Plan business unit of Aetna Life and Casualty Co. relied on a manual system to process new business. And it had stacks upon stacks of paper to prove it.

So when DeAnn Anderson arrived as director of insurance quality, she found the "case installation" process topping the list of re-engineering candidates.

Today, about 90 users from the marketing and case installation groups work with a PC-based system running a selection of Microsoft Corp. software. In the first full year of use, the team was able to turn around 24% more cases than in 1991 and has not missed any deadlines preparing health plans for new clients, Anderson said.

Long before the productivity boost, however, Aetna set up a team to figure out what the current installation process was and how to fix it. Some concerns emerged immediately, Anderson said.

ON SITE

Aetna Health Plan
Hartford, Conn.

Challenge: To revamp a paper-based customer installation system.

Technology: PC-based database and project management along with in-house designed front end.

Inconsistencies abounded

First, the various Aetna regional offices handled the installation process differently, so there was no consistent set of procedures in place.

Second, new case managers were working with almost unmanageable amounts of paper. "Sometimes it would take three 4-inch binders [of documents] for one installation," Anderson said.

These managers were working with little twists and nuances with every potential business client, so each installation was like starting anew. With each case, staffers needed to assemble a work strategy to manage it. That alone could result in a 1-inch thick manual, which had to be updated weekly.

"We looked at this [process] and knew we had to re-engineer it," Anderson said.

Beginning in early 1991, the task force began examining what was in place by breaking the process into manageable pieces. Then the processes in each piece would be identified and fine-tuned — or torn apart, if necessary. Nine months later, the team had the basic concepts down for the Customer Installation Management Systems.

As the group mapped out the process, "we refined it and streamlined it," Anderson said. In the end, the group determined there were 800 tasks that any given case could require.

The group then decided it needed three key pieces: a database management system to store and build customer profiles, a project management system to cut back on the paper volume and automate the work flow and a front-end application to help automate the marketing and installation managers' jobs as well as interface to the back-end pieces.

Aetna opted to do an entirely PC-based system because it wanted it to be flexible and easy to use, said Dianne Cowles, director of national accounts. The group selected the Foxpro DBMS, now owned by Microsoft. It then selected Microsoft Project for Windows as its project management system.

The staff designed the front-end software with Spinnaker Software Corp.'s Spinnaker Plus. This icon-based system requires only pointing and clicking to select items.

Aetna marketing staff members use the front-end piece to select options, or Aetna products, that potential clients want as part of their health plans.

Once they complete this profile, they move it, via electronic mail, to Cowles. She reviews the new business and forwards it to an installation manager who retrieves the E-mail and loads it into the case installation front end, also designed with Spinnaker software. This software is directly tied to the Microsoft project management software.

How suite it is

IS directors find reduced training, other benefits to software

By Michael Vizard

■ As interest in suites of PC application software continues to grow, information systems directors are finding that purchasing these software packages provides a number of substantial benefits beyond simple price savings.

For IS directors, a bundled suite of software such as Microsoft Office from Microsoft Corp. or SmartSuite from Lotus Development Corp. represents an opportunity to standardize their company's PC application software.

This strategy gives IS directors more control over the deployment of diverse PC applications while also serving to reduce training costs because every application in the suite has the same user interface.

For example, Persona Care, Inc. in Baltimore, which manages a large network of nursing homes across the U.S., recently adopted Lotus' $750 SmartSuite for Windows package. The Lotus offering, consists of Lotus' 1-2-3 spreadsheet, Ami Pro word processor, Freelance Graphics, CC:Mail Single User Pack and, for a limited time, Lotus Organizer, which is a personal information manager.

"It's too hard to keep up with all the different PC applications at multiple sites in terms of providing support," said Scott Preston, director of MIS at Persona Care. "We decided to standardize on SmartSuite running on [Novell, Inc.'s] NetWare because everybody at our sites is a heavy 1-2-3 user."

More standardization

Also moving to standardize its PC application software purchases is Northern States Power Co. in Minneapolis, a regional electric and gas utility for the states in the northern part of the Midwest. The utility has opted to standardize on Microsoft Office. Priced at $750, Microsoft Office consists of Microsoft Word word processing software, Microsoft's Excel spreadsheet, PowerPoint presentation graphics software

Suites, *page 39*

Pen computing

Automation to save time for highway inspectors

By Michael Fitzgerald
LANSING, MICH.

While pen computing has developed little more than a bad reputation in the last year, some users have found ways to wipe off the tarnish.

The Michigan Department of Transportation (MDOT), for instance, is on the verge of moving from piloting pen computers to outfitting its highway inspectors with them.

The main thrust of the systems is to make life easier for the MDOT's 300 highway inspectors and to save money. Currently, inspectors file daily reports on progress, material needs and other factors involved in highway construction. In the past, these reports have been reentered by hand. The use of pen computers and standard floppy disks to transfer data should greatly reduce the cost of processing these reports, the agency said.

Michigan highway inspectors *will use pen computers to file reports from construction sites*

The pen computers are also expected to relieve pressure on the MDOT's staff. Michigan has the same budget restraints that most states have these days, and the MDOT cannot replace people who leave the staff.

"Our staff has been going down, so this is one way to save work," said Kevin Fox, senior systems analyst at MDOT.

Fox said the department plans to purchase 275 Grid Convertibles from Grid Systems Corp. in Westlake, Texas. Budget allowing, the purchases will take place in the next two years. For this year, Fox would like to get 150 of the systems, though right now money is budgeted for just 50. Fox said the department estimates that its investment will be paid back in 11 months.

"We'll begin statewide implementation in April, in time for the summer building season," Fox said.

While MDOT has piloted GridPads and has only seen one of the Convertibles, "as soon as we saw [the Convertible] we knew it pretty much answered the problems we had" with pen-based computing, Fox said.

He cited advantages such as the speed of its Intel Corp. 386SL vs. the Intel 8086 in the GridPad, the ability to use a keyboard for special comments on forms and the 3½-in. floppy, which will allow the MDOT to avoid buying costly flash cards for storage and data transfer.

Fox added that the Convertible makes the MDOT's applications, written in Pen Pal, a development tool built by Pen Pal Associates, Inc. in Los Altos, Calif., run much faster. Fox said several other departments in Michigan are watching the rollout to see how it goes, as are highway departments in other states.

HELP LINE

Microsoft Excel

This is another installment in a series of articles containing questions commonly asked by users and responses from software vendors' support lines. This week's focus is on Microsoft Corp.'s Excel spreadsheet.

Q: How can I use Autofill to clear a range?
A: Inraddition to being able to create a range with Excel's Autofill feature, you can also clear cells by dragging the fill handle back through the selected range. The cells in the range turn gray as you drag the mouse over them and are cleared when you release the mouse.

Q: How can I fill a range with a formula or value?
A: If you would like to have the same formula or value fill a range, first select the range, then enter the formula or value in the first cell and hold down the CTRL key (or the CONTROL key in Microsoft Excel for the Macintosh) while you press ENTER. The formula or value will fill the entire range.

Q: Can I get text to wrap within a cell?
A: Instead of having long strings of text overflow into adjacent cells, you can display the text on multiple lines within the cell with text-wrapping. To select cell text-wrapping, choose Alignment from the Format menu or shortcut menu, select Wrap Text and choose OK. You can also add a line break whenever you have text-wrapping selected. To add a line break in a cell while you are typing in Excel for Windows, hold down the ALT key and press ENTER. In Excel for the Macintosh, hold down the OPTION + COMMAND keys and press ENTER.

Q: Is there an easy way to set column width and/or row height?
A: To quickly adjust column width to accommodate the longest cell entry in a column, double-click the line to the right of the column heading. If more than one column is selected, double-clicking the column heading line for one column adjusts the column widths for all the selected columns.

To quickly adjust row height to accommodate the largest font in the row or to adjust row height for cells containing wrapped text that has been edited, double-click the line below the row heading.

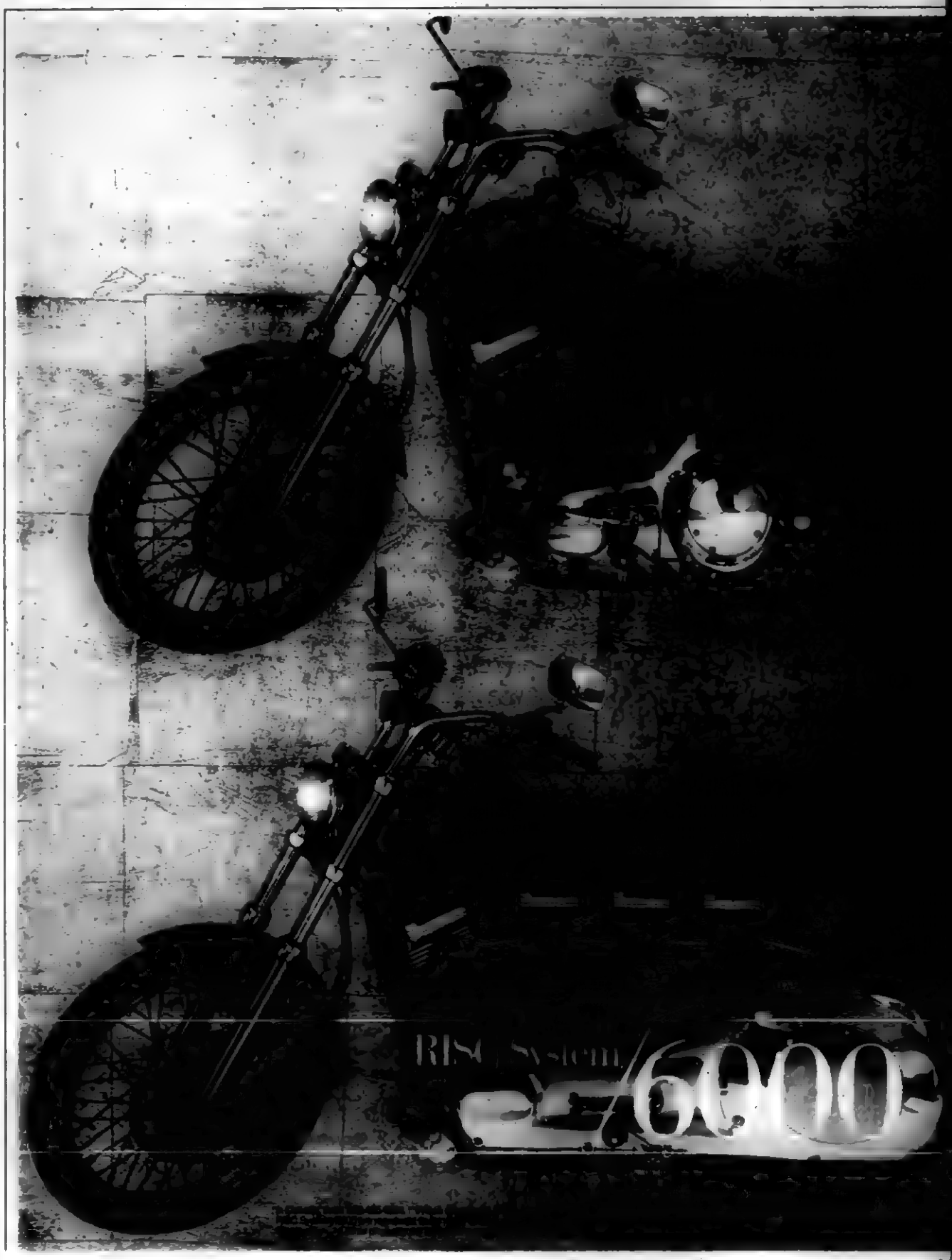
Q: What are some keyboard shortcuts that will help me get my work done quicker?
A: You can change a value or a formula in your worksheet by editing the data in the formula bar. As is shown in the table, using some key combinations with characters in the formula bar will result in a different action than if no characters are selected.

Q: How do I set a new default chart type?
A: You can define a particular chart type to be the default chart type that appears when you choose File New Chart or create an embedded chart on a worksheet.

To define a default chart type, first format an existing chart in the desired chart type. This chart may or may not contain actual data. If the chart contains references to a particular worksheet, these references are changed to the current worksheet when the chart template is used. Place the file in a separate chart window and save the chart as a template by choosing "Save As" from the File menu. Name the file "CHART" and save it in the start-up directory or folder.

Q: What do I need to do to rotate a three-dimensional chart on the screen?
A: You can use the mouse to rotate your 3-D charts to show any view (including a view from "under" the chart looking upward). To rotate your chart, first double-click to activate a separate chart window. Click one of the corners of a 3-D chart (where the axes meet), which will cause black squares to appear at the corners. Note that the word "Corners" will appear in the reference area of the Formula bar to alert you that the chart is now in direct manipulation mode. Drag any black square with your mouse to rotate the chart.

To see the chart outlines while you rotate the chart, hold down the CTRL key (or the CONTROL key on the Macintosh) and follow the same procedure. To reset the chart to the original perspective, choose 3-D View from the Format menu and click Default and OK.



IS finds benefits of software suites

CONTINUED FROM PAGE 37

and a single-user license for Microsoft Mail.

"There's no question we looked at price, but the deciding issue was the savings from training and support, as well as the reduced costs we expect to save from not having to integrate software ourselves," said Dick Elhardt, administrator of information services at the gas utility.

"The initial price of the software is such a small cost of the overall costs," he added.

According to Elhardt, Northern States Power previously had a corporate standard for DOS that was not enforced, but with the appointment of Roger Sandeen as the company's chief information officer last year, a standard for Microsoft Windows applications is now being enforced. The decision to have a PC application standard is being driven by the difficulty associated with supporting diverse packages under Windows, Elhardt said.

"There was a lot of resistance to going with a suite. We had been looking at buying Lotus 1-2-3, WordPerfect and Harvard Graphics, but we weren't too far into deploying Windows when we decided you had to look at the total package rather than individual applications," he said.

However, opting for a suite of applications from one vendor is not without its risks. "Lotus is essentially giving away the software, but the trade-off is that now they have us locked in for the future," Preston noted.

Despite the risks, other large IS organizations are also moving to standardize on suites of PC applications. Microsoft counts Northern Telecom, Inc.; the mid-size car division of General Motors Corp.'s Electronic Data Systems Corp.; and Rugby Darby Corp., a pharmaceutical house, among its large IS accounts.

> **"There's no question we looked at price, but the deciding issue was the savings from training and support."**
>
> *—Dick Elhardt*
>
> *Northern States Power*

The company reported Microsoft Office ranks in the Top 10 sellers list for distributors Merisel, Inc. and Ingram Micro, Inc.

"With DOS, it was virtually impossible to integrate applications. But with Windows, we're seeing a tremendous trend to use applications together," said Marlee Anderson, product manager for Windows Office.

In fact, the average number of applications on a Windows platform is now 7.9, while the average number of applications on an Apple Computer, Inc. Macintosh is 7.1, according to Computer Intelligence/Infocorp, a market research firm in Santa Clara, Calif.

However, while Microsoft has had a two-year head start over Lotus in terms of selling an integrated desktop application software package, Lotus counts among its recent successes Primark International, which makes Tupperware, and Fluor Daniels, an engineering construction firm.

The continued success of Microsoft and Lotus with these packages will depend heavily on how well they can attract upper management in IS organizations.

"Packages like these are a big company sell; they're not that attractive to individual end users, who tend to focus on specific packages," said Bill Higgs, vice president of software research at Computer Intelligence. "A company buys a suite to cut more teeth behind the effort to get people not to buy individual packages that will have to be supported," he said.

"PCs and individual applications tend to be purchased out of individual department budgets, while purchase of suites come out of IS budgets," added John Donovan, director of groupware services at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

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High-tech transition helps fill jobs

By Gary H. Anthes
WASHINGTON, D.C.

While President-elect Bill Clinton's picks for a handful of cabinet posts have garnered most of the publicity, behind the scenes a staff of 1,000 volunteers — aided by a gaggle of information systems technology — is working around the clock to fill as many as possible of 4,000 government jobs by inauguration day this Wednesday.

The offices of the Clinton transition team were recently fitted with a Novell, Inc. local-area network spanning four floors, 13 Sun Microsystems, Inc. workstations, 20 PCs, three high-capacity Fujitsu Ltd. optical character recognition scanners and application-processing software from Resumix, Inc. in Santa Clara, Calif. The system is processing 2,000 resumes a day, matching them with job openings where possible.

Clinton TRANSITION TEAM

Incoming resumes are scanned and input into a Resumix database in two forms: as an exact image and as searchable ASCII text. The Resumix software also builds a standard candidate profile consisting of job classification, address and telephone information, education, work history, skills and experience.

Resumix uses artificial intelligence techniques to build the applicant skill/experience summary, said Rodger Sellers, project manager at Computer Task Group, Inc. in Buffalo, N.Y., which set up the system. For example, he said, the software can establish a context for a reference to "apple" to decide whether the applicant is a farm worker or a PC specialist.

The system matches resumes with job requisitions loaded into a separate database, and promising matches are flagged for manual review by hiring managers. Key word searches can be used to find people with particular combinations of skills, experience and education.

The system generates acknowledgment letters for every applicant. "That's something that was not done in any of the earlier presidential transition periods," Sellers said. "They didn't have an automated system because the technology wasn't available. So a lot of people just sent their resumes into a black hole."

The system is leased for an undisclosed sum, but Mark Bilsky, personnel systems director for the Clinton transition team, said a comparable system would cost about $500,000. Since late November, it has processed 100,000 resumes, a process he said would have taken a year by conventional manual means. "The savings are tremendous. We've saved 500,000 pieces of paper so far, and we've eliminated data entry and file clerk positions," he said.

Desktop to mainframe

DEC users await Windows NT

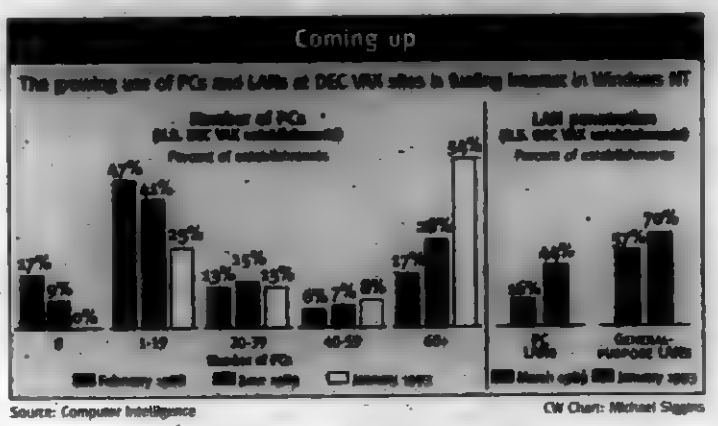
By Melinda-Carol Ballou

Digital Equipment Corp. users with mixed installations of PCs, VAXs and other systems are looking to Microsoft Corp.'s Windows NT as a means of unifying their environments and ultimately acting as potential servers. Although DEC has announced only an Alpha AXP desktop version of Windows NT, internal DEC sources said that work is currently under way for high-end Alpha platforms running as NT servers, including a 10000 mainframe.

While users will be unlikely to bet their businesses on Windows NT in the near term, most major VMS installations are seriously looking at it to determine whether it has the underpinnings to meet their long-term needs.

The growing ubiquity of PC systems at VAX sites (see chart) is at least partly responsible for the high degree of enthusiasm on the part of DEC's current installed base for the potential of Windows NT running on Alpha AXP systems — a key market for DEC.

Although Alpha systems running Windows NT are not slated to ship until later this year, when Microsoft makes the operating system available, many information systems managers are making plans to bring in the platforms as soon as they can purchase them.



Source: Computer Intelligence — CW Chart: Michael Siggins

Operating system of the future

Bankers Trust Co. in New York is one such site. It has roughly 10,000 PCs, half running Microsoft's Windows and most of them networked; 300 VAX systems; three IBM Enterprise System/9000 processors and a mix of DECstations and IBM RISC System/6000s, according to Vice President Stanley Rose, who said his organization believes that Windows NT is likely to be the strategic operating system for the next decade.

"NT seems to hold the promise of providing the kind of capabilities you have on VMS, from the desktop to the data center — multithreaded multiprocessors and a powerful file system," Rose said. "I think NT will be the thing that sells Alpha.... If you have NT running across the environment, you can have one operating system to which everyone programs."

The requirements of a good multitasking operating system that will run DOS is "forcing me to be interested in NT," said Wayne Keeling, an engineer at EG&G Mound Applied Technologies, a contractor for the U.S. Depart-

DEC, *page 43*

HP maintains RISC lead

By Maryfran Johnson
CARMEL, CALIF.

Revenue for reduced instruction set computing (RISC) systems rose 45% in 1992 to hit the $17.5 billion mark, according to this month's issue of consultant Andrew Allison's "RISC Management Newsletter."

Hewlett-Packard Co.'s Precision Architecture-RISC systems held the lead position, with 30.8% of the market, although HP did drop from nearly a 35% share in 1991. Second in line is Sun Microsystems, Inc.'s Scalable Processor Architecture, which captured 25.1% of the RISC market in 1992 — down slightly from 26.4% in '91.

The dark horse in the RISC picture was the former Mips Computer Systems, Inc. — bought last year by Silicon Graphics, Inc. and renamed Mips Technologies, Inc. — which overtook IBM's efforts and ended up placing third, with 20% of the market.

Even with the embarrassing collapse of the ACE consortium, Mips-based system revenue "grew strongly and decisively recaptured third place from IBM's Power architecture," Allison noted.

IBM held steady with 12.3% of the market in '92, compared with 12.4% in '91.

"It's beginning to look as though IBM's objective of becoming the Unix workstation and server leader by the end of next year will be quite hard to achieve," Allison observed. "All in all, 1993 has the making of being a very good year for HP."

Overall, RISC microprocessor shipments tripled last year to 4.1 million units — more than half of them Intel Corp. 1960s, which got a boost from the HP LaserJet IV printer's use of embedded Intel chips.

Allison called Intel's dominance of the embedded RISC market "an ominous sign for the other high-end RISC chips."

In Brief

Client/server conference

The first UniForum Technology Managers Conference, a two-day meeting on client/server application development, will be held March 15-16 in San Francisco. Executives from American Airlines, Hyatt Hotels Corp. and National Can Co., among others, will discuss their experiences in client/server applications. For more information, contact the Hurwitz Consulting Group in Newton, Mass., at (617) 965-7891.

Wyse aids 'velvet divorce'

Prior to the recent breakup of the country, the former Czechoslovakian government's Ministry of the Interior added a $350,000 purchase of Wyse Technology, Inc. systems to the $4.8 million it has spent on Wyse equipment in the past 15 months, company officials said. This latest transaction covers multiuser Unix-based systems that will manage the official split of Czechoslovakia into independent Czech and Slovak countries. The first order included 130 Wyse Unix-based systems and 2,008 terminals.

Michael Drips

Easy access via Access

Microsoft's Windows database, Access, offers IS managers a rare combination of capabilities: The product is easy enough to use that a wide range of people can use it to manage their data, yet it has the power and flexibility that IS professionals require.

A multiuser relational database that can work with data from multiple sources, Microsoft Access could set the standard for Windows DBMSs.

Traditional character-oriented databases have been limited to plain text and numbers. Like other new Windows databases, Access databases can include complex data such as full-color pictures or diagrams. As an Object Linking and Embedding server, Access' databases can also contain sound, video or such objects as Lotus' 1-2-3 spreadsheets or WordPerfect for Windows documents.

Access shares the look and feel of other Microsoft Windows applications, so users will feel right at home. In addition, Access supports such Windows conventions as Dynamic Data Exchange — both as a client and as a server — so developers can create complex applications that integrate information from many Windows applications.

Open to all

Access makes enterprisewide data available to all. As you'd expect, Access can import and export data from such file formats as Microsoft's Excel, Lotus' 1-2-3, ASCII (fixed length and delimited) and popular database formats such as Microsoft's FoxPro and Borland's dBase and Paradox.

It can also read and write data and indexes directly from dBase III+, dBase IV, Paradox 3.0, Paradox 2.5, Novell's Btrieve, and Microsoft's SQL Server.

This allows diverse users with a variety of DBMSs to work together and share data.

Access is a great tool for building client/server applications. Through Open Database Connectivity (ODBC) technology, Access can manipulate data on Microsoft SQL Server in a client/server environment. In fact, users can even create multitable, updateable joins across database formats, and Access will optimize the query to return data as quickly as possible, even if some of that data is on SQL Server.

At Access' Comdex/Fall '92 launch, Microsoft also displayed connectivity to Oracle databases running on OS/2 and DEC's Rdb using additional ODBC drivers. The company has promised to make these drivers available in the first half of this year.

Of course, unlimited access to data can be problematic for IS managers without a sophisticated security system. Here, again, Access more than fits the bill: Its user-level security scheme allows the database administrator to decide who has permission to read, write or delete each database object. Administrators can assign separate user IDs and passwords to every user.

For all its power, Access is easy to use. The product has clearly benefited from Microsoft's usability laboratory, a facility that allows program designers to watch users interact with their products.

Access makes creating complex queries easy. For example, with the Query By Example screen, users simply "point and click, drag and drop" to design queries and create joins among multiple tables, including SQL tables. In minutes, Access can create complex queries that take an hour or more in competing products.

Microsoft Access also features Wizards that allow users to create complex forms, reports and graphs by answering a few simple questions about format, content and style.

A full menu

Finally, for serious database development, Access offers a full development language and Integrated Development Environment.

Access Basic is a powerful database development language patterned after Microsoft's Visual Basic. This is not the Basic users may remember from their distant past. Access Basic is a modern, block-structured language with explicit variable declaration, support for huge arrays, and familiar programming constructs.

Microsoft Access is a bargain. At a suggested retail price of $495, Microsoft lowered the bar on traditional pricing (usually $795 or $895) to bring database pricing in line with other applications such as word processors and spreadsheets.

Looking at a competitive pricing promotion of $99 a copy until Jan. 31, companies and individuals alike can certainly afford to evaluate Access.

Drips is a Prairie Village, Kan.-based consultant specializing in Windows computing, client/server and CASE.

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DEC users await Windows NT

CONTINUED FROM PAGE 41

ment of Energy. The Miamisburg, Ohio, firm could end up running Windows NT on either Intel Corp. or Alpha AXP-based systems.

Windows NT will be a modern alternative to VMS.

A series of reasons are driving interest in Windows NT on the part of DEC customers, according to David Solomon, president of Solomon Software Technologies, a Nashua, N.H., consulting firm. While many users are loyal to VMS, Windows NT will be a modern, scalable, 32-bit alternative that offers many "VMSisms under the covers," Solomon said.

"VMS programmers have an advantage coming up to speed on NT since they already know concepts which are new to 16-bit [DOS] developers," he said.

Preserving investments

Because Windows NT will be running on Alpha AXP platforms, users will be able to run VMS now and ultimately bring in Windows NT, preserving their hardware investment.

Windows NT will offer symmetric multiprocessing, preemptive multitasking and true multithreading support so that users will have the potential for each process on a server to run on separate threads for improved performance, Solomon said.

But users will wait for the system to mature before moving over vital business processes, he said.

According to William Ryan, a project leader at Amoco Corp. in Houston, it is "wait and see," though some users "can't wait" to get Windows NT on current systems and also on Alpha. "We will evaluate it, but until it's released and tested, we don't know where it fits in," he said.

Rose agreed: "This is a make-or-break year. If NT comes out this year with all its capabilities, then it will be a winner. If it comes out and it's buggy, then the door gets pushed open for OS/2, and that will hurt DEC a lot," he said.

SAS gains Unix 'Access'

By Gary H. Anthes
CARY, N.C.

SAS Institute, Inc. recently announced new links from the SAS System to Oracle Corp. and Sybase, Inc. databases. Available now for Sun Microsystems, Inc. workstations running Solaris 1.0, they are the first versions of the company's SAS/Access products for Unix-based databases.

"The most frequently requested new feature from SAS System customers at Unix Expo this year was access to Unix databases," said Marianna Suciu, database interface marketing manager.

With the new SAS/Access interfaces, users can transparently access Oracle and Sybase databases in Sun environments for ad hoc queries to generate reports, join data from other sources and update data in the database, according to SAS.

The new products support SAS' SQL Procedure Pass-Through Facility, which allows SAS users to connect to a relational database management system, execute queries or other SQL statements and then disconnect from the RDBMS. Queries can be optimized because they are executed by the RDBMS, not by SAS.

A first-year license for the SAS/Access Interface to Sybase or Oracle begins at $825.

Workgroup software applications

Rational Data Systems, Inc. is now shipping VoiceOver, a workgroup software package.

The product was designed to add voice annotation capabilities to WordPerfect Corp.'s WordPerfect 5.1 for MS-DOS.

Spoken comments can be recorded and fastened anywhere within a WordPerfect document, with standard WordPerfect communications network boxes displaying where the voice annotations have been placed. The boxes show the annotation's author name, length, time of creation and date.

The VoiceOver audio comments do not interrupt a document's formatting, and they can be cut and pasted, according to the company.

A single-user license costs $129.

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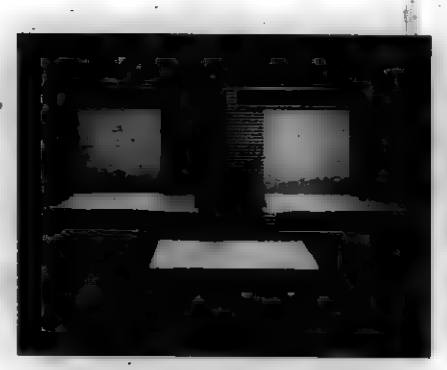

When Your Networks Are Complex, Your Choice Is Simple.

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Integrating Unix mail no piece of cake

By Lynda Radosevich

■ Companies blending Unix-based electronic mail systems into the corporate messaging network realize benefits such as improved communications and reduced training. However, companies are also running into troubles such as lost and jumbled messages, complicated addressing, directory management problems and a lack of delivery reports.

The problem lies in the gateways. Unless a company picks Simple Mail Transport Protocol (SMTP) — the messaging protocol that runs on Transmission Control Protocol/Internet Protocol networks and Unix — as its backbone protocol or uses a public E-mail service provider, it will have to use a gateway to tie Unix users into the corporate system.

"As with all gateways, there are always potential places where things don't operate gracefully," said David Whitten, office information systems program director at Gartner Group, Inc. in Stamford, Conn.

"It's (the directory management issues that are eating us alive," said Steve Bradbury, systems analyst at Chevron, Inc.'s information system planning group in San Ramon, Calif. "Gateways don't handle address-mapping situations well."

Chevron uses an X.400 backbone to interconnect 23,000 E-mail users on IBM's Professional Office System (Profs), Digital Equipment Corp.'s All-In-1 and Microsoft Corp.'s Mail, as well as those on Unix mail systems.

To connect the roughly 2,000 Unix mail users to the backbone — provided by Soft-Switch, Inc. in Wayne, Pa. — the oil giant uses Soft-Switch's SMTP-to-X.400 gateways.

"We have to work hard with the Unix gateways. It's a very different messaging environment," Bradbury said. "It's not cohesive. Things you do in one group of boxes may not work for another, and we have 15 Unix workgroups out there."

One of the biggest headaches, Bradbury said, is getting Unix mail addressing to work in a global directory. That is because each Unix workgroup devised its own naming standard with variable conventions and numbers of characters.

> [redacted]
> For now, there are no end-to-end solutions. We tell clients to go down their list of required functionality and make sure that the gateway supports it," said David Whitten at Gartner Group. Otherwise, users can be in for some unpleasant surprises.

Before Unix users can develop a standard method for the gateway to map a Unix mail address to another mail system such as Profs, they have to come up with an internally standard addressing scheme, Bradbury said.

Another addressing problem arises because Unix mail users require different addresses each time they work from a different host, but the gateway allows Bradbury to map only one address to a corresponding address, rather than many addresses to one. He said he would like to see gateways that allow him to map multiple addresses to one.

User solution

To avoid losing messages, Harvard Medical School in Boston built front-end software to its CC:Mail-to-SMTP gateway.

The front end stores incoming Unix mail messages in a queue and sends them at intervals to the CC:Mail gateway. If the gateway is not available, the front end keeps the messages in the queue and tries again.

"Anyone who is serious about using Unix mail will do this," said Jeff Francis, associate director of information services at the medical school. Otherwise, messages that come in when the processor is busy stand a good chance of getting lost, he said.

For others, trouble lies in the very nature of the Unix mail system. Rosenbluth International, Inc., a travel service company in Philadelphia, is linking users of the nationwide SMTP-based Internet into a corporate information and reservation system that works across most major E-mail systems on an X.400 backbone.

Joe Ruggiero, project manager in charge of implementing the new system, said that sometimes the messages from the company's clients using Internet get lost in the process because if someone's computer is down along the way, the message stops, he said.

While some of these problems are not unique to Unix mail gateways, users and experts agreed that Unix mail gateways are less developed than those for other, more commercial protocols.

"You can find better integration between PC mail systems and mainframe systems than either with Unix," said Andrew Wolfe, president of Lipa Strategic Technologies in Salem, Mass. One reason is that "the code base is free for the taking. Companies don't see it as a product with which to make a profit or to distinguish themselves."

Multimedia messaging

For users of the Internet and Unix-based E-mail, a major downfall has been the limitation to text-only messages. Now a new extension to SMTP that runs on TCP/IP will let users send combinations of digitized voice, video, graphics and binary files among networks. Called **Multipurpose Internet Mail Extension** (MIME), the extension is "critical to enable users with different mail systems across global networks to exchange information," said Andrew Schain, manager of networks at NASA headquarters in Washington, D.C. NASA's "goal is to send multiple attachments of different media without forcing the recipient to break out their decoder ring. MIME is a necessary next step in weaving a feature-rich fabric across E-mail platforms and brings us closer to our goal."

Frontier Technologies Corp. in Mequon, Wis., has announced Super-TCP for Windows, which it claims is the first Windows-based TCP/IP program to implement the new MIME standard.

Vendors offer partial solutions

There are no simple solutions to Unix mail integration problems, analysts said. But vendors are introducing answers for specific problems, ranging from front ends that address user interface problems to SMTP gateways that solve specific system problems.

Novell, Inc. introduced support for Unix mail with an SMTP module that integrates Unix mail with Novell's Message Handling Service (MHS) protocol. The module addresses one user complaint by supporting messages with attached data files.

WordPerfect Corp. said it plans to introduce an enhanced Unix gateway for WordPerfect Office near the second quarter. The gateway will allow Office users to exchange mail with SMTP users using an "alias," or shortened addressing scheme, the firm said.

Wingra Technologies in Madison, Wis., said it will ship next month a software E-mail switch designed for DEC VAXcluster installations. The switch will convert multiple mainframe, PC and Unix-based mail protocols and provide directory management across the gateways, the company said.

Uniplex Integration Systems, Inc. announced Uniplex Mail, a product that functions across mixed Unix machines, workstations and character and X terminals. It connects to DOS and other platforms through an SMTP-to-X.400 gateway. — *Lydia Radosevich*

Wireless networking

Exchange to save $200,000 annually

By Joanie M. Wexler
NEW YORK

Thanks to wireless networking, the Commodity Exchange, Inc. (ComEx) has expanded the number of goods it trades without adding staff and is saving about $200,000 a year in data entry clerk salaries, according to ComEx information systems officials.

Handheld, touch-screen computers communicating commodity price changes over a spread-spectrum local-area network are eliminating a couple of costly time-consuming steps in the reporting process, said Arthur Markowitz, senior vice president of operations and systems.

The abbreviated procedure also gives CRT-watching customers faster market information as they buy and sell gold, silver, other metals and European options, he said. Changed prices are now reported in one or two seconds, down from

Exchange, *page 46*

Arthur Markowitz *says wireless networking will free up staffers*

Exchange saves

CONTINUED FROM PAGE 45

three to five seconds, Markowitz said.

In addition, the exchange is in the prototype stage of testing an infrared-based wireless brokerage network of terminals custom-made by Texas Instruments, Inc. in Dallas for the quicker execution of trades, Markowitz said. He said he expects the evaluation of that network to last four to five months.

"These new wireless technologies should let us use our staff in many more markets without hiring additional people," explained Jack Sabo, vice president of application systems. "We've already expanded the number of commodities we trade to include palladium and platinum without increasing our staff."

The exchange recently equipped 16 trading floor staffers, called price reporters, with handheld devices from Granite Communications, Inc. in Amherst, N.H.

The 19-oz. device — called the Videopad VP5 — communicates via radio waves at 122K bit/sec. to a ceiling-mounted antenna, which passes data to a wired PC server at 56K bit/sec., Sabo said.

He said he expects the number of Granite devices to jump to nearly 50 within the next six to 12 months.

The initial investment in Granite hardware and communications network was about $15,000, Markowitz said. In addition, the exchange developed the software system in-house in three months for about $35,000, he added.

When a buy or sell results in a change in price for that commodity, the Commodities Future Trading Commission requires the exchange to broadcast the price to the market on a "timely" basis, Markowitz explained.

Previously, price reporters would listen for a price change and use hand signals to alert a trading floor supervisor, who would call the price change through a headset to a data entry operator off the trading floor.

The operator would then enter the price into ComEx's price reporting system — a fault-tolerant IBM System/88 — that would transfer the information across a high-speed ticker network to wall boards, CRTs and securities quote services such as Reuters Holdings PLC and Quotron Systems, Inc.

Now, the wired PC server communicates directly with the System/88 across an X.25 link.

Besides being faster, "this frees trading floor supervisors from being involved in price reporting so they can focus on ensuring orderly trades," Markowitz said.

Extensive search

Markowitz noted that ComEx had been looking into handheld computers since 1988 to record executed trades. "We've dealt with every handheld company known to man," he said, "but their devices were all too heavy." Many also had battery life limitations or lacked an accompanying LAN, he said.

"There are very few firms with multiterminal wireless communications," Markowitz said.

With the Granite network already paying dividends, Markowitz said, ComEx is immersed in the TI network project. The 21-oz. terminals allow all three input methods: touch screen, keyboard and stylus.

The terminals automatically time-stamp a transaction and pass data directly to ComEx's IBM 9121-190 trade processing system.

Currently, brokers write out trades on a card, which they give to a data entry clerk, who enters the information into the 9121 from a direct-attached terminal. The exchange is leaning toward an infrared network, Markowitz said, largely for security reasons: Because of infrared's line-of-sight limitation, trades cannot be conducted outside of the trading pit.

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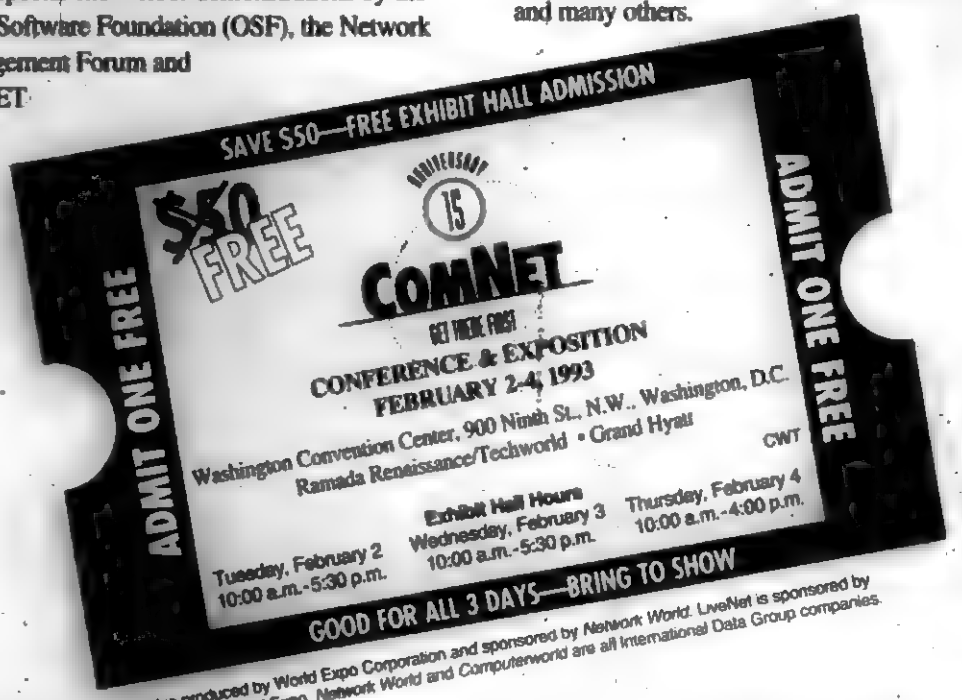

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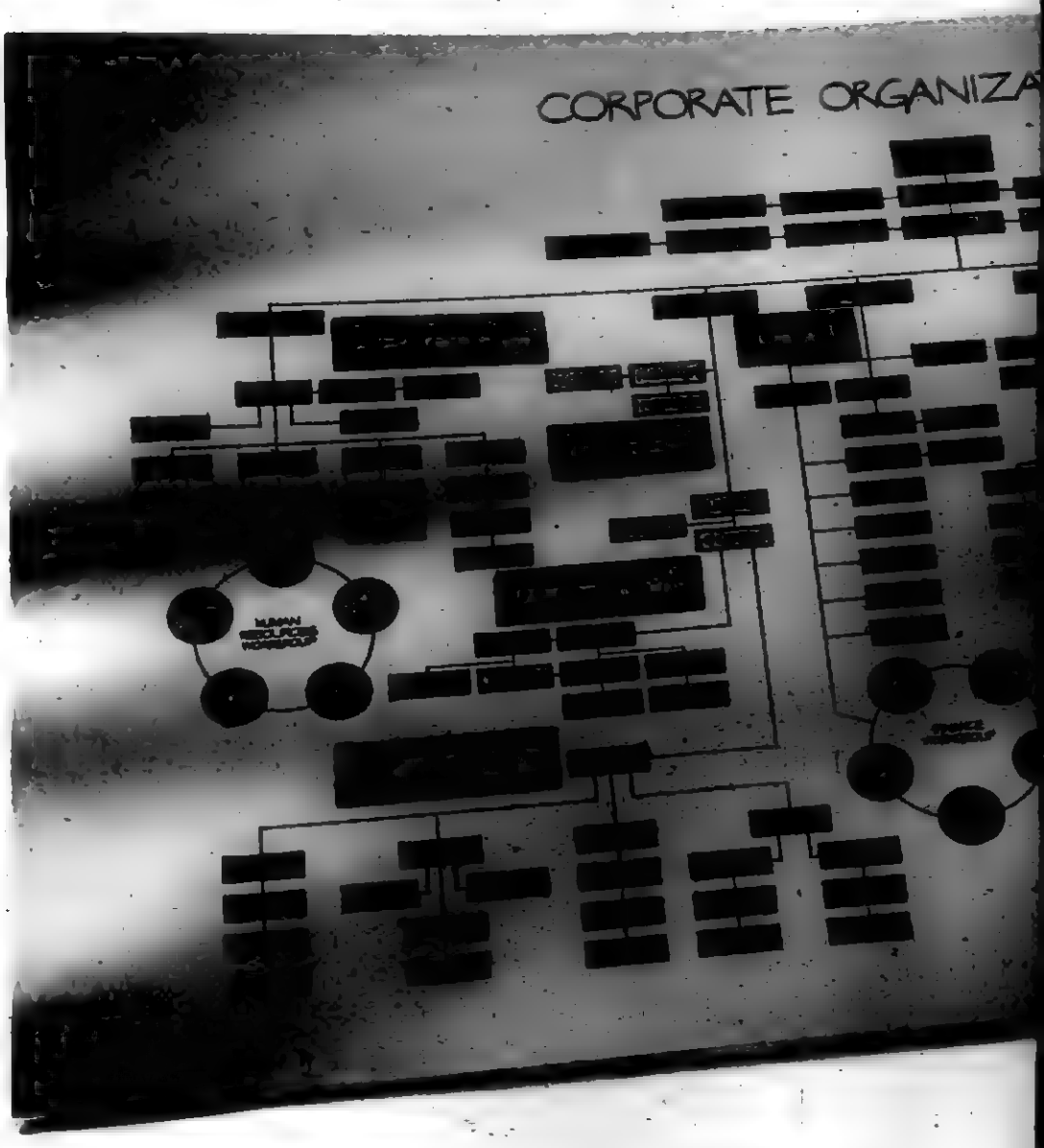

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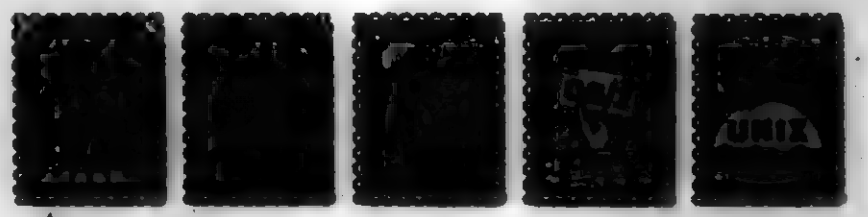

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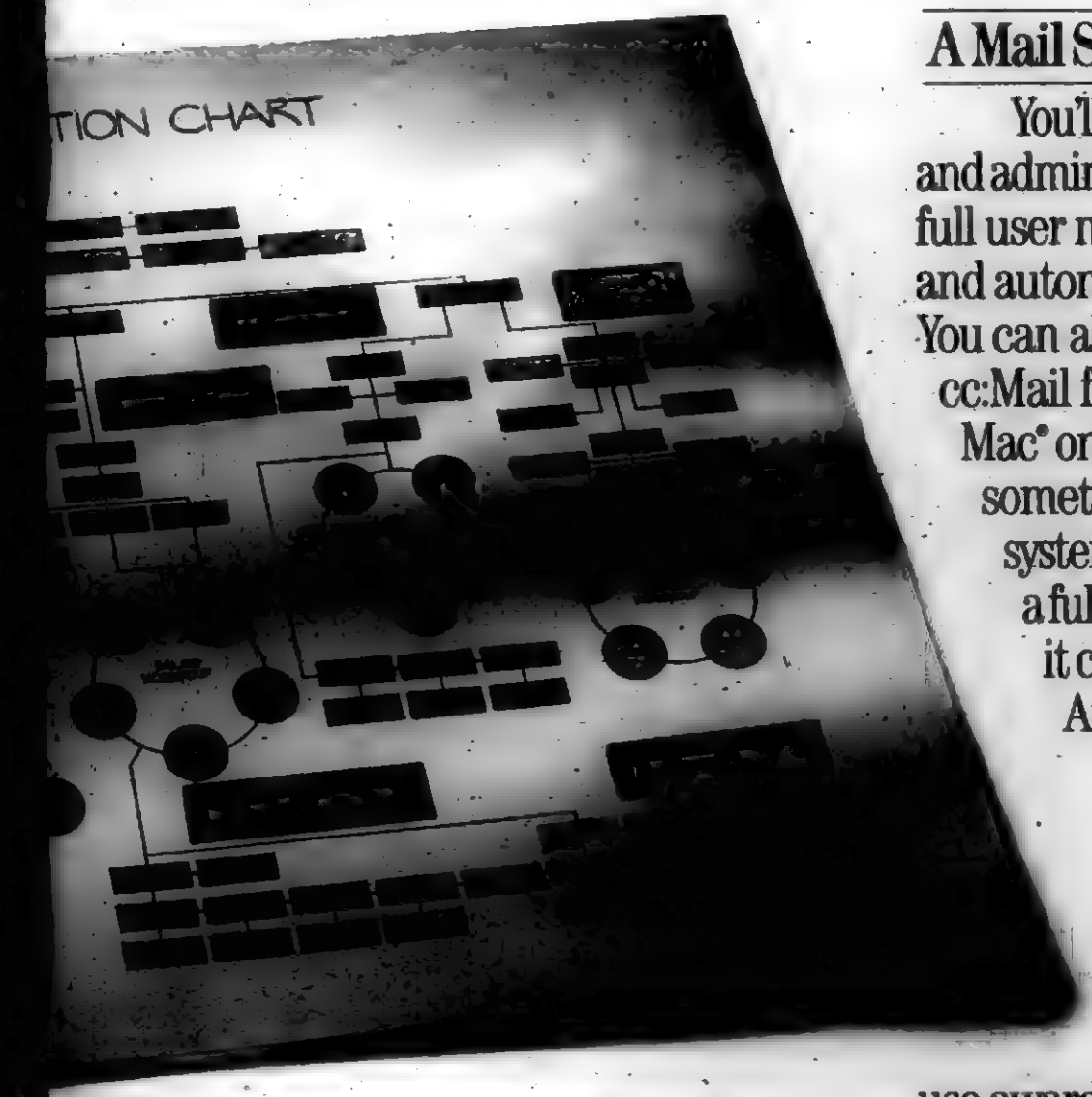

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Net management set for burst of growth

By Elisabeth Horwitt
MOUNTAIN VIEW, CALIF.

Having spent the last few years implementing enterprisewide, multivendor LAN-to-WAN backbones, companies are now looking for ways to ensure that their information lifeblood flows reliably and cost-effectively over these links.

As a result, the network management market is expected to enjoy a hefty 25% compound annual growth rate during the next five years, according to a recently released report from Market Intelligence.

Network management software, services, systems and hubbing will quadruple from $3.9 billion in 1992 to $15.8 billion by 1998.

Outsourcing is by far the fastest growing market segment.

Because many companies' installations are a combination of local- and wide-area networks and different vendors' products and services, they will tend to farm out different aspects of their network management needs to more than one vendor, rather than do one-source shopping, according to Market Intelligence.

Users will also demand shorter and more flexible outsourcing arrangements.

In addition, users will weigh reliability over price in their purchase of network management systems, Market Intelligence said.

Another fertile growth area will be artificial intelligence-based products that enable less technical users to operate network management systems.

The network management market's growth will start decelerating toward the end of the decade with the widespread implementation of network management standards, according to the report.

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28

Micro-to-host

Network Software Associates, Inc. has announced five new software products.

Elite/400 for Windows emulates IBM's 5250 line of terminals and printers, giving PCs access to IBM Application System/400 applications and databases. AS/400 and multiple sessions are supported, and the software builds on the capabilities of IBM's PCS/400 software facility, the company reported.

For users who do not need PCS/400 features, there is the Elite/400DSP for Windows. And the Elite/400 LAN Gateway permits multiple PCs to share a single link to AS/400 client/server applications.

The HLLAPI Toolkit for Windows is an optional software development package that uses IBM's High-Level Language Application Programming Interface and Microsoft Corp.'s Visual Basic to create Windows interfaces to AS/400 applications. The APPC Toolkit for Windows is a similar development package that works with IBM's Advanced Program-to-Program Communications API for Windows.

Prices start at $295.

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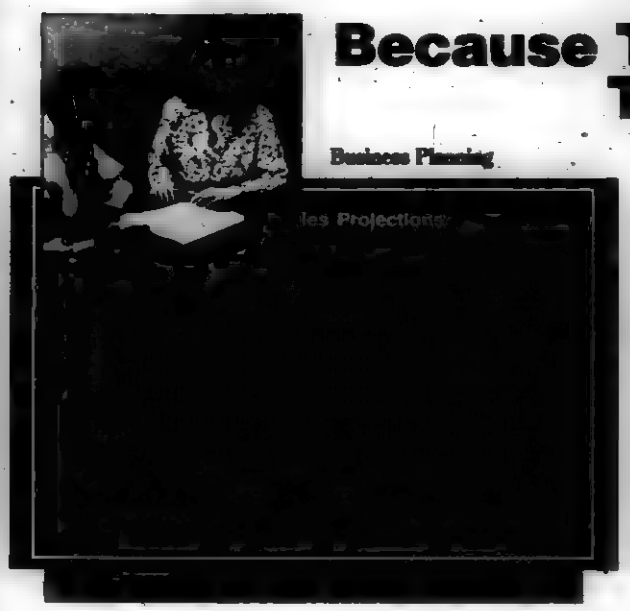

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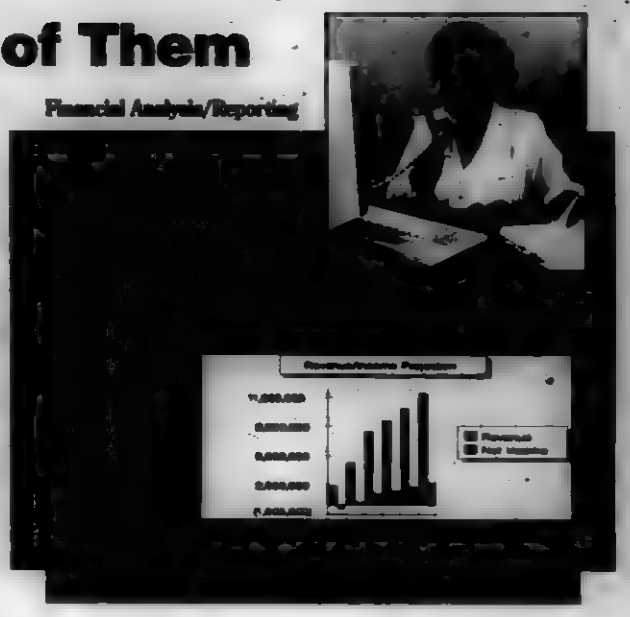

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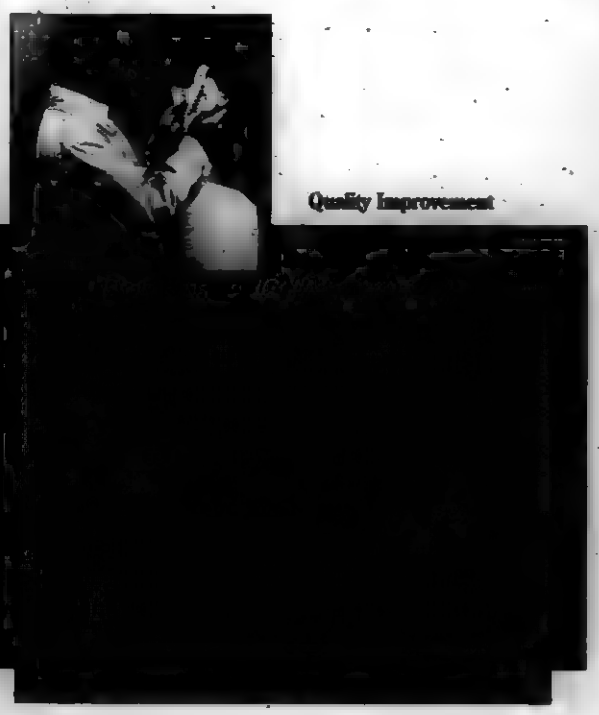

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Database performance

Helene Curtis pushes DB2 envelope

By Jean S. Bozman
CHICAGO

Quality code and high levels of database performance are design targets at Helene Curtis, Inc., as the personal care products firm puts IBM's DB2 through its paces.

Lately, database designers at the firm have been trying to squeeze out better mainframe performance by stress-testing SQL statements even as they are being written.

While DB2 is widely used, most of the estimated 7,000 sites monitor the cost of lengthy queries against large DB2 databases that run to millions of rows. Users must find ways to submit efficient query "plans" for execution by the DB2 database system or pay the costs of slowed response time.

At Helene Curtis, response time is a key consideration. One new pricing application will allow product-line managers to access DB2 directly through IBM 3270 terminal emulation. Response time is made even more critical by the fact that the 3,100-person, $1.02 billion firm wants to stay lean and mean in its competitive battles against large rivals: $29 billion Procter & Gamble Co., the Lever Brothers subsidiary of $40 billion Unilever Group and $7 billion Colgate-Palmolive Co.

ON SITE

Helene Curtis
Chicago

Challenge: To improve performance of IBM DB2-based databases.

Strategy: Identify demands on system resources at the application development stage.

Results: More accurate and efficient code.

Accordingly, Helene Curtis' DB2 application development process is intended to disclose hidden costs caused by improper use of system resources by database queries. Last year, database designers in the company's Business Information Services group began pairing Candle Corp.'s DB/Explain product for SQL analysis with Candle's Omegamon II for DB2 performance monitor.

The result, said database administrator Cindy Emig, has been more accurate code that uses DB2 more efficiently. Developers can identify performance problems before a new DB2 application ever runs on an IBM-compatible mainframe. "We can capture the DB2 transactions, break them down and take a look at how the system is performing over time," Emig said. She noted that the company plans to link the Candle tools directly in 1993.

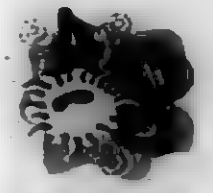
Price test

Bill Kellow, a senior technical specialist, is leading an information systems team in testing a companywide pricing application. The mission-critical application, which has been in development for a year, will be tested against a working model of the production DB2 database.

When the application goes online this spring, it will invoke many thousands of database transactions per day. Sometime this month, end users will try out the application to make sure it meets Helene Curtis' business requirements.

"The pricing strategy is being changed to provide greater flexibility for our merchandisers and

Helene Curtis, *page 54*



Eye on SQL
Helene Curtis is using Candle's DB/Explain utility to highlight inefficient DB2 database queries. DB/Explain suggests modified SQL statements for better response times. Candle's Omegamon II for DB2 performance monitor identifies problem SQL statements and passes them to DB/Explain for further analysis. An enhanced DB/Explain package is priced from $24,000 to $42,000. Candle's enhanced Omegamon II for DB2, also shipped in December, is priced from $37,000 to $65,000.

Chase approves MetroLAN

By Thomas Hoffman
NEW YORK

If all goes according to plan, the 1 million customers of The Chase Manhattan Bank NA will be able to walk into any branch and know that they will receive the same services available at other branches. That is the goal of an estimated $85 million multiyear project under which the bank will develop a common computing environment for its 350 retail branches in New York, Connecticut and Maryland.

The lead contractor on the project — dubbed "MetroLAN" — will be Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing unit [CW, Oct. 26]. The four-year deal supersedes an existing five-year pact between Chase and ISSC for Chase's Connecticut subsidiary. Roughly $70 million of the estimated $85 million MetroLAN funding will reportedly go to ISSC.

The project was designed to provide Chase's regional branches with a common computing architecture so that customers can receive identical services regardless

MetroLAN, *page 54*

Cincom wins defense contract

By Gary H. Anthes
WASHINGTON, D.C.

■ Software vendor Cincom Systems, Inc. in Cincinnati won a five-year, $10 million contract from the Defense Information Systems Agency (DISA) and the Defense Commercial Communications Office to provide relational database management system (RDBMS) and software development products.

Although use of the Cincom products will not be mandatory at U.S. Department of Defense agencies, the DISA contract puts the Cincom products in a "preferred" position, according to Rex Porter, director of Cincom's government systems group.

As part of the Pentagon's Corporate Information Management program, DISA was recently given centralized responsibility for many information systems purchases previously handled by the individual military services.

However, a Defense Department contracting official said the acquisition in question began in 1988 — long before DISA was given the expanded role — and the selection of the Cincom products did not signal an intent to make them the Pentagon's technologies of choice. "Of course, that doesn't keep Cincom from hoping," the official said.

Code serves various platforms

One of the key products involved, Cincom's Supra Server RDBMS, runs on most major platforms such as mainframes running IBM MVS, VM and VSE; Unix- and Digital Equipment Corp. VMS-based midrange computers and servers; and PCs running OS/2 and DOS. Portability and compatibility are ensured because the Supra Server code is almost identical regardless of where it runs, Porter said.

AD/Advantage, Cincom's application development environment, comprises computer-aided software engineering tools that generate and maintain design specifications, SQL statements and other components. It includes Mantis, a fourth-generation language geared for interactive transaction-processing applications.

Views in print

For all the talk about low-end printers, high-speed devices still show growth

Average number of printers installed per site

Speed range (ppm)	1991	1992
1-24	68.1	169.9
25-49	9.7	8.8
50-135	5.7	6.5
136+	5.3	3.8
Respondent base	314	254

On whether the spread of desktop publishing makes it hard to control a company's public image:

Percent of respondents (base)	Agree	Disagree
Service bureaus (30)	43%	57%
User companies (185)	73%	27%

The majority of Xplor members agree that technology is strategic and should not be purchased blindly

Percent of respondents (base)	Agree	Disagree
Would like to provide information-processing solutions close to the user (237)	90%	10%
Information technology is a strategic tool (246)	90%	10%
We attempt to be on the forefront of information technology (253)	81%	19%
We consider equipment after it's been on the market awhile (252)	77%	23%
Printing technology is a strategic tool (247)	76%	24%

On whether document policies should cover office laser printers as well as centralized printers:

Percent of respondents (base)	Agree	Disagree
Service bureaus (30)	36%	64%
User companies (185)	53%	47%

Source: Xplor International — CW Chart: Michael Siggins

Due to a printing error *in the Jan. 11 issue, the above chart is being reprinted.*

Chase approves MetroLAN

CONTINUED FROM PAGE 53

of location, according to Michael A. Levine, a Chase vice president.

Chase's regional branches had been architected and run as "separate entities" prior to the MetroLAN project. "Now, we're looking at seamless integration for our own personnel and for our customers," said Philip M. Giaquinto, senior vice president of retail bank operations and systems.

Giaquinto declined to provide cost-savings estimates, but he said the bank should realize "significant savings in back-office operations and technical efficiencies."

Layoffs possible

Giaquinto would not comment directly on likely staff reductions resulting from the project. "But clearly, if you're going from a multiple-systems infrastructure to support those branches as they exist today to a single integrated multibank, multigeography system, you should be able to save on back-office [costs]," Giaquinto added.

Under the agreement, ISSC will provide Chase with up to 4,000 IBM Personal System/2 PCs and workstations, IBM's OS/2 2.0 local-area network environment and Hogan Systems, Inc.'s Integrated Banking Applications software. ISSC will provide roughly 250 technicians to assist the same number of Chase technicians in replacing existing software with the Hogan package.

Sources said ISSC had bid to manage the MetroLAN project, but Chase decided against farming out these operations. "We've outsourced back-office systems in Arizona and in Connecticut, but we tend to rely on outsourcing only when it meets a specific need," Giaquinto said.

During the past year, Chase has rolled out MetroLAN in a pilot program to 30 regional branches in downstate New York. To launch MetroLAN, Chase is eyeing 10 branches in Long Island, Brooklyn, the Bronx and Westchester County in which to install the common computing platform.

In fact, Giaquinto said Chase converted the first portfolio of consumer loans to the Hogan package before the ink on the ISSC contract had dried.

Helene Curtis

CONTINUED FROM PAGE 53

our product-line managers," Kellow said.

A team of four, which includes specialists in IBM's CICS transaction monitor, the DB2 database and application development, is testing the efficiency of each line of DB2 query code. "We have been looking at every SQL statement," Kellow said. That kind of "SQL walk-through" statement-by-statement review is new to Helene Curtis, he said. Queries that make improper use of DB2's built-in optimizer are being rewritten, he said. The evaluation will also review the new program's impact on existing applications.

Extensive up-front analysis has probably extended the time required to develop the new pricing application, Kellow acknowledged. But he said the results are expected to be worthwhile: "Our objective is to have code that's a lot cleaner when it goes into testing."

Teresa Miao, another database administrator, said the new development approach is finding performance hang-ups early on. When design targets for performance are not met, default settings cause green numbers on a display console to turn yellow or red. "You can play 'what-if' games," Miao said. "The monitor shows you how the DB2 optimizer selects the access path based on a [particular] SQL statement, and it shows you when the response time is very good."

Helene Curtis has been using DB2 databases for nearly five years to store order entry information. It now has seven DB2 development environments and several DB2 Version 2.3 production databases. All new applications are being written for DB2 rather than for older, hierarchical IBM databases such as IMS, Emig said.

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[redacted]

System software

TGV, Inc. has introduced MultiNet Services for NetWare Users.

The software product was designed to permit Novell, Inc. NetWare users to access software and hardware resources on Digital Equipment Corp.'s VAX and Alpha AXP hardware systems, specifically OpenVMS file and print services, the company reported. MultiNet Services for NetWare Users does not require use of Transmission Control Protocol/Internet Protocol or other alternate protocols because it runs over the SPX/IPX stack. Additional software is not needed for NetWare users to gain access to OpenVMS resources because all software is occupied on the OpenVMS server. A shareable library is also included.

Pricing begins at $1,000.

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Software application packages

FileTek, Inc. has released Alternative to Microfiche/Microfilm On-line (AMMO-II), a mainframe software package.

Without any application development or file modification, the product enables FileTek's optical disc-based Storage Machine (SM/2) to be used immediately for microfiche replacement. According to the company, AMMO-II is a menu-driven system that manages the indexing, printing, viewing and transferring of report data on both the SM/2 and the host direct-access storage devices.

Pricing for AMMO-II ranges from $40,000 to $60,000.

➤*FileTek*
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WorksRight Software, Inc. has introduced Project Manager, a software system designed for IBM's Application System/400 and System 36.

Users can create simple project schedules with Project Manager. A name and description are established, and an action description is formed, graphically displaying the information, the company reported. The number of projects that can be scheduled is unlimited, and project schedules can be displayed on the screen or printed.

Project Manager costs $99.

➤*WorksRight Software*
986 Madison Ave.
Madison, Miss. 39110
(601) 856-8337

BlueLine Software, Inc. has introduced Vital Signs for VM/ESA.

The product is an analytical tool and VM performance monitor that was designed to help users manage user and system productivity, the company reported.

Support is provided for both VM/XA and VM/ESA environments. SeekMiser, a component created to optimize direct-access storage device (DASD) access and performance, has been included in the product. Seek activity for VM and VSE files is collected and reported by SeekMiser, which also identifies underutilized DASD space.

A permanent license ranges from $360 to $540 per month.

➤*BlueLine Software*
Suite 690
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Minneapolis, Minn. 55416
(612) 542-1072

Turnkey systems

Kinetic Systems Corp. has introduced Captureplus Data Acquisition System.

According to the company, the product is a complete, flexible package designed to capture and analyze transient events. Captureplus is a turnkey solution that is modular and expandable. For easy configuration, windows and icons are provided. Captureplus features include a nonprogramming environment, 12- or 16-bit resolution, Digital Equipment Corp. VAX/VMS compatibility and high data throughput.

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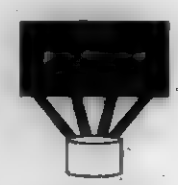

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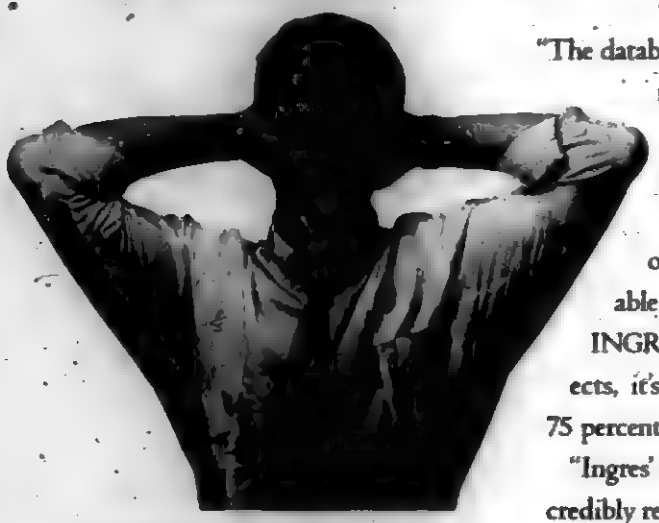

Anders Nicolausson, National Systems Manager, Construction Market Data, Inc., 250 employees in 15 U.S. offices

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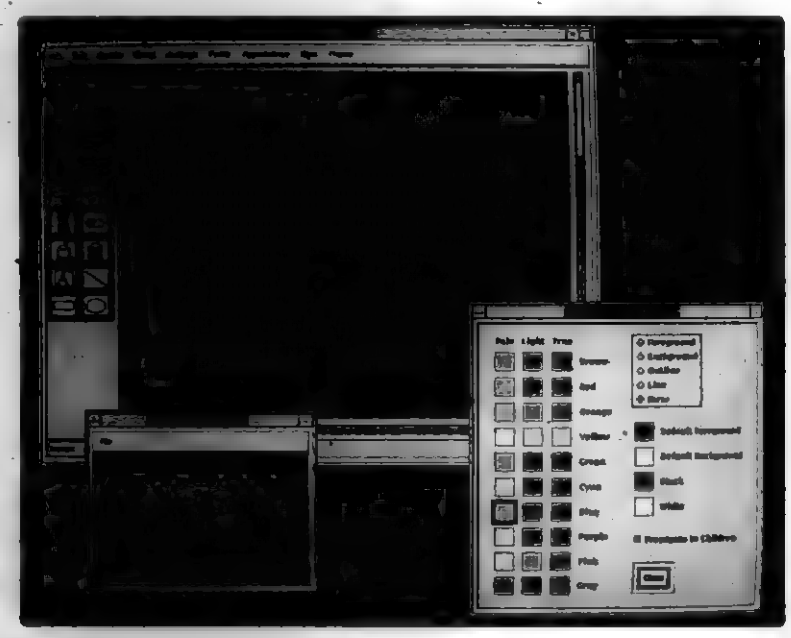

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Application Development

NEW PRODUCTS, 61

User Voices

The hunt for good tools

Question: Do you believe that vendors have delivered the development tools needed for distributed computing and downsizing?

■ **Dave Tovrea,** *information systems technical consultant at Snohomish County Public Utility District No. 1 in Everett, Wash.*

As the programming environment becomes more sophisticated, there's a technological lag. Vendors who have only been doing incremental upgrades over the years have been caught by improvements in hardware technology. Things that were impossible to run five or six years ago can now be run easily. Even companies like Microsoft have been writing two separate applications.

What you're really looking at is the difference in the way that vendors have been looking at the programming problems: There are vendors that have been trying to work with current hardware, and those that are dealing one level up with application development environments. Those latter vendors will come out a bit better.

We have Macintoshes, Intergraph workstations and PCs, and we wanted a single programming environment for them all. At the same time, we made a conscious decision not to become a C shop, and we were not happy with Cobol. We did a pilot, and we were shooting for portability. We chose Smalltalk.

The biggest problem is: How do you distribute and synchronize software releases in a client/server environment? How do you get them out there? Unless you get into local file servers, distribution becomes fairly difficult. We're trying to work with some Digital products for repository and code management, but they're not oriented toward distribution issues.

■ **Larry Cousino,** *director of MIS at Justin Boot Co. in Fort Worth, Texas.*

It's getting better. Certain areas are still slow, such as distributing data among mainframes, LANs and WANs. But we're beginning to see the light at the end of the tunnel.

I look at it from the standpoint of what is the application: who's going to be impacted by it and if it's in the interest of the overall company. If there are multiple users at multiple locations, it's easier to use the mainframe. The decision is based on the overall scope of the application and how to get the best bang for the buck.

There are some fine tools out there, and there is good software that is working well in client/server applications. Oracle is getting there. We're using CASE tools on the PC. Some of the mainframe tools are a little bit expensive.

■ **Bob Gordon,** *project specialist at Coca-Cola Enterprises, Inc. in Atlanta.*

Developers are in danger of picking something that looks easier today but that presents problems down the road. The other alternative is to use advanced tools that don't pay off for at least a year.

So it's all economics. The vendors are doing nothing unless they're pushed into it. That's why people aren't moving fast. They have the mainframe security blanket. Vendors are trying to deliver, but they're not sure what's needed. You can't blame the availability of tools on the vendors.

The biggest thing is to educate the existing work force in using new tools. There's a considerable learning curve. It takes three or four months to evaluate what you need, then an education cycle of three to four months and then a learning curve. So it takes at least a year to deliver good client/server applications.

The problem is that there are so many tools, and people evaluating them have no experience using them. They're trying to evaluate tools based on what they see in a demo, and they don't know for six months if they'll work.

Third-party libraries are getting better and better. Windows Software Development Kit replacement tools have just started to firm up. Even so, it takes a dedicated effort to use these tools.

■ **Chris Veale,** *director of technology for the high-tech practice group at Ernst & Young in San Jose, Calif.*

The problem is that all are promising things which, in fact, don't turn out to be true. They should quit fighting each other and do a serious job of getting together on well-defined standards. Even the vaunted SQL is not a standard if you look at it, and if you go further down the list, there are no standards.

The unfortunate thing about application development standards is that no one from the user community is in any of the standards groups. It's developers, vendors and academia. The vendors want their own standards, and the academics are so far out in the ozone they couldn't see the business reality if it hit them in the face.

There are some tools available, but most tend to be Macintosh and Windows, Windows and Unix, or Macintosh and Unix, or some combination that never covers enough. There's no uniform solution to cover the multitude of environments. If you want to develop for Mac and PCs, there are solutions, but if your task includes downsizing mainframe applications to client/server PC environments, the elegant Macintosh and PC solution may not cover the database piece of it.

Responses compiled by senior editor Garry Ray. Comments have been edited slightly for clarity.

IntelliCorp turns to object-oriented mart

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

IntelliCorp executives said they weathered a long "winter" that plagued many artificial intelligence firms in the late 1980s and are ready to bask in the sun of the hot object-oriented tools market. But the $12 million firm may yet catch a chill, industry analysts said, because it must prove it can be profitable on an ongoing basis.

Objects are the key to IntelliCorp's expansion, even though the Pro Kappa design tool retains a built-in AI inference engine. "They're positioned right by addressing some of the fast-growing market segments, like downsizing, with object-oriented tools," said Steve McClure, a senior consultant for object technology at International Data Corp. in Framingham, Mass. "Now they've got to get some profits."

Recent financial problems have made even loyal IntelliCorp users a bit uneasy. IntelliCorp was very nearly purchased by KnowledgeWare, Inc., until a planned stock swap fell through in late 1991. In October, President K. C. Branscomb left, and Chief Financial Officer Kenneth Haas took her place. Then the firm laid off 20 staff members, leaving a work force of 100.

Meanwhile, stockholders saw little return on their investment. "We're running on sales and on cash," company spokesman Jim Sterne said recently. "We still have $5 million in the bank and no debt."

Intellicorp's low-profile days may be over. Haas said he will forge partnerships with large firms, including relational database companies and systems integrators. "I'm a pragmatist when it comes to business," Haas said. "Get the revenues up, the costs down, and conserve cash." A new relationship with computer-aided software engineering (CASE) firm James Martin & Co. will yield an object-oriented upper-CASE tool called Object Management Workbench (OMW) this year, Haas said (see box).

Some industry analysts are high on IntelliCorp's technology, even if they think the company may change through merger or acquisition. "We're going to list them as one of the companies to watch in

IntelliCorp, *page 60*

New products

IntelliCorp plans three product announcements in the coming months:

In mid-1993, it will announce Kappa 3.0, an enhanced version of Pro Kappa 2.1. Kappa 3.0 will transform Unix code into PC-DOS-compatible code for desktop use.

Sometime in the first quarter, the firm plans to ship the new Kappa CommManager module, a distributed object manager that will spread applications to Unix or PC platforms in Transmission Control Protocol/Internet Protocol networks.

An object-oriented CASE tools also expected in 1993. The new Object Management Workbench was developed in conjunction with James Martin & Co.

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*Comparisons based on switched services of leading national carriers. **Data Communications Magazine User Survey—Private Line Services, August 1992.

In Brief

Landmark purchase

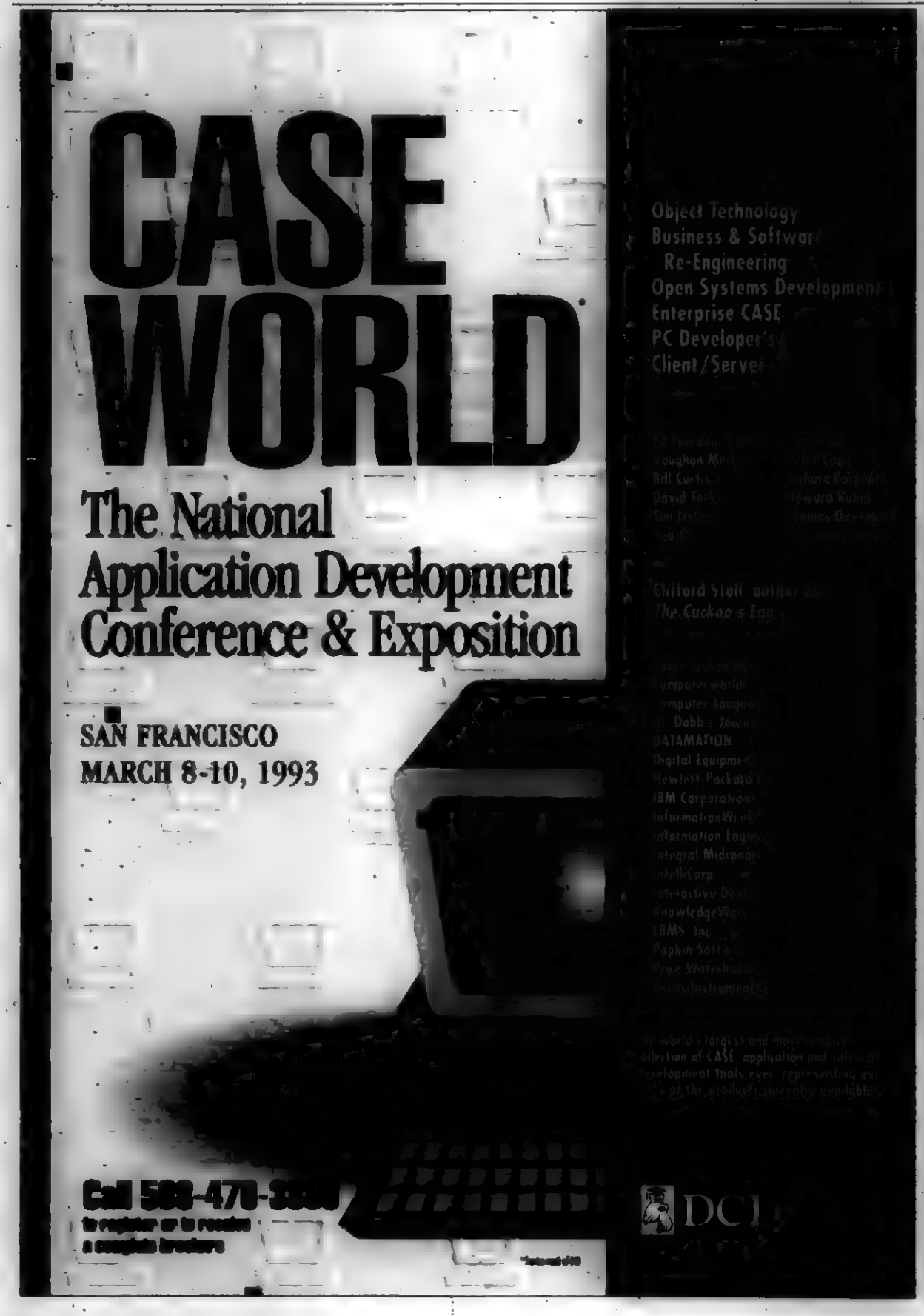
Template Graphics Software, Inc., a San Diego vendor of graphics software development tools based on the Programmer's Hierarchical Interactive Graphics System, has been sold to **Landmark Ventures, Inc.**, an investment group in Simsbury, Conn. Template was formerly owned by **Liant Software**.

4GLs waiting on DEC

Cognos, Inc. and **Information Builders, Inc.** have announced ports of their respective fourth-generation language (4GL) software to **Digital Equipment Corp.**'s Alpha AXP systems. Cognos' PowerHouse 4GL is available for the Alpha AXP OpenVMS platform and will ship with the Alpha AXP systems. Information Builders' Focus for Alpha AXP/OpenVMS was slated for production in the first quarter of this year. Focus for Alpha AXP/OSF/1 is slated for release in the second quarter.

Tools launch Mac attack

American Express Co. subsidiary **IDS Financial Services** will assist in converting a series of knowledge-based development tools from **Inference Corp.** in El Segundo, Calif., to the Apple Computer, Inc. Macintosh. Besides porting Inference tools to the Macintosh, the agreement is expected to result in new tools.



Intellicorp turns to object-oriented

CONTINUED FROM PAGE 57

1993," said Adrian Bowles, director of the advanced software development group at New Science Associates, Inc. in Westport, Conn. "In the worst case, they'll get bought out by somebody else, but I think the technology will survive."

If products were IntelliCorp's only concern, its future would look even brighter, analysts said. At a time when many large companies face the task of re-engineering legacy applications, IntelliCorp's Pro Kappa 2.1 C-code generator can be used to link new code with old Cobol code.

"It allowed me to concentrate on knowledge engineering and not on the intricacies of the C language," said Bill Green, a project engineer at TRW Corp.'s Military Electronics and Avionics Department in Ogden, Utah. Green used Pro Kappa on a Sun Microsystems, Inc. workstation to build a network management system for the U.S. Air Force. "You don't worry about all the data structures, and you wind up writing simpler programs."

Cincinnati Bell Information Systems is also pleased with Pro Kappa's integration capability, even though users there would like to link Pro Kappa directly to object-oriented C++ class libraries. "We are moving gradually from an [IBM] MVS and Cobol environment to a Unix environment, and we need to have systems that are fully interoperable," said Doug Brueckner, vice president of new systems development. "We think object-oriented technology will buy us time to market and save us money."

But Brueckner, whose department has been building phone billing systems with Pro Kappa and Sun workstations, has had some concerns about IntelliCorp's recent layoffs: "We have a couple of hundred people working with this stuff," he said, "so we've wanted [IntelliCorp] to adhere to standards."

Now that they are on a new path, IntelliCorp executives are the first to admit that their old AI game plan did not work. Like its former AI competitors, AICorp. and Aion Corp. — which merged to form Trinzic Corp. — IntelliCorp found that AI products have a limited appeal. "Old AI didn't have the performance characteristics people wanted, and it couldn't integrate with existing systems," said Gary Fine, director of IntelliCorp product development.

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Application development tools

NCR Corp. has announced the Natural Interface for Computing Environments (NICE), a Microsoft Corp. Windows-based application development tool.

The product is a software development kit that works with Visual Basic and C languages running under Windows 3.1, the company reported. Mouse, pen input and touch screen can be used with NICE's applications. A library of custom controls is contained in NICE that includes keypads, multifunction buttons, graphic buttons and an edit box.

The product costs $295.

➤*NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Wind River Systems, Inc. has introduced VxSim, a prototyping and simulation tool.

The product was designed for users with embedded software programs. VxSim simulates the target environment on a Sun Microsystems, Inc. workstation when used in conjunction with VxWorks, the company's flagship product. Before hardware becomes available, users can create programs, produce shortened development cycles and allow the design phases for both hardware and software to occur simultaneously rather than consecutively, the company reported.

VxSim prices begin at $4,995 per user.

➤*Wind River Systems*
1010 Atlantic Ave.
Alameda, Calif. 94501
(510) 748-4100

MicroStrategy, Inc. has announced Version 2.0 of ElSToolKit.

According to the company, Version 2.0 can access more than 50 relational and nonrelational data sources and all major database gateways and create a library of SQL statements. Features include cross-platform support for Microsoft Corp. Windows and the Apple Computer, Inc. Macintosh; support for multiple local data sources; and a spreadsheet engine for signal processing and "what-if" modeling.

Prices start at $1,295.

➤*MicroStrategy*
1 Christina Center
Wilmington, Del. 19801
(302) 427-8800

AdInfinitum Development has introduced ObjX, a development support system for visual database applications.

An interactive, on-line data dictionary is joined with visualization tools within ObjX. According to the company, the product was designed to simplify four-dimensional database development, code-level documentation and maintenance. The hierarchy of procedures and variables that are called by any procedure, script or menu bar are revealed and calculated with ObjX's outliner.

ObjX costs $395.

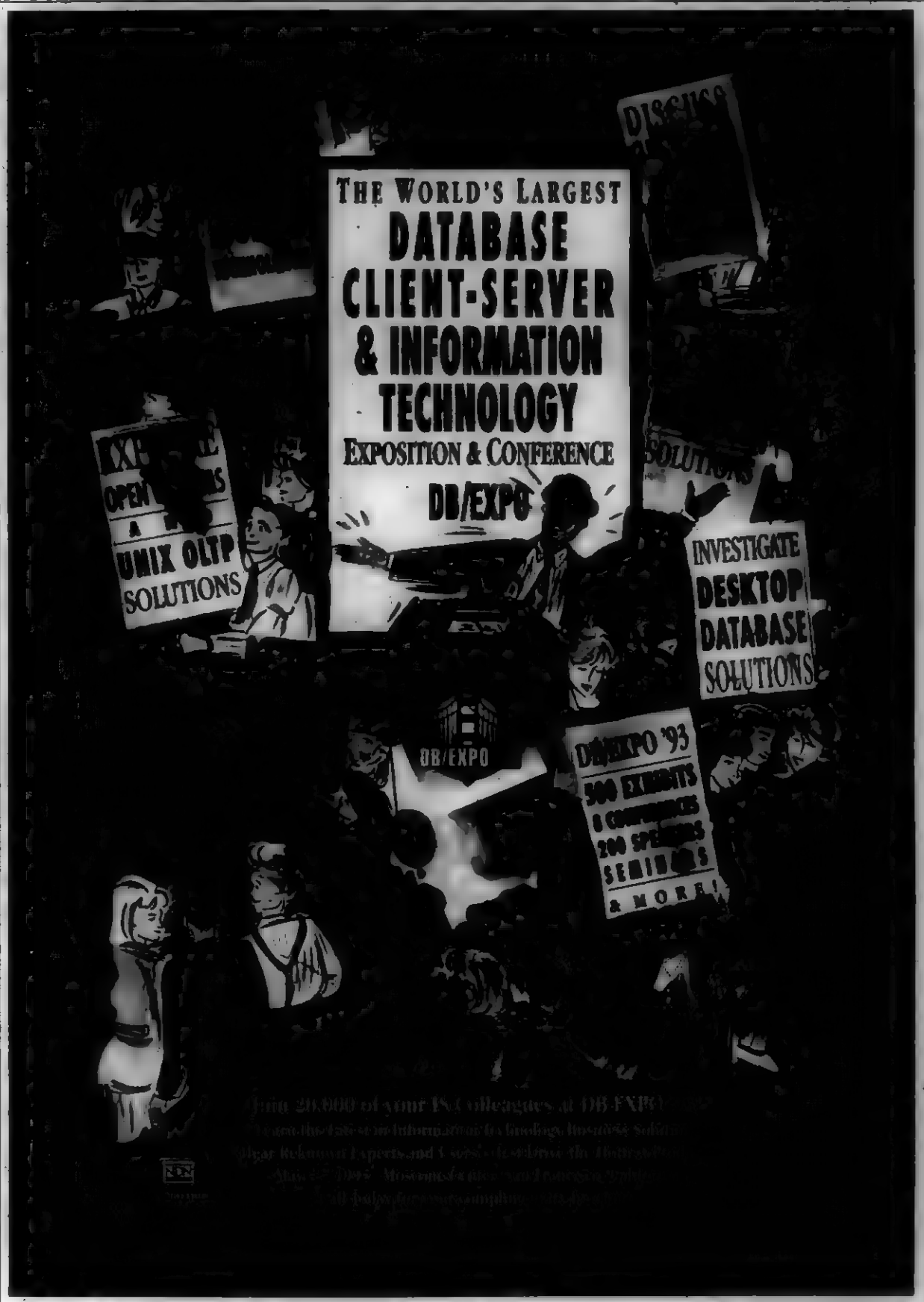
➤*AdInfinitum Development*
Suite 1R
412 7th Ave.
Brooklyn, N.Y. 11215
(718) 788-7092

Computer Innovations, Inc. has introduced Version 3.2 of Debug 2000, a C/C++ debugger.

According to the company, Debug 2000 provides users with a selection of windows that permit multiple views of the C or C++ program being debugged. As the program executes, the user's choice of windows is dynamically updated. Support for the hardware break points is provided as is full C++ support.

A single-user license costs $595.

➤*Computer Innovations*
980 Shrewsbury Ave.
Tinton Falls, N.J. 07724
(908) 542-5920



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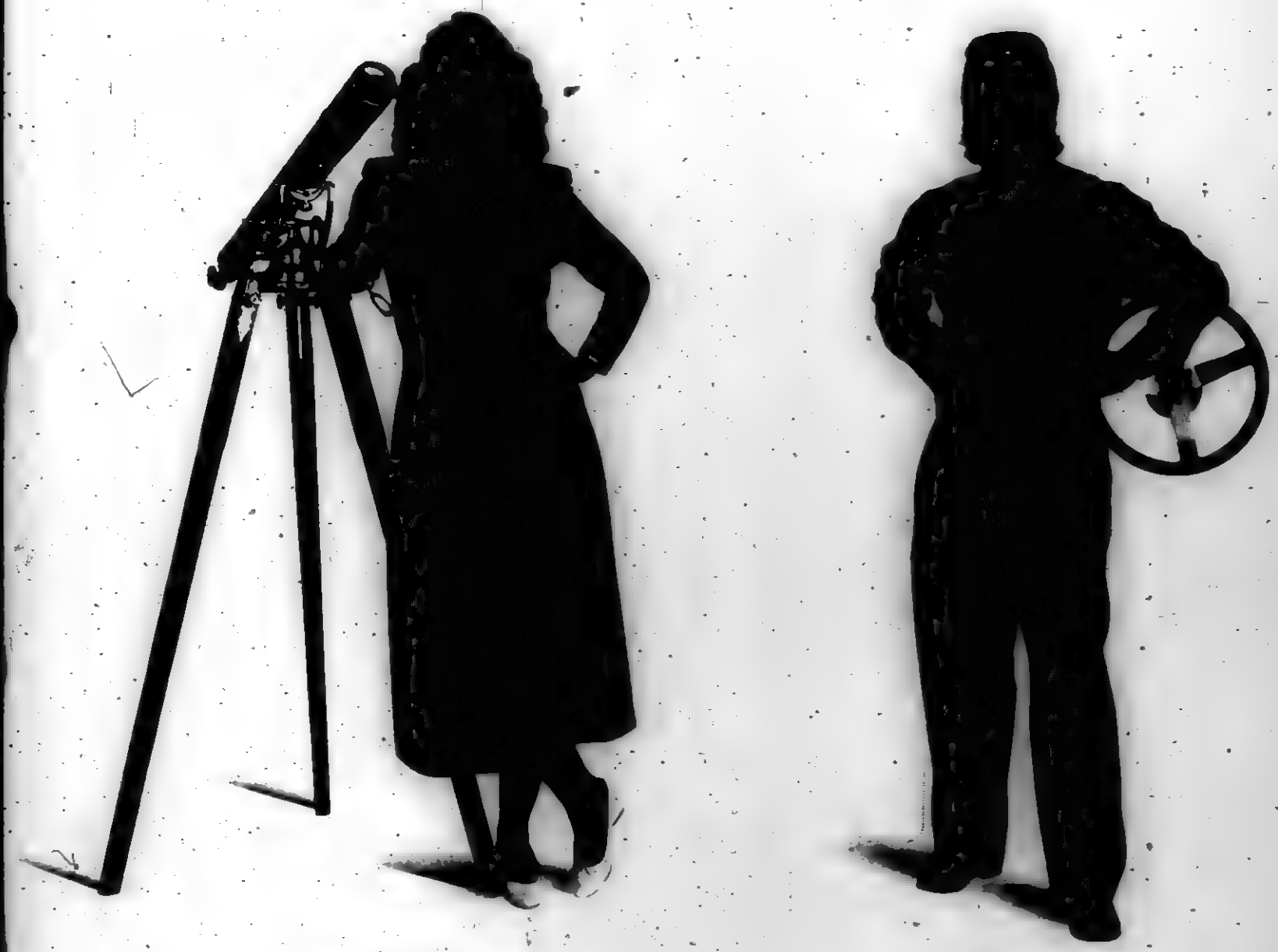

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Yikes! Setting up a GUI can cost 50 times its street price. Even so, IS managers swear the strategic boost is worth it.

Point, Click and *Pay*

Cajun's Don P. Babcock Jr.: *'We haven't needed to upgrade in one fell swoop.'*

By Michael Fitzgerald and Carol Hildebrand

Sure, it's a pretty face. And for many information systems managers, putting a graphical user interface (GUI) on re-engineered and revitalized systems is a hot priority. But would you get a face-lift without finding out the cost? What if you weren't sure you'd look much better when you got done?

Well, when it comes to Microsoft Corp.'s Windows and IBM's OS/2, many IS shops must hold the strategic benefits very high indeed: They are setting loose thousands and thousands of mice without counting the cost of care and feeding. And that tab can be a surprising chunk of change, according to IS managers and consultants.

"The hard costs [of installing GUIs] you can quantify, but the soft costs go all the way down to business goals," says John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. "They can just mutate into something huge."

A new study by the Microcomputer Managers Association (MMA) and IDG Research Services says training and support costs, on top of required hardware and software, push the average price of moving to a GUI to $3,960 *per unit*.

"When we got the survey back and looked at the averages, they blew us away," says George Roukas, director of systems at a Fortune 50 financial services company and author of the new MMA white paper on moving to GUIs. "The actual dollar cost was much, much more than we ever suspected."

Based on MMA/IDG figures, moving to Windows, for example, would cost almost 50 times the software's current $79 retail price. Even though many organizations don't pay full price, managers say the point is clear: What you get costs a lot more than what you see.

Of course, it's possible to get by more cheaply. A study conducted by WorkGroup Technologies in mid-1992 placed the per-unit cost of moving to Windows at about $1,425.

The study, however, presumes a configuration of 386SXs with 4M bytes of random-access memory and an IBM Video Graphics Array monitor. Dunkle also says he assumed very inexpensive training costs and did not allow for increased support.

Microsoft officials were wary of assigning an average cost to Windows migration, however. "The problem is, there's no general answer," says Jeff Phiel, a product manager in the Windows group. "It all depends on where you're coming from."

Phiel does acknowledge that training and support costs are likely to go up during initial phases of a migration.

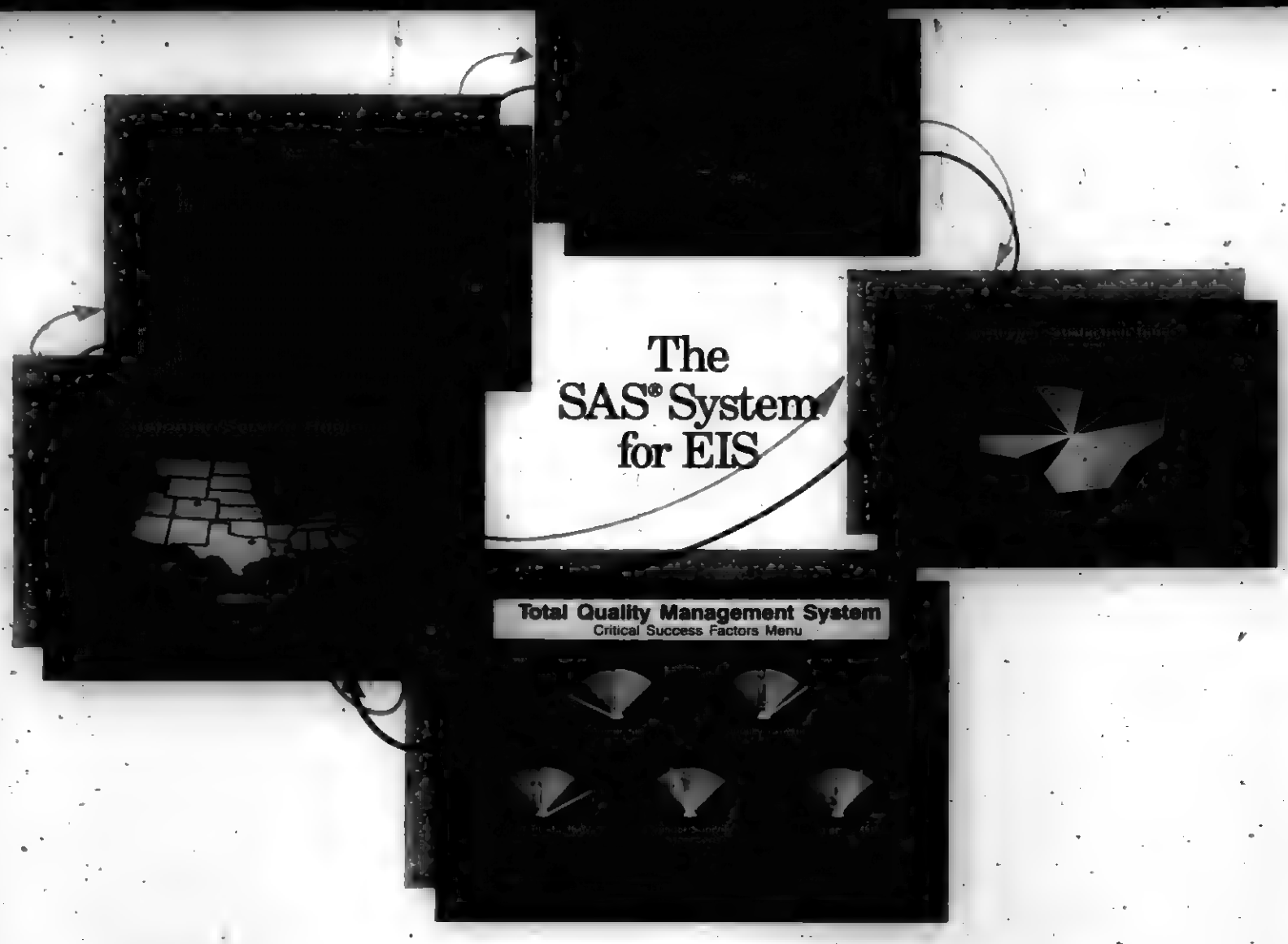
IBM could not be reached for comment.

Given the hefty costs of switching to a GUI, you'd think IS managers would want to be sure of some big payoffs. Not so.

More than 90% of nearly 400 IS managers responding to the MMA/IDG study say they have not measured the savings, if any, of moving to a GUI.

In fairness, Roukas says many believe the justification is

GUIs, *page 67*



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More than 370 IS managers cited the Top 5 issues that have a major impact on their decision to go GUI or not:

Percent of respondents (multiple responses allowed)	
Ease of use	69%
End-user training	61%
Complex upgrades	54%
Ability to tie Windows-based desktops into the enterprise	52%
Applications-specific training	44%

Hardware and training are pinpointed as the biggest money pits of a GUI migration:

Percent of respondents (multiple responses allowed)	
Hardware/ Hardware upgrades	64%
End-user training/ Retraining	45%
Software/ Software upgrades	38%
Support	28%
Lost productivity	5%
Initial setup/ Installation	4%
Other	3%

Those who have already made the move estimate the total cost per unit at almost $4,000

Average price per system	
Hardware	$1,102
Software	$835
Service/Support	$675
Networking hardware/ Networking software	$674
Training	$674
Total	$3,960

In the end, the move shakes out as strategic: More than half of the managers say it increases their staff productivity

Percent of respondents	
More productive	52%
Same degree of productivity	41%
Less productive	8%

Point, click

CONTINUED FROM PAGE 65

strategic, not economic. "Microsoft is seen as very strong, and this is the way Microsoft leads us," he says. Windows buyers "don't want to be the next generation of ICS Cobol users."

Bill Cornfield, president of Windows Support Group, Inc., a New York consultancy, agrees that Windows is often part of a larger business plan. As a result, many managers do not break out their cost as a separate item, he explains.

The bottom line is this: While many IS managers say they expect benefits from the migration, few count on being able to measure them directly. Instead, GUIs are viewed as a necessary front end to larger corporate initiatives.

At Consumers Gas Ltd. in Toronto, the move to Windows is part of a five-year reengineering plan, explains W. Don Brewer, director of information services.

While the whole project is estimated to yield a 20% return on investment, Brewer, a chartered account, acknowledges that "we've formally valued our gains in productivity [from moving to a GUI] at $0."

The reason?

"The ultimate benefits that will come from giving our people new capabilities will be greater than the hard dollar benefits I can demonstrate," Brewer says. "They may not be ones I can point at, but if I save two hours for a manager each day, it will show up over the years, as people will work much more effectively."

Like many, Brewer says GUIs will fly only if they are presented as part of an architecture decision that will yield hard dollar benefits.

How the numbers work

"How can that be?" you ask. How could a seemingly cheap package such as Windows cost thousands of dollars per unit to install and support? Here are figures based on the experiences of more than 400 high-level IS managers recently polled by the MMA and IDG Research:

Average cost per unit to install Windows: $3,690.

Retail price of Windows 3.1: $79. ($3,690 ÷ $79 = 46 × the original cost of the software.)

For a copy of the MMA paper, call Priscilla Tate at (212) 787-1122.

Why bother?

So if GUIs are expensive and hard to justify, why is IS so fond of them? Surely the lure must be more than just a pretty face?

Lower administrative and help costs are one payoff of standardizing on Windows, Dunkle offers. "But what you really want is the ability to do dynamic information sharing." Many organizations install Windows in place of 3270 terminals or PCs to work with on-line mainframe corporate data.

"I don't think GUIs necessarily make things work better," says Richard Campbell, chief of research and development at Federal Deposit Insurance Corp. in Arlington, Va. The agency is now approving OS/2 2.1. "In fact, I can argue that people spend more time making the stuff look better than actually producing it, so it's not the GUI we want. It's the multitasking," he says.

Productivity payoffs from users able to do several tasks at once will be worth it, Campbell says. Still, there are sticky cost issues.

Nearly half of the agency's 15,000 PCs are ancient IBM PC AT machines, and hard-pressed managers are eager to avoid new purchases. Even the few users Campbell expects will be able to justify OS/2 will probably continue to use their character-based applications to save money. So for now, the direct GUI benefits remain at arm's length.

At the Blue Cross/Blue Shield Association in Chicago, senior consultant Jonathan A. Handler says, "The most impor-

Quick. Think of a company with a much broader line of business UNIX computers than IBM.

tant application for GUIs in our plans is imaging under OS/2, Unix or Windows."

GUIs also show up in customer service, when "heavy demands on the performance and the responsiveness of our systems require multithreaded multitasking under OS/2 and Windows," he added.

Others are sure the sweet spots are there but find it hard to pin them down.

"It'd be tough to measure productivity increases, but . . . with Windows, things became a lot easier, and the intimidation factor went away," says Jerry Deal, an information technology specialist at Southern California Edison Corp. in Rosemead, Calif. "Users used to not care if their PC stopped working, but nowadays it's a tool that's as useful as a telephone."

Some organizations have decided that the costs and headaches of cutting over to a GUI simply aren't worth it.

At the American Cancer Society's data center in Austin, Texas, OS/2 is in heavy use on servers, but users run character-based applications because "the costs of moving to a GUI are prohibitive," says Jerald S. Noble, director of telecommunications and PC support at the ACS.

Platforms lite

Some IS managers, aware of how costly GUIs can become, are trying various tactics to keep costs down. Many are fitting the costs of a GUI migration into a natural upgrade path for hardware and software. Others are migrating piecemeal, which allows companies to cushion the costs of more expensive hardware and new software, as well as training costs.

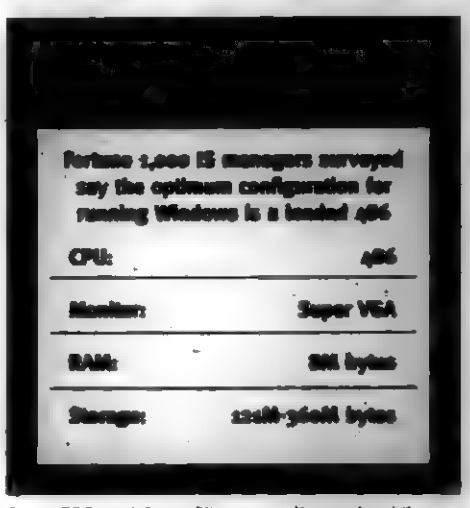
Some, including the Massachusetts Bay Transit Authority (MBTA) in Boston, keep hardware upgrades to a minimum.

"Windows turns a 386 into a 286," says Wayne Dunn, manager of end-user support at the MBTA. "It runs, but if I want optimal performance, my practical experience is I need 8 megs of RAM and a minimum of 120M bytes of disk space."

Dunn estimates it would cost about $700 per system to optimize his IBM Personal System/2s for Windows — about $300 for additional RAM and $400 or so to switch from a 60M-byte hard disk. He says the MBTA has no plans to make blanket upgrades of its desktops. "At some point we'll make a move to 32-bit applications, but I can do that on my own time and my own budget, not as part of a migration" to a GUI, he says.

Other companies are containing costs by being selective about who gets high-powered GUI platforms.

Michael J. Henderson, PC coordinator at James River Corp.'s research facility in Neenah, Wis., says the firm will give Windows and OS/2 to its 290 users this year but will roll out software "on a request basis as users come to us. We keep our hardware pretty much state of the art, so it's primarily software we're concerned about, as well as training and support," he says.



Source: IDG Research Services/Microcomputer Managers Association

Despite a move to OS/2, Cajun Electric Power Cooperative, Inc. in Baton Rouge, La., has not undergone widespread upgrades of old machines.

"We haven't needed to upgrade in one fell swoop because in an organization of our size, there are always people who don't need to do GUI applications," says Don P. Babcock Jr., manager of user services. He says a decision early on to buy 386-based systems let Cajun avoid the cost of upgrading numerous 286 machines or buying new PCs. When it needs to, Cajun upgrades 286s for $300 or $400. Babcock says the firm also continues to use DOS software under OS/2, only upgrading where necessary.

Despite the headaches, big adopters say they believe the payoffs outweigh the headaches. "There are a lot of strategic reasons to move to Windows," says Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. The San Francisco utility believes GUIs make applications easier to use and thus decrease the need for training in the long run. PG&E has already rolled out 10,000 Windows packages and is planning to install another 10,000 copies.

"Before we continue, we need to know if it really makes the business case," Beckman says, adding that early evidence suggests the switch to GUIs is paying off. But there may be a more compelling reason to continue, he says. "Even if this proves untrue, application development is focused in the Windows environment, which may make migration a moot point."

Quick. Think of a company with better business UNIX price/performance than IBM.

Training: It'll cost you

By Michael Fitzgerald

While hardware upgrades can quickly raise the cost of switching to GUIs, it's training and support that really hurt, experienced IS managers say. Their advice: Plan carefully.

"You definitely have to have a well-coordinated plan and good support people behind it," says Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. He says his support staff got Windows before any employees did and created a "Windows cookbook" of tips and tricks. They also established a corporate bulletin board for Windows information swapping.

IS managers in large firms considering Windows might do well to emulate the foresight of Michael Henderson, PC coordinator at James River Corp.'s Neenah, Wis., research facility. GUIs are "a different enough environment that there is going to be retraining for our users," he says. "Support will take a major effort on the part of our department."

Estimating how painful the cost of added support will be can be tricky, though.

Unlike software and hardware, training is a "soft" cost. Ideally, of course, time spent learning the new interfaces is supposed to be offset by productivity boosts. Unfortunately, both are difficult to measure. One thing you can bet on: The costs will probably be more than you thought.

"There's a large training factor, and it's more expensive than people would have you believe," acknowledges Bill Corafield, president of the Windows Support Group, Inc. in New York.

For example, at Brisbane, Calif.-based Hitachi America Ltd., the move to Windows will boost the IS training budget by 30% for two quarters while GUIs are implemented, says Terry Nugent, office automation specialist at the firm.

As for support, Don P. Babcock Jr., manager of user services at Cajun Electric Power Cooperative, Inc. in Baton Rouge, La., notes: "In a Windows environment, every new application's parameters affect all the others, and you run into conflicts. Unraveling those is knotty at times."

Sure enough, at Corporate Software, Inc., a Canton, Mass.-based reseller, Glen Whittaker, technical support manager says Windows has added new dimensions to the calls for user help. Among the calls handled by the firm's help desk are calls about unrecoverable application error to general protection faults.

For some IS shops, training costs are not a big issue, especially after the initial cutover. "If anything, our training costs have probably diminished as a result of moving to a GUI," Babcock says, a claim consultant Cornfield says is credible.

After the initial learning curve for an application, IS managers say users often benefit from the Common User Access built in to GUI applications.

"Basically, it's a day's worth of training for every employee who has a PC," says Wayne Dunn, manager of end-user computing at the MBTA in Boston. "My cost there is minimal, and the corporate cost is not great."

Re-engineering gets real

IS is gearing up to convert concept into action

By Nell Margolis

Jobs imperiled and professional identities in limbo, information systems leaders are beginning to transform "re-engineering" from buzzword into battle cry.

"This is the year when re-engineering is going to move from talk to at least the beginnings of action," said Charles L. Bowerman, chief information officer at Phillips Petroleum Corp. The Bartlesville, Okla., firm, he says, has been actively discussing the topic since 1991.

Indeed, zeal for re-engineering — the deed, not the word — is echoing from IS strongholds across the industrial landscape. A new CSC Index, Inc. report said nearly three-fourths of 407 businesses surveyed now have a "major formal process improvement effort" under way (see chart).

Companies ranging from The Home Depot, Inc., a $2 billion home improvement retailer based in Atlanta, to Bayou Steel Corp., a small Louisiana company, are mobilizing to radically rethink how they do business and deploy technology.

Slow spread

"Automation is creeping into every aspect of this company's business," said Chuck Theaux, who heads the seven-person IS department at Bayou Steel, a minimill in LaPlace, La. "More and more, we're finding ourselves in areas we never used to go into. We're getting pulled into a broader definition of IS than ever before.

"Increasingly," Theaux added, "we're getting viewed as the go-getters."

"Re-engineering is a term that's suddenly in vogue after being around for years," said Andrew McKenna, senior vice president of information services at The Home Depot, which has 180 branches. The current interest, he said, is fueled by a growing realization that the recession and tougher competition will require businesses to make quantum changes to survive and thrive. Many IS professionals, McKenna added, are beginning to see that those who don't serve or drive re-engineering efforts are on the road to extinction.

That concern is evident in CSC Index's recently released sixth annual survey of IS management issues. The Cambridge, Mass., consultancy asked high-ranking IS executives at 407 large U.S. and European firms to rank their 10 most pressing challenges for 1993. "Re-engineering business processes" led the lists on both sides of the Atlantic.

Re-engineering also topped the same chart in CSC Index's 1990 survey, bowing in 1991 to "Aligning IS and corporate goals."

Grim findings on the budget front indicated that for IS organizations, rethinking the ways and means of working so as to accomplish more and better with less — i.e., re-engineering — may be an effort best begun at home. CSC Index respondents in North America reported an average 1993 IS budget increase of 2.5% — a 29% drop from last year's 3.5% increase. In fact, according to CSC Index, the figure has been sliding for six straight years.

Dollar-hobbled IS chiefs in North America, however, still emerged as being well-positioned in contrast to their Europe-based peers. CSC Index survey results from Europe showed a projected 0.4% IS budget increase — a cruel cutback from last year's great expectations of a 5.2% increase.

Hard times

Companies that have begun to take action on re-engineering programs say translating the concept into reality is, predictably, difficult.

"In theory, it was great," recalled Bowerman, whose company participated in a CSC Index-sponsored roundtable on the topic. "But every time we started to talk about what actions people had taken, things began to fall apart. It's not as easy as it looks."

Slowing efforts is a lack of definitive resolution of several key issues, including too few architectural standards, a reluctance to embrace sweeping corporate cultural change and fundamental disagreements as to what re-engineering really means and what role IS should play.

Even so, executives said efforts are moving off the drawing pad and into the workplace.

"We've developed a set of architectural principles for establishing some standards in the information technology area," reported Bowerman, "and we're focusing on making sure we have a real understanding of exactly what the business goals are so that we can indeed become an enabler."

On the technological front, as well as the strategic, CSC Index's 1993 survey found escalating user demands and shrinking IS budgets combining to focus user interest on getting the most out of what they've already got.

Some 47% of the North American respondents tagged client/server computing as the "emerging" technology of greatest interest to their organizations — a contrast with 26% last year and 7% in 1991.

Document imaging and computer-aided software engineering — like client/server and technologies that have been around for a while — rounded out the Top 3, leaving genuinely emerging technologies such as pen-based computing, multimedia and videoconferencing in the dust.

What we're seeing here, several IS executives said, is not a falloff of interest in newer, less proven technologies but a sharpened sense of immediacy on the part of IS organizations.

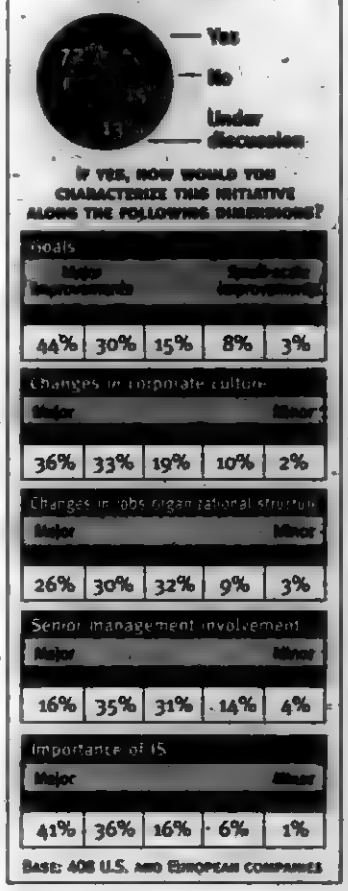
Similarly, "updating obsolete systems" — often a key element in a re-engineering project, according to CSC Index — leaped from No. 18 to No. 8 in the North American vital IS issues ranking, the steepest climb on the chart.

Puzzle time

How important is re-engineering business processes through information technology in Europe? That answer might depend on whether the question is asked in an odd- or even-numbered year. In 1988, the first year of the CSC Index Survey of IS management issues, re-engineering failed to make the Top 20 issues in Europe. In 1989, it entered the chart at No. 17, climbing to the top spot the next year and dropping back one place to No. 2 in 1991. In 1992, it fell to No. 19 — only to re-emerge at the top of the list in the 1993 survey.

Re-engineers think big

Big improvements, big prospects and big changes in culture characterize corporate process improvement initiatives undertaken by large companies in the U.S. and Europe



Source: CSC Index, Inc.

Quick. Think of a company with a better business UNIX environment than IBM.

Intelligence Files

Code of many colors

There are four different ethics codes for computer professionals in the U.S., and each one has its weaknesses. A single, coherent and clear ethics code — much like the medical profession's Hippocratic oath — would do a better job of telling clients, users and society just what they should expect when dealing with computer experts.

The absence of a well-established code of conduct in the computer field is probably due to the fact that the field is relatively young (compared with the medical and legal professions), and technological change keeps raising new ethical issues.

Also, the public may not yet have realized the severity of the problems that can be caused by unethical computer professionals.

Source: "Ethical Standards for Computer Professionals: A Comparative Analysis of Four Major Codes," a paper by Effy Oz of Wayne State University, presented Nov. 3, 1992.

Networking bridges for women

Working in the male-dominated computer industry can be an isolating experience for women, but now there is an online forum for women in information systems.

Called Systers, the forum is the brainchild of engineer Anita Borg.

The forum currently boasts 1,200 subscribers in 75 companies and 150 colleges worldwide.

The interchanges run the gamut from technical discussions to job postings to discussions on comparative pay and which computer companies treat women most fairly.

For more information, send an electronic-mail request through Internet to: systers-request-@wrl.dec.com.

Source: Working Woman, November 1992, Catherine Fredman, author.

Machiavelli on re-engineering

"There is nothing more difficult to take in hand, more perilous to conduct or more uncertain in its success than to take the lead in the introduction of a new order of things."

Source: Niccolo Machiavelli, *The Prince* (1532).

Global outsourcing

Farming out information processing to contractors in foreign countries has become a small but rapidly growing portion of the outsourcing market. India, Singapore, the Philippines and Ireland are among the countries with low-wage, well-trained and English-speaking labor pools that can provide data entry, programming and transaction processing at low costs.

However, the remote locations make project management and quality control more difficult.

In addition, the notion of exporting jobs could raise big political problems in the U.S.

Source: "Global Outsourcing of Information Processing Services," a paper by Uday M. Apte and Richard O. Mason of Southern Methodist University, presented Nov. 4, 1992.

The people button

When it comes to implementing an imaging project, the strategic advantages of use are evolving from "having more" to "knowing more." With imaging, this knowledge is more than learning which button to push. It is a continuing search for functionality from the equipment and the people who use it. "Being smarter" is not something that happens all at once; it is part of an incremental process of improvement. Expect users to resist change, and try to educate them on the big picture rather than on simply on how to use one part of the system.

Source: Special Report: Electronic Imaging's Impact on People, "Training: Programming the Peopleware," by Kathleen Hawk, *Inform*, January 1993.

Compiled by the CW staff.

Calendar

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Document and Image Management Systems Conference. Lake Buena Vista, Fla., Feb. 7-10 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

Compcon Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706.

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7200.

"Doing Business in the Pacific Rim" International Conference. Sydney, Australia, Feb. 25-26. — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

FEB. 28 - MARCH 6

CompTel '93. Washington, D.C., Feb. 28 - March 2 — Contact: Trade Associates, Inc., Rockville, Md. (301) 468-3210.

Share '93. San Francisco, Feb. 28-March 5 — Contact: Share headquarters, Chicago, Ill. (312) 822-0932.

Advanced Object-Oriented Analysis and Design: The State of the Art. San Diego, March 1-4 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Executive Track

A new management team announced in the wake of the recent merger of Kansas City, Mo.-based **Centel Corp.** and Washington, D.C.-based **Sprint Corp.** includes **Ronald J. Ponder** as executive vice president and chief information officer. Ponder retains the title and office he assumed when he joined Sprint a year ago from **Federal Express Corp.**, where he helped spearhead the total quality management program that led Fedex to a 1990 Malcolm Baldrige National Quality Award.

Boston-based **Saunders Real Estate Corp.** has a new MIS manager: **Bonnie D'Agostino**. At her new post, D'Agostino, who formerly served as accounting and systems manager at Cambridge, Mass.-based Alfid Properties, assumes responsibility for Saunders' entire slate of computer-related activities.

John P. "Jack" Thompson, CIO at Sparks, Md.-based **McCormick & Co.** since 1983, retired from the company effective the first of this year. Thompson joined McCormick as MIS director in 1971 with a mandate to develop and implement an integration strategy for the condiment manufacturer; he rounded out his 22 years of service as the head of an information systems organization charged with providing consulting services on systems design and implementation, office automation and telecommunications to the company's worldwide operations.

Recently, before his official retirement, he took on the additional charge of administering the firm's quality program.

Thompson's mantle now passes to C. Robert Miller II. A 26-year veteran, Miller most recently served as IS director for the firm's Flavor division.

In Oak Brook, Ill., **Mel J. Trudeau** has been promoted to the position of senior vice president and CIO of **Official Airline Guides (OAG)**. Trudeau, who was an 11-year United Airlines veteran when he joined OAG in 1961 as director of systems planning and development, now shoulders responsibility for the the company's information systems and for new business arrangements with airlines, their computer reservation systems and travel agencies.

Quick. Think of a company that's sold $6 billion more in UNIX systems than IBM.

Sales figures based on UNIXWORLD Annual Report, 1990-1992. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. ©1992 Hewlett-Packard Company 5091-9301

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Think again.

HEWLETT PACKARD

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Client/server *tell-all*

By Shaku Atre
and Peter M. Storer

You might not know this, but you and Christopher Columbus have a lot in common.

Just think about it. The adventuresome Italian got some funds from a couple of top executives (King Ferdinand and Queen Isabella of Spain) to explore unknown territory in the hopes of enriching the coffers of a country.

So maybe you don't carry a sword, but you're a risk-taker just the same. You've requested money from your business executives to improve your company's fortunes through technology. In your case, however, the terra incognita you're thinking of exploring is client/server computing.

Chances are, you have little experience in client/server-type applications. While this ignorance won't get you killed, it can lead to mistakes in designing and implementing client/server applications.

What follows are some pointers to help you avoid the more common client/server mistakes information systems chiefs make. These tips are culled from our experience with application sites.

Select a mission-critical application as your first client/server application. Most people will give you the exact opposite advice. However, given today's business environment and IS budget restrictions, it may be impossible to promote a complex and expensive project such as a client/server implementation without compelling justification. Most business managers today are unwilling to invest large sums of money to "plan for the future" or "gain experience" in systems.

Atre is president and Storer is director of client/server consulting at Atre Associates, Inc. in Rye, N.Y. Atre Associates consults on client/server application design and development, software evaluation and selection and training. The firm will soon publish a set of client/server guidelines and standards.

Know your application; know your data. Client/server environments require aspects of application planning that you've probably never had to consider before.

For instance, you have to decide how you want to split client and server functionality among such program aspects as the user interface (presentation), logic and presentation flow (function) and data management. Do you want your client machine to be a dumb window into the database management system, with the server handling all other chores? Is some of the logic and flow controlled by the client and some by the server? Or is the server going to act as a central repository, with clients controlling everything except data management?

Each of these options represents a practical model for designing your application; you must make an appropriate, informed choice based on your knowledge of the application.

Knowing your application also involves a choice about where your application logic lies. You can have the rules that apply to your data coded and applied directly at the server, avoiding the need to encode it in the applications programs. In this way, any application that touches your data will automatically have these rules enforced.

Planning also consists of knowing how much of a vendor's SQL extension functionality you should use. Almost every server uses some extensions to SQL for performance reasons. For example, using precompiled stored procedures can dramatically reduce query execution time.

However, if you feel your application may grow enough to warrant a platform change or if you're sharing data across multiple platforms, extensions can be problematic. They make your application less portable.

In designing your application's use of extensions you must weigh the performance benefits that extensions provide against the loss of portability (read: application maintenance).

Pick the right server for the job. One of the most critical aspects of a client/server environment is the server. By "server," we mean the total

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environment in which the database work is done, including the physical server computer, the DBMS running on the computer and the supporting communications software between the server and its clients.

From a physical computer standpoint, if you have the luxury of purchasing a server for the application, buy as much computing power as your budget will allow. Because the CPU for this machine will likely be doing the bulk of the database work, you want to maximize the horsepower available.

In terms of DBMSs, keep in mind that different DBMSs are optimized differently. Some have query optimizers that are oriented toward achieving the maximum number of transactions per second for simple (usually one-table) transactions; these are most appropriate for high traffic/low data analysis applications. Airline reservation systems, for instance, would typify this class of DBMS.

Other DBMSs support relational concepts such as referential integrity and set-oriented processing.

These DBMSs tend to be strong in multitable query optimization and may support tools such as stored procedures and cursor management (for working with result sets). Such systems are geared toward a data analysis/decision support system environment.

The key is to know what your needs are and how the server can meet those needs: Do you want it optimized for speed or for handling complex queries?

Finally, don't overlook the communications aspect of your server. Each hardware/software combination will support one or more well-defined network- and transport-layer communications protocols, such as Named Pipes (standard for OS/2), IPX/SPX (for Novell, Inc. networks), Transmission Control Protocol/Internet Protocol (typically used in a Unix environment) and so on. It is important to understand how this communications environment integrates with your existing environment.

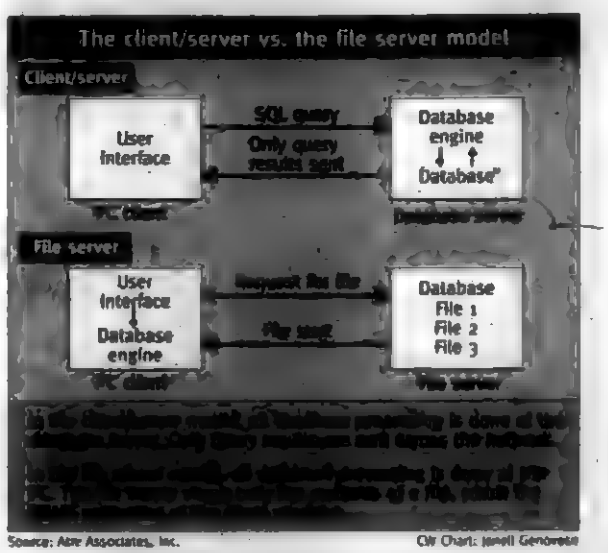
For instance, adding Named Pipes support to DOS or OS/2 clients on a Novell network is simply a matter of installing the appropriate requestor software modules (OS/2 or DOS) on the client. For local-area network server networks, however, the client PC must have "server" software installed so it can share its Named Pipes resources.

Connectivity is one of the most complex aspects of client/server. By matching your server's hardware, DBMS and communications to your existing platforms, architectures and needs, you can achieve a cohesive, integrated computing environment.

Realize that client/server environments don't always require a graphical user interface (GUI) front end. GUIs don't necessarily go hand in hand with client/server. In deciding on your application's front end — including deciding whether you even need one — consider the nature of the application and the skills and requirements of the users.

Make sure you know what kind of environment your end users are accustomed to. If they are not "mousers," do they want/need a GUI, or will they be more comfortable with a text-based screen?

In the case of a data-entry function, for instance, a graphical front end with slow screen refresh or one that forces users to switch between using a keyboard and the mouse can slow down and annoy data-entry personnel.



Source: Aire Associates, Inc. CW Chart: Jewell Genovese

Don't force high-tech changes on low-tech users. Make sure users need the changes and are prepared for them.

Think twice about minimal client hardware requirements. One of the selling points of client/server computing has been the "fact" that you don't have to use powerful PCs as clients. Because all the horsepower is centralized in the server, the story goes, client workstations can be cheap, low-end machines (e.g., Intel Corp. 8086- or 80286-based).

But that's not the case. For the most part, low-end PCs are insufficient to run your application. One company we know of attempted to use such low-end PCs as clients by supplying the machines with upgraded replacement CPUs. Unfortunately, the company experienced a series of memory management nightmares, including system crashes, because the machines were not natively designed to support the CPUs. The IS staff ended up replacing the computers with native Intel 80386 machines.

The need for powerful machines is especially acute if you are implementing a GUI front end, the majority of which run in a Microsoft Corp. Windows environment. Windows typically requires at least a 386 PC with plenty of memory — at least 4M bytes — to achieve even adequate performance.

Even without the GUI factor, client/server means networking (network and device drivers residing in memory), which means sufficient computer brainpower to manage these resources.

Use triggers — cautiously. The most common enforcer of referential data integrity available in database servers is the trigger. This is a piece of code stored directly in the server that is automatically called on whenever a "triggering event" (such as a record insertion, record deletion or record update or modification) occurs. Triggers are not limited to referential integrity, however; another way to think of triggers is as rules implemented at the server that are applied to every request made to the server.

This is a powerful tool — and one that can get you into trouble if used improperly. There are two types of triggers to avoid: triggers that are too general in their triggering conditions and triggers that try to accomplish too much.

We have seen a situation in which an improperly constructed trigger (in this case, one whose triggering conditions were too broadly defined) brought an application to its knees. The trigger turned a simple update based on a key field — an action that should take only a fraction of a second — into a lengthy extravaganza of record, page and even table locking as the changes to the record were programmatically checked for referential accuracy.

Use triggers cautiously and appropriately. For instance, you may want your trigger to fire only after all rows affected by an update query have been altered rather than having a trigger execute once for each affected row. Some servers will allow this.

Avoid making your defined database size too large. You won't hear this advice too often. Most IS chiefs are told not to make their database size too small. Many servers, however, "preallocate" storage, which is then managed exclusively by the DBMS. This situation cuts down on operating system calls that allocate physical storage.

As a result of this preallocation, it's usually a simple task to increase the amount of storage available to your database by adding physical and/or logical devices. On the other hand, once you have set aside this defined amount of space for your database, it is difficult to shrink your defined size to allocate storage to another database. The DBMS spreads your data among the defined devices according to what it thinks best.

Plan ahead for growth, but don't wildly overestimate the amount of space you will ultimately require. If necessary, revise your defined allocation upward at a later time.

Plan to use rapid application development techniques. One of the side bene-

Telling it like it is

What is client/server computing, and how does it differ from conventional computing?

The fundamental characteristic that sets client/server computing apart from the rest of computing is the distribution of computing resources. In its broadest sense, client/server means one CPU (the "client") formulates a request and passes it along to another CPU (the "server"). The server performs the work requested by the client and returns the results of the processing back to the requestor.

The client/server paradigm is most frequently applied in the database world. In this construct, the client CPU formulates a database request and passes it along to a server CPU. This CPU processes the request and returns an appropriate response to the client. In a request for data, for example, the server will perform the query requested by the client and return any records satisfying the query. On an insert, delete or update request, the server will return a status indicating either the success or reason for failure of the request after it has processed the request.

There are many advantages to this method of database computing. Chief among these is the opportunity to centralize the computing horsepower. Because the client is (usually) responsible only for program logic and front-end presentation, it requires fewer resources than if it were also responsible for doing the actual processing.

By the same token, the server should have as much computing power as is available because it will be solely responsible for performing the processing work of the application.

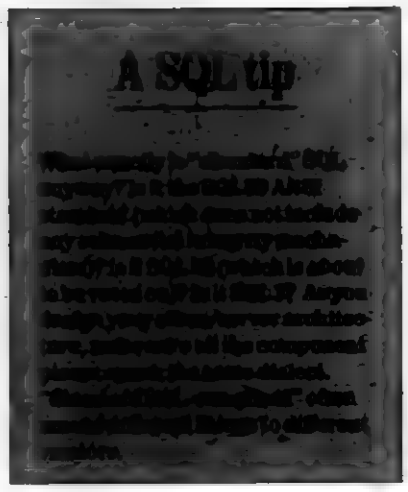
Another important advantage to client/server computing is the centralization of program access control logic. Many database servers support rules implemented at the server that are applied to every request made of the server. Typically, these rules are used to ensure referential integrity and to control access to data.

By having these rules embedded in the fundamental logic of the server, constraints such as "Let only those people who have update privilege update salary data columns" or "Don't fulfill any request that will return more than 10,000 rows of data to anybody without that privilege" can be written once and applied uniformly to all applications that touch the data.

— Shaku Aire and Peter M. Storer

fits of client/server development is that the PC client platform supports a wide variety of tools that support rapid application development. Most front ends either include or support a prototyping tool, which will allow you to create dummy screens for users' approval in days, not weeks.

Expect to overhaul established IS skills. Skills that your IS staff has learned may be either marginally relevant or even wholly irrelevant to the client/server application task at hand. For instance, client/server applications presume a SQL language interface to a relational DBMS. Data navigation skills that were learned for nonrelational databases will not apply in this environment. Also, programmers who have mastered High-Level Language Application Programming Interface design for 3270-type screens may find their knowledge useless in building a GUI screen.



One IS chief we know, whose staff was experienced in developing multiuser, file server-based applications, facetiously observed that conversion from server-based to client/server "is easy—just find all the VIEW and EDIT statements in the code and rewrite those sections." In Borland International, Inc.'s Paradox, those statements make up the heart of the application, and removing them requires a fundamental system redevelopment and the use of new skills.

IS staffers must become familiar with the relational model and the SQL dialect to develop and work with the system. It is vital that IS be comfortable with the concepts of normalization (breaking data down into relationally atomic units) and transactions (units of work and how their size and complexity can influence performance).

Anticipate user expectations. One of the essences of client/server computing is that most of the complexity happens "under the covers" — unseen and unknown to end users.

While you may think this will spare users a lot of agony, it may have the opposite effect. Because users don't know what is happening, they may misinterpret what is going on and blame the system or the IS staff.

For example, while you may have a join across seven multimegabyte tables happening at the server, all your user sees is a screen notation that says "retrieving information — please wait" for the duration of the task. To the user, it may as well read, "System is slow and holding you up." Furthermore, the switch to a SQL front end may be especially frustrating for end users accustomed to working with PC-based databases. These databases enable users to browse through the data, inspecting records in a random, unstructured fashion. On the other hand, a SQL front end to server data imposes an access control layer between the user and the data. Users feel cheated because they can't "touch" the data directly.

Between not knowing what is going on in the system and having a new layer separating them from their data, end users may feel dissatisfied with the client/server application. It is the IS department's job to understand and anticipate these feelings, educating users before they become unhappy and undermine client/server efforts.

As with any new technology, you have to build some "surprise time" into your application development timetable. Hopefully, the advice presented here will help you avoid problems and make your trip to client/server a smooth one.•

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Computer Careers

Neatness doesn't count; clutter does

By Bill Levine

IT'S NOT ENOUGH to be dressed for success. Now the computer professional must also be "desked" for success. The ideal work area can boost your information systems career even more than an uncle in personnel.

A powerful collection of vendor coffee mugs and a hexadecimal calendar are good ideas. But an upwardly mobile work area should start with a firm foundation of hard-copy printouts — the only solid evidence that will prove you're doing more than just basking in the glow of cathode rays all day. Besides, there is no statute of limitations on programmer responsibility for retaining documents. You never know when the 1979 purge listing will need to be reviewed again.

Just the right amount

A career-enhancing cubicle need not have a forest of paper on the floor. In fact, too many dumps is a no-no because colleagues may think that's all you produce. But a small arboretum is well-advised.

The only acceptable excuses for not having printouts in your work area are if you're in the first five minutes of employment or you're a manager in training.

It used to be that a work area was anchored by a dumb terminal. Now work areas have amazingly smart PCs. Make sure your machine reflects well on you. While you'll receive many points for a PC that can communicate with networks ranging from the Strategic Air Command to a McDonald's drive-thru, an even better status symbol is a PC that communicates with the host.

The way the PC responds to you is equally important. A PC log-on can't just state "access permitted." It should show respect for you by responding, "Good morning, sir. Your mission, should you choose to accept it..."

The flimsy walls of the typical work area have purposes other than merely allowing you to eavesdrop on colleagues' phone conversations. What is stuck on these walls can take you to the push-pinnacle of success.

Exemplary walls will be festooned with obscurely humorous cartoons with punch lines *so* esoteric and highbrow that only the Dalai Lama would get them. People who see these cartoons will regard you as an extra heavy and deep thinker (though you won't get invited to be on *America's Funniest People*).

To go along with these character-enhancing cartoons, you should plaster your walls with hierarchical charts because we all know a good computer analyst thinks hierarchically. Ideally, the chart should be of a recognized database, but it can also be a family tree, a dog's pedigree or a tennis ladder.

A nice accompaniment to the chart is a graph showing CPU use. It will prove that you're interested in efficiency and, more importantly, can read a graph.

The sky's the limit

How can you judge if your cubicle is of award-winning status? There should be reams of paper in the in-basket. Such an in-basket says that its owner has no time for leisurely reading. It's better for the bottom of this slush pile to be yellowing than for a computer pro to be caught checking up on his high-tech stocks. As a rule of thumb, unless the oldest magazine in the basket is *Abacusworld*, don't throw out any in-basket material.

Don't take pride in a pencil cup filled with freshly sharpened No. 2s. The outstanding desk will have only the computer pro's writing machine: the mechanical pencil. Only with this technical marvel can you generate the perfect collaboration of graphite and paper we all know as technical specs.

Even your desk calendar must show a commitment to computing excellence. Leave the plain everyday calendars for someone else. An IS careerist would never have a calendar in which October had a lovely model hugging a basket of cute puppies in one hand and carving a pumpkin with the other, surrounded by peak foliage. Better choices: "Cobol verb of the day," "Great days in IBM history" or "Peripheral device of the month" calendars.

Finally, there are some objects that should never be displayed in the open: a hex conversion chart (shows that you can't convert in your head), a flowchart template (shows that you don't have a computer-aided software engineering tool) and a book titled *Understanding Your Friend Mr. Computer*.

Now that I think of it, it may be time for me to neaten up my own personal space. But first I'll have to junk my personal library by getting rid of all my Monarch Notes to Cobol manuals.

Levine is a computer analyst at The New England in Boston.

What's it really like out there? Look around you. What are typical co-workers like? How are IS department meetings really run? Does THE GRASS LOOK GREENER FROM SOMEONE ELSE'S DESK? IS THERE MORE TO A JOB IN THE IS SHOP THAN MEETS THE EYE? SEND YOUR OBSERVATIONS —SERIOUS OR OFFBEAT, BUT ALWAYS CANDID —TO KELLY E. SEWELL, ASSISTANT EDITOR, FEATURES.

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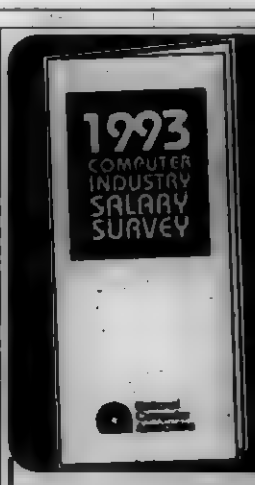

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job close-up

Administrators protect data from the unauthorized

By Kelly E. Sewell

IF YOU ALWAYS wanted to be a police officer when you grew up but ended up in information systems instead, you may still be able to follow your calling by policing information systems. How? As a data security professional.

Jobs for data security professionals, both administrators and managers, are growing as companies become more aware of the need to protect their information.

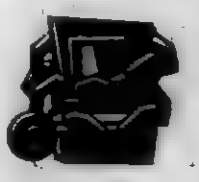
"Data is a corporate asset," says Rod Horning, manager of information technology and security at Kelly-Springfield Tire Co. in Cumberland, Md. It needs to be protected from competitors, hackers, disgruntled employees and even current staff members.

Banks and government hot

The best opportunities for data security administrators are in financial industries and in government, according to Calvin Grimsley, data security officer at Time Warner, Inc. in New York.

"Companies in the private sector have information that should be protected, but there's no policy on it so most of them don't do it until something happens," Grimsley says. "But when you start talking about financial, banking systems and government, they have policies that say, 'You *will* have data security.'"

On a day-to-day basis, data security administrators are in charge of maintaining security on platforms, assigning new users, helping users with password problems, auditing and keeping detailed records of violations and attempted violations and monitoring access of all the platforms, says Wincy Carr, IS manager of database and security for Fresno County in Fresno, Calif.



Data security managers are more involved in policy-setting, creating an awareness of the need for security and ensuring that the controls they've developed work.

Most data security managers expect the data security administrators they hire to have two to three years of IS experience, preferably in applications programming or operations.

The IS background is helpful because it gives administrators a better understanding of how IS works, Grimsley says.

"Programmers that come from the applications side know what it is they're trying to secure, and they know how the operating systems work together," Carr says. This helps the administrator know where the holes are.

Because she is responsible for the security of a government system, Carr would also prefer if the administrator was familiar with state and local regulations because the job entails developing policies and procedures.

"I'd also like them to have knowledge of the platforms [VAX, HP, RISC System/6000, IBM mainframes, Application System/400s] and the security products available," Carr says.

Horning also prefers a knowledge of security products. His company uses IBM's Resource Access Control Facility but other popular security packages include CA-ACF2 and CA-Top Secret, he says.

Horning says data security administrator is not an entry-level position "because if you administer security centrally, then you are granting a great deal of trust to the security administrator because you're giving him the keys to the city."

But because most managers prefer to hire applications programmers into the position, a lack of experience isn't an issue.

In smaller companies, data security is not a full-time function but is included in a programmer's or systems analyst's position. In companies with more than 400 to 500 employees, there is enough work to warrant having a full-time person doing data security exclusively. However, few companies have more than one person on the job.

As companies grasp the concept of securing their data, so are universities. Grimsley says he began teaching a data security course at New York University last year, and he says many universities are now adding such courses to their curricula.

Pluses and minuses

Most data security administrators say the position offers high visibility within companies.

"If you're with a company that's security-minded, it's a visible job. It allows you to get into all aspects of a corporation," Grimsley says.

If there's a downside to the job, it's that the administrative functions become routine after awhile, says Larry Scriven, a security administrator at Hay & Forge Industries in Hesston, Kan.

It's also not a glamorous job, Carr says. "You're a watchdog so you're looked on as a handicap."

"Nobody wants data security; it's a necessary evil," Grimsley says. But, he concedes that it's becoming more accepted. "Management is beginning to realize that it's something they really need to be involved in."

Carr adds that rewards come if nothing happens (such as a virus infection or a hacker break-in). She says it's rewarding to know "you have secured the environment — nobody has gotten in."

Sewell is assistant editor, features.

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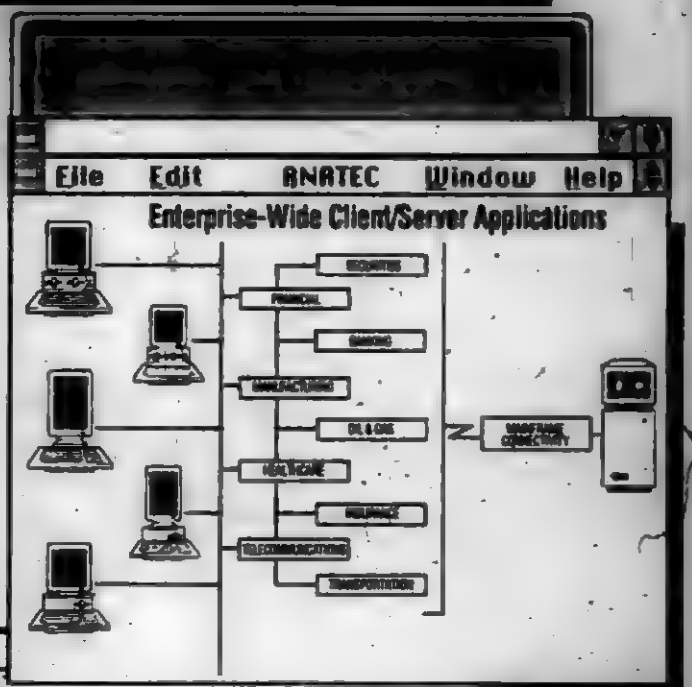

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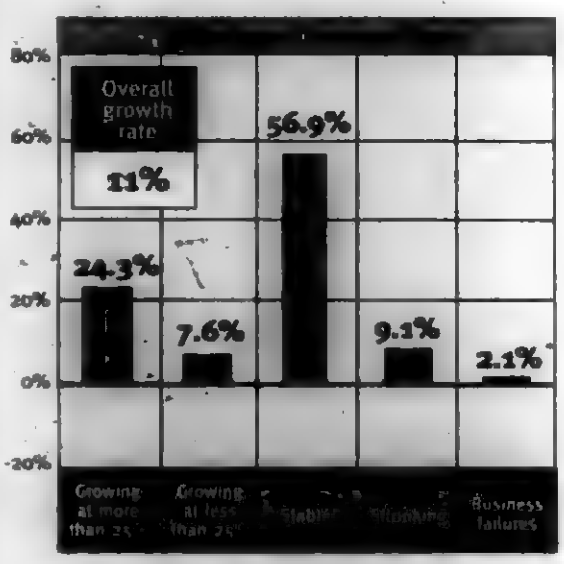

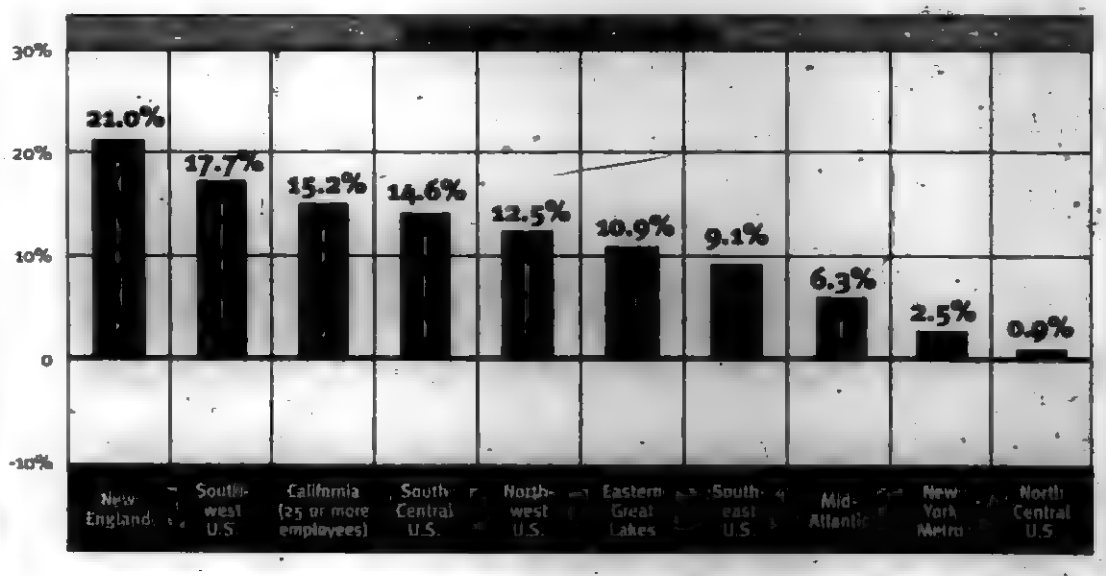

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Learn lingo to avoid lease contract 'gotchas'

By Joe Auer

WHEN NEGOTIATING a lease, it's easy to overspend on things you didn't want or didn't even ask for. Many people simply misunderstand the implications of the contract terms. Unfortunately, these mistakes can cost as much as the combined salaries of your company's top executives.

You can save yourself a bundle by knowing some of the more costly tricks or "gotchas" lurking within the language of standard lease agreements.

Gotcha No. 1: Interim rent

Many salespeople who deal with leasing candidly admit they make their entire commission from a seldom-recognized technique called interim rent. This is rent paid over and above the financing term of the lease, which is otherwise known as the initial period. The cost of the system is financed over the initial period. With interim rent, the lessor collects one extra payment (called a prorated payment) if the installation date does not fall on the first day of a month, or the commencement date. (Interestingly, first-day-of-the-month installations are a rare occurrence — perhaps due to chance, perhaps due to design.)

For example, if the installation date falls on the second day of the month, the prorated payment covers 29 days. Consequently, the lessee pays 36 full payments (assuming it is a three-year lease) and one prorated payment that is only slightly less than a full payment. The financing, however, has been analyzed on the basis of 36 payments. Because the prorated payment is not part of the lease financing, it flows through as extra income and a percentage goes to the salesperson.

A more subtle ploy comes into play here. A lessor may offer a week's free use, say, starting on Nov. 27. That pushes the installation date into December, which causes the lessee to pay interim rent for three-plus weeks because the initial period now does not begin until the new commencement date of Jan. 1.

Advice: Make sure you only pay for the exact term you negotiated for.

Gotcha No. 2: 'Hell or high water' clause

Do not allow an initial period or term to begin with its inherent "hell or high water" (read: pay-up no matter what happens) provision before the lessor pays the manufacturer for the equipment.

Otherwise, you could find yourself 10 weeks into a lease at $110,000 per month only to be told by the lessor that it cannot raise the financing to fund the deal and pay the manufacturer for the equipment. In this case, the lessor may expect you to continue to make the monthly payments, as per the "hell or high water" provision in the contract. After a few days, your lessor may even inform you that it can raise the long-term debt to fund the deal but only if your company agrees to new payments of $122,000 per month.

Contract terms to know:

Interim rent: Additional rent paid over and above the financing term of the lease.

Initial period: The term agreed to by the lessee.

Commencement date: First day of a month following the installation or acceptance of the equipment.

Advice: Avoid beginning an uninterruptible payment stream to the lessor until it has given evidence of full supplier payment and evidence that the equipment has been satisfactorily tested.

Gotcha No. 3: Renewals

Another problem with standard lessor wording lies in the Term of Lease section wherein the lease term is automatically extended for one year unless the lessee provides written notice at least six months prior to the end of the initial period.

Since the required written notice is due well before the time most users expect, this automatic renewal extends the lease before a lessee knows it — at the same rental amount.

The problem in administering this type of renewal provision is that the lease has been filed away for years, and the players have changed. The user may not want the same equipment for another year and now has to exercise an expensive buyout. Or if they do want it, a much lower rental amount should have been negotiated.

Advice: I recommend drafting provisions that give the lessee the right, but not the obligation, to renew. The right to renew should be for an amount equal to the lesser of 1) a predetermined amount; 2) a fair market rental based on actual equipment costs and rates then in effect; 3) competitive bids; 4) or an amount negotiated between the lessor and the lessee at the time of the renewal.

Auer is president of International Computer Negotiations, Inc., a consulting firm based in Winter Park, Fla.

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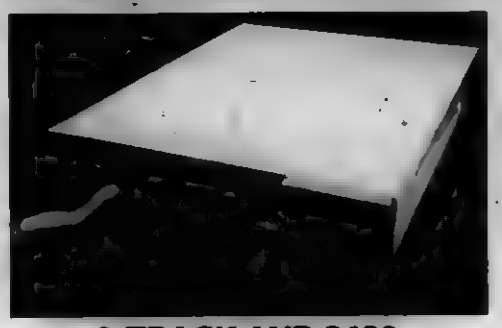

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Creative Technologies Inc.	32.9
Lincoln Cable	30.0
Analysts Int'l.	27.7
Xilinx	24.7
Stratacom Inc.	24.5
Wellfleet Communications (N)	22.0
Picturetel Corp.	22.1

Losers

Percent

MRS (N)	-38.6
Maxtor Corp.	-21.8
IPL Systems Inc.	-16.7
Sequoia Systems Inc.	-15.9
Western Digital Corp. (N)	-15.1
Seagate Technology	-14.7
Network Systems Corp.	-14.7
Tandy Corp.	-14.6

Dollar

Motorola Inc. (N)	14.75
Intel Corp. (N)	14.50
Parametric Technology	10.00
Cisco Systems Inc. (N)	6.88
Wellfleet Communications (N)	6.25
Seagate Inc. (N)	6.13
Synoptics Communications (N)	6.13
BMC Software Inc. (N)	6.00

MRS (N)	-7.00
DGS Systems Inc.	-3.00
Maxtor Corp.	-2.00
Walker Interactive Systems	-3.00
Seagate Technology	-3.00
Progress Software Corp.	-2.25
System Software Assoc.	-2.25
IPL Systems Inc.	-2.00

Net prospects good in '93

With a little cooperation from the economy, the big picture will be bright for networking and communications stocks this year.

According to Wall Street analysts, the fundamental technology directions driving 1992 gains for **Synoptics Communications, Inc.** (SNPX), **Cisco Systems, Inc.** (CSCO) and other companies will continue. John Rohal, senior communications analyst at Alex. Brown & Sons, Inc., pointed to the ongoing trends of downsizing, client/server implementations and the increasing reliability of local-area networks and internetworks.

"The reliability is improving, we have a better infrastructure of hubs and routers, and the idea of doing work through a LAN-based application is becoming very acceptable," Rohal said.

Companies are increasingly betting on enterprisewide networks for greater business flexibility, which is leading to competitive advantage, Rohal said. "So on the fundamentals side, there's room for another great year."

During the calendar 1992 year, Synoptics led all technology issues with a 60¼-point gain. Cisco rose 45½. (See CW, Jan. 11, 1993, page 108 for a list of the Top 20 dollar gainers and losers.)

However, in order to match their explosive growth of 1992, networking stocks will need some additional help from general economic conditions, Rohal said.

"If overall economic rates are fairly slow and interest rates stay moderate, these stocks are going to continue to look very attractive because they're growing quickly in a world where everything else is going slow," he said.

Analysts said investors will be willing to pay premium dollar for networking and communications stocks in such a business environment.

Rohal said specific issues that should perform well during the next year include market leaders **Novell, Inc.** (NOVL), **Banyan Systems, Inc.** (BNYN) and **Wellfleet Communications, Inc.** (WFLT), as well as Cisco. Novell, Wellfleet and Cisco also earned Buy ratings from Needham & Co. analyst Marly Cardozo in a 1992 year-end report.

Some companies that performed less spectacularly last year may catch on in 1993 as well.

Network General Corp. (NETG) is one possible rising star. Network General's Sniffer diagnostic products may gain more attention as LANs and internetworks become more complex and more mission-critical, according to both Needham and Alex. Brown.

— Derek Slater

Exch	52-Week Range			Jan.15 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT						
OTC	31.00	9.63	3 COM Corp. (H)	31.00	2.50	8.8
NYS	74.50	56.25	American Info Techs Corp.	74.25	3.13	4.4
NYS	54.00	36.63	AT&T	54.00	3.25	6.4
OTC	4.25	0.75	Artel Communication Corp.	1.81	0.00	0.0
OTC	24.00	10.25	Banyan Systems Inc.	24.00	3.00	14.3
NYS	53.88	40.25	Bell Atlantic Corp.	53.25	3.50	7.0
NYS	55.50	43.38	Bellsouth Corp.	54.50	2.38	4.6
NYS	6.75	3.63	Bolt, Beranek & Newman	5.75	-0.25	-4.2
OTC	17.25	10.00	Brooktrout Technology	15.75	1.00	6.8
NYS	87.00	42.13	Cabletron Systems (H)	87.00	5.00	6.1
OTC	30.25	17.75	Chipcom Corp.	29.75	3.75	14.4
OTC	88.38	33.00	Cisco Systems Inc. (H)	88.38	8.88	11.2
OTC	31.25	5.50	Compression Labs Inc.	11.50	0.00	0.0
OTC	3.38	0.88	Data Switch Corp.	2.50	0.31	14.3
NYS	23.63	13.75	Digital Comm. Assoc.	19.75	0.88	4.6
OTC	14.75	7.50	Digital Systems Int'l Inc.	10.75	-0.25	-2.3
OTC	23.88	4.00	DSC Communications (H)	23.25	0.38	1.6
OTC	10.88	4.75	Fibronix Int'l Inc.	8.75	1.25	16.7
OTC	37.50	20.50	Frelnet Corp.	16.25	1.75	12.1
OTC	4.06	1.50	Gandalf Technologies Inc. (H)	4.06	0.69	20.4
OTC	2.25	0.69	Gateway Communications	1.50	0.19	14.2
NYS	7.25	2.88	General Datacomm Inds. (H)	7.25	0.50	7.4
ASE	5.88	1.38	Gti Video	3.00	-0.13	-4.0
NYS	35.75	28.88	GTE Corp.	35.50	1.13	3.3
NYS	72.13	56.25	ITT Corp.	71.13	1.13	1.6
OTC	42.50	29.50	MCI Communications Corp. (H)	42.50	2.00	4.9
OTC	14.25	2.25	Microcom Inc.	5.88	-0.13	-2.1
OTC	20.50	12.00	Nepsi Corp.	19.00	0.25	1.3
OTC	16.75	9.63	Network Computing Devices	15.25	0.38	2.5
NYS	18.25	8.13	Network Equipment Tech. (L)	8.88	-0.75	-7.8
OTC	25.50	8.00	Network General	19.00	1.00	5.6
OTC	17.88	8.50	Network Systems Corp.	10.88	-1.88	-14.7
OTC	44.25	10.38	Newbridge Networks Corp.	44.25	3.63	8.9
NYS	49.25	30.50	Northern Telecom Ltd.	43.00	1.75	4.2
OTC	33.50	22.50	Novell Inc.	31.75	2.25	7.6
NYS	88.50	69.13	Nynex Corp.	85.63	1.50	1.8
OTC	37.50	14.50	Octel Communications Corp.	26.75	4.25	18.9
OTC	9.63	3.38	Peiral Data Comm Networks	4.75	0.13	2.7
OTC	53.00	10.25	Picturetel Corp.	28.75	5.25	22.5
OTC	18.75	7.00	Proteon Inc.	11.38	1.63	16.7
NYS	27.50	10.16	Scientific Atlanta Inc.	27.50	3.25	13.4
NYS	75.25	56.63	Southwestern Bell Corp.	75.25	2.50	3.4
NYS	26.88	20.75	Sprint Corp. (H)	26.38	0.63	2.4
OTC	27.00	7.25	Standard Microsystems Corp (H)	25.00	-0.25	-1.0
OTC	16.50	6.38	Stratacom Inc.	16.50	3.25	24.5
OTC	87.00	18.75	Synoptics Communications (H)	87.00	8.13	10.3
OTC	7.13	4.38	Telebit Corp.	6.25	0.63	11.1
OTC	24.25	13.38	US Robotics	22.75	2.50	12.3
NYS	40.00	32.88	U S West Inc.	39.50	1.63	4.3
OTC	44.50	12.00	Wellfleet Communications (H)	44.50	8.25	22.8
OTC	22.00	7.00	Xircom	8.75	0.00	0.0
PC'S AND WORKSTATIONS						
OTC	10.00	3.13	Advanced Logic Research	3.75	0.13	3.6
OTC	70.00	41.50	Apple Computer Inc.	61.50	-0.75	-1.2
OTC	23.75	11.25	AST Research Inc.	23.75	2.00	9.2
NYS	19.25	6.13	Commodore Int'l (L)	6.38	0.13	2.0
NYS	53.63	22.25	Compaq Computer Corp. (H)	53.63	6.13	12.9
OTC	48.50	15.00	Dell Computer Corp. (H)	47.00	1.13	2.5
OTC	7.75	0.13	Everex Systems Inc.	0.25	0.00	0.0
NYS	36.63	26.63	Harris Corp. (H)	36.50	1.25	3.5
NYS	85.00	50.25	Hewlett Packard Co.	73.25	3.88	5.6
NYS	29.75	14.13	Silicon Graphics	29.50	1.50	5.4
OTC	38.50	22.50	Sun Microsystems Inc. (H)	38.50	2.63	7.3
NYS	32.13	22.25	Tandy Corp. (H)	29.13	-1.00	-3.3
NYS	11.13	5.00	Zenith Electronics	6.13	-0.00	0.0
OTC	24.75	2.75	Zeos International Ltd.	4.00	-0.13	-3.0
ABLE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	7.50	0.63	9.1
NYS	16.38	6.75	Convex Computer	8.38	0.38	4.7
OTC	9.50	1.88	Cray Computer	4.75	0.38	8.6
NYS	68.50	19.00	Cray Research Inc.	27.00	4.00	17.4
NYS	17.75	7.13	Data General Corp.	11.88	0.00	0.0
NYS	65.50	30.38	Digital Equipment Corp.	41.88	7.00	20.1
NYS	100.38	45.88	IBM (L)	48.38	2.13	4.6
OTC	19.50	5.50	Kendall Square Research	18.00	0.00	0.0
NYS	118.00	83.00	Matsushita Electronics	88.00	-1.88	-2.1
OTC	17.50	6.00	Pyramid Technology	14.50	0.75	5.5
OTC	22.63	11.13	Sequent Computer Sys.	22.63	1.38	6.5
OTC	17.25	1.38	Sequoia Systems Inc.	1.81	-0.34	-15.9
NYS	54.25	29.50	Stratus Computer Inc.	35.88	1.75	5.1
NYS	16.50	9.88	Tandem Computers Inc. (H)	16.50	0.75	4.8
NYS	12.25	5.13	Unisys Corp.	12.25	1.63	15.3
ASE	7.50	0.06	Wang Labs Inc. (N)	0.44	0.06	16.0
SOFTWARE						
OTC	65.75	25.25	Adobe Systems Inc.	40.50	7.38	22.3
OTC	36.50	10.25	Aldus Corp.	15.25	0.25	1.7
OTC	19.75	7.00	American Software Inc.	8.50	-0.38	-4.2
OTC	24.75	9.75	Ask Computer Systems	24.75	3.00	13.8
OTC	56.50	23.25	Autodesk Inc.	52.25	4.50	9.4
OTC	37.75	3.75	Bachman Info. Systems	5.25	-0.13	-2.3
OTC	43.00	34.00	B&S Systems Inc.	39.00	-3.00	-7.1
OTC	82.25	37.25	BMC Software Inc. (H)	82.25	8.00	10.8
OTC	25.50	16.25	Boole & Babbage	22.25	-1.00	-4.3
OTC	82.50	18.50	Borland Int'l Inc. (L)	19.00	-1.75	-8.4
OTC	10.50	3.63	CE Software	3.63	-0.25	-6.5
ASE	34.13	9.38	Cheyenne Software Inc. (H)	34.13	3.38	11.0
OTC	17.75	8.25	ChipSoft	17.00	-0.25	-1.4
OTC	12.38	5.63	Cognos Inc.	7.50	0.00	0.0
NYS	22.00	10.88	Computer Associates (H)	21.25	0.63	3.0
NYS	12.38	6.00	Computervision Corp.	5.38	-0.13	-2.3
OTC	19.00	6.75	Comshare Inc.	12.00	-0.75	-5.9
OTC	66.75	6.00	Easel Corp.	13.50	0.50	3.8
OTC	26.50	11.75	Frame Technology	16.00	0.50	3.2
OTC	25.00	12.50	Group I Software	15.75	1.75	12.5
OTC	7.63	3.50	Hogan Systems Inc.	7.63	1.25	19.6
OTC	25.75	13.75	IMRS (H)	17.50	-7.00	-28.6
OTC	36.25	18.50	Information Resources	32.50	1.63	5.3
OTC	37.75	9.63	Informix Corp.	36.75	2.63	7.7
OTC	21.75	11.00	Intergraph Corp.	13.00	0.25	2.0
OTC	15.00	7.75	Interleaf Inc.	12.75	0.25	2.0
OTC	19.75	10.25	Intersolv Inc.	13.75	-1.25	-8.3
OTC	21.38	9.50	Knowledgeware Inc.	13.25	-1.63	-10.9
OTC	52.75	28.75	Legent Corp.	52.50	4.00	8.2
OTC	38.75	14.75	Lotus Development	20.13	1.13	5.9
OTC	23.25	13.00	McAfee Associates	15.25	0.00	0.0
OTC	7.38	1.88	Meca Software	6.75	0.75	12.5
OTC	22.25	5.25	Mentor Graphics	9.38	0.50	5.6
OTC	42.75	27.25	Micro Focus	41.63	-0.63	-1.5
OTC	20.50	6.50	Micrografx Inc.	12.25	1.25	11.4
OTC	95.00	65.50	Microsoft Corp.	90.25	3.63	4.2
OTC	30.75	12.00	Oracle Corp. (H)	29.63	0.00	0.0
OTC	59.00	25.25	Parametric Technology	59.00	10.00	20.4
OTC	32.75	22.50	Peoplesoft (H)	31.75	-0.25	-0.8
OTC	11.00	3.50	Phoenix Technologies	6.38	0.13	2.0
OTC	29.25	11.25	Platinum Technology	22.25	3.00	15.6
OTC	61.50	29.00	Progress Software Corp.	56.50	-2.25	-3.8
OTC	26.50	3.50	Quarterdeck Office Sys.	3.50	-0.50	-12.5
OTC	32.75	11.75	Rainbow Technologies Inc.	17.75	0.25	1.4
OTC	22.75	4.00	Rasterops	6.63	-0.50	-7.0
OTC	17.25	3.63	Ross Systems	9.13	0.63	7.4
OTC	27.25	8.50	Sapiens USA Inc. (H)	26.25	0.50	1.9
OTC	26.25	6.75	Software Publishing Corp.	8.75	-0.25	-2.8
OTC	8.50	2.00	Software Toolworks Inc.	8.50	1.00	13.3
OTC	7.25	0.75	Spinnaker Software	1.13	-0.13	-10.0
OTC	16.50	3.25	State of the Art	8.50	-0.50	-5.6
NYS	25.25	13.75	Sterling Software Inc.	21.13	1.25	6.3
OTC	29.00	8.00	Struct. Dynamics Research	12.38	0.13	1.0
OTC	53.75	21.00	Synsage Inc. (H)	53.75	8.13	17.8
OTC	51.00	6.88	Symantec Corp.	13.13	0.88	2.9
NYS	13.75	5.25	Systems Center Inc.	7.88	0.13	1.6
OTC	25.50	11.86	System Software Assoc.	21.75	-2.25	-9.4
OTC	13.25	2.50	Trinzic Corp.	4.38	-0.75	-14.6
OTC	23.75	14.50	Walker Interactive Systems	17.75	-3.00	14.5
OTC	5.38	1.38	Wordstar	2.00	0.31	11.6
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	20.25	0.88	4.5
NYS	17.25	8.63	Analog Devices Inc. (H)	16.88	0.88	5.5
OTC	17.88	7.63	Atmel Corp.	17.88	-1.50	9.2
OTC	14.13	3.25	Chips and Technologies	4.88	0.25	5.4
NYS	17.38	7.38	Cypress Semiconductor Corp	10.88	0.50	4.8
NYS	15.38	7.00	Dallas Semiconductor (H)	14.50	0.13	0.9
OTC	112.75	46.50	Intel Corp. (H)	112.75	14.50	14.8
NYS	11.63	6.88	LSI Logic Corp. (H)	11.63	0.88	8.1
NYS	22.88	12.88	Micron Technology	22.88	2.38	11.6
NYS	123.75	72.88	Motorola Inc. (H)	123.75	14.75	13.5
NYS	14.13	7.50	National Semiconductor	11.50	0.13	1.1
OTC	27.00	8.25	Sierra Semiconductor	13.00	1.00	8.3
OTC	38.50	22.25	SynOptics (N)	38.25	1.25	3.4
NYS	57.00	21.50	Texas Instruments (H)	56.25	2.00	3.7
OTC	10.50	6.00	VLSI Technology	8.50	0.13	1.5
OTC	7.63	3.13	Weitek	6.13	0.25	4.3
ASE	9.63	3.50	Western Digital Corp. (H)	7.75	-1.38	-15.1
OTC	31.00	16.50	Xilinx	29.63	5.88	24.7
OTC	39.00	17.50	Zilog Inc. (H)	38.00	0.00	0.0
DISK DRIVES AND SUBSYSTEMS						
OTC	29.75	16.75	Banctec Inc.	28.25	0.50	1.8
OTC	23.50	9.25	Cambex Corp.	14.00	0.25	1.8
ASE	17.75	6.00	Cognitronics Corp.	17.25	1.13	7.0
NYS	23.88	16.75	Conner Peripherals	22.13	0.50	2.3
OTC	24.25	10.75	Creative Technologies Inc.	24.25	6.00	32.9
OTC	27.50	14.25	Data Race Inc.	25.50	1.00	4.1
ASE	19.66	4.75	Dataram Corp.	12.13	1.00	9.0
NYS	25.50	7.25	EMC Corp.	25.50	2.88	12.7
OTC	10.50	5.38	Emulex Corp.	9.25	-0.38	-3.9
OTC	23.00	13.25	Evans & Sutherland	17.75	-0.50	-2.7
OTC	40.63	12.00	Exabyte	17.75	1.38	8.4
OTC	66.00	19.00	Intelligent Inpt. Systems (H)	66.00	4.00	6.5
OTC	11.25	4.75	Iomega Corp.	7.13	-0.25	-3.4
OTC	20.00	10.00	IPI Systems Inc.	10.00	-2.00	-16.7
OTC	23.25	10.75	Komag Inc.	17.50	0.25	1.4
OTC	19.63	7.75	Maxtor Corp.	10.75	-3.00	-21.8
OTC	12.63	7.13	Micropolis Corp.	9.13	-0.38	-3.9
NYS	107.00	89.50	3M Corp	100.00	0.63	0.6
OTC	6.75	4.00	Printronix Inc.	6.75	2.00	42.1
NYS	13.50	6.88	QMS Inc.	13.25	0.00	0.0
OTC	18.00	12.13	Quantum Corp.	15.00	-1.13	-7.0
OTC	12.75	3.75	Radius Inc.	5.25	0.00	0.0
NYS	15.50	7.50	Recognition Equipment (H)	14.63	0.38	2.6
OTC	13.88	6.75	Rexon Inc. (L)	7.75	-1.00	-12.1
OTC	22.38	10.75	Seagate Technology	17.38	-3.00	-14.7
NYS	78.00	18.38	Storage Technology	30.75	0.38	1.2
NYS	22.50	16.50	Tektronix Inc.	22.13	0.63	2.9
NYS	86.00	60.75	Xerox Corp. (H)	86.00	2.50	3.0
SERVICES						
OTC	23.50	12.16	American Mgmt. Systems	22.11	1.25	5.7
NYS	5.38	3.00	Amacomp Inc.	4.50	0.25	5.9
OTC	30.00	15.50	Analysts Int'l	30.00	6.50	27.7
NYS	55.63	38.75	Auto Data Processing	53.50	1.75	3.4
NYS	17.25	8.36	Comdisco Corp.	15.13	0.13	0.8
NYS	21.78	12.50	Condisco Inc.	14.13	0.13	0.9
OTC	13.50	6.75	Computer Horizons	10.25	0.50	5.1
NYS	84.88	57.00	Computer Sciences	78.25	2.63	3.5
NYS	10.13	7.13	Computer Task Group	7.75	-0.50	-6.1
NYS	40.50	22.00	CompUSA Inc.	36.50	3.38	10.2
OTC	19.25	6.00	Corporate Software	11.75	0.00	0.0
OTC	30.75	7.75	Edgmead Discount Software	10.38	0.13	1.2
NYS	34.00	25.25	General Motors E (EDS)	32.25	1.13	3.6
OTC	18.25	9.25	Ikagon Corp.	18.25	6.25	30.4
OTC	30.38	6.25	Intelligent Electronics	14.75	0.63	4.4
OTC	14.88	6.63	Merisel	11.38	0.50	4.6
OTC	15.75	5.75	Microage Inc.	9.75	1.38	16.4
OTC	40.00	21.66	Paychex	35.00	0.25	0.7
NYS	83.50	59.75	Policy Management Sys.	77.00	-1.00	-1.3
NYS	25.56	16.81	Reynolds and Reynolds	25.50	0.50	2.0
OTC	37.00	22.00	SEI Corp.	30.25	-0.50	-1.6
OTC	24.38	16.88	Shared Medical Systems	21.38	0.63	3.0
OTC	14.38	5.75	SMI Systemhouse	7.13	0.13	1.8
OTC	29.25	18.25	Software Spectrum Inc.	25.75	2.50	10.8
OTC	31.50	18.75	Sungard Data Systems (H)	29.75	0.25	0.8
NYS	5.63	1.13	Ultimate Corp.	2.25	0.38	20.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Intel profits rise

Citing an across-the-board uptick in demand, **Intel Corp.** last week reported fourth-quarter net profits of $429 million, up 127% from the comparable period last year. Revenue was $1.86 billion, up 54% from the same quarter in 1991. For the year, the Santa Clara, Calif.-based chip maker achieved record profits and revenue of $1.07 billion and $5.84 billion, respectively, up 30% and 22% respectively from 1991.

Adobe results mixed

Adobe Systems, Inc. recorded fourth-quarter profits of $8.4 million, off 46% from the like period last year. The net included a $6 million write-off of a real estate partnership investment. Revenue for the quarter was $70.7 million, up 13% from 1991. For the year, the Mountain View, Calif.-based company earned $43 million on revenue of $265 million — off 16% and up 16%, respectively, from last year.

SHL back in black

SHL Systemhouse, Inc. posted fiscal first-quarter net earnings of $900,000, compared with a net loss of $1.3 million in the year-earlier period. Revenue for the period ended Nov. 30, 1992, grew 10%, to $201.6 million. Services revenue jumped 55% in the quarter, the Ottawa-based company said.

SHORT TAKES Citing weakness in the U.S. and Asian markets, **Intergraph Corp.** in Huntsville, Ala., said its fourth-quarter revenue would be below expectations — in the $305 million to $310 million range — pushing the workstation maker into a break-even position for the period. ... Artificial intelligence pioneer **Symbolics, Inc.** is reducing its 110-person work force by 36% after a 20% decline in second-quarter revenue.

Strong growth predicted for high-tech industry

By Gary H. Anthes
WASHINGTON, D.C.

As usual, high-technology industries lead the way in the annual forecast of industrial activity compiled by the U.S. Department of Commerce. The agency predicted the U.S. economy will grow 3% overall in real terms in 1993, but it said sales of most computer-related products and services are expected to increase from three to five times that rate (see chart).

But more sales will not necessarily translate into more jobs. The Commerce Department said the computer equipment industry will post its fifth consecutive annual loss of employment, with the work force shrinking from 224,000 to 220,000 people, down from a peak of 290,000 workers in 1988.

Rosy outlook

The Commerce Department expects 1993 to be a good year for the U.S. information technology industry

Worldwide growth projections for selected U.S. industries (in billions)

	1992	1993	Increase
Electronic information services	$12.6	$13.5	16.4%
Data processing and network services	$40.2	$45.7	13.7%
Computer professional services	$55.5	$61.0	9.9%
Computer hardware and peripherals	$53.7	$58.0	8.0%
Packaged software*	$23.3	$26.5	13.7%

*U.S. only

Source: U.S. Department of Commerce — CW Chart: Michael Siggins

"Computer equipment should be one of the strongest sectors in 1993, with domestic purchases growing rapidly and exports resuming," said Timothy J. Hauser, acting undersecretary for international trade. "While some growth in mainframe sales is expected, the most significant trend is downsizing. In 1993, workstation sales are expected to grow by 28%, to $14 billion."

Back on track

The bullish projections found in the Commerce Department's "U.S. Industrial Outlook 1993" report are partially based on surveys of U.S. business spending plans. Those surveys found that "a large number of corporate information systems directors were beginning to reinstate major computer hardware procurements, previously deferred or canceled, to relieve substantial pent-up demand for greater processing power."

"Eight percent growth [for hardware] is very reasonable, very doable," said Neeraj K. Vohra, computer industry analyst at Standard & Poor's Corp. in New York. "And that means significantly higher growth — maybe 15% to 20% — in unit sales because prices are falling."

Vohra said the PC price wars, which are temporarily on hold due to a shortage of Intel Corp. 1486 microprocessors, will resume by midyear, fueling higher sales. That, combined with the robust sales of PCs in 1992, will sharply boost sales of peripherals as well, he said.

On the money

Last year, the Commerce Department over-predicted the performance of the computer industry but only slightly. Current estimates for 1992 sales lie in the range of 95% to 100% of the forecasts the agency made in 1991.

The Commerce Department report also predicted the following:

- Semiconductor firms will boost shipments by 12% in 1993, as they did in 1992.
- The downsizing trend will hold mainframe sales growth to 4%, about twice the rate of growth in 1992. Price per million instructions per second (MIPS) will fall from $100,000 in 1992 to $15,000 in 1995.
- Sales of conventional supercomputers will grow 5%, but sales of massively parallel computers will rise 40% to $420 million.
- Shipments of midrange systems will grow by roughly 8%.
- Sales of workstations will soar 28% while uniprocessor performance for high-end units will climb to 300 MIPS.
- The U.S. PC market will grow 8%.
- Laptop sales will grow 8%, while notebook shipments will nearly double in volume.
- The value of U.S. computer imports including parts and peripherals will exceed the value of exports for the third year in a row, boosting the U.S. computer trade deficit to $7 billion.

"Much of the import growth is in peripheral equipment and parts from U.S. offshore and foreign plants," Hauser said. "The growth in imports reflects the fact that the production of hardware is becoming more globalized. At the same time, the U.S. computer industry continues to be extremely competitive in systems and software technologies."

Small increase

While the Commerce Department says U.S. computer industry revenue will rise by billions of dollars this year, it is not clear where the money is going to come from. Computer Sciences Corp. recently completed a survey of 407 IS executives and found that IS budgets will rise just 2.3% in the U.S. and 4% in Europe this year, the smallest increases in five years.

Prodigy to cut staff 22%

By Ellis Booker
WHITE PLAINS, N.Y.

Prodigy Services Co., the on-line services joint venture between IBM and Sears, Roebuck and Co., last week said it would slash 250 positions, or more than 22% of its 1,100-person work force.

In addition, Prodigy will use a Sears unit, SPS Payment Services, Inc., to handle its customer service operation. Sixty-five Prodigy employees are being offered jobs at SPS, and Prodigy said it will pay for their relocation.

Formed in 1984, Prodigy began its graphical, on-line service in October 1988. The information service claims that it has 2 million households as subscribers and 85 companies that advertise on-line.

Patience questioned

But Prodigy, which at times has been dogged by controversies over pricing and privacy issues, has yet to turn a profit. Industry observers have wondered about the continuing patience of partners IBM and Sears — which have invested an estimated $800 million to $1 billion in the venture — given their own recent financial woes.

"You have to assume [Prodigy President Ross Glatzer) was getting pressure from IBM," said Lorraine Sileo, editor of "IDP Report," a weekly newsletter on the information services industry published by Simba Information, Inc. in Wilton, Conn. Prodigy's announced layoffs last week followed several senior executive departures.

Prodigy rejected speculation that IBM or Sears had a hand in pressuring the decision. "There was none," said a spokesman, adding that senior executives from both companies have been quoted as saying they have no intention of changing their relationship with each other or Prodigy.

While Prodigy officials will make no calendar predictions about profitability, Sileo predicted the service could go into the black by next year. "They have a good chance after this restructuring and the write-offs," she said.

Prodigy's Media operation will now be split into four lines of business, each with its own general manager.

Wysiwyg

WINDOWS WEIRDNESS

By Jeff McGroary

Want to get to one of Windows 3.1's undocumented features? Try this combination:

1. Press and hold the Ctrl and shift keys throughout the remaining steps.
2. From the Program Manager "Help" menu, open the "About" dialog box.
3. Double-click on one of the panes of the Windows logo in the upper left-hand corner of the dialog box.
4. Click the "OK" button.
5. Repeat steps 2 and 3 again, double-clicking on the same pane. Notice the fluttering Windows logo flag.
6. Click the "OK" button.
7. Repeat steps 2 and 3 again. Depending on which pane you clicked, you'll see either Bill Gates, Steve Ballmer, Brad Silverberg or T-Bear (the Windows 3.1 development team mascot) pointing to the scrolling credits listing members of the development team.

Find any interesting, undocumented features in your applications? If so, please contact Lory Dix or Jodie Haze at (800) 343-6474. If we use your ideas, we'll send you a gift.

DUH!

"Network management is the largest concern of network managers today."

—From January 1993 "Networker," a newsletter for Novell resellers in the Great Lakes region.

PR BLOOPER

In a press release from Borland, Philippe Kahn was described as the company's "characteristic chairman."

We know he's a character, but . . . What they probably meant? Charismatic.

BETTER LUCK NEXT TIME!

The Fifth Wave

"AND TO COMPLETE OUR MULTIMEDIA PRESENTATION..."

Inside Lines

Let's hope the E-mail is shorter than the speeches

Jeff Eller, a communications aide for President-elect Bill Clinton, told *Computerworld* last week that the new administration will make its speeches and other public documents available on-line and eventually plans to allow the public to communicate with the White House via electronic mail. "We have a real commitment to make this happen, but it won't happen overnight," Eller said in a telephone interview from Little Rock, Ark. He added that the CompuServe/Internet address used by the Clinton campaign for public communications will remain open when Clinton takes over the White House. That address is 75300.3115.

Hold that eraser, really

The Bush White House, after being ordered to save some 4,000 mainframe backup tapes for posterity [CW, Jan. 11], wanted to erase the original messages and PC hard disks to "wipe the slate clean" for the incoming Clinton administration. After a federal judge issued another order blocking the erasure of any electronic federal records, the Bush administration made a last-ditch appeal to the U.S. Court of Appeals. The appeals court said late Friday that the White House could erase records, but only if complete backup tapes are made.

Core of the problem

Apple Computer recently unveiled a new keyboard that splits in the middle and allows users to adjust the angle at which they type, thus reducing stress-related injuries. However, in 1986 Anthony Hodges patented a remarkably similar product; he has been trying unsuccessfully to get Apple to produce it ever since. Apple officials deny they stole the idea.

Not yet ripe

Still waiting for a new PowerBook 180, Performa 600 or Quadra 950? Better sit tight. Apple Computer Chairman John Sculley last week bumped back the full-availability date of products already in short supply. "We do not expect to be out of backlog on certain products until the second half of the year," Sculley said. No word on what those "certain products" are.

To route or to bridge?

High-end-router maker Coral Network Corp. next week will introduce a version of its Backbone Express internetworking gear that is said to beef up routing performance to rival that of bridging, "making the choice to bridge or route a nonissue," according to a company official. Users today often elect to bridge traffic between networks for the benefit of higher speeds, though they give up routing benefits of partitioning networks for security and automatic reroute around failures.

When lawyers meet hackers

The most vigilant system administrators and security officers use network analyzers to monitor the keystroke activity of outside hackers. But a super-picky reading of federal wiretap law reveals that they may be breaking the law because they are "intercepting" the messages. So, the legal eagles at the U.S. Department of Justice have come up with a humongous, 101-word warning message that federal agencies should use on their log-on screens to notify regular users and hackers that their keystrokes may be monitored.

The FCC has more than one Howard Stern to contend with. Sprint Data Group's director of market analysis happens to carry the same moniker as the generously maned, uninhibited radio deejay and sometime TV personality who has riled the FCC over what it considers to be "pornographic" material. The well-groomed Howard J. Stern from Sprint, who frequently visits the FCC on telecommunications issues, said he gets more than a sideways glance when he signs in under his real name. He has been advised to scribble down an alias to avoid potential unrest and abuse at FCC headquarters. Got any news tips? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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COMPUTERWORLD

Giants spar over networked DBMSs

Microsoft, Borland aggressively court IS

By Jean S. Bozman
SAN FRANCISCO

■ Like two warring gods in ancient mythology, Microsoft Corp. and Borland International, Inc. are fighting to win over information systems managers looking to "upsize" their PC local-area network databases.

Each vendor is throwing lightning bolts in the form of feature-packed tools and aggressively low prices.

For example, to attract power users to a type of programming usually practiced by trained systems analysts, both Borland and Microsoft are providing many ease-of-use features.

Microsoft's Access has "wizards" and "cue cards" to prompt end users building database reports. The object-oriented development language in Borland's Paradox for Windows is also intended to expand the user base.

But winning IS loyalty could require a more direct, hands-on approach as corporations move to open systems, analysts said.

With that in mind, Borland and Microsoft have come calling at large user sites where they have already installed many products.

"The end-user community has been dying for a database for Windows applications. We're looking at both of their tool sets and seeing how they match into our plans," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco.

Sweeteners such as introductory prices of $99 for Access and $139 for the delayed Paradox for Windows (CW, Jan. 18) are supposed to gain IS managers' mind share when database servers are

Giants, *page 14*

Doubts grow over NT package, date

By Christopher Lindquist
REDMOND, WASH.

■ Windows NT is going to be either late or "lite," according to well-connected industry analysts and users queried last week.

In a scenario that is increasingly beginning to resemble the early days of OS/2, Microsoft Corp. appears to be struggling to determine not only how to present Windows NT but even what Windows NT will be in its first release.

While Microsoft still insists that Windows NT will ship in the second quarter with all promised functionality, analysts and users are betting that the new operating system will either have to be delayed as much as several months or stripped of some functionality to meet the scheduled ship date of May or June.

There are also reports that an NT product containing only client functionality — limited networking — may be in the works for release before the full Windows NT shipment, something Microsoft vehemently denies.

What is apparent, based on the near unanimity of opinion by analysts and users, is that Microsoft still has something of a credibility gap to bridge. Despite Microsoft's strong statements to the contrary, observers still have doubts about the firm's ability to deliver on what it promises.

> **Microsoft will be "hard-pressed to have [Windows NT] out by June."**
>
> *— Craig Goldman, Chief Information Officer, Chase Manhattan Bank*

"The pattern that's shaping up is beginning to look a lot like OS/2," said Neal Hill, senior analyst/computing strategies at Forrester Research, Inc. in Cambridge, Mass.

IBM's experience with OS/2 2.0 included several slipped shipment dates and a final product that contained less than the originally promised functionality.

Microsoft has already pushed back Windows NT's shipment date several times — from late 1992 to second-quarter 1993 — since announc-

Windows NT, *page 8*

Mapping the future

Industry looks to Clinton regime to accelerate technology highway

By Gary H. Anthes and Joanie M. Wexler

Now that a technology-savvy administration is settling into the White House, opinions abound as to what role the federal government should play in building a coast-to-coast electronic information highway — a pet project of Vice President Albert Gore.

The tumult of last week's inauguration did not stop Rep. Edward J. Markey (D-Mass.) from holding a congressional hearing to examine ways to unite warring factions such as newspaper publishers and local telephone companies behind a program to bring digital net-

Clinton, *page 20*

■ President Bill Clinton will face pressure from the high-technology industry to address the need for a nationwide electronic information highway.

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Wal-Mart spotlights fast LANs

Retailer hopes to speed up store-to-supplier ordering

By Elisabeth Horwitt
BENTONVILLE, ARK.

Wal-Mart Stores, Inc. is counting on a high-speed, enterprisewide local-area network, slated for completion in April, to feed the bandwidth-hungry applications and business practices it hopes will keep it ahead of its retailing rivals throughout the decade.

The crux of the network is LAN Advantage, a product from Hughes Network Systems, Inc. that puts Hughes' very small-aperture terminals directly on Token Ring LANs installed at stores, warehouses and headquarters.

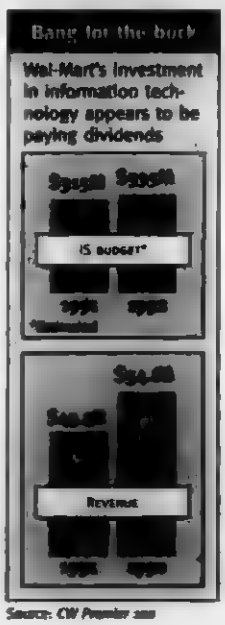
The network will boost transmission speeds of individual stores on Wal-Mart's enterprise backbone from about 19.2K bit/sec. to hundreds of thousands of kilobit/sec., according to Michael Fitzgerel, special project manager of the retailer's network.

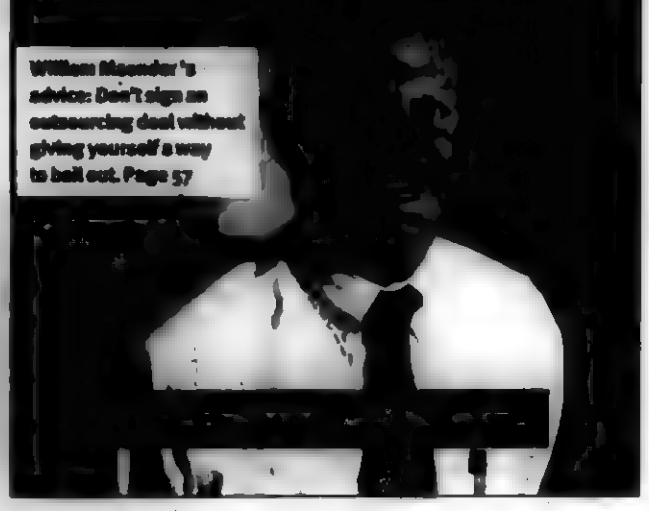
The faster connections are crucial, given that "we have a number of applications coming along, each of which has the need to move multiple gigabytes of data per day to and from the stores," Fitzgerel said.

Among the more strategic of these applications are Wal-Mart's multiyear push toward direct store-to-supplier ordering as well as recent experiments with multimedia PCs as training vehicles.

The new direct LAN-to-satellite links will make file transfers go five to seven times faster and will speed up Unix server-to-IBM host interactions by as much as 50% — all without the need to replace Wal-

Wal-Mart, *page 16*





William Macomber's advice: Don't sign an outsourcing deal without giving yourself a way to bail out. Page 57

NEWS

Industry heavyweights kicked off the new year with a bushel of bad financial news. A bedeviled IBM announced its biggest loss ever, glumly noting that its fortunes are unlikely to be reversed anytime soon. And a beleaguered Borland posted a startling $63.1 million loss for the third quarter. One bright spot was Computer Associates, which revealed record revenue and earnings for its third quarter. *Pages 4, 14*

President Bill Clinton barely got through his inauguration before debate over nationwide telecommunications issues began. Chief on the list is the disposition of a super data highway. Also high on that to-do list is finding a replacement for the DOD's IS czar, Paul Strassmann, who resigned last week. *Pages 1, 10*

The battle for the desktop has moved into overdrive on both the operating system and database fronts. Microsoft is particularly busy lately, slugging it out with Borland for the desktop database market while also owning up to bugs in Access. Microsoft also must fight off continued doubts about NT's scheduled delivery date and packaging. Meanwhile, the upcoming release of several key PC applications under OS/2 2.0 adds to the pressure. *Pages 1, 8, 14*

Ten-year-old Novell finds it must confront new obstacles, including increased competition and support issues. *Page 12*

VIEWPOINT

Industry watcher John Gantz predicts a boom in 32-bit operating systems and a resulting shake-up in IS. *Page 29*

THE CW GUIDE: PRESENTATION SOFTWARE

Presentation tools are serious business for sales and marketing departments, which are often left on their own to choose and support tools. *Page 63*

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A PUBLICATION OF IDG

Tandem drives client/server

By Jean S. Bozman
CUPERTINO, CALIF.

A year after outlining its client/server strategy, Tandem Computers, Inc. this week will launch a series of software products that support cooperative processing between Tandem's fault-tolerant computers and a wide array of desktop machines.

The client/server initiative, expected to be announced at this week's Client/Server Expo in San Jose, Calif., is based on a software tool kit with application programming interfaces (API) to link clients and servers.

Tandem is also bundling the tool kit with CLX/R servers ranging in price from $69,900 to $233,000. Some of the tools are now available; the rest will be available in the second quarter.

Tandem's client/server tool kit ties Tandem's proprietary Guardian systems to a wide range of clients, including Unix, IBM's OS/2, Microsoft Corp.'s MS-DOS and Windows and Apple Computer, Inc. Macintosh clients.

Other tool kit options will allow users to build Windows applications using Microsoft's Visual Basic or tools from Gupta Corp. and Powersoft Corp., according to Gary Sabo, Tandem's director of product marketing.

Some of the 100 beta-test sites have long wanted to retrofit their character-based applications with graphical user interfaces on PCs and Unix workstations. Previously, users often employed dumb terminals to view Tandem database applications.

"We're going to bring some of the system functions, like screen processing, out to the workstation," said Doyle Kitchen, president of Information Processing Corp., a firm in Dallas that writes Tandem banking applications. "Now we can bring the data out of the NonStop SQL database and conduct the analysis and graphics work in our Windows applications."

Some longtime Tandem users could not wait for the new client/server packages. "We jumped the gun on Tandem and wrote a client/server application before the beta program," said Doreen Wakefield, manager of data administration at Viking Freight System, Inc., a San Jose, Calif., trucking firm.

The tools will extend Tandem's proprietary Guardian operating environment, industry analysts said. "Tandem is recognizing that OLTP [on-line transaction processing] in the '90s is often front-ended by a GUI PC," said Roy Schulte, a software analyst at Gartner Group, Inc.

Tandem's fault-tolerant computers have always had a requester/server architecture, Sabo said. But without the new kit, users had few ways to link Tandem's proprietary NonStop SQL relational database with applications running on other vendors' hardware.

Building blocks

Tandem's client/server OLTP tool kit for client/server applications includes the following:

- Remote Service Call, a server-based API that links client and host applications.
- Pathway Open Environment Toolkit, a Tandem application development tool kit for developing client/server software.
- Tandem Dynamic Data Exchange (DDE) Gateway, which allows users to build Windows applications using Microsoft's DDE.
- Tandem Dynamic Link Libraries (DLL) Gateway, which uses Microsoft's DLL to link Windows applications with host database services.

Miller resigns from Wang

By Melinda-Carol Ballou
LOWELL, MASS.

Wang users and third parties were surprised by the sudden resignation last week of Richard Miller, Wang Laboratories, Inc.'s president and chief executive officer.

Miller, who drastically reduced the company's staff and sought to refocus Wang during the past four years, had previously said he would see the company through its Chapter 11 proceedings.

But last week, Miller defended his decision to leave, saying the company's reorganized business plan will be in place within several weeks. Such a plan must be filed by March 16.

Miller added that he believes the company is ready to "emerge from Chapter 11."

"Because Wang is preparing to emerge as a much smaller company, it needs to bring in a less costly management structure," Miller said. "I decided to step aside to allow the new management team to step in place."

Trio to take over

Replacing Miller will be a team of three managers that he brought in over the past several years: Michael Mee as chairman and chief financial officer; Donald Casey as president and chief development officer; and Joseph Tucci as president and CEO.

"It would be foolish to say it wasn't a surprise, but it's consistent with Wang's attempt to downsize," said Bill Sturgeon, president of the U.S. Society of Wang Users. He minimized the impact of the decision on the installed base.

The company reiterated its focus on end-user software, services and systems integration and its intent to continue moving away from manufacturing and the increasingly moribund minicomputer hardware market.

Tucci hastened to reassure customers that the company will support existing products and continue to make VS systems as long as "anyone wants to buy them."

But that reassurance is irrelevant for many users who are in the process of making the transition away from Wang products, according to Bill Sines, an analyst at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

He said Wang's proprietary offerings were not holding a user base that is increasingly drawn to open systems, and that software shipments planned for release in the next month or so on a range of Unix platforms may come too late.

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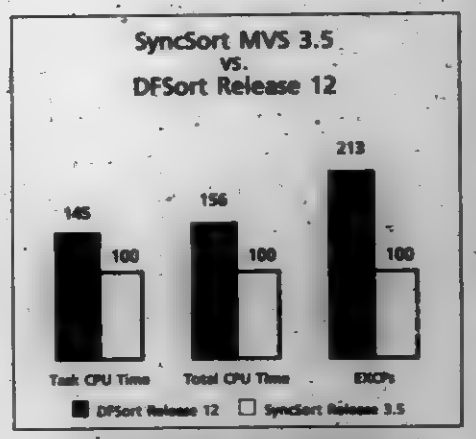

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CA extends Unix software

Port plans
CA is reportedly working with NCR and Unisys Corp. to port Unicenter to their open systems platforms. Joseph G. Brown, vice president of marketing at Unisys' Unix Systems Group, confirmed that CA and Unisys have plans for a Unicenter-to-Unix port for Unisys' U 6000 Unix servers. However, Brown would not discuss delivery dates. CA's Sanjay Kumar declined to confirm such plans. CA could also eventually port its systems management package to Digital Equipment Corp.'s Alpha OSF/1 operating environment, analysts said.

By Thomas Hoffman
ISLANDIA, N.Y.

In a week filled with moribund financial news, Computer Associates International, Inc. stood out with record quarterly revenue and earnings while detailing plans to expand nonmainframe software and support across its product lines.

At the center of CA's announcements was its decision to port its CA-Unicenter systems management product suite to IBM's RISC System/6000 AIX operating environment.

"If they're going to put better management tools on the RS/6000, that's good news for us. We're all looking for bigger and better tools to manage integrated networks," said Richard W. Lester, vice president of information services at Associated Grocers, Inc. in Seattle, which has 10 RS/6000s.

But Associated Grocers also runs Hewlett-Packard Co. and NCR Corp. Unix machines on its network, so Lester said he would like to see a systems management tool designed for heterogeneous Unix network control. "It's important that the Unix systems management tool not be tied to any single vendor," he noted.

That is no problem, according to CA. Alan Paller, director of open systems at CA, said Unicenter for Unix can manage multiple Unix environments from a single console as if it were one common network.

Unicenter plans

CA, which earlier announced a Unicenter port to IBM's OS/2 2.0 operating system, plans to begin shipping Unicenter for the RS/6000 within the next 12 months, said Sanjay Kumar, CA's senior vice president of planning. The company is also porting Unicenter-to-Unix platforms from HP and Sun Microsystems, Inc.

Unicenter for the RS/6000 comes as CA follows through on earlier promises to improve customer service and support across its product lines [CW, April 20, 1992]. Last spring, CA created teams of client service representatives empowered to discuss with CA customers issues ranging from support to technical problems.

FINANCIAL UPDATE
Computer Associates

Computer Associates' third-quarter income of $80 million was a quarterly record

	3rd quarter
[illegible]	$501.5M
[illegible]	19.7%
[illegible]	
[illegible]	

Source: Company reports

Since then, CA has doubled the size of its client services staff from roughly 80 agents to more than 170, according to Kumar.

Some CA customers said they have noticed an improvement in support. "We've definitely noticed a difference," said Laurie Belisle, a database administrator at Empire Financial Group in Kingston, Ontario. Since the client service program began, Belisle said, CA has been more accessible and has even helped Empire Financial reduce its annual software maintenance costs.

However, she added one caveat. "We find that they have a very high turnover rate in the reps that we deal with. Every few months we have to rebuild that working relationship. It may be the way they run the company, but it's kind of difficult for us," she said.

Still, CA's responsiveness to its customers appears to have positively impacted its bottom line (see chart).

"Without a doubt, one thing that is infinitely apparent when you talk to CA customers is how attentive CA is to them. It's helped customer relationships, and it's helping benefit CA," said Terrence Quinn, managing director at Furman Selz, Inc., a New York brokerage house.

IBM waves goodbye to worst year in company's history

By Johanna Ambrosio and Maryfran Johnson
ARMONK, N.Y.

IBM last week revealed a $4.97 billion loss for 1992, the largest in U.S. corporate history, and said there is little hope of things getting better anytime soon. Even markets that have traditionally been bright spots for IBM, such as minicomputers and workstations, will see slower growth during 1993, analysts said.

"A modest recovery in the U.S. is being offset by very soft economic factors in Europe," said John Jones, an analyst at Salomon Brothers, Inc. in San Francisco. "We're expecting 1993 to be a very tough year."

An IBM spokesman concurred. "The near-term outlook remains unfavorable," he said.

The 1992 loss (see chart) includes charges for capacity and employee reduction programs and for accounting changes. Without deducting the charges, IBM's worldwide 1992 earnings were $1.42 billion.

Financial summary

IBM's financial results included the following:

- Mainframe revenue fell 12% for the year, with total hardware sales plummeting by 20%.
- Revenue from PCs was down by about 15% compared with 1991, even though it bounced back some during the fourth quarter, the IBM spokesman said.
- Software revenue rose 5.8% for the year.
- Nonhardware sales, which include consulting, software and leasing hardware, accounted for 48% of IBM's 1992 revenue. This compares with 43% in 1991. Services performed particularly well, with revenue up 32% for the year.

FINANCIAL UPDATE
IBM

IBM's financials took a beating, ending the year with close to $5 billion in losses

	4th quarter	Year end
[illegible]	$19.6B	$64.5B
[illegible]	(10.9)%	(.38)%
[illegible]		
[illegible]		

* Not meaningful

Source: Company reports

Particularly troublesome was the fact that even sales of IBM's traditional highfliers, the Application System/400 minicomputer and the RISC System/6000 workstation lines, slowed during 1992.

Although new products expected next month may help generate new revenue, any new sales probably will not make up for lost revenue elsewhere in IBM's lineup, analysts said.

Revenue from the AS/400 family fell by about 2%, compared with 1991, the IBM spokesman said.

Some users are still signing up for new machines. Jeffrey Mahoney, data processing manager at SCM Office Supplies, Inc. in Marion, Ind., said he has already ordered one of the new AS/400s, a Model F35 that will be introduced next month. "We're interested in getting the most horsepower we can," he said. The new F family is expected to better the E models' price/performance by 30%, analysts said.

A similar story is told of the high-flying RS/6000 family, which had been growing by more than 40% per year but slowed to about 30% during 1992 and will pretty much stay there during 1993, according to analysts.

IBM is thought to be doing quite well with its high-end RS/6000 sales, but low-end desktop devices are priced too high, cramping large volume sales. Also, analysts said, RS/6000s sell most strongly in accounts that already have some IBM gear.

"Hewlett-Packard is beating them up in the commercial marketplace," said Bob Tipton, president of RS Tipton, Inc., a technical consulting firm in Denver. "And they've forsaken their bread-and-butter customers in the scientific/technical market" by failing to keep up with the superior graphics capabilities of some other vendors' workstations, he said.

Joe Garner, MIS director at CRSS Architects in Houston, said he recently signed on for three RS/6000s because of improved price/performance. And preliminary figures from Dataquest, Inc. show IBM holding fast to its No. 3 position in worldwide workstation revenue. From 1991 to 1992, IBM's market share grew to 18.4%, from 15.8%.

Although analysts said they expect IBM to stir up the competition once again on Feb. 2 — with the announcement of faster, cheaper RS/6000s from low to high ends — industry watchers are also mindful of the slumping economies both here and abroad.

"IBM tends to sell a lot of workstations into the aerospace and automotive industries and in Europe, and they've been impacted by economic issues," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Room to grow
A report by Needham & Co. in New York said that after new-unit sales increased by 40% in 1989 and 30% in 1990, growth leveled off to about 11% in 1991 and 10% in 1992. Meanwhile, the market for AS/400s at large companies is saturated but still has some room for growth, according to a recent survey by Computer Intelligence in La Jolla, Calif. The research firm estimated that some 49% of mainframe sites in the U.S. have one or more minicomputers, up from 43% in 1989. The most popular minicomputer installed at these sites is an AS/400, the survey said. But some analysts disagreed about the AS/400's potential. "It's clear IBM is not getting follow-on business" for complex applications, said Tom Willmot, an analyst at the Aberdeen Group in Boston.

DISTRIBUTED QUERY COMPARISON

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
se
wh
ba
    CREATE PROCEDURE la_qty
    /* for use on WESTCOAST server */

    /* returns count for one part only */
    @partno char(6),
    @la_count int output
    AS
/*  SELECT @la_count =
    (SELECT qty FROM la_parts
/*  WHERE partno = @partno)

    DECLARE @cnt int
    DECLARE @counter int
/*  DECLARE @la_count int
    DECLARE @partno char(6)
    SELECT @cnt = COUNT(partno) FROM ny_parts
en
    /* ny_parts is the parts master; need count
/*  for sequential comparison with la_parts
*/  to simulate a distributed join */
DE
DE
pr
se
wh
ba
se
@@
up
    SELECT @counter = 0

    /* create temporary table for part numbers
    and quantities from ny_parts */
    CREATE TABLE #allparts1
       (partno char(6) NULL,
       ny_qty int null)

    /* create temporary table for row numbers
    for sequential call of la stored procedure */
    CREATE TABLE #allparts2
       (seq int)

    /* create temporary table for
    sequential build from first two temp tables */
    CREATE TABLE #allparts3
       (partno char(6) NULL,
       ny_qty int null,
       la_qty int null,
       seq int)

    /* build sequence numbers for each ny row */
    while @counter 1> @cnt
    begin
       select @counter = @counter + 1
       insert into # all parts 2 (seq) values ( @ counter )
    end

    /* populate temp table with ny parts and quantities */
    insert into #allparts1 (partno, ny_qty)
    select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

These two programs do exactly the same thing: retrieve data from multiple servers. Oracle does it with a single 3 line Industry Standard SQL query. Sybase requires 90 lines of complex code. If productivity is important to you, call 1-800-633-1071 Ext. 8185.

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News Shorts

SCO picks Michels' successor

The Santa Cruz Operation (SCO) last week selected the company's top European manager, Lars Turndal, to lead SCO. The appointment fills the gap left by company co-founder Larry Michels, who retired abruptly last month after a sexual harrassment lawsuit was filed against him. The SCO board of directors also promoted Doug Michels by adding "chief technical officer" to his title of executive vice president.

IBM forms multimedia team

Unwilling to cede the budding desktop multimedia applications market to Apple Computer, Inc., IBM last week formed a separate unit within its IBM PC Co. charged with fostering the development of multimedia applications. President of the new Fireworks Partner unit at IBM is Robert L. Carberry. He will report to James Cannavino, IBM senior vice president and general manager of Personal Systems.

Intergraph adds workstations

Intergraph Corp. in Huntsville, Ala., last week rolled out a new family of computer-aided design, manufacturing and engineering workstations and servers based on its C400 reduced instruction set computing (RISC) processor. The Series 2700, 6700 and 6800 workstations and servers, priced from $12,500 to $70,000, run Unix now with an option for Microsoft Corp.'s Windows NT later.

HP offers trade-in

With an eye to those 100,000 users still chugging away on former Apollo Computer Domain-based machines, Hewlett-Packard Co. last week announced its most extensive trade-up program yet to lure those potential customers into the fold. HP's Trade-Up '93 program, which will run throughout the year, accepts a broad range of workstations, PCs and X Window System terminals toward the purchase of new Precision Architecture-RISC workstations from HP. And not to be outdone, Sun Microsystems, Inc. is expected this week to counter with its own expanded trade-up program for Apollo users.

Chipcom blueprint

Local-area network vendor Chipcom Corp. last week mapped out its plan for migrating customers toward higher bandwidth communications. The firm plans to enhance its smart hubs to allow users to dedicate a full 10M bit/sec. Ethernet LAN to one workstation this quarter. Later in 1993, it will bring LANs onto a high-speed Asynchronous Transfer Mode (ATM) backbone, then bring ATM to the desktop in 1994 by integrating an ATM switching module into its hub, said David Fowler, Chipcom vice president of marketing.

Net management action

The SNA MIB Consortium had its first meeting last week to discuss how to develop management information bases (MIB) that would enable a variety of IBM Systems Network Architecture products to be managed via the Simple Network Management Protocol. The group plans to propose at next month's Internet Engineering Task Force meeting that a working group be formed to develop such MIBs.

SHORT TAKES Todd Rulon-Miller, former sales vice president at Next, Inc. has resurfaced as president of banking software vendor Software Alliance Corp. in Berkeley, Calif. . . . Syquest Technology officials have advanced a new software driver standard they said will help ensure 100% interchangeability among drive subsystems.

News shorts, *page 16*

Stepping into a new system

By Johanna Ambrosio
HYDE PARK, MASS.

J. Baker, Inc., one of the country's largest shoe manufacturers, has injected a dose of high-tech soul into its soles. This month, the company will complete a multimillion-dollar mainframe conversion, which it accomplished while acquiring two companies, with another purchase on the way.

The move from a Honeywell Bull, Inc. DPS 8000 mainframe — and 15-year-old software — to an IBM mainframe started in September 1989, when Baker decided to re-engineer its entire business.

"We were not able to find information or to manipulate it, and we didn't have data down to the level of detail we needed," said Jay Scheiner, chief information officer.

The company decided to stay mainframe-oriented because at the time, it felt large systems were the only computers robust enough to handle its needs. Baker owns 140 shoe stores and leases space in 1,100 discount outlets, including Jamesway Corp. and Caldor Corp. For the year ended Feb. 1, 1992, sales were $494 million; compound annual growth during the past five years has been more than 20%.

True payback on the system is slated for 1995, but the company will probably see big benefits beginning this year, Scheiner said. "We started building the database in October 1991, but now everyone is just really starting to use it. We'll have data down to the level of what sizes are selling where."

Already, though, there have been a few advantages. The warehouse inventory levels in November 1992 were the lowest ever, Scheiner said. "It's a whole lot easier to run a business when everyone is working from one set of numbers."

Work on the technology component began in January 1990, when the company hired Andersen Consulting to determine whether to upgrade the Honeywell or move to a new system. An IBM 3090-150J was brought in but was upgraded to a Model 300S. "There were lots of Band-Aids holding [the software] together," Scheiner said.

Package picked

Baker opted for software from Computer Business Applications, which Andersen helped customize. Called Genesis, the package includes integrated modules for database management, merchandise analysis, purchase order management, sales and financials, among other tasks.

At the time of the conversion, Baker had 20 people in its information systems department; that figure has grown to 75. To help make the cutover, the company hired contract programmers to maintain the Honeywell system while Baker's own staff worked on and learned the new system.

In January 1991, Baker moved the corporate payroll data over to the IBM system. The Parade of Shoes division came up in June, the licensed-shoes division in September. In October 1991, Baker pulled the plug on its old mainframe.

Meanwhile, Baker was expanding into the apparel business by acquiring Casual Male Big & Tall stores and then the Wearguard store chain. The Wearguard group was brought up on the IBM system in February 1992, and the Casual Male division's cutover will be completed next month.

The firm chose an unusual way of rolling in the new system. After three months of making software changes and testing the IBM, Baker pulled the plug on the Honeywell and brought up the IBM during a weekend. That way, he said, "we wouldn't have to do a lot of throw-away work writing interfaces between the two systems or have inconsistent data between the two."

The real test may come later this year, as Baker gets ready to acquire Morse Shoes, which will almost double the size of the company. Scheiner is working with the IS executives at Morse to try to integrate the two. But he said he is not worried. "Our MIS staff is trained to do this. We have it down pat."

Forbes names first formal IS director

By Neil Margolis
NEW YORK

Thomas J. Casey, former information systems manager at the Boston general office of New York Life Insurance Co., last week surfaced as *Forbes*' first formal IS director. His first assignment will be to get the magazine's five departmental PC local-area networks on speaking terms.

Powered to the front ranks of business journalism by the late entrepreneurial legend Malcolm Forbes, the company is now moving to give its IS setup some of the gloss that characterizes its expanding stable of publications.

Eleven months ago, the privately held company unplugged its IBM 4341 mainframe and outsourced its formerly mainframe-driven order fulfillment operations to CDS, Inc. in Des Moines, Iowa. That left the LANs — Novell, Inc. NetWare v3.11 setups — "currently running everything from Arcnet to Ethernet," according to Casey.

Fills a need

It was the need to build an infrastructure to support, interconnect and eventually expand these LANs that spurred *Forbes* to carve out its first officially designated IS director's slot, Casey said.

"As the technology has evolved, so has the title and the responsibilities that go with it," noted *Forbes*' Scott R. Yablon, vice president of administration. "Tom's job isn't necessarily bigger than the job that his predecessors held, but it certainly is different."

Forbes' IS staff formerly worked under the supervision of electronic data processing director Joseph DeMarte, who now works for the firm's circulation department.

Forging tight LAN connections, Casey said, will help pave the way toward a series of IS initiatives aimed at slicker, quicker and substantively enriched production of the four magazines that make up the *Forbes* family: the flagship business biweekly; its two supplements, *FYI* and *ASAP*; and *American Heritage*.

Top agenda items for the new IS chief include replacing fax with on-line transmission of the barrage of research data constantly flowing among the home office editorial staff and their peers in *Forbes*' dozen or so bureaus, and giving writers and editors access to a slew of outside databases. "We're even talking about getting on the Internet to tie the editorial staff more tightly into what's coming out of academics," Casey said.

Right off the bat, Casey will be helping implement the editorial department's move from an Atex, Inc. publishing system to a PC-based system, final selection of which is imminent, Yablon said.

REFERENTIAL INTEGRITY COMPARISON

SYBASE

200 LINES OF PROPRIETARY CODE

```
/* Make sure updates manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed.*/
/*  check "emp.deptno <--> dept.deptno" foreign/primary
            key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7™

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

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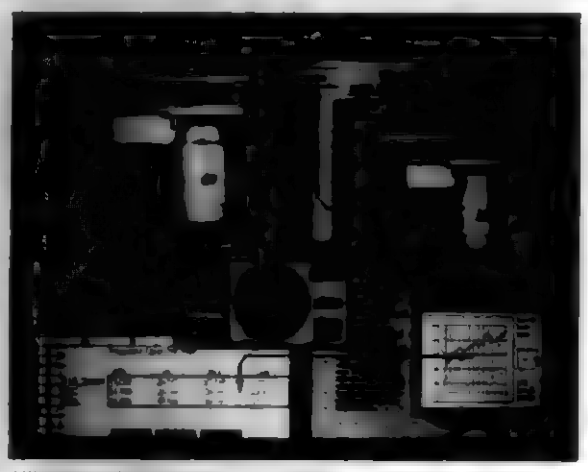
Silicon flexes 3-D muscle

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc. upped the ante in the technical computing market today with the introduction of a line of advanced graphics supercomputers said to be 10 times more powerful than any previous Silicon Graphics system. The $1 billion visual computing vendor is making headway against Hewlett-Packard Co. and Sun Microsystems, Inc. in technical accounts, particularly where three-dimensional graphics capabilities are important, said Ted Krum, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.



Silicon Graphics' *Indigo workstation creates 3-D model*

Along with the Onyx line of graphics supercomputers, Silicon Graphics is rolling out a $35,000 Indigo 2 Extreme workstation, which is scheduled to ship this quarter with a 100-MHz CPU based on Mips Technologies, Inc.'s R4000 chip. A daughter card upgrade to the 150-MHz R4400 chip will be available later this year for $6,000.

The company said it also doubled graphics performance in the midrange of the Iris Indigo line with the Indigo XZ reduced instruction set computing PC, priced at $23,000.

The Onyx systems, costing from $114,000 to $800,000, include Silicon Graphics' Reality Engine and VTX graphics subsystems. They can scale upward from two to 24 processors and are particularly well-suited for image processing, video production, visual simulation and scientific computation.

"We're intrigued with the Onyx, and we'll be using one for sure," said Michael Zeitlin, team leader at Texaco, Inc.'s integrated visualization technology project in Houston. Texaco is deploying Silicon Graphics machines in a multimillion-dollar, worldwide acquisition of visualization technology.

"I can't get enough of faster graphics for what I do," he said, echoing the comments of other users whose firms are ramping up their use of visual computing systems.

At Deere & Co. in Moline, Ill., for example, engineers are using Silicon Graphics' systems for analysis and prototyping work. "We like the SGI boxes because they're fast, elegant and easy to program for three-dimensional work," said John Howell, project manager at Deere. Increasingly, Silicon Graphics has been pulling its high-performance graphics downward into systems in the $10,000 to $40,000 range, a trend Howell called "refreshing."

"We think they're moving in the right direction," said Tom Linehan, director of visualization at CRSS Architects, Inc. in Houston, where roughly 20 Silicon Graphics systems are used for producing video and composite imagery, scene simulation and 3-D models. "We've also gotten a real competitive edge with the fast turnaround time between modifications of design. It used to take two to three months to redo a water color drawing, and now we can do it over lunch."

NT doubts grow

CONTINUED FROM PAGE 1

ing it in the summer of 1991. What remains to be seen is whether Windows NT ships with all functions intact when it is released.

Dwayne Walker, director of Windows NT and networking products at Microsoft, said NT will be fully functional when delivered. He added he is confident it will ship on schedule. "The feature set we've laid out will absolutely be in the Windows NT first release," Walker said in a recent interview.

However, he added that Microsoft would not "paint ourselves into a corner" and be forced to release the operating system before it is ready.

Indications are that it will not be, at least not by Windows World in May, when Microsoft is expected to throw its Windows NT launch party, according to Jesse Berst, publisher of the Redmond-based "Windows Watcher" newsletter.

Berst was optimistic that Microsoft could ship Windows NT by June, although he said the system may be slower than people had expected.

Others said it would be more likely that Microsoft will strip out some trouble spots, particularly in the area of networking, and release a lower functionality version of Windows NT that would be followed by a full package later in the year.

Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York, said he has reason to believe Microsoft will be "hard-pressed to have [Windows NT] out by June" and noted it made sense that the networking would be the first to go.

Networking first

Hill agreed, saying Microsoft would "pull the networking first and work their way down." A network-light version of NT could still be used on the desktop and would contain most of the benefits of a full 32-bit, preemptive multitasking operating system, minus some network management features.

Such a move would dovetail with information that indicates Microsoft may be considering shipping a "client" version of Windows NT that would include basic networking services such as full 32-bit processing and have preemptive multitasking.

However, it would lack symmetric multiprocessor support and some of the network and memory management tools of the full-blown Windows NT package.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said sources close to Microsoft told him that the company was investigating the possibility of releasing such a "client" version. But he could not confirm whether the decision had been made.

"That will not happen," claimed David Thatcher, group product manager for Windows NT. He noted that Microsoft has been pointing to Windows NT as both a client and server platform for the high end, so producing a "client" version of the operating system would be pointless.

Applications

1-2-3, WordPerfect coming for OS/2 2.0

By Michael Vizard

■ Users committed to OS/2 will begin to see their years of patience pay off as OS/2 2.0-compatible versions of two of the most popular PC applications are scheduled to roll out during the next four months.

Lotus Development Corp. in Cambridge, Mass., will deliver 32-bit OS/2 implementations of 1-2-3/G for OS/2 and its Freelance presentation graphics software in the first week of February, said Hilmi Ozguc, senior product manager for 1-2-3/G for OS/2.

Meanwhile, WordPerfect Corp. in Orem, Utah, last week said it will port its 16-bit implementation of WordPerfect for Windows to OS/2. Slated to ship in the spring, it will let users run Microsoft Corp.'s Windows package under OS/2.

The arrival of mainstream applications for OS/2 will put some substance behind IBM's claims of 1,200 32-bit applications available for OS/2. Most of these are user-built or service small niches.

Pricing for the Lotus packages will be about the same as for their Windows-based siblings. "We no longer believe that OS/2 application software can command a premium," Ozguc said.

Lotus intends to deliver Version 2.0 of its 16-bit 1-2-3 for Windows offering in the second quarter. "After that we'll be able to leverage the 32-bit work we did for OS/2 on the 32-bit version of 1-2-3 for Windows NT," Ozguc said.

WordPerfect's port of its 16-bit Windows implementation of WordPerfect is based on Version 5.2 of its word processor. The port uses technology developed by Micrografx, Inc. in Richardson, Texas, to allow a 16-bit Windows application to run over the 32-bit OS/2.

"It's a hybrid application. A native 32-bit version of WordPerfect for OS/2 will not arrive until WordPerfect 6.0 is delivered toward the end of the year," said Rich Running, director of marketing of WordPerfect for OS/2.

"The life of OS/2 will be maintained if the applications are there. Seeing the applications is encouraging because it provides a leap of faith in OS/2," said Tim Catton, manager of office system technology at Union Gas Ltd. in Ontario.

32-bit preference

While WordPerfect users running OS/2 would have preferred a native 32-bit implementation, they expressed some satisfaction with the firm's decision to make the hybrid port available.

"It's not a full 32-bit implementation, but it placates people," said Eric Lebow, network administrator for the 17th Judicial Circuit Court of Broward County in Fort Lauderdale, Fla.

Like most OS/2 sites, Union Gas had been running Version 5.1 of WordPerfect for Windows under OS/2. However, that version of WordPerfect is "ill-behaved," Catton said.

"Making 5.2 available on OS/2 is exciting to us because it resolves many of the issues we had with 5.1," he said.

"Over 80% of our users need Lotus' 1-2-3, Freelance and WordPerfect, so we need to deploy this software on the clients we are using for a client/server application we are building around CICS [transaction processing monitor] and OS/2," Catton said.

Lebow said his site's need for mainstream PC application software for OS/2 is being driven by a decision to standardize on OS/2 clients and servers in the interest of minimizing support costs.

"Windows doesn't have enough memory, and we need multitasking for some of our applications. Right now NT is vaporware, and the criticisms that Microsoft has leveled at OS/2 about large memory and disk space requirements have been exceeded in NT," he said.

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Information Builders, Inc.

Defense Department IS chief steps down

By Gary H. Anthes
WASHINGTON, D.C.

The sudden resignation of Paul A. Strassmann as U.S. Department of Defense information systems czar left the Clinton administraion in a lurch last week.

Strassmann was the Pentagon's accomplished but controversial director of defense information. Strassmann said officials in the Clinton transition team, with whom he had met several times, made it clear that he would not be retained by the new administration.

Strassman said he opted to resign rather than stay until a replacement was hired.

Driven by a mandate from Congress to slash spending at the Defense Department, Strassmann struggled — with some success, most observers agreed — to modernize and bring order to the department's immense IS infrastructure.

He launched the Corporate Information Management (CIM) program, which is intended to save the Pentagon $36 billion over seven years [CW, June 8]. Under CIM, Strassmann made progress toward streamlining and centralizing IS development and boosting software productivity.

He also introduced business process modeling and a departmentwide data dictionary.

But while acknowledging his successes and intellect, critics said he was at times dictatorial, he paid insufficient attention to details, and some of his reforms went too far.

Paul Strassmann *launched the CIM program*

"The strategic [CIM] program he put in was very, very important — the right thing to do," said Philip Kiviat, vice president of federal programs at Atlanta-based KnowledgeWare, Inc. and a longtime professional associate of Strassmann. "But his tactics were poor. Most people didn't know what to do once they got past the high-level order."

The clash between Strassmann-led reformers and risk-averse entrenched interests reached a crescendo last fall over a Defense Management Review Decision, called DMRD 918. That order moved huge chunks of IS authority from the various military services and consolidated them into one central authority.

In an interview last week from his home in New Canaan, Conn., Strassmann acknowledged that implementation of the order had not gone well.

"What I do is controversial," he said. "Some of the concluding chapters, especially around DMRD 918, were not done by due process. They were dictated. Ultimately, DMRD 918 had to be rammed down. That's not my way."

Good timing

Thomas Giammo, assistant commissioner for IS at the U.S. Patent and Trademark Office, said Strassmann was smart to quit while he was ahead. "From a political point of view, the best way [to make significant change] is to just come in and smash it all and then move on. But ultimately, you have to be sacrificed. Hopefully, the good stuff you have done survives," Giammo said.

Several observers said it is difficult to judge the commitment of the Defense Department to further IS reform until assistant and deputy secretaries are appointed. But Kiviat said, "CIM must survive because [Congress] has taken all the money out of the budget. The only way they can afford to do things is by coming up with the savings CIM is supposed to produce."

Strassmann said the biggest challenge facing his successor — who is still unchosen — will be to develop an "enterprise model" for how information technology will support joint military missions.

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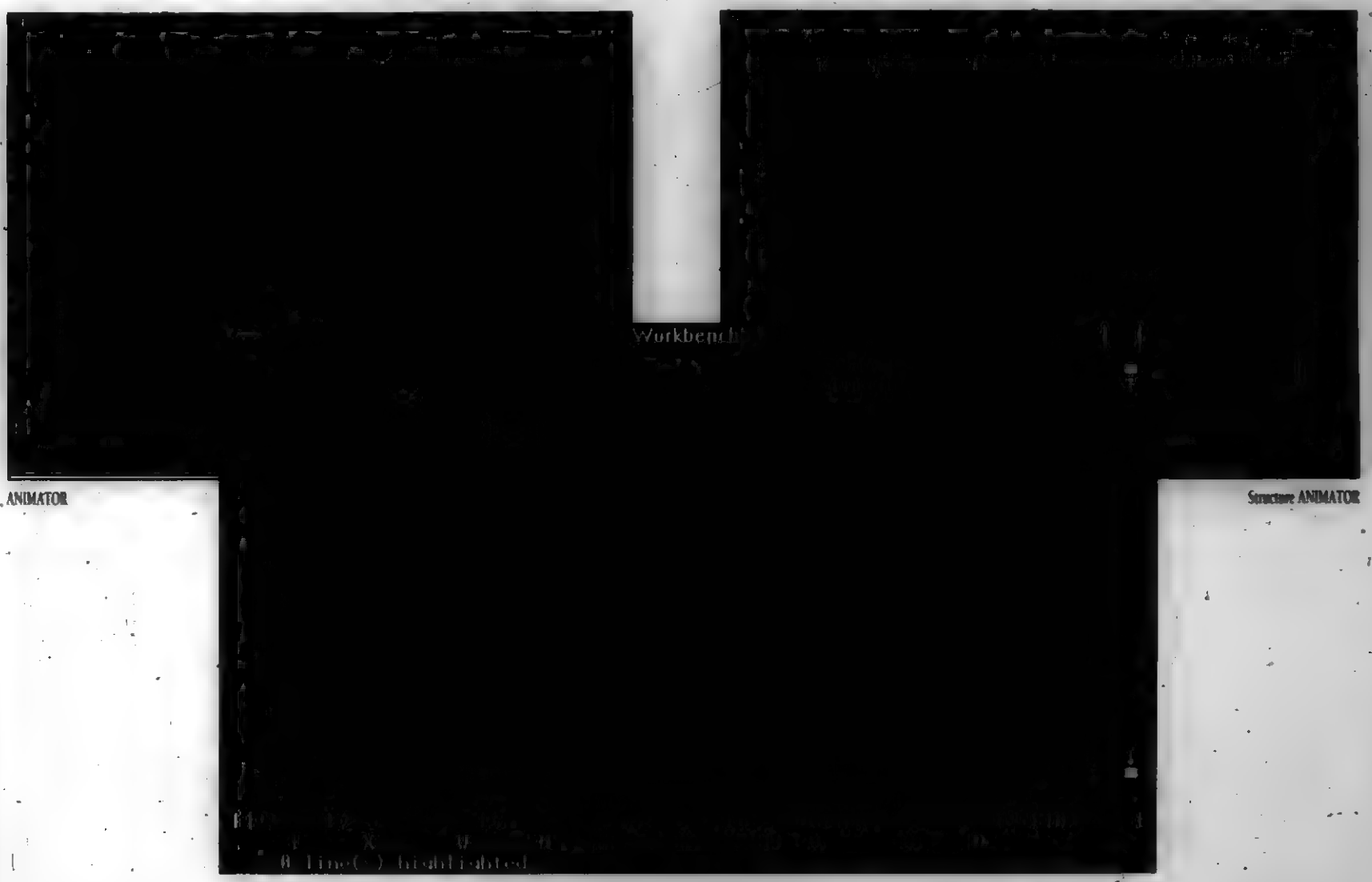

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The next decade

Support, enterprise nets top Novell's future agenda

By Michele Dostert
PROVO, UTAH

In 1981, Drew Major had a bad feeling about working for a small company called Novell Data Systems. "I walked through the door and just knew they were going to go bankrupt," Major said. "They had horrible products, and they were burning up money. We made them pay us every week because we didn't think they'd last."

Today, Major is chief scientist at Novell, Inc., the standard-setting successor to Novell Data Systems that will mark its 10th anniversary this week with more than 3,600 employees and 1992 revenue of $933 million. Novell's NetWare network operating system is holding fast to a commanding two-thirds share of the local-area network market despite competition from vendors in virtually every market segment.

As such, Novell is not resting on its laurels. The company knows it has to face and meet a brand-new set of challenges in the next decade. "Now we'll have to prove ourselves in more complex environments, where networking is the order of the day, and we'll have to respond to increased competition," said Ray Noorda, Novell's president and chief executive officer since its incorporation in 1983 (see timeline).

Chief among those challenges is providing enterprisewide computing products and strategies for networks managed and built by information systems groups. This feeds into a second objective: winning over IS managers.

Ray Noorda: *'We'll have to prove ourselves'*

Novell's corporate buddies have a long shopping list of additional technology they expect Novell to provide in the near future. These include application programming interfaces and integrated technology for building client/server applications, wide-area links, multiprocessing support and beefed up capabilities on its multiprotocol router.

"We need our LANs in Switzerland to talk to our LANs here, and we're not sure if Novell can handle it or if we should build an SNA backbone," said Patrick Carney, IS director at ASEA, Brown, Boveri's office in North Brunswick, N.J.

In an interview this fall, Darryl Miller, Novell's executive vice president, said the firm spent a lot of time in 1992 with Fortune 1,000 IS vice presidents and chief information officers to learn their concerns. "We're making NetWare easier to manage and doing extensive work in multiprotocol routers and hubs" as a result, he said. "Through our agreement with Memorex Telex, we're hoping to hasten LAN-to-host and wide-area products to market." Miller said Novell is also working on multiprocessing and transaction monitoring for NetWare platforms.

The speed with which Novell can respond to IS requests such as these will determine its success in the Fortune 1,000 market, said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

For example, users have long pressed Novell to deliver directory services similar to StreetTalk from Banyan Systems, Inc. The long-awaited NetWare 4.0, now being beta-tested, is supposed to address that issue. So far, early reports have been positive [CW, Jan. 18].

Also key to Novell's future success is its response to increased competition and the threat that network operating systems may get pulled back into the operating system.

Possibly its closest threat is Microsoft Corp. Microsoft's LAN Manager failed to dent Novell's lead, but the Bellevue, Wash., company has formulated a new plan of attack: incorporating the network operating system into the desktop operating system.

Microsoft's new Windows for Workgroups product has built-in peer-to-peer networking, the forthcoming Windows NT will have both the client and server software for LAN Manager built into it at no additional cost.

Two-pronged attack

Novell is attacking on two fronts: bundling peer-to-peer networking and DR DOS in a forthcoming package called "Personal NetWare" and preaching the gospel of modular systems.

"We think users shouldn't be forced into signing up with one vendor for everything at the cost of functionality," said John Edwards, vice president of Novell's Desktop Products Division.

But Microsoft's "buy the desktop, get the networking free" strategy appears to have Novell worried. Novell's acquisition of Digital Research, Inc. in 1991 and proposed acquisition of Unix System Laboratories, Inc. late last year is viewed by analysts as a reactive strategy.

The December release of Novell's UnixWare — a merged version of Unix System V Release 4.2, the NetWare operating system and Unix tools available in client and server versions — positions UnixWare as a direct competitor to Microsoft's forthcoming Windows NT.

The company also moved quickly to challenge Microsoft's use of its NetWare code, charging unauthorized use in both Windows for Workgroups and the Access database. The two firms are still arguing over this.

Craig Burton, president of The Burton Group, a Salt Lake City-based LAN research firm, and Novell's executive vice president of development until 1989, said: "Novell should focus all of its efforts on networking products and support, and not worry about Microsoft."

Milestones

October 1981: NetWare developers begin work at Novell Data Systems.

January 1983: Ray Noorda joins Novell Data Systems as president and CEO. Company incorporates as Novell, Inc.

January 1983: First Network File Server software released.

September 1987: NetWare for Intel 286-based boxes.

December 1988: First NetWare server for the Macintosh.

February 1989: NetWare for Unix.

September 1989: NetWare 3.0 for 386/486-based servers.

December 1989: NetWare SQL ships.

October 1990: Records $497 million in revenue.

May 1990: Lotus merger aborted.

February 1991: Novell/IBM alliance.

March 1991: NetWare v3.11.

April 1991: USL investment.

September 1991: NetWare Lite.

October 1991: Buys Digital Research.

December 1991: Forms joint venture called Univel with USL.

September 1992: NetWare 4.0 enters beta testing.

October 1992: Records $933 million revenue.

November 1992: Ships UnixWare.

December 1992: Acquires USL.

Coral, Cisco broaden WAN options

By Joanie M. Wexler

■ Two vendors took action last week to satisfy user hankerings for more reliable and higher performing internetworking gear — demands spurred by the increasing sophistication of corporate data highways.

Router market leader Cisco Systems, Inc. rolled out its long-awaited next-generation platform, the Cisco 7000 [CW, Jan. 18]. The 7000 is available now and allows Cisco equipment to better rival the appeal of some competitors' scalable, redundant devices.

Meanwhile, start-up Coral Network Corp. revved up its high-end Backbone Express bridge/router with a new model said to be fast enough to make performance a nonissue in users' bridge vs. router decisions.

While Cisco touted performance leaps derived by shifting some nondata forwarding tasks from the router's main 533M bit/sec. internal bus to two other, lower speed buses, "this architecture leaves a lot to be desired," said Frank Daubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Daubeck said he was expecting a "business" — switching — architecture and predicted a life span of "about three years" for the 7000.

Users, though, were excited to get backup power protection and hot-swap capabilities, which greatly increase network uptime. "Reliability and survivability are more important to us" than performance, said David Paul Zimmerman, telecommunications analyst at New Brunswick, N.J.-based Rutgers University, a Cisco 7000 beta-test site. Zimmerman said he actually "got bored trying to break the box."

Zimmerman has replaced three of his four high-end Cisco AGS+ routers with one 7000, which supports about 25% more networks than the AGS+.

Another beta-test site, the Oak Ridge National Laboratory in Oak Ridge, Tenn., has found the 7000's ability for centralized software downloading "important in a 24-hour enterprise environment with lots of hosts and wide-area connections," said Curt Bemis, a senior staff member.

Coral's Backbone Express 2000 reportedly raises routing performance of Transmission Control Protocol/Internet Protocol to 120,000 packets per second via a home-designed silicon switch processor. That number is slated to increase to 400,000 packets per second in June and apply to several other key protocols during the second half of the year.

"Right now, we're not basing our bridging vs. routing decisions on speed," said Ken Roux, a telecommunications/network manager at Coral customer Claris Corp. in Santa Clara, Calif. "But that will truly be an issue for us in the future, so it's not to be passed off lightly."

"Performance no longer being an issue is good," added Tom Schnabel, a network engineer at Coral customer TRW, Inc. in Redondo Beach, Calif. "Bridging tends to be faster, but we don't get the firewalls" and security-oriented partitioning from other networks "that we do with routing," he said.

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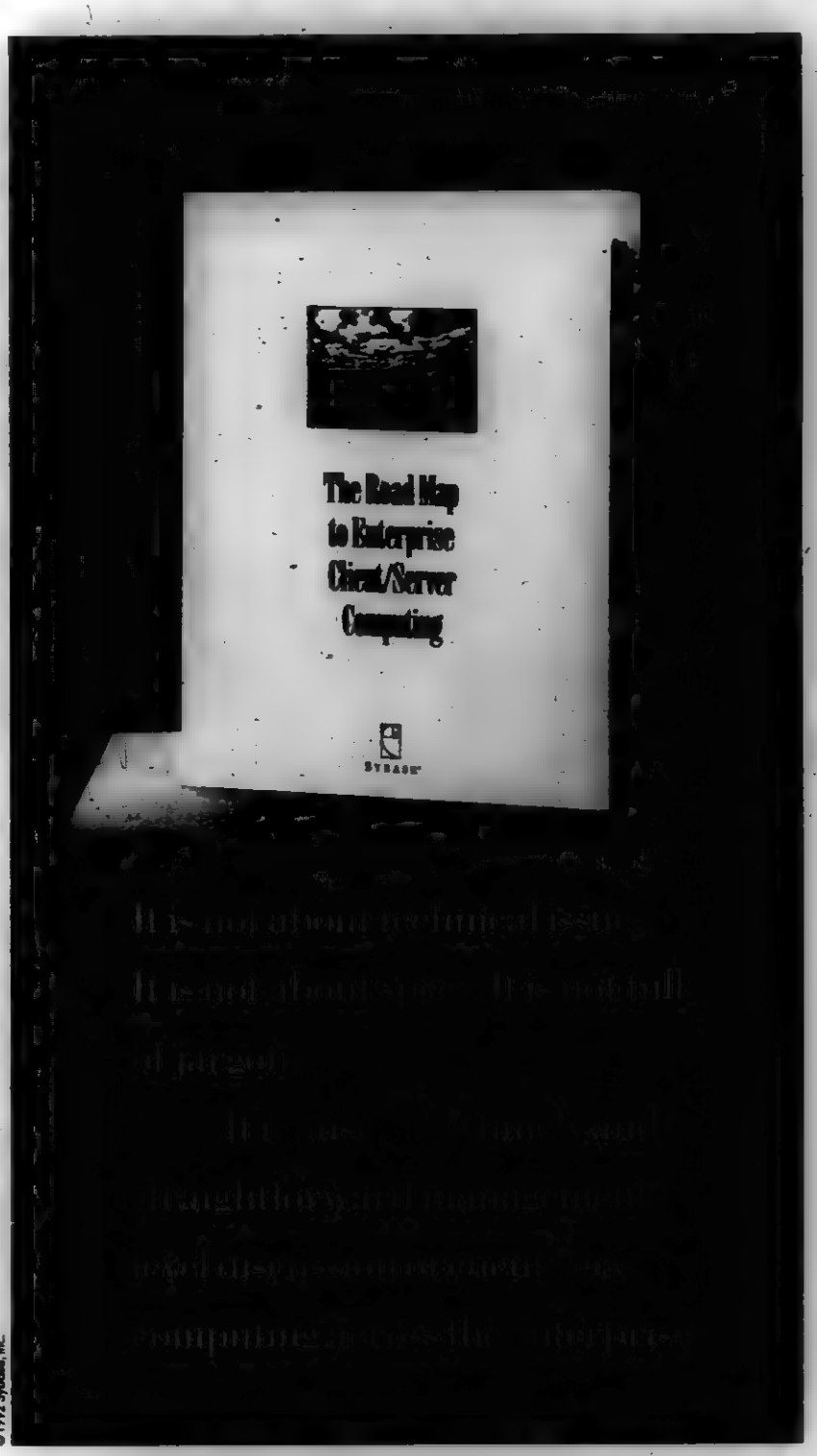

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Borland blames marketing, revamp for loss

By Michael Vizard
SCOTTS VALLEY, CALIF.

The effects of a failed marketing effort for its Quattro Pro spreadsheet, combined with an inability to deliver other Microsoft Corp. Windows applications in a timely manner, came home to roost last week at Borland International, Inc. as the company reported a $63.1 million net loss for the third quarter ended Dec. 31.

During an address to members of the Massachusetts Computer Software Council, Inc. last week in Newton, Mass., Borland Chief Executive Officer Philippe Kahn said the company's loss reflects the restructuring it undertook in 1992, which Kahn has previously described as his worst year ever.

"We are building an organization that is in full-battle mode. We have to compete with a company in the Northwest [Microsoft Corp.] that is very powerful, builds good products, is very aggressive and omnipresent," Kahn said.

Some users are confident Borland will overcome its problems. "I think Borland will be around for a long time to come," said Barton Evans, vice president of operations at Dionex Corp., a Sunnyvale, Calif., manufacturer of chemical analytical equipment. "A lot of companies face the same fundamental problems Borland does, so if Borland goes away then they'll all go away for the same reasons, and I don't think that will happen."

Reasons for slide

Taking its toll on Borland's latest results was a $25 million charge related to a decision last month to cut 15% of its 2,200 employees. At the same time, Borland incurred a $9.8 million charge related primarily to a failed marketing campaign for its Quattro Pro for Windows spreadsheet.

That program let users buy Windows and DOS versions of Quattro Pro in the same package. "It was essentially two different products in the same package, and the market was confused by it," said Chief Financial Officer Alex Hendricks.

Borland has initiated an equally aggressive 90-day, $99 price for Quattro Pro [CW, Jan. 18], both to make up for the failed Quattro Pro program and to respond to Microsoft's aggressive introduction of its Access database.

FINANCIAL UPDATE
Borland

Consolidation and work force reduction charges contributed to Borland's third-quarter loss

	3rd quarter
Revenue	$104.3M
Percent change from same quarter 1991	(39%)

The quarter included a $25 million pretax charge for work force reduction, facilities and write-off of software technology as well as a $9.8 million charge for inventory write-downs, freight and rework.

* Not meaningful

Source: Company reports

Another key to Borland's recovery is delivery of Paradox for Windows, which Kahn said will ship on Feb. 1, for a 90-day introductory price of $139.95.

"Succeeding at databases is key to our company's future," he said. "When [Microsoft Chairman Bill] Gates released Access for $99, we knew we were in his cross hairs," Kahn said. Microsoft has sold more than 500,000 Access licenses.

Beyond 90 days, however, Borland has yet to decide what the price of Quattro Pro and Paradox will be, he added.

Because of its current financial troubles, Borland is expected to focus on servicing its installed base. "There's a lot of pent-up demand for Paradox, and the company stumbled badly with Quattro Pro," said Mary McCaffrey, a vice president at C. J. Lawrence, Morgan Grenfell, Inc., a New York-based securities firm.

Analysts are also concerned that Borland carried a $23 million operating loss on revenue of $104.3 million for the third quarter. The company attributed a $10.7 million drop in quarterly revenue to its latest Quattro Pro promotion, which offered a rebate to sites that purchased the Win-DOS version of the spreadsheet.

Key to success
Borland needs a 35% share of the Windows spreadsheet market and more than 50% of the database and C++ language market for Windows in order to be truly successful, Kahn said.

R&D rise
Borland spent $18.9 million of its research and development budget during the third quarter. That represents a 34.8% rise over the $14 million spent in the same quarter a year ago. Those costs were largely incurred as the result of adopting an object-oriented programming approach for its Windows application development environment.

Microsoft gives Access interim bug fixes

By Jean S. Bozman

Microsoft Corp. has owned up to 23 bugs in its first release of the Access desktop database and query tool. None are showstoppers, said Charles Stevens, manager of Microsoft's database division. Software engineers have provided workarounds for the bugs that are posted on the Microsoft Access Forum on CompuServe, he added.

"Before June, we will ship Release 1.1 with new database drivers, and we will fix any of the bugs that have been reported," Stevens said.

Here are some of the top Access bugs and the workarounds:

• Microsoft Access SETUP program may leave temporary directory and files on disk.

Microsoft's explanation: "If you request SETUP to install SHARE and then choose the option to reboot your machine, SETUP will not properly clean up temporary files on your hard disk."

Fix: "Do not choose to reboot your machine at the end of the installation process; or simply delete the [temporary] files and directory after the reboot process."

• Stac Electronics, Inc.'s Stacker 3.0 data-compression program for hard disks incorrectly states Access database files are corrupted.

Microsoft's explanation: "The file is fine."

Fix: "The newest version of Stacker 3.0 fixes these messages and is available from Stac Electronics in Carlsbad, Calif."

• Access cannot use Novell, Inc.'s Btrieve data with indexes across column boundaries.

Microsoft's explanation: "Access does not support Btrieve indexes, which have keys defined on a column or across boundaries."

Fix: "You must remove the indexes or recreate them so that they align on column boundaries."

• Problem importing .DBF files where record length exceeds Borland dBase maximum.

Microsoft's explanation: "CodeBase++ Version 1.07 lets you create .DBF files where the record length exceeds the dBase IV max."

Fix: "Export the CodeBase++ .DBF file to delimited text, then import the ASCII file into Microsoft Access."

Networked DBMSs

CONTINUED FROM PAGE 1

picked for evaluation. Normally, PC database prices range from $500 to $700.

The database pricing wars should reach a new level on Feb. 1, when Borland is expected to ship Paradox for Windows, complete with a new object-oriented development environment called Object Paradox Application Language. On the same day, Microsoft's introductory price for Access will jump to $495. But Microsoft believes its three-month promotion will produce about 700,000 Access evaluations.

Microsoft Chief Executive Officer Bill "Gates has made it very clear that he'll use any means at his disposal, including price, to get there," said Terrence Quinn, a managing director at New York investment firm Furman, Selz, Inc.

But winning account loyalty will take more than pricing as the drift toward open systems gets stronger. "All the pieces of our architecture are very modular," said Kim Everingham, a systems analyst at SRI International, Inc. in Menlo Park, Calif., which uses both Microsoft and Borland products. "We could switch out Microsoft Excel as a front end, and we could use any SQL-based back-end database."

Even so, Microsoft is advocating a building-block approach, said Charles Stevens, manager of Microsoft's database division.

Borland, which had nearly 80% of the PC database market, has seen its dBase market erode, while the Paradox base is growing, Quinn said. It is counting on a more integrated approach, linking all its database products through the Integrated Database Application Programming Interface and consolidating data on its high-end InterBase server.

The Westpal Group, a custom software house in Camarillo, Calif., moved up from desktop Paradox to an InterBase server on a Unix machine four months ago. "Right now, we think InterBase is terrific," said President Paul Sharp, "but if Microsoft comes out with a better product tomorrow, then we'll wave the Microsoft flag. I have to do what makes business sense."

The timing for the database deal is right: Many large firms will start to weave standalone databases into networked enterprise resources later this year, as a wave of Microsoft Windows client/server development begins.

At the same time, several powerful database platforms will become available, including Windows NT servers, Novell, Inc. NetWare Loadable Modules of most major databases and new Unix PC LAN servers.

Many users are eager to shift I/O-intensive database loads to high-capacity platforms. "Those PC databases start huffing and puffing when you start running 100M-byte database tables and doing a lot of heavy querying," said Sharp, who develops and tests applications for several Fortune 500 companies in California. "The data load is just killing those LANs."

Many sites count on cost savings from downsizing applications onto cheaper hardware. SRI International plans to save the cost of a new minicomputer by consolidating old flat-file databases and deploying new applications on Sun Microsystems, Inc. workstation servers and Apple Computer, Inc. Macintosh clients.

The intensity of the Borland/Microsoft marketing war has not been lost on users. "I want a small tool suite that is robust," said Michael Fitzmaurice, director of information systems at the National Association of Broadcasters in Washington, D.C.

KnowledgeWare to buy client/server firm

Acquires Matesys Corp. to challenge Powersoft's turf in expanding market

By Garry Ray
ATLANTA

The bells for client/server computing tolled once again as mainframe computer-aided software engineering vendor KnowledgeWare, Inc. last week agreed to acquire a small developer known primarily for its client/server tools.

KnowledgeWare's bid to acquire Matesys Corp. in Larkspur, Calif., and its ObjectView development tool places the company in head-to-head competition with Burlington, Mass.-based Powersoft Corp., the dominant player in the client/server tools market.

Powersoft filed its initial public offering last week, seeking an estimated market value of more than $250 million for its shares (see story page 93).

What a relief

KnowledgeWare's acquisition would relieve concerns about the company's less-than-robust offerings in the client/server arena.

Last year, the company acquired Viewpoint Systems, Inc. for its graphical user interface development tool, Flashpoint. Analysts said the tool was not a robust client/server offering.

"Flashpoint is a nice product, but it's for revamping mainframe applications," explained Andrew Mahon, a senior analyst at consultancy New Science Associates, Inc. in Westport, Conn. "ObjectView is on par with [Easel Corp.'s] Enfin/2 or PowerBuilder," which focus on building true client applications.

KnowledgeWare officials agreed that they will be vying for Powersoft's turf with Mateesys and said they think they have found a competitive offering.

"From a competitive perspective, ObjectView stacks up rather well against PowerBuilder," said KnowledgeWare President and Chief Executive Officer Donald P. Addington.

Addington outlined a three-phase plan to integrate ObjectView with application development tools from KnowledgeWare and other vendors. He said the points of integration will be the ADW Encyclopedia, IBM's LAN Repository and an application programming interface to ObjectView itself. Integration with the ADW Encyclopedia would be "nearly immediate."

David Dewan, vice president and co-founder of Powersoft, said there is plenty of room in the exploding client/server tools arena for more than one player.

"We're seeing the beginning of enormous change in platforms. The market is huge," he said.

The acquisition, which KnowledgeWare will fund with a 900,000-share stock issue, is valued at about $12 million.

According to Matesys President and CEO Michel Prompt, the sale should be complete "by the end of February" because of the company's French ownership. However, he said, "We consider that the deal is done now."

All in the family

ADD MATESYS TO THE LONG LIST OF KNOWLEDGEWARE ACQUISITIONS

2Q '93 revenue: $31.6M
Income: $858,000
Number of licenses: 104,000

	Company	Technology
1/91	UDM Technology	Cooperative processing tools
5/91	Quinsoft	Object-oriented client/server
8/91	Language Technology	Cobol restructuring maintenance
6/92	Viewpoint	GUI builder
10/92	Computer and Engineering Consultants Ltd.	Client/server tools

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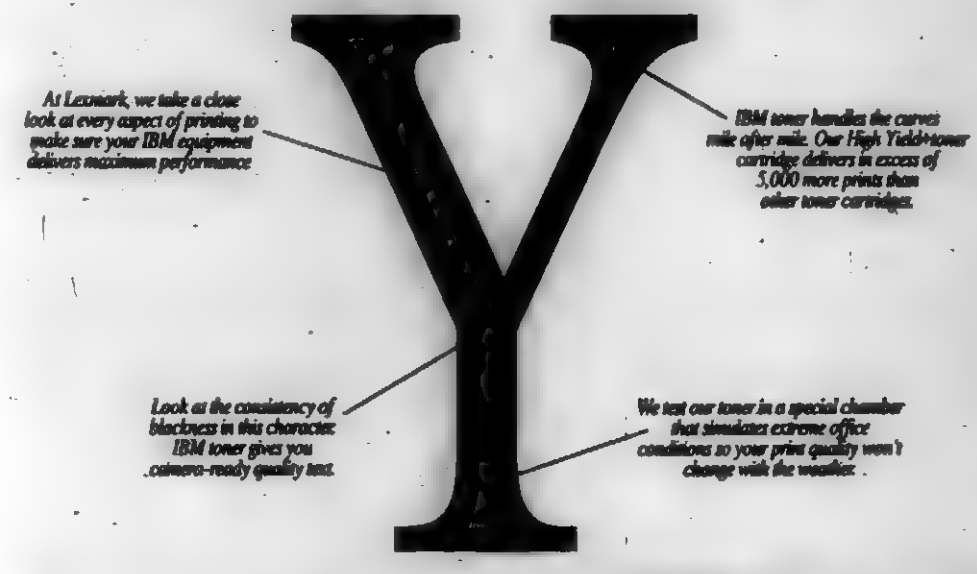

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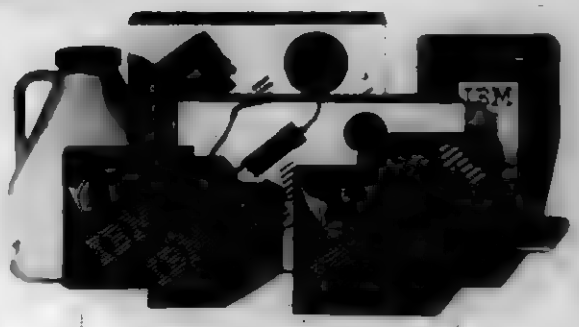

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News Shorts

Compaq pares notebook prices

Compaq Computer Corp. cut prices on its Contura line of notebooks by 12% to 16%, bringing the price of a passive-matrix color notebook to less than $2,000. Analysts said the move was largely to make room for new **Intel Corp.** 1486-based versions of the Contura, expected later this quarter. **Janet Cole, analyst at Dataquest, Inc.**, added that Compaq's perception as a price leader in the market may make other notebook vendors follow suit with across-the-board price cuts on the low end of their product lines.

DEC adds industry specialists

Digital Equipment Corp. last week announced another appointment of a vice president from outside the organization: Paul Kozlowski will head up DEC's communication, education and entertainment business unit. Kozlowski founded **Contel Cellular, Inc.** in 1982 and led its merger with **GTE Mobile Cellular, Inc.** in 1991. Earlier this month, DEC brought in John Klein as vice president of the consumer and process manufacturing industries business unit and Francis Arnone as industry director at DEC's retail/wholesale business unit. Klein is a 25-year **IBM** veteran. Arnone was formerly chairman and chief executive officer of **Marshalls, Inc.**

DEC offers POS package

DEC announced its "No-Fail Retail" system at the National Retail Federation Conference in New York, introducing a system designed to minimize point-of-sale downtime. The Unix-based system includes DEC's High-Availability Data System, a disk-mirroring technology designed to provide redundancy.

Lotus, Borland head for trial

The legal war between **Lotus Development Corp.** and **Borland International, Inc.** is set to go to trial next week in U.S. District Court in Boston. The judge has allowed Lotus to amend its complaint to include Borland's use of a macro key reader in Quattro Pro for Windows. The macro key reader allows Quattro users to use the macros they created for Lotus' 1-2-3 spreadsheet. The case hearing is scheduled for Feb. 1.

Coke licenses Delrina software

Delrina Corp. in Toronto last week said its wholly owned subsidiary **Delrina Technology, Inc.** has signed a worldwide license for its PerForm Pro Plus forms processing software with **The Coca-Cola Co.** in Atlanta. The deal marks Delrina's largest corporate license ever with a Fortune 100 company and is valued in excess of $2.5 million. The latest release of PerForm Pro Plus includes extensive database management features and a macro-like language that allows users to link forms created with the package.

SHORT TAKES DEC has penetrated the Top 10 PC maker ranking for the first time, according to **Computer Intelligence**, which said DEC's PC sales ramped up past about 20 other vendors to reach its ranking of No. 9. . . . The **International Trade Commission** established an Office of International Competitiveness to analyze the factors that affect U.S. economic competitiveness. . . . Electronic-mail vendor **Beyond, Inc.** in Cambridge, Mass., raised $6.6 million in a round of financing for the research and marketing of workgroup computing products, with **Novell, Inc.** and **Banyan Systems, Inc.** each kicking into the pot. . . . Vendors of Token Ring networking products, including **Proteon, Inc.**, will gather at the University of New Hampshire next month to begin testing their products' interoperability running at 16M bit/sec. over unshielded twisted-pair wiring.

X.400 directories synchronized

By Lynda Radosevich
SANTA CLARA, CALIF.

Retix this week will announce a new X.400 directory exchange server as part of its Open Messaging Solution strategy for companies faced with connecting dissimilar electronic-mail systems.

The $9,995 Directory Exchange Server (DXS) aims to address one of users' loudest complaints about sending mail between different systems: getting the various directories "synchronized" so that one system recognizes E-mail addresses from other systems.

Combined with Retix's upgraded "gateways" — software that translates CC:Mail, Microsoft Corp. Mail and Message Handling Service protocols to the X.400 protocol — the DXS will maintain a central database of users across the network and send the information to participating mail systems. It will also provide a migration path to the upcoming X.500 directory standard.

"Directory synchronization is a big problem," said Mark Gleason, network analyst at PMA Reinsurance Corp. in Philadelphia. The company exchanges E-mail with insurance brokers from more than a dozen firms.

PMA uses a gateway to connect DaVinci mail to a Retix X.400 server, while the other firms have gateways from their systems to X.400. Although the companies can exchange mail over the X.400 backbone, users commonly call the intended recipient and get their address over the phone before sending a message to another company, Gleason said.

The directory synchronization products from Retix could help solve the problem, he said, but he was concerned that automatic directory exchange would give other companies *all* of PMA's E-mail user addresses.

Other new products will be included in Retix's announcement: remote management software, updated E-mail "gateways" (software that converts E-mail formats) and an upgrade for Retix's line of X.400 messaging servers.

The Retix solution is confined to PC-based local-area networks. Although a gateway to the Simple Mail Transport Protocol used by Transmission Control Protocol/Internet Protocol networks is "coming down the road," Retix offers no gateways to mainframe-based E-mail systems such as IBM's Systems Network Architecture Distribution Services (SNADS).

Rival Soft-Switch, Inc. in Wayne, Pa., also provides an X.400 messaging backbone in its EMX line and offers gateways to 50 E-mail systems, including SNADS. The company will introduce directory synchronization capabilities for its EMX line in six months, according to a Soft-Switch spokesman.

Wal-Mart spotlights fast LANs

CONTINUED FROM PAGE 1

Mart's basic satellite infrastructure, Fitzgerel added.

Like most major retailers, Wal-Mart needs satellite links to reach its more remote sites, which are still inaccessible to high-speed carrier services such as frame relay, he added.

For some time now, Wal-Mart has been in the vanguard of an industry trend toward tracking products in greater and greater detail, for purposes of market analysis and faster inventory turnover, according to Carl Steidtmann, vice president and chief economist at investment research firm Management Horizons, a Price Waterhouse division in Columbus, Ohio.

"It used to be we just tracked, say, sweaters, by the number sold," Fitzgerel said. "Now we track by size and color — much finer detail. And with that comes additional data" to be sent back to the data center for analysis.

In addition, Wal-Mart is four or five years ahead of its competitors when it comes to implementing "a continuous replenishment system," in which stores send orders for new merchandise directly to the suppliers as soon as the consumer takes it out the door, Steidtmann said.

At Wal-Mart, stores order replacement items directly from the supplier daily, Fitzgerel said. Point-of-sale (POS) terminals that record the transactions send the data to a Unix server via a Token Ring LAN; the server then sends the orders, via satellite link, to the home office IBM Enterprise System/9000s. There they are batched together with other store orders, he said.

Store purchasing can also be done through handheld bar-code terminals connected into the LAN via radio-frequency modem. The bar-code terminals are used to ensure accuracy of pricing and shelf level data.

The advantage of direct store-to-supplier ordering is the ability to keep the right products in stock while maintaining extremely low inventory costs, Steidtmann said. Indeed, Wal-Mart's inventory-to-sales ratio in 1991 was 1 to 5.94, compared with Kmart Corp.'s ratio of 1 to 4.58, he added.

Several other strategic applications of the new network are now in the works at Wal-Mart. One that came out about a month ago involves downloading to store department managers images that depict how a given item can best be displayed, he said.

The retail chain is also experimenting with replacing "thousands of trees worth" of training manuals with on-line training support delivered via multimedia PCs installed at stores, Fitzgerel said.

The LAN-to-VSAT link also promises to boost customer satisfaction and get customers out the door faster by speeding up POS transactions such as credit-card verification, Fitzgerel said.

Wal-Mart's IS department is particularly thrilled at the ability to manage 20,000 or so LANs as one system, Fitzgerel said. An increasingly distributed, client/server environment has increased Wal-Mart's reliance over the past few years on effective network management to keep all systems and links up and running, he added.

The department has been working since September 1990 on a Simple Network Management Protocol-based network management system. Besides doing the usual traffic monitoring and troubleshooting of LAN and satellite links, it will monitor the Unix servers, PCs, power supplies and, eventually, even environmental systems in buildings, Fitzgerel said.

Connections

These elements make up Wal-Mart's network:

LANs: Assorted Token Rings.
Satellite connections: Hughes Network Systems Personal Earth Stations.
Protocols: TCP/IP, SNA.
Systems connected on LANs: IBM 3090s, assorted Unix servers, Telxon 960 handheld PCs and POS terminals.
Network management: SNMP.
Routers: From Cisco Systems, Inc.
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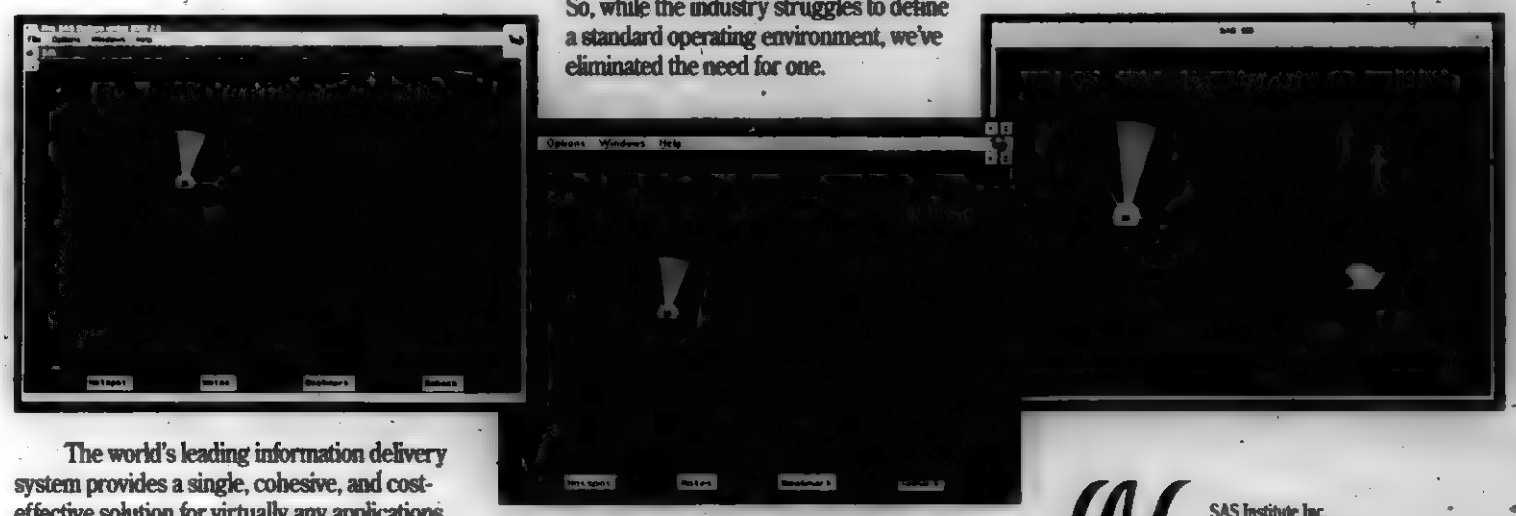

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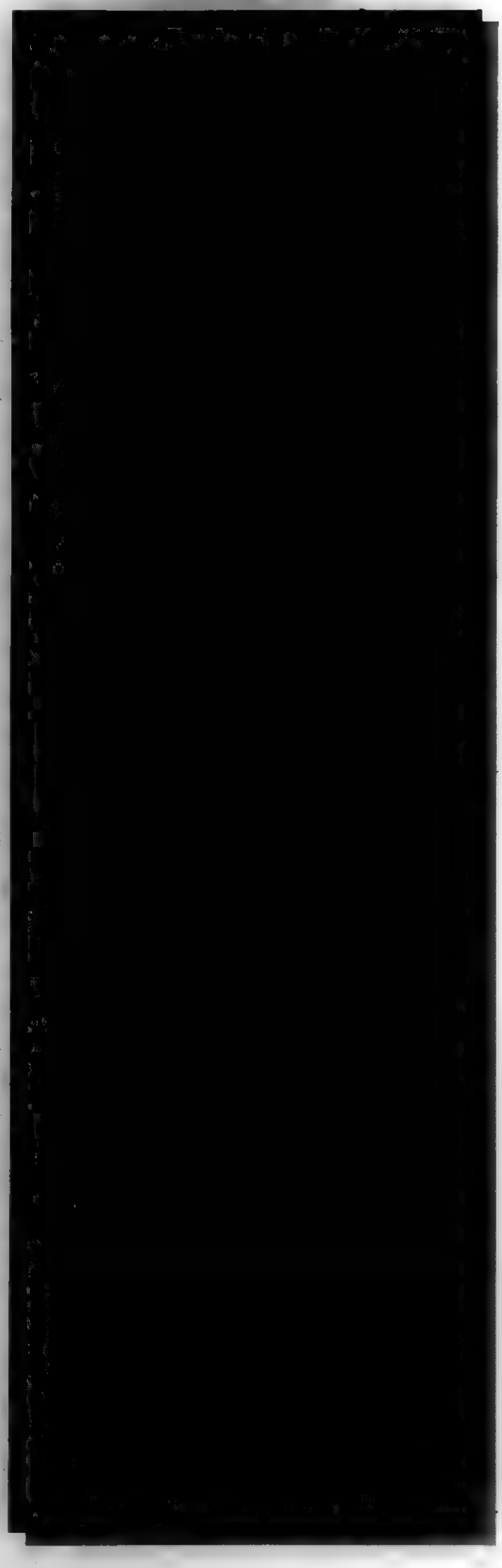

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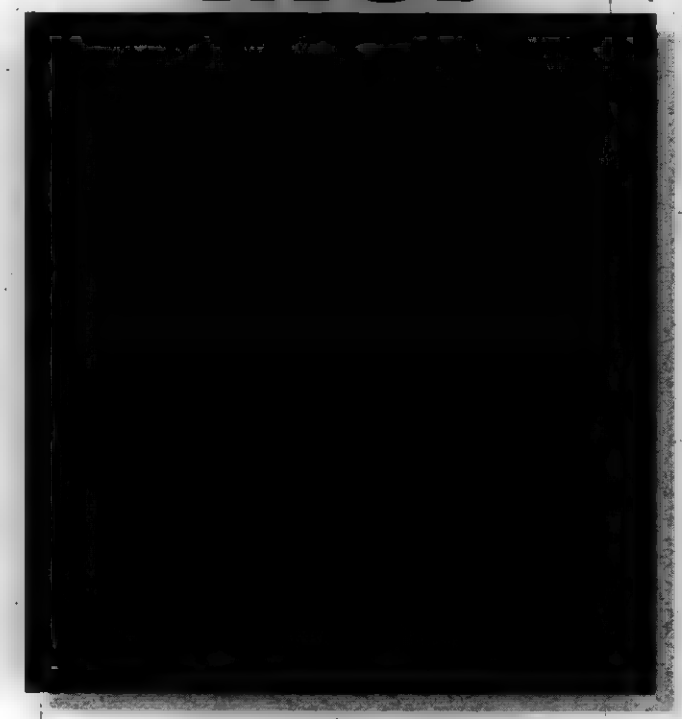

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* MCI is a registered trademark of MCI Telecommunications Corporation.
*Comparisons based on switched services of leading national carriers. **Data Communications Magazine User Survey—Private Line Services, August 1992.

Clinton regime to speed tech highway

CONTINUED FROM PAGE 1

work services to all of America.

Using private digital infrastructures, a number of large companies have improved quality, lowered costs and shortened time to market, according to Craig Fields, chairman of the Microelectronics and Computer Technology Corp. in Austin, Texas, who spoke at the hearing.

A more far-reaching "data superhighway" would boost the nation's economic competitiveness, aid the growing population of mobile computer users and promote socially worthy goals, most observers agreed.

Mitch Kapor: *Helping to create vision and high-tech policy*

However, inhibiting development of the high-speed digital network that Gore sees as all-fiber by the year 2015 are competing views on how the infrastructure should be built, by whom, when and at whose expense. To date, the Clinton administration has offered few implementation and regulatory details.

In no hurry

That is OK with some corporate users who are wary of any government participation at all.

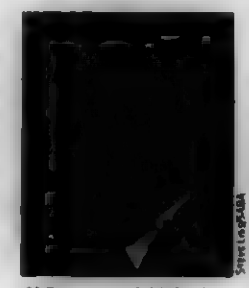
"I don't think it's government's business to get involved," said Michael Higgins, who oversees telecommunications at Byer California, a clothing manufacturer in San Francisco. "Virtually nothing the government controls runs well. [The infrastructure] should probably be managed by a consortium" of companies, as is today's education- and research-oriented Internet, he said.

"Gore wants [the network] to be publicly owned," said Joseph S. Kraemer, national industry director of the Telecommunications and Electronic Services practice of Deloitte & Touche in Washington, D.C. "But if Clinton is serious about cutting the deficit, it is not clear why you would substitute public for private capital." He added that the infrastructure will require closer synergy between federal and state regulatory bodies.

In a similar vein, carriers generally want the government to limit its role to funding research and network trials. At President Clinton's Conference on the Economy last month in Little Rock, Ark., AT&T Chairman Robert Allen said, "I think the government should not build and/or operate such networks. I believe the private sector can and will be incented to ... make it possible for people to connect with ... information anyplace in the world."

But the federal government should at least "articulate a vision and adopt policies consistent with it," said Mitchell Kapor, chairman of the Electronic Frontier Foundation (EFF), a Washington, D.C.-based organization that provides counsel on social and competitive issues arising from technology.

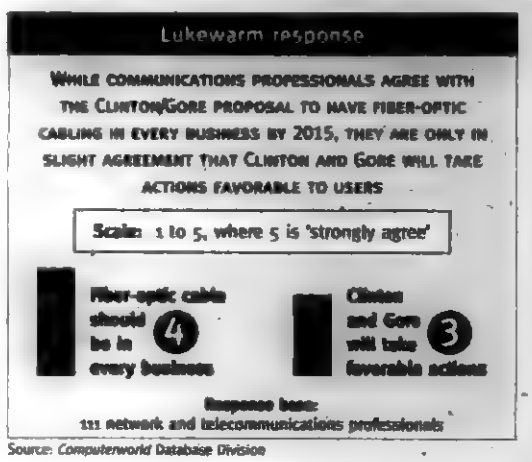
Computer companies, which are not subject to regulation, nevertheless agree with Kapor. Without knowing the government's views, Apple Computer, Inc. Chairman John Sculley, who testified at last week's hearing, said, "If the private sector doesn't know ... the government's position on security, privacy, access, First Amendment rights and intellectual property issues, then obviously that limits our enthusiasm to invest."



Al Gore *would like to build a coast-to-coast electronic information highway*

Clearly these issues must be resolved before the technology challenges of blending protocols, networks and equipment can begin.

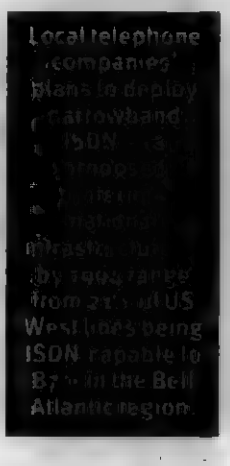
Meanwhile, the EFF is not content to wait a decade or more for fiber everywhere. It is drumming up support for an interim narrowband Integrated Services Digital Network (ISDN) infrastructure. Dial-up ISDN runs over today's telephone lines at speeds of up to 1.5M bit/sec.



Source: *Computerworld* Database Division

The Consumer Federation of America said narrowband ISDN could bring 80% of the benefit of broadband fiber optics to the home at 10% of the cost. EFF and others said it can be made ubiquitous in three to five years without massive investments.

Bell Atlantic Corp., for example, already plans for 87% of its lines to be ISDN-capable by 1994. Several other regional Bell operating companies plan to have 50% to 70% of their lines ISDN-capable in the same time frame.



Some users consider this viable. "As a corporation, we're committed to ISDN basic rate" — 1.44K bit/sec., said W. Edward Hodgson, manager of computing and communications at Schindler Elevator Corp. in Morristown, N.J., and chairman emeritus of the North American ISDN Users Forum.

"If we had that to all locations, we could get services that today we have to fight for," such as putting modems in employees' homes and desktop conferencing, Hodgson said.

The influential Markey and a number of computer companies have thrown their support behind the EFF proposal. Last month, Markey said ISDN could save billions of dollars in health care costs during the next two to three years by streamlining patient data, claims processing and inventory control processes.

Specifically, Arthur D. Little, Inc. said widespread adoption of telecommunications and information technology could reduce the cost of health care in the U.S. by $36 billion a year.

Meanwhile, the RBOCs are planning an assault on Capitol Hill this year to remove the cable television ban and other restraints placed on them during the AT&T breakup. They want their fair share of the infrastructure pie.

Countering their efforts is Rep. Jack Brooks (D-Texas), chairman of the House Judiciary Committee, who last year sponsored legislation to bar the Bells from offering information services. His bill failed, but he is likely to try again this year.

There are other political barriers. Newspaper publishers, for example, argue that a sprawling electronic information network would constitute unfair competition. Also, it is unclear today whether local access to a nationwide broadband digital network will eventually be provided by the phone companies, cable TV companies, wireless network providers, another entity or all of the above.

The new Federal Communications Commission chairman — not yet named by Clinton — will be a key figure in resolving these issues. John B. Lynn, chairman of the telecommunications public policy committee of the International Communications Association user group, said the commissioner will face a difficult balancing act setting appropriate regulations while promoting competition and protecting users from monopoly practices.

Some have said the fight for the infrastructure is not a technology winner-take-all proposition. "I used to think the country could only afford to do it one way, but I've totally abandoned that," said Michael Roberts, networking vice president at Educom, a 600-member association of colleges and universities.

Clearly, no road map for the information superhighway exists yet. However, the combined forces of commercial interests, user needs and an administration strongly committed to the concept make it likely that one will begin emerging this year, perhaps as soon as Gore and a new FCC chairman have unpacked their bags.

A healthy diet

While the industry argues over the concept of a national data superhighway, fiber deployment in the public long-distance network is proceeding nicely via the invisible hand of competition.

Of the 50,000 telephone network miles collectively run by AT&T, MCI Communications Corp. and Sprint Corp., 31,000 of them are fiber. The carriers' fiber lines, which have a much higher traffic-carrying capacity than copper wiring or microwave links, are supporting an average of 80% of the carriers' customer network traffic.

In addition, Sprint last week announced it will spend more than $500 million during the next five years deploying a Synchronous Optical Network infrastructure — a fiber transport technology initially running at 622M bit/sec. speeds.

Delivering fiber services to fringe locations via subnetworks from the regional telephone companies is a greater challenge.

For example, while RBOC backbones are collectively about 75% fiber, just 15% of RBOC feeder lines (cut-to-smaller central offices) are. And there is next to no fiber running from feeder switches to the home.

According to Laird Walker, vice president of federal relations at US West, telephone companies will have to spend $200 billion to $300 billion more than their planned capital budgets to roll out a ubiquitous fiber-optic network. That amount should be covered at least in part by higher user costs.

Walker said rates could be comparable to the $30 to $40 most Americans pay each month for cable television.

US West's executive vice president of mass markets and operations, Thomas Synhorst, also warned that federal mandates for widespread fiber network construction could result in a misappropriation of resources in areas where services are not yet needed. — *Gary H. Anthes and Joanie M. Wexler*

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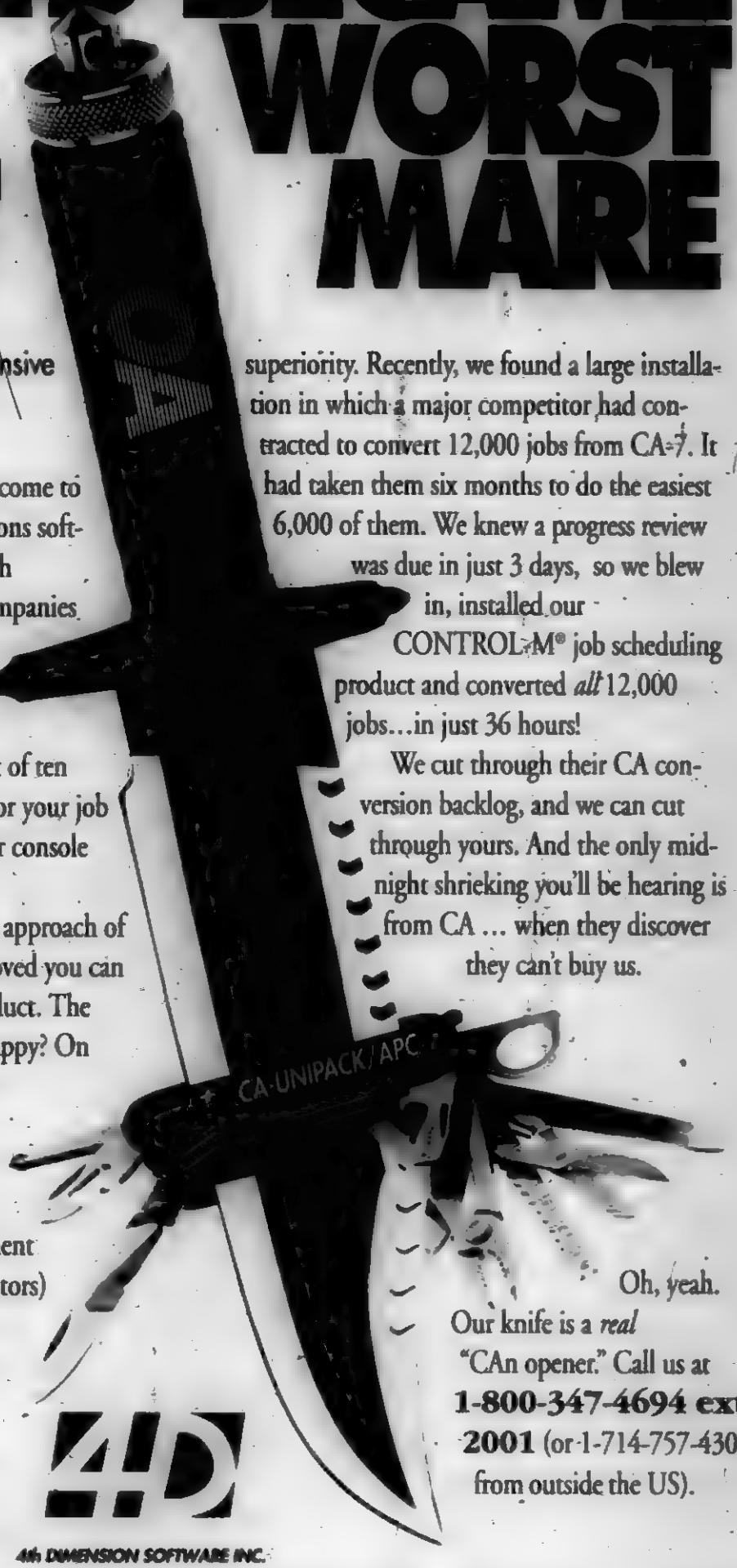

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TRBA

Bush Presidential Library first to employ high tech

By Mitch Betts
WASHINGTON, D.C.

As "Clinton Platter No. 1" was inserted into an optical jukebox at the White House correspondence office on Inauguration Day last week, the 12-in. optical discs holding the outgoing Bush administration's correspondence were carted off to the National Archives.

Eventually, the Bush platters will go to the George Bush Presidential Library and Museum in Texas, where planners hope to build a sophisticated multimedia system that will allow Bushophiles to see correspondence, polls, press reports and video clips on computer workstations.

The multimedia system "will change the way people do research," said George C. Edwards III, director of the Center for Presidential Studies at Texas A&M University, where the Bush library will be located.

People analyzing the 1992 election, for example, could retrieve campaign strategy documents, see the television ads that grew out of that strategy and then review polling data to see how the public reacted, Edwards said.

The electronic archives will also be available to researchers across the country via the Internet or the planned National Research and Education Network if all goes according to plan, he added. Construction of the Bush library is expected to start in 1995 and be completed in 1997.

Much work to be done

Edwards said he has discussed his vision with vendors such as IBM, Xerox Corp. and Apple Computer, Inc., but the library is far from being ready to sign a contract. One of the biggest challenges the project now faces is how to index and store thousands of videotapes for fast retrieval on multimedia workstations, according to Edwards.

The scanning of unclassified correspondence into the optical disc system by the White House correspondence office was a key step toward creating the electronic library.

The digital images often include attachments and handwritten notations from various officials who have reviewed the correspondence.

The 5-year-old optical archive was poorly maintained and was plagued by a variety of problems, so the White House hired Mastech Systems Corp., a Pittsburgh systems integrator, for a complete overhaul.

Library rivalry

The Bush library will be the most high tech of the presidential libraries. While the Reagan library has an electronic index of documents, the documents are not in a database. The Bush library will be built with privately donated funds on a 90-acre site in College Station, Texas. The cost is estimated at $87 million.

In the last six months, the firm replaced faulty software and upgraded the servers on a network that includes 80 Unix-based workstations, according to Mastech project manager John Sparhawk.

It appears that the Bush library will also be getting thousands of computer tapes holding the electronic mail of the Bush White House (CW, Jan. 11). A federal court has ruled that the backup tapes must be saved, although the Bush administration has appealed the ruling.

Edwards said he is looking forward to getting the E-mail archives, but he added that "historians will have to learn how to use it. We're not used to dealing with correspondence at that level of intimacy."

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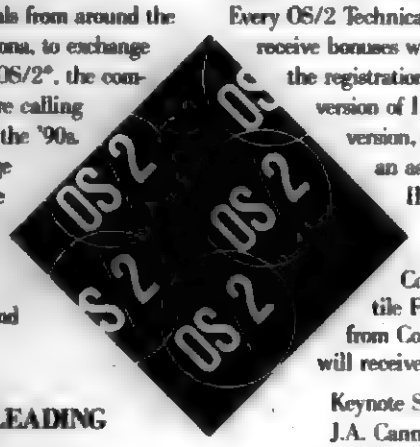

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To PC, But Which PC? That Is the Question

Let Benchmarks Play a Leading Role in Your Decision

There was a time — not too long ago — when the idea of a personal computer on every desktop was farfetched. Soon, the technology became available, but the cost was prohibitive. Today the number of computer vendors marketing their brand of PC is increasing at a dizzying rate. The result? Higher-quality machines at lower prices. Plus, some tough decisions for you.

Studying specific benchmarks can help as you decide which PC is right for your business. In fact, there are several PC benchmarks that can be used to differentiate systems from model to model and vendor to vendor.

Benchmarks, highly visible and widely quoted, are a less than perfect yardstick for measuring PC performance. At the very most, they're only a test designer's best guess at emulating what you're really doing on the computer. However, whether you're buying a PC to use as a stand-alone, as client, as server, or in a networked environment, benchmarks can be quite relevant to your purchasing decision — as long as you select those that are most appropriate for your business.

Your computing environment — whether traditional MS-DOS or Windows — will play a key role in the benchmarks you choose. Although several benchmarks are fine for both environments, there are some that are strictly windows-based. It's also important to choose benchmarks that make comparative ratings available. Unlike benchmarks in the UNIX arena, most of the widely used PC benchmarks have been created and maintained by magazines and independent testing labs. So, don't hesitate to ask for the source of benchmark results.

Critical areas of measurement for stand-alone PCs include: CPU, disk I/O, graphics, floating point unit (FPU), and applications. For a networked PC, the network interface also becomes important. Let's take a closer look at specific benchmarks in each of these categories.

CPU

CPU benchmarks measure the speed of the central processing unit (CPU) and may be paired with single measurements of other components, such as a graphics processor, disk, or network interface. Specific CPU benchmarks include:

- **PC Bench *(PC Magazine)***

This benchmark suite provides application-based benchmarks in several desktop areas, including word processing, spreadsheet, and database. (Metrics: DosMark, WinMark)

- **Norton SysInfo V6.0 (Norton SI from Symantec/Peter Norton Computing Group)**

Norton V6.0 refers to the sixth version of the Norton Utilities, a collection of programs that enhance your PC's capabilities. SysInfo refers to a specific utility measuring performance through two tests: System Index (SI) for CPU speed, and Disk Index for disk speed. A third aggregate index averages the two test results together. (Metric: SYSINFO)

- **Dhrystone**

This benchmark measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. (Metric: Integer MIPS)

- **iCOMP (V1.0 from Intel)**

The iCOMP benchmark is new and represents Intel Corporation's first attempt at providing a comparison of their CPU chips in terms of performance. The iCOMP index is a weighted mean of the results of other CPU benchmarks, including ZD Lab's CPU benchmark, Whetstones, SPECint92, and SPECfp92. The iCOMP index is scaled so that a 25 Mhz 486sx is rated at 100 iCOMPS.

Graphics

Graphics benchmarks are usually relative to an imaginary system and are expressed as single metrics for one or more graphics options. These benchmarks also contain elements of window management, pure graphics, and character manipulation. They include:

- **WinBench *(PC Magazine)***

WinBench is a windows-based graphics benchmark that measures not only the performance of graphics operations, but also the effects of disk caching under windows. (Metric: Winmark)

- **WinTach (Texas Instruments)**

WinTach is also a windows-based graphics benchmark. Its RPM rating provides a composite of four test scores, including word processing, CAD/DRAW, spreadsheet, and Paint Windows applications.

- **PC Bench**

Applications

The earliest benchmarks available concentrated on raw CPU speed. Today the trend is to test the actual environment and simulate or even use the actual application to test systems. Application benchmarks include:

- **SYSmark (Business Application Performance Corporation)**

With the SYSmark suite, you're provided with actual application-based benchmarks in the areas of word processing, spreadsheet, database, desktop graphics, desktop publishing, and software development. (Metric: Individual SYSmark in each category, overall aggregate SYSmark)

- **WinTach**

Network

These benchmarks measure network performance. Specifically, some measure the performance of the network interface card, while others test throughput of the server system, usually determined by a combination of CPU, NIC, and disk performance. Network benchmarks include:

- **NETbench (Ziff Davis Labs)**

NETbench consists of three benchmarks that focus on CPU throughput with the metric in transactions per second, Network Interface Card (NIC) throughput in bits per second, and I/O throughput in bits per second.

- **Norton SysInfo V6.0**

Disk I/O

With the advent of caches on disk controllers and software disk caches, these benchmarks tend to measure more than just raw disk performance. Some measure at the application level; others measure at the operating system level. Still more measure attributes of the disk system. Disk I/O benchmarks include:

- **CORE (V2.0 from CORE International)**

The CORE benchmark measure attributes of the disk system, including transfer speed and track-to-track times, through standard metrics, such as data transfer in Mb/s.

- **Norton SysInfo V6.0**
- **PC Bench**

Floating Point

These benchmarks measure the FPU, usually associated with the 80 × 87 coprocessor instruction set. However, since most PC applications do not take advantage of floating point, there aren't many "typical" application-based FPU benchmarks. Those that exist include:

- **Whetstone**

Written in Fortran, the Whetstone benchmark measures single- and double-precision integer processor and compiler efficiency. (Metric: KWIPS or WIPS)

Beware the Creeping Foo of Benchmarks

There are two important ideas to remember when selecting PC benchmarks. First, the results of different versions of benchmarks should not be compared. Benchmarks evolve along with hardware and software and may change significantly with each new version.

Second, beware of benchmarks created by manufacturers. Naturally, they will represent their own product in the best light. Actual use may not exhibit similar increases in performance.

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Dave Stark, Manager, Computer Operations
GE Computer Service (GECS)

For GE Computer Service (GECS), a leading provider of comprehensive, multivendor computer maintenance service and equipment rental, ensuring quick resolutions to customers' problems is critical. That's why the Norcross, Georgia-based company began to investigate new computer hardware when it reached full capacity on its existing system in 1991.

What was needed was a scalable computer system to form the foundation for future growth. GECS looked to Digital for the solution — and found it. The company selected Digital's VAX 6000 system because of its increased capacity and processing functionality. In addition, a cluster of VAX 6000 systems was selected to serve as the host system, providing increased power and flexibility to accommodate GECS' business expansion.

In addition, GECS saw the OpenVMS operating system as a more suitable platform than a client/server UNIX-based system on which to run the company's mission-critical dispatch applications.

The next challenge: to convert DART to OpenVMS without disrupting established procedures or creating system downtime. DART, the company's integrated Call Management System, was originally developed in a PICK-based system to take advantage of Pick System's strengths in commercial applications.

GECS began researching technologies that would keep DART intact but allow the application to take advantage of Digital's VAX architecture and OpenVMS operating system. The company selected Unidata, Inc., a Digital third-party partner, to provide the critical link between GECS' existing system and the new Digital environment.

"A key element in our initial selection of Unidata was our ability to maintain the same look and feel throughout the entire application," said Jim Schneider, Manager, DART Application Development, GECS. "We were amazed at how easily our PICK BASIC programs and our Report Paragraphs were converted to Unidata."

All in all, the Digital/Unidata partnership provided superior hardware technology and robust RDBMS to ensure the viability of the GECS' DART system well into the future.

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Digital's Alpha AXP technology — based on an advanced 64-bit RISC architecture — will provide users with a major increase in processing power and addressability at an affordable price. So what's in store for the future? Quite possibly, newer, more powerful applications and styles of computing that have yet to be imagined.

Many of "yesterday's ideas" are things we simply take for granted today, like the automobile, the telephone, the VCR. Ideas that have enhanced our capabilities and that have made our lives easier and more productive.

In computing, it's the same story. Emerging technologies will bring about a major paradigm shift in the way people use computers. Multimedia, speech recognition, imaging, and other technologies will enable the computer to work the same way people work to accomplish non-computer tasks today. These technologies will permit even the most casual user to access powerful information storage and manipulation capabilities.

In fact, the application of computing is about to experience the same leap that took us from mainframes and 16-bit minicomputers of the early 1970s to the 32-bit microprocessors of the mid-1980s. This leap ushered in the age of desktop computing with windowing user interfaces. Affordable 32-bit microprocessors facilitated development of new classes of applications, such as desktop publishing — a capability taken for granted today.

What, you may ask, will stimulate the next technological leap that brings us applications of the future? The answer is an advanced, 64-bit RISC architecture — an architecture that provides for unlimited growth into the 21st century by offering dramatically increased performance and addressing capabilities. Digital has given it a name: Alpha AXP.

The Significance of a 64-bit Computing Architecture

The combination of speed and enormous addressing capability will be required to run the next generation of high-impact applications. Digital's 64-bit Alpha AXP architecture is the industry's first to offer both features — enabling you to run applications faster, with increased detail, and at a reduced cost. With Alpha AXP, the power of the supercomputer will be made affordable and available on the desktop.

Another key difference between Alpha AXP and first-generation 32-bit RISC architectures is longevity. For a computer architecture, longevity is based on three requirements: addressability, support for multiple operating systems, and scalable performance. Digital's Alpha AXP technology offers all three:

- 64-bit addressing capability
- Support for UNIX, OpenVMS, Windows NT, and operating systems to be developed in the future
- Performance that's scalable by a factor of 1,000 during the next 25 years.

Digital's first-generation Alpha AXP systems have already established new high-water marks for RISC system performance. Benchmark figures include:

- SPECmark89: 184
- SPECfp92: 200
- SPECrate_fp92: 17187

In fact, competitors' sixth- and seventh-generation 32-bit systems — perhaps at their peak performances — have already been surpassed by first-generation Alpha AXP systems.

Alpha AXP: Imagine the Possibilities

No matter what business you're in — from financial analysis to aircraft design — 64-bit computing gives you the power to solve not only today's problems fast, but also more complex problems even faster. For example:

- The enhanced speed and addressability of Alpha AXP will allow pharmaceutical companies to rely on the accuracy of computer modeling technology to enhance the work of the bench chemist. Alpha AXP will enable scientists to model more complex molecules over a longer period of time — and will ultimately shorten a drug's design, development, and approval cycles.
- The addressability of Alpha AXP can drastically improve the productivity and efficiency of the documentation process at power plants. For instance, searching for information through reams of microfiche and paper cartons is a time-consuming process. With Alpha AXP technology, volumes of documentation can be brought online and into memory — making the search process easier and tremendously efficient.
- Just as technological advances of the past have facilitated new styles of computing, so the Alpha AXP RISC architecture will be the catalyst for applications of the future, including voice integration and virtual reality. For example, Alpha AXP capabilities will make transcription from audiotape a thing of the past. In the healthcare industry, physicians' notes could be transcribed automatically in real time via speech recognition at a workstation.

Alpha AXP Versus IBM: Digital Wins on Price and Performance

CERN, the European Nuclear Research Center located near Geneva, Switzerland, has developed a set of benchmark tests that help its staff select computer systems. The CERN benchmark suite tests a broad range of system capabilities.

So, how did Digital's Alpha AXP system fare when compared with an IBM [illegible] benchmark suite, the DEC 7000 AXP [illegible] starting at $168,000 — rated [illegible] performance. On the same benchmark, [illegible] — at an entry-level price [illegible] for the operating system) — [illegible] units of performance.

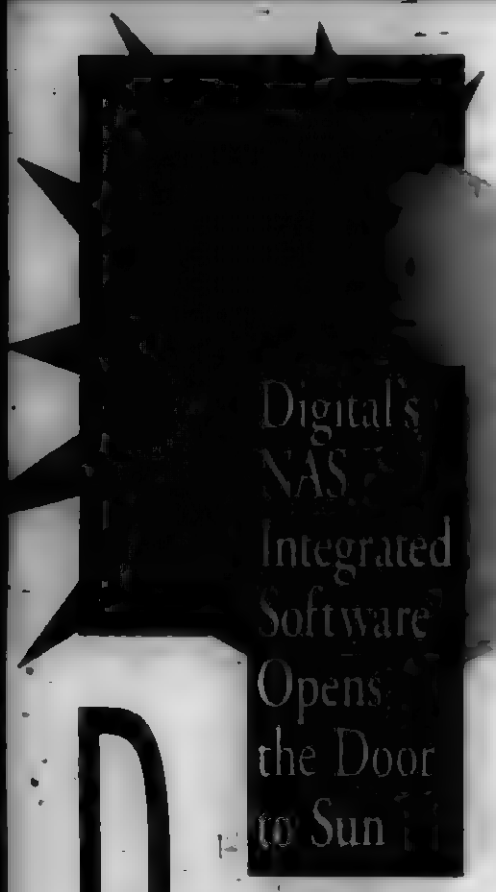
In short, the [illegible] performance [illegible] the price.

Use Fast FAX Service to Get the Facts on Alpha AXP

Digital's "Alpha AXP Fast FAX Service" enables Digital customers to order literature and receive it within minutes using a Touch-Tone telephone and fax machine (in the U.S. and Canada), or a fax machine and attached phone (outside the U.S. and Canada).

Simply dial a telephone number specific to your calling area and then follow a series of voice prompts to select and order documents you want. You then receive the literature through your fax machine a few minutes after you hang up.

Alpha AXP Fast FAX:
[illegible]



Digital has simplified multivendor computing at Sun sites with our Network Application Support (NAS) 250 for SunOS SPARCstation product — enabling SunOS users to easily integrate applications across a variety of vendors' platforms.

Like all NAS products, the NAS 250 for SunOS SPARCstation product simplifies multivendor computing by providing a common layer of software that shields you from underlying differences among operating systems. As a result, NAS can streamline access to data and information across different computing platforms, such as MS-DOS, MS Windows, Macintosh, UNIX, OS/2, OpenVMS, and IBM platforms.

The NAS 250 for SunOS SPARCstation product integrates three software components, all based on open industry standards. They include:

DECwindows Motif
DECwindows Motif is Digital's OSF Motif-based software that provides a common user interface optimized for high-resolution displays on a bit-mapped SPARCstation. It also includes features, such as online help facilities, structured visual navigation, customization of windows, and support for Asian and multinational character sets.

Application Control Architecture (ACA) Services
ACA Services is software that enables you to effectively integrate distributed applications and information easily, using object-oriented technology.

Compound Document Architecture (CDA) Services
CDA enables you to store, transport, and interchange compound documents in a multivendor environment. NAS 250 for SunOS SPARCstation software is also server-enabled — allowing access from other SunOS SPARCstations in the network as clients or peers.

Order Information

NAS 250 for SunOS SPARCstation Software	
QL-04NAJ-38	
$265	

For information on any of Digital's NAS software products, or to order NAS 250 for SunOS SPARCstation software, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 69F.

NAS Success in Pueblo County

Using NAS 300 Integrated Software from Digital and GIS software from Environmental Systems Research Institute (ESRI), Inc., Colorado's Pueblo County is building a GIS Center — a general query system for county agencies, based on data from property records, parcel boundaries, census data, aerial photography, and associated land records.

NAS-based SQL Access services allow users to create direct links to information without needing to know where it resides. The CDA architecture of NAS allows users to create and share compound documents using different data types, such as bit-mapped and vector graphics, maps, and text.

NAS 300 also enables personnel to automatically trigger events from one department to another via DECmessageQ. For example, if a lien is filed in the clerk's office, DECmessageQ will trigger an alert in the records department. This, in turn, may trigger a flag in the treasurer's office that tax payments are delinquent — thereby preventing a deed from being recorded.

All told, NAS features enable employees from different agencies within the county to link to ESRI's GIS database, located on a DECsystem 5000 server — allowing easy access to sharing, locating, and storing information. Since the GIS Center is strategically located with a combined Emergency Dispatch Center for the city and county of Pueblo, virtually all NAS 300 components will also be used by 1994 to support valuable emergency response applications.

> "NAS 300 allows us to integrate our PCs, UNIX systems, and VAX systems, and share our GIS (Geographic Information Systems) among multiple departments. In addition, we can share X.400 mail between our PCs, UNIX systems, VAX systems, and our IBM AS/400 systems — providing greater information sharing between departments."
>
> *Gerald Carleo, Director Information and Computer Systems Pueblo County, Colorado*

Digital Opens Network Printing Software to HP and Apple PostScript Printers

With DECprint Supervisor for OpenVMS

With DECprint Supervisor (DCPS) for OpenVMS, Digital expands its printing support to include popular third-party PostScript printers in the OpenVMS and PATHWORKS environments — including several models of the Apple LaserWriter and the Hewlett-Packard LaserJet families.

With roots in DECprint Printing Services for OpenVMS, DCPS is layered software, offering powerful PostScript printing for your PC, Macintosh, workstation, and VAX OpenVMS systems. DCPS also increases "at the desktop" printer control, and adds sophisticated output features, including:

- Automatic data type detection and translation to PostScript of selected printer languages such as: DEC ANSI (PPL3), HP PCL, IBM ProPrinter, DDIF bitonal image, ReGIS, or TEKTRONIX. This feature also continues searching text data streams to detect and print appended PostScript data — greatly simplifying queue management and ensuring that documents are printed right the first time.
- Job status and printer condition messages for both users and system administrators.
- Number-up (N-up) and lay-up features that let you specify the number of page images per sheet as well as page placement on the sheet.

A three-product offering, DCPS allows you to tailor your printer support to suit your specific printing needs.

The first, DCPS-Base, drives Digital's line of PostScript printers, including our DEClaser 1152 printer — the world's first PostScript printer priced at under $1,000. It outputs PostScript from PostScript or simple ASCII files, and supports all printer features, including tray selection and duplex printing. There's no cost for DCPS-Base, as its license is part of the OpenVMS license.

The second, DCPS-Open, lets you drive selected third-party printers, supporting all of those printers' features, and outputting PostScript from simple ASCII or PostScript files.

The third product is DCPS-Plus — offering value-added features, including number-up and lay-up, plus Automatic Data Type Detection and Translation. DCPS-Open and/or DCPS-Base are prerequisites for DCPS-Plus. Both DCPS-Open and DCPS-Plus require a license, with each CPU-based license allowing the operation of *any number of printers.*

All in all, the modular flexibility of DCPS offers maximum value. For a limited time, a special introductory price has been established for DCPS-Plus — providing even greater savings.

Order #	Product	Price
QL-09FA*-AA	DCPS-Open	From $350–$2,324/CPU
QL-09LA*-AA	DCPS-Plus	From $50–$100/CPU
QA-09NAA-H	Media/Documentation	$285

*All CPUs in a cluster can print via a single CPU.

To order any or all of Digital's DECprint Supervisor (DCPS) for OpenVMS offerings, call 800-DIGITAL (800-344-4825) and press 1. For information on DCPS, press 2 and ask for literature #EC-F2094-56.

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Don't choose technology without him

Neal M. Goldsmith is a director of technology strategy at American Express Co.'s headquarters in New York, where he is responsible for a multimillion dollar research and development fund for the deployment of artificial intelligence systems across five American Express subsidiaries. He is one of five directors at American Express' Corporate Technology Strategy (CTS) group.

Jerry Bino

Goldsmith joined American Express in February 1989. Before joining the company, he was a research analyst at Gartner Group, Inc. in Stamford, Conn., and a senior research associate at AT&T's Technology and Productivity Center in Piscataway, N.J. He talked recently with Computerworld correspondent Thomas Hoffman.

American Express Co. is a $25.76 billion diversified financial services firm. Industry analysts estimate its information systems budget last year was $850 million.

Q: What's the mandate of American Express' CTS group?

A: To provide technical thought leadership to American Express and assist with technology strategy development for the business units. CTS also facilitates technology diffusion across American Express. In addition, the organization coordinates advanced R&D projects and manages strategic vendor relationships, especially with larger vendors such as IBM and AT&T.

Q: How do you select R&D projects?

A: Each summer, CTS circulates a memo to each business unit and corresponding Advanced Technology Group (ATG). The ATGs and user communities then discuss the business issues and R&D priorities of their organizations.

Then, the ATGs send a one-page proposal to corporate. The proposals include the application planned for R&D, the expected payoff from the technology employed and the net present value of the implemented application.

CTS then works with the business units to form cross-business unit R&D partnerships in order to capitalize on potential synergies and foster improved technology transfer.

After prioritizing the proposals, CTS sends its recommendations to executive management, which modify and then approve that year's selections.

Q: Is senior management involved in the selection of advanced technology projects?

A: Management is very involved. Our organization, which was launched in 1986, was the brainchild of [outgoing American Express Chairman and Chief Executive Officer] Jim Robinson. The corporate R&D fund encourages business units to invest long term in R&D, regardless of their quarterly or annual financial results.

You really need someone with vision to champion the concept of R&D. Jim Robinson and [American Express President] Harvey Golub have been deeply involved in encouraging the technology innovation process. Senior management truly rewards technology risk-taking, which is one of the reasons the company is known as a trendsetter.

Q: How does your organization help the business units implement new technologies?

A: CTS focuses on three central issues. First, the technology itself has to be valid and appropriate. Second, we focus on what's important to the users. Third, we look at current internal cultural and political conditions and whether the project fits the user department's budget.

We also look at the process of innovation and the barriers and aids to implementation. We involve end users — that's very important. The staff has to own the project, and department heads need to be convinced of the potential dollar payoff.

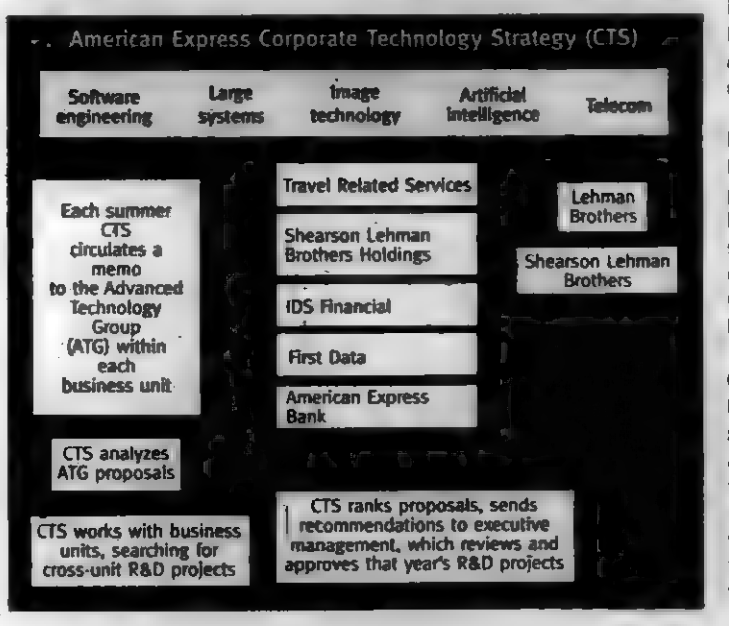
Q: Can you cite an example of a successful project?

A: Yes, the Authorizer's Assistant [an expert systems-based credit authorization system], which was developed in 1987 and was our first R&D project. It was wildly successful, and it saves American Express millions of dollars each year.

The system does the work of 700 human authorizers, who have either left or were reassigned within the company. That project was implemented by the Travel Related Services [TRS] subsidiary using software from Inference Corp. It is unlikely that this system would have been developed as early by TRS without corporate funding.

Q: What advanced technologies hold promise in the financial services sector?

A: Distributed applications, parallel processing and AI. Within AI, the most promising technologies are neural networks. Neural networks involve quantitative pattern recognition, which is what financial analysis is all about.



Turnaround

Can you think of a company whose mainframe revenue actually grew last year, by about 25% no less?

It is also a company that in a recent study ranked head and shoulders above its competition in mainframe customer satisfaction in Japan, where users are particularly demanding and quality-conscious.

Finally, this is a company that many people pretty much gave up for dead a short time ago, but which last week posted its fifth straight quarterly profit.

Among the companies that amassed and later lost fortunes in the last two decades selling proprietary iron, Unisys has engineered a turnaround that is impressive even to the most jaded of industry watchers. It is an accomplishment made all the more impressive by the seemingly endless tidal flows of red ink being hemorrhaged by IBM, DEC, Wang and others groping for bottom in an unforgiving market.

The accomplishments of Unisys and its chairman, James Unruh, hold excellent lessons for any business, be it a computer vendor, user company or anything else. And it comes down to this: Lose sight of your customer and you risk losing the entire enterprise.

Its customers, like all users today, clamored for more openness in systems architecture. So Unisys "surrounded" its proprietary mainframes with integrated, Unix-based workstation solutions. This gave its mainframes the open characteristics that users wanted in a big server and arguably made its big boxes the most interoperable of any mainframe available. That's why Unisys sold more last year than the year before, and it expects to see more mainframe growth this year.

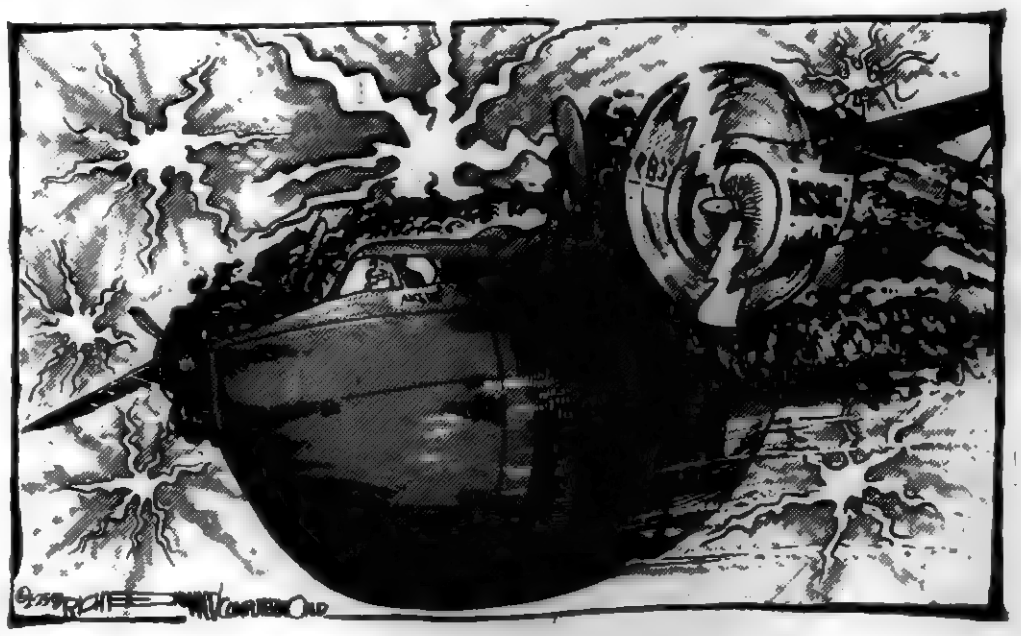
Unisys also emulated what the marketplace was doing by reducing the number of data centers in the $8 billion company from 46 in 1991 to 22 today, with a goal of further reducing it to one within two years. That's a great way of seeing the world the way your customers view it.

Perhaps most importantly, a beaten, demoralized work force at Unisys — one that saw the number of employees drop from 120,000 five years ago to 55,000 today — was made to believe in itself once again. I visited the company 18 months ago when the mood was like a funeral parlor during a wake.

Today its top executives, whom I visited last week, are carrying out Unruh's mandate to methodically transform Unisys into a provider of open systems-based products and services, away from the mainframe legacy of its past. They seemed confident yet also humbled by the lesson they learned: Arrogance and smugness have no place in today's market. They realized the past is far gone and that a recovery can only be sustained if they meet the needs of their customers.

Bill Laberis

Bill Laberis, Editor in chief



Not true

Paul Gillin obviously has no idea what he is talking about ["Easy as 1-OS/2-3," CW, Jan. 11]. When he recommends installing OS/2's dual boot feature, he says "the dual boot requires repartitioning your hard disk, resulting in a total loss of all data on it." Nothing could be more false. As a matter of fact, dual boot requires that you already have data on the partition — namely DOS.

The fact that he also can't locate any OS/2 applications may mislead readers to believe that *Computerworld* writers don't bother to research a product before providing an evaluation.

Thane Smith
Tempe, Ariz.

Different opinions

The In Depth article "Quick and dirty" by Lowell Jay Arthur [CW, Dec. 14, 1992] was a wonderful description of the direction in which application software must evolve. His metaphors were not just entertaining; they very accurately model the way it is. I especially liked the creation/evolution metaphor: Do it quick, then let it evolve.

As vice president of professional services at Syscorp, I have overseen scores of PC network projects. All I can say to Mr. Arthur is "Amen!"

Thomas O. Meadows
Austin, Texas

Regarding Lowell Jay Arthur's ideas on "rapid evolutionary development," the process Mr. Arthur heralds as the wave of the future is an echo of the past. Before software developers were enshrined into departments with huge backlogs, they could be found in symbiotic relationships with people who would one day be known as their customers.

Secondly, his ideas on paperwork prevention are criminal. I won't dispute that most project documentation is more useful when it's acting as a pedestal for my monitor. However, the disappearance of the programmer/customer relationship can be traced to the belief that documentation can be handled informally when only a few people are involved.

Quick, yes. Dirty, never!

Corey P. Huber
Casenovia, N.Y.

Cite your source

In "Question everything" [CW, Dec. 28, 1992/Jan. 4, 1993] you state, "For every application rewritten in C or C++, the cost of software maintenance plummets compared with the cost of maintaining Cobol code." On what data do you base this statement? I have been looking for an authoritative, controlled study that quantifies the comparative cost of C and C++ to Cobol with little success to date.

The only study I've found compared the costs of developing in several languages, two of which were C and Cobol. This study discovered they were roughly equally productive for development.

Your article goes a long way to dispelling several costly, damaging myths. How ironic it would be if, in the same article, you would perpetuate another.

Preston W. Black
Cincinnati

People power

Michael Schrage makes some excellent points in his article "Bloodless revolution won't work" [CW, Nov. 30, 1992]. A key one is that "information doesn't create value — people do."

The ability to view financial statements 24 hours a day from home or office is worthless if the accounting is flawed.

For information to have value, people have to transform that information into knowledge by applying it with intelligence to a problem or a need.

There is, however, one area where Schrage perpetuates one of the most massive myths foisted on the business community by (mainly) computer companies. The simple phrase "information technology" is innocuous on the surface but has immense ramifications when accepted uncritically. I have seen no evidence that computer companies know anything about "information technology."

What they do know is how to move larger and larger quantities of bits and bytes faster and faster between more and more locations. That, however, is neither "information technology" nor "information management."

Marcis Esmits
Vancouver, British Columbia

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How vendors can die from downsizing

Marty Gruhn

During a recent trip to the East Coast, I sat next to the manager of worldwide support at a second-tier computer company whose problems have become legend. Our seatmate chat turned to the problems facing the computer industry.

"I'm watching the problems at DEC and IBM with some amusement," he began. "You know, both companies are facing real problems. They have to cut a hellacious number of employees, and I hear their organizations are in chaos. We, on the other hand, have already completed our downsizing and have those problems behind us. In fact, we should be profitable this quarter. You know, I heard that IBM...." He lapsed into a series of anecdotes about the missteps and mishaps of his largest competitor.

I felt like I was listening to a sailor from the Edmond Fitzgerald critique the design points of the Titanic. True, both ships sank, but thousands of the Titanic's passengers were saved. The Edmond Fitzgerald went down with all hands on deck.

What my seatmate didn't realize was that I knew the costs of his company's decisions. My firm had been interviewing thousands of his customers — and those of other companies — who were living with the results of a downsizing decision. The carnage wasn't a pretty picture. Here's why:

The first reaction of most vendor companies planning to downsize is to deposit the president or CEO in front of a podium to promote downsizing as an event that will make the company leaner, meaner... and better for the customer. Forget it. History shows that downsizing really results in organizations that are in shell shock for at least a year, usually longer.

Translated into customer terms, this means fewer people and resources, less responsiveness to problems and more aggravation.

The CEO's time would be better spent working on problems and talking directly to customers. If response times will go from four to 24 hours during the transition, the bad news should be on the table from the start. If the sales staff will become smaller, alternative ways to order products should be discussed.

Few vendors do this. Even fewer do the even smarter thing — talk to customers before the fact to see what products and services could be cut back with little or no adverse result. If they did, the outcome would probably surprise them. In a recent study, we found that customers would accept a 50% reduction in service response time for a 5% cut in service costs.

Sure, the vendor would have to give up a little revenue in this scenario, but it could also downsize and centralize its service organization at a substantial annual savings *and* keep its customers happy. Even with downsizing, there's no such thing as a free lunch. If you cut products, services and responsiveness without some quid pro quo for the customer, the inevitable result is, you will have no customer.

And what of my seatmate and his boasts that his company has gone through the fire and emerged stronger and essentially unscathed? Well, I suppose he would have had more credibility if he hadn't told me that most of his customers are content with the changes (they're not), that the downsizing was successful (it wasn't) and that his mainframe accounts are going to ignore client/server (they aren't). But when he told me he had been at the same firm for more than 20 years, I understood completely. I turned out my light and went to sleep.

Gruhn is executive vice president of Alliance Development, a Scottsdale, Ariz., sales and marketing services firm.

Life won't be the same in a 32-bit world

FIRE WATCH *by* John Gantz

Sometime between Comdex/Spring '93 and Comdex/Fall '93, the number of 32-bit PCs in the world will equal the number of 16-bit PCs. In the next four years, the number of 32-bit systems shipped will top 100 million. The number of millions of instructions per second (MIPS) installed during Bill Clinton's first term will grow by a factor of 15 — faster than the deficit. We're talking about a couple of billion MIPS sitting out there in briefcases and on desktops in 1996.

This is why I have suddenly become bullish on 32-bit desktop operating systems and bearish on the information systems profession.

The main argument for 32-bit operating systems — IBM's OS/2 Release 2.0, Microsoft's Windows NT, a handful of Unixes — is all this powerful hardware sitting out there ready to rock and roll and faced with the prospect of doing so with DOS. Would you want your family car running on baby buggy wheels?

There are other reasons too, such as the swift things you can do with program development tools and the marriage of GUIs with all this desktop power, but they are too technical to get into here.

Anyway, I only want you to buy into my first proposition so I can lead you into the box canyon of my second. And that is this: The IS profession is heading over a waterfall. Downsizing is a permanent thing. Here is my reasoning:

- New 32-bit operating systems, themselves a lot more complex than what users are accustomed to, will radically increase the requirement for remote-site, workgroup and division IS functionality. The same is true for new groupware applications (none of which are shrink-wrapped), network-based applications and network software.
- As this demand increases, organizations will compensate by consolidating central site resources and cutting headquarters' IS professional staff. The clever trick of off-loading the IS budget onto end-user budgets will backfire as the IS corpus under CIO or IS manager command shrinks to a small consulting staff.
- Top technical talent, always in demand, will flee to growth areas such as consulting firms, resellers and software companies.

If you think this is farfetched, then you didn't look beyond the numbers in last year's *Computerworld* Salary Survey [Sept. 7, 1992], which pointed out how IS salaries are actually going down. Nor did you understand the pathos of another front page story in that same issue — one about programmers unionizing.

Now here's the twist. I think the number of individuals performing IS functions will increase as all this operating system and application complexity hits those fallow 32-bit computers. But those individuals will come from a variety of sources and report to a variety of corporate departments and third-party organizations. A once-solid, stable profession will fragment and do so with the speed of a Pentium chip. To think, only a decade ago we were worried about the coming programmer shortage.

For individuals caught in the squeeze play, there are three options:

- Hone the high-demand technical skills left: networking and systems software design.
- Spearhead the charge into client/server computing for your company and gain job security in the resulting confusion (see my column of Dec. 21, 1992).
- Dynamite the passes out of Silicon Valley and bottle up those quarter-inch mainframes coming out of Intel and Motorola.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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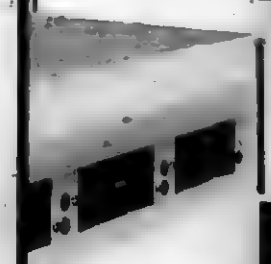

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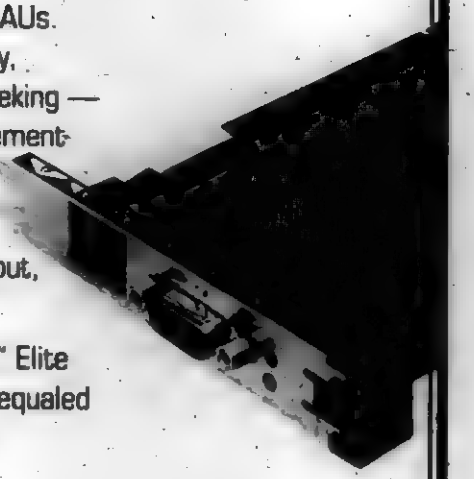

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Charles Babcock

Soft gains, secret savings

As many IS managers know, PC users scarcely finish congratulating each other on the bargain-basement hardware prices they find before the real costs of ownership start to mount up. There's the hidden cost for support — $6,000 or more per PC per year. There's the cost of networking. And a soon-to-be-released study from the Microcomputer Managers Association says there are hidden costs to moving to a graphical user interface.

Making invisible costs tangible and keeping a realistic tab is the mark of a good manager. What's often forgotten, however, is that savings gained should be tracked just as aggressively.

PCs can save money in unexpected ways, and given a realistic accounting of these savings, top management is more likely to sign off on the next investment.

One person who knows the value of keeping track of benefits as well as costs is Jim Coyne, senior vice president of IS at Acacia Federal Savings Bank.

In 1988, Coyne was commissioned to automate as much of the mortgage processing as possible at the Annandale, Va., savings and loan. He did so under considerable performance pressure. Overhead was outrunning revenue, and Acacia was losing $1.2 million a year in only its third year of existence. He was also working under the gaze of a bank president "who believed computers and boats have something in common — they're both black holes for money."

Before he was finished, Coyne had turned this skeptic into a believer with a combination of good results and salesmanship.

What Coyne did wasn't terribly complicated. His results may not have been startlingly better than those obtained by other projects in other places. But what he did made all the difference. He paid attention to and made explicit the soft gains and hidden savings that technology people often overlook.

As Coyne told a Networld audience in Boston recently, he started small, with a NetWare LAN with a 300M-byte server and 11 386-based PCs. When employees described each step of their work to him, he was surprised to find that 30% of their jobs consisted of repetitive tasks that could be reduced or eliminated through the use of WordPerfect, Lotus' 1-2-3, a relational database and the file transfer capability of the network.

In an interview after his talk, Coyne described how the network flattened the organization in a way that has been described in many *Harvard Business Review* studies. It wasn't part of the original network plan, but secretaries disappeared. People doing repetitive tasks disappeared. Middle management disappeared. The remaining jobs took on higher level responsibilities.

Accuracy also improved — mistakes carried through to mortgage closings declined precipitously. Coyne attributes the drop in misspelled names and mistated dollar amounts to "peer pressure."

The network made mistakes more trackable, a quality-control factor that no one had anticipated.

Acacia began processing loans more quickly, frequently beating competitors on the time needed to close. The tighter time frame narrowed the window of exposure to changes in rates, an area where an S&L can lose money on a deal.

As revenue doubled and the network expanded, Coyne carefully tallied the cost of the network in 1992 — $350,000 — and then compared that figure with what the company would have been paying in additional salaries if the number of employees had kept pace with revenue — $650,000. He then shared these figures with the president.

What did that accomplish? Instead of talking about black holes, the president wanted to know, "Can't we do more with this technology?"

Babcock is *Computerworld*'s technical editor.

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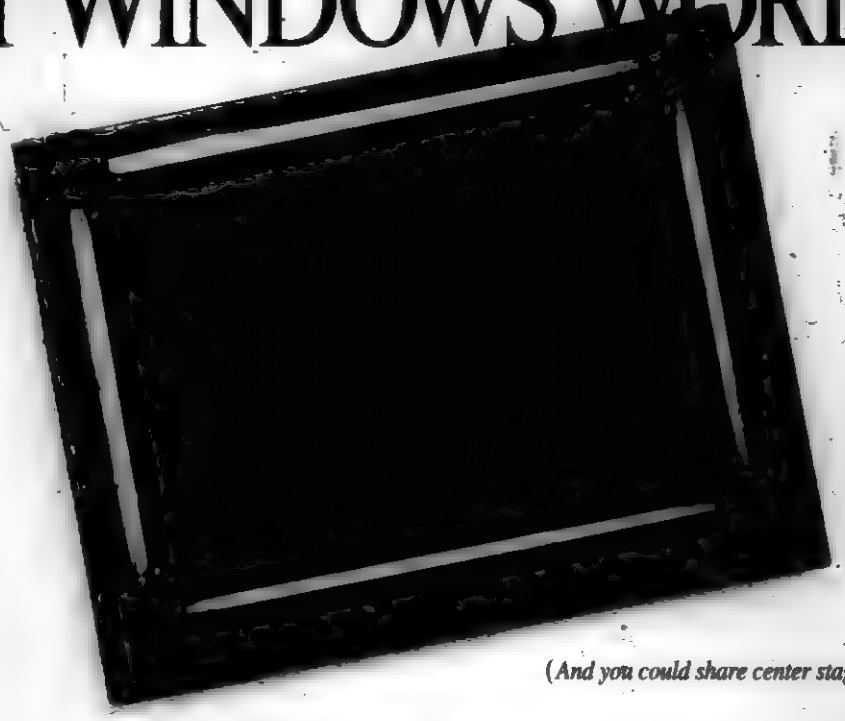

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Hardware confronts viruses

New solutions sought as number and variety of viruses challenge protection software

By James Daly

As the number of new viruses grows at an incendiary rate, information systems managers who want to keep their sanity and their jobs are increasingly looking for ways to ferret out and destroy rogue code.

The traditional method of fighting viruses with software-based scanners that search for known strings of virus code was acceptable when new viruses emerged every few months. Now, with new viruses being identified daily, security managers are questioning the traditional reactive software approach — detecting and eradicating primarily known viruses — and looking toward something new: hardware-based antivirus solutions.

Proponents say a number of protection techniques are made possible or more reliable by using an add-in adapter card. For example, the read-only memory on such a card has an opportunity to execute before the PC boots, virtually assuring a virus-free environment.

While traditional software scanners search for code strings to identify and eliminate known viruses, hardware does not need to know the specific virus in order to work.

"No product is going to catch every virus, but we like to believe we've made life harder for virus authors," said Anne Stewart, president of Warrenton, Va.-based JAS Technologies of the Americas, Inc., which is readying an add-on card called Virustrap. "We'd really like to put the virus authors out of business, and I think this is a step in that direction."

Secure circuitry

Virustrap, which will be manufactured by Texas Instruments, Inc., works by securing the circuitry of all the executable code on the hard disk. It detects and intercepts unwanted disk formats, blocks alterations of operating system files and stops all writes to protected areas on the hard disk.

Because no part of the program resides in random-access memory, Stewart said that no software attacks are possible. Virustrap, however, is not cheap: It will retail for about $329 per PC when it is available in April.

Some of the other important products in this field include the following:

•Thunderbyte is one of the oldest hardware-based antivirus products on the market, having been on the shelves since 1990. It consists of an add-on card, a configuration program and a flat cable; the hard disk and controller are then patched through the Thunderbyte add-on card. Security levels are set by means of a dip switch on the adapter.

The product is effective because it is based on special algorithms that register any attempt to contaminate a program or data file. Although the product is RAM-resident, the vendor denies that it can be attacked by software in any way.

Thunderbyte was developed in the Netherlands and is now manufactured and marketed by Glynn International, Inc. in Brookline, Mass.

•An Australian-developed product called C:Cure, which will be marketed by Leprechaun Software International Ltd. in Marietta, Ga., is just about ready for release in the U.S. The $229 C:Cure sits on the cabling between the I/O port and the disk drive. According to officials, the device allows the user to partition the drive and put all day-to-day .EXE and .COM files on one drive, which protects them from any modification.

> "No product is going to catch every virus, but we like to believe we've made life harder for virus authors."
>
> *Anne Stewart, JAS Technologies*

•Digital Enterprises, Inc. in Gaithersburg, Md., has developed the V-Card, which protects systems from attacks on the boot sector, system and .EXE files. It will sell for $495 when it becomes available in late January.

•In November, Western Digital Corp. introduced a single-chip controller that uses proprietary antivirus circuitry to write-protect all areas of the hard disk containing the executable code to which viruses tend to attach themselves. The WD7855 controller then monitors write operations to the hard disk and watches out for suspicious activity. It, however, is more a product for the OEM than the end user.

Hardware-based antivirus products are good, but they are not God's gift to IS executives. Critics contend that these boards seem especially vulnerable to virus writers because they can specifically write their virus to detect the presence of the board and circumvent it. Hardware proponents say that such logic is spurious; at the software level, it is analogous to saying that because a virus writer has access to a software antivirus product, it can be circumvented.

Analysts have given a thumbs-up to hardware-based virus protection. "It's a terrific idea," said Charles Rutstein, a virus researcher in Geneva, N.Y. But he also added some caveats: "Many of the cards are still too expensive," he added. "I see prices going down in the next year, but right now many of the manufacturers are just trying to recoup their investments."

Hardware-based virus protection

Pluses
- Hardware protection cannot be circumvented by software.
- Viruses, known and unknown, are stopped prior to entering system.
- Does not require frequent updates.

Minuses
- Board must be inserted in each PC individually.
- More costly than software; $200 to $500 per PC.
- May not be compatible with hard disks.

Do not enter

While no antivirus product is 100% effective, hardware may have an edge. Here is how it works:

Essentially, hardware-based products protect specific areas of the hard disk, trapping generic calls that are frequently used by a virus. This is particularly effective for preventing boot-sector viruses.

Antivirus software reacts to the presence of a virus, but hardware blocks the entry of the virus into the system.

Still cheaper than downtime

One strike against hardware-based antivirus products is their cost. It is hard to justify spending upward of $300 for virus protection on a machine, even in the best of times.

But Forensic Medical Advisory Services, Inc. (FMAS) in Rockville, Md., has found a way to ease that monetary pinch: It has equipped one PC with an antivirus card to screen all incoming floppy disks.

> Software scanners frequently missed existing viruses.

FMAS works as a subcontractor for the Department of Defense (DOD) as part of an extensive quality-control program. Several times a year, FMAS sends staff members to military hospitals around the world to download randomly sampled patient records onto floppy disks and send them back to headquarters. The DOD then analyzes the gathered information to make sure it meets proper care standards.

It was a procedure that invited trouble. "In the past, we've inherited lots of viruses that cost hours of heartburn and heartache," said Allen Richards, a senior analyst at FMAS. A variety of software scanners frequently missed existing viruses, he added.

Instead, FMAS decided to equip two PCs with the V-Card from Digital Enterprises. The first PC serves as a screening machine, which every incoming floppy disk goes into without exception. FMAS staff members then "exercise the program," Richards said, running it through certain procedures to see if a virus is trying to launch. A second card on an Everex Systems, Inc. PC is used as a file server; it serves a watchdog role.

The FMAS solution to the high cost of hardware-based antivirus devices is obviously not for everyone in mainstream corporate America. FMAS has roughly 30 people in its IS department, while larger organizations may have hundreds. There are just too many floppy-brandishing employees and too much work coming over the networks to make it workable at many large IS shops.

But at FMAS, add-in cards have made a big dent in the virus problem. "The first time we got hit by a virus, it cost us a week's worth of work for eight people," Richards said. "I'd say it's cheap by comparison."

—James Daly

Security

RSA public-key encryption plan wins support

By James Daly
REDWOOD SHORES, CALIF.

A growing number of vendors have thrown their support behind a data encryption standard developed by RSA Data Security, Inc. — a move that could significantly ease the ability of users to exchange sensitive data among different platforms.

At a data security conference earlier this month, officials from Apple Computer, Inc., Sun Microsystems, Inc., Novell, Inc. and Unisys Corp. used varying degrees of specificity to describe upcoming products that employ the RSA standard. Digital Equipment Corp. and Lotus Development Corp. have already signed licensing agreements with RSA, with the latter integrating RSA's features into its workgroup software, Lotus' Notes.

"RSA needs market momentum to succeed, and I think you're beginning to see that here," said Ray Kaplan, an independent security consultant in Tucson, Ariz.

RSA's system, which was invented by three MIT mathematicians, uses what is known as a public-key design. It employs two keys, one public and one private. Data encrypted with the public key can be decrypted only with the private key. The use of two keys also creates what is known as a digital signature that can be used to prove authenticity.

This contrasts with the private-key Data Encryption Standard (DES), a government-approved algorithm for encrypting digital information that requires only one key for encryption and decryption.

Unbeatable algorithm

RSA gets high marks from security professionals for its sophistication; the algorithm connecting the two keys is so advanced that it is considered unbeatable. Perhaps the highest compliment for the RSA data encryption method has come from hackers, who now use it to scramble messages on dial-up bulletin boards that they fear are monitored by law enforcement personnel.

Novell engineer Kevin Kingdon said Novell will use RSA technology in its upcoming NetWare 4.0, which is expected in the first half of this year. "We're committed to the security of data and the security of interaction," he said.

Apple engineering manager Victor Chang said his company plans to integrate RSA's technology into Apple's upcoming Open Collaboration Environment (OCE), a system software extension that promises to foster growth in the Macintosh collaborative computing market. Chang said Apple hopes to provide a digital signature service that can be called by any application.

Although Microsoft Corp. and IBM mysteriously canceled their attendance at the two-day show, there are reports that Microsoft will implement RSA security features in Windows for Workgroups, Mail and the Windows NT operating system.

RSA President Jim Bidzos said the NT implementation could be the shape of things to come. "By 1995, many of the major operating systems will have public-key cryptography built into them," he said. "The need for this type of security is just too obvious to ignore."

To ignore, yes. But to do something about — that is another story. Although multivendor adoption of the RSA standard could ease the transfer of encrypted data, security experts said a cryptography system typically must clear hurdles imposed by management.

"The cost of administering the system is one of the biggest hurdles that RSA will have to clear," said Philip Chapnick, director of the Computer Security Institute in San Francisco. "The end users are going to have to convince management that those administrative costs are worth it, and that may take a while."

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New hardware, software boost languid pen market

By Michael Fitzgerald

The pen market may be as slow as molasses in January, but it does continue to creep along.

While many projects seem to be stuck in perpetual pilot, some are coming to fruition, and vendors continue to probe the market. For example, Fujitsu Personal Systems Ltd. in San Jose, Calif., last week announced March delivery of a full-fledged pen-based tablet built almost entirely on 3.3V components for longer battery life.

At 3 pounds, the 325Point system will use two Personal Computer Memory Card International Association slots, which will run the cards for the company's Poqet Computer Corp. computer and PoqetPad.

Fujitsu said the system will run all the major pen computing environments on the market and will cost $2,295.

Software front

There has been some activity on the software side as well. Pensoft Corp. in San Mateo, Calif., delivered Perspective, a $299 personal information manager, 11 months after it was announced.

Also, Pen Pal Associates, Inc. in Los Altos, Calif., released Version 4.0 of its Power Pen Pal application development tool. It has added support for PenDOS, an operating environment from Communication Intelligence Corp. in Redwood Shores, Calif. It also has reportedly improved handwriting recognition and program development tools. It is slated to be available in March for $995.

Vincent Ferraioli, senior systems analyst at Consolidated Edison Co. in New York and a Pen Pal user, said the product works well, but "our problem is hardware. We can't find any that can operate efficiently in the field."

Ferraioli said hardware in his environment has to be water-resistant and durable. One meter-reader's handheld computer came back with dog bites. He did credit vendors with being responsive to complaints, and he said pen technology "is great and will be very helpful in the utility business."

Analysts said that outside of new hardware, this burst of activity means little.

"The pen market has been hyped so much that whatever it does, people yawn," said Jeff Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

Still, pen vendors said stronger sales in 1993 will help dim memories of the market's lackluster sales to date. They also defended the overhyped industry's slow start.

"We have to crawl before we can walk," said John Zeisler, a longtime veteran of Claris Corp. and Apple Computer, Inc. who is now president and chief executive officer at Pensoft. "I can remember struggling [at Claris] to define the horizontal market for desktop publishing when people didn't understand specifically how to use it."

"The pen market probably should be further along than it is — but by second half, things will start to pick up a little bit," predicted William Lempesis, publisher of "Pen Vision News," a newsletter based in Pleasanton, Calif.

Lotus to add mail services support to Organizer for Windows

By Michael Vizard

CAMBRIDGE, MASS.

Looking to integrate its graphical personal information software with electronic-mail services, Lotus Development Corp. has outlined a plan to integrate support for CC:Mail, Notes mail and other mail services with its Organizer for Windows software.

The support for mail services will allow Lotus to integrate group calendaring and scheduling with Organizer, which presents users with an interface similar to commonly used datebook organizers.

Mail services support will allow Organizer for Windows users to set up various types of mail directories covering both private and public mailing lists.

Scheduled to be available later this year, the Organizer software with E-mail services will make a product that is essentially stand-alone software into an application that can be used to schedule group meetings. By accessing the mail services, users will be able to set up various types of mail directories covering both private and public mailing lists.

Using the Vendor Independent Messaging programming interface specification, Lotus intends to integrate Organizer with other mail systems. It also plans to build separate gateways to link the software to large E-mail systems such as Professional Office System from IBM.

"Organizer is fairly simple to install and use. The people we've given it to have learned to use it without needing any of the documentation," said Monsour Zadeh, manager of systems and telecommunications at Pizza Hut International in Wichita, Kan.

"We've been using CC:Mail for a year and will incorporate it into Organizer when it becomes available," said Zadeh, who plans to purchase Organizer in large quantities following the end of the software's evaluation period.

"The response to Organizer from our users both here and internationally has been very strong," he said.

According to Barbara Baird, senior product manager for Organizer, the Lotus software differs from a traditional organizer product in that it lets users search for meetings, key words and names. "Traditional datebooks are good ideas, but try finding something in one of them once you've written it down," Baird said.

Lotus' Organizer is priced at $149.

Untethered computing

Radio-frequency parts may make wireless shine

By Joanie M. Wexler

SANTA CLARA, CALIF.

National Semiconductor Corp. said it will announce today integrated components for radio-frequency-based communications devices aimed at overcoming some of the cost, weight and battery-life limitations of today's wireless networking options.

National Semiconductor's Wireless Communications Group plans to ship in March more lightweight components with a longer battery life for devices such as laptop computers, pagers, wireless telephone switches and cellular telephones. Weight and battery life are key concerns for the growing number of nomadic users wishing to minimize the weight they lug around while on the road.

First step
Users must choose wireless gear containing National Semiconductor's integrated components based on the type of network they intend to use, such as cellular, paging or packet data nets. Selection of a network service should precede the purchase of end-user equipment.

National Semiconductor's PLLatinum line — the first fruits of the 2-year-old startup group — integrates RF, digital and analog functions on one 3V integrated circuit. Most of the wireless products on the market in the U.S. today are still based on the more draining, 5V power consumption scheme, though many in competing nations such as Japan have brought the technology down to the 3V mechanism, according to VLSI Research, Inc., a market research firm in San Jose, Calif.

Inconvenience factor

The shorter battery life forces mobile users to carry battery chargers with them "that can weigh as much as their laptop computers," said G. Dan Hutcheson, VLSI Research's president. Because of the inconvenience this causes, "consumers have started buying products based on battery life," he said.

The vendor said the silicon products use 66% less power and represent a 51% smaller package size.

On the down side, National Semiconductor's components attempt to address a very broad RF range — up to 2.5 GHz for spanning a variety of technologies. This approach could aggravate wireless devices' vulnerability to interference, said Andy Seybold, editor of "Outlook on Computing," an industry newsletter published in Boulder Creek, Calif.

"The more finely you tune the radio, the less susceptible it is to interference; the broader it is, the more susceptible it is," Seybold explained.

Integrating functions for more portable computing is a trend emerging from the likes of Motorola, Inc., Analog Devices, Inc., AT&T and NEC Corp., although none of these companies addresses the RF market yet.

In addition, the National Semiconductor chip is "cheaper because you get away from using gallium arsenide, which is like the difference between using diamonds and glass" from a cost perspective, Hutcheson said. He estimated that PLLatinum could mean that the wireless components for the RF section of a device could run $100 less than today's multichip 5V parts.

"Those are pretty significant savings" that will ultimately be passed down to the end user, he said.

For example, a European manufacturer of wireless voice/data systems that has struck a deal with National Semiconductor for PLLatinum has reduced its part count by 66%, said Curtis Schmidek, a member of National Semiconductor's wireless product marketing group. Schmidek estimated that RF components account for about one-sixth the cost of a wireless device.

National Semiconductor said it has also cut deals with vendors whose products conform to the Mobitex wireless packet data standard, as well as cellular phone and high-frequency cordless phone makers. These vendors are expected to make their own availability announcements in the coming weeks, according to National Semiconductor.

Hands on

Procrastinators can beat the clock with Guide Line

By Michael Fitzgerald
CUPERTINO, CALIF.

Symantec Corp. promises its new project manager, Guide Line, will have you scheduling projects within 10 minutes of installation.

Because it usually takes me 10 minutes to clear a space on my desk where I might plan a project, I decided to prove how outlandish this claim was. I was wrong; it did what it said it would.

I started planning in Guide Line for Windows 30 seconds after getting it installed, and I am now certain my Mardi Gras party will be far better than it otherwise would have been. (Of course, there is now a lot more to do than I thought.)

Symantec built Guide Line with 16 guides for easy project scheduling, ranging from frivolous tasks such as parties to serious ones such as local-area network administration and small business start-up. Each guide creates a project outline and schedule by presenting choices on-line. The finished project can then be printed out, provided Time Line for Windows, Time Line 5.0 or Microsoft Corp.'s Project for Windows is already on the system.

Users who want increased flexibility can purchase Guide Line Maker. Guide Line Maker is an authoring system built around the Guide Programming Language, a scripting language.

Both Guide Line and Guide Line Maker run in DOS or Microsoft's Windows, and a version of Guide Line supports Project for Windows. Guide Line supports several project management products from Symantec, including Time Line 5.0 for DOS, Time Line for Windows and On Target 1.0. It imports files from all these programs, as well as Project for Windows.

Guide Line is priced at $149.95. Guide Line Maker costs $490; Guide Line for Project for Windows costs $299.

Utilities

Mastersoft, Inc. has released Word for Word-Windows Edition, a document conversion utility.

The product is a Microsoft Corp. Windows-based application that supports document conversion between more than 100 PC formats and Apple Computer, Inc. Macintosh word processing, mail merge, spreadsheet and data formats, the company reported. A formatted document can be previewed before conversion with a file viewer.

The product costs $149.

➤*Mastersoft*
Suite A-320
6991 E. Camelback Road
Scottsdale, Ariz. 85251
(602) 277-0900

Macintosh products

Attain Corp. has introduced Version 2.0 of In Control, a to-do list manager for the Apple Computer, Inc. Macintosh.

More than 50 new features have been added to this version. A set of time management capabilities are available, including automatic reminders; more flexible printing to generate reports, outlines and lists in a variety of formats; and scripts to automate common time management activities.

In Control 2.0 costs $129.95.

➤*Attain*
48 Grove St.
Somerville, Mass. 02144
(617) 776-1110

Eastman Kodak Co. has announced Version 1.0 of Kodak PhotoEdge for the Apple Computer, Inc. Macintosh.

The software enables Macintosh users to quickly and easily produce basic image enhancement and correction of Photo-CD images and digital images in various formats.

Finished images can be copied, printed or exported.

PhotoEdge was designed to be used with desktop publishing, word processing and presentation packages. It supports a number of formats, including Tag Image File Format.

The product costs $139.

➤*Eastman Kodak*
343 State St.
Rochester, N.Y. 14650
(716) 724-4000

Software application packages

POC-IT Management Services, Inc. has introduced MicroMan Esti-Mate Express.

The product is a restricted function version of MicroMan Esti-Mate, the vendor's PC-based estimating and planning tool. MicroMan Esti-Mate Express was designed to determine the estimated hours needed for project events.

Model templates are used to make project plans, the company said.

MicroMan Esti-Mate offers additional features that allow users to create and modify original project templates and to adapt estimating algorithms to their environment with a self-adjusting "expert" feedback mechanism.

MicroMan Esti-Mate Express costs $2,000; MicroMan Esti-Mate costs $5,000.

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- BIM-FLEET - RJE File Transfer Utility
- BIM-FMAP - On-line CICS MAP Generation Facility
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- BIM-JOURNAL - VSAM Batch Journaling
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- BIMMONTR - DOS/VSE System Status, Performance, and POWER Queue Display
- BIM-ODIS - On-line CICS System Status Display
  - ODISTRAK - Optional feature used to record major CICS statistics
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- BIMSERV - DOS/VSE Library Display
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- BIMSPLSR - BIMSPOOL Laser Printer Support
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- BIMTEXT - Batch Word Processing, Document Composition System
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- BIMWNDOW - VTAM Multiple Session Manager

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Technical markets still Unix stronghold

By Maryfran Johnson

A favorite topic with Unix workstation vendors these days is how briskly sales are going in commercial business accounts.

Alas, the cold, hard research numbers tell a less enthusiastic tale.

Traditional technical markets remain the stronghold for Unix workstations and will continue to do so for years to come, according to a recent study by International Data Corp. (IDC) in Framingham, Mass.

IDC figures show 77% of workstation sales tied to applications such as software engineering, me-

Unix, *page 42*

By a large margin

WordPerfect outsold all other third-party software providers on six* selected Unix workstations in 1992

RANK	VENDOR APPLICATION	TYPE	LICENSES SOLD
1		Word processing	
2		Office automation	
3		Database management	
4		Technical publishing	
5		Mechanical engineering	
6		Graphics/ Word processing	
7		Document publishing	
8		Numerical computation	

*Sun, HP, DEC, IBM, Silicon Graphics, Inc. and Intergraph Corp.

Source: International Data Corp.

Groupware

Notes for Mac, Unix nears

By Michael Vizard
CAMBRIDGE, MASS.

Following the planned arrival of Version 3.0 of Notes next month, information systems directors can expect to see Lotus Development Corp. begin to make an all-out push to extend the number of platforms and network protocols supported by Notes.

Lotus' Notes has already sold close to a half-million licenses, but one of the factors limiting even wider acceptance of the groupware is that the software is available only on OS/2 servers.

In the hope of broadening its Notes base, Lotus will put in place during the next several months support for Macintosh clients, Unix clients and servers and a broad array of networking protocols.

Version 3.0 will also support text retrieval and imaging and work-flow software.

The prime mover for expanding the Notes base will be the arrival of Notes Version 3.0, which, according to sources, should be announced on Feb. 24. That date, however, may slide to March 5, depending on trade show conflicts, they said.

Version 3.0 will provide support for a Macintosh client in addition to text-retrieval services, work-flow software and imaging software.

Shortly after the release of Notes 3.0, Lotus will make available support for Unix clients and servers under Notes, said Cliff Conneighton, Lotus' director of marketing for communications products.

"If Notes was up on Unix today, we would buy 500 to 600 copies," said Greg Buchanan, director of technology planning and development at Cincinnati Bell Information Systems, Inc. in Maitland, Fla. "Our immediate interest is having support for a Unix client, but we'd also deploy Notes on Unix servers alongside our OS/2 servers."

Lotus is also working on a Notes port to Microsoft Corp.'s Windows NT, and for the past nine months has been working with Novell, Inc. to make Notes a NetWare Loadable Module (NLM).

"At the time of the announcement last April, we said we would have an NLM for Notes in about 15 months. We expect to hit that schedule," Conneighton said. That would place the arrival of a Notes NLM in the next six months.

He said Lotus' ability to bring Notes to NetWare users is tied to the delivery of NetWare 4.0, which is due at the end of this quarter, and the arrival of Notes 3.0, now in beta testing.

"Having Notes available as an NLM is very attractive to us," said Dahrien Rao, senior manager at Price Waterhouse. "Right now we have to have a separate OS/2 server for Notes. It would be better to be able to put Notes on the same server as other applications."

To link the disparate clients and servers that will be covered under the Notes architecture, Lotus said it intends to deliver native IPX/SPX support for Novell's NetWare in March, with support for Apple Computer, Inc.'s AppleTalk, Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Pathworks implementation of LAN Manager from Microsoft to follow.

Novell users cool to Windows for Workgroups

By Michele Doetert
BOSTON

Although Microsoft Corp. has marketed Windows for Workgroups as the ideal client for corporate local-area networks, attendees at the recent Networld '93 said Novell, Inc. NetWare users are reluctant to install it on their desktops, for both technical and political reasons.

"I don't think Windows for Workgroups is selling nearly as well as Microsoft had expected, and I think the NetWare compatibility is a major reason why," said Michael Howard, president of Infonetics Research Corp. in San Jose, Calif.

Forrester Research, Inc. in Cambridge, Mass., surveyed 50 Fortune 1,000 users in December; it found only 16% of them firmly planning to buy Windows for Workgroups — and most of them planning installation at small, remote sites.

At the top of NetWare users' list of complaints is Windows for Workgroups' use of the Microsoft-supported Network Device Independent Specification (NDIS) standard, instead of the Novell-supported Open DataLink Interface (ODI) standard, to configure multiprotocol network interface cards.

"I was pretty disappointed when I started to install it and found that I would have to use NDIS and NDIS syntax instead of the ODI we have. In fact, I gave up in disgust," said Tabi Freedman, network manager at a large nationwide securities firm.

No major rollout yet

Freedman said that although she may use Windows for Workgroups to provide networking to small, remote offices with two or three unconnected PCs, she is holding off on a major Windows for Workgroups rollout until she can run the product over the same IPX/SPX-over-ODI transport used by her Novell LANs.

Another complaint was that the Microsoft NetBEUI protocol used by Windows for Workgroups cannot cross Novell-compliant routers to reach Windows for Workgroups users on other LAN segments.

"Since most companies now segment their LANs at 20 users, this limits Windows for Workgroups' usefulness to within a small group," said Rick Nyhan, president of General Networks, Inc., a large Los Angeles-based reseller of both Novell and Microsoft products. Nyhan said he thought users would be confused by being able to reach the corporate network via NetWare but not via Windows for Workgroups.

Windows, *page 40*

Peer-to-peer pluses

Early adopters of Windows for Workgroups are uniformly enthusiastic about the peer-to-peer networking included in the product.

Bob Willier, a facilities manager at Dairy Queen in St. Louis, had a typical installation. He connected his Windows for Workgroups-based PCs and installed his electronic mail in about an hour, start to finish.

Willier said the hardest part of the installation was putting in network cards and pulling cable. "When I turned on the PCs, Windows for Workgroups autodiscovered the network card, installed the driver and then autodiscovered the other PCs," he said.

Dan Larner, a senior research analyst at Allen-Bradley Co., a Milwaukee-based maker of industrial control products, said, "A gorilla could set this stuff up. I think it's the perfect solution for small groups."

—Michele Doetert

Novell users cool to Windows client

CONTINUED FROM PAGE 39

Some Windows for Workgroups users also report problems with MS-IPX, the Microsoft version of Novell's IPX/SPX that the Windows product uses to access Novell servers.

Although Microsoft says MS-IPX packets are identical to those generated by IPX/SPX, Novell said it has identified several problems with MS-IPX. According to William Donahoo, Novell's desktop products division manager, these include problems with print backup and device drivers.

NetWare users also said they are reluctant to invest in a product that Novell has so far declined to support.

"Microsoft didn't consult with us when they built the NetWare connectivity into Windows for Workgroups, and the way they did it, Novell doesn't feel that it can support Windows for Workgroups in the way that our customers need," Donahoo said.

He added that although Microsoft did not submit Windows for Workgroups to the Novell-sponsored Technical Support Alliance for testing, Novell wants to support that Windows environment and is working with Microsoft engineers to resolve problems.

Russell Siegelman, Microsoft's former product manager for Windows for Workgroups who is now assigned to a special project, said his company is open to suggestions.

"We had a team of engineers at Novell for a week on the NDIS stuff. None of these problems are things that can't be resolved," he said.

"It would be a mistake for both companies if Microsoft and Novell force users to choose between Windows for Workgroups and NetWare," said Jamie Lewis, vice president of The Burton Group, a Salt Lake City LAN research firm. "They need to sit down and get these problems fixed — and quickly, before user frustration gets worse than it already is."

Peer-to-peer minuses

As a management issue, many corporate NetWare shops refuse to allow the peer-to-peer camel inside their networking tent.

"One of the primary assets of client/server LANs is that administrators can control access to and storage of applications and data," said Patrick Carney, information systems director at Asea, Brown, Boveri in North Brunswick, N.J.

"I don't want somebody calling me because they had a file stored under Windows for Workgroups on Joe's laptop, and Joe took the laptop to Japan with him, and could I please get him the file," he said.

Carney said that while he wants to offer Windows for Workgroups applications to his users, he is concerned about their using the environment to circumvent IS-dictated security and management procedures.

Rich Tong, Microsoft's new product manager for Windows for Workgroups, said corporate managers concerned about manageability should disable the product's peer-to-peer networking during installation.

—Michele Deutert

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10. Utilities
11. Education
12. Process Industries *(Mining/Construction/Petroleum Refining/Agriculture/Forestry)*
13. Government State/Local
14. Government Federal
15. Military
16. Aerospace
17. Consultant *(Independent)*
18. Carriers
19. Interconnects
20. Manufacturers *(Computer/ Communications)*
21. VAR/VAD/Systems House
22. Distributor, Computer Related
23. Distributor, Comm. Related
24. Other *(Specify)* _____

C. WHAT IS YOUR JOB FUNCTION (CIRCLE ONE)

Networking Management
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2. LAN Mgmt.
3. WAN/Datacom/Telecom Mgmt.
4. Operations Mgmt.
5. Technical Network Mgmt.

MIS Management
6. MIS, IS, IT Mgmt.
7. System
8. App./End User Comp. Mgmt.

Corporate Management
9. Corporate Mgmt. *(CEO, CIO Pres., V.P., Dir., Mgr., Financial Mgmt.)*
10. Consultant *(Independent)*
11. Other *(Specify)* _____

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2. 100-499
3. 500-999
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5. Over 5,000

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11. Education
12. Process Industries *(Mining/Construction/Petroleum Refining/Agriculture/Forestry)*
13. Government State/Local
14. Government Federal
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11. Education
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14. Government Federal
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5. Technical Network Mgmt.

MIS Management
6. MIS, IS, IT Mgmt.
7. System
8. App./End User Comp. Mgmt.

Corporate Management
9. Corporate Mgmt. *(CEO, CIO Pres., V.P., Dir., Mgr., Financial Mgmt.)*
10. Consultant *(Independent)*
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10. Utilities
11. Education
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13. Government State/Local
14. Government Federal
15. Military
16. Aerospace
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Technical markets Unix stronghold

CONTINUED FROM PAGE 39

chanical design and engineering, scientific research and electronic design automation.

"It's interesting to see that as the vendors continue to push in commercial marketplaces, the majority of workstation shipments are still in areas like CAD/CAM [computer-aided design and manufacturing] and software engineering," said Nancy Battey, an IDC analyst in Mountain View, Calif. "The commercial segment does seem to be growing, however, to about 23% of the worldwide total in 1991" — up from 20% in 1990.

The IDC report compiled data on the primary applications running on Unix workstations in 1991, the most recent annual revenue data available. By market share rankings, the Top 6 Unix workstation vendors were Sun Microsystems, Inc. (34%), Hewlett-Packard Co. (18%), Digital Equipment Corp. (13%), IBM (8%), Intergraph Corp. (7%) and Silicon Graphics, Inc. (6.5%).

In the blizzard of numbers generated by the report, a few surprises emerged, such as the following:

- IBM remained the only vendor among the Top 6 that failed to place first in any of the 17 application segments that IDC evaluated. "IBM really needs to get out there and own some application segments," Battey noted. "All our data points to the fact that applications are what drive workstation sales."
- Silicon Graphics broke out of its high-end graphics niche and began competing in broader segments such as mechanical design. Silicon Graphics "is giving HP a real run for its money in that area," Battey said. The company ranked first in three segments — biological/chemical engineering, simulation and animation — but from 1990 to 1991 lost its No. 1 position in industrial process analysis to HP, and in imaging to DEC.
- DEC lost its No. 1 position in scientific research/research and development to HP in 1991, but picked up the No. 1 position in both imaging and measurement and control. However, imaging represented only 1% of the market, and measurement and control is the smallest segment, with 0.5% market share.

Overall, Sun, HP and DEC represented nearly two-thirds (65%) of total revenue and 70% of total shipments in the worldwide workstation market.

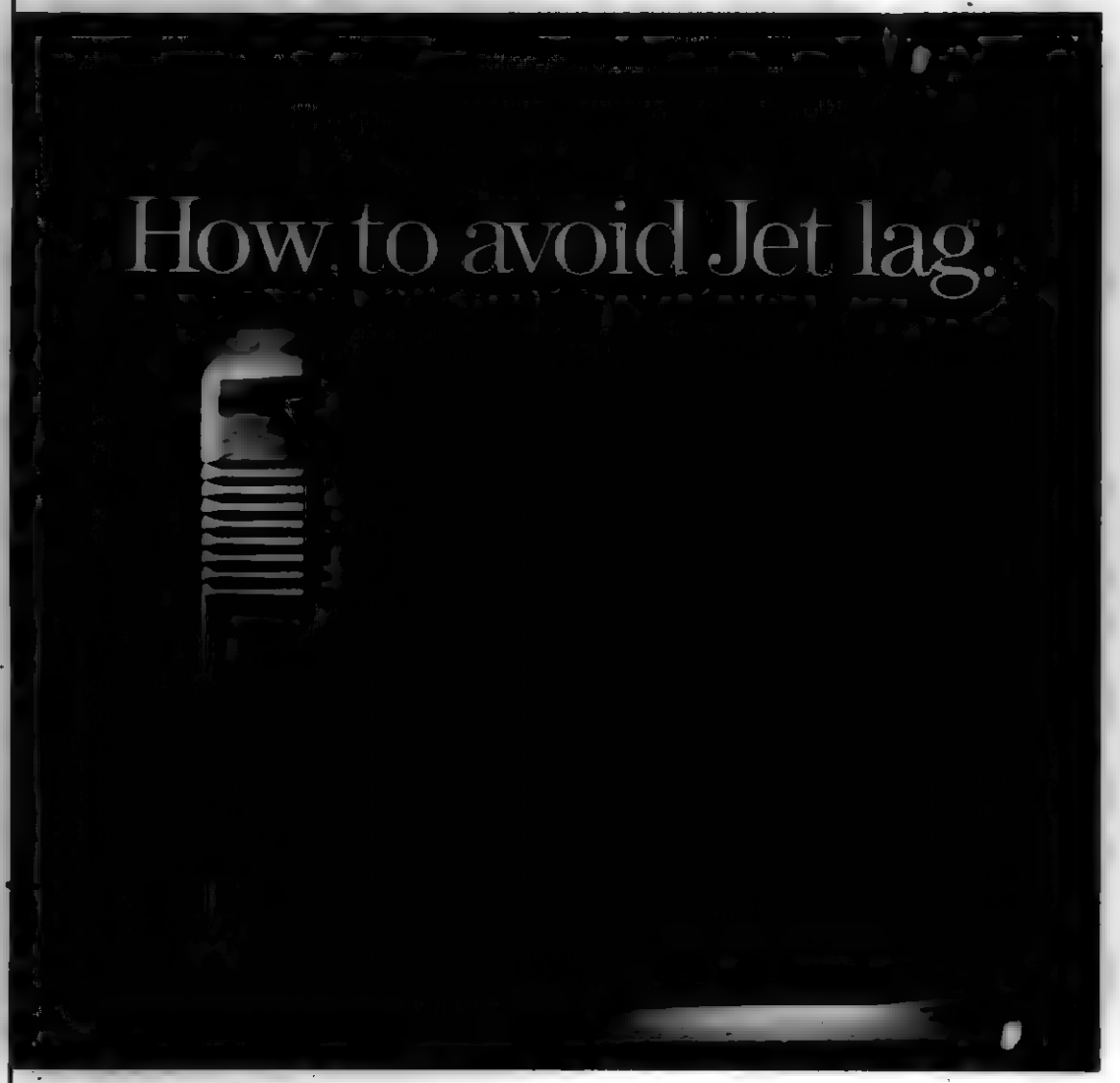
The second-tier workstation vendors — IBM, Intergraph and Silicon Graphics — brought in 22% of worldwide revenue for 1991 but had only 12% market share of shipments.

The business/professional portion of the Unix application market grew 32% in 1991 — a big letdown from its 61% growth in 1990. Over the next few years, Battey said, Unix companies such as Sun and HP are unlikely to see more than 30% of their workstation sales going into business, rather than technical, accounts.

"The vendors are making great strides in commercial accounts, in going from zero business to about 20% of their sales," Battey pointed out. "But it's not like we're seeing workstations taking over the commercial segment from PCs."

The wild card that has yet to be played is Microsoft Corp.'s NT 32-bit advanced operating system. DEC and Intergraph have committed to running NT on their platforms, but no other major workstation vendor has broached the issue yet.

The four fastest growing application segments worldwide were industrial process analysis, "other" commercial (including office applications), classified defense and biological/chemical engineering.



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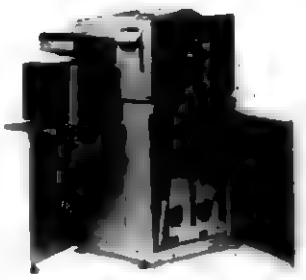

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Hints

Recovering from hacker invasion

By Mitch Betts
WASHINGTON, D.C.

Your interstate computer network has been cracked, hacked and attacked. What do you do next? How do you prosecute?

The world of criminal investigations and prosecutions is foreign territory for most information systems managers — and what little they do know may be wrong, according to James L. Kolouch, a special agent at the Federal Bureau of Investigation who specializes in investigating computer crimes.

At the January meeting of the local chapter of the Information Systems Security Association, Kolouch described a multitude of misconceptions that IS managers have about the law and investigations.

For example, many IS managers believe the key statute, the Computer Fraud and Abuse Act of 1986, applies only to federal government computers, which is not true. It also covers interstate crimes involving private-sector computers.

Hack-attack response

What to do if victimized by a hacker:

- Promptly notify your network security officer and law-enforcement authorities.
- Select one authoritative person, such as the IS manager, who will be the main point of contact and the person called to testify.
- Start keeping records, collecting and securing evidence and compiling cost information.
- Plan what you will say and do if the intruder contacts you.
- Provide technical assistance to investigators.
- Do NOT "clean up the system" (which destroys evidence) or discuss the case over unsecured electronic mail.

Source: Federal Bureau of Investigation

Presented here, in question-and-answer format, is a summary of the key points Kolouch made in his remarks.

Q: What is the current law covering computer crimes?

A: The federal Computer Fraud and Abuse Act of 1986 covers crimes involving a "federal interest computer," which is defined as a computer used by the federal government (including government contractors); a federally regulated financial institution; or any private-sector computers in more than one state. The law also gives special protection to medical records.

The act has many provisions, but the two most useful to prosecutors are the following:

- Section (a)(4), which covers access to a federal interest computer with intent to defraud.

Recovering, *page 45*

'Smarter' LAN tools debut

By Elisabeth Horwitt
BOSTON

■ Network General Corp. and Novell, Inc. unwrapped local-area network diagnostic tools featuring greater intelligence at the recent Networld '93 conference. The vendors said they will eventually offer the ability to diagnose multiple LANs from a central, Simple Network Management Protocol (SNMP)-based system.

In an increasingly competitive arena, tools to help less technical — and less highly paid — users perform network diagnostics are at a premium. Previously, rivals Hewlett-Packard Co. and Network General jointly announced a certification program that tests network administrators' knowledge and hands-on expertise in protocol analysis.

The LAN analysis market grew from $111.1 million in 1991 to an estimated $172.2 million in 1992, with Network General maintaining dominance and Novell and HP in the No. 2 and No. 3 slots, respectively, according to Dataquest, Inc., a San Jose, Calif., research firm.

Network General President Harry Saal promised to extend expert system capabilities beyond the company's original, stand-alone Sniffer offering to two additional products. The Distributed Sniffer, which collects diagnostic data from multiple LAN servers, will get the capability later this quarter. Sniffer Internetwork Analyzer, which troubleshoots LAN-to-LAN connections, will get its expert system at a later, undisclosed date.

Novell also said it was providing expert system capabilities for LANalyzer for NetWare, its low-end analyzer that troubleshoots NetWare LANs. A NetWare Loadable Module (NLM) priced at $1,495, the product will also be the first LAN diagnostic tool with a Windows 2.0 interface, Novell said. Novell has renamed it LANalyzer for Windows.

The term "expert system" in a LAN analyzer can mean anything from a sophisticated rules-based system that analyzes the source of a problem, runs a series of diagnostics and tries to correct it, to a series of help desk templates that automatically call up the likely source of a problem when the user clicks on an icon.

NetWare Expert, Novell's expert system for its LAN diagnostic tools, suggests the best

Smarter tools, *page 44*

Price guide

LANalyzer for NetWare: Price, $1,495; about 5,000 units installed.

Network General Sniffer: Priced starting at $12,000, roughly 10,000 installed.

LAN analyzer market: 1991: $111.1 million, or 68.8% more than 1990; 1992: Estimated $172.2 million (roughly 55% growth over 1991).

Novell repositions messaging server

By Lynda Radosevich

At Networld '93 Boston, Novell, Inc. relaunched its NetWare Global Messaging server, giving the product a new name, some updated features and a publicity drive to position it as a player in the corporate messaging market.

Now called NetWare Global MHS, it is a set of messaging modules that can be loaded in the Novell NetWare operating system.

Novell said the name change is intended to highlight Message Handling Service (MHS), the mail transport technology that Novell licenses from Action Technology, Inc. in Alameda, Calif.

NetWare Global Messaging now includes FirstMail, a simple electronic-mail utility for DOS and Apple Computer, Inc. Macintosh computers, and a server support feature that lets one MHS server collect and route messages for users based at other servers. Additional modem support includes Telebit Corp.'s T1000 and Intel Corp.'s 2400 EX. Asynchronous message transferring has been improved so the messages can travel more efficiently over lines in both directions at once. A new mail notification feature enables users to read messages without leaving the application.

Novell is also shipping MHS gateways to Simple Mail Transport Protocol (SMTP), the mail transport for Transmission Control Protocol/Internet Protocol networks, and IBM's Systems Network Architecture Distribution Services (SNADS). Novell is developing an MHS-to-X.400 gateway with Retix, which Novell said will ship in the first quarter.

For companies such as PMI Food Equipment Group, a commercial and retail food equipment manufacturer in Troy, Ohio, MHS is vital for linking disparate E-mail systems. PMI has roughly 250 PC users running Futurus Team Mail on a NetWare LAN.

The E-mail users can connect to nearly 1,000 IBM mainframe users running Fisher International Systems Corp.'s EMC 2 through Fisher's MHS gateway. The PMI mail system also connects about a dozen Macintosh users running Pegasus Mail with an MHS gateway.

"We built our local-area network and electronic-mail systems as a grass roots effort starting in engineering," said Jeff Lyons, a design systems engineer at PMI's weigh/wrap engineering division. "Once people on the mainframe saw what engineering could do with E-mail, they wanted it too, and we had to expand. MHS let us do that."

PMI plans to migrate to the updated NetWare Global MHS and deploy the SMTP and SNADS gateways to take advantage of new directory synchronization features across the gateways, according to Lyons.

Native form

As part of the overall push to highlight MHS at Networld '93, Keyword Technologies Ltd. announced Keypak NLM, an E-mail package that lets NetWare Global MHS users send and receive word processor documents in their native format.

The software automatically translates attached files from WordPerfect Corp.'s WordPerfect, Microsoft Corp.'s Word, IBM's DCA/RFT and Digital Equipment Corp.'s DX formats, according to Keyword. This lets users work with attached electronic files when they do not have the original application. It is slated to ship by the end of the month.

'Smarter' LAN tools debut

CONTINUED FROM PAGE 43

course for resolving a problem and also has an eight-hour training course that takes users through the basics of network analysis, Novell said.

However, "Novell really doesn't have an artificial intelligence front end," said Gary Whippick, a communications analyst at Union Bank of Switzerland who uses both LANalyzer and Sniffer. "What it has are templates of tests that it thinks you should run" when a problem surfaces, he said. "It doesn't interpret results" as Sniffer does.

Sniffer's more sophisticated expert system "automatically goes out and checks when something goes wrong," and it determines the most likely reason for "certain error conditions," Whippick said. On the other hand, Sniffer's expert system only handles a limited number of trouble scenarios, while Novell's LANalyzer provides test suites for a wider range of problems, he added.

LANalyzer for Windows has also gained the ability to analyze Transmission Control Protocol/Internet Protocol and Token Ring LANs. It also generates alerts that notify the user of IPX or Apple Computer, Inc. AppleTalk router failures, Novell said. Version 1.0 only supported Ethernet LANs.

All in one

Wal-Mart Stores, Inc. special project manager Mike Fitzgerel said that he wanted to see a Sniffer that would automatically bring up on one console "the big picture" of what is happening across enterprise LAN installations.

A Windows-based version of Distributed Sniffer, due to ship later this year, will enable the network manager to monitor multiple remote LANs in multiple windows on the screen, according to Network General's Saal.

However, this is not the same as having software automatically monitor multiple LANs simultaneously and present consolidated information as graphics on a screen, he conceded.

New kid in town

A relative newcomer to the protocol analyzer scene, Dolphin Systems introduced ESP Plus at Networld+Interop '92. ESP Plus has a "full-blown expert system that advises users on timing problems and packet errors," and it runs on a 486DX/50-MHz Extended Industry Standard Architecture PC, a spokesman for the Norcross, Ga., firm said.

ESP Plus can write incoming protocol analysis data directly to a 540M-byte hard disk. Other protocol analyzers that write to random-access memory have limited room for writing real-time network traffic statistics, the spokesman added.

ESP Plus also supports two network cards and can handle diagnostic information coming in from two separate Ethernet or Token Ring LANs, the spokesman said. However, the system can only process information from one LAN at a time. Pricing for the ESP Plus software starts at $5,000 with a single network card. An ESP Plus card costs an additional $3,495 for a single-attached station and $7,495 for a dual-attached station.

—Elizabeth Horwitt

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Recovering from hacker invasion

CONTINUED FROM PAGE 43

• Section (a)(5), which covers unauthorized access to a federal interest computer that damages, alters or destroys data (or prevents regular use) and causes losses exceeding $1,000.

Both the FBI and the U.S. Secret Service have jurisdiction to investigate cases under this law.

Q: What is the role of the Secret Service?
A: Under a "memorandum of understanding" between the [Secret Service and the FBI], the Secret Service tends to handle cases involving credit bureaus, credit cards, automated teller machines, telephone fraud and U.S. Department of Treasury computers.

Q: What is the role of the FBI?
A: The FBI tends to handle cases involving espionage, classified data, government-related fraud, terrorism, bank fraud, wire fraud and organized crime.

The FBI only does investigations, not prosecutions. In essence, it must collect enough evidence to "sell" an assistant U.S. attorney on the idea of prosecuting the case, and that can be a tough sell.

FBI agents are spread thin, so they must be selective about the cases they take on. When you call your local FBI agent, the agent will try to get answers to the following questions:
• Is this a violation of a federal statute?
• Is this related to another pending case or one being handled by another agency?
• Is this case significant enough to interest the U.S. attorney general?
• Has the victim done something — such as "cleaned up the system" or waited too long — that jeopardizes the investigation or prosecution?

Q: What exactly can the FBI do?
A: If the FBI opens an investigation of the case, it has a variety of tools at its disposal, including court-ordered wiretaps and searches, grand jury subpoenas, hidden cameras, informants, polygraphs and foreign police contacts.

The FBI will *not* "take control" of a company's computer system, as many companies fear. Rather, it will ask the system operator to provide technical assistance.

Many companies ask the FBI to interview a suspect for the purpose of "scaring the daylights" out of the hacker, but the FBI is not allowed to do that.

Be forewarned that investigations are slow. They often take a year or two, and you will *not* get briefings on their progress.

Q: What is the best evidence?
A: Audit trails and unaltered copies of the computer database as it appeared before, during and after the incident. Carefully label, initial and seal the evidence and limit the number of people handling it, to ensure that it is not corrupted.

Q: Are "warning screens" required for convictions?
A: No, but they are helpful because they show that the hacker "knowingly" intruded.

Likewise, "welcome screens" do not preclude prosecution but are discouraged because the defense might attempt to emphasize the literal definition of "welcome."

Q: Are computer-illiterate judges and juries a problem?
A: No. Prosecutors can use simple "doors and locks" analogies to explain the issues.

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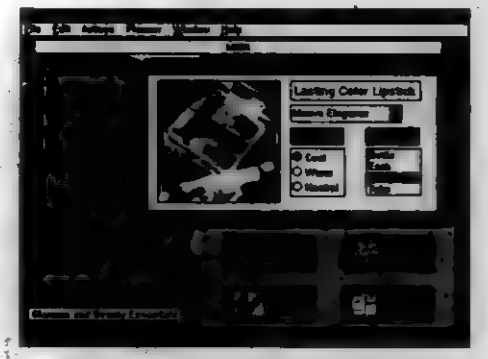

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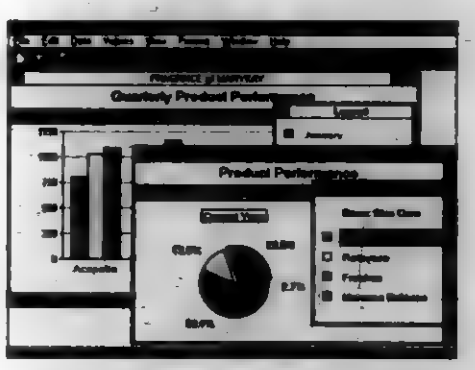

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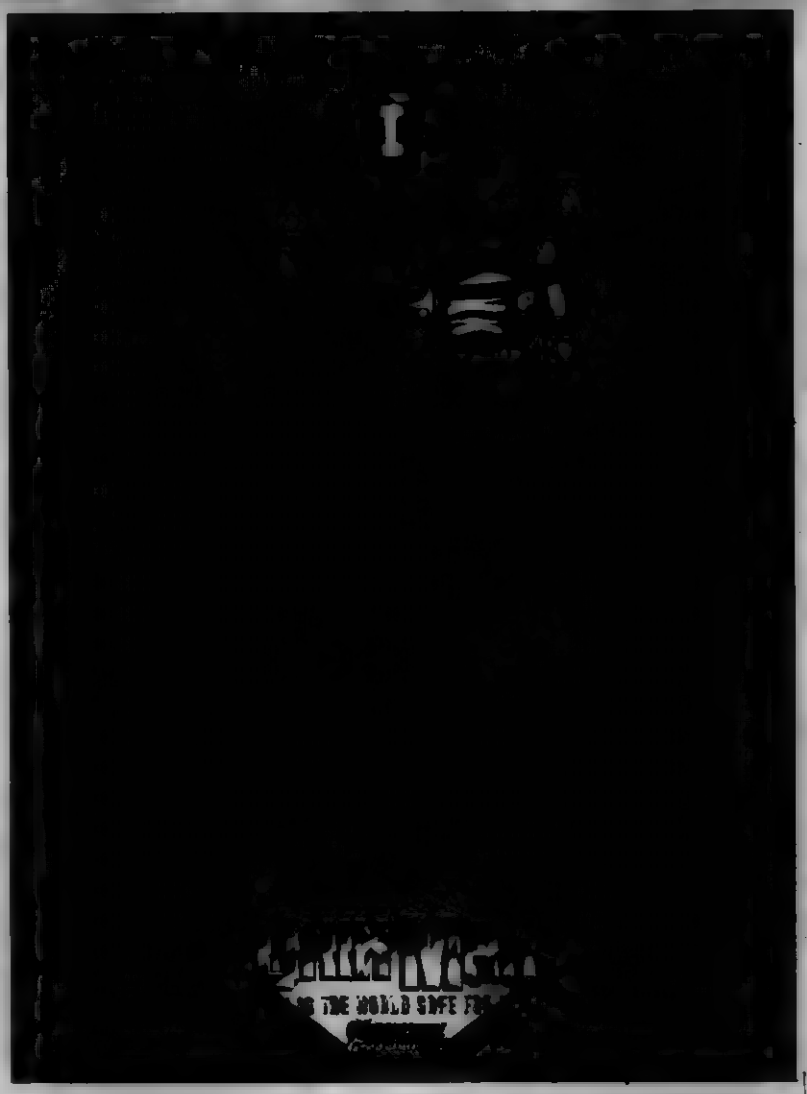

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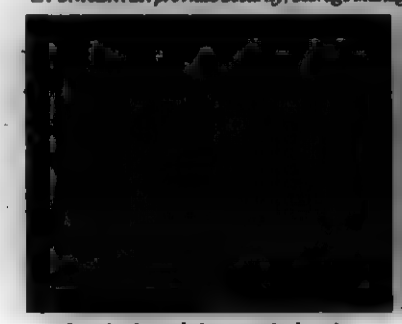
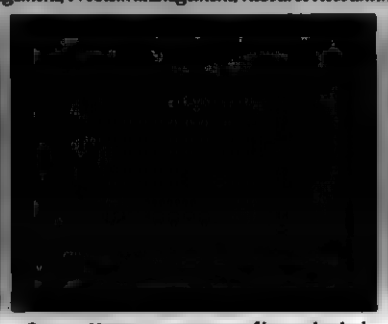
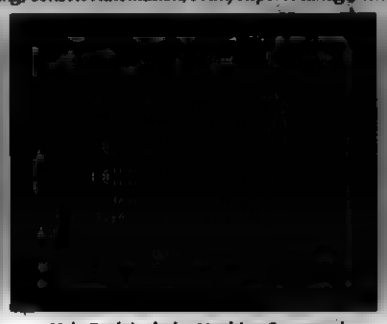


Security Control gives you single-point control for the entire system. It provides the first and only method for limiting authority of superusers.



Storage Management ensures files are backed up and archived. Frees space when file systems become full and keeps backup and archived files safe from accidental or intentional destruction.



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Client/server strategies pervasive

By Rosemary Cafasso

It is hard to find an information systems manager these days who is not interested in client/server computing or who says he will not be interested very soon.

Two recent surveys drive that point home. A report from International Data Corp. (IDC) and a soon-to-be-released survey from Sierra/Alliance, Inc. track the rising importance of client/server technologies in IS managers' plans.

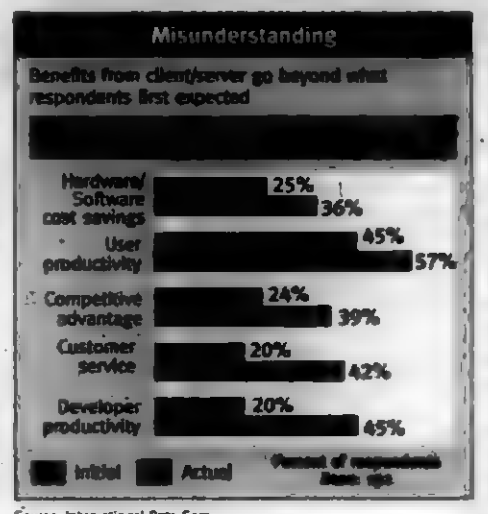
The IDC report, based on interviews with 243 IS managers with commitments to client/server computing, shows that even among those sites that plan only a gradual shift to this architecture, the goal is effectively to double the number of current client/server applications by 1995.

Client/server worldwide

The managers in the IDC study were part of a larger survey in which approximately 1,000 of 6,600 worldwide respondents had either implemented client/server applications or planned to do so.

Of the 100 IS managers interviewed for the Sierra report, 80% either were currently involved in client/server projects or said they will eventually move to this architecture.

Both market research firms reported that many of the IS managers who have implemented client/server technology were reporting productivity boosts but were not yet seeing significant cost savings. In fact, the IDC study said that more than half of IS managers were reporting the new client/server applications as "net expenses," while 34% said the applications produced "net savings."



Source: International Data Corp.

"Client/server is actually costing more right now," added Marty Gruhn, executive vice president of Alliance Development Corp., which owns Sierra/Alliance. "But IS managers are willing to pay more now instead of paying later."

The IDC report, completed in December 1992, said many users reported bigger benefits than originally expected in such areas as improved user productivity. Anthony Picardi, IDC's director of software research, said some respondents may have toned down initial expectations if they were uncertain of what the actual results would be.

Cost savings delayed

People expecting client/server to save money will be disappointed, as that is not going to happen immediately, Picardi said. "With the cost issue aside, the question is, were the business objectives reached? Their answer here is yes. In other words, client/server is working as a software architecture."

Picardi said the survey showed several benefits to users, including better access to data, easier use of applications and overall productivity boosts. In addition, respondents said client/server applications have improved developers' productivity, which in turn translated to improved application quality and better customer service.

He also said respondents, on average, were allocating about 40% of their staff time to client/server projects.

Storage

Optical disc yields far speedier storage system

By Thomas Hoffman
NEW YORK

A new optical disc-based image storage system for historical record keeping at the New York Clearing House Association is expected to save the organization more than $100,000 annually in maintenance and microfiche upkeep.

Clearing House, founded in 1853 and supported by 11 New York banks, is the nation's largest bank clearinghouse. Initially formed to bring order to the exchange and settlement process among the banks of New York, Clearing House today is responsible for two primary applications.

Clearing House Interbank Payments System (Chips) is an on-line, real-time electronic payment system that transfers funds and settles international transactions for 122 banks in U.S. dollars. It handles $1 trillion each day.

The second application, the New York Automated Clearing House (ACH), was launched in 1975 to act as a network for domestic consumer and commercial payments by 650 depository financial institutions in New York, northern New Jersey, Puerto Rico and the U.S. Virgin Islands. ACH is a batch-oriented system that handles nearly $170 billion — or 18 million transactions — each month for commercial banks, savings and loans, savings banks and credit unions.

Until recently, Clearing House downloaded Chips and ACH transactions from Unisys Corp. magnetic disks and an Eastman Kodak Co. Komstar microfiche system, respectively.

George Thomas *expects a one-year payback time*

However, the microfiche system has been expensive to maintain and cannot conduct text searches as can the optical disc-based system, according to George F. Thomas, senior vice president and director of data processing at Clearing House.

"We wanted multiple indexes for things like system sequence numbers," said Thomas, who noted that these tasks can now be performed using an image software system from Macro Soft in Beaconsfield, Quebec.

Clearing House wrote a program designed to download data from the magnetic disks on its Unisys A-15 mainframe systems to its Novell, Inc. local-area network environment. From there, the information is downloaded to 12-in. optical discs, which are housed in a Laser Magnetic Storage International, Inc. Rapid Changer jukebox.

Radical time difference

Speed is a key benefit from the new system. According to Thomas, daily Chips data can be downloaded in 2½ hours on optical discs. Using microfiche, that process took 14 hours.

Clearing House expects to save $50,000 annually in microfiche maintenance for both the Chips and ACH systems and $60,000 each year on microfiche costs alone, Thomas said. Clearing House began using the optical system for Chips in early January, with ACH targeted for February rollout.

Thomas would not discuss the cost of the new

Optical disc, *page 49*

ON SITE

New York Clearing House Association
New York

Challenge: To replace a microfiche-based storage system with an optical disc image-based system for historical records on national and international banking payments processed without hurting uptime.

Technology: Macro Soft software, Laser Magnetic Storage International Rapid Changer jukebox, four Unisys A-15 mainframes.

Results: Annual savings of $50,000 in microfiche maintenance, $60,000 in microfiche costs.

Court sends message via CA ruling

By Thomas Hoffman
UNIONDALE, N.Y.

Though a recent decision by a federal appeals court on trade secrecy does not set any legal precedents, legal pundits said the ruling sends a strong message to the software industry to beware of trade secrecy protection.

On Dec. 18, the U.S. Court of Appeals for the Eastern District of New York reversed a circuit court decision made in June (CW, June 29, 1992) that restricted Computer Associates International, Inc. from stopping Altai, Inc.'s illegal use of trade secrets. The case has been in litigation since 1988, when CA filed a lawsuit against Altai for misappropriation of trade secrets and copyright infringement.

In 1988, CA filed the trade secret misappropriation/copyright infringement suit against Altai, claiming Altai had used CA's Adapter code in CA-Scheduler to design Altai's Oscar 3.4.

Altai then rewrote Oscar's source code. Although the court has continued to uphold its decision that Oscar 3.5 — the rewrite — did not violate copyright infringement against CA, the Dec. 18 reversal on the trade secrecy decision may pave the way for CA to seek a permanent injunction barring Altai from marketing any products that violate CA's trade secrecy rights.

Praise for decision

One legal observer said the court corrected itself. "I think the Second Circuit's reversal is a more correct take on the Copyright Act than its first decision," said Barry Rein, an attorney at Pennie & Edmonds in New York who has been following the case.

As a result of the court's reversal, CA may be entitled to compensatory damages, according to Michael McElroy, a vice president at CA. The appeals court sent the case back to the trial court, where CA said it will seek to have Altai permanantly barred from further marketing Oscar 3.5 and to collect "several million dollars."

Several legal experts said the decision will force software vendors to be more wary of recruiting employees from competitors. "You can't ignore what information someone is taking with them from another job. It brought [Altai] more trouble than they ever bargained for," said Ronald Abramson, an independent attorney at Hughes Hubbard & Reed in New York.

"Companies are going to have to be careful in their hiring practices of competitive employees. Lawyers who advise those companies are going to have to read this case most closely," said David Binney, an attorney at Preston, Thorgrimson, Shidler, Gates, and Ellis, a Seattle law firm representing Microsoft Corp. in its "look-and-feel" case against Apple Computer, Inc.

Binney said vendors will be forced to closely scrutinize the hiring of competitive employees and perhaps force them to sign waiver agreements that insulate the hiring vendor from trade secrets that may be passed on by the employee, even if the employee passes secrets along unknowingly. Binney added that user companies should also be wary in their own hiring practices because unlawful intellectual property transfer could also affect them.

Abramson, who is also chairman of the Computer Law Committee of the Association of the Bar of the City of New York, said the decision, while not precedent-setting, is still important because it reaffirms trade secrecy protection, especially if companies do not have a valid copyright protection claim.

However, he added that it would be a mistake for a software vendor to rely solely on trade secrecy protection. "A growing number of software firms are protecting themselves through the patent process, many of which are pursued secretly," Abramson added.

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Mitsubishi to leave mainframes behind

By David Kellar
TOKYO

Japan's Mitsubishi Electric Corp. has stopped development of mainframe computers and shifted its focus to networked client/server systems, according to officials at the manufacturer.

The decision affects Mitsubishi's Melcom EX800 series, the company's only remaining independently developed large-scale computer line, and reflects the general trend among users away from mainframes toward more cost-efficient client/server systems.

Mitsubishi will continue to produce and sell the EX800 for now but said it plans eventually to phase out all mainframe production.

Mitsubishi's withdrawal from the mainframe arena actually began in 1991, when the firm started reselling IBM Enterprise System/9000 mainframes under its own brand name as the Melcom EX900 series. Officials said Mitsubishi will now direct new customers to either the IBM-made EX900 machines or the high-end servers in its PC line, which are supplied by Apricot, Mitsubishi's wholly owned UK-based affiliate.

In conjunction with the move, Mitsubishi plans to set up four new divisions by spring to concentrate on network development and system integration services. The firm will transfer an unspecified number of employees from its mainframe division to the new units.

Mitsubishi's virtual withdrawal from the mainframe market leaves only three Japanese mainframe makers — Hitachi, Inc., Fujitsu Ltd. and NEC Corp.

Kellar is a correspondent at the IDG News Service.

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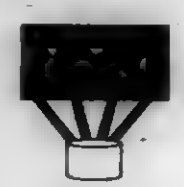
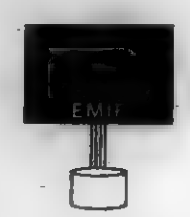


16 CHANNELS
Without EMIF, each logical partition needs its own dedicated channel.



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IBM

Optical disc

CONTINUED FROM PAGE 47

system, but he estimated that it would pay for itself within one year.

In addition to the optical disc system, Clearing House is busy with other information systems projects. According to Thomas, Clearing House plans to install a Unisys Remote Database Backup (RDB) system designed to facilitate ACH data recovery between Unisys A-15 mainframes at the ACH primary data center in Weehawken, N.J., and the alternate ACH data center in New York.

Without the RDB, data recovery from one site to another usually takes up to one hour. With RDB, Thomas said he expects the data switch to be completed in 15 minutes.

Chips data recovery between New York and Weehawken is facilitated by an in-house software package running on Hyperchannel, a channel connection/mainframe interface from Network Systems Corp. in Minneapolis.

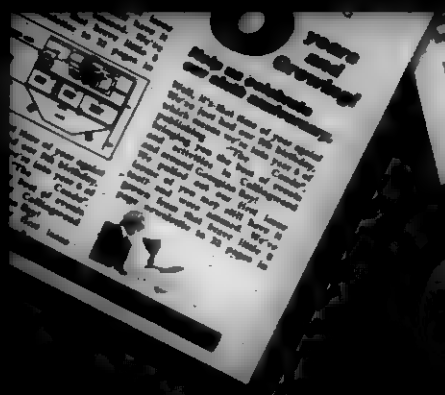
Gradual testing

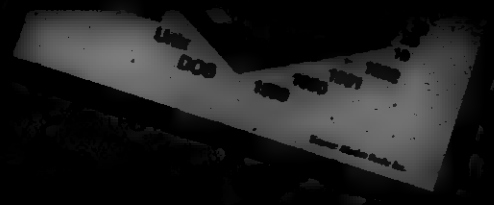
Thomas said the remote database for ACH will be installed by year's end. Clearing House will begin testing the database by transferring check processing transactions from a Unisys Micro A computer used at a downtown facility by the end of the first quarter.

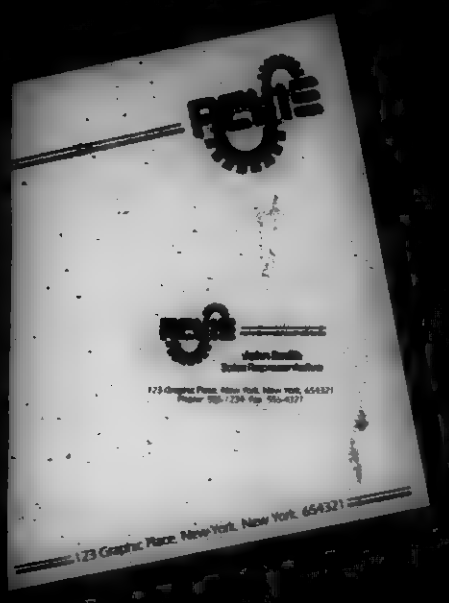
Clearing House is also working on a pilot aimed at significantly reducing the $25 billion in combined check fraud its 11 member banks report each year. One system, called the Clearing House Electronic Check Clearing and Return System, will allow banks to send images of checks to one another, regardless of each bank's computing environment.

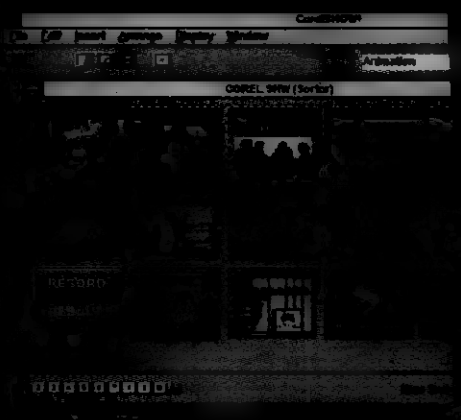
Thomas said an accompanying system, called Electronic Check Presentment (ECP), will provide banks with earlier notification of returned checks by using NCR Corp. 7710 low-speed scanners to read the microline attached to each check processed, thereby providing faster turnaround on check verification. This helps reduce check fraud, he said.

ECP, Thomas said, will also let member banks debit customer checking accounts one day faster than current methods.









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C++ users lack cross-platform support

By Christopher Lindquist

C++ has been positioned as an ideal transitional language for developers looking to move to object-oriented programming. But while the number of C++ compilers has increased in recent years, they have yet to reach the level of platform and tool support that C programmers have come to expect.

"As much as I would love to use it, [C++] is out of the question," said Clark Maurer, president of Raleigh, N.C.-based MicroEdge, Inc. Maurer's company makes several development tools, including a programmer's editor called SlickEdit, that support as many as 14 computing platforms.

That wait may continue for several more years, according to other potential C++ users and analysts. Standards for C++ have yet to be fully implemented by the American National Standards Institute's (ANSI) C++ committee, and compilers today generally follow either the AT&T C++ standards or the preliminary ANSI standards, which are not always compatible. Nor is code, including third-party libraries, written for one compiler likely to work with others. And that is a problem for any company that has to support code on a variety of systems.

The C++ market "is very immature," said John R. Rymer, editor of "The Distributed Computing Monitor" at the Patricia Seybold Group in Boston. "There are a lot of companies selling technology, but no one is selling a solution."

Coming up short

That situation is apparent to Cadence Design Systems, Inc., according to Rene Churchill, a senior member of the firm's technical staff in Lowell, Mass. Cadence supports a variety of Unix platforms and has been investigating C++ compilers hoping to find one that could be used across platforms.

The results so far have not been particularly encouraging. Adequate tools, particularly debuggers, are not plentiful for C++ compilers, Churchill said. And while most of the hardware companies Cadence works with supply C++ compilers for their systems, those compilers are not likely to be portable to a competitor's system.

There is one compiler that seems to meet most of the requirements: The GNU C++. Tools are available for it, and it is portable across a large number of platforms. Even better — it is free. But that very positive point results in the biggest negative for the GNU C++ compiler.

The GNU C++ compiler is another result of the Free Software Foundation's GNU Project. The compiler, complete with source code, is available on request from the foundation and can also be downloaded from many electronic bulletin boards. Because of the availability of source code and the fact that it is free, users have ported the GNU C++ to dozens of platforms, including DOS and many variations of Unix. It sounds good, but the drawbacks are considerable.

C++ sampler

A partial listing of available C++ compilers and the platforms they support

COMPANY	PRODUCT	PLATFORM
Borland International, Inc.		
Symantec Corp.		
Free Software Foundation		
Liant Software Corp.		
Microsoft Corp.		
Lucid, Inc.		
Metaware, Inc.		

"There are a lot of companies selling technology, but no one is selling a solution," said John R. Rymer, editor of "The Distributed Computing Monitor" at the Patricia Seybold Group.

Lack of support

The Free Software Foundation will not support you. For that you will have to go to an outside support firm such as Cygnus Support in Mountain View, Calif. Cygnus President Michael Tiemann not only supports GNU C++, he wrote it. According to Tiemann, Cygnus will provide customers with everything from simple maintenance releases to custom porting services for a fee that ranges from four to six figures per year.

There is another consideration when using GNU C++, however. Because GNU C++ is a product of the Free Software Foundation, it is covered by its "copyleft." The copyleft is a license that says users can use, modify and distribute GNU software provided it is does so free of charge and that source code is available upon request — something many software developers are loath to do.

There is a loophole for the compiler, however. Simply using the compiler to compile your code does not subject your code to the copyleft. The problem occurs if you use any GNU libraries, which is quite likely. Under those circumstances the foundation has an out for you: You simply must supply the libraries and their source code upon request and allow users to modify and relink those libraries at will. You need not supply all of your source code.

Tiemann admitted that even the loophole is not enough to assuage some potential customers. "A lot of people are not comfortable with the GNU Library License," he said.

So for now, C++ may be an option only if you are doing development for a specific platform and have no need to port it soon.

User groups form to pressure object-oriented software vendors

By Garry Ray

■ Commercial users of object-oriented technology have decided that vendors do not understand their problems. Now they are out to set things straight.

In the last year, two user groups representing hundreds of corporate technologists have been formed to influence object-oriented software vendors and industry associations such as the Object Management Group (OMG).

The two organizations — the Forum for Distributed Object Computing (FDOC) and the roughly 250-member Corporate Facilitators of Object-Oriented Technology (CFOOT) — share a similar mandate despite differences in organization. While both groups focus on the business implementation of object-oriented technology, CFOOT functions primarily as an information-sharing group. FDOC, a smaller group of high-powered information systems managers, wants to influence object-oriented vendors and standards bodies.

Driving both groups is the conviction that "vendors have been focused on the technology, not on the corporate issues," said Bob Marcus, the founder of CFOOT and coordinator of object-oriented technology at Boeing Computer Services in Seattle.

Marcus independently started CFOOT as a vehicle to bring a wide range of corporate technologists together over the Internet electronic-mail network. He is also an original member of FDOC, which has had a slower start because of administrative and legal concerns.

However, Marcus said he thinks both groups can influence the direction of the technology: "If we can work on technology and business issues and bring pressure upon the vendors, there can be a real breakthrough" in object-oriented systems, he said.

Other CFOOT participants value the group as a forum for discussion but do not think it will have much influence on object-oriented vendors. "I have a stronger lever with vendors as the representative of a large company," said Bruce Bohannan, a scientist at Hughes Information Technology Co. in Denver.

FDOC, the smaller but potentially more potent user organization, was formed last year by IS managers from about 30 companies including American Airlines, DHL Airways, Inc., Electronic Data Systems Corp. and Citibank NA. Although the group remains temporarily stalled due to administrative issues, members said they hope to have a notable presence with ven-

User groups, *page 56*

How to reach them

Corporate Facilitators of Object-Oriented Technology can be reached by E-mail at marcus@boeing.atc.com.

The Forum for Distributed Object Computing, currently undergoing a more formal organization, will convene at the Patricia Seybold Distributed Object Computing Technology Forum scheduled to be held in Boston in April.

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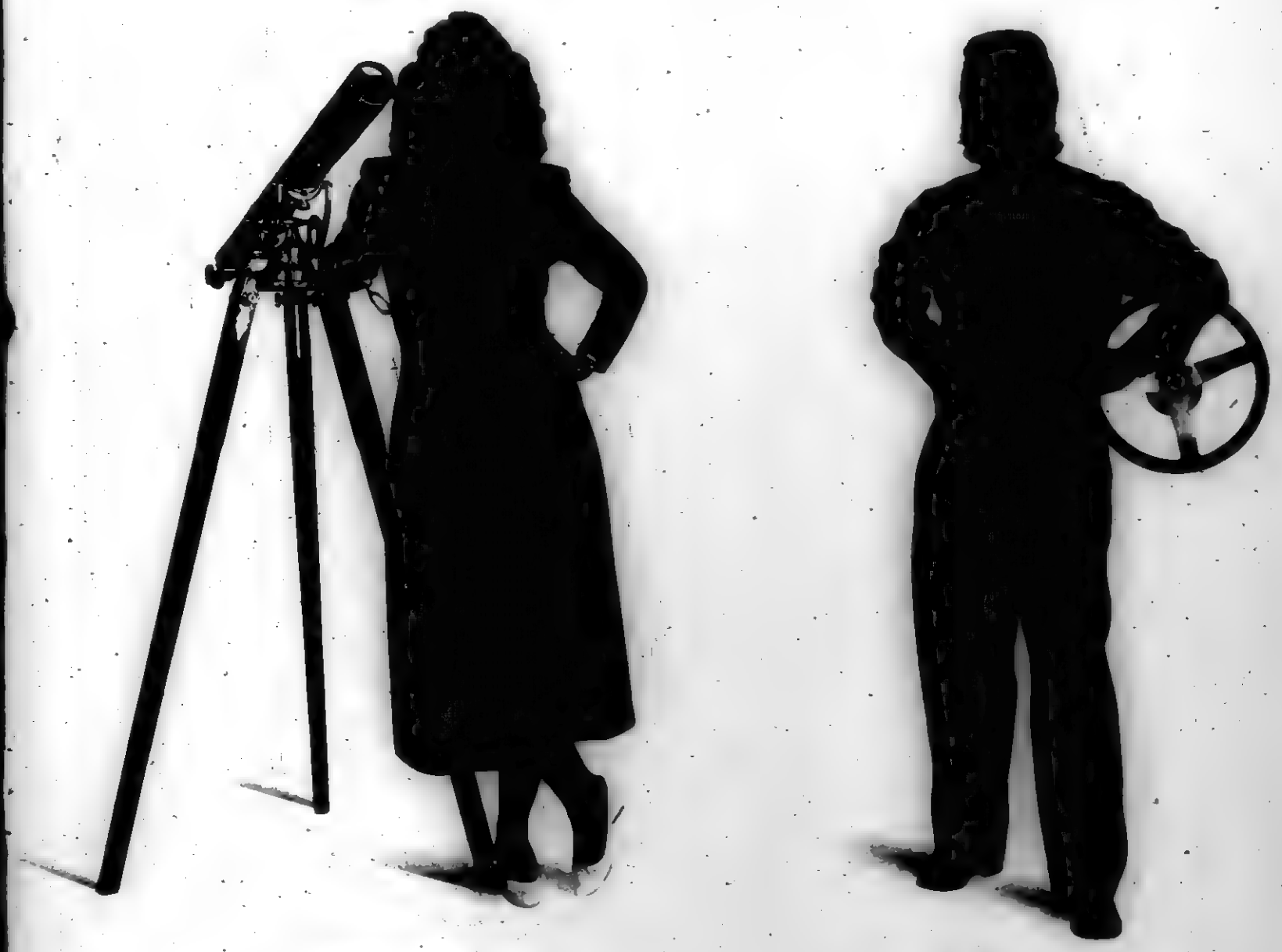

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The Newspaper of IS

Paul Winsberg

Has IBM scored?

Late last summer, IBM downsized Repository Manager and AD/Cycle, its mainframe CASE strategy. According to most reports, Repository Manager development is now frozen; instead, IBM is hard at work on a LAN strategy called AD Platform. This approach is of great significance for IBM and the CASE market.

AD Platform is an internal name only; the official name may be different. Unlike AD/Cycle, it is oriented to LAN-based, client/server computing and the public standards inherent in open systems.

Here are the key components of AD Platform:

■ **Operating system independence.** Initially, AD Platform will run on AIX and OS/2; tools and users of AD Platform will be unaware of the underlying operating system.

■ **Object-oriented database.** The repository runs on the Versant Object Technology Corp. object database system; however, it was designed to port to other object databases with minimal changes.

■ **Tool services.** The repository consists of C++ code layered on top of Versant. This code implements CASE utilities, such as time and resource tracking, task management, distribution of data and processing and parallel development. These utilities are the crucial interface between CASE tools and the repository; CASE tool builders at IBM and other vendors must write for these utilities to plug into the repository.

■ **User interface services.** IBM will provide a set of classes and associated methods to support Common User Access (CUA) and Motif. It should be straightforward to extend the library to Windows or OpenLook in the future.

■ **IBM and third-party tools.** Although IBM has made no announcements on this subject, the smart money says most of the AD/Cycle case tools eventually will be available in AD Platform. This includes products such as the CMVC/6000 configuration management tool, Workstation Interactive Test Tool, Bachman, KnowledgeWare and other independent software vendor tools. Lower CASE products such as Cross System Product may take longer to arrive in AD Platform because they are more difficult than upper CASE tools to port to AIX and OS/2.

■ **IBM Information Model.** The Information Model is the only important tangible product of the ill-conceived AD/Cycle debacle; alongwith Portable Common Tools Environment (PCTE), it is the key CASE standard today. It is proprietary to IBM, but it is now before ANSI and European Computers Manufacturers Association committees and is in any case becoming a de facto industry standard.

The Information Model will be adopted in AD Platform. Currently, the Information Model supports the high-level business model and the low-level technology model but does not cover the critical mid-level design model.

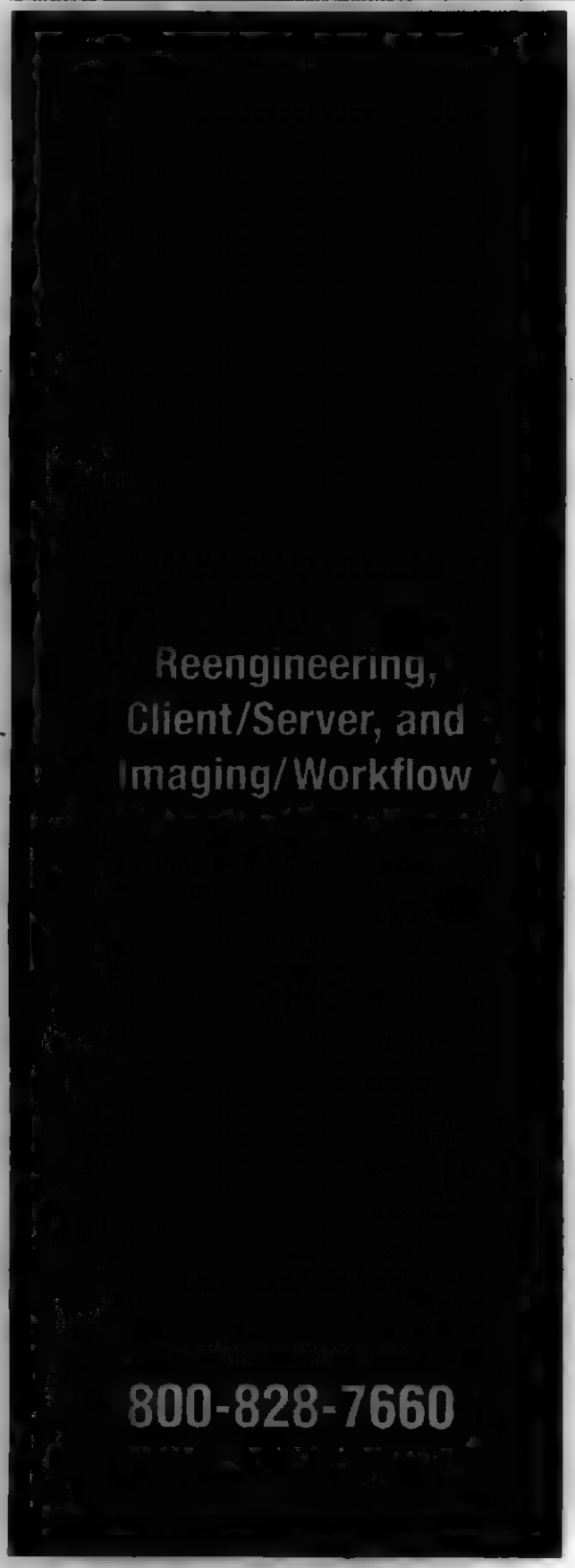
There are many good things about this new strategy. It emphasizes immediate software development needs, such as configuration management, and defers lower priority goals such as enterprise data modeling. It incorporates the right standards (Unix, PCTE, CUA, IBM Information Model).

The LAN and workstation orientation offers superior price/performance to mainframes for computationally intensive applications.

The list of Repository Manager flaws is lengthy and well-documented; it is enough to say that Repository Manager was a bad solution (severe technical flaws) to the wrong problem (mainframe CASE, based on proprietary standards). It seems that AD Platform solves the right problem with sound technology and a rational architecture.

Has IBM finally got it right?

Winsberg is a principal of DataBase Associates and an associate editor of "InfoDB" in Berkeley, Calif. He has also served as a senior consultant at the Codd & Date Consulting Group.



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User groups form

CONTINUED FROM PAGE 51

dors and industry standards groups.

Part of that influence will be needed to nudge reluctant software vendors to invest in new technologies and platforms. Because the demand for object-oriented wares is small and experimental, vendors seem unwilling or unable to make the investments needed to address the problems of large corporate installations, members of both groups said.

"We were seeing slow motion on the part of the vendors to address our needs," said Meg Lewis, a managing director at the Sabre Computer Services division of American Airlines in Fort Worth, Texas. "They're trying to balance their [technology] investment portfolio, just the way we are."

Although uncertain that FDOC can directly address the economics issue, Lewis speculated that consortium development — a potential direction for the organization — could provide the financial incentive for vendors to move more quickly. "There might be a way for the developer and 15 companies to fund development. Everybody wins," she said.

FDOC and other user organizations also provide the one element software vendors and standards organizations cannot replicate: real-world experience.

"No one is looking at the end-to-end issues of the technology, from the user interface to databases," said CFOOT member Rao Mikkilineni, director of advanced software technology at US West Advanced Technology in Boulder, Colo.

Mikkilineni said vendors and standards groups are carving out small areas of technology expertise but are ignoring the more complex and difficult issues of systems integration and software infrastructures. Users who have begun to implement object-oriented systems know "what architecture makes sense, what bottlenecks have been discovered and what the problems of implementation really are," he added.

Despite the good intentions, FDOC and CFOOT may not have quite the same promise as originally envisioned. Ultimately, the ambitions of FDOC may be bottlenecked by concerns about corporate trade secrets and antitrust regulations. "My hope is that we can decide what to discuss and what not to discuss," Mikkilineni said.

In the end, the success or failure of the groups may answer a question posed by Bohannan: "Do users drive the industry, or do vendors drive the industry?"

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IBI promises easier access to VAX data

By Melinda-Carol Ballou
NEW YORK

Information Builders, Inc. (IBI) is now shipping Release 2.1 of Focaudit for Digital Equipment Corp.'s VAX/VMS systems. Focaudit is a set of interactive financial auditing tools designed to make it easier for auditors to independently access data files for audit reports.

This new version of Focaudit for VMS is consistent across VAX, IBM mainframe and PC environments, which enables auditors to more easily switch among computing platforms without retraining, IBI said. Focaudit is used with IBI's Focus fourth-generation language. A new point-and-click user interface remains the same across operating systems and databases, officials said.

"Release 2.1 is all point and click to enable anyone to come up to speed quickly, but the bottom of the screen shows the [Focus] code you generate for more sophisticated users," said Sheldon Isaacson, manager of business development at IBI.

IBI is likely to release Microsoft Corp. Windows and X Window System versions of the software late this year, with support for IBM's Application System/400 platform by midyear, Isaacson said. IBI also has plans for Focaudit to run on Microsoft's Windows NT and Unix operating systems in 1994, he added.

Focaudit Version 2.1 for VAX/VMS is available now. Prices range from $14,000 to $66,000. Prices range from $44,000 to $72,000 for IBM mainframe users on DOS or VM CMS. Prices include IBI's Focus 4GL.

Get ready for

BAILOUTSOURCING

Smart IS managers are building safety valves into outsourcing pacts in case business goes sour or booms. Vendors have no choice but to follow.

LaBarge's Bill Maender *says his defense-related manufacturing firm pulled the plug on a $5 million outsourcing pact because the EDS unit couldn't keep costs down*

By Willie Schatz

Next time your company is tempted to sign a megabucks, multiyear outsourcing contract, remember the reality clause. Information systems managers and legal experts say a little preventive medicine could save your project, your company — and maybe even your career.

The basic idea is simple: Businesses change, so contracts should, too. Say you are locked into a five- or 10-year multimillion-dollar deal. If your business, location, assets or product mixes change dramatically, you don't want to get stuck with a pact that doesn't match your circumstances.

Take the case of Meritor Savings Bank. In April 1989, the Philadelphia-based bank was a $12 billion colossus when it signed a 10-year, $300 million contract with Electronic Data Systems Corp. Three years later, Meritor had closed two-thirds of its branches and had shrunk to $4 billion in assets.

Obviously, says Larry Liss, Meritor's senior vice president of operations and technology, the bank needed far less processing services in its drastically slimmed-down state.

"We knew we had to realign the original contract with the current size of the institution," Liss explains. "We thought [downsizing] might happen, so we put a provision into the contract about downsizing even though we didn't know what form it would take."

Sound like backing out? Hardly, according to IS managers, who say keeping flexible is just smart business sense.

In fact, as outsourcing continues to enjoy popularity (a recent CSC Index, Inc. survey of more than 400 top-level IS managers found 68% were outsourcing or considering doing so), more and more companies are building bailout or safety valves into their contracts.

Robert Zahler, a partner specializing in outsourcing at the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge, says the last two dozen or so deals he has made have included "extraordinary events clauses" designed to ensure flexibility for both client and outsourcer.

He notes that one result of the trend is that sourcing ven-

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Schatz is president of The Schatz Group in Washington, D.C.

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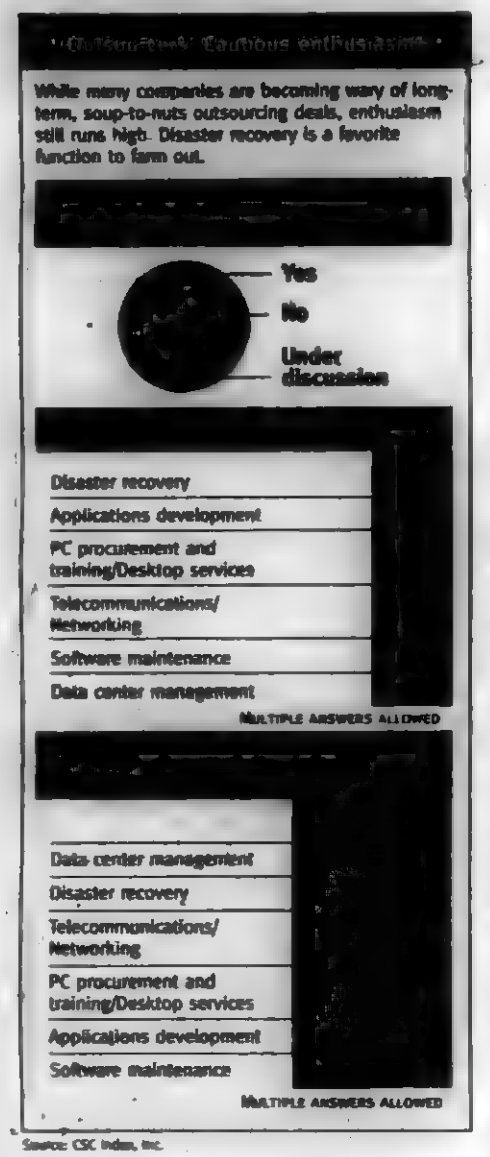
Bailoutsourcing

CONTINUED FROM PAGE 57

dors, including giants such as EDS and Integrated Systems Solutions Corp. (ISSC), are being forced to be more flexible when writing outsourcing deals.

"To compete in the outsourcing market," Zahler notes, "you have to have flexible product offerings instead of rigid ones. Vendors are tailoring their products to what customers are looking for."



Source: CSC Index, Inc.

A couple of recent examples illustrate why it's worth spending time learning about reality clauses.

Flex time at Meritor

"We were running out of ideas on how to save money," Liss says. "Our budget had been cut substantially in the preceding two years [since 1990], so even though we'd reduced our expenses by 25%, we were trying to figure out how to reduce costs beyond what we'd already done." They decided to rethink the contract.

Until recently, it would have been well within standard ethics for the outsourcing vendor to say, "Sorry, guys, but that's business." But Meritor had the foresight to insert a reality clause into the contract that EDS was forced to honor.

"I'm not about to try to make up the shortfall at Meritor," says Bobby Grisham, division president of EDS' financial institution strategic business unit.

"You can't stiff the market," Grisham says. "If I've got a long-term, fixed-price contract, I can't stick with it if the customer's business circumstances change. I'm not going to pull out my calculator and bill by the hour. My goal is to make them so . . . happy that they come out knowing we're the partner that helped them be successful without focusing on what that means to us."

So Meritor and EDS rolled up their sleeves and cut a more realistic deal that satisfied both partners. The original 10-year term would remain, but Meritor's cost (which Liss declined to reveal) was slashed to better reflect the bank's shrunken empire and processing needs.

For its part, EDS retained a key customer for the next seven years — and possibly longer. It also demonstrated a flexibility that could give it more muscle in future confrontations with big foes such as IBM and Andersen Consulting.

How to keep outsourcing contracts flexible

Harvest Foods, a 54-store grocery chain that recently outsourced IBM ES/9000 processing, advises potential outsourcers to carefully consider the following when drafting contracts with outsourcing vendors

- Volume growth
- Expanded scope
- New technology
- Manpower requirements

- Reason
- Associated charges

- Changing business
- Changing marketplace

Source: Harvest Foods, Inc.

Switching in midstream

Sometimes, however, lots of elastic might not be enough. That was the case at St. Louis-based LaBarge, Inc.

The company, a $75 million interconnect systems manufacturer with a big defense-related business, got into outsourcing for the same reasons many others do.

"Technology had passed us by," says Bill Maender, vice president and secretary at LaBarge. He describes the company's former IS configuration as the typical in-house hodgepodge from various manufacturers without much integration.

Although it wasn't losing business because of the antiquated IBM 4330-based system, LaBarge faced a huge annual maintenance cost of $1.5 million and outdated, inadequate in-house software.

But after obtaining new software from Western Data Systems in Calabasas Hills, Calif., Maender says he discovered the software was too much for the hardware to handle. Instead of trying to re-engineer, LaBarge decided to try something new.

"We'd never done outsourcing before," Maender says, "but we elected to look at it as a potential way of reducing the total cost and time of implementation. We wanted to buy the package and get it running in seven months."

So in December 1990, the firm decided McDonnell Douglas Corp.'s McAuto unit in St. Louis was right for the job. The companies signed a five-year, $5 million pact.

Unfortunately, Maender says, things went wrong almost immediately. LaBarge maintains that for six consecutive months, McAuto far exceeded the contractual price cap for data processing.

And despite its best efforts, McAuto — which was acquired by EDS early in 1991 — couldn't seem to deliver the work at the agreed-on price, LaBarge officials maintain.

Apparently anticipating problems, LaBarge had protected itself with an escape clause, which allowed the company to terminate the contract if costs exceeded the fixed-dollar amount. After paying consultant KPMG Peat Marwick $40,000 to review the situation, LaBarge reluctantly pulled the plug on McAuto.

The deal was rebid, but McAuto declined to participate. The winner was May & Speh, Inc., a Downers Grove, Ill., outsourcer. Maender says the newcomer won the similarly sized deal because of its attitude toward converting LaBarge's chaos into order.

"We didn't know them, but they came in and confidently said they could do the job," he recalls. "They didn't blow smoke. And their competitors didn't mesh with us the same way."

The switch seems to have paid off: Maender says his processing costs have decreased by 40% since May & Speh took over. "We'd absolutely do the same thing again," he says. "We walked away from EDS because of price, not service. Their people were concerned with the [cost overrun] problem but didn't know how to fix it. Or maybe they didn't want to. But they couldn't change their cost structure to make it viable [for us] to stay with them."

It would be a mistake, though, to presume that fear of hard times and uncertain futures are the only factors driving the new flexibility in outsourcing arrangements.

In fact, just the opposite is true at Kaiser Permanente. The San Francisco-based health care giant is just one of the many firms turning to flexible outsourcing as a means of hedging current and prospective growth.

Late last month, Kaiser inked an agreement to outsource its five smallest (but quickly growing) health maintenance organization areas to ISSC [CW, Jan. 18]. The goal, according to company officials, was to modernize technology and provide disaster recovery backup.

The contract (terms were mostly undisclosed) packs plenty of flexibility, says Andy Dubill, a Kaiser interregional services vice president. The motivation, he says, was not fear of a bust but anticipation of a boom.

Take your time

So what's the message for IS managers pondering outsourcing? Go for a multiyear, multimillion dollar contract with a monster such as EDS or ISSC and build in flexibility? Or let a smaller niche player such as May & Speh do the job from the start?

Washington, D.C., contract lawyer Harry Glasspiegel warns against jumping to conclusions too quickly.

"Each outsourcing transaction has its own set of issues and its own dynamics," says Glasspiegel, a partner in Shaw, Pittman, Potts & Trowbridge. "People should be very careful about drawing inferences or trends from a particular transaction."

He agrees with Zahler, however, that outsourcing vendors are clearly eager to play ball.

That's good news, Liss and others note, because many clients are also taking a more fragmented approach to outsourcing. Thus, vendors and buyers seem to be in the same ballpark — or at least headed that way.

"You don't need to address specifics such as downsizing in the contract," Grisham argues. "But you've got to create a framework within the contract that allows both sides to deal with swings in the customer's business. You've got to be able to move, whether the customer's business goes up or down."

Zahler is more blunt. He flatly advises against doing business with "any vendor who says they will not change a deal."

As for IS, it definitely pays to get smart about outsourcing pacts. "You're always afraid the little details are going to blow you out of the water," Maender says. "You just take the paper out there and pray like hell that it runs." ▪

One company's solution

Here's a snapshot of a company and its outsourcing methods.

The firm: Harvest Foods, Inc. is grocery market share leader in Arkansas.

Goal: To switch from a mix of older corporate IBM and NCR Corp. systems.

Backstage: Handled by a group, including the chief financial officer, chief information officer, human resources officer, general counsel and board members.

First steps: Review objectives. Then determine total IS cost, 10-year plan and budget. Finally, draft outsourcing requirements.

Action: Outsource to ISSC.

Payoffs: Twenty store systems installed in two months; smooth operations; improved development structure.

Advice: Outsourcing should not be done for a quick fix or for lack of technology strategy.

Source: Presentation by Robert M. Baugh, executive vice president and CFO of Harvest Foods.

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With a single point and click, the Button Bar lets you do things that take multiple keystrokes in Harvard. And you can even customize the Button Bar with powerful editing tools.

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WordPerfect®

Joseph Maglitta

Outsource for better living

What a great idea, this outsourcing! Pay someone else to do things they can do better and more cheaply anyway. But why stop at computers?

Why not expand the concept and outsource other areas of your work and even your personal life? You'll not only create time for important things such as channel surfing but also help the economy by creating thousands of new jobs. Below are suggestions to help you get "out" there:

Snoutsourcing. Pay other people to smell things for you. This is a godsend for sinus sufferers, the olfactorily challenged and anyone who just hates things that smell bad. Perfect when purchasing fish, changing diapers, deciding whether it's time to send items to the dry cleaner, etc.

Doubtsourcing. Would your autobiography be titled *Gullible's Travels*? Are you the kind of person who believes everything — a real pushover? Then take a hint: Hire a skeptic. He'll ask the tough questions you hate, and pretty soon people will be treating you like Lee Iacocca instead of Polyanna or Gomer Pyle.

Poutsourcing. Nobody likes a poop. So why risk being labeled a malcontent or Sad Sack when you can hire a skilled and willing sourpuss to do your brooding for you? You'll feel better once you get it off his chest — guaranteed. Often packaged with the following two services:

Shoutsourcing. WHAT'S THE MATTER, IDIOT??!!! MAYBE YOU DIDN'T HEAR ME THE FIRST TIME! I SAID IT'S A LOT LESS WEAR AND TEAR TO PAY SOMEONE ELSE TO DO YOUR YELLING FOR YOU THAN TO GET ALL WORKED UP YOURSELF! GET IT?

Cloutsourcing. Formerly known as delegation. Hire dupes to do things for you, or better still, to tell *other* people to do things for you. Yell if they resist (see above). Works swell with preteen kids and (small) dogs, too.

Stoutsourcing. Think of this as a stand-in food-taster, only hungrier. Every time you see something you'd simply *love* to inhale a la Jabba the Hut, simply beckon your charge and have him scarf it for you. You'll get a real voyeuristic thrill watching him deliciously wolf down, say, that double chocolate torte, and he'll pack on all the calories! Bon appetit, Slim.

Troutsourcing. Let's face it: Sportfishing is seldom as easy as it is on *Celebrity Fish Kill with Bubba Cheeks* or those other Saturday morning video safaris. Spare yourself (and maybe your kids and pals) the embarrassment: Pay a pro to take the kids fishing. They'll be sure to catch more than gnat bites, and you'll be a cinch to land a "Dad/Mom of the Year" trophy from the delighted little bait tossers.

Scoutsourcing. Similar to above. Sure, you want to be a great dad or mom. But do you really want to know that much about mealworms, garbage-eating microbes or slip knots? Are you truly eager to tromp miles out into the chilly foothills to Camp Damp, to arise miserable and foggy at dawn and vainly scavenge for a few pitiful twigs to burn in an evil, smoky fire that will heat some unidentifiable freeze-dried and salty skank from a tinfoil pouch? AND DRINK INSTANT COFFEE!!??? I didn't think so. Hire a pro from the local gun shop instead.

Checkoutsourcing. There's nothing more irksome than waiting in the supermarket checkout line watching some baffled teenager go BLEEP BLEEP BLEEP in vain hopes of getting the bar code reader to work. Attention shoppers: Pay someone to stand in line for you, and go read *The Star* where you should — in the commode.

Groutsourcing. An old favorite. You needn't be rich to pay someone to get down on his knees and scrub your bathroom tiles with a brain-melting toxic substance and an old fingernail brush — just lazy, busy or deathly afraid of anything growing under your sink that looks like shepherd's pie.

Let-it-all-hang-outsourcing. A naughty one that's fun, especially at company picnics and Christmas parties. Measure your surrogate party animal for lampshade, toga size and favorite cocktail and watch *his* once-promising career sour like the guacamole while you coolly sip Perrier and lime from the sidelines. See you at the top, you nut.

Maglitta, senior editor, features, paid someone to write this column.

Calendar

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 967-1001.

Document and Image Management Systems Conference. Lake Buena Vista, Fla., Feb. 7-10 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

International Society for Hybrid Microelectronics (ISHM) Advanced Technology Workshop: Advanced Materials, Processes and Interfaces. Ojai, Calif., Feb. 15-17 — Contact: ISHM/IEEE Workshop Registration Desk, Reston, Va. (703) 471-0066.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Downsizing Expo. Chicago, Feb. 16-18 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Adobe Technology Exchange Expo (ATXPO) Conference and Exhibition. Santa Clara, Calif., Feb. 16-19 — Contact: ATXPO '93, Santa Clara, Calif. (408) 562-6104.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

The Software Development Exhibition and Conference '93. Santa Clara, Calif., Feb. 22-26 — Contact: Software Development Conference '93, Carrollton, Texas (214) 245-6012.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

Compcon Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

The Networking Management, Interconnectivity and Security Symposium. New York, Feb. 24-25 — Contact: Association for Information Technologies, Kings Park, N.Y. (516) 269-6713.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7208.

Executive Track

Joseph Brophy, long an outspoken advocate of the importance of information systems in the insurance and health care arenas, will retire from his current post as president of the **Travelers Managed Care and Employee Benefits Operations** unit of Hartford, Conn.-based **The Travelers Corp.**, effective March 31. **Richard Booth**, Travelers' president and chief operating officer, will assume Brophy's duties.

In Northampton, Mass., **Herb Nickles** has been named director of information systems at **Smith College**.

Nickles, a veteran of IS in academia who most recently served as director of academic computing at New Orleans-based **Loyola University**, is charged with spearheading IS and communications advances at Smith.

He will also manage the Office of Information Systems, which coordinates academic and administrative computing and campus networks.

He replaces **Charles Staelin**, who has returned to his full-time teaching post in the college's economics department.

State University College in Cortland, N.Y., has a newly created position — associate vice president for information resources — and the person to fill it: **Paula Warnken**, who has served as director of libraries at Cincinnati-based **Xavier University** since 1984.

Effective March 15, Warnken will be responsible for planning, coordinating and budgeting IS on the Cortland campus, as well as working with statewide committees to develop information resources and networks.

Gary McCarty is the new MIS manager at the Washington, D.C.-based **Electronics Industry Association** (EIA). Before joining the EIA in 1992, he served as a computer specialist and instructor at **Halliburton Industries**.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Neil Margolis at 1-800-343-6474 to pass the news along.

This is not a TOY

Presentation tools are serious business for sales and marketing — they're a basic means to a good image

By Linda Musthaler

You might think that presentation graphics software is a trivial thing, not worth your time or interest. But from a business perspective — and especially a sales and marketing perspective — it is a serious tool.

Image counts for a lot in sales, and these products play a strong role in how a client views your company when the presentation is through. Even for internal use, sales departments very much want to make a lasting impression on the head of sales. Presentation software can't do everything, obviously, but a poor system can wreak a lot of damage.

In reality, though, most sales and marketing staffs get little support from the information systems staff with selecting and even learning how to use their presentation software. Most companies see presentation graphics as a "localized need," leaving support and purchase decisions to individual business departments.

This mind-set can cause presentations to suffer, leading to a disjointed public image of the company. Have you ever seen a sales pitch where the salesperson obviously was not comfortable with the presentation tools? Or had handouts that were unclear and hard to follow? If yes, you probably walked away less interested in the product and the company than you were before.

How much support is enough? At the very least, IS should set the standards for the products to buy, in terms of platform, software and peripherals. It should also provide product updates, as well as help desk support and training on the mechanics of using the product.

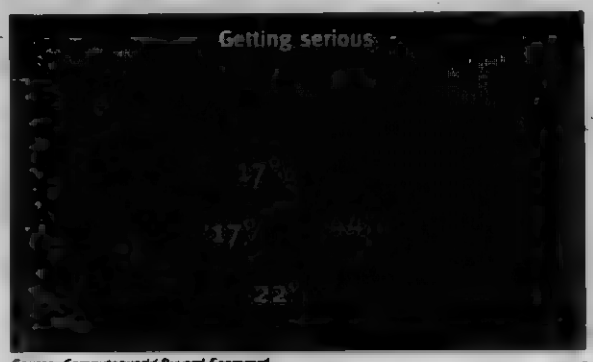
Knowing your audience

Before selecting a package, you have to understand the needs of the sales and marketing departments. For one, they won't be satisfied with the presentation capabilities embedded in word processing or spreadsheet packages.

Great sales presentations incorporate heavy-duty elements and require a variety of features. Fortunately, most of the high-end presentation graphics products available today suit sales and marketing needs.

In fact, vendors have all but ceased leapfrogging each other with new features; instead, they are making the creation process more efficient by taking the burden of presentation design and placing it on the application software.

For example, all of the high-end products today offer chart styles with a gallery of options. If the user chooses a bullet chart, the package automatically determines the bullet style, places the text, sizes the font and sets colors for bullets and the background. Thus, the presenter can concentrate on the content of the message rather than on the show itself.



Source: *Computerworld Buyers' Scorecard*

Available products either are highly specialized — those that do one or two things very well — or are integrated products with a range of features.

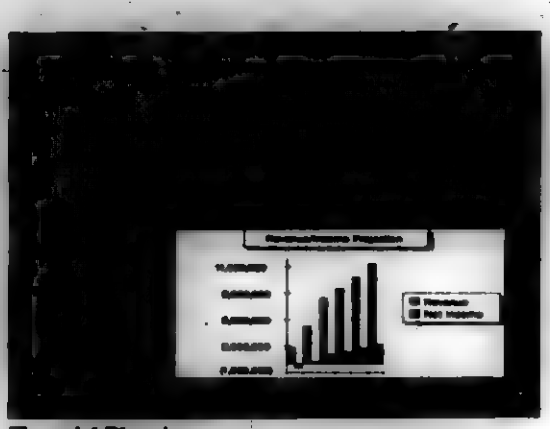
For instance, there are a number of multimedia products that give life to otherwise sedate slides by adding sound and video capabilities.

Though many typical presenters have at least experimented with screen shows, multimedia presentations are not yet meant for the average sales staff. Instead, they are still for those with the time, money and design skill to create a polished result. •

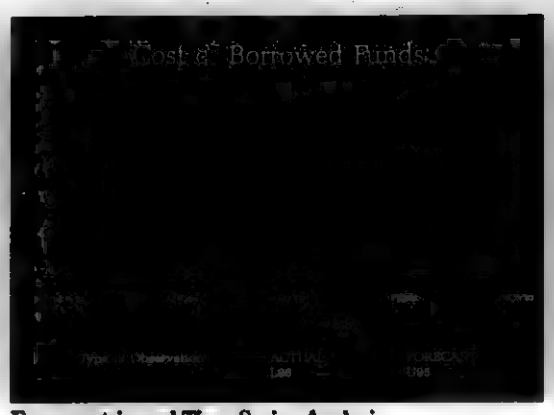
Musthaler is an industry analyst at Carrid & Co., a Houston-based consulting firm.

inside

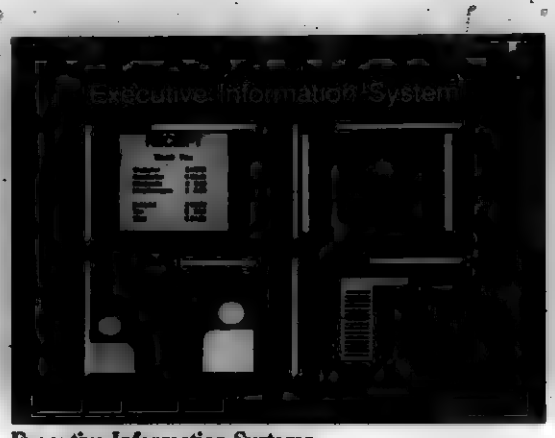
- Will your presenters be taking their show on the road . . . and other important considerations? **Page 65.**
- Asymetrix' Multimedia Toolbook development kit earns kudos from reviewers. **Page 70.**
- Aldus' Persuasion for the Macintosh tops three Windows heavyweights in presentation graphics buyer satisfaction. **Page 66.**
- Multimedia update. **Page 69.**



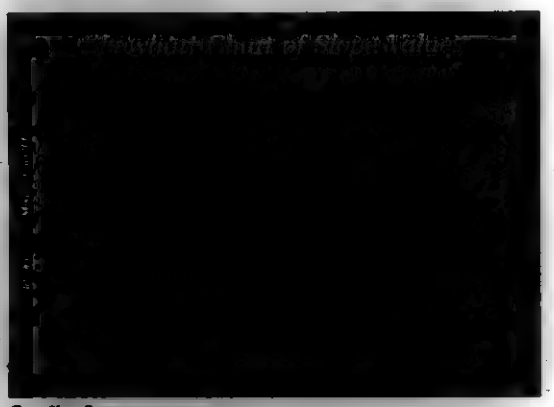
Financial Planning



Econometric and Time Series Analysis



Executive Information Systems



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Reporting

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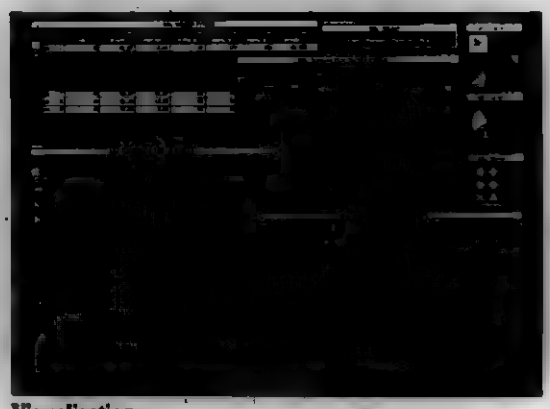
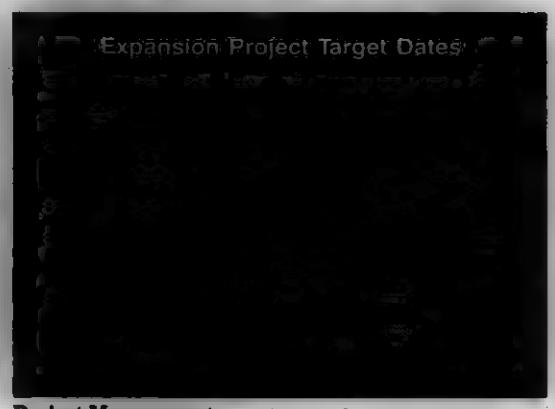
Business Graphs



Visualization

Data Analysis



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DEPARTMENTAL MANAGEMENT
81. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
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70. Communications Systems/Public Utilities/ Transportation
75. Mining/Construction/Petroleum/Refining/Agric.
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Presentation Tools

What's behind the polished image

By Linda Musthaler

"Old reliable" . . . but with a sizzle. The king of simplicity . . . but capable of making an impact.

That's what sales and marketing departments most likely want in a presentation system. After all, salespeople not only have to be smooth and ultraprofessional, but they also have to get noticed.

How will you find out their requirements? Ask them! Here are the most crucial categories to query. Have them rate these categories in terms of what's most important to them.

Of 962 respondents, 64% plan to purchase presentation software in the next year, according to the Computerworld Database Division.

Operating systems

On which platform are the best presentation packages available? Traditionally, the Apple Computer, Inc. Macintosh has been known for its superior graphic capabilities, but Microsoft Corp. Windows is becoming more widely used than Macintoshes.

Most new developments in graphics capabilities are on Windows, and it offers better product integration, allowing a presenter to mix and match chart types, clip art and even video from many sources.

DOS is also still viable, and the OS/2 market is playing catchup on the desktop.

If your company needs a mixed environment, select products from software vendors that are committed to several platforms. For instance, Microsoft's PowerPoint is available for both Windows and the Macintosh.

Openness

If users have many other computing resources at hand, you'll want the system to interoperate with them; for instance, it should support a good variety of add-ons and peripherals. It should also be able to exchange files with other existing applications and be compatible with many other products for input, output, clip art, data import and other features.

Market share

Followers are the top 3 presentation graphics products in three categories in terms of U.S. units shipped.

DOS	Macintosh	Windows
Software Publishing Corp.'s Harvard Graphics	Microsoft Corp.'s PowerPoint	Microsoft's PowerPoint
WordPerfect Corp.'s DrawPerfect	Deltapoint, Inc.'s DeltaGraph	Micrografx, Inc.'s Charisma
Lotus Development Corp.'s Freelance	Aldus Corp.'s Persuasion	Lotus Development's Freelance for Windows

Source: International Data Corp.

Scalability

Users of the system might range from the head of sales to an intern. To ensure that a system will be viable for a variety of users, try to standardize on one or two presentation graphics products.

Scalable, high-end systems such as Software Publishing Corp.'s Harvard Graphics and Lotus Development Corp.'s Freelance are good choices because they are easy enough for the beginner yet have sophisticated features for the expert.

You may also want to consider opting for a high-end package and letting your users grow into it. Also, keep the door open for sound and video extensions because they will likely be important in the future as more people become accustomed to multimedia.

Portability

On-screen presentations given at the client's site can be more flexible and have more impact than paper output; as a result, most corporate "road warriors" will want to create and display their presentations all on the same machine.

Fortunately, most laptop and notebook systems are capable of running desktop presentation software. The size of the audience should dictate the equipment required. For audiences of one or two people, running a screen show on a laptop is adequate. With larger groups, an external monitor is recommended. When multimedia is used, extra storage is necessary, which notebooks often don't have, requiring a CD-ROM or extra hard disk.

It's a simple thing to add extra tools such as large-screen monitors, sound boards and speakers, but there is a practical limit to the amount of external devices a traveling salesman can take with him. Some of the equipment, such as large-screen monitors, projectors and LCD panels, is also expensive to buy, lease or rent.

If you're intent on a full-scale production, you may want to ask about the client's facilities. Large firms usually have fully equipped conference rooms that can support a presentation and save you the effort of carrying equipment with you.

Ease of use

Many products are easy enough to use without any formal training. Good tutorials cover the basic features and get a user up and running in less than 15 minutes. If certain users in the group won't be using the graphics package every day, the product should be easy to use on an infrequent basis as well. A new feature from Microsoft called Wizards prompts users through difficult tasks, one step at a time. Design elements such as chart galleries also ease use by offering a number of charts to use in your presentation.

Sophistication

Most sales departments will want the resulting presentation to be sophisticated enough to suit a variety of audiences. Your job is to make sure the presentation package can produce shows that are appropriate for the intended audience.

To add a sophisticated touch, an "interactive presentation" feature allows users to change the path of the presentation while it's being given.

Sophistication can also be achieved through products that can launch other applications from within the show. For example, if sales figures are being reviewed, users can show sales performance within the last two years by launching a spreadsheet with the data.

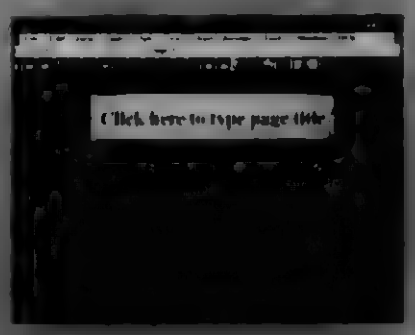
You may even want to look for a package that can do some of the design and layout work for the user, such as choosing the background color, chart style and font size.

GUI support

Though a graphical user interface (GUI) is not required for graphical work, it helps to have one when working with clip art and cutting and pasting objects between presentations. For instance, Windows' Clipbook enables clip art to be used and stored while maintaining the integrity of the objects. With DOS, transferring clip art is a more involved process, resulting in some loss of the object's integrity. GUIs also minimize the relearning curve for infrequent users because the interface remains standard. The device drivers of many output devices are also supported. •

HIGH-END FEATURES

Adding sound to presentations: With the "launch application" dialog box, you can set up files containing prerecorded sound clips. By pressing the "record" button, you can play the sound during the presentation. *(Pictured: Software Publishing Corp.'s Harvard Graphics for Windows.)*



Design help with built-in skills: Templates — called "Smartmasters" on Lotus Development Corp.'s Freelance — give users "click here to" prompts for entering titles, subtitles, text and graphics directly into ready-made presentation pages. *(Pictured: Lotus' Freelance Graphics for Windows Release 2.0.)*

Runtime versions: A button bar enables presenters to navigate backward and forward, either automatically or manually through a slide show. This runtime version allows the slide show to be viewed without the presentation software. *(Pictured: A slide created in Aldus Corp.'s Persuasion and viewed in a Persuasion Player — a runtime version of the show.)*

Presentation Tools

Buyers' Scorecard: Persuasion bests presentation software competition

By Derek Slater

Presentation graphics software for Microsoft Corp.'s Windows is one of the fastest growing application categories. According to the Software Publishers Association, retail revenue from Windows presentation graphics packages was up 250% in 1992.

However, a contender from the Apple Computer, Inc. Macintosh platform topped three leading Wiadows packages in this week's Buyers' Scorecard user satisfaction survey.

Aldus Corp.'s Persuasion for the Macintosh earned an overall tally of 75. Microsoft's PowerPoint and Lotus Development Corp.'s Freelance Graphics Windows packages scored 72 each. Software Publishing Corp.'s Harvard Graphics for Windows followed with a score of 67.

Aldus' Persuasion outscored the other products in support for data and graphics import, value for the dollar and color controls. It also took the highest mark for speed, though none of the products impressed users in that area.

In verbatim responses, Persuasion's users indicated that the product yields professional-looking presentations; they also noted that the outlining tool is a particular strength.

Microsoft's PowerPoint topped the most important category: ease of use. PowerPoint is a market share leader on both the Windows and the Macintosh platforms, aided by its inclusion in Microsoft's Office product suite. Users said PowerPoint's interaction with other Microsoft applications was an important strength.

However, the product lagged behind its competition in numeric and text charting, where users must rely more heavily on importing data, as opposed to creating charts within PowerPoint.

Freelance Graphics, which is bundled into Lotus' SmartSuite for Windows, took highest honors in quality and variety of templates and drawing tools but trailed behind PowerPoint and Persuasion in ease of use.

The DOS market share leader, Harvard Graphics, has found the Windows market hard to crack. The product trailed notably in ease of use and value for the dollar.

Last month, Software Publishing beefed up the product's multimedia capabilities by introducing an add-in Video Player for Harvard Graphics. Video Player allows users to incorporate scalable digital video clips into screen shows.

Graphic diversity

Interestingly, close to one-third of the respondents said they currently use more than one presentation graphics package. Users' top desired improvement for the products was a greater number and variety of presentation templates. The need for enhanced data import capabilities was also mentioned frequently.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their presentation graphics software in 16 specific categories.

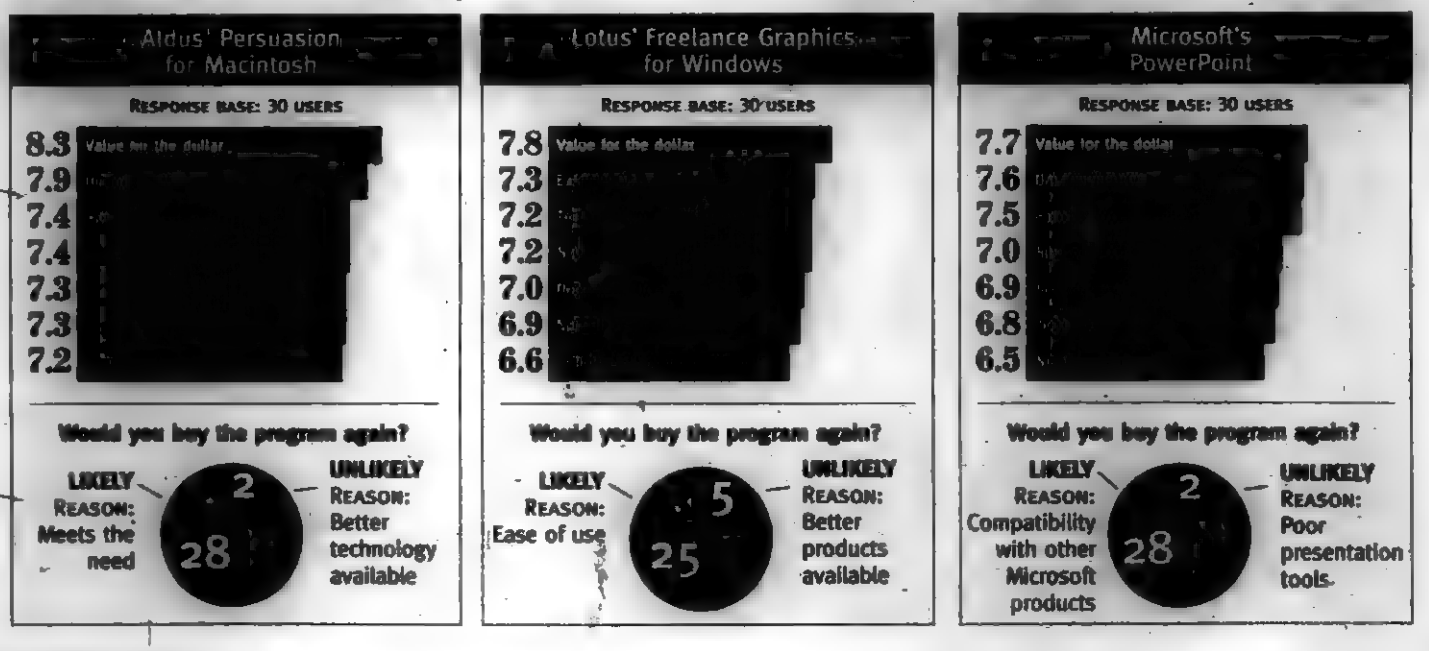
All categories were factored into the final scores. The scores for each product in the seven most important categories are listed in the tables below. •

Presentation graphics software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users for each product.

TOTAL POSSIBLE SCORE 100 MEAN SCORE 72

PRODUCT	PROS	CONS
Aldus' Persuasion for Macintosh — SCORE 75	"IT'S FLEXIBLE — YOU CAN USE MULTIPLE TEMPLATES AND COMBINE TEXT AND GRAPHS."	"IT'S HARD TO ENSURE THAT YOU ARE GOING TO GET QUALITY COLOR OUTPUT."
Lotus' Freelance Graphics for Windows — SCORE 72	"EASY TO USE WITH GREAT CHARTING CAPABILITIES."	"IT'S SLOW AND TAKES UP A LOT OF HARD DISK SPACE."
Microsoft's PowerPoint for Windows — SCORE 72	"IT'S EASY TO USE AND GIVES CRISP COLOR OUTPUT."	"IT'S SOMEWHAT SLOW AND DOESN'T HAVE ENOUGH OPTIONS FOR CHARTS."
Software Publishing's Harvard Graphics for Windows — SCORE 67	"IT HAS A LOT OF FEATURES." "THERE'S QUITE A BIT OF CLIP ART."	"IT'S SLOW AND NEEDS TO BE MORE USER-FRIENDLY."



Presentation Tools

Worthwhile elements

Some features are better than others

Vendors are no longer climbing over each other to offer the latest and greatest presentation features. The big push today is to incorporate features that make the whole effort more efficient. The most worthwhile of these can be classified in three categories: design, presentation and productivity elements.

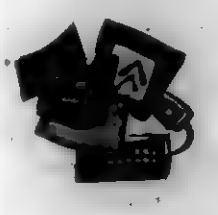
design elements

Mainly found in high-end products, these features facilitate the layout and design of a presentation. Also thought of as "design intelligence," they provide built-in expertise that controls and recommends colors and font sizes, alignment, background options, positioning and sizing of elements within a presentation. Here are some popular design features:

- **Chart galleries** give you a collection of chart types and styles to choose from, such as three-dimensional pie charts and stacked bar charts.
- **Templates** allow you to set a standard design for repetitive work.
- **Text layout** controls the placement and style of text on the charts.

Getting it all

Look for a system that provides many output choices, including printed copies, transparencies, slides, screen shows and other media as required. Design work such as digitized logos and corporate templates can be important as well.



- **Color palettes** provide a predetermined set of colors that contrast with or complement each other.

presentation elements

These features were designed to improve the presenter's delivery and enhance a lasting message, which is important for sales and marketing. Most of these features, listed below, are found in high-end products:

- **Screen shows** are a method for delivering the entire presentation on the PC screen. Most high-end packages also allow screen shows to be created and compiled. From there, they can be put onto a floppy disk and sent to a client to watch on a PC that does not run any presentation graphics software.
- **Interactive presentations** are a means for changing the path of the presentation as it is being given. For example, if a sales representative is making a point and wants to give extra detail, he can drill down to additional slides containing the information. But if he chooses to skip over them, he can.
- **Transition effects** control the way the presentation progresses from one slide to another. Instead of having the screen change abruptly between slides, a smooth rain or fade effect can be used.
- **Multimedia extensions** jazz up the presentation with support for audio and video to corroborate the text and graphic images.

productivity elements

Most presentation graphics packages have a set of productivity features that are meant to make the product easier to learn and use.

- **On-line tutorials** provide a quick overview of how to get started with the product. This is important for infrequent users.
- **Wizards** step the user through a difficult function with prompts, acting like an on-line tutorial that works with your live data.
- **Data import/handling** takes data from many sources (spreadsheets, databases, direct entry) and charts it in appropriate layouts (pie charts, bar charts, etc.)

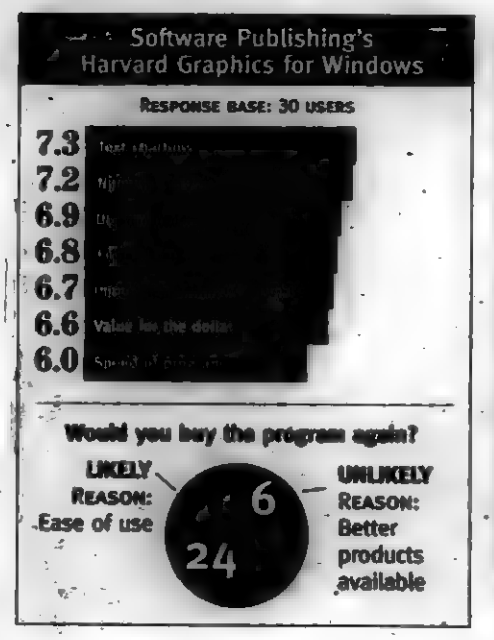
—Linda Musthaler

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 30 users per product.

The ratings categories, in descending order of importance, were as follows: ease of use, support for importing data and graphics formats, documentation, value for the dollar, speed of the program, text charting, numeric charting, responsiveness of vendor service, text editing, quality of vendor support, drawing tools, color controls, notes and handouts, quality and variety of templates, outlining and on-screen organization of presentations.

To compute the overall score for each product, we performed the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.



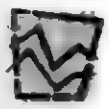
Quick. Think of a company with a much broader line of business UNIX computers than IBM.

Presentation Tools

Popular packages' true colors

By Alice Bredin

Sales and marketing staffs can pull together a presentation in less than an hour with presentation software. But there are lots of packages from which to choose. Users talk about the pluses and minuses of their products.



Most people use overheads, slides and handouts for their presentations, according to a Dataquest Scorecard survey. Fewer use videos (<8%) and PC-based presentations (<1%).

Software Publishing Corp.'s Harvard Graphics and Lotus Development Corp.'s Freelance for Windows.

User: Art Silverglate, PC specialist, network administrator, Land Rover North America, Inc., Lanham, Md.

Primary use: Presentations to dealers (Harvard Graphics), in-house documentation (Freelance).

Pluses: "Harvard Graphics is easy to use; our people learned it themselves with some class time. Lotus, however, is faster and has WYSIWYG capabilities. We can also set it up so users can only get to certain menus."

Minuses: "Harvard has features that Lotus doesn't, such as the ability to scan in a picture — say a Range Rover. But Harvard Graphics doesn't let you move back and forth between graphics and spreadsheets."

Lotus' Freelance for Windows.

User: Tony Gleicher, brand research manager, Pepsicola Co., Somers, N.Y.

Primary use: Handouts for presentations to management and promotional material for sales managers.

Pluses: "What makes it unique is the ease with which you can customize the Smart Masters. I also like the ability to toggle between black-and-white and color. A small but simplifying feat is the way clip art is seamlessly integrated as part of a tool box on the screen."

Aldus Corp.'s PageMaker, Corel Systems Corp.'s CorelDraw, Microsoft Corp.'s Word, Lotus' Freelance for Windows.

User: Cathy Gisdispenza, graphics specialist, Scudder, Stevens & Clark, Inc., a New York investment firm.

Primary use: In-house and client presentation material, such as portfolio performance presentations that show people what their money looks like.

Pluses: "CorelDraw is good for creating company logos, and Freelance is good for bar charts. Word and PageMaker make some pretty text. For the most part, I create graphs and pictures in Freelance or Draw and bring them into PageMaker. It's pretty easy to move things around."

Minuses: "Freelance for Windows is easy but buggy. I understand the new release will change all that. Freelance also doesn't have rulers, and I never know if I'm on the page. It makes my eyes get buggy after a while."

WordPerfect Corp.'s WordPerfect Presentations 2.0 for DOS.

User: Richard Wilkinson, controller, Universal Enterprises, Provo, Utah.

Primary use: Business presentations, forms, in-house flyers, logos and graphics for newsletters.

Pluses: "The real plus is it looks like Windows, and it can be used with a mouse. It has pull-down menus and help functions."

Minuses: "There is no ability to scale your drawings when you print."

Software Publishing's Harvard Graphics 3.0.

User: Rick Jacobson, PC technician, analyst, George A. Hormel & Co., Austin, Minn.

Primary use: Presentations for new sales hires and for sales force reference materials.

Pluses: "We support 65 sales offices, so it's important to have a product that's easy to train on. Harvard Graphics' menuing system is straightforward."

Minuses: "It has a speed problem. It's slow for detail or background. I understand that Version 3.05 speeds it up."

Bredin is a free-lance writer based in New York.

Quick. Think of a company with better business UNIX price/ performance than IBM.

Presentation Tools

User view

Sound, vision add presentation punch

By Robert M. Knight

When Joseph Duncan consults the oracles of the economy, people listen. And they watch.

As vice president and chief economist at The Dun & Bradstreet Corp. in New York, Duncan presents his views throughout the U.S. and the world as many as three times a week.

But unlike many economists, who are often technology-shy, Duncan has trained himself to be an expert in computer-generated graphics and animation.

When Duncan made a November presentation to his most important audience, the D&B board of directors, he was able to dress it up not only with static graphics but also with videotape digitized to fit the CD-ROM drive that supports his presentations. In one instance — as part of a D&B team overseeing a joint venture in the former Soviet Union — he included in his core presentation footage of Russians lining up for food and commodities.

Joseph Duncan, vice president and chief economist at The Dun & Bradstreet Corp., has trained himself to be an expert in computer-generated graphics and animation.

"I [have] a PC with a CD-ROM drive and internal speakers and plugs for various kinds of inputs from internal sources. I juiced it up with a 1.2G-byte SCSI drive because when you're doing digitized video, it burns up a lot of storage space," Duncan says.

Duncan started out with an IBM program called Hollywood, which IBM has since sold to Claris Corp. "Hollywood is a good way to get dynamic graphics that grow easily on the screen," he says.

System support

Today, Duncan uses Harvard Graphics, a package from Software Publishing Corp. in Mountain View, Calif. The package includes several support programs, including Linkway, which captures digitized video.

Among the benefits of using multimedia is that Duncan no longer has to pay a commercial film lab for each image in his presentation. He was spending $8 to $10 for each slide.

Nor does he have to worry about updating his visuals every time something changes in the economy. He keeps his data updated daily on a Microsoft Corp. Excel spreadsheet, which drives the graphics.

"When you're making, on average, one presentation a week, and that used to mean paying $400 to $500 a week [for updated slides], it doesn't take long to save a lot of money," Duncan says.

Although Duncan uses the Software Publishing product now, "we're constantly looking at other things," says John Wu, a New York multimedia consultant who works on contract with D&B. "Harvard Graphics isn't the easiest system to use, but we feel that the strengths it has in presentation flexibility far outweigh any small disadvantages.

"It uses 'hyperlinks' to let you go from slide to slide within a presentation, instead of being bound by the normal linear sort of program like you get with a 35mm slide presentation," Wu continues. "With hyperlinks and a set of backup slides, Joe can go to a particular graphic if he needs to, especially during question-and-answer sessions."

Certain technology advancements need to be made to take full advantage of multimedia.

"Obviously, there are hardware issues," he says. "At the moment, full-motion video needs a special part from Intel or IBM that supports digital video interaction. Until recently, you needed a card to play digital video on-screen. But now Microsoft has announced Video for Windows, which lets you play back video without a special card."

A multimedia PC standard is also needed, as well as more support for CD-ROM, Wu says. "As file sizes get larger, we need a medium that can store very, very large amounts of data."

Knight is a free-lance writer based in Chicago.

Multimedia update

Of 226 respondents, most are not multimedia users, but a fairly decent minority are employing the technology		Most say the investment is "worth it"	
Yes: 37%	No: 63%	"Expensive but worth it"	26
		"Too expensive"	11
		"Good results for a low price"	8

Those that use multimedia have common purposes		Enhanced communications is the biggest benefit	
Training	29	More effective internal communications	29
Sales presentations	28	Better trained employees	11
Internal presentations	29	Increase in sales	9
Other	8	None	3
		Other	11
(Multiple responses allowed)		(Multiple responses allowed)	

Source: *Computerworld* Buyers' Scorecard

HIDDEN COSTS

Add-on clip art packages, expensive output choices and special hardware needs (such as video boards and digitizing tablets) can drastically add to the cost of presentations. However, presentation packages can also save a lot of money. Julie Sall, director of marketing at MathSoft, Inc. in Cambridge, uses Lotus Development Corp.'s Freelance for Windows and saves about $5,000 a year. "I used to pay $100 per slide to a design firm, and it took two weeks to get them," she says.

Quick. Think of a company with a better business UNIX environment than IBM.

Presentation Tools

Technology Analysis: Asymetrix's Multimedia Toolbook good overall value

Reviews	Ease of learning	Ease of use	Performance	Documentation	Programming environment	Media/Data import	Animation	Support	Overall value
InfoWorld 3/9/92	Easy to get started	Components are well-integrated	Robust	Very thorough	Rich language	Wide range	Good	Poor	Great deal with few weaknesses
PC Magazine 3/31/92	Plenty of examples	Takes significant skull work	Slow	Difficult to master	Not always intuitive	NC	Weak	NC	Plenty of flexibility
PC Week 6/29/92	Excellent	User-friendly design	Winner	Well-communicated	Flexible	NC	NC	NC	Fundamental simplicity
Users									
Henry Welch, National Association of Realtors	Good	Good	Good	Fair	Good	Very good	NC	Good	Really happy with it
Michael Lawrence, Multimedia developer	Very good	Very good	Very good	Very good	Very good	Very good	Very good	Very good	If I could, I would have written it
Nick Martlock, Intel Corp.	Good	Good	Very good	Good	Very good	Good	Good	Very good	Having phenomenal success with it
Brigitte Ludgate, Defense Language Institute	Very good	Good	Good	Very good	Good	Good	Good	Very good	Should be constantly updated
Analysts									
Rick Arnett, Multimedia Computing Group	Good	Good	Poor	Fair	Very good	Fair	Fair	Good	Good application
Bill Caffery, Gartner Group, Inc.	Good	Good	Fair	Very good	Very good	Good	Good	Good	Super value

Key: Very good, Good, Fair, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Asymetrix Corp.'s Multimedia Toolbook is an object-oriented programming environment designed to create multimedia productions. Based on Version 1.5 of Toolbook, the company's Windows-based authoring tool, the product offers additional animation files, sound, video and commands and tools to access CD-ROMs.

Reviewers said users will be pleased with Multimedia Toolbook's programming environment and its media/data import capabilities of importing bit-mapped files in a variety of file formats, but some reviewers were less than thrilled with its animation and documentation.

Ease of learning: Sample applications help teach users how to copy and paste objects, scripts and entire pages.

Ease of use: Nearly every Toolbook application is based on scripts, so knowledge of OpenScript — Multimedia Toolbook's programming language — is necessary. Learning OpenScript proved to be time-consuming for some reviewers, while for others mastering it was a breeze.

Documentation: *PC Magazine* described the documentation as disorganized. Reviewers had to sift through four or more manuals to make a specific feature work.

Programming environment: The product supports all standard programming constructs, including branching, looping and case statements. A wide scope of string manipulation tools and math functions are available as well as matrices and local and global variables.

Media/data import: Multimedia Toolbook offers a variety of media types, all of which are supported by Multimedia Windows. Dynamic Link Libraries are available to read and write dBase files, and the product imports and exports text as fixed-field, delimited-field or unformatted ASCII files.

Animation: *PC Magazine* found Multimedia Toolbook's ability to manipulate simple animation tasks weak, citing the absence of facilities needed to transfer a bit-mapped image around the screen. *InfoWorld*, however, said users can produce extensively animated graphic elements using Multimedia Toolbook's basic vector drawing tools or imported bit maps.

Support: Forty-five days of free but not toll-free telephone support is provided.

Overall value: Despite a few minor drawbacks in animation and documentation, reviewers said Multimedia Toolbook is a bargain at $695. It is loaded with features; for example, it provides more than 250 clip art examples called widgets that perform cut-and-paste multimedia functions.

Summary by Lisa Davidson.

Vendor background data

BELLEVUE, WASH.-BASED ASYMETRIX IS A PRIVATELY HELD FIRM THAT DOES NOT DISCLOSE FINANCIAL INFORMATION. ACCORDING TO THE COMPANY, THE ESTIMATED COMBINED INSTALLED BASE FOR MULTIMEDIA TOOLBOOK AND TOOLBOOK — ASYMETRIX'S AUTHORING TOOL — IS MORE THAN 100,000 COPIES. DURING 1992, MULTIMEDIA TOOLBOOK WENT FROM GARNERING 5% TO 65% OF THE COMPANY'S REVENUE.

ASYMETRIX RESPONDS

Glenn Morrissey, group manager of multimedia marketing and technology:

Ease of use: OpenScript language is really a straightforward language. We tried to get as close to the English language as possible. The biggest hurdle for nonprogrammers is a conceptual one, which will happen in any programming environment.

Documentation: We have not heard of many problems with the documentation. There are different angles to certain features, depending on how you want to approach it.

Animation: These are features that we are looking into beefing up with our core technology. We have a product coming out in the first half of the year that has a good part of that module.

Multimedia Toolbook *supports all standard programming constructs*

Quick. Think of a company that's sold $6 billion more in UNIX systems than IBM.

Sales figures based on UNIXWORLD Annual Report, 1988-1992. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. ©1992 Hewlett-Packard Company 5957-9301

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Think again.

HEWLETT PACKARD

AT&T announces another inauguration in Washington this year.

Come see the inauguration of the first tariffed* nationally available Fractional T45 Service at this year's ComNet Show in Washington, D.C.

The swearing in of a new leader isn't the only exciting event going on right now in the nation's capital. Because the leader in business communications, AT&T, is debuting ACCUNET® Fractional T45 Service, to give your business a powerful competitive edge.

Now your company has access to a new generation of applications requiring speeds between T1.5 and T45. Speeds of 4.6, 6.2, 7.7 and 10.8 Mbps can help make video imaging, CAD/CAM and LAN-WAN applications a reality for your business.

AT&T ACCUNET Fractional T45 Service offers co-routed interoffice channels, minimizing differential delays, improving throughput and providing faster transmission.

And as with all AT&T network services, Fractional T45 Service is supported by FASTAR℠—the exclusive technology that gives AT&T a nationwide, self-healing network that can automatically bring circuits back up in minutes.**

We'll be demonstrating ACCUNET Fractional T45 Service at ComNet. So, if you've been waiting for Fractional T45 Service, come to AT&T booth #1126. Because this is one inauguration you won't want to miss.

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Mister ASIA

Technology information flows from the U.S. to Asia all the time. David Kahaner's job is to move information the other way.

NUMERICAL ANALYSIS, COMPUTING AND HIKING in the mountains of Japan are the passions of David Kenneth Kahaner, a mathematician and supercomputer buff who is arguably the one person in the world most in touch with the global status of high-performance computing. He is a senior scientist at the U.S. Office of Naval Research (ONR) in Asia. He joined ONR in 1989 on a four-year leave from the National Institute of Standards and Technology (NIST), where he was group leader and supervisory mathematician at NIST's Computational and Applied Mathematics Division.

Kahaner's job at ONR is to do competitive assessments of science and technology throughout Pacific Asia, with a special emphasis on computing, including computer-integrated manufacturing, artificial intelligence and fuzzy logic. His beat spans nearly half the globe, ranging from Australia to India and including Japan, Korea, Taiwan and China.

Though based in Tokyo, Kahaner spends much of each year traveling to other Asian countries, where he talks to scientists, researchers, academics and program directors involved in high-level computer projects.

The copious reports Kahaner writes on his findings (he has produced more than 200 during his three years at ONR) are disseminated to thousands of U.S. government personnel, scientists and industry leaders and are published regularly by forums ranging from the Institute of Electrical and Electronics Engineers, Inc. to The New York Times.

In addition to his duties at ONR, Kahaner serves as the Asian program chairman of the world's largest annual supercomputing conference, which attracts more than 5,000 professionals from around the globe.

Kahaner spoke recently with David Kellar, Tokyo correspondent at the IDG News Service, in Japan. (Kahaner's views are his own and do not represent those of the U.S. government.)

Q: In the three years you've been at ONR in Japan, what has made the strongest impression on you?

A: I am now convinced it is very important that we continue to be aware of what's going on in computing in this part of the world. Not only in Japan but in many parts of Asia.

I just came back from India, where I had the opportunity to visit a very active massively parallel computing project that most people are not really aware of.

Other countries are making rapid advances as well. The People's Republic of China, for example, has a supercomputer project in which they're building hardware similar to early Cray machines.

Generally speaking, Asia is very active.

Q: What are the areas of strongest activity in computer research in Japan, and in what areas are the Japanese ahead of the U.S.?

A: The Japanese are very good at building devices. They are excellent at building things that people then buy. All of the high-end computer technology developed in the last few years in Japan has been essentially built upon their excellence in device technology.

At the device level, I think it is safe to say that what the Japanese are doing is at least comparable, if not superior, to what we are doing in the U.S.

Look at the major Japanese supercomputer vendors: Their products are — technologically speaking — very, very advanced.

David Kahaner, *page 74*

Vital stats: David Kahaner

Personal
Born in 1941 in New York. Married, two children.

Education
- B.S. (cum laude), Mathematics/Statistics (1962), City College of New York.
- M.S., Mathematics (1964) and Ph.D., Applied Mathematics (1968), Stevens Institute of Technology.

Significant accomplishments
- Developed VoltaGraphix, the only public domain Fortran callable graphics package, combining ease of use and interactive capability.
- Researched, designed and implemented the Plotted Solutions of Differential Equations (Plod) numerical analysis system, a central part of research studies of dynamical systems, epidemiology and chaotic behavior. Awarded U.S. Department of Commerce silver medal in 1988 for his work on Plod.
- Climbed Mt. Fuji, 1991.

David Kahaner

CONTINUED FROM PAGE 73

But building a supercomputer is not just a matter of building hardware. It's a very complicated process with a lot of system software and integration — both physical integration and system integration. Those areas are not as advanced in Japan. U.S. companies are several years ahead of them in those aspects.

While the Japanese are very, very advanced in the areas of hardware development, they are a little behind in issues related to system software, application software, total machine throughput, etc.

Q: Some have said that single-CPU performance will top out as early as the middle of this decade. Do you think Japan will lose out when the emphasis switches from simple hardware performance to overall system performance?
A: Well, what's happening is that U.S. high-performance computer vendors are looking at other models such as parallelism and distributed computing to try to improve performance. The U.S. is ahead [of Japan] because it has a lot of experience in this area. Already, several products have appeared.

The Japanese are more conservative. They are watching and doing quite a lot of prototype work [in this area], but they don't have any commercial products yet. They are behind; there is no question about that. But not decades behind — just a few years.

David Kahaner: *'The Japanese are very good at building devices. They are excellent at building things that people then buy.'*

Q: Do you think there is more emphasis on long-term research in Japan than in the U.S.?
A: Japanese industry places much more weight on research than U.S. industry does. In the U.S., universities and the large government laboratories play a key role in fundamental research. In Japan, the universities and government laboratories do play a role, but that role is relatively small. Industrial research laboratories play a greater role, and they tend to be more practically oriented.

Some of the projects are fairly long-term in nature, but the long-term ones tend to be pretty small. The image that we have in the West — that you can go into some Japanese company and see 500 people working on some project that will come to fruition in 50 years — is simply not true. At least I haven't seen it. There are plenty of advanced research projects, but they are small projects with just a few people.

Q: What are your views on the Japanese government's latest high-performance computing project — the Real World Computing Program? [The Real World Computing Program is a 10-year project launched in 1992 for advancing use of massively parallel computing, neural networks and optical computing technologies in future systems.]
A: You can think of the [Real World Computing] project as a successor to the Japanese government's Fifth-Generation Computer project.

The Fifth-Generation project was very useful for Japan because it educated a tremendous number of young Japanese scientists in fairly advanced ideas, such as knowledge processing. Perhaps that was one of its most important successes. The concrete accomplishments of the project are maybe not quite as important as these harder to quantify things.

If the same thing happens with this sixth-generation project, then the project will, I think, help propel Japanese science to a more advanced state.

The concrete things they are hoping to do, such as build a million-processor parallel processing computer, are in my opinion not tremendously outrageous. After all, you can go out today and buy a machine having 256,000 processors. So it is not so unreasonable to say that in 10 years you're going to have a design for a million-processor machine.

Probably the most important thing to be gained from this project will be to bring Japanese research-ing stature to a more world-class level.

Q: So you think the Japanese government's intentions in internationalizing the Real World project are driven more from a desire to educate Japanese researchers than from outside pressure to open up?
A: This is one way of trying to immerse themselves in the international community, and I think they have a real desire to make a contribution. The technical originators of this project feel they have identified a problem that is important for the world, and they would like to try and make contributions. They feel Japanese scientists are as intelligent and creative at that level as their Western counterparts.

The place where the U.S. has difficulties with the project has to do with the development of high-level technology. We worry in the West that we're ahead in certain technological areas and that cooperating with the Japanese in this project will lead to a movement of that technology from the West to Japan.

Q: The Japanese seem to be leading in the area of creating a high-speed communications infrastructure based on the Integrated Services Digital Network (ISDN) standard. Do you see this as an area in which Japan might have an edge in the future?
A: Well, if things go forward on the schedule and at the pace that the Japanese have planned, I think they will have a tremendously impressive communications infrastructure. But I've heard recently that the pace is perhaps being slowed down because subscribers for ISDN have not signed up in the numbers the Japanese telephone industry had anticipated.

One thing I noticed is that Japanese companies have been working on the development of products associated with ISDN and broadband ISDN. So when that infrastructure comes to fruition, it would seem that the Japanese will have a very good start.

This is not to say, however, that there is not also substantial investment in this area being carried out in the U.S.

Q: Can you pinpoint any misperceptions that people in the U.S. have about Japanese technology?
A: One thing that maybe should be corrected is the seemingly widespread belief that Japanese cannot write software. I have been asked repeatedly whether the Japanese can write software, and I really can't understand why anyone would ask that question, as if there is some sort of genetic predisposition to being able to write programs. I just don't understand it.

The Japanese are using advanced software techniques, some of which were developed in the U.S.

What you maybe don't see here are these clever new software products that are forever appearing in the U.S. But big software projects are a different matter because they are more like an engineering activity, relying on tremendous cooperative organizational and management techniques more than insight and brilliance. I think the Japanese are perfectly capable of doing that. And the use of Unix, which is now spreading as a platform on which so many things are being developed, is going to help.

Q: Do you see any major differences in focus on high-level computing and high tech in the U.S. and Japan?
A: In the U.S., I get the impression that the way high-end computing has been developed — especially recently, with parallel computing — is that vendors think about some new architecture or a new design, attempt to build hardware and then go out looking for customers.

In Japan, however, the emphasis seems to be on building to a particular application rather than building something general.

Now as I said before, the Japanese are behind us and don't have any commercial products yet; they only have prototypes. But their prototypes have almost exclusively been developed by starting out looking at a particular class of applications and developing hardware for those applications. That makes it much easier to sell what you've got because you've immediately got a user.

Q: What are your goals?
A: I think one of the reasons the Japanese, and Asians in general, seem to be doing very well relative to us is that they have a lot of information about what is going on in the U.S.

We're not doing nearly so well at keeping abreast of what's going on in Asia. Statistics prove this. There are tremendously more Asian scientists and students who come to the U.S. and Europe to go to conferences, to study, to work, etc., than go in the other direction. In fact, the numbers are so imbalanced that unless we do something, there's going to be a constant net flow of information out of the U.S. to Asia.

It is very important to try to improve the science information "pipe" from Asia back to the U.S., and I have a personal goal of trying to do that. I've started here at ONR, and I think what I've done has been very effective. But it needs to be continued. ■

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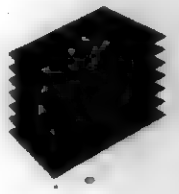
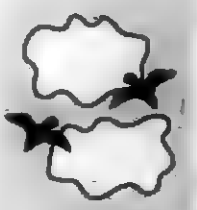


From war to business machines

David Kahaner on the shift in the U.S.' focus from military to more commercial applications for high-level computer technology:
"I think that probably over the last five years, and even more so in the last two or three years, there has been an accelerated effort to move away from weapons into other applications for computing. First of all, the Cold War has diminished, or at least the pressure has diminished. Second of all, industry has observed that high-performance computing is very important. We see the use of very advanced computers in some prosaic industries.

"I was told just last month when I was in the U.S. that American Express has bought two very advanced parallel computers. That type of organization is about as middle-of-the-road as you can get. So I think you've got a combination of a diminution of emphasis on weapons and a recognition from other parts of industry that they can do some productive work with advanced technology."



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Training in the age of downsizing

By Emily Leinfuss

As companies shave or completely cut training budgets, information systems departments — and the employees in them — are seeking cheaper and more effective ways to keep technically up to date. The advent of technical training vehicles such as computer-based training and other media-based instruction enables technical professionals to continue their technology education without losing job time or breaking the company's bank. Increasingly, companies are also using in-house experts as instructors.

LPC, a Pitney Bowes subsidiary that produces mainframe-based mail processing software, last year established a first-of-its-kind, in-house training department to address the needs of new employees and give systems professionals a chance to increase their skills.

Donna Hahn, LPC's training consultant, says it is economical and effective to rely on peer experts to share their knowledge through on-the-job training, offer a library of media-based training or bring formal training in-house.

In setting up classes, Hahn addresses employee needs. If there is a demand for CICS training, for instance, she finds a resident expert in CICS to conduct it.

Ben & Jerry's Homemade, Inc. in Waterbury, Vt., also brings specific courses in-house if there is enough employee interest. For example, Christine McClary, manager of system development, plans to hold a train-the-trainer course and a project management course.

Some companies take a more informal approach. LPC, for instance, hosts brown-bag lunches to show educational videos. In-house experts attend so they can answer questions. Hahn says these group events are motivational and instructional. Group sharing of information may even have a higher value than individual instruction, she adds.

McClary agrees. "It is very helpful as we sit in a room as an entire department and get into discussions about how course material relates to our environment," she says.

Channing Jackson, director of technical control at Capital Cities, ABC Television Network Group in Hackensack, N.J., also finds that approach effective. He says productivity increases when employees are trained by and with peers. Employees are sent off-site for training and then share what they learn with the staff. "You send two people out to a class and they become the gurus."

Some companies also provide computer-based training facilities that systems staff members can use to augment their technical skills. LPC's training room, where employees come for instruction in such subjects as technical training and career planning, is set up with CD-ROM and laser disc players. By taking a computer-based training course and asking questions of more learned staffers, Kelly Hradeck, a programmer/analyst at LPC, taught herself IDMS.

Steven Lute, an LPC senior software developer, prefers the self-paced aspect of computer-based training. "Often, it was difficult to find time to fit training into my schedule. With video-based training I can take it home and learn without having to take time away from the office," he says. He recently learned CICS this way.

Jackson says that bringing training in-house is obviously cheaper, but systems and application training is essential to the outcome of a project. He has turned to on-the-job training to assure that systems will be built by people who have the appropriate knowledge.

He also recognizes his staff's need to keep their skills current for the sake of their careers. "The world of technology is constantly changing," Jackson says.

Needs assessment

But what kind of training do systems people need? Hahn goes straight to the source. Every year she conducts a training needs analysis where senior managers evaluate their staffs' training needs. Additionally, she allows IS staff to suggest course topics.

At ABC, management decides how to spend training money, and it is strictly project and job related.

Of course, these companies are active in working with systems employees to meet training needs, but if your company cannot do it for you, you can do it for yourself.

"MIS professionals need to figure out their career path, and if their company is not giving formal training, they should try to get on-the-job training from a peer or learn by self-study," says Elliot Masie, executive coordinator at the Association for Computer Training and Support.

Leinfuss is a free-lance writer in Sarasota, Fla.

Soft skills

While technical education lends itself to tangible forms of training, soft skills, such as learning to prosper in a political corporate culture, may be best learned from a mentor, says Howard Piggne Jr., an IS business manager at Corning, Inc. in Corning, N.Y.

Mentoring is individually targeted, spontaneous and reactive, Piggne says. Having a mentor offers him the chance to get feedback on his work experiences, he says. "As the dynamics of a situation change, I can get in touch with my mentor and talk over the issues."

Piggne's mentor, whom he meets with monthly, is Harvey Shrednick, vice president of information services at Corning.

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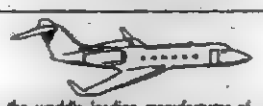

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Career advice for the '90s

Where to find descriptions of IS jobs

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles executive search firm that specializes in placing computer professionals.

Q: Where can I find job descriptions for information systems positions? I work for an IS department at a bank. We want to have our people properly classified so they can be paid according to industry standards. To give you an idea, I manage four networks, but I'm still listed as a PC specialist because that's the closest description our human resources department has.

A: The Bureau of Labor Statistics publishes salary data by job category but at a fairly high level. Local user groups will often conduct salary surveys that include job descriptions. Nationwide IS recruiting firms also distribute similar information with a regional orientation.

In addition, many companies are beginning to publish very specific job descriptions in compliance with the Americans with Disabilities Act. Perhaps you could locate a company that has done this successfully and would be willing to help you create your own descriptions.

Q: I was laid off from a programming job more than five years ago. I found a comparable position two months later and have worked steadily in IS ever since. I find, however, that my involuntary termination can be a problem during interviews even today. What can be done to present this circumstance in the best light?

A: The previous stigma of having been laid off is quickly vanishing. Your best approach is to tell the hiring manager that your company had to let staff go because of its financial situation. A good manager should recognize this as a 5-year-old situation and concentrate on your more recent experience.

Q: I am over 50 and have more than 25 years of computer operations management experience with on-line transaction processing and mid-range IBM systems. What are my chances of gaining a similar management position?

A: In general, your prospects should be quite good. The advent of the Application System/400 opened management opportunities considerably. These machines have become integral to client/server configurations and departmental computing and as PC file servers. Additional skills in disaster recovery, downsizing and telecommunications can also be invaluable.

Q: I am a senior analyst at a large Northeast bank. I have been trying to get a similar job in another state but without much success. How can I improve my chances?

A: Trying to relocate in the current economy is difficult. Besides not knowing the local companies, you're viewed as an outsider.

Carefully evaluate your commitment to such an important move. You'll want to fully research the company and the community you are considering. Have solid reasons for why you are leaving your current job/home. Understand that you may have to undergo a salary adjustment to reflect differences in the cost of living. Make an extended trip to the new area to be available for interviews. Finally, don't expect the new company to pay your relocation expenses because it would increase your cost and will make you less attractive.

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■ Business skills increase your value because you can use technology to benefit the business — specifically, total quality management and being adept and understanding the ins and outs of client/server technology. You also need to be able to understand process re-engineering and have a business background (courses) to show that you're not just a specialist in programming or open systems, but you're more well-rounded.

Thomas Charbonneau, 31, manager of corporate information services/business administration
Bose Corp., Framingham, Mass.

TIPS from the TIMES

■ I worked in finance, sales and logistics in technology-type roles. I think getting cross-functional experiences has absolutely helped me get here this fast. In the past, people frowned on leaving your discipline and going somewhere else. But everything we're doing is becoming so cross-functional, that that has helped me the most.

Wayne Shurts, 33, director of logistic systems,
Nabisco Foods Group, East Hanover, N.J.

■ I worked hard and did whatever was asked of me . I was at a large vendor corporation where there were a lot more management opportunities. I got to visit a lot of customer locations and see many computer shops. I think a vendor background is the best training you can get to see all aspects of the business.

George Thomas, 44, senior vice president and director of data processing,
New York Clearing House Association, New York

What kind of tips would you like to read about? Call your ideas in to Kelly Sewell, assistant editor, features, at (508) 879-0700.

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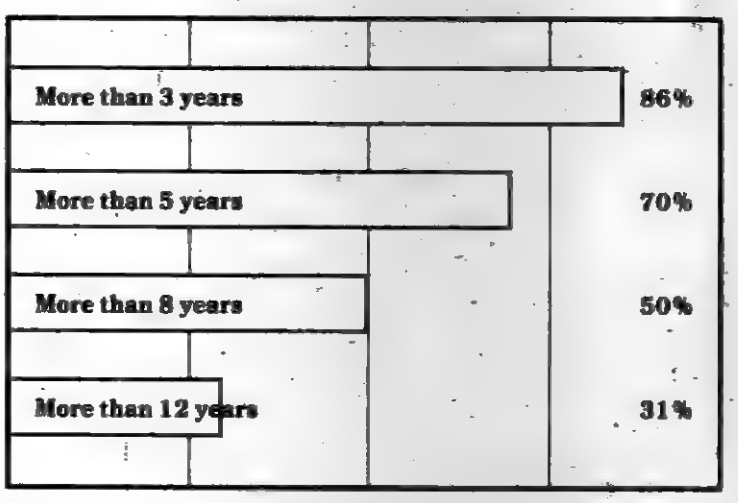

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Applications will be accepted until the position is filled. Apply to Dr. Joel E. Richardson, Mouse Genome Informatics Project, The Jackson Labbratory, 600 Main Street, Bar Harbor, ME 04609. E-mail: jer@jax.org.

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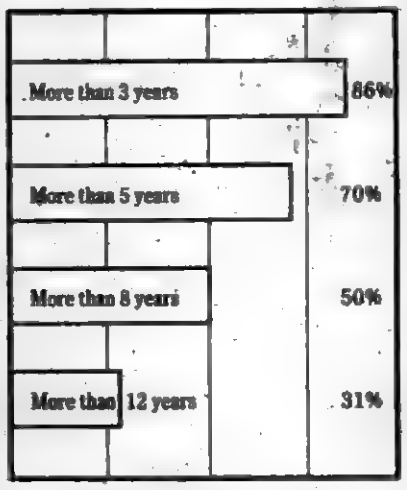

SOURCE: Skill Survey of Computerworld's Audience, August 1992

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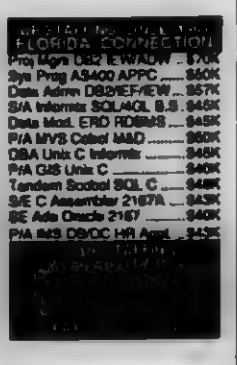

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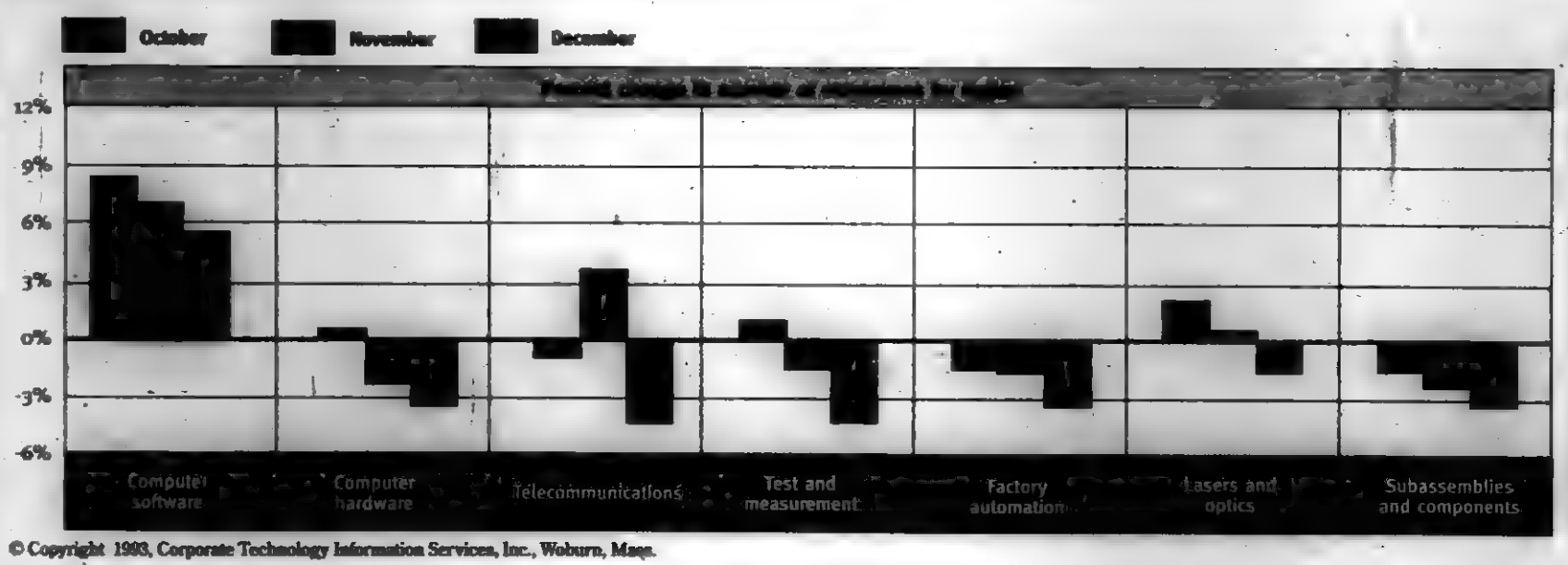
Computerworld/CorpTech Career Index

Except for computer software, most industries cut numerous jobs during the month of December



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Veterans tell how to avoid bad buys

By Alice Bredin

We all make bad purchases from time to time, but the last thing you want to do in these bottom-line-conscious days is spend thousands of dollars on something you won't use.

One way corporate buyers deal with buying compulsions is through worksheets, which are step-by-step evaluations that weed out the "must-haves" from products destined to become "shelfware." Here, three veteran buyers share their purchase worksheets.

➤Goal: To buy products that add to the business. **Buyer:** Morris Enyeart, assistant vice president of systems architecture at The Continental Insurance Co. in Neptune, N.J.

✔ **Is there a need within the organization?** Look at the business to determine if it can be improved, enhanced or substantially changed by automation. If it can, the product is a candidate for further study.
✔ **Does the product fit within the business needs and the existing systems architecture?** Some buyers are lured by whatever has the best features at the time. Shop with an architecture, business environment and a long-term plan in mind.
✔ **Is the product compatible with existing systems, and can it be integrated?** The answer to both questions must be yes.
✔ **Does the product help the business?** It must add to the bottom line by increasing productivity or eliminating the need to use outside resources.

➤Goal: To ensure the product fits into the firm's architecture and position to real-user needs. **Buyer:** Joel Martin, manager of client access services and information technology planning at Bose Corp. in Framingham, Mass.

✔ **Define components of the product architecture.** Explicitly state what the company wants to buy.
✔ **Map what the company has in that area now.**
✔ **Identify missing or weak component areas.** For example, a department may have an item that everyone in the department doesn't like.
✔ **Make priorities.** Talk to people in business units about the problems they have.
✔ **Subject an evaluation expert to try several products.** Have someone devote at least 20% of their time to evaluating products.
✔ **Create "light" definitions of product requirements:** Don't spend too much time on product requirements. Instead, keep it general. For example, indicate only that the software must run on an Apple Computer, Inc. Macintosh.
✔ **Select and acquire evaluation products.** Narrow the field to three or four products based on the company's requirements and evaluate them.
✔ **Run pilot projects.** Base a pilots involve 10 employees using a product for six to eight weeks. At the end of the pilot, participants discuss whether the product fits the company's needs and ease-of-use criteria.
✔ **Add to your list.** If the product meets requirements, it is added to the standards list and recommended for purchase.

Products too large and expensive to be evaluated with the worksheet are decided on at the executive level.

➤Goal: Long-term product viability. **Buyer:** Murray Stein, director of Point-Source Communications, a Prescott, Ariz., consultancy.

✔ **How well does the product interact with existing products?** For instance, look for products that have the ability to move a text document into a graphics package, as well as those that encode and move documents easily.
✔ **Multiplatform support.** Applications must run well on PCs, Macintoshes and workstations. Most important questions: Can documents be loaded without changes across platforms? How much will memory be impacted?
✔ **Upgrade path.** Make a practice of buying families of products to ensure compatibility.
✔ **Time on market.** Before buying, carefully consider how long a product has been on the market. No one will fire you for buying Lotus, but if you are buying new material, at some point a product is going to fail.

Minimize risk by purchasing only from small companies that make a strong support effort, such as offering technicians' home numbers.
✔ **Support.** Measure support in terms of hours and extra features. Check all support lines to verify quality of service. For critical products, look for purchase contracts that include extra support such as media updates, electronic mail and fax communications.

Bredin is a free-lance writer based in New York.

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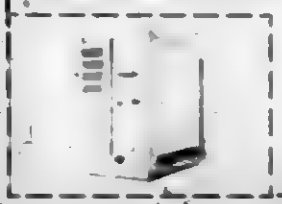

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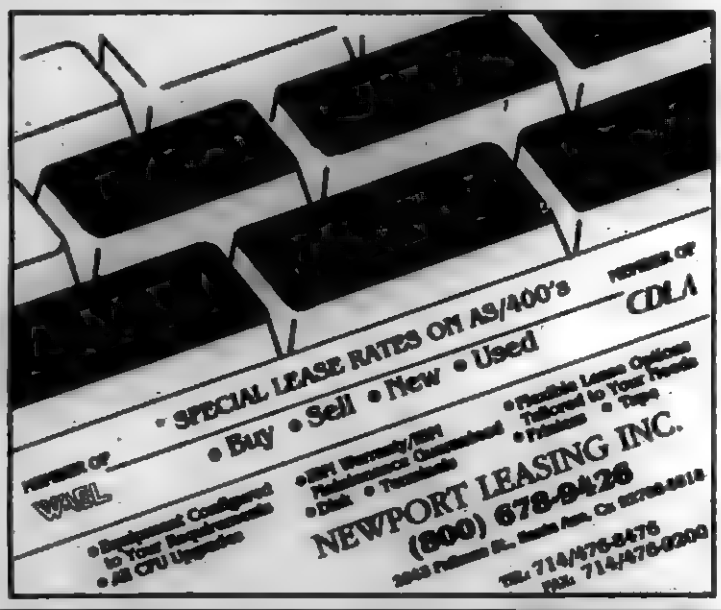

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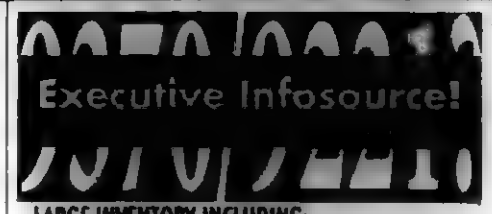

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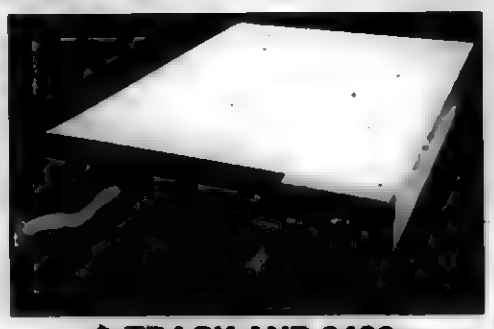

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Computerworld's Friday Stock Ticker

Gainers

Percent

Symantec Software	63.8
Software Publishing Corp.	62.9
Zeos International Ltd.	60.6
Creative Technologies Inc.	38.1
Microdyne Inc.	28.2
General Datacomm Inds. (H)	25.9
Computer Associates	25.3
Mapica Software	20.4

Dollar

Creative Technologies Inc.	9.38
Computer Associates	5.38
Cisco Systems Inc. (H)	5.13
Synoptics Communications (H)	4.88
Adobe Systems Inc.	4.50
Oracle Corp.	4.13
Intelligent Inds. Systems (H)	4.00
Novellesian Networks Corp. (H)	3.88

Losers

Percent

Sunrise Software	-20.6
Bachman Info. Systems	-18.0
Walker Interactive Systems (L)	-18.3
Exabyte	-17.6
Tandem Computers Inc. (H)	-17.4
System Software Assoc.	-16.1
Eagle Corp.	-14.8
Sierra Semiconductor	-14.4

Dollar

SMC Software Inc. (H)	-3.50
System Software Assoc.	-3.50
Autodesk Inc.	-3.38
SynOpsys	-3.25
Walker Interactive Systems (L)	-3.25
Group I Software	-3.25
Exabyte	-3.13
Xircom Corp.	-3.13

Buy on weakness

Despite fourth-quarter difficulties for several companies in 1992, analysts said they like the stock market prospects for some industry firms. If their stock prices dip in response to disappointing quarterly reports, these issues can present good investment opportunities.

FileNet Corp. (FILE)

FileNet's preliminary report indicated revenue of $35 million, a full $9 million below average Wall Street expectations, according to The Chicago Corp. The revenue shortfall resulted in a $5 million net loss.

In a Jan. 11 report, analyst Robert Johnson said the difficult economy makes it hard to anticipate when the imaging company will turn the situation around. Johnson also noted that a poor quarter has historically presented a good purchasing opportunity in FileNet's stock, though the current situation is worse than in previous instances.

In light of FileNet's forthcoming products (including a low-cost pilot imaging system), solid gross margins and good competitive positioning, The Chicago Corp. maintained a Buy rating on FileNet issues. FileNet closed last Thursday at 15.

IMRS, Inc. (IMRS)

Business-reporting software vendor IMRS projects fourth-quarter revenue of $14 million, again below Wall Street's expectations. Management attributed the shortfall to the failure to close several large deals that nonetheless remain in the pipeline. The company's product mix is in transition, with the Microsoft Corp. Windows-based Hyperion report writer contributing an increasing portion of revenue.

Both The Chicago Corp. and Alex. Brown & Sons, Inc. rated IMRS stock as a Buy in reports issued Jan. 11. Since then, however, the stock's price has tumbled from about 20 to 15¼ at Wednesday's close. IMRS regained 1¼ Thursday to finish at 16½.

Marcam Corp. (MCAM)

Several factors contributed to a disappointing quarterly report from Marcam, according to a Jan. 12 report from Alex. Brown. Slow domestic unit sales of Marcam's software were matched by increased international unit sales but at lower margins. The company also absorbed unexpected expenses related to the acquisition of IBM's Mapica product.

Alex. Brown downgraded Marcam from Strong Buy to Buy. The stock closed Thursday at 20¼.

—Derek Slater

Exch	52-Week High	52-Week Low		Jan. 22 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS NETWORKING						
OTC	34.38	9.63	3 COM Corp. (H)	34.38	3.38	10.9
NYS	74.50	56.25	American Info Techs Corp.	74.38	0.13	0.2
NYS	54.50	36.63	AT&T (H)	54.00	0.00	0.0
OTC	4.25	0.75	Artel Communication Corp.	2.00	0.19	10.3
OTC	24.50	10.25	Banyan Systems Inc. (H)	23.75	-0.25	-1.0
NYS	53.88	40.25	Bell Atlantic Corp.	53.38	0.13	0.2
NYS	55.50	43.38	Bell South Corp.	54.50	0.00	0.0
NYS	6.75	3.63	Bolt, Beranek & Newman	5.38	-0.38	-6.5
OTC	17.25	10.00	Brooktrout Technology	16.00	0.25	1.6
NYS	89.75	42.13	Cabletron Systems (H)	89.75	2.75	3.2
OTC	30.75	17.75	Cincom Corp.	30.75	1.00	3.4
OTC	93.50	33.00	Cisco Systems Inc. (H)	93.50	5.13	5.8
OTC	29.75	5.50	Compression Labs Inc.	13.50	2.00	17.4
OTC	3.38	0.88	Data Switch Corp.	2.56	0.06	2.5
NYS	23.63	13.75	Digital Comm. Assoc.	19.38	-0.38	-1.9
OTC	14.75	7.50	Digital Systems Int'l Inc.	9.50	-1.25	-11.6
OTC	26.50	4.00	DSC Communications (H)	26.50	3.25	14.0
OTC	10.88	4.75	Fibronix Int'l Inc.	7.50	-1.25	-14.3
OTC	37.50	10.50	Fremont Corp.	15.00	-1.25	-7.7
OTC	4.38	1.50	Gandalf Technologies Inc. (H)	3.63	-0.44	-10.8
OTC	2.25	0.69	Gateway Communications	1.44	-0.06	-4.1
NYS	9.13	2.88	General Datacomm Inds. (H)	9.19	1.88	25.9
ASE	5.88	1.63	Go Video	2.81	-0.19	-6.2
NYS	35.75	28.88	GTE Corp.	35.38	-0.13	-0.4
NYS	74.38	57.13	ITT Corp. (H)	74.38	3.25	4.6
OTC	43.38	29.50	MCI Communications Corp. (H)	41.75	-0.75	-1.8
OTC	14.25	2.25	Microcom Inc.	5.38	-0.50	-8.5
OTC	20.50	12.00	Metrix Corp.	20.50	1.50	7.9
OTC	16.75	9.63	Network Computing Devices	15.25	0.00	0.0
NYS	18.25	8.13	Network Equipment Tech.	9.38	0.50	5.6
OTC	25.50	8.00	Network General	17.63	-1.38	-7.2
OTC	17.63	8.50	Network Systems Corp.	11.13	0.25	2.3
OTC	48.13	10.88	Newbridge Networks Corp. (H)	48.13	3.88	8.8
NYS	49.25	30.50	Northern Telecom Ltd.	41.25	-1.75	-4.1
OTC	33.50	22.50	Novell Inc.	31.25	-0.50	-1.6
NYS	88.50	69.13	Wyse Corp.	85.00	-0.63	-0.7
OTC	37.50	14.50	Octel Communications Corp.	27.75	1.00	3.7
OTC	9.38	3.38	Perrill Data Comm Networks	5.50	0.75	15.8
OTC	53.00	10.25	Picturetel Corp.	29.75	1.00	3.5
OTC	18.75	7.00	Proteon Inc.	10.88	-0.50	-4.4
NYS	29.38	10.16	Scientific Atlanta Inc. (H)	29.38	1.88	6.8
NYS	75.63	56.63	Southwestern Bell Corp. (H)	73.38	-1.88	-2.5
NYS	28.13	20.75	Sprint Corp.	28.13	1.75	6.6
OTC	27.00	7.25	Standard Microsystems Corp.	22.25	2.75	11.0
OTC	17.25	6.88	Stratacom Inc. (H)	17.00	0.50	3.0
OTC	91.88	18.75	Synoptics Communications (H)	91.88	4.88	5.6
OTC	7.13	4.38	Telebit Corp.	6.00	-0.25	-4.0
OTC	26.25	13.38	US Robotics	23.50	0.75	3.3
NYS	40.00	32.88	US West Inc.	39.13	-0.38	-0.9
OTC	45.00	12.00	Wellfleet Communications (H)	45.00	0.50	1.1
OTC	21.00	7.00	Xircom	8.75	0.00	0.0
PCS AND WORKSTATIONS						
OTC	10.00	3.13	Advanced Logic Research	3.38	-0.38	10.0
OTC	70.00	41.50	Apple Computer Inc.	60.00	-1.50	-2.4
OTC	24.25	11.25	AST Research Inc. (H)	22.13	-1.63	-6.8
NYS	17.75	6.13	Commodore Int'l	7.25	0.88	13.7
NYS	55.13	22.25	Compaq Computer Corp. (H)	54.88	1.25	2.3
OTC	48.38	13.00	Dell Computer Corp.	46.88	-0.13	-0.3
OTC	7.75	0.25	Everex Systems Inc.	0.25	0.00	0.0
NYS	38.63	24.63	Harris Corp. (H)	35.25	-1.25	-3.4
NYS	85.00	58.25	Hewlett Packard Co.	73.33	-0.13	-0.2
NYS	33.00	14.13	Silicon Graphics (H)	33.00	3.50	11.9
OTC	39.50	22.50	Sun Microsystems Inc. (H)	39.50	1.00	2.6
NYS	92.13	22.25	Tandy Corp.	77.25	-1.88	-6.4
NYS	11.13	5.00	Zenith Electronics	5.88	-0.25	-4.1
OTC	25.50	3.75	Zeos International Ltd.	5.63	1.63	40.6
LARGE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	7.88	0.38	5.0
NYS	16.38	4.75	Convex Computer	7.38	-1.00	-11.9
OTC	9.50	1.88	Cray Computer	5.00	0.25	5.3
NYS	46.50	19.00	Cray Research Inc.	28.00	1.00	3.7
NYS	13.00	7.13	Data General Corp.	11.75	-0.13	-1.1
NYS	65.50	30.38	Digital Equipment Corp.	42.88	1.00	2.4
NYS	100.38	45.88	IBM	48.50	0.13	0.3
OTC	19.50	5.50	Kendall Square Research	18.00	0.00	0.0
NYS	117.75	83.00	Matsushita Electronics	88.75	0.75	0.9
OTC	17.50	6.00	Pyramid Technology	13.25	-1.25	-8.6
OTC	22.88	11.13	Sequent Computer Sys. (H)	22.88	0.25	1.1
OTC	16.38	1.38	Sequoia Systems Inc.	1.69	-0.13	-6.9
NYS	54.25	29.50	Stratus Computer Inc.	33.50	-2.38	-6.6
NYS	16.88	9.88	Tandem Computers Inc. (H)	13.63	-2.88	-17.4
NYS	12.88	7.00	Unisys Corp. (H)	12.88	0.63	5.1
ASE	7.50	0.06	Wang Labs Inc. (A)	0.50	0.06	14.2
SOFTWARE						
OTC	65.75	25.25	Adobe Systems Inc.	65.00	4.50	11.3
OTC	36.25	10.25	Aldus Corp.	35.75	0.50	5.3
OTC	19.75	7.00	American Software Inc.	8.63	0.13	1.5
OTC	25.25	9.75	Ask Computer Systems (H)	24.13	-0.63	-2.5
OTC	56.50	23.25	Autodesk Inc.	48.88	-3.38	-6.5
OTC	37.75	3.75	Bachman Info. Systems	6.25	-1.00	-13.0
OTC	43.00	34.00	BGS Systems Inc.	41.00	2.00	5.1
OTC	84.13	37.75	BMC Software Inc. (H)	78.75	-3.50	-4.3
OTC	25.50	14.50	Boole & Babbage	21.75	-0.50	-2.2
OTC	82.50	17.50	Borland Int'l Inc. (L)	20.00	1.00	5.3
OTC	10.50	3.38	CE Software (L)	3.38	-0.25	-6.9
ASE	34.75	9.38	Cheyenne Software Inc. (H)	14.00	-0.13	-0.4
OTC	17.75	8.25	ChipSoft	16.50	-0.50	-2.9
OTC	11.88	5.63	Cognos Inc.	7.25	-0.25	-3.3
NYS	26.63	10.88	Computer Associates	20.63	5.38	25.3
NYS	12.38	4.00	Computervision Corp.	5.13	-0.25	-4.7
OTC	18.50	6.75	Comshare Inc.	10.75	-1.25	-10.4
OTC	46.50	6.00	Easel Corp.	11.50	-2.00	-14.8
OTC	26.50	11.75	Frame Technology	18.88	2.88	18.0
OTC	25.00	12.50	Group I Software	12.50	-3.25	-20.6
OTC	7.88	3.50	Hogan Systems Inc. (H)	7.88	0.25	3.3
OTC	25.75	13.75	IMRS	16.50	-1.00	-5.7
OTC	36.25	18.50	Information Resources	31.25	-1.25	-3.8
OTC	38.25	11.00	Informix Corp. (H)	38.00	1.25	3.4
DTC	21.38	11.00	Intergraph Corp.	13.00	0.00	0.0
OTC	15.00	7.75	Interleaf Inc.	11.63	-1.13	-8.8

Exch	52-Week High	52-Week Low		Jan. 22 3 PM	Wk Net Change	Wk Pct Change
OTC	19.75	10.25	Intersolv Inc.	14.00	0.25	1.8
OTC	21.38	9.50	Knowledgeware Inc.	13.00	-0.25	-1.9
OTC	52.75	28.75	Legent Corp.	51.25	-1.25	-2.4
OTC	38.75	14.75	Lotus Development	23.75	3.63	18.0
OTC	23.25	13.00	McAfee Associates	15.88	0.63	4.1
OTC	8.13	1.88	Meca Software	8.13	1.38	20.4
OTC	22.25	5.25	Mentor Graphics	9.38	0.00	0.0
OTC	43.75	27.25	Micro Focus (H)	42.75	1.13	2.7
OTC	20.50	6.50	Micrografx Inc.	12.00	-0.25	-2.0
OTC	95.00	65.50	Microsoft Corp.	89.75	-0.50	-0.6
OTC	33.75	12.00	Oracle Corp.	33.75	4.13	13.9
OTC	59.50	25.25	Parametric Technology (H)	59.50	0.50	0.8
OTC	34.50	22.50	Peoplesoft	34.50	2.75	8.7
OTC	11.00	3.50	Phoenix Technologies	6.50	0.13	2.0
OTC	23.50	11.25	Platinum Technology (H)	23.50	1.25	5.6
OTC	61.50	29.00	Progress Software Corp.	56.50	0.00	0.0
OTC	24.50	3.13	Quarterdeck Office Sys. (L)	3.94	0.44	12.5
OTC	32.75	11.75	Rainbow Technologies Inc.	18.50	0.75	4.2
OTC	22.75	4.00	Rasterops	7.25	0.63	9.6
OTC	17.25	3.63	Ross Systems	10.00	0.88	9.6
OTC	27.25	8.50	Sapiens USA Inc.	24.50	-1.75	-6.7
OTC	26.25	6.75	Software Publishing Corp.	12.50	3.75	42.9
OTC	8.88	2.00	Software Toolworks Inc. (H)	8.13	-0.38	-4.4
OTC	7.25	0.75	Spinnaker Software	1.84	0.72	63.9
OTC	16.50	9.25	State of the Art	8.75	0.25	2.9
NYS	25.25	13.75	Sterling Software Inc.	22.63	1.50	7.1
OTC	25.25	8.00	Structl. Dynamics Research	13.25	0.88	7.1
OTC	54.75	21.00	Sybase Inc. (H)	54.75	1.00	1.9
OTC	49.75	5.88	Symantec Corp.	12.75	-0.38	-2.9
NYS	14.00	5.25	Systematics Inc.	8.00	0.13	1.6
OTC	25.90	11.84	System Software Assoc.	18.25	-3.50	-16.1
OTC	13.25	2.50	Trinzic Corp.	5.13	0.75	17.1
OTC	23.75	13.75	Walker Interactive Systems (L)	14.50	-3.25	-18.3
OTC	4.38	1.38	Wordstar	2.81	-0.19	-6.7
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	19.88	-0.38	-1.9
NYS	17.25	8.63	Analog Devices Inc.	16.88	0.00	0.0
OTC	18.88	7.63	Atmel Corp. (H)	18.88	1.00	9.6
OTC	14.13	3.25	Chips and Technologies	4.50	-0.38	-7.7
NYS	16.88	7.38	Cypress Semiconductor Corp.	11.88	1.00	9.2
NYS	15.38	7.00	Dallas Semiconductor	14.75	0.25	1.7
OTC	118.00	46.50	Intel Corp. (H)	113.75	1.00	0.9
NYS	41.88	4.88	LSI Logic Corp. (H)	11.75	0.13	1.1
NYS	23.63	12.88	Micron Technology (H)	22.38	-0.50	-2.2
NYS	63.00	36.44	Motorola Inc. (S)	60.00	-1.88	-3.0
NYS	14.13	7.50	National Semiconductor	11.38	-0.13	-1.1
OTC	27.00	8.25	Sierra Semiconductor	11.13	-1.88	-14.4
OTC	38.50	22.25	SynOpsys	35.00	-3.25	-8.5
NYS	57.13	31.50	Texas Instruments (H)	55.00	-1.25	-2.2
OTC	10.50	6.00	VLSI Technology	8.00	-0.50	-5.9
OTC	7.63	2.13	Weitek	7.13	1.00	16.3
ASE	9.63	3.50	Western Digital Corp.	8.50	0.75	9.7
OTC	32.75	14.50	Xilinx	32.75	3.13	10.5
OTC	39.13	17.50	Zilog Inc.	39.13	1.13	3.0
PERIPHERALS AND SUBSYSTEMS						
OTC	29.75	17.50	Banctec Inc.	29.75	1.50	5.3
OTC	33.50	9.25	Cambex Corp.	14.00	0.00	0.0
ASE	17.75	6.00	Cognitronics Corp.	17.13	-0.13	-0.7
NYS	23.88	16.75	Conner Peripherals	23.50	1.38	6.2
OTC	33.50	10.75	Creative Technologies Inc.	33.50	9.25	38.1
OTC	28.25	14.25	Data Race Inc.	28.25	2.75	10.8
ASE	19.66	4.75	Databank Corp.	11.25	-0.88	-7.2
NYS	26.50	7.25	EMC Corp. (H)	26.50	1.00	3.9
OTC	10.50	5.38	Emulex Corp.	8.50	-0.75	-8.1
OTC	23.00	13.25	Evans & Sutherland	17.50	-0.25	-1.4
OTC	40.63	12.00	Exabyte	14.63	-3.13	-17.6
OTC	71.75	19.00	Intelligent Info. Systems (H)	70.00	4.00	6.1
OTC	13.25	4.75	Komag Corp.	6.50	-0.63	-8.8
OTC	24.75	9.50	Pi Systems Inc. (L)	10.50	0.50	5.0
OTC	23.25	10.75	Komag Inc.	17.75	0.25	1.4
OTC	19.63	7.88	Maxtor Corp.	11.88	1.13	10.5
OTC	12.63	7.13	Micropolis Corp.	9.00	-0.13	-1.4
NYS	107.00	85.50	3M Corp.	98.75	-1.25	-1.3
OTC	7.25	4.00	Printronix Inc. (H)	6.50	-0.25	-3.7
NYS	15.50	6.88	QMS Inc.	15.25	2.00	15.1
OTC	18.00	12.13	Quantum Corp.	16.38	1.38	9.2
OTC	12.75	3.75	Radius Inc.	5.25	0.00	0.0
NYS	16.25	7.50	Recognition Equipment (H)	15.88	1.25	8.5
OTC	13.88	6.50	Reason Inc. (L)	7.88	0.63	8.6
OTC	22.38	10.25	Seagate Technology	18.38	1.00	5.8
NYS	78.00	18.38	Storage Technology	20.50	-0.25	-1.2
NYS	22.63	16.50	Tektronix Inc. (H)	22.50	0.38	1.7
NYS	82.88	63.63	Xerox Corp.	82.88	-3.13	-3.6
SERVICES						
OTC	23.50	12.16	American Mgmt. Systems	23.25	0.13	0.5
NYS	5.38	3.00	Amacomp Inc.	4.38	-0.13	-2.8
OTC	33.50	15.75	Analysts Int'l (H)	33.50	3.50	11.7
NYS	55.63	38.75	Auto Data Processing	52.13	-1.38	-2.6
NYS	17.25	8.56	Ceridian Corp.	15.00	-0.13	-0.8
NYS	20.00	12.50	Comdisco Inc.	14.00	-0.13	-0.9
OTC	13.50	6.75	Computer Horizons	12.00	1.75	17.1
NYS	84.88	57.00	Computer Sciences	75.38	-2.88	-3.7
NYS	10.13	7.13	Computer Task Group	8.88	1.13	14.5
NYS	40.50	22.00	CompuUSA Inc.	34.00	-2.50	-6.8
OTC	19.25	6.00	Corporate Software	13.38	1.63	13.8
OTC	30.75	7.75	Egghead Discount Software	10.50	0.13	1.2
NYS	34.00	25.25	General Motors E (EDS)	33.00	0.75	2.3
OTC	20.50	9.25	Imacon Corp. (H)	20.50	2.25	12.3
OTC	30.50	6.25	Intelligent Electronics	14.13	-0.63	-4.2
OTC	14.88	6.63	Merisel	11.88	0.50	4.4
OTC	15.75	5.75	Microage Inc.	12.50	2.75	28.2
OTC	40.00	21.66	Paychex	35.75	0.75	2.1
NYS	83.50	59.75	Policy Management Sys.	78.88	1.88	2.4
NYS	28.50	16.81	Reynolds and Reynolds (H)	28.50	5.00	11.8
OTC	32.00	22.00	SEI Corp.	30.38	0.13	0.4
OTC	24.38	16.88	Shared Medical Systems	22.63	1.25	5.8
OTC	14.38	5.75	SHL Systemhouse	7.25	0.63	1.8
OTC	29.25	16.75	Software Spectrum Inc.	26.50	0.75	2.9
OTC	31.50	19.00	Sungard Data Systems	30.00	0.25	0.8
NYS	5.63	1.13	Ultimate Corp.	2.13	-0.13	-5.6

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Note: Motorola Inc. completed a 2-for-1 stock split.

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In Brief

PowerSoft files IPO

Client/server tool start-up **PowerSoft Corp.** last week filed an initial public offering (IPO) with the Securities and Exchange Commission. The company hopes to sell 1.8 million primary shares and 65,000 secondary shares. The Burlington, Mass., company expects the initial per-share price to range from $14 to $16.

Beyond raises cash

Beyond, Inc. has attracted $6.6 million in equity financing from a group of investors that includes **Banyan Systems, Inc.** and **Novell, Inc.** Also participating in the Cambridge, Mass., electronic-mail vendor's third round of financing were new investors **Trinity Ventures, Greylock Management** and **Highland Capital**, as well as existing investors **Matrix Partners, Merrill Pickard, Andersen & Eyre, New Enterprise Associates** and **Atlas Ventures.**

BCE to sell SHL stake

BCE, Inc. will sell its 22% stake in **SHL Systemhouse, Inc.** for roughly $65 million under an underwriting agreement with **Gordon Capital Corp.** BCE and SHL last June scrapped a proposed partnership in which the Montreal-based parent of Bell Canada would have increased its stake in the Ottawa systems integrator to 60%. In return, SHL would have gained access to BCE's extensive data centers.

SHORT TAKES **Pillar Corp.**, a Foster City, Calif., developer of budgeting software, has received $2 million in additional venture capital.... **Frame Technology Corp.** in San Jose, Calif., has agreed to acquire **Verity, Inc.** in Mountain View, Calif. Verity makes a text-retrieval server engine. Frame is a supplier of electronic publishing software.

Next to cool black box, push OS

By James Daly
REDWOOD CITY, CALIF.

Next, Inc., the workstation maker launched with great fanfare by Apple Computer, Inc. co-founder Steve Jobs in 1985, is once again doing what it does best: struggling.

Key products are late, and at least six top executives have departed during the last year. However, analysts and developers said 1993 should see a major transmogrification of the Next game plan. By year's end, Next is expected to shift away from its powerful but slow-selling workstations and over to its flashy object-oriented operating system, NextStep — a technological gem that analysts have always considered the company's crown jewel. Next officials were unavailable for comment.

FINANCIAL UPDATE
Next

Next's revenue growth rate of 10% is more than double that of the workstation markets — 4.2%

Worldwide revenue

Source: Company reports

Why the shift? Jobs' plan of putting a "best of breed" sleek black cube of a workstation on the desktops of corporate America is just not working. This failure follows an equally unsuccessful strategy of targeting the machine exclusively at the university market.

The Motorola, Inc. 680X0-based Next models initially impressed many with a bevy of breakthrough technologies, such as a slick user interface and its ease of crafting custom applications. However, it was hobbled by a lack of wide-ranging business software, compatibility issues and the delayed introduction of the final operating system. The machines, moreover, have not come close to matching unit volume shipments of market leaders Sun Microsystems, Inc. or Hewlett-Packard Co.

RISC in the wings

Next may be circling the wagons in the hardware department, but it is also planning a May introduction of a reduced instruction set computing-based workstation. Some said the new model will not make much of a difference for the bottom line at Next and is one more symbol of Jobs' hardware fixation.

With the commoditization of the hardware market, it may be increasingly difficult for Next's sales force to make a case for their sleek black cube. "The Next machine is nice, but it's by no means unique," said Ken Anderson, a senior program analyst and Next user at Phibro Energy, Inc. in Westport, Conn.

NextStep, on the other hand, is different. The well-regarded operating system sports a sterling interface and is being touted as a great platform to develop sophisticated custom in-house applications. "NextStep is by far the best thing to come out of the company and the best operating system out there today," according to David Peter, founder and president of HSD, Inc., a Next software developer in Mountain View, Calif.

NextStep today delivers the kind of object-oriented environment that potential rivals such as Microsoft Corp.'s Cairo or Apple Computer, Inc. and IBM's Taligent systems cannot guarantee until mid-decade.

The company's secret weapon, however, is NextStep 486, which will run on the 2 million PCs that researcher Dataquest, Inc. estimates use Intel Corp 1486 microprocessors. Jobs has called NextStep 486 the "Trojan horse" that offers the widespread appeal to finally get his firm's foot firmly in the door of corporate America. "The head of our arrow is definitely pointed at NextStep 486," one inside source said.

But there have been delays. NextStep 486 was due last year, but working out the details regarding peripheral interoperability has proven tricky. It is now scheduled for release about midyear.

Would it disappoint users if Next were to become an operating system-only company? "Not in the least. They definitely should be an operating systems company," Anderson said. "That's where their strength is, and that's where the money is."

Next, however, still faces significant financial obstacles in selling NextStep 486 to PC users. In addition to shelling out $995 for the user version of NextStep 486, extra circuit boards, memory and disk drive capacity may be needed to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next machine — adding several thousand dollars to the cost of the machine.

But analysts do not expect NextStep 486 to work miracles. "I really think the NextStep interface is the best on the market, but what are you going to run on it?" asked Dataquest analyst Paul Cubbage. "There are only a handful of applications around for it and the rest you'd have to develop internally. Next is still fighting years of corporate standards."

Meanwhile, Next has already chewed up some $200 million in funding from Japan's Canon Ltd. and Ross Perot — and even Jobs' own wallet. For now, Next has gained a little breathing room because it received an additional $55 million line of credit from Canon.

Additionally, the executive-level hemorrhaging continued at Next this month when hardware chief and co-founder Richard A. Page left for personal reasons. Said a friend: "People get driven pretty hard by Jobs. They get burned out. Rich just had enough."

In the ballpark

Insiders say Steve Jobs is a self-described "hardware junkie," who is still emotionally committed to and convinced of his machines' superiority. Indeed, some reports bear him out on this. In a recent Datapro Information Services Group survey of 2,370 workstation users, Next came in a close second in general use, only a notch behind HP's Model 700 and ahead of Sun's SPARCstation, the Iris workstation from Silicon Graphics, Inc. and models from IBM and Digital Equipment Corp. (CW, Aug. 10). NextStep's power has already attracted orders for several thousand machines from companies such as Chrysler Corp. subsidiary Chrysler Financial, McCaw Cellular Communications, Inc. and First Chicago Corp.

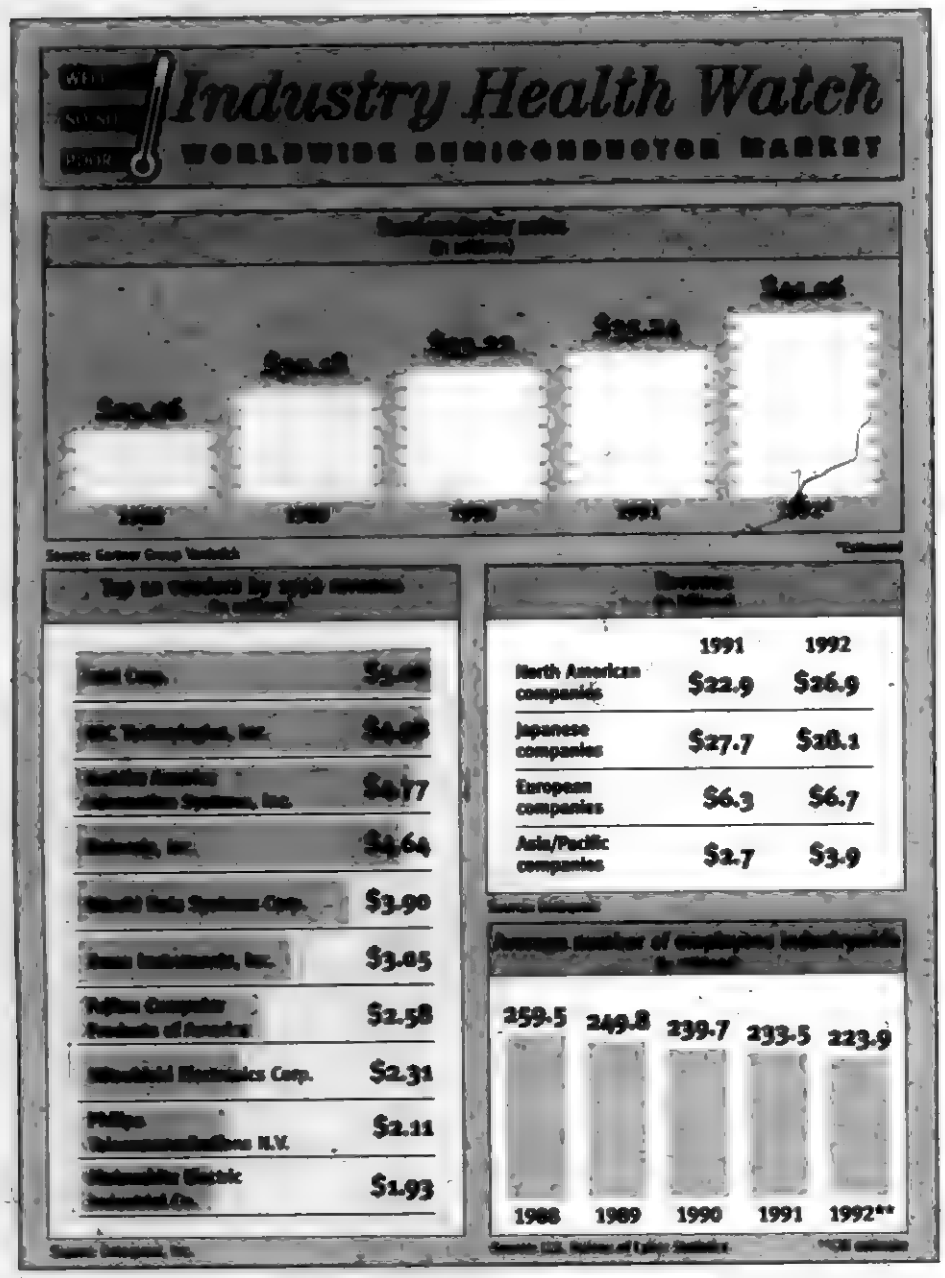
1992 fourth-quarter earnings

Many technology companies ended the 1992 calendar year with a sour quarter

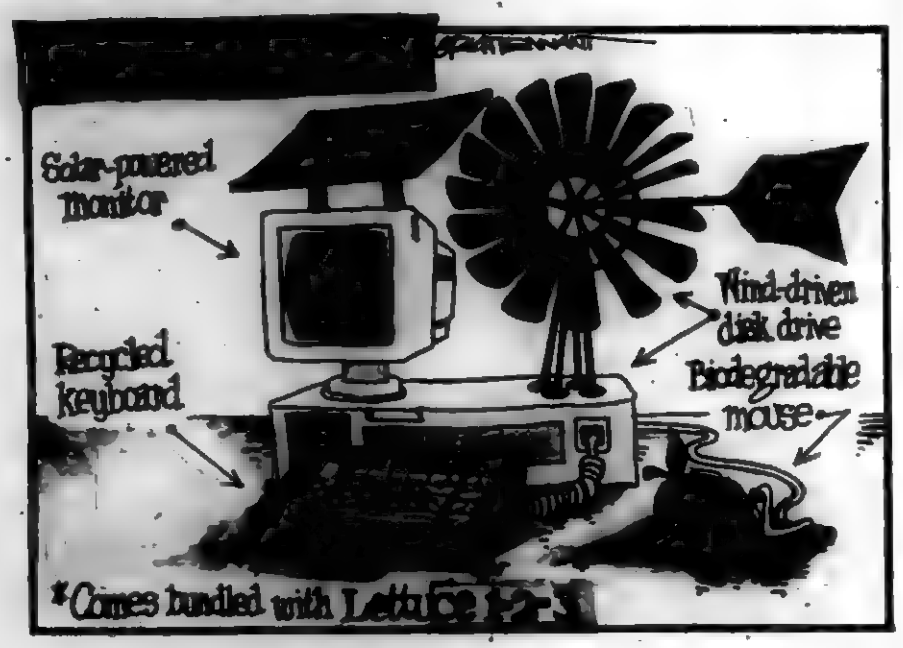
[illegible]	$744.9M	91%	$2.5M	119%
[illegible]	$113.5M	6.1%	$3.6M	248%
[illegible]	$346.3M	45%	$14.6M	(13)%
[illegible]	$279.6M	(5.2)%	$800,000	(80)%
[illegible]	$414.3M	(13)%	$(7.7M)	*
[illegible]	$48.7M	(15.9)%	$(170,000)	*
[illegible]	$483.9M	6.5%	$17.5M	118%
[illegible]	$2.26B	(8.4)%	$139.2M	73%
[illegible]	$40.1M	110.7%	$6.0M	54.3%

*Not meaningful

Source: Company reports



The Fifth Wave



Inside Lines

Cashing in

Struggling General Motors may be getting ready to leverage the strength of its Electronic Data Systems outsourcing subsidiary to help get its financial house in order. Word is GM wants to sell a portion of EDS to obtain a much needed cash infusion. It apparently now has an interested buyer: the UK's BT. It's not clear if BT would purchase equity or if it would buy EDS stock, which is known as GM Class E (GME) and is based on EDS' performance. BT is believed to be considering a 20% to 25% share. GM now owns close to 60% of all GME. EDS would gain an outsourcing contract and access to BT's TimeNet network, sources said.

Much ado about nothing?

The *Wall Street Journal* touched off a brouhaha last week concerning alleged December 1992 merger discussions between Borland and Lotus executives. According to Lotus Senior Vice President Robert Weiler, Lotus CEO Jim Manzi approached Borland about possibly selling its database product line to Lotus. Nothing came of the discussion, which Borland CEO Philippe Kahn said included talks about Lotus' potential support for Integrated Database Application Programming Interface and the settling of an ongoing suit between the two companies. Last week, Kahn told a gathering of software executives at a meeting sponsored by the Massachusetts Computer Software Council that the *Journal* story "was a joke."

Small wonder

Why is IBM's financial management being closely scrutinized? Consider this: IBM outsourcing subsidiary ISSC is providing The Chase Manhattan Bank with 4,000 IBM PS/2s as part of the bank's MetroLan branch automation project. ISSC is providing the PCs at cost plus 3% to the Chase branches. However, because ISSC doesn't have the PCs in inventory and has to work through third-party distributors such as MicroAge and ComputerLand, it is paying list price for each PC that it sells to Chase. ISSC is thereby losing 15% on each unit sold, according to a source close to the project. However, the source said ISSC still stands to profit on the contract through networking and other services.

Getting small

Compaq is readying a salvo of products in the hopes of burnishing its newfound price leadership image. Besides new Contura notebooks, the company is expected to create a new line of PCs, which will be positioned below ProLinea and aimed at the mass market. Compaq officials hinted at the new line by saying they want to sell low-end products through discounters such as CostCo. Also on the Compaq agenda: a new laser printer targeted at individuals. This product will come PostScript-ready, print up to eight pages per minute and cost $900.

Serving clients

Stop by the client/server conference in San Jose, Calif., this week: IBM is expected to announce software that enables OS/2 servers to act as distributed database and application servers, with APPN providing the connections and distributed resource directories. A "skinny client" announcement is also expected that would enable DOS and perhaps other types of clients to participate as nodes in APPN-based distributed applications.

"We don't makes bombs; we're the friendly Unison," explained Bob Bready, president of Unison Information Systems, an optical storage device manufacturer in Framingham, Mass. Last week, Cable News Network ran a story about the bombing of Iraq's Al Rashid Hotel in Baghdad. CNN said one of the bombs used in the raid was made by Unison Industries, an aircraft ignition manufacturer in Jacksonville, Fla. Shortly after the report, the Framingham-based Unison received calls from customers wondering whether there was a connection between the two companies. There isn't, Bready said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2418, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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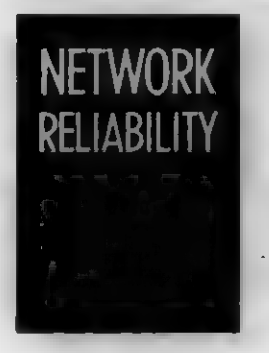

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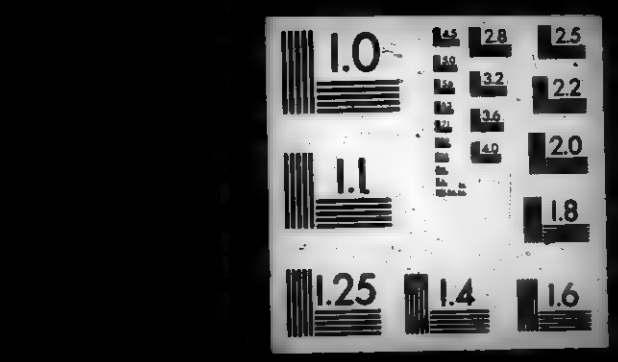
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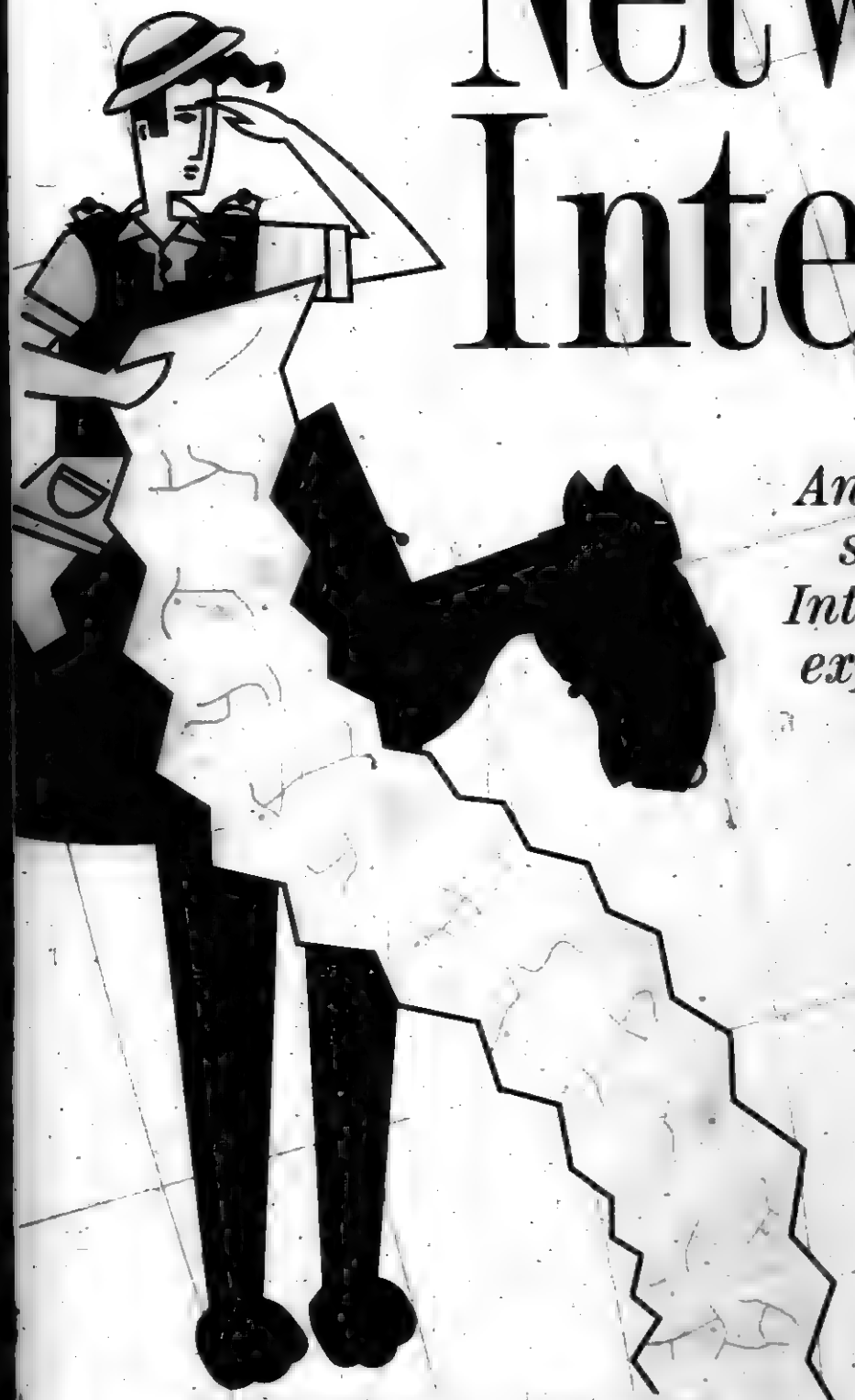
COMPUTERWORLD

Network Integration

How rough is it?



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- **The great divide between network management wishes and realities**
- **The outsourcing option . . . where it's likely to be considered**
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February 1, 1993, Vol. 27, No. 5, 124 Pages. $2/Copy. $48/Year

COMPUTERWORLD

Mainframe futures

Users taking slow road to parallel processing

By Rosemary Cafasso and Johanna Ambrosio

The future of mainframe computing is here. But for many mainstream information systems shops, it could still take close to forever to get there.

Because of advancements in microprocessor technology and parallel processing techniques, lower cost multiprocessor systems and massively parallel machines are creeping into commercial IS.

IBM will unveil a reduced instruction set computing-based parallel processing machine this week and a System/390-based parallel processing data engine later this year. It could also outline its strategy for commercial parallel processing as soon as next month. The company, however, declined to comment.

Mainframes, *page 16*

Microsoft woos IS

Licensing plan offers steep discounts, more flexibility

By Christopher Lindquist
REDMOND, WASH.

In what it says is the first in a series of new programs aimed at strengthening ties with large customers, Microsoft Corp. last week unveiled a licensing program that gives volume buyers some breathing room in how they purchase software.

While early adopters of the program have found it liberating, some potential customers remain skeptical about its value. The only serious concern to emerge from early reactions is a fear of being "locked in" to Microsoft products under the plan, which requires a certain degree of forecasting.

Under the Microsoft Select program, customers forecast how many units of a product or mix of products they expect to buy during a two-year period. That figure is used to determine pricing, which can be set per license or per machine. Customers then decide whether to use a license-based or enterprisewide tally, after which they can install the software as needed.

Have it your way

Microsoft Select consists of three individual programs:

Microsoft Multiuser License Pak: Up to 100 licenses for the same product at a 20% to 30% discount.

Microsoft Variable License Pak: By forecasting needs over two years, users can save 50% to 60%.

Microsoft Enterprise License Pak: By running Microsoft software on all their machines, users can earn discounts of 60% to 70%.

Customers must provide Microsoft with a quarterly report on the number of licenses installed or the number of hardware systems purchased and make quarterly payments to an approved "large account reseller" that is working with Microsoft. "LARs" are responsible for implementing the Select program with their customers.

The result, according to customers who have been beta testing the program, is an extremely flexible license that makes the job of tracking software — and staying legal — far easier.

Microsoft's previous licensing practices nearly cost it some sales

Microsoft, *page 20*

Inside

Women in IS
HOW ARE THEY DOING? A NEW *COMPUTERWORLD* SURVEY SHOWS THAT DESPITE LOWER PAY AND THE GLASS CEILING, ENTHUSIASM REMAINS HIGH. SEE PAGE 67.

BEGINNING THIS WEEK, *COMPUTERWORLD* IS AVAILABLE ON CD-ROM. EACH DISC INCLUDES THE COMPLETE TEXT OF THE PAST FOUR YEARS OF *COMPUTERWORLD*, THE PREMIER 100 AND COMPUTER CAREERS SUPPLEMENTS, AS WELL AS SELECTED GRAPHICS AND SURVEYS. SEE PAGE 84.

IBM lowers Unix boom

By Maryfran Johnson
NEW YORK

IBM will present itself as a newly aggressive player in the fiercely contested low end of the workstation market tomorrow, when it breaks the $4,000 price barrier with a Unix-based color workstation.

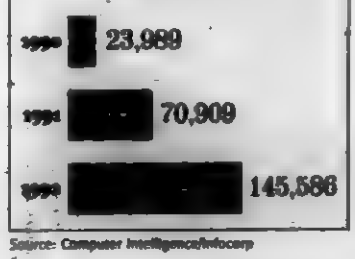
Sources close to the company said the bargain-basement RISC System/6000 — about one-third the cost of IBM's current low-end color model — is expected to be the star of a show featuring several new models of the RS/6000, better graphics plus a new data server and parallel processing system.

Only Sun Microsystems, Inc., the workstation market leader, is currently offering a color workstation for less than $4,000, while vendors such as Hewlett-Packard Co. sell gray-scale, diskless machines near that price point.

A real workhorse

IBM hopes its new RS/6000s will fuel continued growth in open systems

Installed base units



Source: Computer Intelligence/Infocorp

"This announcement is one more instance of IBM maintaining its credibility. They don't have a free ride anymore," said George Weiss, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn.

Weiss and other analysts said a strong commitment to open systems is crucial to IBM's future because so many of the firm's clients are moving to multivendor, client/server environments.

Despite the shadow of IBM's looming financial difficulties, several RS/6000 users expressed confidence in the direction of the Unix-based workstation and server line.

IBM's John Akers

"Every six months, IBM has significantly improved their price/performance," said William H. Anderson, chief information officer at Prudential Securities, Inc. in New York, which is installing 400 RS/6000s in brokerage offices nationwide. "Between Sun, HP and IBM, we have three vendors that are making the marketplace very desirable for the consumer."

Another large Wall Street cus-

IBM, *page 12*

Sales force revamp?

Akers departure appears to ruffle few feathers

By Johanna Ambrosio
ARMONK, N.Y.

Large IBM customers said they foresee no immediate changes in their relationships with IBM as a result of last week's sudden announcement that John Akers will retire as IBM's chairman as soon as a successor is named.

"I don't feel that it makes any difference at all," said Bill Sheehan, project leader at Stone & Webster Engineering Corp. in Boston. "I didn't trade in my General Motors car when Stempel left GM. John Akers' leaving is between the board and him."

Some of the largely unruffled customers greeted the news as evidence of a revitalized IBM. But some industry watchers warned

Akers, *page 14*

Newspaper

Are You

Ready?

Your company is facing a flood of data. And your people are demanding bigger, faster and more diverse services. Like E-mail, videoconferencing, LAN interconnection and high-speed data transmission. This means your network is growing in size and complexity. That's why you should call on your local phone company. Your phone company is backed by the products and services of AT&T and AT&T Bell Laboratories. That makes it easier for them to give you the quality and reliability you need. So it'll be easier for you to get your service up. To get all your people hooked up. And to keep your network up. Your local phone company can provide all the bandwidth you demand, on demand. So call your local phone company. And see how easy it is to handle your data when you're wired into the right people.

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NEWS

It's been a busy month for IBM and IBM watchers alike. Last week came the sudden resignation of Chairman and CEO John Akers, followed by the birth of a search committee to find his replacement. And there is some concern that IBM might go back to fielding separate sales forces. This week, IBM unveils its cheapest ever Unix color workstation, along with performance boosts for other systems, in an aggressive bid to keep the RS/6000 line competitive. Meanwhile, Big Blue's storage business, Adstar, is expected to weather R&D cutbacks and a tough business climate. *Pages 1, 12, 14, 15 and 59*

Connet '93 will offer the tantalizing specter of commercial implementation of truly integrated, multivendor network management as both HP's OpenView and Open Network Management Forum's CMIP talk about increasing vendor support for their approaches. Separately, IBM will preview a Blueprint specification that promises to help limit the number of transport protocols needed on the internetwork. *Page 8*

Software deliveries and distribution were recurring themes last week as a host of vendors worked to mollify impatient users. Microsoft unveiled a new pricing plan for large sites that offers the flexibility users have been clamoring for. Borland users finally received Paradox for Windows, while Oracle and Lotus users had to settle for half a glass. Oracle is shipping Oracle 7, but two other application development tools won't arrive until the summer. And to ship Notes 3.0 on time, Lotus will cut features promised in the initial release of Version 3.0. *Pages 1 and 4*

VIEWPOINT

A look back at John Akers' own prescriptions for a healthy IBM from interviews past. *Page 28*

IN DEPTH

Client/server development tools are not all created equal. Some excel at the creation of sexy GUIs, while others are best for cross-platform work. *Page 83*

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DEC still a work in progress

By Melinda-Carol Ballou
MAYNARD, MASS

Digital Equipment Corp. is in the final stages of realigning its product portfolio, as indicated by a confidential memo concerning expected reductions in software that was released internally last week. But some industry analysts are concerned that these decisions do not go far enough and are not being implemented fast enough to give the company the boost it needs to return quickly to profitability.

According to the memo, which was sent out to company managers and some employees, a series of eight products will be retired.

Fifty others are under consideration for a range of options, such as acquisition by third parties or cuts in funding, according to internal sources familiar with the process. Key products include DECimaging applications and other end-user software products, such as Browser for Windows and DOS and Mobilizer for DOS.

Sharon Kiellor, DEC's vice president of business and marketing management for software, insisted this list is "work in progress" and that decisions will not be finalized until customers have been informed.

Users and analysts, on the other hand, were more surprised by the lack of products cited than by the specific ones targeted in the memo.

"The specific products were not a surprise to me; the big surprise was that the list is so short," said David Frydenlund, sessions notes chairman of Digital Equipment Computer Users Society (DECUS).

"A small number of people will be bitterly disappointed, but there's not a substantial customer base behind them," added Kevin Kindschuh, chairman of DECUS' electronic publishing special interest group.

Industry analysts said the cuts do not go far enough, as DEC seeks to regain profitability and refocus its efforts. "It's a good start, but they're a long ways from the finish. . . . They don't want to alienate [users], but they have to go further," said Chris Christiansen, a director at International Data Corp., a market research firm based in Framingham, Mass.

Ultimately, decisions about which products will be supported and pushed by DEC engineering groups will be driven by a new company-wide structure that goes into full effect in July, the beginning of the next fiscal year.

Then, each of DEC's nine business units will determine cost structures in conjunction with 13 geographical groups, according to Arianna Stadecker, who was appointed vice president of executive operations last week. Those units will then go to engineering with their requests, which will be translated into products.

On the block

The following DEC products are under consideration for retirement:

- **DECTrellis** — Object-oriented development environment.
- **TeamData** — Database tool.
- **DECimage storage manager** — Stores images.
- **Browser for Windows and DOS** — Data access tool.
- **PathworksLinks** — Provides hypertext linking in Pathworks.
- **Mobilizer for DOS** — Electronic-mail access utility.
- **Vivace** — Desktop application.
- **DECreport** — Report writer.

News Briefs

Wang seeks to sell headquarters

Wang Laboratories, Inc. late last week said it is seeking a buyer for its Lowell, Mass., headquarters. Smaller offices in the area are being sought to accommodate a work force that is expected to shrink below the 8,000 threshold targeted last summer, officials said. Wang, meanwhile, disclosed a second-quarter operating loss of $6 million, compared with a profit of $7.8 million last year. The company eked out a net profit of $400,000, benefitting from foreign exchange adjustments. Revenue for the quarter was $351.2 million, off 30% from the comparable period last year.

DG prevails in suit

A U.S. District Court jury in Boston last week ruled in favor of Data General Corp. in a four-year copyright infringement suit against Grumman Systems Support Corp. DG was awarded $36.4 million in damages and additional interest of approximately $15.9 million. Grumman said it will appeal the verdict. The litigation began in March 1988, when DG sued Grumman for copyright infringement and misappropriation of trade secrets related to its proprietary MV/ADEX diagnostic software. Grumman countersued DG, claiming antitrust violations. The countersuit was dismissed.

Stern quits Northern Telecom

Paul G. Stern is resigning as chief executive officer of Northern Telecom Ltd. to pursue other interests such as a new appointment as a visiting executive professor at The Wharton School in Philadelphia. The company's board of directors has appointed Jean C. Monty, president and CEO of the company, to take over for Stern effective March 1.

Storage Tek shows LAN management software

Storage Technology Corp. in Louisville, Colo., will introduce a storage device next week that can relay data stored on Unix local-area networks to a central automated tape library. Due to be announced at this week's ComNet '93 show in Washington, D.C., NearNet was jointly developed with Epoch Systems, Inc. in Westboro, Mass. The storage device will be priced at about $200,000 and is expected to ship in the second half of the year, according to Storage Tek officials.

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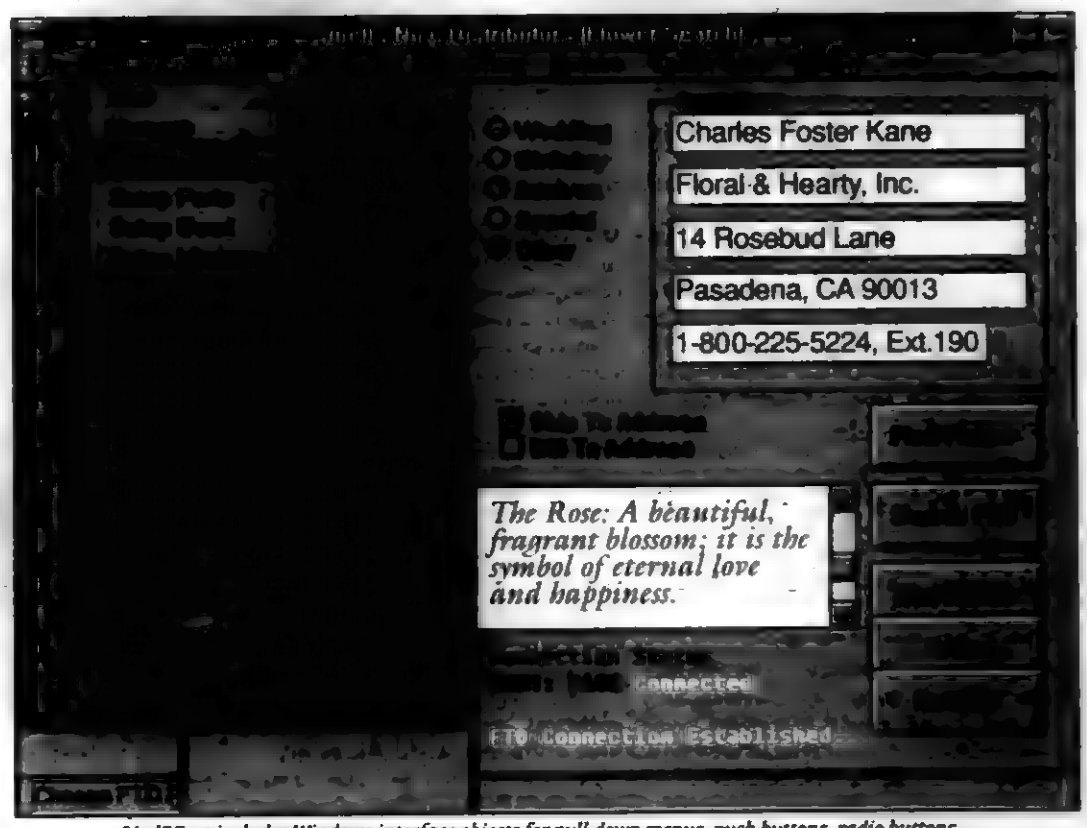

CA-dBFast includes Windows interface objects for pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes, bit-mapped graphics and more.

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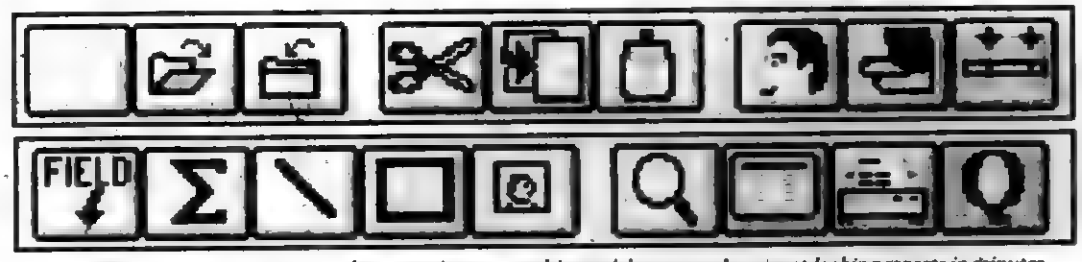

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Lotus to delay some Notes 3.0 features

By Michael Vizard
CAMBRIDGE, MASS

Lotus Development Corp. will delay some features initially planned for Notes 3.0, its groupware package, in order to meet its first-quarter delivery commitment, according to George Gilbert, Notes product marketing manager.

A source close to the company said the Version 3.0 announcement is expected on March 24, although the first shipments could come as early as March 5.

The initial release of Notes 3.0 will focus on support for Apple Computer, Inc. Macintosh clients and improvements to the object-oriented file system that forms the basis of the Notes database architecture. It will also include a text-retrieval engine from Verity, Inc. in Mountain View, Calif.

Among the promised features that will trail the first release of Notes 3.0 are support for Microsoft Corp.'s Object Database Connectivity interface, a derivative of the SQL Access standard, and the integration of work-flow software from Action Technologies, Inc. in Alameda, Calif., Gilbert said. Unix client and server support will also be delayed.

However, Gilbert said support for these capabilities will ship shortly after the initial release of 3.0.

Systems integrators working with Notes said the phased release of Notes 3.0 will ensure that Lotus delivers a stable environment.

"A lot of clients have been waiting for Version 3.0 because they didn't want the hassle of upgrading from Version 2.0 to 3.0. It's really important that Lotus gets this version out, even without some of the features promised," said Eric Wilson, president of Thinking Tools, Inc., a systems integrator in Newton, Mass., that is serving as a beta-test site for Notes 3.0.

"Lotus realizes they will be better off dropping features from the initial release rather than delivering unstable product," said Norman Weizer, president of Weizer Associates, a consulting firm in Lexington, Mass.

What's featured

According to Gilbert, the major features in the initial release of Notes 3.0 include the ability to support a look-up function from a database field, improved work-flow control software inside the Notes database kernel, the ability to create access-control lists down to the document level and improved support for Microsoft's Object Linking and Embedding protocol, which allows users to employ PC applications such as spreadsheets or word processors in place of the native Notes editor.

The improved work-flow software in the Notes database differs from the Action Technologies software in that the latter package is a layered piece of software designed for large enterprisewide projects, while the work-flow software in Notes concentrates on improving control and tracking documents in the database kernel itself.

The new release of Notes also will support a richer set of macros. "A lot of things that you would do using an API [application programming interface] in Version 2.0 can now be done using macros. This will save a lot of development time when it comes to customizing forms for an application," Wilson said.

According to Gilbert, much of the demand for Notes is being driven by former users of standalone database packages. "A lot of people are using the memo fields in these databases to capture documents. Notes is the reverse of that process in terms of being document-centric, with forms fields attached to the documents," Gilbert said.

On the bandwagon

Trellis, a member of the Asset Group in Princeton, N.J., last week joined the Notes bandwagon by offering a systems integration service that will allow Notes users to add voice-annotated messages to Windows applications using Remark, voice integration software from Simpact Associates in San Diego.

Oracle 7 users await tool kit

By Jean S. Bozman
SAN FRANCISCO

Oracle Corp. had to push hard to get its Oracle 7 relational database management system out the door last month. Now it is pushing even harder to deliver a series of related products that are key to building the next generation of robust client/server applications.

Without a new graphical tool set, which will ship piecemeal from March to June, users will turn to Oracle's character-based tool set or to independent suppliers of Microsoft Corp.'s Windows database tools, analysts said. And without the new version of Oracle's SQLnet communications software, due by June, users will have to program their own client/server protocol translations.

Because the company is pushing so hard on its delivery dates, Oracle Chief Executive Officer Lawrence Ellison told industry analysts last week, a month-by-month shipment schedule is posted outside elevators throughout Oracle's Redwood City, Calif., headquarters.

Oracle's CEO Lawrence Ellison: *SQLnet 2.0's absence not holding up customers*

Industry analysts said Oracle did not give fixed dates for the tool set introduction, but users had expected the SQLnet 2.0 communications software to be packaged with Oracle 7.

While SQLnet 2.0 is an essential ingredient of the next generation of distributed database applications, corporate programmers can start building Oracle 7 code right away, Oracle said. SQLnet 2.0 has built-in protocol translation that reduces the need to write as much application-specific code.

"In practical terms, the difference is in development time and maintainability," said Dale Lowery, director of advanced systems at federal contractor VGS, Inc.

Ellison said the company's integrated set of graphical user interface-based development tools will be introduced next month.

Development problems slowed the progress of Oracle's Cooperative Development Environment tool set, analysts said.

Up and running

At Oracle's annual analysts meeting here Ellison said the tools are in working order. "We've got a complete integrated tool suite up and running on Windows, the Macintosh, [Sun Microsystems, Inc.'s] OpenLook and even dumb terminals," he said.

SQLnet 2.0's absence is not hurting the company or its customers. "It is not slowing migration to Oracle 7 at all," Ellison said. Users "are not waiting for it, but they sure would like to have it."

But longtime Oracle users said last week that they did not expect the wait. "It was my understanding that [the tools] were being packaged with Oracle 7," said David Kreines, a project manager at Educational Testing Service, Inc. in Princeton, N.J., who chairs the International Oracle Users Group annual conference.

The delay will slow Kreines' plan to combine database servers running Banyan Systems, Inc.'s Vines local-area network protocol with Unix servers; dozens of PCs off the Educational Testing Service campus support only the Vines protocol.

Paradox for Windows to tackle corporate projects

By Christopher Lindquist
SCOTTS VALLEY, CALIF.

Borland International, Inc.'s new flagship, Paradox for Windows, has finally set sail. All that remains to be seen is how well it floats in the increasingly choppy database market waters — especially because it was launched in the wake of Microsoft Corp.'s fast-selling and low-priced (if a bit leaky) Access.

Users and analysts contacted last week said Paradox for Windows is a first-class product. Borland, meanwhile, said the database will target those customers who are most likely to notice the subtle, but important, differences between it and other products on the market — for example, corporate developers.

"We're not going to position it as a low-end, entry-level toy," said Dave Watkins, Borland's vice president of product marketing. Instead, he said, Paradox for Windows will be positioned as "a powerful relational database that corporations can standardize on," with temporarily low-end pricing.

One company looking to standardize on the product is Paramount Pictures in Hollywood, but not without some reservations, according to senior analyst David Rolston. Among them is the fact that the drivers necessary for SQL access are not yet available.

While Borland has promised the first set of drivers — for Oracle Corp., Sybase, Inc. and Interbase Software Group servers — within three to six months, Rolston said he is taking a "wait-and-see" attitude, given Borland's recent history of shipping products late. Paradox for Windows was initially slated for release last summer.

One analyst said the lack of SQL drivers could prove detrimental to Paradox for Windows' initial corporate push, turning off the very developers Borland is targeting. "Future promises are not going to sell against Access," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago. While Access' SQL abilities are weak, at least they are there, he said.

Beyond that, Paradox appears to be a much better architected product than Access in terms of future extensibility and flexibility, according to Finkelstein.

Rolston's general impression of the database seemed to bear that out. He said he believes Paradox for Windows is superior to anything he has seen on the market, including Paradox for DOS.

Paradox for Windows is available until April 30 for $139.95.

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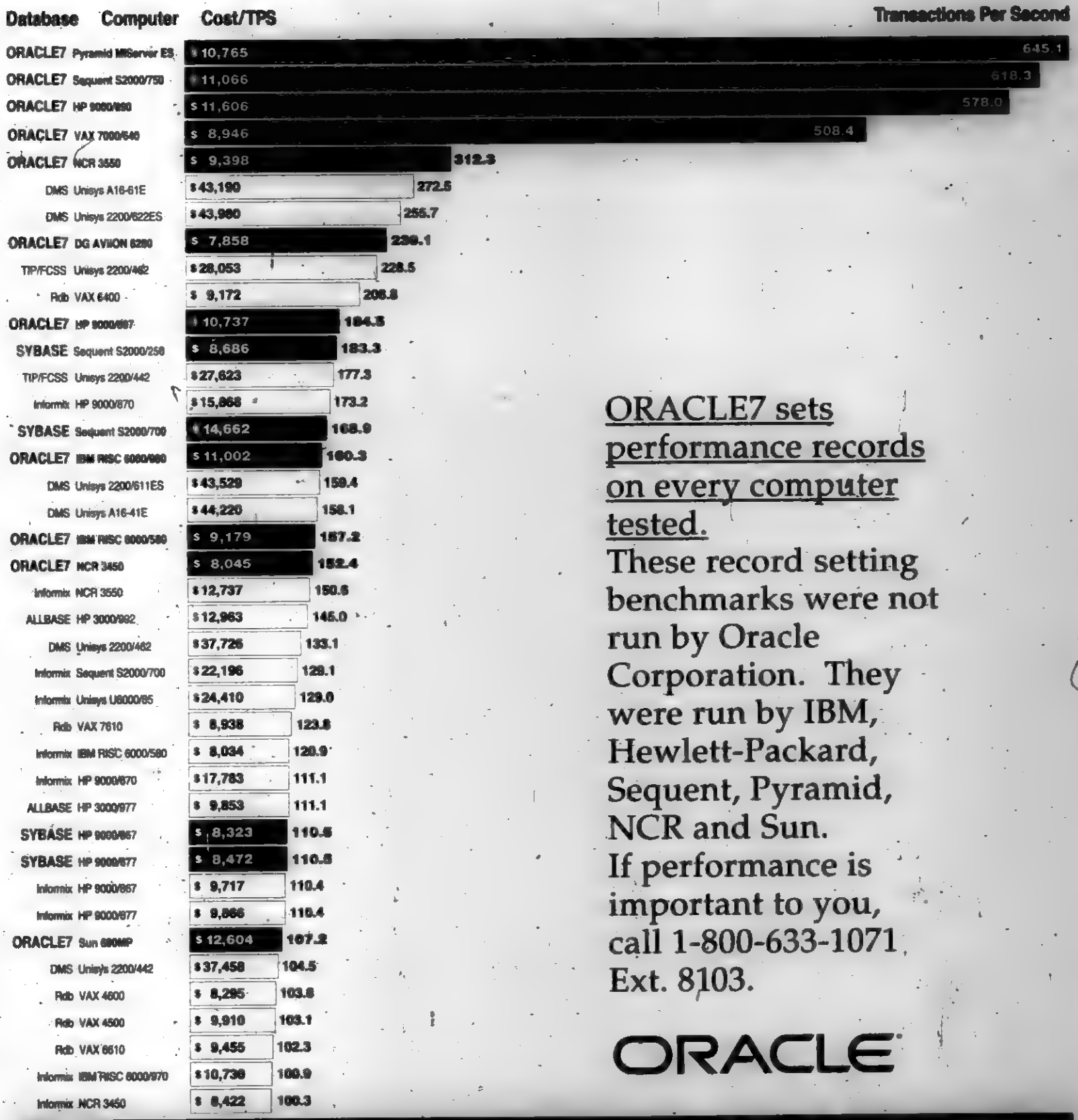

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News Shorts

Unisys plans new PC line

Unisys Corp. this week will roll out a new line of PCs, workstations and entry-level servers. The PW2 Advantage Plus systems include Intel Corp. 1486 microprocessors that were designed to support Intel's upcoming Pentium chip. The desktop Model 4333 and the six-slot Model 4666, with prices starting at $2,899 and $3,499, respectively, are available now.

Covia heads for Solaris

Sun Microsystems Computer Corp., the hardware subsidiary of Sun Microsystems, Inc., and Covia Technologies, Inc. announced that Covia will port its Communications Integrator software to Sun's Solaris operating system by next fall. Covia's multivendor, message-based software for distributed processing will allow Sun systems to interoperate with other platforms running the integrator software.

DARPA pushes fiber nets

The Defense Advanced Research Projects Agency (DARPA) formed the Optical Networks Technology Consortium, a government-industry alliance, to conduct research and develop prototypes for all optical telecommunications networks. DARPA contributed $7 million in funding.

Seagate gets into flash memory

Seagate Technology, Inc. bought a 25% stake in flash memory maker Sundisk Corp. Sundisk is currently the only company able to ship flash memory cards. The privately held firm's sales are estimated at $25 million.

Executive leaves MicroAge

William C. Keiper left his job as president and chief operating officer at Tempe, Ariz., reseller MicroAge, Inc. to take the same position at Tucson-based Artisoft, Inc., maker of LANtastic. Jeffrey D. McKeever, MicroAge's chairman and chief executive officer, will take over Keiper's role.

Printers go green

The Clinton administration got cracking on the environment last week when the Environmental Protection Agency teamed with leading industry companies to unveil an energy efficiency program for computer printers. The Energy Star platform was designed to encourage the use of energy-saving features or power management software.

SHORT TAKES Novell, Inc. and Saber Software, Inc. have announced that Novell will bundle a subset of the Saber Menus for DOS, a widely used menuing system, with its forthcoming NetWare 4.0 local-area network operating system.... Texas Instruments, Inc. and Hitachi Ltd. have agreed to do joint research and development on a 256M-bit memory chip.... Computer Associates International, Inc. plans to port its CA-Unicenter, CA-IDMS, CA-Datacom and Masterpiece financial software to Data General Corp.'s Aviion servers running under Unix.... Corporate Software, Inc. extended its PC service program to include 24-hour telephone support for PC and Apple Computer, Inc.'s Macintosh application software.... IBM consolidated its federal government marketing and support staff within its Federal Systems Co.... Pacific Bell laid out a plan for converting all of California's 14 million-line telephone network to digital services by 1997.... Ericsson GE slashed the price of its 1-pound wireless Mobidem Portable Wireless Modem from $1,395 to $775 and cut the price of its wireless electronic-mail package from $1,895 to $995.... Elmer Baum, whose loan help fund Apple's beginnings, has died at age 75.

Brokerage overhauls net

Frame relays could result in eightfold increase in power

By Joanie M. Wexler
WEEHAWKEN, N.J.

PaineWebber, Inc. last week disclosed that it is embarking on a two-year overhaul of its communications infrastructure that hinges on nationwide frame-relay networking — a pioneering move on Wall Street.

The network overhaul is being driven by a corporate shift to local-area networks — which also largely got under way last week — in the firm's 275 branches. The new network should increase the power of PaineWebber's corporate internetwork eightfold without the firm having to shell out any bottom-line cash, according to the company.

This is because the bandwidth-conserving nature of frame relay and the consolidation of several existing networks should cancel out network upgrade expenses, said Thomas Randall, corporate vice president of communications.

The securities firm intends to merge a 9.6K bit/sec. multipoint mainframe-based network with myriad Quotron Systems, Inc. data feeds, which supply brokers with continual market information, onto a 64K bit/sec., router-based information highway, Randall said.

The networks will come together on a Network Equipment Technologies, Inc. (NET) private backbone that PaineWebber is upgrading to frame relay for $2.3 million and linking into its AT&T Tariff 12 network.

Frame relay's most touted application is for interconnecting LANs because it efficiently handles "bursts" of data traffic when files are transmitted.

PaineWebber's Robert Benmosche: *Goal is to be 'independent from the vendors we do business with'*

In addition, broadcasting Quotron data across the corporate network just once rather than footing the bill for separate feeds to each of PaineWebber's branches is obviously more economical, Randall said. The Quotron network consolidation is slated for 1994.

> "We didn't have time to stop the business of PaineWebber while we built a new network," said Thomas Randall, corporate vice president of communications.

The network design also jibes with PaineWebber's goal to become "independent from the vendors we do business with," said Robert Benmosche, executive vice president and director of operations, systems and administration. For example, in the new scenario, "if something happens to Quotron, we can just plug in another [vendor's] feed, and we're up and running."

Moving to the LAN platform also speaks to vendor independence, Benmosche said. IBM RISC System/6000-based LANs will support 5,000 Personal System/2 broker workstations running Microsoft Corp. Windows-driven Quotron applications. The shift from standalone Quotron 1000 platforms to an "open" Windows environment ensures that "as technology evolves quickly, we can leverage what's going on in the industry," Benmosche said.

Fortunately, NET's scheme for allowing its Integrated Digital Network Exchange multiplexers to support frame relay via an add-in card means the PaineWebber backbone can straddle the new and old networking environments while the company is in transition.

"We didn't have time to stop the business of PaineWebber while we built a new network," Randall said.

Poach approach

Another reason behind choosing frame relay is the technology's inherent ability to let users "poach" on other users' assigned bandwidth when it is not being used. The frame-relay network automatically knows to throttle that bandwidth back when the "real" user wants to transmit.

Also, Randall and Benmosche said they consider frame relay a migratory step toward Asynchronous Transfer Mode (ATM) networking, an emerging switched technology more appropriate for delay-sensitive voice and video.

PaineWebber's close relationship with AT&T as its long-distance provider is one reason the firm elected to use Cisco Systems, Inc. rather than NET multiprotocol routers for its backbone. Cisco and AT&T, along with StrataCom, Inc., recently teamed to spur end-to-end ATM networking [CW, Jan. 18].

AT&T said it will introduce its national ATM service this week at the Communication Networks Conference and Exposition '93 in Washington, D.C.

Emerging fast technology controversy remains

By Lynda Radosevich

Last week's meeting of the IEEE 802.3 committee did not solve the controversy surrounding the media-access layer of the emerging 100M bit/sec. Ethernet standard. However, the committee did agree on a number of physical layer objectives for the fast technology.

Agreement on the objectives means that "we will have something that fits into people's wiring, and we will have something that gets higher speed but is transparent to people's software," said committee chair Pat Thaler.

A vote to retain Carrier Sense Multiple Access/Collision Detection (CSMA/CD) as the media access layer — supported by vendors including Cabletron Systems, Inc., Chipcom Corp., Grand Junction Networks, Inc., Intel Corp., LAN Media Corp., Synoptics Communications, Inc. and 3Com Corp. — did not receive the 75% support it needed to settle the issue, according to Thaler.

The result is that other non-CSMA/CD standards, such as one proposed by Hewlett-Packard Co., AT&T and Ungermann-Bass, Inc., will be considered.

The committee did agree on the following objectives: a maximum distance of 100 meters between hubs and stations, support for the Ethernet shielded and unshielded twisted-pair wiring schemes, specification for a media-independent interface, emissions requirements similar to 802.3 standards and frame format identical to the 802.3 format.

Microsoft sued over DOS data compression

By Christopher Lindquist
REDWOOD CITY, CALIF.

PC data compression leader Stac Electronics, Inc. jabbed at Microsoft Corp. last week by unveiling a compression standard designed to compete head-on with the Microsoft Real-time Compression Interface (MRCI). Stac then followed with an uppercut — a patent infringement suit — that if successful, could land more than a glancing blow on Microsoft's plans for MS-DOS 6.0.

The suit targets Microsoft's DoubleSpace integrated data compression technology, which is slated to be included with the as-yet unreleased MS-DOS 6.0. Stac is asking for unspecified monetary damages and for Microsoft to cease infringing on the patent, essentially by removing infringing code allegedly built into MS-DOS 6.0. No court date has been set.

Should Microsoft lose the case and be found to have willfully infringed on Stac's patent, the Redmond, Wash., software giant would be liable for treble damages and a reasonable royalty, according to Tom Villeneuve, head of the technology group at Brobeck Phleger & Harrison, a law firm in San Francisco.

However, he noted that patent cases are usually settled out of court to avoid the normal two- to three-year resolution times.

The altercation started after Microsoft announced MRCI and a development tool kit that the company hoped would establish the compression method as an industry standard. The same day, Stac President Gary Clow revealed that Stac was releasing its own standard and that it had filed a patent infringement suit against Microsoft in a California district court.

> Clow said talks fell apart when Microsoft appeared unwilling to offer a suitable royalty arrangement and when Microsoft reps began making "veiled threats" concerning using a competitor's technology.

According to Clow, the suit claimed that Microsoft knowingly infringed on Stac's patents for data compression when it integrated DoubleSpace compression technology into the recent beta-test release of MS-DOS 6.0.

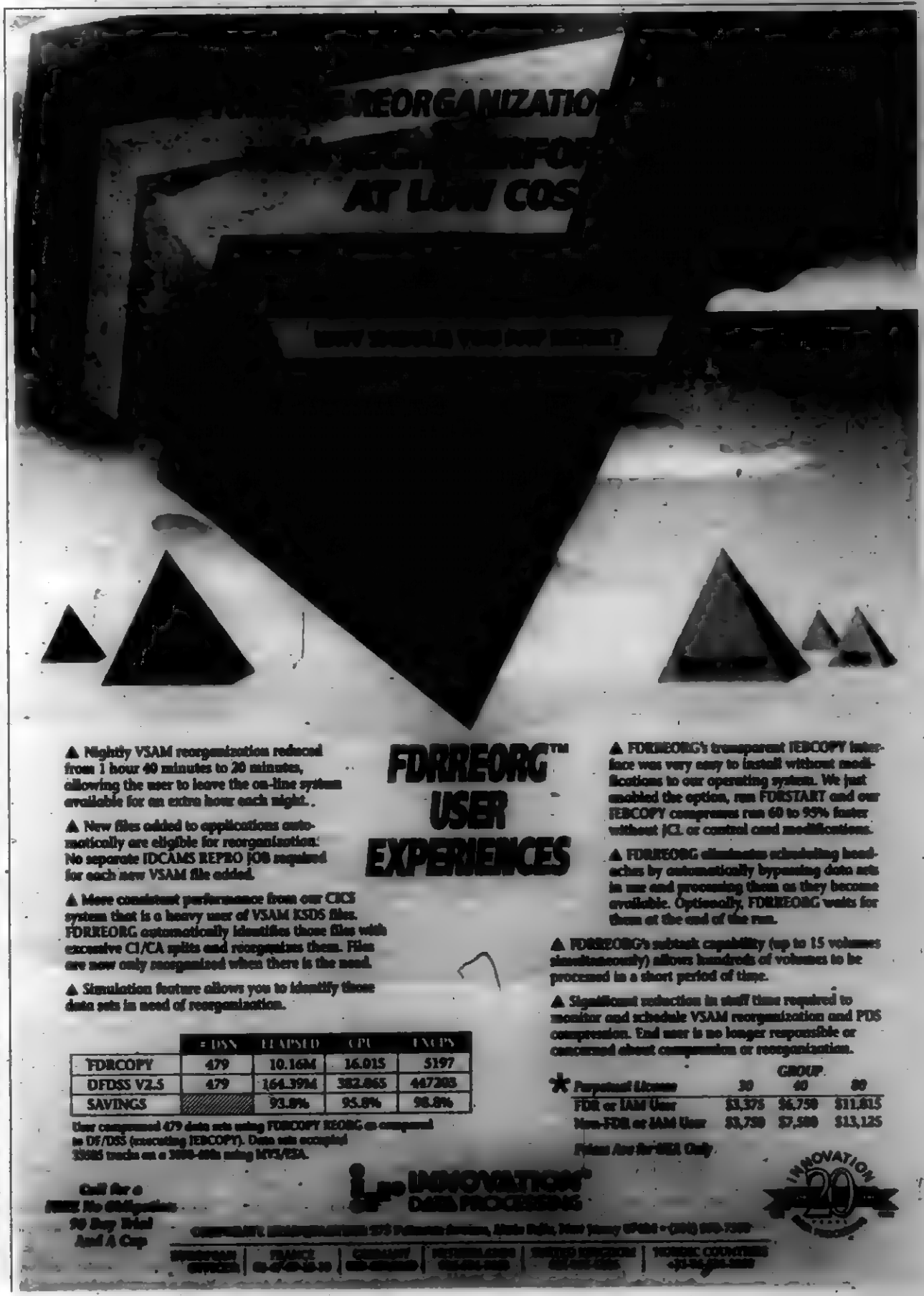
Clow said Stac and Microsoft had been in periodic discussions concerning the possible licensing of Stac technology for use in DOS products ever since Microsoft President and Chief Executive Officer Bill Gates approached Clow at Comdex/Fall '90.

Clow said the talks fell apart when Microsoft appeared unwilling to offer a suitable royalty arrangement and when Microsoft representatives began making "veiled threats" concerning what would happen to Stac's market if Microsoft were to use a competitor's technology.

Clow also said that Stac has been cooperating with the Federal Trade Commission's (FTC) investigation of Microsoft since the final talks broke down. He did not comment on whether Stac had approached the FTC or vice versa.

MS-DOS general manager Brad Chase confirmed that his company had been in discussions with Stac and "a lot of vendors" about compression products, but he refused to comment further.

He also denied that DoubleSpace infringed on Stac's patent and stated that the compression technology in the Microsoft product was largely a result of the company's own development effort, though there was some third-party involvement by a company other than Stac.



IBM Blueprint to attack net chaos

By Elisabeth Horwitt
WASHINGTON, D.C.

■ IBM will demonstrate at Communication Networks Conference and Exposition '93 next week the next phase of its Blueprint for Networking strategy, which is expected to provide some degree of transport independence for applications communicating over an enterprise internetwork backbone. Blueprint's release is due next month.

The ability to help customers create "a transport-independent infrastructure" will be a "real competitive advantage" to IBM as more and more users mix Systems Network Architecture (SNA) with a variety of local-area network protocols, according to Dick Boyle, a program director at Gartner Group, Inc. in Stamford, Conn.

IBM's Multi-Protocol Transport Networking (MPTN) software will take data streams from an application written to one type of transport protocol and translate them so they can work over another type of network, said IBM's lead MPTN architect, Diane Posefsky.

Both IBM and popular LAN protocols will be supported. This in turn will enable users to simplify their management chores by choosing one type of transport for all their applications, regardless of what those applications originally suported, Posefsky added.

One piece of the initial software will let Transmission Control Protocol/Internet Protocol (TCP/IP) Sockets applications talk SNA, Posefsky said. This will enable Unix systems to communicate over an SNA backbone so that customers can avoid having to "introduce TCP/IP" into the corporate network mix, she added.

The second initial piece will let SNA-based applications talk TCP/IP, targeting IBM shops that want to migrate to TCP/IP without having to rewrite all of their legacy SNA applications, Posefsky said.

Boeing Computer Services is one IBM customer that is working with the vendor to implement SNA on top of TCP/IP, via MPTN, IBM confirmed.

Other protocols to come

Subsequent MPTN releases will support translation across other types of transport, including NetBIOS, Posefsky said. Other protocols to be supported include Apple Computer, Inc.'s AppleTalk and Novell, Inc.'s IPX, Boyle said. Also to come, probably within the next few months, is support for Digital Equipment Corp.'s DECnet IV, an industry source said.

Industry sources indicated that IBM is likely to begin implementing MPTN on OS/2 systems next month and on the 6611 router later.

Last month, IBM quietly announced a beta test of an OS/2-based MPTN product that allows applications written to the Open Software Foundation's (OSF) Distributed Computing Environment to run over a LAN using NetBIOS, Posefsky said.

Users will be able to implement an MPTN translator either on the end systems or on a gateway that would do the translating for multiple clients, she added.

While MPTN is a step in the right direction, IBM's Blueprint still does not promise "any-to-any" communications for companies such as The Travelers Corp., which uses a combination of TCP/IP, LU6.2 and the OSF's remote procedure calls (RPC), according to Steve Simon, senior telecommunications engineer at the insurance firm.

Posefsky confirmed that IBM's Blueprint still requires that applications be written to the same interface — such as RPC or IBM's Common Protocol Interface for Communications, which speaks to LU6.2 — in order to speak to one another.

ComNet

No clear winner

Less than half of 50 information systems managers surveyed by Salomon Brothers, Inc. said IBM is best suited to offer a solution to integrate LANs and SNA networks. About 34% said Novell is best suited for the job, while 10% said no vendor is equipped to integrate LANs and SNA networks. But only 18% of the respondents said they had evaluated IBM's 6611 multiprotocol router. When asked about their general perceptions of the router, many compared it with a similar product from Cisco Systems, Inc., though 44% said they felt it was inferior.

Baby Blue

This week at ComNet '93, IBM is expected to announce a much less expensive, slightly less powerful version of AIX NetView/6000 for users who want to manage small networks.

NetView/6000 is IBM's Simple Network Management Protocol-based software for managing Ethernet networks running TCP/IP.

AIX NetView/6000 Entry Version 1 will be priced at $4,500, compared with $15,000 for regular NetView/6000, an IBM spokeswoman said.

The Entry version will have all the features of its elder brother, "or maybe even more," she added.

While The Travelers would be interested in a scaled-down version of NetView/6000, the real cost is the price of the RISC System/6000 it runs on, said Steve Simon, senior telecom engineer at the insurer.

Taking into account hardware costs puts the price of regular NetView/6000 at about $50,000, Simon said.

—Elisabeth Horwitt

CMIP alive and kicking

Several leading T1 switch vendors will use this week's ComNet '93 show to demonstrate that reports of Common Management Information Protocol's (CMIP) demise are exaggerated, if not dead wrong.

Network Equipment Technologies, Inc.; Ascom Timeplex; Newbridge Systems, Inc.; and Telematics International, Inc. are expected to announce commercial availability of products conforming to the Network Management Forum's Omnipoint, which is based on CMIP. The four vendors will also take part in a CMIP-based interoperability demonstration with BT's Concert, said to be the only other CMIP-compliant network management system now on the market.

By announcing CMIP compliance, the switch vendors are aligning with the carrier industry, which has also indicated its support for the Open Systems Interconnect-based standard, according to Ginny Mellinger, a senior analyst at International Data Corp. In contrast, the internetworking and LAN industries are rapidly coalescing around a rival standard, Simple Network Management Protocol (SNMP).

The SNMP standard still lacks features that CMIP provides, BT spokesman Keith Miller said. The next version is expected to correct these omissions.

The Open Software Foundation's Distributed Management Environment promises to bridge the standards. BT, Network Equipment Technologies and others support CMIP and SNMP. BT is also working to link Concert with HP's OpenView and Sun's SunNet Manager via CMIP. *—Elisabeth Horwitt*

HP's OpenView gathering support

By Elisabeth Horwitt
WASHINGTON, D.C.

Hewlett-Packard Co. is expected to announce a database structure next week it hopes to push through as the industry standard for sharing data across multivendor network management applications.

The company plans by late this year or early 1994 to release an "open database schema" that it will encourage other network management vendors to support, said Scott Safe, an HP marketing manager. "I am not aware of any industry standard body doing this, so we are stepping into the breach," he added.

Leading integrated network management vendors such as Digital Equipment Corp., IBM and Sun Microsystems, Inc. may have other plans. IBM, at least, offers a similar "standard" data structure in SystemView.

Initial support for the database will come from the Premier Partners, four companies that committed last fall to integrating their network management products with OpenView on a deeper level than the average Simple Network Management Protocol link. The partners — including Ki Research, Peregrine Systems, Inc. and Network Edge — extend OpenView's management mandate to DEC, IBM and Novell, Inc. networks, respectively. The fourth partner, Isicad, Inc., offers a combination trouble-ticketing and physical network configuration management package called Command.

Pass over

HP's database will enable the partners' applications to pass data back and forth so that, for example, alerts collected across DEC, IBM and Novell networks can generate alerts via HP Event software and generate trouble-tickets via Isicad's Command, Safe said.

In a common scenario, a network administrator, alerted by Ki's OpenDNM of a DECnet server failure, can call up Command to "find out what that server is connected to and what its assets are," an Isicad spokeswoman said.

Support from the above third-party products may make OpenView a viable replacement for rival products, sources said. 3M Co., for example, is looking at managing its DEC networks, if not DEC systems, via a combination of OpenView and Ki's OpenDNM product, said Chris Amley, a lead telecommunications analyst at 3M.

HP's common data structure is potentially useful to 3M, which uses OpenView to manage its internetwork and is evaluating both Peregrine's and Ki's OpenView-compatible products, Amley said.

However, 3M would like to integrate not only Isicad's Command but also its own legacy IBM InfoMan trouble-ticketing system with OpenView, Amley said. The fact that even "open" platforms such as OpenView still integrate only a limited set of applications shows how far the industry still is from a universally supported network management standard, he said.

HP is also aggressively migrating OpenView onto its rivals' turfs: The product now runs on IBM AIX and Sun Microsystems, Inc. SPARCstations.

Furthermore, DEC VMS and Ultrix versions are in the pipeline, an industry source said.

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Server maker targets supercomputing

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc. weighed in on the low end of the supercomputing market last week with a pair of high-performance servers aimed at scientists and technical professionals unable to afford multimillion-dollar supercomputers.

Starting at $120,000, the Power Challenge line of shared-memory symmetric multiprocessing systems is based on a 64-bit Mips Technologies, Inc. processor called TRP, or True Floating Point.

The machines, which will not be available until the first half of 1994, are expected to challenge vendors such as Cray Research, Inc. and Convex Computer Corp.

"This represents a real change in the way people are putting supercomputers together," said Ken Anderson, co-publisher of "The Anderson Report" newsletter. "Rather than having dedicated, special-purpose kinds of machines, they combine groups of standard workstationlike processors with symmetric multiprocessing technology."

Your pick
The Power Challenge deskside system, priced from $120,000, will have two to six TFP processors. The Power Challenge XL rack system, with two to 18 TFP processors, will be priced from $170,000.

Based on Silicon Graphics' own measurement, the new line hits a peak performance of 5.4 billion floating-point operations per second; offering a jump in power and speed over Silicon Graphics' current server line. One manager likened the difference to flying from San Francisco to New York in seven minutes instead of five hours.

The systems will run the next version of the firm's Irix Unix operating system.

But one missing piece of the application scenario is the suite of development tools needed to build software that takes best advantage of the Power Challenge architecture.

"They are going to make those tools available, but we don't know how good they'll be," said Ted Krum, an analyst at D. H. Brown Associates in Port Chester, N.Y. "For low-end supercomputing situations, these systems have much better cost/performance. There is definitely a chunk of the supercomputing world that will be attracted, but there will always be a sector for which there's never enough

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Supercomputer guru suffers setback

By Ellis Booker
EAU CLAIRE, WIS.

After five years and more than $100 million invested by IBM, Supercomputer Systems, Inc. ran out of time and money last week, ceasing operations without ever producing a commercial product.

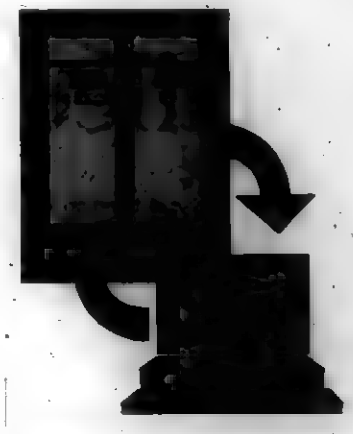
Run by the legendary computer designer Steve S. Chen, Supercomputer Systems' mission was to bring forth the world's fastest vector supercomputer. Even as doubts began to surface about the company's future, the aura of mystery around both the venture and Chen continued to fascinate those in the high-performance computing community.

But last Monday, the supercomputing guru told the company's 320 employees that the firm was halting operations and providing 60 days of benefits. "Your technical achievements have been extraordinary, and I thank you," Chen said. He also announced that a working prototype of the SS-1 had run benchmarks under the operating system at 2.5 nsec, "producing the world's highest performance for a single processor."

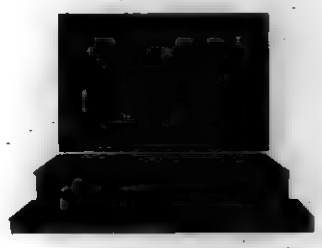
A spokesman confirmed last week that Chen would continue a worldwide search for $60 million to complete the development and manufacturing of the SS-1.

But industry analysts were doubtful this effort would succeed, noting that users are moving away from single-processor systems to multiprocessors.

Four Issues. Nothing But Solutions.

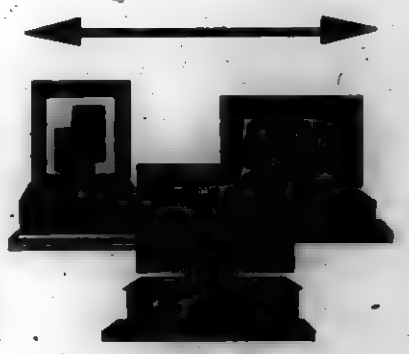


Offloading Mainframe Development and Maintenance



PC Programming

Client/Server Computing



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OS/2 components unbundled

By Kim S. Nash
SAN JOSE, CALIF.

IBM finally got around to prying apart OS/2's database and communications facilities last week, opening up client/server options for OS/2 users and making good on a 2-year-old promise to sell the components separately.

Some users and analysts were underwhelmed by IBM's insistence that the uncoupling demonstrates a "strong commitment" to client/server computing because OS/2 systems can now be configured as database or applications servers or communications links.

Organizations such as the Federal Reserve Bank of Chicago questioned the extent to which separating the products opens them to heterogeneous client/server computing, as IBM claimed.

Piecemeal availability of a 32-bit database and various networking tools does give users more leeway for creating customized — and possibly less expensive — OS/2-based client/server schemes. IBM also enhanced the products, adding remote systems administration to DB2/2, the OS/2 2.0 database, to make it easier to use on a local-area network, for example. Questions remain, however, about how easily the products work with non-IBM systems and whether IBM has made client/server strides.

Waste not, want not

The per-piece pricing strategy means users will no longer have to buy more than they need, according to Richard Belles, program director at IBM's Enterprise Information Group (see chart).

But users who want to buy all three components will pay a higher price than before the unbundling, noted Eric Jones, manager of technology services at the Department of Transportation in Phoenix.

IBM took its time coming out with DB2/2, time that relational database rivals used to cut into territory once dominated by its big iron sibling DB2, analysts said. DB2/2 is "a competitive database, but they haven't done anything that doesn't already exist with Oracle, Sybase or others," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass.

Still, DB2/2 gives mainframe DB2 users a "cleaner" migration option with which to move applications to smaller platforms, Hurwitz said. DB2 users will like the downsized DB2/2's ability to speak SQL, she added.

The Federal Reserve branch in Chicago, which is rolling out OS/2 to 70 local users, plans to start evaluating databases for downsizing a major economic analysis application now running on an IBM 3090 mainframe. However, the bank's extensive Novell, Inc. network "limits where we look," said Scott Johnson, systems analyst.

Just which environments DB2/2 and Communications Manager/2 work with is a sticking point, according to Neil Hill, an analyst at Forrester Research, Inc. in Cambridge, Mass. "IBM is breaking out the products, but they haven't said a thing about making them run on operating systems other than OS/2," Hill pointed out.

Key products

- OS/2, a 32-bit database based on OS/2 Extended Edition Database Manager, is said to have mainframe-class security and processing power.
- Communications Manager/2, a refurbished version of OS/2 Extended Services communications software, supports up to 26 — rather than 16 — concurrent sessions on three hosts and works with Integrated Services Digital Network Basic Rate Interface switched digital links at total speeds of up to 144K bit/sec.

Mix & match

IBM is unbundling OS/2 to take advantage of emerging client/server requirements

	Before	After
Communications Manager (stand-alone)	$595	$475
Database Manager (stand-alone)		$425
Database Manager (server)	$1,995 plus $75/user	$2,495 plus $75/user
Communications Manager (server)		$1,995 plus $95/user

CW Chart: Michael Siggins

Madge boosts LAN speed

By Lynda Radosevich
SAN JOSE, CALIF.

Two Token Ring products soon to be released by Madge Networks, Inc. are aimed at helping users get the highest speeds possible out of their 16M bit/sec. local-area networks.

What is driving this technology is not that users are hitting the wall with their 16M bit/sec. Token Rings. Instead, Madge is anticipating that users will move to faster operating systems such as Microsoft Corp.'s Windows NT, said Charlie Robbins, director of communications research at Aberdeen Group in Boston.

Madge acknowledged that it plans to one-up IBM by announcing in several weeks the first 32-bit Micro Channel Architecture (MCA) Token Ring adapter card. The card will work with AIX, IBM's implementation of Unix for its RISC System/6000 series of workstations.

Madge Networks said its revenue grew 130% to nearly $80 million in 1992.

"By providing AIX support, we will allow RS/6000 users to get the highest performance out of 16M bit/sec. Token Ring," said Martin Taylor, director of product marketing at Madge.

The company will also announce this week a new version of its FastMac software drivers, which users and analysts agreed considerably speed up the performance of Token Ring products based on Texas Instruments, Inc. chips, such as those from Cabletron Systems, Inc., Cisco Systems, Inc., Hewlett-Packard Co., SynOptics Communications, Inc. and Wellfleet Communications, Inc. The new software, FastMac Plus, will increase the throughput of data packets and deliver speed increases from 10% to 15%, the company said.

Users said they are interested in higher Token Ring performance, mostly in their bridges and routers. However, some said the added capability is more than they currently need, especially running to the desktop.

Bridge appeal

"I'd be interested in FastMac Plus for bridges, but not for workstations because our rings are well-designed," said Kasey Kasemodel, a network analyst at Mazda Systems Services of North America in Flat Rock, Mich. Mazda started using Token Ring a year ago in manufacturing. At first, it installed IBM cards that "were giving us congestion errors," he said.

For the high-load nodes, he replaced all IBM cards with Madge (FastMac-equipped) adapters. "By replacing the IBM cards, the errors went away. It would be interesting to learn more about FastMac Plus," he added.

For Abbott Laboratories, a pharmaceutical and medical products company in North Chicago, the added performance of Madge's 32-bit MCA adapter for AIX "will be interesting eventually, but at this point, the applications we have don't need that kind of bandwidth," said Mick Schroeder, senior systems analyst. "As we get into graphics and multimedia, users might start banging on doors asking for more bandwidth."

The existing FastMac software has been licensed by many network vendors. Some companies, including Cabletron, HP, Wandel & Goltermann Technologies, Inc. and Wellfleet Communications, said they plan to evaluate FastMac Plus and will consider including it in their networking products.

For existing Madge customers, FastMac Plus software is available for free by calling the firm.

Unix boom

CONTINUED FROM PAGE 1

tomer, PaineWebber, Inc., was also optimistic about the RS/6000. "It is extremely competitive and a real processing engine," said Bob McKinney, executive vice president and CIO at PaineWebber. "The only weak link in the chain that we see is the AIX operating system."

PaineWebber recently began a rollout of 400 RS/6000 Model 340s to its branch offices around the country, and McKinney said the firm has discovered some annoying instabilities in AIX along the way (see story page 8). "If you configure it in a standard, cookie-cutter way for all the branch offices, it's fine," he said. "But once you introduce variable software, it's not quite Unix anymore."

Other users voiced similar complaints about AIX, saying it is difficult to use, overloaded with unnecessary features and clumsy to administer. "They've made it very complicated to deal with," said Bill Duggan, a senior engineer at Stone and Webster Engineering Corp. in Boston.

New for the RS/6000

- A new low-end color workstation priced under $4,000.
- A new X Window System terminal with industry-leading performance.
- One higher performance model in the 500 series, plus three new 300 series boxes packaged as ready-to-use technical graphics workstations.
- Enhancements at the high end of the line, plus the formal unveiling of the Power Parallel processing system and an RS/6000 data server.

Playing favorites?

Some industry observers have also questioned how avidly the sales force pushes the RS/6000 — particularly in comparison to the higher margin, proprietary Application System/400 [CW, Dec. 21].

"I've heard stories about people wanting to buy an RS/6000, but the IBM sales rep wants to sell them an AS/400," said Gary Donnelly, a director at the National Information Technology Center in Rockville, Md. "There may be commitment to open systems up the ladder in IBM, but in the trenches, the salespeople are pushing the products they know best."

IBM's positioning of the $4,000 color workstation should be intriguing to watch, several users said. Any Unix machine, they noted, has an uphill struggle unseating low-end PCs because of the wealth of software available under MS-DOS and Microsoft Corp.'s Windows environments.

PaineWebber, for example, is attaching some 8,000 Personal System/2s running Windows off the RS/6000s going into its branches. Even if an RS/6000 were cheaper than a PS/2, McKinney said, the volume of available applications would swing the decision away from Unix.

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Departure ruffles few user feathers

CONTINUED FROM PAGE 1

customers to gear up for at least one more major change that will probably occur within a few years: a reinstitution of separate sales forces for at least some of IBM's spun-out companies.

While some users said they would grudgingly accept this, others said they are loath to return to the 1970s situation where they had multiple IBM sales representatives banging on their doors.

Steep learning curve

IBM's new, yet-to-be named chief executive officer will probably not implement any major actions until year's end, analysts said, especially if the new executive comes from outside the industry, as some have predicted. An outsider would face a lengthier learning curve than would an insider (see story page 15).

Meanwhile, many challenges loom. Among them are charting the company's financial turnaround; cutting up to 100,000 more employees; choosing the market niches in which IBM will compete; becoming or staying the lowest cost producer and most effective competitor in those segments; and keeping existing customers happy while wooing others back to the fold.

"IBM needs to regain my business," said Eric Singleton, director of the information services division at the Orange County Property Appraiser's Office in Orlando, Fla. "In the last several years, IBM has not offered anything that is cost-effective or innovative to us. I mean, really — get with the program."

IBM's announcement that it will seek a new chairman had been expected, but the timing caught many industry watchers by surprise. Akers had insisted during the past few months, even as he announced the worst financial results in IBM's history, that he was going to steer the company through its crisis and even stay past IBM's traditional retirement age of 60 to do so.

Most analysts speculated that increased pressure by large stockholders, Wall Street and even the media forced Akers to retire sooner rather than later.

Nevertheless, not much will change for IBM shops. "By the time the strategy filters down to the customer level, it's a long way down the road," said Irwin Bernstein, vice president of planning and administration at Maidenform, Inc. in Bayonne, N.J.

Stay the course

One possible strategy that will not elicit much enthusiasm in some quarters is any move back to separate sales forces. Most analysts said they believe IBM will continue along its current path of breaking the company up into independently operating companies and, if anything, will speed up the process. It may then be just a matter of time before these independent business units gain their own sales forces, industry watchers said.

"If it were me, with this sense of crisis, I'd make that happen on Jan. 1, 1994," said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "They need their own sales forces."

IBM executives, especially marketing head Robert LaBant, have repeatedly insisted that this will not happen because customers reacted so negatively the last time around. Many observers said it is inevitable, although most customers still intensely dislike the idea.

"I am very concerned about that possibility," said Michael Jecko, vice president and director of information systems at The Rouse Co. in Columbia, Md. "The upside of that is you're dealing with more focused people, but I have always felt we received good service from dealing with one person."

Indeed, that is the rub. "IBM spent most of the 1980s trying to recover from the problems of having independent sales forces," said Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Plenty of elbow room

"Still, it is difficult for one sales force with hundreds of products in its bag to compete on a skills basis against a Xerox printer or Storage Tek disk salesperson." Gens suggested there is room for something in between a large, generalist sales force and one that sells only PCs.

There will likely be some shorter term fallout from Akers' resignation. "Obviously, IBM competitors will be doing everything they can to get business away from IBM," said Charles Casale, chairman of the Aberdeen Group in Boston.

"The whisper campaigns have already started: 'Gee, they may not be around next year.' And of course it's the ultimate irony because it's the same fear, uncertainty and doubt that IBM used for years on everyone else."

Correspondent Thomas Hoffman and staff writer Lynda Radosevich contributed to this story.

THE AKERS LEGACY

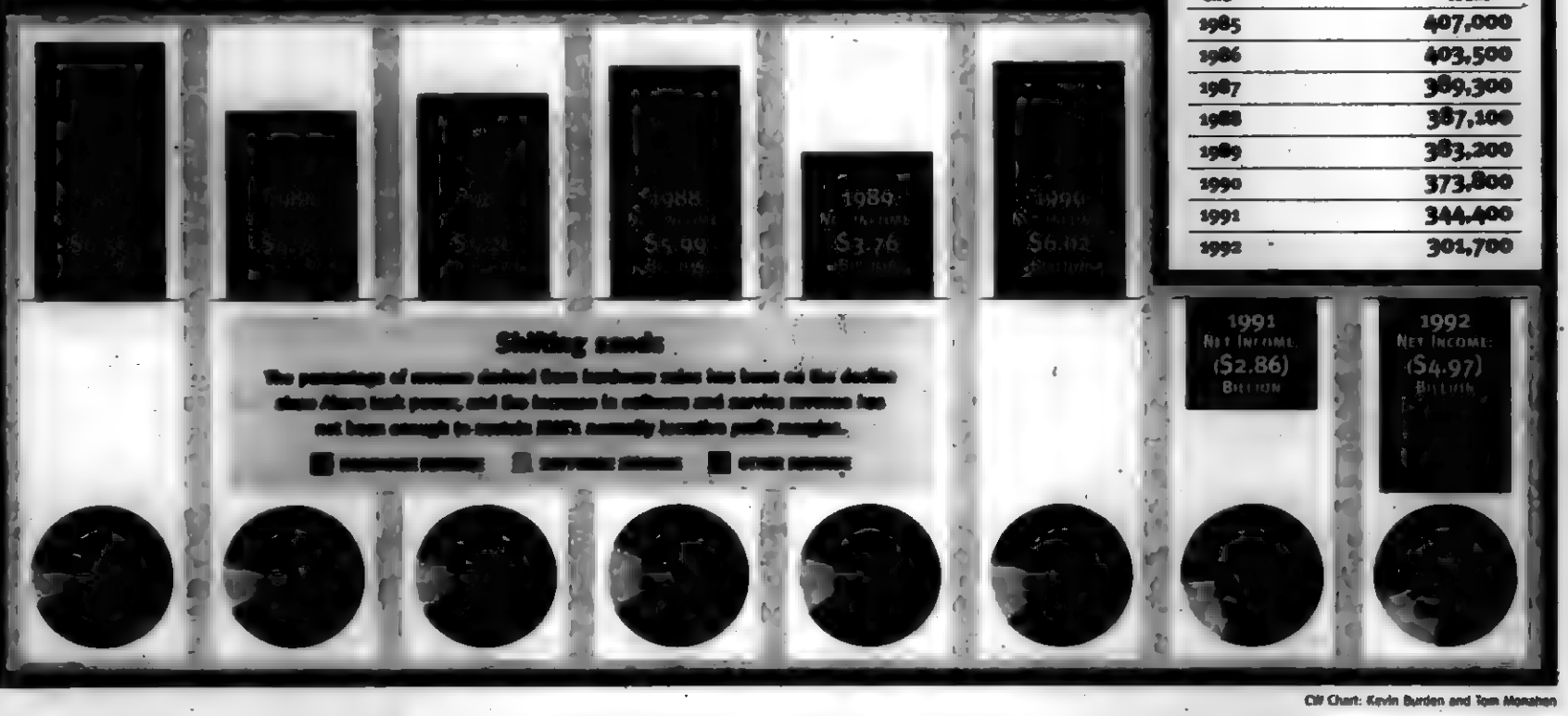
- Joined IBM in 1960.
- Promoted from senior vice president to president in February 1985, became CEO in February 1985 and assumed the chairmanship in June 1986.
- In 1988, he began a reorganization into lines of business that over time will spin IBM into separate companies.
- Under his watch, a series of technology blueprints emerged, starting with SAA, designed to address incompatibilities and shortcomings across IBM's multiple architectures. Except for Information Warehouse, none had a real impact on customers.
- Akers did not move quickly enough, many believe, to cut corporate fat and focus the company in growth areas such as software and services. Losses began to mount in 1990.
- He resigned January 1993 amid pressure from stockholders and others.

IBM

We're outta here . . .

Since 1986, IBM has initiated 67 different voluntary incentive programs that have reduced headcount by more than 65,000 employees. Managers alone have decreased from 50,000 to 36,000.

Year end	Employee count
1985	407,000
1986	403,500
1987	389,300
1988	387,100
1989	383,200
1990	373,800
1991	344,400
1992	301,700



Clif Chart: Kevin Burden and Tom Monahan

Speculation rife on outsider as IBM CEO

By Johanna Ambrosio

The buck stopped with John Akers, and so will the time-honored tradition of selecting IBM's top executive from within the ranks of the company. The troubled giant's next chairman will most likely be from outside IBM, industry watchers said.

"They do need to go outside," said James F. Moore, president of GeoPartners Research, Inc., a Cambridge, Mass., consulting firm. "Everyone senses intuitively that they need someone who can symbolize change."

But the agreement ends there. Some analysts argued for someone with solid computer industry experience who has run — and changed the culture of — a multinational corporation.

Candidates include executives such as former Hewlett-Packard Co. Chief Executive Officer John Young and AT&T's Robert Kavner.

Financial genius

Others said it is more important that IBM's next top executive be a tough-minded financial and operational whiz, preferably someone from another industry who could bring an entirely new perspective and help the listing giant focus on new markets and lop off unprofitable ventures.

One potential candidate is John Welch of General Electric Co., who successfully restructured that multibillion-dollar conglomerate by jettisoning businesses in which the company could not successfully compete and investing in those the firm could dominate.

Regardless of who lands the chairman's job, an IBMer may well get the No. 2 spot. This could provide an incentive for the current crop of IBM talent to stay put and would help ensure an orderly transition from the old regime to the new.

Any one of a bevy of newly minted senior vice presidents — PC chief James Cannavino, telecommunications head Ellen Hancock or mainframe guru Nicholas Donofrio — is capable of filling this role.

A seven-person executive search committee, comprising IBM directors, is expected to make its selection in time for IBM's annual meeting in April.

An ideal candidate would have turnaround expertise. For this reason, Unisys Corp. Chairman James Unruh has been mentioned as a dark horse.

However, finding a highly qualified non-IBMer to take the job may be difficult. "The guy who assumes this position assumes high risk," said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "Folks who are CEOs or ex-CEOs have success stamped on their forehead, and the guy who takes this job must face the fact that he might not succeed."

Corrections

Because of an editing error, the article "Point, Click and Play," [CW, Jan. 18] quoted Jonathan Handler as saying he liked OS/2 and Windows for their multithreaded, multitasking capabilities. In fact, the reference should have been to OS/2 and Unix. *Computerworld* regrets the error.

Clarification: Grammatik, the grammar checking software that WordPerfect Corp. recently acquired from Reference Software International, is bundled with Lotus Development Corp.'s Ami Pro 3.0 and Microsoft Corp.'s Word for Windows only in France; in the U.S., it is bundled with WordPerfect for Windows 5.2.

Because of a reporting error, the electronic-mail address for The Corporate Facilitators of Object-Oriented Technology was incorrect in the Jan. 25 issue. The correct address is rmarcus@atc.boeing.com.

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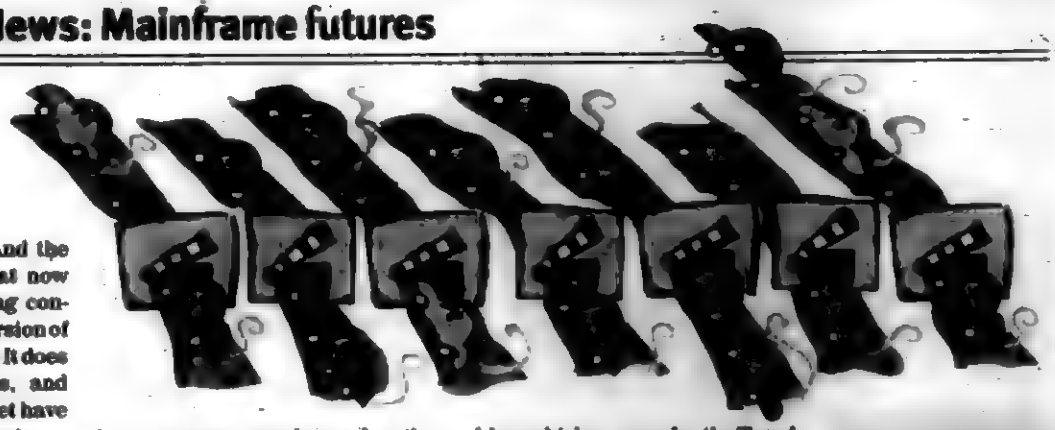
Users taking slow road



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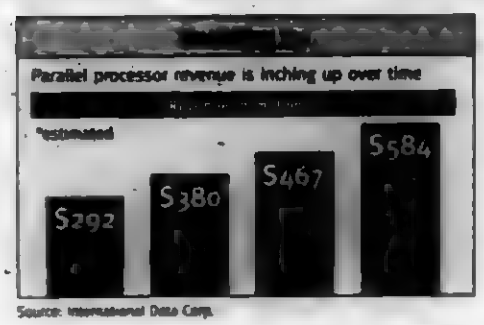
These new microprocessor-based engines offer raw computing performance equivalent to or better than today's mainframes — at a lower cost. For example, current mainframe alternatives from companies such as Hewlett-Packard Co. are selling for as low as $12,000 to $15,000 per million instructions per second (MIPS), while an IBM-class mainframe has a street price of between $50,000 to $55,000 per MIPS, said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn.



Source: International Data Corp.

The hardware direction and its price/performance advantage are clear. But the future large-system platform does not yet provide an answer to IS' burning question: How do you get there from here?

"Very slowly," said Howard Richmond, a director of high-performance computing research at Gartner Group.

The potential rewards of this new generation will be hard won, added several IS executives, computer makers and industry analysts interviewed recently. In short, tremendous software barriers still exist, so most IS shops will have to take small steps toward the new hardware.

But the real dilemma is that the most robust large-system commercial software in the world, IBM's MVS, was not designed to accommodate a full-blown parallel processing architecture. And the operating environment that now handles parallel processing configurations — typically a version of Unix — has two drawbacks: It does not run MVS applications, and even if it could, it does not yet have the full suite of sophisticated systems management tools that are MVS' hallmark.

So, if a customer wants to stay with MVS as the company moves to parallel processing it will have a long journey ahead. IBM will provide dedicated engines as it works toward creating a parallel processing version of MVS, but this is a huge task. Traditional rivals, Amdahl Corp. and Hitachi Data Systems Corp., also have parallel processing projects in the works.

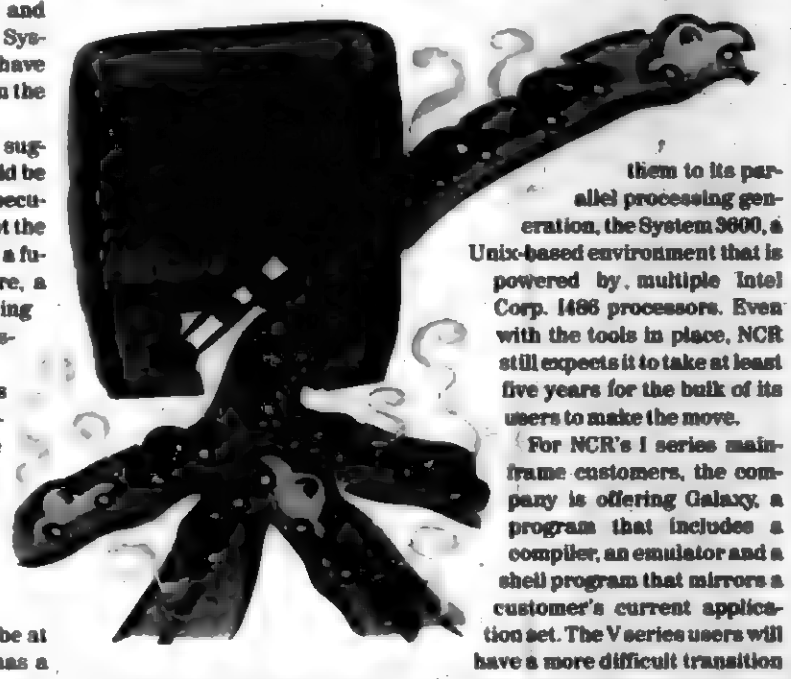
Some analysts have even suggested a brand-new MVS would be required, and at least two speculated that IBM may try to adopt the micro-kernal architecture for a future version. The architecture, a layered approach, is being adapted for its desktop systems.

The current MVS needs work in several key areas, analysts said. For example, the JES component needs a major overhaul so it can juggle work loads that are split among dozens, even hundreds, of processors, Cassell said.

Most observers said it will be at least two years before IBM has a general-purpose version of its 390-based parallel processing engine. Furthermore, they expect users will keep varying degrees of conventional processors in their large-system complexes for the rest of the decade.

"There will be certain applications that will lend themselves to parallel processing and certain ones that don't," said Tom Loane, vice president of IS at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "That's why we will have collections of different engines slung together."

And, if a customer wants to take advantage of a non-IBM platform today, he will take on the risk factor of a less-robust operating environment and the daunting task of converting applications to the new operating environment. Observers said the exception is typically when a user is involved in a re-engineering project and is overhauling software and hardware requirements anyway.



But to avoid the possible pitfalls of moving a standard application to a non-IBM parallel processor, several early adopters of these new engines are using them in conjunction with a mainframe host environment. Such is the case at Kmart Corp., where a database machine from Teradata Corp., now owned by NCR Corp., is successful at processing massive databases but still relies on the host for system services and application processing.

"To my mainframe systems, it looks like a tape drive," said Ed Spreder, director of operations and technical services at Kmart.

Spreder said the database machine, which runs under the Teradata Operating System, does not have a scheduling methodology equivalent to the MVS. While his vendor "has promised to give us as much help as possible," Spreder's staff is required to manage the data engine's work load.

Ultimately, users will have little choice but to slowly evolve to the new generation because of the software hurdles.

NCR is proof of that. The company is already providing its installed base with tools to move them to its parallel processing generation, the System 3600, a Unix-based environment that is powered by multiple Intel Corp. 1486 processors. Even with the tools in place, NCR still expects it to take at least five years for the bulk of its users to make the move.

For NCR's I series mainframe customers, the company is offering Galaxy, a program that includes a compiler, an emulator and a shell program that mirrors a customer's current application set. The V series users will have a more difficult transition because of the older technology on which that mainframe is based. Currently, NCR provides connections to link the System 3600 with the older equipment. It is working to improve communications tools, added Ben Barnes, an assistant vice president of worldwide marketing at NCR.

While vendors slowly shift the software environments to these new hardware platforms, users will move forward cautiously. Gartner Group's Richmond estimated that about 20% of the IBM mainframe world will seriously evaluate parallel processing technology this year.

"The concepts of parallel processing make so much sense on paper," said Michael Burwen, president of Palo Alto Management Group, Inc. "But, there are a number of barriers to use those systems, and at this point, it isn't clear if the barriers will be overcome in this decade."

Parallel processing in the mainstream

IBM: Will release parallel processing engines based on a microprocessor version of its 390 technology. Also plans to deliver high-end systems based on its Power RISC chips.

IBM's long-term plans: Massively parallel machines with 500+ microprocessors performing at speeds measured in floating-point operations per second and handling more than 1 billion FLOPS.

Amdahl: Building a mainframe-class system based on Sun Microsystems, Inc.'s Scalable Processor Architecture chips. Also plans an "IBM-compatible" machine with CMOS processors.

Why are mainstream vendors moving to parallel processing machines?

"If we don't improve the price/performance in light of the other technologies that are out there, the balance between centralized and desktop computing will lean more to the desktop," said David Anderson, Amdahl's vice president of compatible products.

Hitachi: Will not provide details other than to say many projects are in the works.

The little database engine that could

Commercial parallel processing is finding a home in the database end of IS operations because a database is one of the easier mainstream applications to do in parallel.

Typically, multiple simultaneous queries hit a database, and they are often self-contained or unrelated requests. As a result, the database can more easily be split across several processors. Much of the Teradata technology was used to make the more general-purpose NCR 3000 series of parallel processing machines. And IBM will likely grow its database engine to a more general-purpose machine.

In contrast, many core IS applications, such as financial programs, were written so the completion of one task was dependent on the results of a previous task. This sequential operation requires a single processor to rapidly fire through each task in a given order.

—*Rosemary Cafasso*

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[illegible] Printers [illegible] Thunder

Compaq's new low-cost, high-speed PageMarq laser printers should give the Hewlett-Packard LaserJet IIIsi a run for its money. The PageMarqs fix the major deficiencies of many earlier network

–PC Week, September 7, 1992

Compaq's Pagemarq Series of [illegible] users just about anything they could want in a reasonably priced line of network printers.

–PC Magazine, December 22, 1992

and best of all, a fax-modem board that turns the printer into a plain-paper fax that can receive faxes even as it handles incoming print jobs. [illegible] is included that [illegible] DOS PC

– Macworld, January 1993

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> [illegible] a desktop-publishing docum[illegible] that contained mixed text and graphics, the PageMarq 20 was almost 100 percent faster than the LaserJet IIIsi, while the PageMarq 15 ran about 50 percent faster than the HP printer.
>
> *—PC Week, September 7, 1992*

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> [illegible]
>
> According to analysts at BIS Strategic Decisions in Norwell, Mass., the Compaq printer has scored a bull's-eye. "Its kind of features are state-of-the-art. They've
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> *—Computerworld, September 21, 1992*

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> [illegible] bringing a printer to the network printer market after listening to its most important resource: its customers. The PAGEMARQ series is a direct result of users' wants and needs.
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> *—BIS Special Report, August 1992*

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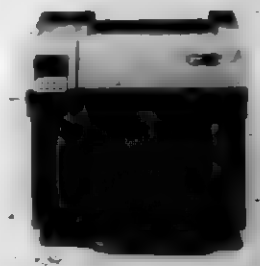

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Microsoft woos IS, offers flexibility

CONTINUED FROM PAGE 1

at Northern States Power Co., according to Dick Elhardt, administrator of information services for the gas utility in St. Paul, Minn.

The old system required that each building at Northern purchase a separate license, which was difficult for Elhardt to sell to Northern management. Now, because Microsoft Select enables Northern, a program beta-test site, to have one contract for the entire company, "it's so much easier for us to administer," Elhardt said.

It does not hurt that Microsoft is working directly with Elhardt's reseller, DCT Entre, to provide license-tracking services. DCT installs the software for Northern and reports the number of licenses purchased back to Elhardt.

"All I have to do is pay the bill," Elhardt said. In fact, this setup spares him having to track all the licenses himself and leaves him eligible for volume purchase discounts.

Among the current LARs are Corporate Software, Inc., Computerland Corp., Egghead Discount Software and PC Plus Ltd.

A user at a large western utility provides one example of how Microsoft Select can be implemented. This company has worked out an arrangement with its reseller whereby each time a preconfigured machine is purchased, the software licenses are added to the company's overall tally. And when users of existing systems need to purchase a license, they simply send a request to the reseller and copy the software to their PCs.

The user company receives a monthly report on the number of licenses installed and in turn, reports a quarterly figure back to Microsoft.

According to this user, the most important aspect of the arrangement is mutual trust. The reseller must report the licenses accurately and on time, and Microsoft must trust its customers to do the same — something the company seems willing to do.

Despite some early enthusiasm, the program is far from perfect, according to some Microsoft users who asked not to be named. Of particular concern is the fear that having to make two-year projections will lock customers into Microsoft products and reduce flexibility in purchasing decisions.

Rivals take action

Microsoft's rivals haven't been sitting on their hands. Borland International, Inc.'s Evaluate, Adopt, Standardize Easily (EASE) program encompasses prerelease availability, volume purchasing discounts and software maintenance. Others, including Lotus Development Corp., are reportedly working on similar programs.

The program is also viewed in some quarters as most beneficial to those companies that standardize fully on Microsoft products and therefore receive the biggest benefits.

"We're still not pleased with the program," said Dave Ness, consulting services manager at the *Washington Post*. "It requires too big a hit and too much of a commitment."

Part of that commitment is the projected purchasing plan. For example, if a Microsoft Variable License Pak buyer does not hit a preset percentage of projected sales in the first year of the contract, the discount is cut back on all further purchases, although previous purchases are not affected.

The situation is slightly different for Microsoft Enterprise License Pak customers: If they do not meet the projected number of licenses, they are required to purchase the remainder at the end of the contract.

Several early adopters commented that most large companies need to standardize on software products if they are to keep support costs reasonable. As such, the projections are not unreasonably difficult to make.

Senior editor Michael Fizzard contributed to this report.

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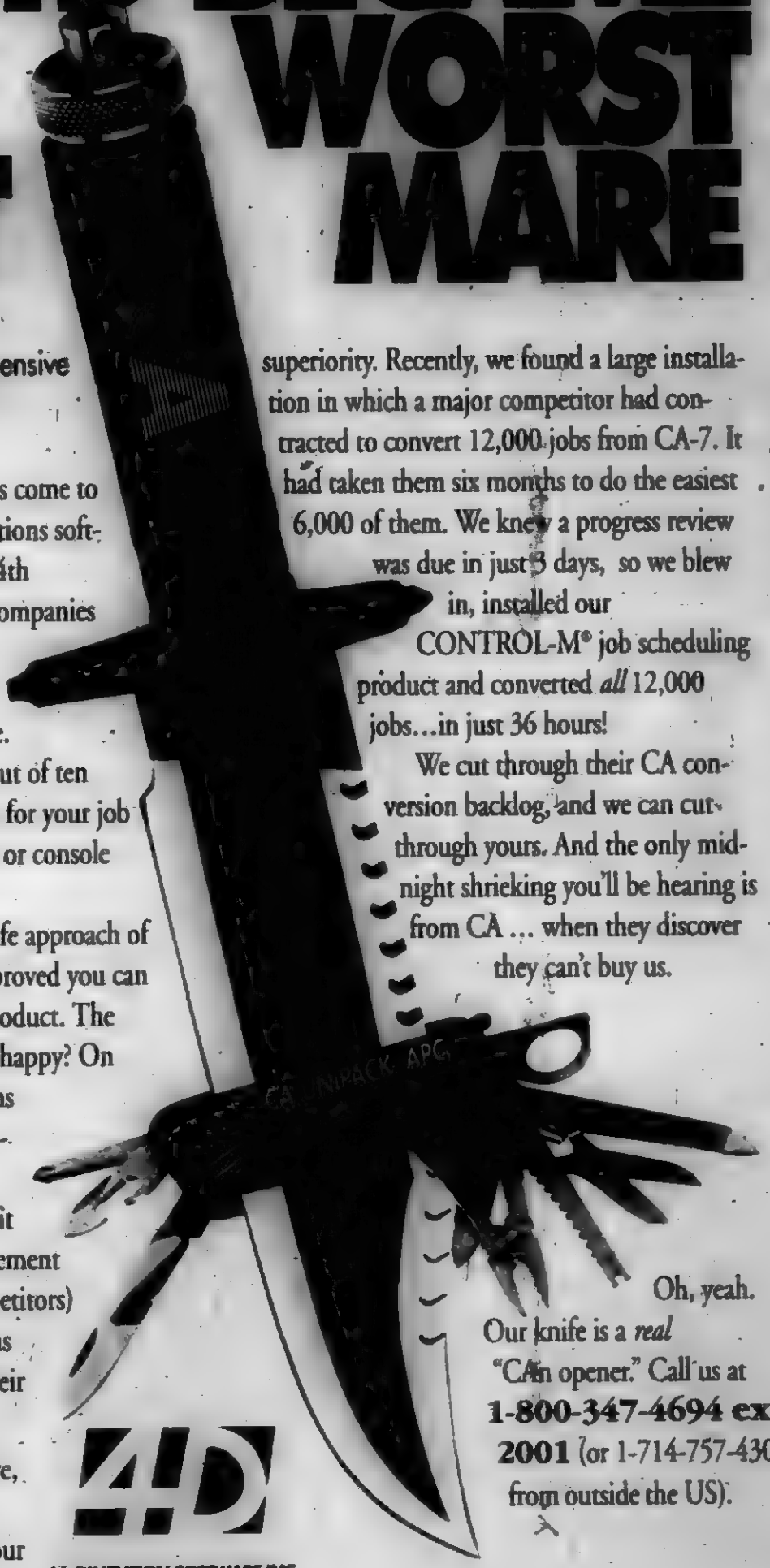

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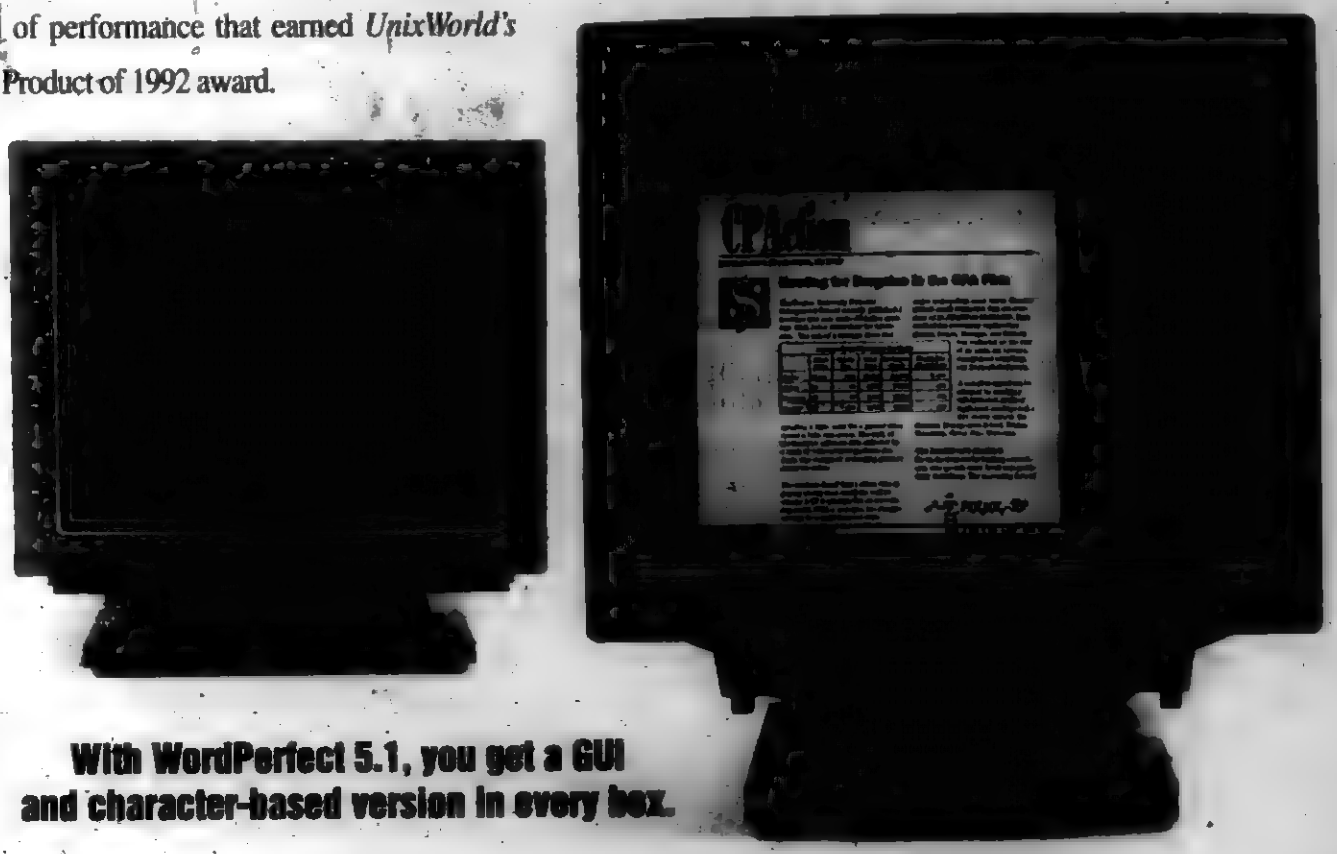

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Microsoft, Infonet target software tracking

By Michael Vizard
SEATTLE

Microsoft Corp. last week partnered with Infonet Services Corp., a provider of wide-area network services, in a distributed systems management effort designed to simplify the distribution and tracking of PC applications software.

Code-named Hermes, the Microsoft systems management project uses Microsoft's SQL Server database running under Windows NT to track the configurations and software running on every PC on the network. An information systems director would then make use of the functions in the NT distributed operating systems to download PC applications to clients on the network.

Only one copy of Hermes will be required per company, according to Dave Berry, product manager for Microsoft systems management technology. That copy of Hermes records a script for every client on the network, which is linked to code running on the PC that sends configuration data to Hermes. Using this technology, Microsoft will make it much easier to administer its recently announced Microsoft Select program (see story page 1).

Appealing prospect

"The idea is extremely intriguing. It would give me virtually unlimited access to my network nodes worldwide," said Brian Anderson, director of information services at Trans Ocean Ltd., a leasing company for container ships in San Bruno, Calif.

"We have a lot of small offices worldwide that we can't afford to have a system staff for. Upgrading software at these offices frequently involves getting on a plane, which usually happens three to four times a year. Hermes would eliminate a lot of those trips," Anderson said.

Eventually, Anderson said, he expects to see Hermes tied into a network management console, which would allow him to perform systems and network management tasks from the same console.

Berry added that he expects Hermes to be used to allow people to travel to remote offices, log on to servers at their home office and have the remote PC dynamically reconfigured to match the configuration of the PC in their home office.

Hermes is scheduled for availability at the end of this year. Pricing has yet to be determined.

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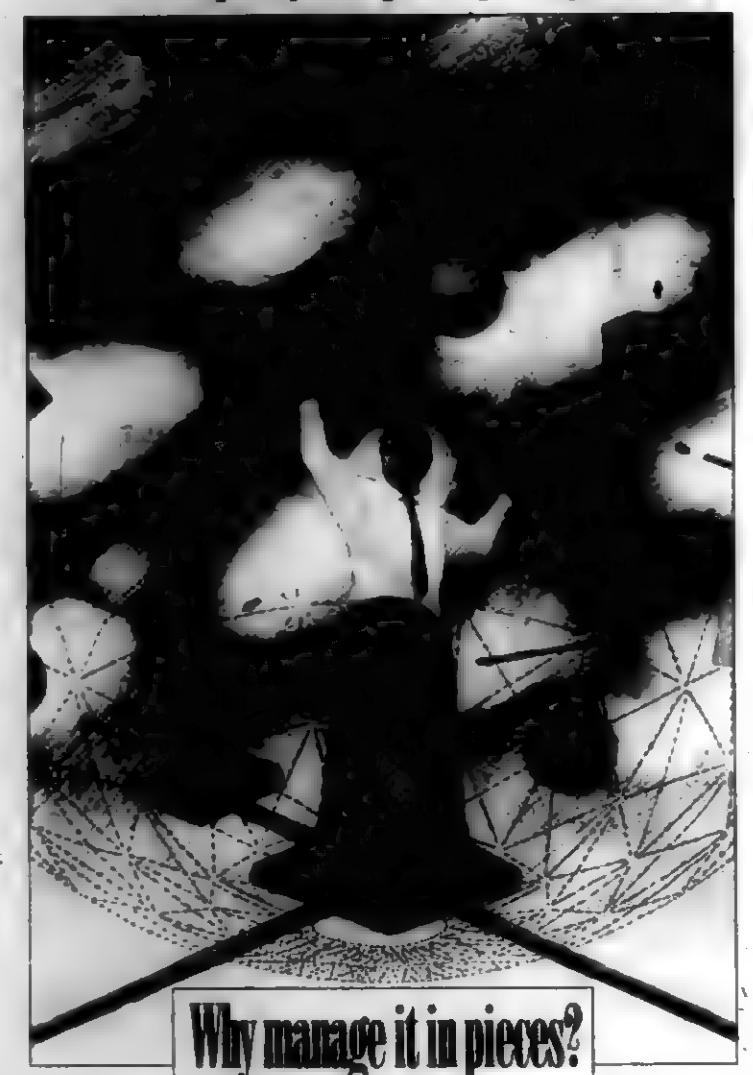

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3Com spearheads partnership to standardize support

The internetworking industry took strides last week toward reducing vendor fingerpointing and ensuring multivendor product interoperability *before* customers sign on the dotted line.

A technical support alliance spearheaded by 3Com Corp. in Santa Clara, Calif., has emerged to encourage hub, router and bridge vendors to coalesce around a standard level of service and support.

The move parallels Novell, Inc.'s formation in 1991 of a vendor group charged with fostering cooperation among suppliers whose products run on NetWare.

Companies that have joined 3Com in the partnership so far include Hewlett-Packard Co., IBM, Proteon, Inc., SynOptics Communications, Inc., Ungermann-Bass, Inc. and Wellfleet Communications, Inc.

3Com said it expects the alliance members — slated to meet for the first time at the Interop show next month — to begin elevating the internetworking vendor community's level of expertise and code of conduct by this summer.

Meanwhile, 3Com unbundled two of its professional services — network design and survey/mapping — from its turnkey package to give users more variety in their service and support choices.

— Joanie M. Wexler

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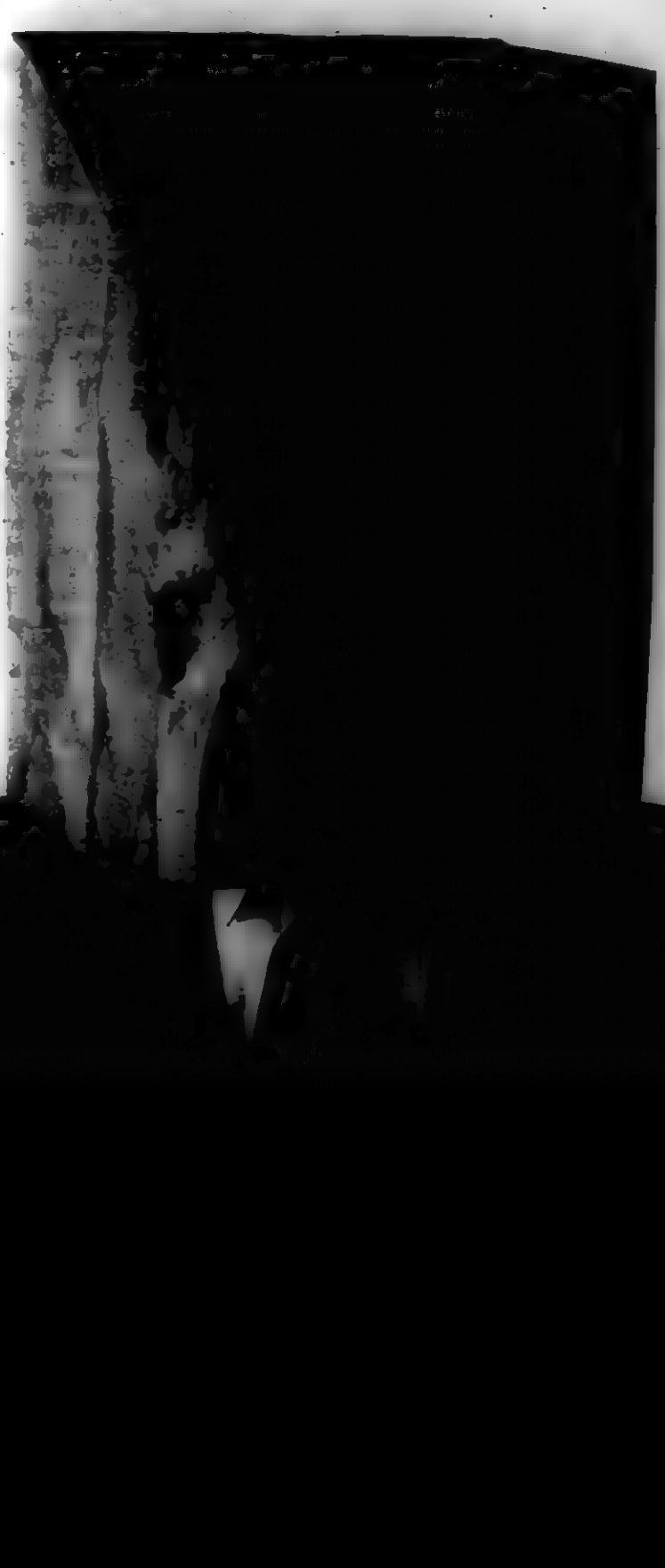

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Technohumanities 101

Scholars are pushing computers in the humanities far beyond their traditional roles

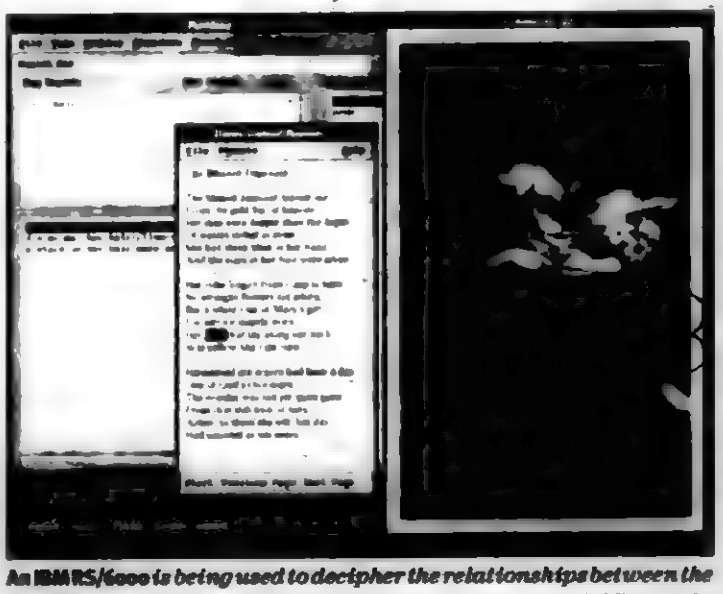
By Gary H. Anthes

It was an integrated yet open environment, one that facilitated the interactive flow of information across disciplinary boundaries.

A recent implementation of peer-to-peer computing? No, Thomas Jefferson called it an "academical village" — the University of Virginia at its birth 174 years ago.

"If you had told me 18 months ago I'd be excited about computers in the humanities, I'd have said you were crazy," said William Wulf, a computer science professor at the university and chairman of the committee whose work led to the creation of the Institute for Advanced Technology in the Humanities three months ago. "I had the image they were all technophobes."

That was before Wulf met history professor Edward Ayers, English professor Jerome McGann and a few others on campus. Ayers, McGann and a handful of scholars at other universities are pushing computers in the humanities far beyond their traditional roles as word processors. According to Wulf, "I think you'll see as dramatic a change in the methods of humanistic scholarship [as a result of computers] as we have seen in scientific scholarship. Just as in the sciences, you're going to be able to ask questions you never even thought of before."



An IBM RS/6000 is being used to decipher the relationships between the paintings and poems of 19th-century artist Dante Gabriel Rossetti

Textbook of the future?

Ayers is writing a book about the Civil War that contrasts life in two opposing Shenandoah Valley towns — one in Virginia and one in Pennsylvania. But this is no ordinary book; it is a key to a library. In addition to the traditional text, readers — perhaps they should be called "users" — will have access to all the information that Ayers used in his research for the book. That will include 30 years of census data on tens of thousands of residents of the two communities, the military records of 10,000 soldiers, images of local newspapers of the day and detailed three-dimensional county maps.

"You come to a footnote and you click on it," Ayers explained. "Instead of getting the name of the newspaper from which I had drawn a quote, you can see the entire paper. Or you could click on a person and see where he lived on a beautiful color map."

Or, readers might elect to do some pioneering research of their own. A reader could, for example, construct queries such as, "Were poor Southerners more likely than Northerners to desert?"

According to Ayers, the importance of this technology goes far beyond the sheer fun of being able to transcend the fixed, printed word. "The old paradigm was that every thought that's in a book someone else has already had. Here, there's going to be a lot of stuff I didn't pursue. I have no doubt that this will revolutionize the way scholarship is done."

Indeed, the power of computers applied to newly digitized texts is literally turning into one-day undergraduate exercises what previously might have been the basis for a doctoral dissertation.

Classic applications

For example, classical studies professor James O'Donnell, coordinator of the Center for the Computer Analysis of Texts at the University of Pennsylvania, recently unearthed a 400-year-old translation error in St. Augustine's "Confessions" by electronically scanning all 5 million words written by the fourth-century bishop.

O'Donnell had wondered about a word used in the translation but was surprised when the computer told him it was used solely in the suspect translation. "The likelihood that he used the word exactly once in his life is quite low," O'Donnell said. He has now proposed a better translation, one he said is generally accepted by other scholars.

Professor McGann is using an IBM RISC System/6000 to untangle the complex relationships between the paintings and poems of the 19th-century artist Dante Gabriel Rossetti. Rossetti wrote sonnets interpreting his paintings and painted pictures about the sonnets. He also sketched and copied his pictures, photographed them and sometimes changed the faces of the people in them from one version to the next. In addition, multiple copies and translations of his poems exist, many annotated by his hand and others.

McGann is putting together a "hypermedia research archive," a body of graphic files and texts organized in hypertext fashion. The picture files contain archival and critical information about the paintings and drawings, and the archive is linked to a database containing the 22-volume *Oxford English Dictionary*.

Users of the Rossetti Archive, which is envisioned by its creator as a 15-year project, will be able to select and display for comparison in adjacent windows any combination of color images of paintings, bit-mapped images of original handwritten pages or transcriptions of those pages. Users will also be able to produce their own unique "editions" of Rossetti's works — a collection of sonnets about medieval Italian painters, for example.

The ability to quickly find and compare elements in Rossetti's works will enable insights that would be difficult or impractical to achieve by more conventional means, McGann said. "This ... represents a major innovation not only in textual theory and text management, but ultimately in the whole way the study of literature will be conducted," he said.

Not your ordinary software

"Issues in the humanities are more subtle and more complex than they are in the sciences, and the amount of material you need to do anything worthwhile is much larger," said William Wulf, a computer science professor at the University of Virginia.

"Computers are just getting powerful enough to deal with these issues."

Indeed, technology is just reaching the critical mass needed to give a quantum boost to the productivity of humanist scholars.

One key to making the dreams of the technohumanists come true is Standard Generalized Markup Language (SGML), a scheme for "marking up" information by "tagging" it to define its purpose. Without SGML tags, ordinary word search software cannot distinguish "baker" the profession from "Baker" the author, for example.

More and more text databases are being offered with SGML tags, relieving users of the tedious task of marking up their documents.

Later this year, WordPerfect Corp. will introduce a conversion program that will convert text files into SGML format in accordance with industry-standard or user-defined rules.

Along with SGML, electronic networks containing on-line catalogs and databases, multimedia functions, relatively cheap mass storage for graphics and images and powerful workstations are redefining centuries-old research methods.

— Gary H. Anthes

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Starting over

I interviewed IBM's outgoing chief executive officer twice following his ascension to the top office, and each time John Akers offered up a clear vision of what IBM needed to do to prosper. Either he didn't follow his own advice or his instructions were not carried out. Nonetheless, it was good advice. Maybe someone else can put it to use. Here's a sample:

"For 75 years, certainly for the past 25, IBM has had a remarkable performance in business success. That success tends to have a management team not wanting to tamper with what's in place. What had to happen for this enterprise is to have reality come in and hit us on the head. Reality has hit us on the head."

"I think the cold, hard light of day is upon us; we understand what we have to do, and we're working hard at it."

"The top management in American industry is constantly asking whether or not they're getting their return on investment in information systems. [The IS manager] has to help answer the question, and we have to help as well."

"The vast majority of organizational and management changes are in place today [January 1989]. You don't organizationally change a business as large as this one, as much as we have, without creating some disruption. There's been a feeling on the part of IBM people that we're on the right track — and then schizophrenia about more change vs. 'let's absorb what's already in place.'"

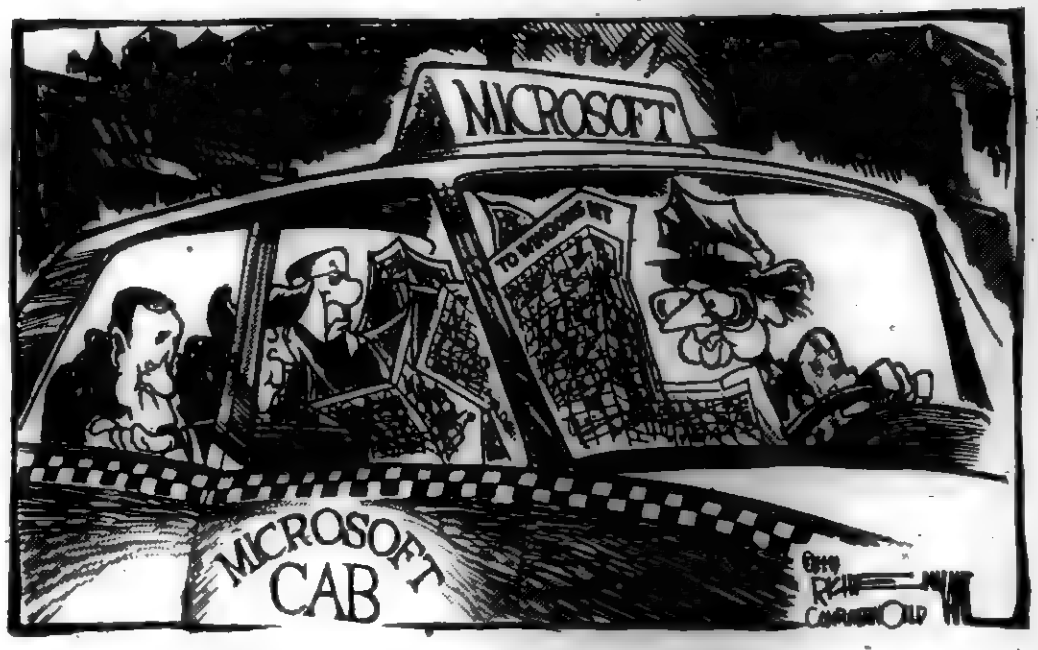
"What IBM needed to do better was to be closer and more in concert with our customers. We needed to have a better product line and we needed to be more efficient."

"We don't force anybody to do anything. We try very hard and sometimes better than others to develop products to make our customers the most satisfied of any customers."

The job "has been much more challenging than I ever would have thought."

"I have taken every job that IBM has been nice enough to give me, with a little fear and trepidation. I've tried to learn it and run as fast as I can so that I at least stay even with the challenges. And when I've gotten to the point where I think I know what I'm doing, I usually am asked if I'd like another job . . . and the thing starts all over again."

Bill Laberis, *Editor in chief*



What's the count?

In his Virus Watch column "Viruses ringing in the new year" [CW, Dec. 28, 1992/Jan. 4, 1993], James Daly stated the "unofficial DOS virus count is approximately 1,500." Something seems wrong. Virus expert John McAfee claimed "over 1,200 viruses" existed in spring 1992 and stated they grow by an average of 20 each week. This means we should have at least 2,200 viruses right now, not 1,500.

The press sometimes claims new viruses appear at an average of six each day. By those estimates, we should have about 4,500 distinct DOS viruses, not 1,500.

And we all remember the 5 million computers scheduled to die on March 6, 1992, at the hands of the Michelangelo virus. I cried when I imagined how one of every 16 PCs worldwide would suddenly go belly-up. But in the end they didn't, and I don't know why.

I wonder if inflated statistics had anything to do with it?

Rob Rosenberger
O'Fallon, Ill.

Fan of OS/2

After reading the column by Paul Gillin "Easy as 1-06/2-3" [CW, Jan. 11], I felt compelled to respond. I have long seen this type of writing in multiple publications describing negative experiences that, from my own personal experience with 2.x, are hard to believe.

I have been running OS/2 Version 2.x since IBM started the early beta-test programs two years ago. My experiences have been 90% positive.

The OS has been very solid for me in multiple environments.

There are many apps, tools and utilities available and coming. Every user I know of who has given 2.x a fair shot has happily dumped that other Intel graphical user interface in favor of OS/2. I no longer fight with DOS to squeeze out an extra kilobit or two of memory. With no effort, I have DOS sessions with 633K of available memory.

You have not lived until you have a 9.6K bit/sec. upload, a CPU-intensive task such as archiving with compression to a floppy, 32-bit application compile and a session with F15 Strike Eagle III running at the same time . . . flawlessly.

H. V. Belton
Plano, Texas

No more tears

Thank goodness for John Chisholm's courage in standing up to the crybabies of the software industry ["Stop whining and leave Microsoft alone," CW, Jan. 18].

I for one am sick to death of the half-baked excuses for software being peddled by vendors that spend too much money on lawyers and too little money building usable software. If we believed the likes of some vendors, there would be software nirvana if Microsoft were out of the picture. Maybe the crybabies should take the lead from Microsoft and produce quality software that fulfills real-world business needs. Until they do, I think I'll just stick with Mr. Gates and company.

Keith Stillinger
Atlanta

Multimedia: A successful trainer

What Paul Gillin failed to mention in his commentary "Don't be fooled by hype of multimedia [CW, Dec. 28, 1992/Jan. 4, 1993], is that the No. 1 use for multimedia systems today is computer-based training.

This is not pie-in-the-sky technology. Computer-based training is here, and more and more information systems managers are taking a serious look at it.

As IS managers are learning, the benefits are clearly measurable. Instead of bringing users to training centers, IS can bring training to the users. Moreover, content is always consistent. Users can also explore lessons individually, select topics related to job-specific functions and even measure their level of comprehension.

Gillin is wrongheaded to say that "multimedia is a marketing concept designed to extract big money from you for little benefit." Practical applications are available for those willing to look for them. And those applications are winning over the hearts, minds and budgets of IS managers.

Mike Seither
San Francisco

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Working with VANs: No easy passage

Cynthia L. Smith

Very little having to do with technology is as easy as advertised, and that is particularly true when it comes to electronic data interchange (EDI) and value-added network (VAN) providers.

EDI has become a buzzword. We continually see articles describing successes achieved with it, but we don't always hear about the struggles implementation can involve. To the layman, EDI sounds as simple as connecting to a VAN; but in reality, the road to EDI can be a long one, with quite a few rough spots. In fact, quite a few of those rough spots have to do with the VAN providers.

My company has worked with a variety of VANs, and our experience has been mixed. Contrary to what one might assume, the larger VAN providers usually give us the most trouble and seem to have less technical expertise. If you don't get hold of the right person, you are often out of luck. Customer service people are usually available but often aren't fully trained or really able to help.

One project in which we used a large VAN should have taken weeks but took months. As we tested the link, we began to encounter strange problems such as corrupted files and missing test files. The VAN provider was less than helpful in troubleshooting these problems, which meant our technical department had to spend time tracking down the cause.

The root of the problem turned out to be the type of link used. Although we had never been told this, it turned out that we were on an experimental-type X.25 link, which was not direct, did not work correctly and was unfamiliar to the VAN personnel. Once we found this out, we requested a more common and reliable type of connection.

We've also experienced problems with the interconnects between two large VANs. The VAN providers were not willing to follow up on their interconnects, so it was necessary for us and our trading partner to follow up on every transmission with both VANs to make sure the data actually made it through. This sort of checking can be quite time-consuming because VANs seem to have some difficulty tracking message traffic. A message transmission confirmed one day can disappear from the records the next.

No one expects these projects to be problem-free, but we expected more help. We were lucky to have a patient, helpful trading partner — one that was acquainted with the problems that can crop up and already inclined to give its less-than-helpful VAN provider the boot.

Although in both of the instances described (and many others) we have been able to establish successful, ongoing EDI connections, the process is frequently frustrating and prolonged — a far cry from the popular image. In fact, I know of one very large corporation that has geared up for EDI connection twice in the past five years and then backed off both times because of the difficulty involved.

I believe in the value of EDI, but I don't believe there is any benefit to disguising the facts. The reality is that implementing EDI can be challenging, and many VAN providers don't give the service they should. Keep that in mind the next time you read one of those glowing "success stories."

Smith is vice president of IS at Danzas Corp., a worldwide transportation company. She is based in Bellevue, Wash.

Tiptoeing through the outsourcing minefield

MIS PERCEPTIONS *by* Max D. Hopper

Outsourcing of some kind is now a foregone conclusion for most IS operations. These days, the relevant question for the majority of companies is not whether to outsource IS functions, but how much to outsource and to whom.

Unfortunately, many regard these as simple matters, mere "details," when in fact those details can really land a company in hot water.

Probably the biggest danger lies in the siren song of turnkey solutions.

Today, some companies are tempted by the ultimate extension of outsourcing — the "relax and leave it all to us" option. Allowing outsiders to handle the tactical implementation of your information technology needs is one thing, but permitting them to define what those needs are is quite another. Most, if not all, major companies' interests would be best served by retaining this strategic role. To farm this out is to risk "buying the farm."

At a minimum, a company should retain the functional equivalent of a CIO, who can direct vendor activities from an informed insider's perspective. Also, unless world-class solutions exist in the marketplace, the organization should consider retaining key application development responsibilities.

If your company is leaning toward any substantive outsourcing relationship, I would encourage you to assure yourself of the vendor's credentials in several areas:

- Recognized leadership in technology. The fact is that outsourcers often achieve their margins by lagging behind the technology curve.
- A client base and scope of operations that offer true economies of scale. It's a mistake to think that such economies are the natural outgrowth of all outsourcing arrangements.
- A thorough grasp of your business processes and proven expertise in your industry. The woods are full of generalists who know the buzzwords and not a lot more.
- State-of-the-art applications that promise to anticipate the evolving needs of your business. Otherwise, outsourcing is nothing more than a holding action.
- Willingness to provide you with the right of exit. The only way to have a win/win partnering situation is to have an arrangement that fosters an attitude of trust. You must have the ability to exit gracefully if the partnership does not work out as anticipated.

If no one vendor meets all these criteria — or even if one does, but you prefer to retain more functions yourself or to pick and choose "best of class" providers — another option would be to contract the company's IS needs cafeteria-style.

Choosing to employ the most qualified vendors in various functional areas, such as internal systems, commodity processing services such as billing and communications network services, is obviously a more complex route. It requires more management capabilities and probably dictates that you retain more of an infrastructure, but it also provides considerably more quality control.

As a business strategy, vending out noncritical IS functions is very much in tune with all the reorganization, downsizing and re-engineering efforts afoot today and a natural choice for companies that want to concentrate their resources on their real business.

Just be careful not to hand off more than makes sense or to underestimate the disruption that outsourcing can cause to your operations. These are not choices that can be made lightly.

Hopper is senior vice president of information systems at AMR Corp.

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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Charles Babcock

Mac pushed by Windows

Sometimes when I look at reams of data, an unanticipated image emerges, a snapshot in which the future is revealed. Such an image pops out of the latest survey by the Microcomputer Managers Association, and it bodes ill for the Apple Macintosh in corporate environments.

Invading the business stronghold remains a cherished goal of the marketing battalions at Apple. If client/server applications are needed in the business world, then Apple is ready to produce a server to work with Macintoshes, according to James Groff at Apple's Enterprise Systems Division. But such a server is likely to get a cool reception from its intended audience if our snapshot is correct.

It isn't that the Microcomputer Managers Association doesn't value the Macintosh interface. In fact, the majority of the 402 members who participated in the survey indicated that they believe it produces the highest user satisfaction of any GUI available. But micro managers may not have the luxury of opting for the most ardently supported interface. Only 40% said they expected the Macintosh to be a supported system at their sites 12 months from now, although 48% currently support it.

This is a 17% drop-off in Apple's favorite targeted market. If the Macintosh loses ground at this rate for six or seven years, its corporate presence will shrink to the point where it is supported only as a niche system for design, graphic arts and specialized desktop publishing.

Is it valid to draw such pessimistic conclusions from a single survey? I'd say so.

The average respondent to the Microcomputer Managers survey manages 685 PCs, and hence the attitudes of this group have the potential to reach deep into the corporation. Their responses show an escalating acceptance of Microsoft's Windows as they move beyond the version noted for its crashes. Since Version 3.1 began to supplant 3.0, acceptance has gone up at a rate that represents a tripling of sites.

This is not to say Windows 3.1 is the equal of the Macintosh interface. It may only do 80% of what a Macintosh can do, but that is probably enough to convince managers that it doesn't make sense to buy a Macintosh purely for the interface when something standard is so similar.

IS managers, sensing the expense of supporting a variety of GUIs, are beginning to impose a more rigid hegemony over what they will support.

"I put a PC running Windows 3.1 out among my Macintosh users and told them to find something on it that they couldn't do. I had no takers," the vice president of a San Francisco bank noted at the recent Windows/OS/2 Conference in San Jose, Calif.

In most instances, such a challenge would trigger the reaction one used to expect from taking a stroll down Snipers Alley in Sarajevo. The bank IS manager had a point, however.

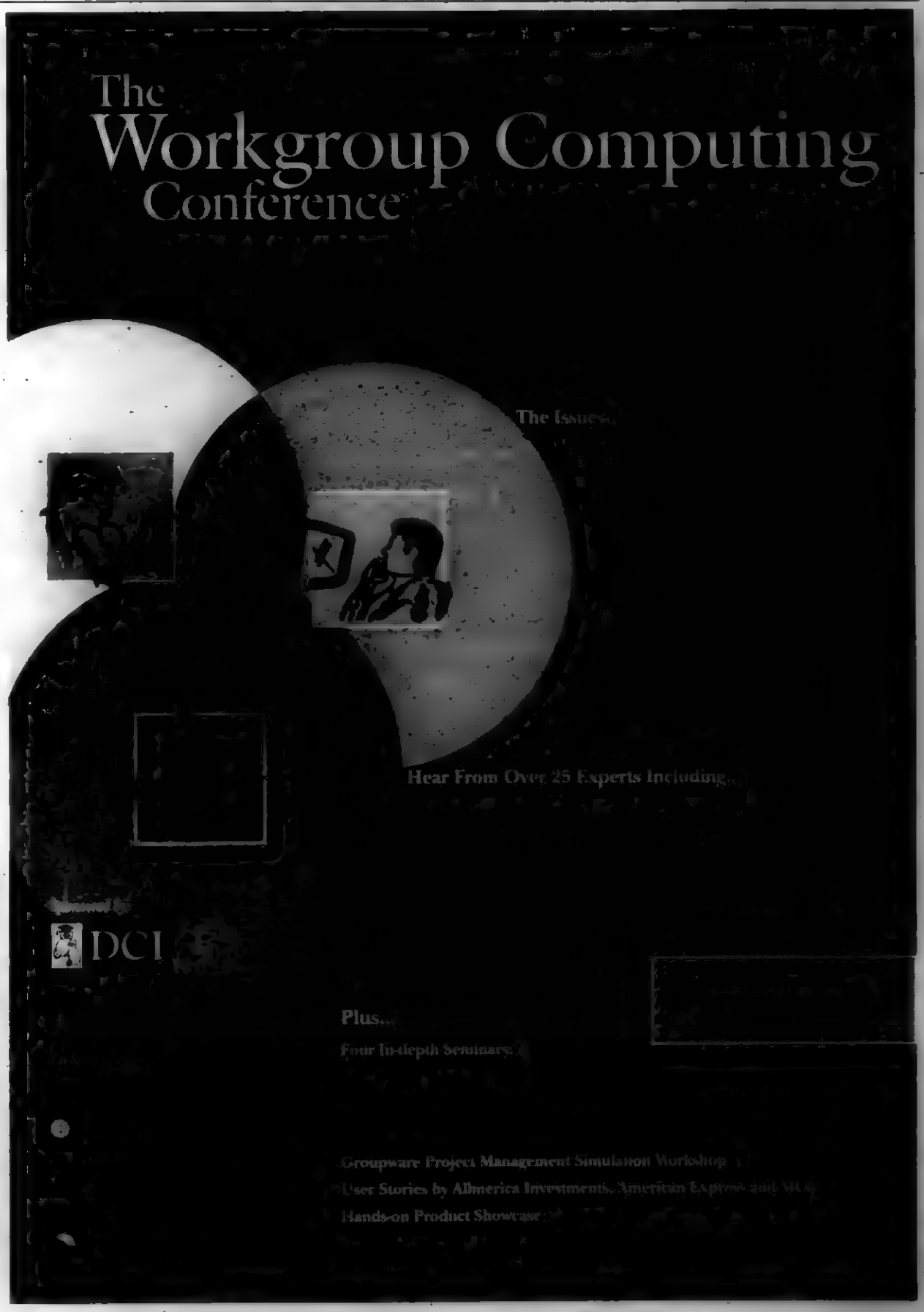
The expense of moving MS-DOS users to a GUI is greater than most users imagine, and the cost of moving to multiple GUIs multiplies that expense. There are hidden training costs to bringing users up quickly on an application and hidden support costs to keeping them expanding their repertoire. The study pegged these expenses at $3,286 per user.

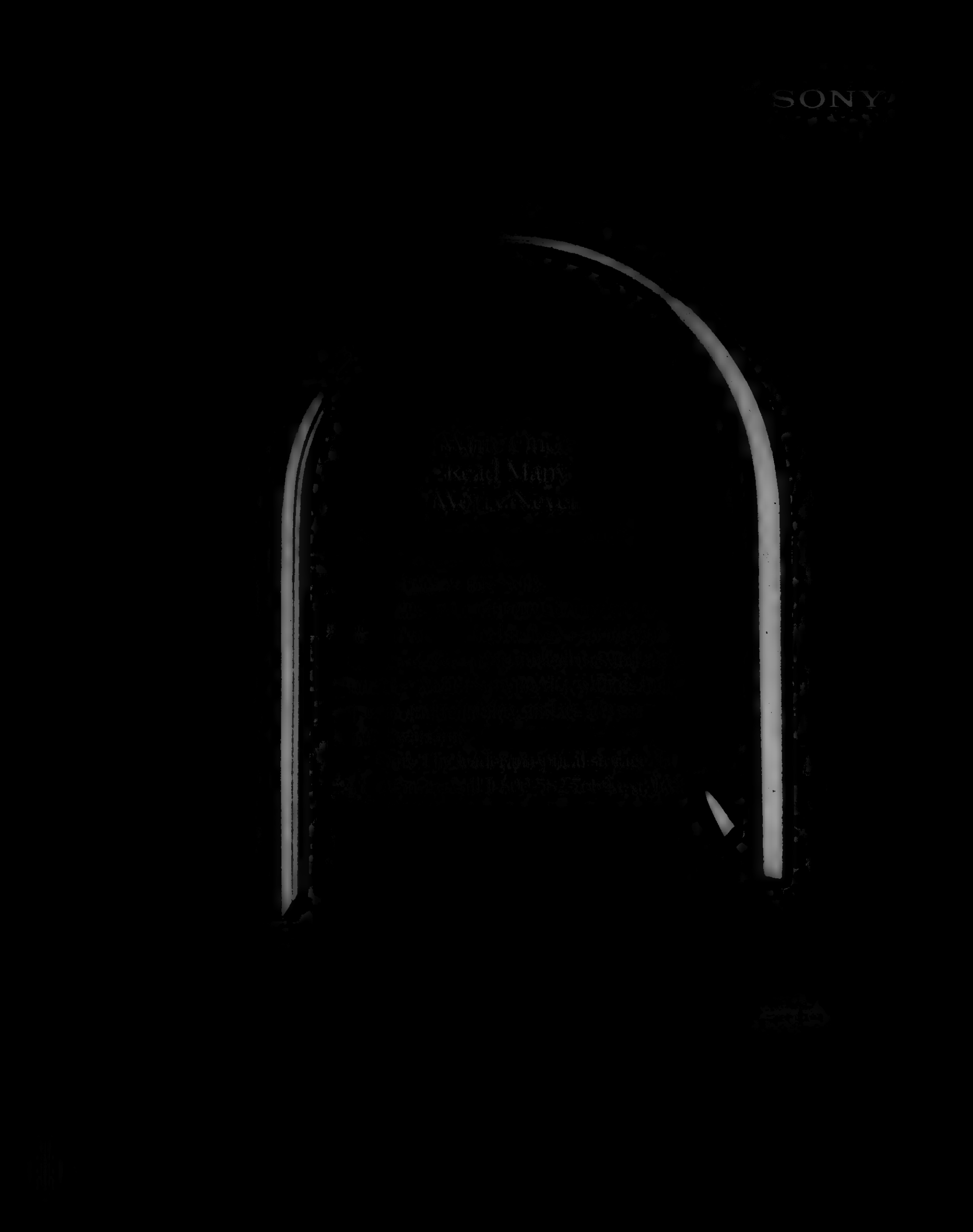
If microcomputer managers have a choice of satisfying most user needs with Windows, leaving isolated pockets of Macintosh users largely supporting themselves, how many new Macintoshes do you think they will endorse purchasing?

If an opportunity for spreading standard Intel-based PCs more widely through the company beckons, how long will PC managers or IS try to resist?

This is the threat that the improved Windows interface poses to the Macintosh, and it will start showing up soon.

Babcock is *Computerworld*'s technical editor.




SONY

Reservation systems

Travel agency looks to future system freedom

By Michael Fitzgerald
STAMFORD, CONN.

Being an information systems director at a travel agency is no day at the beach. In fact, it can occasionally look like jail, particularly at some of the many agencies that continue to get hardware and software for a single reservation system, such as AMR Corp.'s Sabre.

This is the case at McGregor Travel, Inc., a Top 50 travel agency. A longtime user of Sabre, McGregor has always had to accept hardware and software offerings directly from AMR, the parent company of American Airlines. Within the last year, though, the computerized reservation systems (CRS) were forced to allow agencies to buy data-line access without a commitment for hardware, and five-year contracts were reduced to three-year terms.

McGregor's contract with Sabre is entering its third year now, and the company is looking forward to upgrading from its current system to a more powerful one this year.

"We need to go to higher technology this year; we're constrained by what American provides us with," said Christine Sikes, director of MIS/accounting at the $50 million agency. For instance, she said, Sabre only last month said it would support memory management, which exists in versions of DOS after 3.0.

Myriad choices

McGregor now has several options: renegotiate with Sabre, accept only some pieces of the Sabre offerings (McGregor would probably buy its own hardware, for instance, instead of leasing from Sabre) or switch to a new carrier. The rival Apollo system, for instance, has offered Microsoft Corp. Windows support for two years, while Sabre said it will begin offering that support later this year.

Right now, McGregor uses a Sabre-supplied canned system based on a Data General Corp. MV 7800XP running AOS/VS.

The front ends are 25-MHz 386 PCs from AT&T, which was AMR's main PC provider until the airline switched to Grid Systems Corp. and other vendors last year. McGregor's 38 offices connect to the back-end system via a Sabre switching center in Tulsa, Okla. American has proposed moving the back-end system off the DG minicomputer and onto an Aviion workstation running Unix.

One of the benefits Sikes said she hopes to gain is greater functionality, sometimes through third-party applications. For instance, with Automated Travel Systems, Inc. in Katonah, N.Y., McGregor has designed Fact, a rate polling program to take advantage of certain airline pricing practices.

"Airlines will drop [low] fares into the market at 3 a.m. and weird hours like that and then pull them out 20 minutes later, so this program will grab the fare and book

Travel, *page 38*

McGregor's Christine Sikes: *'We need to go to higher technology this year; we're constrained by what American provides us with'*

Paul Gillin

Borland's crunch time

Philippe Kahn has called 1993 "a make or break" year for his company, and he's running Borland like he means it.

This week, Borland will kick off a limited-time promotion of its newly released Paradox for Windows database that will slash the price of the $795 product to $139. Borland will also affix a $99 price tag on Quattro Pro for Windows for the next three months. Borland calls the offers "promotional pricing." I call it a good, old-fashioned price war. In either case, it's the buyer who wins.

Kahn professes not to be worried about

Gillin, *page 36*

Docile drive market heating up

By Michael Fitzgerald

The almost nonexistent market for 1.8-in. hard drives is suddenly generating a lot of activity, with two companies making significant announcements recently.

Maxtor Corp., a large San Jose, Calif., maker of hard drives, entered territory once solely occupied by start-ups MiniStor Peripherals, Inc. and Integral Peripherals, Inc. by announcing the highest capacity 1.8-in drive: the 105M-byte MXL-105-III. Maxtor and the IBM PC Co. have publicly talked about IBM using the drives in environmentally conscious PCs due out later this year.

MiniStor, emphasizing the need for ruggedness in what it believes will be a highly portable market, announced two new drives, dubbed the MiniPort 42 and MiniPort 85 after their capacities, that can withstand twice the pressure of anything else on the market. Officials also said it will have "at least" a 130M-byte drive on the market in the second half of the year.

All of this is occurring in a market that will make up perhaps 400,000 of the 30 million hard drives sold in 1993, according to projections by Computer Intelligence/Infocorp, a research firm in Santa Clara, Calif.

"They'll still be fairly exotic by the end of the year," said Kathryn Hilton, program director at CI/Infocorp. Hilton said that as vendors such as Apple Computer, Inc. scale down their expectations for products like the Newton personal digital assistant, the likelihood that subnotebook products will sell in quantity diminishes. These products were expected to have the greatest need for 1.8-in. drives.

MiniStor, however, said other markets will fill the place of subnotebooks. It said it generated 25% of its sales last year from noncomputer systems. Hilton said she did not see this as a big market because of the price of the drives. "Why buy a $300 part for a machine that might cost $600?" she asked.

At the same time, she said the market should produce a 120% annual growth rate during the next several years, hitting 1.7 million units in 1995.

Maxtor's new drive uses the Personal Computer Memory Card International Association (PCMCIA) interface, while MiniStor's comes in both PCMCIA and integrated drive electronics versions. Both firms adhere to PCMCIA Type III.

"With PCMCIA, it ushers in a new generation of systems where you don't need an embedded hard drive," said Crawford Del Prete, an analyst at International Data Corp. in Framingham, Mass. Del Prete said the market for these sorts of portable drives may take off. He said that while companies such as Epson America, Inc. have attempted to push the removable hard drive concept in the notebook arena, "with the Epson approach, there's only one thing you can put in that slot. [With PCMCIA], you can put anything you want to put in that slot."

Viruses wave ebbs in February

By James Daly

The chill winds of February slow down a lot of things: how fast you get out of bed in the morning, how quickly your old Chevy turns over, your enthusiasm for late-night walks. Fortunately, they seem to have also temporarily diminished the number of destructive viruses set to go off this month.

But do not let that lull you into complacency. There will still be plenty of nuisance viruses around, according to the folks at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software.

The first of February's two sets of rogue code bent on hardcore destruction of data is set to launch tomorrow, Feb. 2. Its name is Marauder. It is a nonresident, direct-action infector of .COM programs, including COMMAND.COM. When an infected program is executed on this date, the virus will overwrite all files in the current directory. Marauder is an encrypted virus, so no text strings are visible within the viral code.

Another annoying set of rogue code is the Why Windows virus, which is a strain of the Swedish Boys group of viruses. It is a nonresident, direct-action infector of .COM programs, including COMMAND.COM, and it will infect one .COM program located in the current directory each time an infected program is executed.

The Why Windows virus attempts to delete the file WINDOWSWIN.COM on Feb. 23, 24 and 25. On Feb. 23 it will attempt to delete C:AUTOEXEC.BAT. On Feb. 24, it will attempt to delete C:CONFIG.SYS, and on Feb. 25, it will attempt to overwrite the C drive root directory and file allocation tables.

As with all viruses, their activation dates are for general awareness and are not exclusive. Many a skilled programmer can do a little tinkering under the hood to change a few lines of a code and make the virus go off whenever he desires. You know the rules: Scan any new disk before it is used and backup, backup, backup.

Viruses expected to activate this month

February 1, 8, 15, 22 Garfield, Exterminator, Bad Guy, Bad Guy 2	**February 9, 16, 23** Ah, Kamasya, Demon, Demon B
February 2 Ah, Kamasya, Demon, Demon B, Flip, Nuke, Marauder	**February 10, 20, 28** Day 10
February 3, 10, 17, 24 Victor	**February 12, 19, 26** Frere Jacques, Smack, Payday
February 5 Frere Jacques, Smack, Payday, Frog's Alley	**February 13** Monxla
February 6, 13, 20, 27 Finger, Phenome, Migram	**February 18** Form 18
February 7, 14, 21, 28 Sunday, Sunday 2	**February 25, 26** Skism, Skism-1
February 8 Taiwan	**February 23, 24, 25** Why Windows
	February 26 Sub-Zero B

Source: FIS Virus Watch — Off Chart: Michael Siggins

Gillin

CONTINUED FROM PAGE 35

Microsoft's remarkable success with the $99 promotional pricing of its Access database, but that has to be scaring Borland. Microsoft has sold between 500,000 and 750,000 Access licenses during the product's first two months on the market. That's nearly as much revenue as the entire PC DBMS industry brought in during the third quarter of 1992, according to Software Publishers Association figures.

Borland can't afford to lose its leading market share in PC database management. Kahn says he wants 50% unit share in Windows databases and 35% in Windows spreadsheets by the end of 1993, and my guess is that he'll fight a protracted price war to get it.

Ready for battle

All this should be great news for users. Borland makes excellent products, and its pricing keeps the rest of the market honest. Borland's year-end layoffs and restructuring were done in preparation for the fierce margin-slicing campaign it is now launching. It's slashing overhead, eliminating middle management and cutting organizational redundancy. Kahn says he won't pay any attention to the stock price, which has plummeted 75% from its 1992 high, for another six months. He and his managers appear to be focusing on what Borland needs to do: Get lean and dig in for a long battle.

Borland will also open a quieter but perhaps equally important front in its campaign for the hearts and minds of IS management on Feb. 19. That's when it will describe in detail its Integrated Database Application Programming Interface (IDAPI) architecture.

IDAPI promises to smooth over the bumpy process of accessing multiple DBMSs from a single view by providing consistent access to PC- and server-based databases through one common set of program calls. Borland's most impressive claim about IDAPI is that it will be able to unite relational and navigational databases in a single view.

Borland has signed up heavyweights such as Oracle, Novell, Computer Associates and IBM to support IDAPI, which is no small accomplishment because most of those vendors have their own data access schemes. But it still has a lot of work to do to prove that IDAPI isn't just another markitecture.

Beta-test versions of the software development kit won't ship until late spring at the earliest, and the acid test will be whether developers start integrating IDAPI into their products by early next year.

Borland's hole card is that it has a huge base of third-party Paradox and dBase database developers who would just love to have an enterprise data access scheme from a vendor they already know. But it's also launching IDAPI into a market that's stuffed with data access options.

Here's hoping it succeeds. Borland makes good products and sells them at competitive prices. It's iconoclastic, and it isn't afraid to break the rules. A healthy Borland is good for the industry. Buyers need someone who can keep the competition on its toes.

Gillin is *Computerworld*'s executive editor.

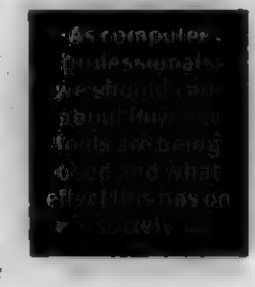
David Coursey

Multimedia obsession

There are mornings when I look into my PC monitor and could swear I see the devil looking back at me. Sometimes I am quite certain that Leisure Suit Larry and his successors, the electronic denizens of zillions of mindless computer games, are leading us toward the end of civilization.

It is a world where reading and thinking no longer matter, where symbols are everything and instant gratification is not fast enough. Where users — in the substance abuse meaning of the term — sit passively in front of their screens bathed in the flood of entertainment. Where people interact so much with the electronic world they have little energy left for the real one.

Usually, when these ideas occur to me, I'll wake up in a cold sweat, kick the cat off the bed, roll over and fall back to sleep. But what if this isn't just a bad dream? Maybe multimedia really will finish the job television and video games have already started. Will children have any attention span left once the collective might of the computer and entertainment industries is done with them?



Yes, I know I sound like a Luddite. And whenever I do this, people send letters and electronic messages accusing me of being a flat-earther, destined for the landfill of history. Perhaps, but if you think television has been a wonderfully positive force in society, just wait until multimedia really gets going.

Sure there will be worthwhile multimedia titles, just as *Sesame Street* and *60 Minutes* are worthwhile television programs. There will be multimedia reference works and information sources, perhaps equivalent to CNN or the Weather Channel. Yet I wonder what multimedia will be remembered for.

My guess is it will be for arming the folks who bring us garbage in prime time with an arsenal of new tricks. And for what purpose? Selling soft drinks, beer, fast food, antiperspirant and six different varieties of aspirin?

This is not a blanket indictment of multimedia. Already, multimedia is providing a valuable service: saving thousands of PC displays from image burn-in through the miracle of talking screen savers that are much more interesting than the applications running behind them. And maybe that is the point: Multimedia is such an addictive mind candy that it can easily block the flow of more worthwhile information.

That's not an issue for some people. Many families are turning off their TVs and controlling their children's access to electronic amusements of all kinds. Some parents, probably those without careers outside the home, actually have time to read to their kids.

But go to a poor neighborhood — or a Third World country — and what you'll see is people glued to their TVs and video games. Their children, instead of learning skills, are simply being entertained.

As computer professionals we should care about how our tools are being used and what effect this has on society. I believe we should be tremendously concerned that the multimedia tools we're creating will be used more to propagandize than to educate and to tranquilize rather than to inspire.

It would not be surprising to see, at some point, a serious proposal for government regulation of multimedia program content in the mass media, much as the Federal Communications Commission used to have programming standards for broadcasters. Perhaps software vendors will be required to develop educational multimedia and distribute it free of charge as a means of offsetting the sins of multimedia entertainment. Might some future president appoint a director of the MEPA, the Media Environmental Protection Agency, to protect us from amusing ourselves into oblivion?

Nearly three decades ago, Edward R. Murrow, the pioneering broadcast journalist, expressed his concern about the future of television. His words may be even more prescient as we stand at the advent of mass-market multimedia: "This instrument can teach, it can illuminate; yes, and it can even inspire. But it can do so only to the extent that humans are determined to use it to those ends. Otherwise it is merely wires and lights in a box."

Coursey is editor of "P.C. Letter," a San Mateo, Calif.-based industry newsletter. His electronic addresses are 568-4460 on MCI Mail, 76711,23 on CompuServe and DCoursey on America Online.

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Travel agency looks to future system freedom

CONTINUED FROM PAGE 35

the lower fare," Sikes said. "Also, the airlines will drop seat prices on [low-capacity] flights a few hours before flight time, so we can poll those and pick up lower fares for customers as well."

McGregor also uses its front-office systems to perform a variety of services. For instance, Sikes runs Blyth Software, Inc.'s Omnis 7 database on an IBM PC clone from Peak Microsystems, Inc. to generate Datafact, a reporting package McGregor built to consolidate client reservations information. Another facet of Datafact is Executfact, a summary of travel information put together for top executives at client companies.

The main issue for McGregor is the limited services it can provide with its current system. For instance, the agency would like to automatically receive travel requests from customers via fax or electronic mail and send back flight and hotel options via the same method.

A problem here is that "we don't know how it'll work with the Sabre system," Sikes said. Sabre is testing this technology right now.

Multiple carriers

After all is said and done, Doug Knight, McGregor's vice president of finance, said the company may just buy its own hardware and a Lanyon board from Lanyon PLC and tie in to several CRSs. Lanyon boards allow multiple line access for a system, which would give McGregor access to other carriers' lines.

The advantages of this would have to be weighed against the cost of subscribing to other CRSs and the headaches of not having a single CRS to troubleshoot problems.

Down the road, Knight said he thinks travel agencies will become much more automated, to the point where many transactions will be handled without agents.

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IBM/Canon alliance spawns notebook

IBM Japan Ltd. and Canon, Inc. have announced a jointly developed notebook PC incorporating IBM Personal System/2 technology and a Canon bubble-jet printer in an integrated unit approximately the same size as IBM's previous notebook models.

The ThinkPad 550BJ, to be released in Japan Feb. 19 and at an undetermined later date in the U.S. and Europe, is the first product of an alliance cemented between IBM and Canon last year to develop notebook computer products.

The bubble-jet printer module, positioned between the keyboard and the 9.½-in. 16-gray-scale monochrome liquid crystal display, is only one-fourth the size of the unit used in Canon's BJ-10 portable bubble-jet printer model. Its reusable ink cartridge can print up to 70 pages between refills.

The 116 char./sec. printer was designed to produce 360 dot/in. quality.

The 550BJ incorporates a 25-MHz 486SLC microprocessor made by IBM under license from Intel Corp.

Prices start at $2,380 for a floppy disk-based model.

—David Kellar, IDG News Service

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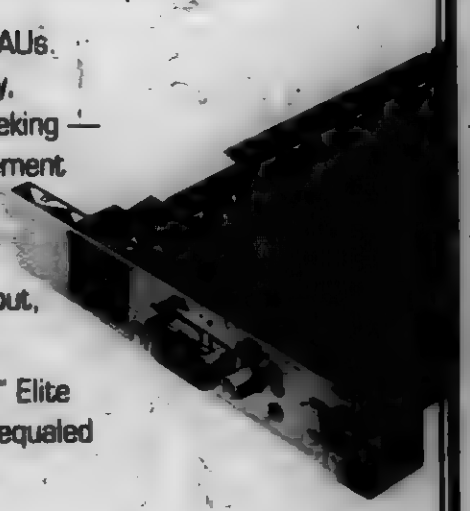

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HP trade-in push

Streamlined program targets Apollo users, probes Sun's vulnerabilities

By Maryfran Johnson

Training its sights ever more sharply on the 100,000 stubbornly faithful users of the former Apollo Computer, Inc. workstations, Hewlett-Packard Co. recently fired off its most aggressive upgrade program ever.

The roster of acceptable trade-in gear includes everything, it seems, but toaster ovens and microwaves.

From the old Apollo DN Series to HP/Apollo 9000 Series 300s and 400s, HP's TradeUp '93 offers 15% trade-in credits on Sun Microsystems, Inc. SPARCstations, Silicon Graphics, Inc. workstations, IBM RISC System/6000s or RT workstations, and Digital Equipment Corp. DECstations.

The Palo Alto, Calif.-based vendor, which acquired Apollo in 1989, is also offering deals on its HP 700/RX line of X Window System terminals. Users can trade in 80386- and 1486-based PCs or several other brands of color X terminals for 10% discounts on HP 700/RX stations.

"It's a fairly aggressive trade-up program," said Doug Eltoft, director of operations for the Iowa Computer-Aided Engineering Network at the University of Iowa in Ames, which still uses dozens of Apollo workstations and older HP machines.

Eltoft said he is trading in 10 to 15 HP 400T workstations, which run the Apollo/Domain operating system, for a comparable number of HP 9000 Model 715s running HP/UX Unix.

What's deal?

Highlights of HP's trade-up '93 program:

A 15% trade-in credit toward the purchase of an HP workstation on machines from Sun, DEC, IBM, Silicon Graphics, HP's Apollo division and Apple.

A 10% trade-in credit for Intel 80386/1486-based PCs and X Window System terminals.

Discounts on expanded RAM and mass storage devices.

"We amortize our computer equipment over four to five years, and looking at when I bought these systems and the cost of trade-up, HP is right on our depreciation schedule," Eltoft noted. "I didn't have any trouble justifying the purchase."

Pump up the power

The power boost will be a substantial one, he added, because the 400T rates about 11 SPECmarks of performance while the Model 715 boasts 72 SPECmarks.

At the very least, the program offers a more streamlined, stable alternative to HP's past efforts, which company officials described as "burdensome" and "difficult to communicate."

"We had tables with 15 different levels of credit, depending on what you were trading or buying, and those tables changed every three months," said Pete Dubler, the installed base marketing manager of HP's workstation group. "We also had separate programs for distributors and certified resellers. Now we've combined them all with the objective of one simple, long-term program that's here for all of 1993."

Despite the admitted drawbacks, HP claims to have converted thousands of Apollo/Domain users in 1992. Its archrival, Sun, which has its own trade-up program aimed at Apollo users, likewise claims to have lured thousands of users to its Scalable Processor Architecture (SPARC) platform.

Just last week, Sun announced a new wrinkle in its own upgrade program with a 40% discount for users moving to the $18,000 SPARCstation 10 Model 30. Because the Model 30 will run the Solaris 1 operating system as well as the follow-on Solaris 2, it should also appeal to users unwilling to make the operating system switch just yet.

New operating systems and relicensing software are often causes for "considerable resistance" to trade-up programs, said Lisa Thorell, an analyst at Dataquest, Inc. in San Jose, Calif.

What could weaken that resistance among HP users now is the allure of high-performance hardware — the new workstations offer seven to 10 times the power of the old ones — and an increasing number of features and migration tools built into HP/UX 9.0 specifically for Apollo/Domain users.

Analysts suggested that HP's newly aggressive trade-up program could stimulate market growth in its direct and indirect channels. Another possible benefit for HP would be boosting its visibility in Sun territory.

Dataquest analysts noted that HP leads Sun in workstation price/performance numbers and has built a solid technical track record during the past two years. Sun is also more vulnerable now because of the conversion to Solaris 2 and the SPARCstation 10 line, which has been hobbled somewhat by shipping delays.

For Sun's part, however, analysts said the SPARCstation 10 offers a more flexible upgrade path with scalability to multiprocessor systems. And when it comes to the discounting wars, Sun often out-discounts its rivals.

DEC heads toward PC LAN/VMS link

By Michael Vizard

Digital Equipment Corp. recently put in place a major piece of its plan to integrate PC local-area network environments with its VMS-based systems.

The move is the result of WordPerfect Corp.'s announcement that its word processing software now supports Version 1.0 of DEC's TeamLinks for Windows groupware.

TeamLinks, which is still undergoing beta testing at DEC customer sites, is a set of software packages designed to foster the integration of PC applications across DEC's Pathworks network operating system. Pathworks is DEC's implementation of LAN Manager from Microsoft Corp.

Video, mail and conference

The DEC groupware offering consists of TeamRoute, an X.400-based electronic-mail system that can be used to link PCs with host-based office automation systems, including DEC's All-in-1 office automation systems for VMS; VAXnotes conferencing software that supports PC clients; and DEC's VTX videotext application.

The TeamLinks lineup also includes DECquery, which allows PC users to query and browse SQL-compliant products, such as Oracle, Rdb, RMS, DB2, VSAM or IMS databases, and services that convert data for different document and file formats as users exchange documents across the network.

Underlying these applications is a distributed file cabinet that integrates Windows applications using a Dynamic Link Library (DLL). Suppliers of Windows applications that support the DLL in TeamLinks include WordPerfect, Lotus Development Corp and Microsoft.

WordPerfect added a module to Version 5.2 of WordPerfect that enables users to access other applications using TeamLinks, said Shaun Stirlind, product manager for WordPerfect for Windows. As a result, users of applications under TeamLinks will be able to click on a WordPerfect document to mail that document to another user. Previously, users had to file that document, leave WordPerfect, open an E-mail application, create a message, access the WordPerfect document and send it as an attachment to the E-mail message.

"We have a long-term investment in Digital products, so TeamLinks gives us a migration plan for integrating PCs with our DEC systems," said Bob Adams, manager of technical services at Ciba Corp., a pharmaceutical firm in Hawthorne, N.Y.

Adams noted that another benefit for Ciba is the reduced cost of purchasing PC software on a per-user basis. Previously, Ciba would purchase a full All-in-1 license of its VAX, but that software used only about 10% of Ciba's VAX processor horsepower. The TeamLinks approach allows him to purchase the exact amount of PC software he needs for Ciba.

Pricing for TeamLinks starts at $99 per user for media, documentation and license, which includes DEC's TeamRoute software. Additional user licenses are priced at $79, and server software pricing starts at $364.

In Brief

Novell documentation on-line

Novell, Inc. announced that it has licensed Electronic Book Technologies' DynaText publishing software to produce on-line documentation for Novell's upcoming NetWare 4.0. The technology will let users view, search and print documentation under DOS, Microsoft Corp. Windows, Unix and Apple Computer, Inc. Macintosh platforms, Novell said.

Mass-market LANs

Microsoft Corp., Proxim, Inc. and AST Research, Inc. are teaming up to offer a prepackaged, wireless local-area network system through the mass-market channel. Aimed at small businesses and companies with mobile offices, the Advantage Net system includes Microsoft's Workgroup for Windows networking software on AST PCs based on Intel Corp.'s 1486 chip. The PCs are linked together using Proxim's RangeLAN/ISA wireless LAN adapters. Retail pricing is expected to start at about $2,000 per node.

HELP LINE

Lotus' CC:Mail

This is another installment in a series of articles containing questions commonly asked by users and responses from vendors' support lines. This week: Lotus Development Corp.'s CC:Mail electronic-mail package.

Q: Sometimes I need to increase performance of CC:Mail Remote for MS-DOS. How do I do this?
A: Just like the regular CC:Mail post office, the remote database needs maintenance from time to time for optimum performance. Run the remote reclaim process to clean up your remote database.

Q: Is there any way to automatically save a copy of messages I send?
A: Yes. You should create a personal folder called "message log." A copy of each message you send will be placed in this folder automatically.

Q: The "backspace" key and some of the other keys near it (like the "=" key) send different characters to the screen under DOS. Instead of a backspace, I get a foreign-looking character. Why does this happen?
A: You have OEMANSI.BIN=XLAT850.BIN (or some other XLATx.BIN file) in the keyboard section of SYSTEM.INI. Our install program (and other applications' installation programs) will place this there if you select international character setup. This allows programs to display character sets that are specific to the particular language.

Replace that line with:

OEMANSI.BIN=

Also, if you have a 101-key keyboard, make sure that Type=4 is set in the same section.

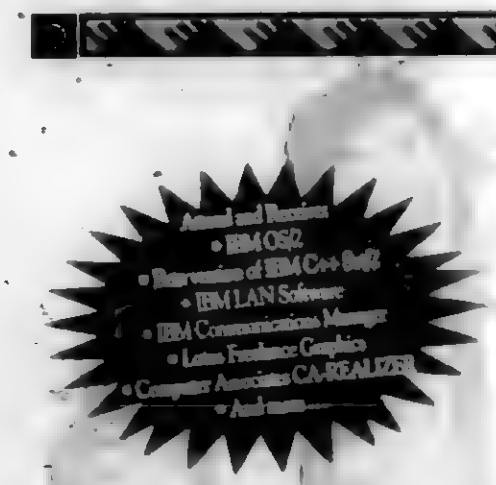
Type=3 is for 84- or 86-key keyboards.

Q: I get the message "Incomplete installation" when trying to access CC:Mail for Windows 1.1b or 1.11. What is the cause?
A: This means that your SOFTEK.INI or TEMPLATE files (TEMPLATE.BMP, etc.) are not in your Windows directory. This is usually caused by neglecting to perform the workstation part of the software installation. You must run the INSTALL program on the User Install disk from within Windows for each PC that will be running CC:Mail for Windows. There are tips for automating this process discussed in the Windows Installation Technote from our bulletin board service at (415) 691-0401. Or, get this information via CompuServe (GO LOTUSB, Section 11).

Q: How do I force a page break using CC:Mail for MS-DOS?
A: Place the CTRL-L (.) character in the body of the text.

Q: Sometimes faxes I receive through CC:Fax are upside down. How do I read them?
A: The "upside down" appearance is caused by the sender, who has put the paper in the machine upside down. You can rotate fax images 180 degrees so they appear correctly in CC:Mail. To rotate faxes, do the following (depending on which version of CC:Mail you are using): In CC:Mail for MS-DOS or Windows, simply press the asterisk (*) key. For CC:Mail for Macintosh, just press the fax rotation button in the lower left corner of the CC:Mail window.

Q: I set the CCMAIL-SMTP-DIR-PATH environment variable, but no SMTP addresses appear in the SMTP directory window when I click the view button. Why does this happen?
A: The CCMAIL-SMTP-DIR-PATH variable must be set to the full path and file name of the SMTP directory file (by default it is ".ccmail-smtp-dir").



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J.J. Kenny Solves its
Architectural Crisis

OOPERATIV

AN ENTERPRISE SOLUTION

BY RICHARD A. SKRINDE

"The information infrastructure in today's typical enterprise is plagued by an 'architectural crisis' — a profusion of vendors and incompatible products. In this complex environment it has become increasingly costly to acquire, use and operate computer systems."

— The Gartner Group

Today, the Information Systems (IS) organization is indeed facing a crisis. Over the past few decades it has presided over the growth of an ad hoc infrastructure that has increasingly become a liability to the enterprises it serves. Faced with rising costs and increasing demand, IS must somehow turn the liability of this ad hoc distributed information infrastructure into an advantage if it is to survive.

Adopting a new technology foundation will lead to that advantage. Framingham, Mass.-based market researcher International Data Corporation (IDC) polled more than 1,600 IS departments and found their number one priority is migrating to more modern systems.

Sensing this impending migration, Oracle Corporation responded by developing cooperative-server technology that allows IS to easily deploy, integrate and maintain database applications on an enterprise-wide basis. Users are finding this new technology to be a high-powered answer to their architectural crises.

This new cooperative-server technology comes at a time when enterprises are pervaded by "point solutions" — computer systems with a local focus that fail to address enterprise architectures. "Users in search of solving specific problems have acquired many point solutions that may be ill-suited to IT strategies," notes the Gartner Group, a market research firm in Stamford, Conn. "These solutions create redundant, inconsistent and inaccessible data. Vendors have designed applications that

E-SERVER

operate within their proprietary environments but fail to interoperate in the users' increasingly multi-vendor IT infrastructure."

Point solutions do provide short-term financial savings through improved business unit productivity and lower computer system costs for individual applications. Nonetheless, with no technology or methodology to connect the myriad of points, the enterprise faces global information gridlock.

Impact of Gridlock

IS is spending too much time and money trying to keep this crazy quilt of point systems operational. On top of that, users are demanding more and more IS support. The IS department at J.J. Kenny, the world's leading municipal bond rating and trading firm, exemplifies today's IS architectural problems.

> ***"I had four separate operations going on and the overhead was killing us. A good portion of our yearly expenses was related to IS. We knew we had to simplify our IT architecture. We also knew that any new IT investment would have to provide both short-term economic savings and a compelling long-term strategic advantage."***
>
> ***— Thomas Zielinski, CIO J.J. Kenny***

Chief Information Officer Thomas Zielinski describes his situation this way: "I had four separate operations going on and the overhead was killing us. A good portion of our yearly expenses was related to IS."

And if things aren't bad enough, the Gartner Group warns that IS will face an even bigger challenge in the '90s: "The enterprise's traditional hierarchical structure is flattening in order to reduce overhead and costs while increasing organizational responsiveness and innovation. Pushing decision making down to the work group level implies that the information necessary for proper judgments is available at that level. In this environment, IS will be charged with providing global integration on a massive scale."

How can struggling IS departments make the quantum leap in capabilities required to provide enterprise-wide data access and distribution? And what is the role of vendors? They can no longer rely on pie-in-the-sky architectures or future standards; the architectural crisis is now, and products are needed immediately.

Search for a Solution

Within its current architectural constraints, IS cannot possibly meet the full range of growing user requirements. Yet IDC research reveals that the search for a technology migration pattern that will modernize the IS infrastructure must be financed by a budget whose growth is tied to the rate of inflation. Given that restriction, eight out of 10 IS executives surveyed by IDC say they are still willing to consider any affordable new technology. Five out of 10 surveyed IS sites have already adopted what they claim to be an open systems architecture.

A recent survey of 671 mainframe sites performed by Computer Intelligence, a market research company based in San Diego, supports the IDC findings. That survey finds that only 39% of planned new applications will run on mainframes. In addition, 40% of existing mainframe applications being rewritten are destined for other platforms.

Zielinski is a user who knows that the time has come for such changes. "We knew we had to simplify our IT architecture," he states. "We also knew that any new IT investment would have to provide both short-term economic savings and a compelling long-term strategic advantage." (Sidebar to follow)

Client/Server: Only a Partial Solution

Client/server computing implies processing a database application on multiple computers. The client exploits the cost/performance of the workstation to process the user interface and the application logic. This allows the server to concentrate on data-intensive operations. The two sides are connected by a network, allowing any client access to any server.

> ***"Client/server architecture requires complex application programming to move beyond accessing data on a single server."***

The trade press is filled with tales of successful off-loading, downsizing, and rightsizing projects based on the seemingly divine ability of client/server computing to unify mainframes, midrange systems and PCs. But is client/server computing really a panacea for the '90s?

Proponents claim that client/server computing is the bridge that connects the needs of departmental users wanting ready data access with centralized IS, which wants data control. These proponents further claim that the client/server approach will:

- foster system integration
- allow organizations to respond quickly to business changes
- adapt easily to new technologies
- take advantage of computing

price/performance improvements
• solve the entire IS architectural crisis.

The Gartner Group is more conservative in its evaluation, saying, "Client/server is a good fit with organization restructuring, it exploits the ever-growing power of hardware, and it supports the shift in the use of desktop systems from standalone machines to heterogeneous networks. Client/server implementations have provided short-term economic returns through end-user productivity, reduced training time and expense, and improved customer service."

Despite these advantages, however, client/server computing is still only a point solution. And like any other point solution it can only improve productivity and lower costs for individual systems.

According to Colin White, president of Database Associates and the foremost expert on database technology, "Client/server computing has not fully solved the integration problem, nor has it matured enough to tackle core IS applications that must support upwards of one thousand users. Client/server approaches must provide mainframe-equivalent response time, throughput, availability and reliability. Until the tools for the integration and management of large-scale, mission-critical client/server applications appear, it will be difficult for IS to widely adopt client/server technology."

Research done by IDC and the Gartner Group seems to substantiate White's position. IDC finds that the number of users moving or planning to move to client/server computing shows little growth, while the Gartner Group says only about 5% of the total application portfolio in most large IS shops employs client/server technology.

"Until the tools for the integration and management of large-scale, mission-critical client/server applications appear, it will be difficult for IS to widely adopt client/server technology."

— Colin White, president, Database Associates

Says IDC: "The disparity between the promise of client/server computing and the reality of technical implementation threatens to slow further technical development and inhibit customer adoption of client/server computing." Concurs the Gartner Group: "An uncertainty still surrounds client/server computing, particularly with respect to potential problems and complexities that neither the vendors nor the trade press address."

COOPERATIVE-SERVER
AN ENTERPRISE SOLUTION

In order to solve this architectural crisis, the scope of client/server computing must be expanded to include:

- automatic and transparent integration facilities to connect all of the point systems
- streamline application development support for the enterprise's largest mission-critical applications
- open architecture and emerging standards compliant.

With these objectives in mind, Oracle introduced the ORACLE7 cooperative-server, its latest database release. This product, which represents the results of an intensive, 300-man-year development effort, is designed to satisfy both the departmental and central IS communities. Using cooperative-server technology, IS can now easily deploy, integrate and maintain database applications across the enterprise. These capabilities clearly elevate the ORACLE7 cooperative-server above earlier client/server approaches.

Describing the IS status quo prior to cooperative-server technology, the Gartner Group states, "Investment in IT — mainframes, minicomputers, PCs, personnel and services — generally yielded less than the sum of its parts. Synergy among the various components of the IT infrastructure was accomplished through horrendously expensive system integration projects, piecemeal approaches, or not at all."

Now, with ORACLE7, any client can access data on one or more servers with full location transparency and site autonomy. This is accomplished by allowing data to be transparently distributed, replicated or processed in parallel.

According to IDC, "Cooperative-server technology provides any site with the intelligence to communicate with servers at all other sites, which minimizes management overhead of communications and opens up data to any place in the enterprise. Location transparency and site autonomy allow a query or update to access any number of servers with the same SQL statement as if the data were on a single server. The cooperative-server also provides a cost-based optimizer to minimize network and system overhead, and a resource limiter to protect against 'runaway' queries.

"Cooperative-server technology allows IS to create an application once. It can then be spread to other locations throughout the enterprise without changes, no matter what the arrangement of the computers or the software."

In order to be a successful architectural solution, a distributed database must extend beyond site autonomy and location transparency to include vendor-network and vendor data store transparency. Oracle achieves vendor network transparency with Version 2.0 of its SQL*Net network connectivity product. SQL*Net provides automatic, multi-protocol interchange capabilities that extend the reach of the cooperative-server across previously incompatible networks. For example, an application running on a TCP/IP network may seek access to data located on a mainframe, a Novell network or any major systems vendor network. In such cases, SQL*Net transparently translates the protocols. This eliminates the need for expensive hardware-based internetwork bridges or protocol routers.

"Oracle is the foundation of the database industry. With the introduction of its ORACLE7 cooperative-server, Oracle provides a solid footing for a new distributed database architecture for the '90s."

— International Data Corp.

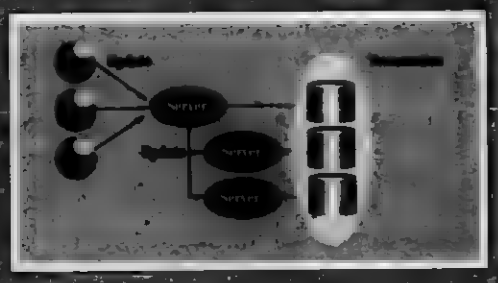
Beyond its multi-protocol interchange capability, SQL*Net 2.0 takes advantage of the redundancy found in most enterprise networks to provide automatic alternative network routing. In this environment, if the primary network is down, SQL*Net attempts to make the connection through an alternative network.

DISTRIBUTED APPLICATION FLEXIBILITY

Cooperative-server technology uses distributed transactions and three modes of data replication to
- allow distributed application flexibility
- insulate applications from the complexity of managing distributed updates
- keep mission-critical applications up and running despite server crashes or sluggish or failed networks

Distributed Transactions

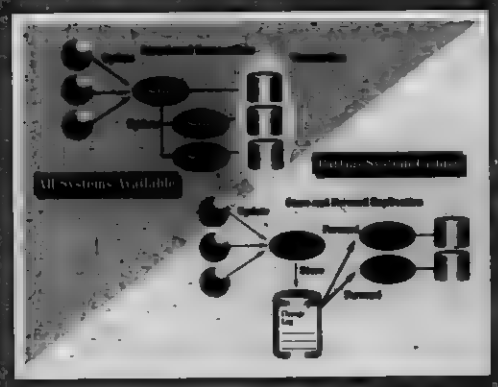
For applications that require multiple sites to store the latest updated information, the distributed transaction mode insures absolute consistency of all data at all times. For example, transferring funds from checking to savings requires two update statements. If these statements access two separate machines, both statements must update or neither statement can update. The cooperative server accomplishes this with a two-phase commit. The application is assured of location transparency because the same commit statement applies to a transaction located on one, or many servers.



Real-Time Replication

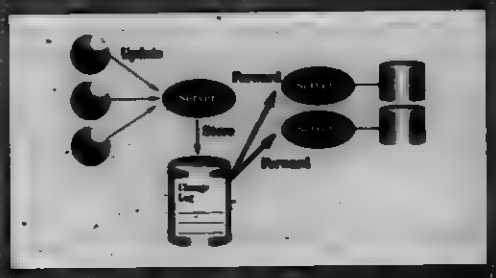
Other applications may need more flexibility than is provided by the distributed transaction mode. They require current information and cannot stop processing in the event of a site failure. For example, a manufacturer might want to update the shipping system whenever a new order is placed. However, if the shipping system goes down, the manufacturer cannot stop taking orders. The real-time mode uses data replication to accommodate such situations.

In the event of a site failure, rather than rolling back, ORACLE7 automatically engages a store-and-forward mechanism to record all updates destined for the failed site. When the site comes back on-line, the stored data is automatically forwarded using two-phase commit to insure that all sites have received all updates once, and only once. Real-time replication is useful for many applications because it provides the integrity of distributed transactions when all sites are up, while allowing processing to continue in the case of a site failure.



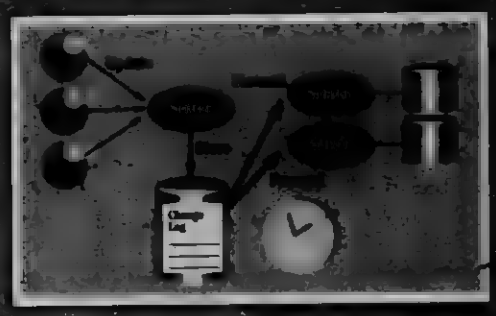
Store-and-Forward Replication

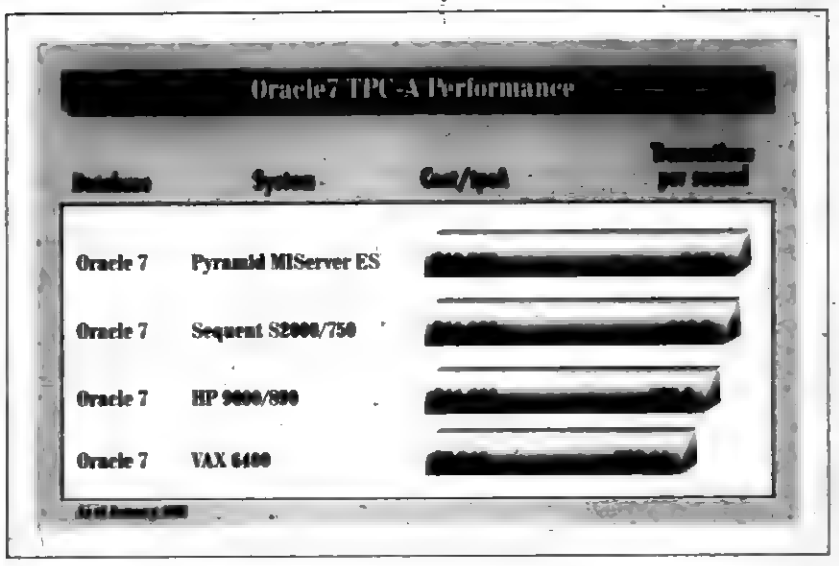
Some applications want their multiple sites to share information at intervals. This can also be accomplished using the store-and-forward mode of replication. With store-and-forward, updates destined for other sites are recorded locally and forwarded on a periodic basis. These updates can range in frequency from incremental bursts in near-real-time to dial-up connections for notebook computers. Again, the two-phase commit insures that all sites receive updates once, and only once.



Time-Based Replication

Just as some applications require multiple sites to share information at intervals, others require multiple sites to share information on a set schedule. For example, the headquarters of a retail chain may want to distribute pricing information to all of its stores at the beginning of each business day. ORACLE7's time-based mode of data replication facilitates this. As a result, network overhead is reduced while throughput is increased.





Just as the typical enterprise does not rely on a single network protocol, neither is it married to a single database management system. The Oracle Open Gateway family of products allows IS to transparently reach into all of the enterprise's data stores. Through the Open Gateway, an application SQL statement automatically accesses and combines both relational and non-relational data found in most major data stores.

"We have systems in place today that we can't live without. And at the same time we have new systems that need to be developed. The cooperative-server allows us to simultaneously access data from both our MVS and our UNIX environments."

— John Black
systems architecture manager
US West, New Vector Group

The Oracle Programmable Gateway Tool Kit extends this capability to include the data stores of robotic systems controllers, electronic mail or Electronic Data Interchange (EDI). It does this by allowing users to build custom interfaces through remote database procedure calls.

John Black, systems architecture manager at US West, New Vector Group, emphasizes the need for transparency across networks and data stores. "We have systems in place today that we can't live without," he notes. "And at the same time we have new systems that need to be developed. The cooperative-server allows us to simultaneously access data from both our MVS and our UNIX environments."

With ORACLE7, Black is able to isolate his applications from changes to the data stores, servers or networks. This interoperability gives him the ability to leverage the value of both his new and old system architectures.

Dealing With Centralized Applications

Clearly, the cooperative-server allows IS to unify applications that are distributed across multiple servers, networks and data stores. But what about applications that do not fit well into a distributed architecture and are best left centralized?

Until now, when a host-based or client/server application outgrew the host or server, users had two alternatives. They could either replace the outgrown computer with a larger, more expensive device, or fragment the database among multiple smaller computers. If they chose to replace the computer, they paid more for a larger machine and lost productivity during the transition. Support costs for retraining and other upgrade overhead also increased. If they chose to fragment the database, the database administrator was forced to manage a distributed database architecture.

The cooperative-server allows IS to effectively process large, centralized applications by automatically linking several smaller, less expensive computers together to replace an expensive, large one. This is accomplished through the parallel processing of data. Multiple servers can now transparently share data on a common set of disks. This provides a nearly unlimited scale of performance. It also provides high availability because if one server should fail, the other servers have access to all of the information. Best of all, the Database Administrator (DBA) only has a single database to manage.

Streamlining Application Development

Enterprise integration is a crucial component in a successful computing architecture, but in order to realize its full value, a great number of new and replacement applications must be rapidly developed. How can this be done at a time when IS budgets are so constrained?

"ORACLE7 also makes our programming job simpler. It allows us to define the business rules once in the database so we don't have to define them over and over again in our application code. We can respond more quickly to changes in the business."

— John Black
systems architecture manager
US West, New Vector Group

Removing code from each individual application and centralizing it in the server is critical to solving this problem. The cooperative-server offers ANSI/OSI standard declarative integrity constraints. These constraints eliminate procedural programming when implementing entity and referential integrity business rules such as "inventory quantity must be greater than zero," or "no customer can be deleted while it still owes money." This will reduce at least 25% of the procedure code from a typical server application.

Of course, procedural programming of the server will always be required for organization-specific business rules such as inventory reorder policies or special audit policies. To assure IS success in this effort, modern programming tech-

nologies have been integrated into the server.

PL/SQL, Oracle's procedural extension to industry standard SQL, has incorporated many of the best features found in other advanced programming languages such as C++ or ADA. IS programmers, even those with no prior server programming experience, will quickly gain confidence and productivity due to the richness and ease-of-use of this language.

Enterprise applications are large, requiring a multi-application, multi-developer team approach. ORACLE7 provides modular programming constructs that leverage team programming efforts. The PL/SQL procedure package treats collections of procedures, functions, cursor definitions, constants, variables or exemption definitions as single database objects. It further defines the procedure interface separately from the body. This frees programmer teams to develop and test independently once an interface has been defined.

All 12 ANSI SQL3 trigger types, including "before", "after", "row" and "statement" triggers are supported. They more efficiently support programming tasks such as auditing, initializing global variables, or preventing updates that violate security or integrity constraints.

These features have been proven by users to save time and money. "ORACLE7 makes our programming job simpler," claims Black. "It allows us to define the business rules once in the database so we don't have to define them over and over again in our application code. This makes our application code simpler, makes our programming faster and lets us have more flexible applications so we can respond more quickly to changes in the business."

Mission-Critical Production Environment

For cooperative-server technology to play a pivotal role in solving the architectural crisis, it must be able to off-load and replace the expensive host-based architectures that are processing the enterprise's largest applications. For this to happen, the cooperative-server must provide mainframe-equivalent availability, reliability and performance. And today's DBA must be able to support these applications.

ORACLE7 is a proven production environment for mission-critical applications, as it is built upon the same engine as the widely accepted Oracle Version 6 database. A recent survey of Oracle customers substantiates this claim. In addition, ORACLE7 TPC-A performance benchmarks prove it to be a match for the mainframe. (Chart opposite)

Administrative Tools

A new generation of administrative tools is required to simplify the management of cooperative-server computing. The cooperative-server provides a first tier of tools with its distributed administration system. A menu-driven point-and-shoot DBA interface and high-availability utilities such as on-line backup and recovery help to simplify administration of

J. J. Kenny Solves its Architectural Crisis

J.J. Kenny, the nation's largest municipal bond information and brokerage organization, solved its IS architectural crisis with ORACLE7 cooperative-server technology. At Kenny, the database system is not just an adjunct to its business. Given the database-intensive nature of rating, tracking and trading, the database is at the core of the company.

Prior to implementing ORACLE7, Kenny's IS infrastructure was typical of the traditional, heterogeneous, conglomeration found in today's larger IS organizations. An IBM mainframe running DB2 was surrounded by Digital Equipment VAXs running the Oracle database, Hewlett-Packard processors running the Image database and Concurrent Systems running a homegrown database.

Chief Information Officer Thomas Zielinski believed that migrating to the cooperative-server platform would provide a considerable short-term cost savings and long-term competitive advantage because it would allow his firm to offer better on-line products and services. Zielinski's wish list was not inconsiderable. He wanted to:

- centralize operations
- improve database performance
- fit into the existing satellite delivery system
- allow for incremental growth in processing power and application development.

His new technology plan was approved in 1990 and he was on track to have the first of several applications out of test and into production before the end of 1992. Most of the old systems are being replaced by a pair of identical, symmetrical Sequent computers running the ORACLE7 cooperative-server under UNIX.

In this open systems environment the Sequent system was linked to PCs running Microsoft Windows with the Gupta 4GL database frontend. Connectivity is provided by Novell and the Tuxedo TPM from UNIX System Labs.

Zielinski's IS group found the Alpha version of ORACLE7 to be bullet, fighter and more bugless than production releases of predecessor software products. According to Max, Oracle demonstrated considerable leadership in the team effort required to implement this system.

A 2,800,000-row table filled with production data was loaded into the new system as a performance test. Skeptics predicted that it would take days to load. As it turned out, using the new ORACLE7 SQL*Loader, the table was loaded in about 12 minutes. It seemed too good to be true, so the table was emptied and loaded again — with the same results. Upon further testing, it was discovered that the team of Kenny's IS veterans, a portfolio update taking 18 to 20 hours on the old system, could be run in about 30 minutes on the new system.

Kenny now has a technology platform that gives their clients unparalleled real-time data support capabilities in the marketplace. Kenny is [illegible] capability into new products and services. For example, [illegible]

mission-critical applications.

Security management has been simplified through the ORACLE7 cooperative-server role-based security capability, wherein security is assigned by job type rather than by individual. This implementation has been accepted by the ANSI/ISO SQL standards committee as the basis for future security standards.

Open System Approach

The architectural crisis requires a multitude of products to operate in the enterprise environment. Therefore it is very important to have standards. To meet this need, openness has been built into all aspects of the cooperative-server. ORACLE7 is 100%-compliant with the ANSI/ISO 1989 SQL standard and includes support of its enhanced integrity section with declarative referential integrity. ORACLE7 has also passed the U.S. Federal Government's SQL compliance test. Its triggers are designed to meet future ANSI/ISO SQL standards.

Transaction processing monitors are becoming an important IS tool. With this in mind, ORACLE7 is designed to comply with the X/Open, XA standard. Its role-based security supports external RACF and ACF2 in the mainframe environment, as well as the UNIX and Novell group function. It also supports emerging network authentication services as outlined in the Open Software Foundation's Distributed Computing Environment (DCE). Its global naming function is designed to support the DCE X.500 directory services standards.

Cooperative-Server's Role in Solving The Architectural Crisis

IDC believes that the cooperative-server takes a big step towards solving the architectural dilemma. It states, "Oracle is the foundation of the database industry. With the introduction of its ORACLE7 cooperative-server, Oracle provides a solid footing for a new distributed database architecture for the '90s. Due to the industry-wide support of Oracle, IS can be assured of finding sources from third-party suppliers of the tools and applications that will make ORACLE7 the complete solution that IS requires."

The time is now for migrating to a new architecture. By adopting ORACLE7 cooperative-server technology, IS can gain maximum productivity from its existing IT investment and begin resolving its architectural crisis.

Zielinski puts it this way: "The Kenny database is our most valuable corporate resource, with all of our business dependent upon its performance and viability. Our new ORACLE7 architecture positions us for growth in the '90s and will allow us to produce new products more quickly than ever before. All of this will be done in a more efficient and economical manner than with our traditional host-based environments."

What is the database future in your IS shop? A lot of tough questions must be answered. For starters, what are the actual costs and benefits of adopting cooperative-server? And what will it take for upper management to buy into supporting cooperative-server technology?

Oracle understands the difficulty of resolving these questions and has developed a program to help you determine how the cooperative-server can best work for your organization.

The CB-90 (Cost Benefit Justification Process for the '90s) is a program created to help users make more cost-effective technology decisions by identifying the real business value of alternative investments. It is based upon the Information Economics model which has been in worldwide use for several years.

Oracle has adapted this methodology to key issues facing IS. These issues include rightsizing, business process reengineering and the following match-ups: networks versus mainframes, and host-based systems versus client/server and cooperative-server systems.•

Richard A. Skrinde is a leading DBMS authority and strategic planner specializing in the role that emerging technologies play in improving enterprise information systems.

Call 1-800-633-0747 [illegible]
CB-90 [illegible]

Utility warming to client/server

Gas-modeling software improves customer response time, job precision

By Lynda Radosevich
NEIGHBORVILLE, ILL.

February's single-digit temperatures highlight the importance of a good natural gas distribution system for the 1.7 million customers of Northern Illinois Gas, most of whom use the gas to heat their homes and water.

To improve analysis for designing and operating that system — which contains 26,000 miles of gas line — the utility, a subsidiary of Nicor, Inc., is moving its gas flow computing operation to a PC-based local-area network. The network will run a custom-built graphical modeling application and store the models on a fault-tolerant storage device.

"The graphical version makes interpretation of data faster and more obvious, and that improves decision-making," said Chuck Roberts, gas distribution manager. Not only does that mean better analysis of the cold weather needs but it also means big savings, he said.

More for less

Better gas consumption analysis will allow the utility to determine more precisely the correct pipe diameter for new installations. Because narrower pipe is cheaper, a 2% reduction in the diameter of pipes in new installations will let the $1.4 million dollar system pay for itself in just over two years, Roberts said.

Currently, analysts pore over stacks of printed gas load data generated by the company's mainframes. They use the data, which includes pipe locations and consumption patterns of users on a given section of pipe, along with general rules of thumb to make certain that adequate amounts of gas flow under various conditions.

For major changes in gas flow requirements, such as the addition of a big new customer, the analysts alter portions of the mainframe program by using a text editor and running simulations. The data is used by gas distribution system engineers to draw maps and make judgments about installing new lines and maintaining and upgrading existing lines. Using these methods, the analysis for adding new customers can take up to five days to complete, Roberts said.

The problem is that the calculations take too long and are too labor-intensive to evaluate all of the possible scenarios for new installations. Plus, the hand-drawn maps quickly get out of sync with the newest customer information, Roberts said.

The new system will give planners desktop access to graphical models of the pipe system derived from the mainframe's data. The planners can test various scenarios in as little as a half hour and print updated color system maps for the maintenance crews, Roberts said.

ON SITE

Northern Illinois Gas
Neighborville, Ill.

Challenge: To improve planning for the natural gas needs of 1.7 million customers.

Technology: Gas flow modeling software, a RAID disk array system and an Ethernet LAN with Intel 1486-based PCs.

Anticipated benefits: Better analytical abilities leading to cost savings; ability to respond quicker to new customers' requests for service.

The utility's move is "part of a broad energy industry trend" away from mainframe to client/server applications, according to Ronald Samuels, vice president of sales and marketing at Dwight's Energydata, Inc. in Richardson, Texas. "A lot of good [graphical PC and workstation] software is available now, so we're beginning to see migration in the industry away from expensive mainframe computing to LANs with PCs and workstations."

The Northern Illinois Gas system, which is in its final testing stage, includes custom-built client/server software from Stoner Associates, a developer of piping system model software in Carlisle, Pa.

"We color-code the pipe to indicate the quantity of gas flowing through it so planners can see at a glance what the model is trying to tell them," said Joe Kroon, Stoner Associates' vice president.

The software accepts daily customer location and uses data that is downloaded from the mainframe by an Interoom gateway from DCA's Intercomputer Communications Corp. The software converts the data into working models or maps of the gas distribution system.

The mainframe is updated by a customer service department that takes "hundreds of calls each day" from customers requesting changes in service. By receiving fast and accurate feedback on customers' use, the engineers determine pipe size for new installations and replacements.

RAID solution

Before moving the utility's critical modeling functions to a LAN, Roberts said he had to be sure that the data would be readily available and safe. He picked a redundant arrays of inexpensive disks (RAID) storage device from Micropolis Corp. in Chatsworth, Calif. The RAID system provides fault tolerance by writing data to several disks.

"If I lose a drive I can just recreate the data from another drive," he said.

System planners will access the models using five Intel Corp. 1486 PCs on an Ethernet network running Novell, Inc.'s NetWare. The utility also plans to install PCs in 13 stations throughout the state once it decides on a wide-area distribution scheme.

This company's first foray into client/server computing began in January 1992. Roberts said he expects the new system to be fully operational by the third quarter of 1993.

In 1994, the utility plans to add another level of analysis to the software that will let planners determine which nodes to shut down to isolate sections of the system during emergencies.

NetCensus tracks systems, licenses

Tapping into ongoing sensitivity about software licensing issues, Tally Systems Corp. in Hanover, N.H., recently introduced software that automates the inventory of hardware and software residing on networked PCs.

Called NetCensus and announced at Networld '93 in Boston, it is aimed at network managers who have large systems to track and software licenses to enforce and at financial professionals who need precise inventories to predict upgrade costs.

The software runs on network operating systems, including Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines and Microsoft Corp.'s LAN Manager. It collects serial numbers for leading software packages such as Lotus Development Corp.'s 1-2-3, Microsoft's Excel, WordPerfect Corp.'s WordPerfect, Aldus Corp.'s PageMaker and Borland International, Inc.'s dBase IV.

For the major network operating systems, it includes identification of network shell and driver versions and local-area network addresses. The software also inventories hardware components such as type of PC, manufacturer, amount of storage, add-on board and monitor types.

The package — a network version of the company's 3-year old PCCensus — includes an automatic scheduler that performs inventories at specific times or whenever users log on.

Pricing starts at $149 for a five-user pack. — *Lynda Radosevich*

SUDS automates software distribution

One of the big hits of the Networld '93 show in Boston was Frye Computer Systems, Inc.'s Software Update and Distribution System (SUDS), a PC local-area network software distribution and management system.

SUDS, which began shipping right before the show, provides automated software distribution and automated text and binary file updating or replacement. It works with both DOS and Microsoft Corp. Windows, supports multiserver wide-area networks and runs over all major LAN operating systems, including Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines, Microsoft's LAN Manager and IBM's LAN Server.

The new product lets network managers set the rules by which files are placed on a client PC or file server. For example, a user with an old version of an application, 2M bytes of random-access memory and a Video Graphics Array monitor could get the appropriate update configuration. However, a user with no version of the application, 1M byte of RAM and a Color Graphics Adapter monitor could get another configuration that includes complete installation of the software — all with no user intervention required.

SUDS allows network managers to automatically select, delete, replace or edit any text file, including AUTOEXEC.BAT, CONFIG.SYS, WIN.INI and WIN.SYS files. Networld attendees said this capacity would save them considerable time by automating the installation, tracking and standarding on the configuration and application environment of their client PCs. — *Michele Doetert*

LAN hardware

John Fluke Manufacturing Co. has introduced the Fluke 650 CableMeter, which was designed for testing unshielded twisted-pair and coaxial wiring for Token Ring and Ethernet networks.

The Fluke 650 CableMeter assists users in locating the area of faults and certifying local-area network cabling. Ethernet traffic and noise can also be recorded and monitored.

The product costs $1,695.

➤ *John Fluke Manufacturing*
6920 Seaway Blvd.
Everett, Wash. 98206
(206) 347-6100

Workgroup software applications

Emerald Systems has announced that Xpress Librarian 2.0 will support Microsoft Corp.'s Windows for Workgroups when running on Novell, Inc. networks.

Xpress Librarian 2.0 is Windows-based backup and storage management software that, when used in conjunction with Windows for Workgroups, will back up every available file server to the tape drive and any other workstation running Windows for Workgroups, the company reported.

The product lets users monitor the use of server disk space. For off-line archiving, users can choose files or groups of files by selecting specified criteria.

Xpress Librarian 2.0 costs $695.

➤ *Emerald Systems*
12230 World Trade Drive
San Diego, Calif. 92128
(619) 673-2161

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Local-area networking

Chipcom aims for higher speed nets

By Joanie M. Wexler
SOUTHBORO, MASS.

■ Smart-hub vendor Chipcom Corp. last week mapped out its plan for helping local-area network users migrate to higher speed communications while milking existing equipment investments for as long as possible.

The blueprint, which the vendor said will be filled in with product announcements and industry partnerships in the coming weeks, includes bundling LAN switching into Chipcom gear, eventually over a high-speed Asynchronous Transfer Mode (ATM) backbone.

The LAN-switching move parallels the migratory "network-per-user" concept pioneered by companies such as Alantec Corp., Kalpana, Inc. and Synernetics, Inc., which use various schemes for providing individual Ethernet users with their own private 10M bit/sec. LAN. This alternative allows companies to retain investments in desktop network interfaces while preventing several users from sharing — and eventually exhausting — network bandwidth.

Hub competitor 3Com Corp. resells the Synernetics technology in its 3GH high-end hub, although a separate wiring hub is required for cabling. Another competitor, Synoptics Communications, Inc., has a deal with Kalpana to integrate Ethernet switching into its devices.

"There are certainly pockets of people in large corporations with bandwidth constraints, such as those involved with technical, multimedia and image applications," said Lee Doyle, director of LAN research at International Data Corp., a research firm in Framingham, Mass. Doyle observed that doing network-per-user switching in a device separate from the wiring hub "makes it tougher to manage and integrate the network."

Beyond Ethernet

Unlike its competitors, Chipcom indicated that it would extend the LAN switching concept beyond Ethernet to Token Ring and Fiber Distributed Data Interface networks. Meanwhile, the company said it will provide backbone ATM products in late 1993 and desktop ATM networking in 1994.

Desktop ATM would require switching modules within Chipcom's OnLine Concentrator hub rather than an ATM backplane, said Dave Fowler, Chipcom's vice president of marketing.

However, Fowler indicated that "you may need a higher speed backplane, which I can't talk about yet."

"I'm not sure about ATM in particular, but the need for wider bandwidth is there," said Eric Olson, manager of network services and operations at Keyport Life Insurance Co. in Boston, a Chipcom shop. He said Keyport servers hosting policy administration applications are "over 50% utilized, and the network seems to be the bottleneck." Today, Keyport uses 10Base-T (Ethernet over unshielded wiring) LANs exclusively.

"We're challenged with performance issues all the time" because of the firm's widespread downsizing effort that is creating LAN-based, distributed computing, Olson said.

Fowler estimated that on average, corporate networks are growing five to 10 times faster than information services budgets. These grim figures are the rationale behind many networking vendors' efforts to help customers grow their networks incrementally.

Options increase for T3 users

Chunks of 45M bit/sec. links can now be more finely allocated

By Joanie M. Wexler
SANTA CLARA, CALIF.

Telecommunications network users are poised to gain tighter control over their burgeoning wide-area bandwidth this quarter.

T3Plus Networking, Inc. said it will soon support the channelized DS3 format on its BMX45 T3 multiplexer, which had supported only bursts of unchannelized traffic at speeds of up to T3, or 45M bit/sec.

With the addition of the new capability, organizations using T3Plus gear can interface with carrier networks and more finely manage the way they divvy up bandwidth throughout the public switched network. By channelizing traffic, for example, users can buy one T3 circuit and slice it into T1 (1.5M bit/sec.) or fractional T3 links that can be dropped off at locations throughout the public network. This is more economical than buying multiple point-to-point T1 or fractional T3 lines, said Alan Menezes, T3Plus' director of marketing.

Fractional T3 services are currently offered by AT&T and WilTel.

T3Plus shop Northrop Information Service Center in Pico Rivera, Calif., said it anticipates using the channelized capability as a "fallback to a T3 failure, where we can't afford to have an extra DS3 line sitting there for redundancy," said John Beecher, network technologist. In such a scenario, highest priority circuits would be routed over multiple T1s, he said.

In addition, he said, the capability might allow Northrop to "give service to customers in areas where T3 is not available but T1 is. We could buy multiple T1s and let the system inverse-multiplex them" across T3s in the backbone.

Inverse multiplexing on the BMX45 allows a multimegabit data circuit to be split across multiple channels in bandwidth increments of T1. Inverse multiplexing is available for under-T1-speed networking from vendors such as Ascend Communications, Inc. and Teleos Communications, Inc.

With T3Plus' announcement, "they can solve just about any of the basic T3 requirements," said Richard Malone, principal at Vertical Systems Group, a consultancy in Dedham, Mass. Vertical Systems estimated that roughly 2,040 T3 circuits were in use at the end of 1992 and expects that number to more than double by late 1994.

Channelized support has been available on unmanageable, lower end T3 multiplexers from phone switch makers such as AT&T, NEC Corp., Fujitsu Business Communications Systems and Alcatel Network Systems, Inc. Ascom Timeplex and Adaptive Corp. offer channelized support on more intelligent, manageable equipment.

T3Plus is the only vendor to support the unchannelized format as well, which is necessary for supporting packet-based traffic such as local-area network interconnect and emerging Asynchronous Transfer Mode traffic, he said.

T3Plus' unchannelized function has allowed users to accommodate, for example, 100M bit/sec. Fiber Distributed Data Interface internetworking at speeds greater than 1.5M bit/sec. But such a setup "was not very efficient for a whole group of applications that required consolidating separate T1 networks across T3 pipes," Malone said.

T3's raison d'etre

T3's 45M bit/sec. bandwidth will shift from being used primarily for consolidating T1 lines to LAN and host connectivity applications

Percentage use of T3 bandwidth by application

	1991	1992	1993*	1994*
T1 consolidation	61%	52%	43%	31%
LAN interconnect	12%	16%	20%	24%
Host connectivity	20%	23%	27%	31%
Image	5%	6%	7%	9%
Video/multimedia	2%	3%	3%	5%
Total leased T3 lines	1,510	2,040	2,980	4,450

*Projected

Source: Vertical Systems Group — CW Chart: Michael Siggins

LAN administrators empowered

Suppliers beginning to offer ways to monitor power glitches

By Elisabeth Horwitt
BENTONVILLE, ARK.

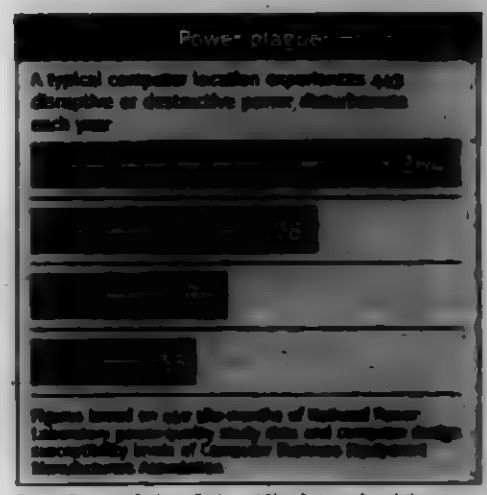
It is a problem that has long plagued LAN administrators: A workstation, hub or server on a far-off local-area network has gone kablooey, but before you call in the hub or Token Ring circuit board vendor, you would like to be sure that the source of the problem is indeed the network, not the power supply.

With 2,000 stores nationwide, Wal-Mart Stores, Inc. is placing a high priority on finding a way to track surges, spikes and outages on remote LAN devices, according to Mike Fitzgerel, special project manager at the store chain. "The [power] units we have today may or may not survive a

Power glitches, *page 54*

Power plague

A typical computer location experiences 443 disruptive or destructive power disturbances each year



Source: Computer Business Equipment Manufacturers Association

Network management

Consortium gets to work

By Elisabeth Horwitt

SEAGIRT, N.J.

Eight prominent vendors met here two weeks ago to discuss how to develop industry-standard management information bases (MIB) for managing IBM Systems Network Architecture (SNA) products via Simple Network Management Protocol (SNMP).

Particularly promising for the group's long-term viability was the presence of an IBM representative at the meeting.

The SNA MIB Consortium, founded by independent testing laboratory InterLab, defined an initial goal of getting the Internet Engineering Task Force (IETF) to sanction an SNA MIB working group at next month's IETF meeting, according to Michael Bowman, a spokesman from member company Netlink, Inc. who attended the meeting. Now under consideration are MIBs for managing SNA LAN gateways, traditional SNA devices such as cluster controllers and devices that send IBM Synchronous Data Link Control traffic across LANs.

Networked PCs

An average of 52.4% of PCs are on LANs, according to a recent International Data Corp. survey of 202 IBM mainframe sites.

Of the 79 sites that had more than 65% of their PCs on LANs, 38% said routers would be very important to their network strategies during the next two years.

IBM is considering whether to throw open to the group its MIB for managing Advanced Peer-to-Peer Networking, scheduled for release this quarter, an IBM spokeswoman said.

Delmarva Power & Light Co. would very much like to see a MIB for managing its Ethernet-attached McData Corp. SNA controllers via Cabletron Systems, Inc.'s Spectrum, its SNMP-based network management system, said John Scoggin, supervisor of network operations at the Newark, Del., utility. Right now, the controllers are managed by NetView, which makes them the "odd man out on the internetwork" and difficult for internetwork managers to monitor, Scoggin said.

Delmarva is currently looking at BlueVision, Cabletron's recently announced product to provide bidirectional links between Spectrum and Netview. "It's pretty kludgey and not inexpensive; [it would be] much better if McData supported an SNMP MIB," Scoggin said.

Metro Toronto is another organization yearning for an SNMP-based system to manage its "old SNA devices and the gateways that emulate them," as well as Cisco Systems, Inc. routers that handle its SNA traffic, said Charles Peyton, a consultant to the civic agency.

This would provide the agency with end-to-end integrated management of its current mixture of SNA and LAN devices, which share a network backbone, he added.

Representatives from Digital Equipment Corp., Rabbit Software Corp., Attachmate Corp., Sun Microsystems, Inc.'s SunConnect division, Systems Strategies, Inc. and Peregrine Systems, Inc. also attended the meeting.

Vendors such as Cisco, Cabletron and Sync Research Corp. said they intend to work with the consortium. Sync Research is expected to announce its own SNMP MIB this week.

Power glitches

CONTINUED FROM PAGE 53

radical fluctuation in power. But regardless, we'll never know, if a Unix system goes down, whether [the cause] was the utility power going down to 50V" or a failure on the system itself, he said. "There would be an enormous payback in being able to tell."

Several leading power supply vendors used the recent Networld '93 in Boston to launch products directly aimed at companies such as Wal-Mart that want central management of power supplies on their enterprisewide LANs:

•Best Power Technology, Inc. introduced a new version of its Logic Voltage Monitor, which is said to monitor Best power supplies on Novell, Inc. NetWare servers and Microsoft Corp. Windows workstations in real time.

A PC user can display graphs to show whether voltage is spiking below or above a predefined range of acceptable power levels, a Best spokesman said. This, in turn, enables administrators to pinpoint potentially dangerous trends, such as a power supply overloaded with too many devices, and also determine whether a recent problem such as data loss or corrupted files corresponds to a voltage surge or sag, he added.

The product is a NetWare Loadable Module with a list price of $199. A DOS version is scheduled for release at an undisclosed date.

•American Power Conversion Co. in Kingston, R.I., and Network Security Systems, Inc. in San Diego announced products that perform "managed shutdown" of a variety of LAN devices during a power outage. This involves saving data and closing files before the uninterruptible power supply's (UPS) battery backup runs down, which takes about eight minutes.

Both American Power Conversion's PowerChute Version 4.0 and Network Security Systems' enhanced version of LANSafe II are said to support both Novell NetWare servers and Microsoft Windows workstations, as well as hubs and routers. Managing shutdown of a Windows workstation typically involves closing multiple sessions or applications running on-screen. Shutting down a hub means ensuring that it has first sent all data sent to it.

Before the advent of automatic safe shutdown products, LAN administrators "had to run around shutting off" LAN systems before batteries ran out during a protracted power failure, an American Power Conversion spokesman said.

PowerChute 4.0 is scheduled to support Novell's Windows-based NetWare Management System by the second quarter. List priced at $99, it is available immediately.

Network Security Systems' LANSafe II can also send real-time data on power supply voltage and status to a Novell NetWare Management System.

The product will support IBM's OS/2 2.0 and Unix systems in the April to May time frame, the vendor said. LANSafe II for Novell networks is priced at $135.

•Oneac Corp. in Libertyville, Ill., provides automatic system shutdown for NetWare, OS/2, IBM's LAN Server and LAN Manager and Unix systems, the vendor said.

Last week, Oneac announced the "SNMP-ready" On Series of rack-mounted UPSs for internetworking devices.

The product will support the emerging Internet Engineering Task Force (IETF) standard for managing UPSs via Simple Network Management Protocol (SNMP), due out later this year.

The other leading UPS vendors also promised support of the IETF standard.

Wal-Mart is looking at SNMP-based monitoring of its UPS systems, Fitzgerel said. "Being able to get statistics on power and turning individual plugs on and off would be real handy." Wal-Mart is encouraged by work at the IETF to develop an SNMP standard for monitoring UPSs, he added.

Downsizing

Large-scale EDI staying on big iron

By Rosemary Cafasso

While many mainframe applications are being targeted for downsizing, electronic data interchange (EDI) applications are likely to stay on the bigger platforms for the near future, according to a recent survey by BIS Strategic Decisions in Norwell, Mass.

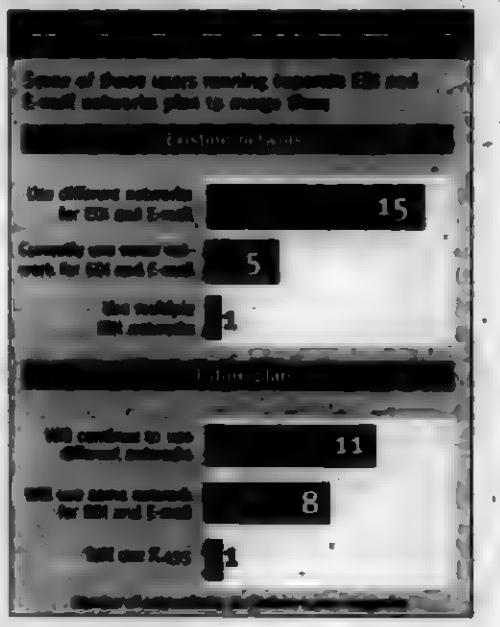
Large-scale EDI applications tend to be managed centrally, typically reflecting the centralized purchasing process at the user company, according to the survey.

As a result, companies also maintain separate networks for EDI and internal messaging, the survey showed, although many companies said they plan to merge these networks in the future.

"EDI would move at a slower pace to LAN [platforms] than electronic mail because it is really more akin to data processing than E-mail is," added Donald Ryan, vice president of telecommunications research at BIS Strategic Decisions.

BIS surveyed 20 corporate giants that had either implemented an EDI network or plan to within two years. Respondents included Hughes Aircraft Co., Bechtel Corp., Texaco Corp., Johnson & Johnson and Sears, Roebuck and Co.

The survey found that most users rely on EDI to improve their purchasing and invoice payment applications. However, EDI has begun moving into more strategic applications and, in some cases, is now playing a role in just-in-time systems.



Source: BIS Strategic Decisions CW Chart: Stephanie Faucher

Survey respondents said they expect more messaging traffic during the next two years at their companies, predicting an average of 1 million messages per month in 1994.

Multiplexers, front ends

Network Devices, Inc. has introduced the Gemini Fiber-MUX, a fiber-optic multiplexer.

The product has the ability to locate the full eight ports of an IBM Application System/400 workstation controller more than 5 km from the host. The Gemini Fiber-MUX works in conjunction with the company's Gemini-2000 active hub.

Pricing begins at $2,215.

➤*Network Devices*
8-11 Jan Sebastian Way
Sandwich, Mass. 02563
(508) 888-5200

Network management

KI Research has announced OpenDNM, a product for managing Digital Equipment Corp. networks running on Hewlett-Packard Co.'s HP 9000s and the HP OpenView network management system.

OpenDNM is said to monitor, configure and perform fault resolution on DECnet Phase IV and local-area transport networks via a graphical user interface. It also displays remote systems memory, CPU and disk use as well as the number of users and processes.

The product is priced from $12,000 to $36,000.

➤*KI Research*
6760 Alexander Bell Drive
Columbia, Md. 21046
(410) 553-0181

Fibermux Corp. has announced the Token Ring SmartLink (CC6682T).

According to the company, the SmartLink is the first network management module to maintain in-band network management communications during a beaconing fault. Compatibility is provided with IBM's LAN Network Manager and NetView. Network management can also be extended to Token Ring multistation access units that were unmanaged.

SmartLink has two Texas Instruments, Inc. TMS380 Token Ring controller chips and was designed for Fibermux's Crossbow line of multi-LAN hubs and LightWatch graphical Simple Network Management Protocol management software.

The product costs $4,995.

➤*Fibermux*
9310 Topanga Canyon Blvd.
Chatsworth, Calif. 91311
(818) 709-6000

Gateways, bridges, routers

Telematics International, Inc. has announced nine frame-relay products, including backbone switches, adapters and access devices. The adapters and access devices were slated to ship last month, and the backbone switches are scheduled to ship in May.

The NetFrameXchange product line ranges in price from $3,400 to $150,000.

➤*Telematics International*
1201 Cypress Creek Road
Fort Lauderdale, Fla. 33309
(305) 772-9070

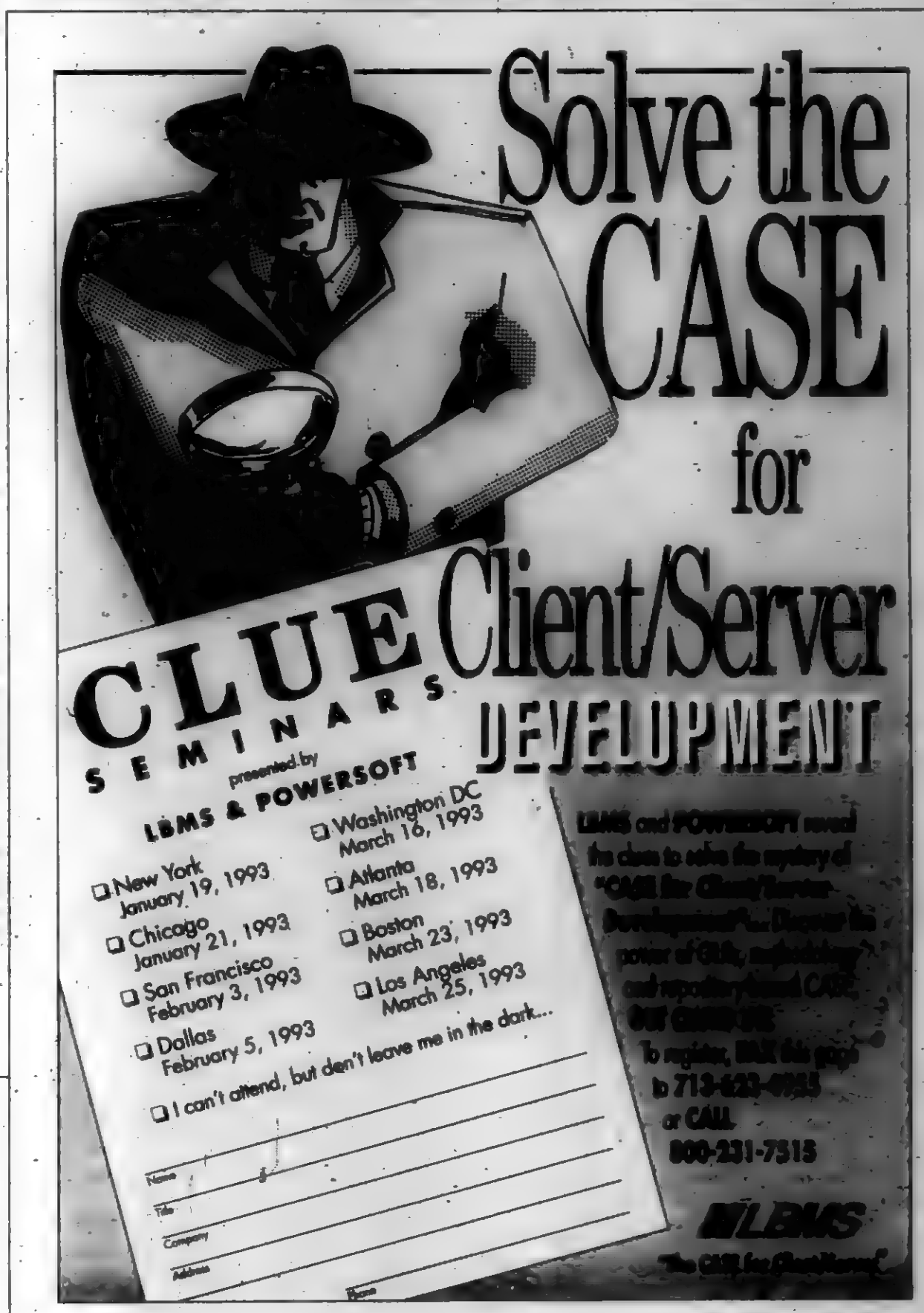
Engage Communication, Inc. has introduced the ExpressRouter for Apple Computer, Inc. Macintosh computers.

The product connects local-area networks with digital phone lines, transmitting data among various locations seven times faster than standard phone lines. ExpressRouter is available with one or four ports and operates with switched or dedicated digital phone lines.

Features for ExpressRouter include a selection of RS232, RS449 and V.35 ports and password protection for network dial-in security. Other options include inverse multiplexing and zone cloaking.

ExpressRouter costs $1,995.

➤*Engage Communication*
9053 Soquel Drive
Aptos, Calif. 95003
(408) 688-1021



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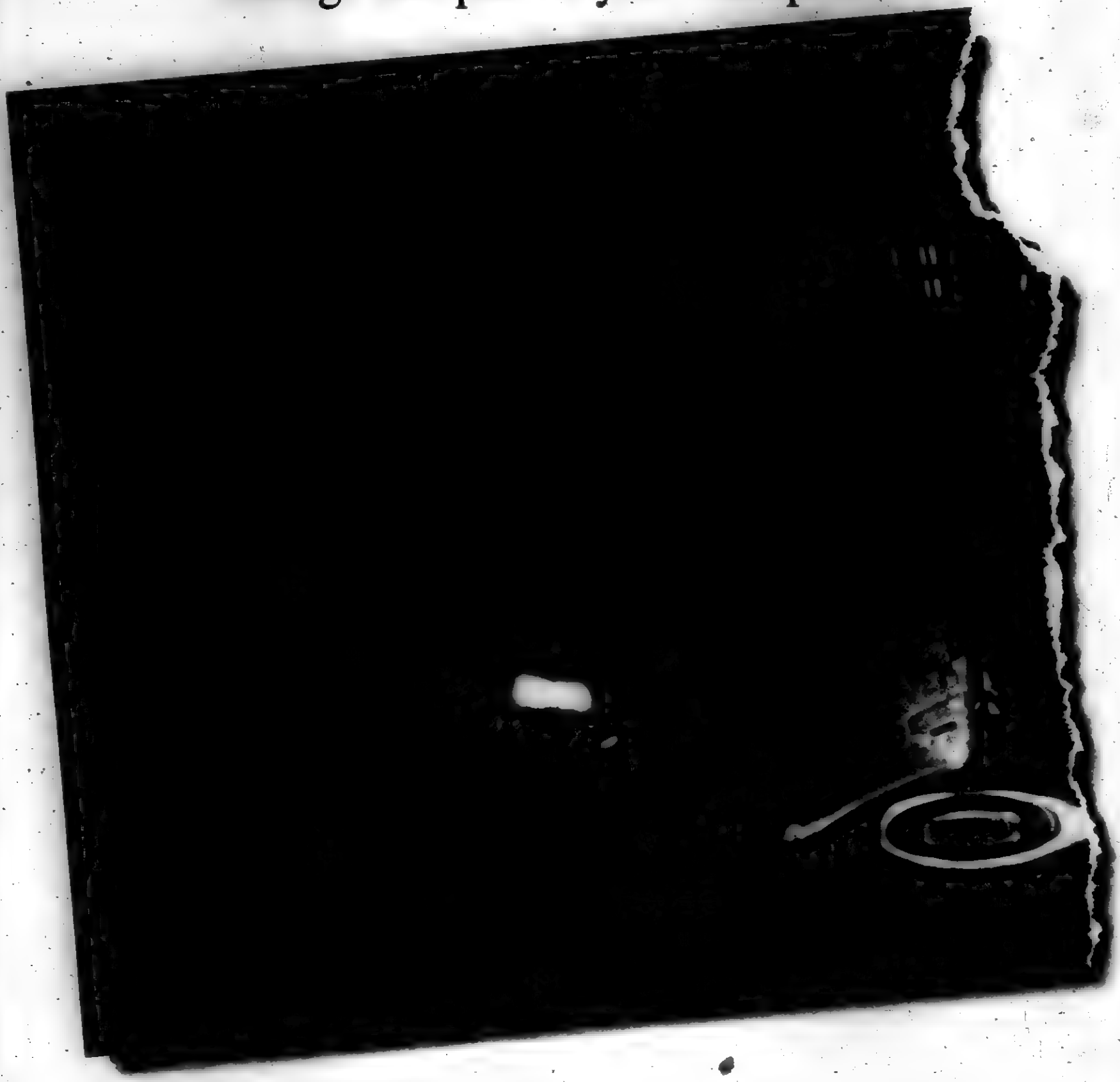

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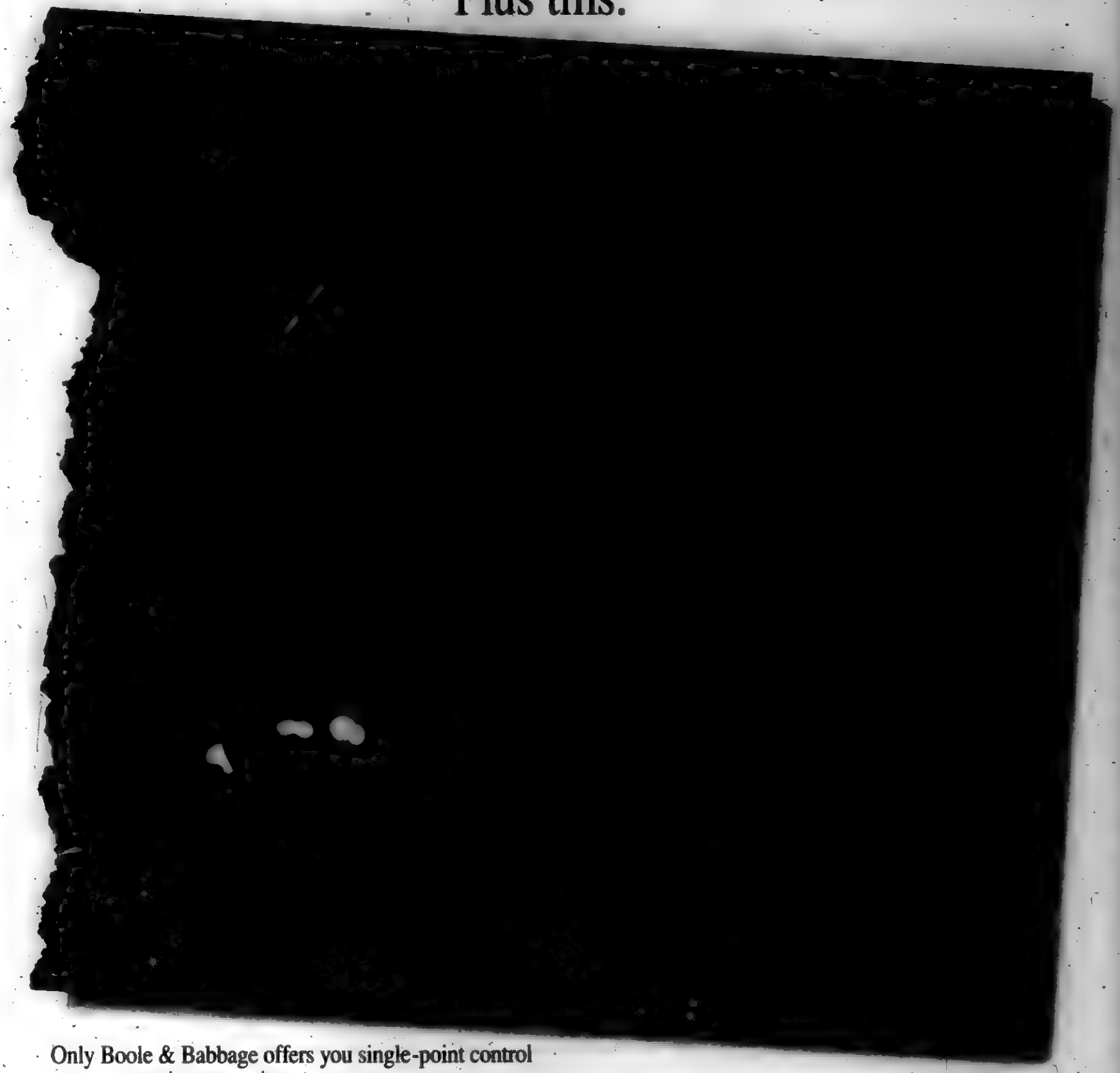

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Storage systems

Distance from IBM helps Adstar

By Johanna Ambrosio

■ IBM's storage systems business, Adstar, is well-positioned both financially and technologically, analysts said, but it will have to fight to keep its edge this year as it becomes more independent from its parent company.

IBM-wide cutbacks in research and development may have some long-term negative effects on this extremely technology-dependent business, some customers said. They also noted there is little to differentiate one supplier from another in this cutthroat market. And some users said they are increasingly willing to purchase disk drives and other storage devices from IBM competitors.

Further, Adstar — like most of its siblings within IBM — is coming off a difficult year. Jon Judge, assistant general manager of marketing at Adstar, said 1992 revenue was "basically flat" compared with that of 1991, but the business is profitable. He added that it is difficult to compare the two years' financial results because "we have shifted our whole [financial] measurement system from retail to wholesale."

James Porter, president of research firm Disk/Trend, Inc., said IBM's worldwide disk drive revenue took a hit in 1992 because of "the softness in the mainframe business and the intense competition in the [PC] business. IBM has had several price reductions on their PC drives and is now charging less than half of what they charged a year before."

Another challenge will be to woo customers who have gotten used to shopping around. "IBM's competitive advantage isn't as strong," said Doug Underhill, vice president at CSX Technologies, Inc. in Jacksonville, Fla. "IBM generally gets there first but doesn't stay there for very long. There's equivalent technology from all the players."

Evan Wride, director of information systems at Nissan Motor Corp. USA in Gardena, Calif., recently bought third-party disk drives, an unusual purchase in his mostly all-IBM shop. "IBM's price was 30% higher. It was a cost choice. I didn't see a 30% difference in performance, service and quality," he said.

Older drives

Also, some IS shops are using older disk drives as a cost-saving technique. "Why buy 3390 Model 3s when there's no appreciable change over the older model?" asked Tom Loane, vice president at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "We're buying used Model 2s."

Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn., said IBM will try to turn these perceptions around through more partnerships with large customers. "I expect to see more prototyping in user shops: going to the oil industry and asking what they need. Once it works, then Adstar will announce it as a general product."

There are several bright spots in Adstar's future. Most industry watchers characterized Adstar as being extremely well-run and said Adstar's increasing independence from IBM corporate will be to its advantage. Most expected Adstar to spin off into a completely separate company within a few years.

"If they are spun off, the rest of the computer industry will be much more prone to purchase products from Adstar," said Phil Devin, vice president of storage technologies at Dataquest, Inc. in San Jose, Calif. "The other computer manufacturers don't want IBM corporate to know what they're doing, and they're afraid that IBM demands could take priority in the factory."

Still, the OEM business is growing, Judge said — from $270 million in 1991 to $450 million in 1992. This year's expectation is for $850 million in revenue.

On the technology side, Judge said, the focus is on smaller, faster and ever-more-intelligent storage devices. Adstar is continuing to shift its manufacturing plants toward more 2½- and 3½-in. disks that will be used across IBM product lines, from the PC to the mainframe.

Adstar is also working on more intelligent software to manage the storage mix in large customers' shops, as well as on optical and tape units. A high-end redundant arrays of inexpensive disks device has been promised by the first quarter of next year.

Judge said IBM's cutbacks on R&D will not impact Adstar's ability to compete long term. "We've mapped ourselves to our competitors to make sure we're on the right track."

ON SITE

Dallas Morning News

Challenge: To absorb additional staff, circulation and advertising acquired from a competing newspaper while implementing new production system.

Technology: Based on Tandem Computers hardware and System Integrators software.

Results: System should handle increased user demands while adding multitasking and improved page layout.

Acquisition speeds system upgrade

By Mark Halper
DALLAS

Technology at the *Dallas Morning News* is so overburdened these days that dealing with deadlines often means dealing with dead lines.

When crunch time hits, the paper's 8-year-old Digital Equipment Corp. PDP-11/84s typically run out of conduits for routing stories among some 320 writers and editors, as the system's 500 available queues, or "in/out baskets," fill up.

In other words, writing an article can represent merely half the battle for an intrepid reporter huffing and puffing to get it in on time. Sending it to the next stop in the editing process can pose just as large a challenge, usually one completely out of the writer's control.

"On evenings when we have special events, like bombings in Iraq, the system is incredibly slow," said Bonnie Rogers, news systems manager.

In the time-critical newspaper business, any glitch in the system can have dire consequences. As assistant managing editor Walt Stallings noted, a slowdown at the editing stage usually pushes back the rest of the production process, ultimately slowing delivery to 500,000 subscribers anxiously awaiting their first daily gulp of newsprint.

"If the paper's not there, it doesn't do them any good," Stallings observed.

Until the *Morning News* brings on line a Tandem Computers, Inc.-based system from Sacramento, Calif., integrator System Integrators, Inc., it is implementing a few stopgap measures. On particularly busy nights, its remedy is one that is the bane of all reporters — deadlines are pushed up.

But Stallings said that interim approach has not always been successful.

For instance, on the evening of Super Tuesday during last year's primaries, editors requested that reporters file their stories 15 minutes earlier than the usual deadline. Nonetheless, "when production time came up, we still had 17 stories backed up waiting to go out on deadline," he said.

The reporters were doing their jobs, but the

Newspaper, *page 61*

In Brief

Goodyear chooses SAP

The Goodyear Tire & Rubber Co. will implement mainframe-based financial and manufacturing software from SAP America, Inc., the vendor said. The R/2 system is being installed in Goodyear's Akron, Ohio, data center.

Canadian utility downsizes

Ontario Hydro is replacing its mainframe-based fixed-assets application with a PC running SunSystems accounting and financial software from Systems Union Canada.

Accepting nominations

The Association for Computer Operations Management (Afcom) in Orange, Calif., is accepting nominations for its "1993 Data Center Manager of the Year" award. The award will be presented in April. For information, contact Afcom at (714) 997-7966.

Bank moves to Oracle on supercomputer

By Joan S. Bozman
AMSTERDAM

Frustrated by the throughput of conventional relational databases on IBM mainframes, one of the largest banks in the Netherlands is moving some of its time-sensitive IMS applications to a relational database management system running on a supercomputer.

ING Bank International is in the process of migrating some IMS-based equities-trading applications from IBM Enterprise System/9000 mainframes to a 32-node NCube supercomputer. If all goes as planned, the 50,000-employee bank will have several applications in production on mirrored Oracle Corp. databases this month. The bank's six ES/9000 mainframes handle 10 million transactions per day using IBM's IMS and VSAM file-oriented databases for CICS transaction processing and IBM's DB2 for customer accounts.

The bottom line for supercomputer databases will be better performance on $500,000 NCube machines at a fraction of the cost of multimillion-dollar IBM mainframes. "Our options-trading group needs operational information on a short-term basis," said Michel Hoevenaars, an information specialist at the bank. "All the trading data should be available as soon as some action has taken place, and I may assure you that in an IBM DB2 environment that is absolutely impossible." The bank plans to acquire NCube 3 supercomputers this year, he said.

The motivation for re-engineering was a need to process trading data as quickly as possible. "There is always a mismatch between the viewpoint of the users and the structure of the database," Hoevenaars said. He added that DB2 optimizers are used to speed performance and reduce response time. "What we wanted to achieve was to combine transaction processing and information retrieval in one operational environment."

Migration of IMS database applications was eased by earlier prototyping of Oracle 6.2 applications on the NCube beginning in July 1992. "We re-engineered the [mainframe] applications step by step," Hoevenaars said. Working with software engineers from Oracle headquarters in Redwood City, Calif., Hoevenaars' team of four created the NCube-compatible Oracle applications in two months.

The team used multiple NCube processors to translate flat files from IBM's IMS database into relational files for use in the Oracle database. "We used one node to translate one table," he said. "By using 32 nodes, we will be able to translate 32 flat files at the same time." The entire translation process from IMS to Oracle will take several weeks. The target is to start with a 30G-byte working database and grow it to about 200G bytes by 1994.

The first test of the Oracle 6.2 database, running since late December, was about 8G bytes, Hoevenaars said. The bank planned to have a new Oracle 7 database running in parallel with the first one by the end of last month.

Oracle 7 provides a parallel server option that allows two copies of the database to access the same data sets. Parallel processing will reduce the time needed for number-crunching large volumes of data. "If we really want to achieve massive production," Hoevenaars said, "we need to have parallel queries." Each of the NCube's 32 nodes has more than 16M bytes of memory available, he added.

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Newspaper

CONTINUED FROM PAGE 59

paper's technology was failing.

Even on a normal day, technology operations are helter skelter: Rogers races around the newsroom conducting intermittent roll calls in search of available computer space.

"I have to ask if people are gone, and can I delete their work queues," she said.

In fact, sometimes not only are there too few queues available, but the paper must also cope with a shortage of terminals on which reporters can write their stories.

The *Morning News* has been stretching the PDP system — which runs the DEC IAS Plus operating system and a DEC software program called Text Management System — for several years. However, the paper's acquisition a year ago of the assets of rival *Dallas Times Herald* exacerbated the PDP's shortcomings.

With the acquisition, the *Morning News* picked up circulation, reporters and pages, an across-the-board increase in operations that has taxed the PDP system beyond reasonable limits.

Choosing the System Integrators' system over other options was an easy decision for the paper because the *Morning News* had acquired the system in its *Times Herald* buyout. The *Morning News* had been considering a solution from Digital Technology International in Orem, Utah. But, with System Integrators equipment suddenly available, the Digital Technology evaluation became a moot matter.

Stallings said he is looking forward to features in the System Integrators system that are not part of the DEC system, such as multiple split screens, messaging and multitasking, which will allow him to run line-justification programs while he tends to other editing chores.

The System Integrators system also provides "area" text layouts that replicate the final look of a page, rather than "galley" layouts that simply provide text in columns, which then have to be manipulated into a page design. It is also capable of receiving more wire services than the DEC system, which tops out at 14, Rogers said.

System Integrators is installing eight Tandem servers, four live and four backups, each with 8M bytes of memory. It is also adding 157 of its System Integrators Coyote PCs to the hardware mix, which includes 149 Coyote terminals that the *Morning News* acquired from the *Times Herald*.

The integrator has transferred the *Times Herald*'s license to the *Morning News* and is providing staff training.

Rogers said the *Morning News* will look for buyers for the antiquated Intel Corp. 80286-based PCs it currently uses and for some of its four DEC minicomputers. It plans to hold on to at least one of its DEC machines to receive election results.

The paper plans to phase in the new system starting with less deadline-intensive sections, such as features, in April. It hopes to complete installation by the beginning of the high school football season in early September, a particularly demanding time in the world of Texas news reporting.

Until that time, the *Morning News* hopes to continue to avoid its worst nightmare.

"Our greatest fear has been that we can't get the paper out," Stallings said. "It's never happened, but it's been the fear in everyone's minds."

Software application packages

B.O.S. Software Technologies has introduced BOS-Complement 1.0, a software product for IBM's VTAM.

The product was designed to provide every mainframe system environment running under VTAM the ability to create on-line documentation and pop-up help windows with a PF-Key. All IBM subsystems are supported.

Pricing ranges from $75,000 to $125,000.

➤*B.O.S. Software Technologies*
Suite 200
10660 Scripps Ranch Blvd.
San Diego, Calif. 92131
(619) 578-7755

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Data storage

Aquidneck Systems International has announced the Optical Disk Silo Manager (OSDM), a storage subsystem running under IBM MVS.

According to the company, the optical storage and retrieval system accesses data stored in one or more optical disc autochangers, functioning transparently with utilities and user applications. Mainframe-based client/server technology is used, and OSDM supports LU6.2, IBM's Advanced Program-to-Program Communications.

For enterprisewide management of the optical storage complex, users can configure OSDM with the company's Optical Disk Communications Server and with as many optical storage subsystems as needed.

Prices range from $125,000 to $425,000.

➤*Aquidneck Systems International*
650 Ten Rod Road
North Kingstown, R.I. 02852
(401) 295-2691

Software application packages

Systems Design & Development, Inc. has introduced the Telecommunications Call Manager/400 (TCM/400), call accounting software.

By using monthly and quarterly rate table updates, users can trail and post outgoing telephone calls, the company reported. TCM/400 is fully integrated with IBM's Application System/400 and S/38 computers and offers capabilities such as unlimited storage capacity, record retention, high-speed processing and report generation.

Features include multiple phone switches and multiple site processing and incoming call record-tracking.

TCM/400 prices range from $8,000 to $30,000.

➤*Systems Design & Development*
Atrium Financial Center
Suite 412
1515 N. Federal Highway
Boca Raton, Fla. 33432
(407) 367-1648

Database management

BMC Software, Inc. has released Version 3.2.03 of Change Manager, Alter, DASD Manager and Catalog Manager, DB2 administrative products.

Change Manager and Alter now offer support for View-Text Validation. According to the company, View-Text Validation enables the products to perform the required syntax, analysis and consistency checking needed when automating modifications across production subsystems.

Change Manager also supports Location Grouping Identification and a new Info command that maintains catalog statistics by allowing a feedback loop to computer-aided software engineering tools.

Catalog Manager has a new Explain command, and DASD Manager offers an improved space estimation facility and enhanced statistical data collection.

Prices range from at $8,000 to $26,000.

➤*BMC Software*
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8300

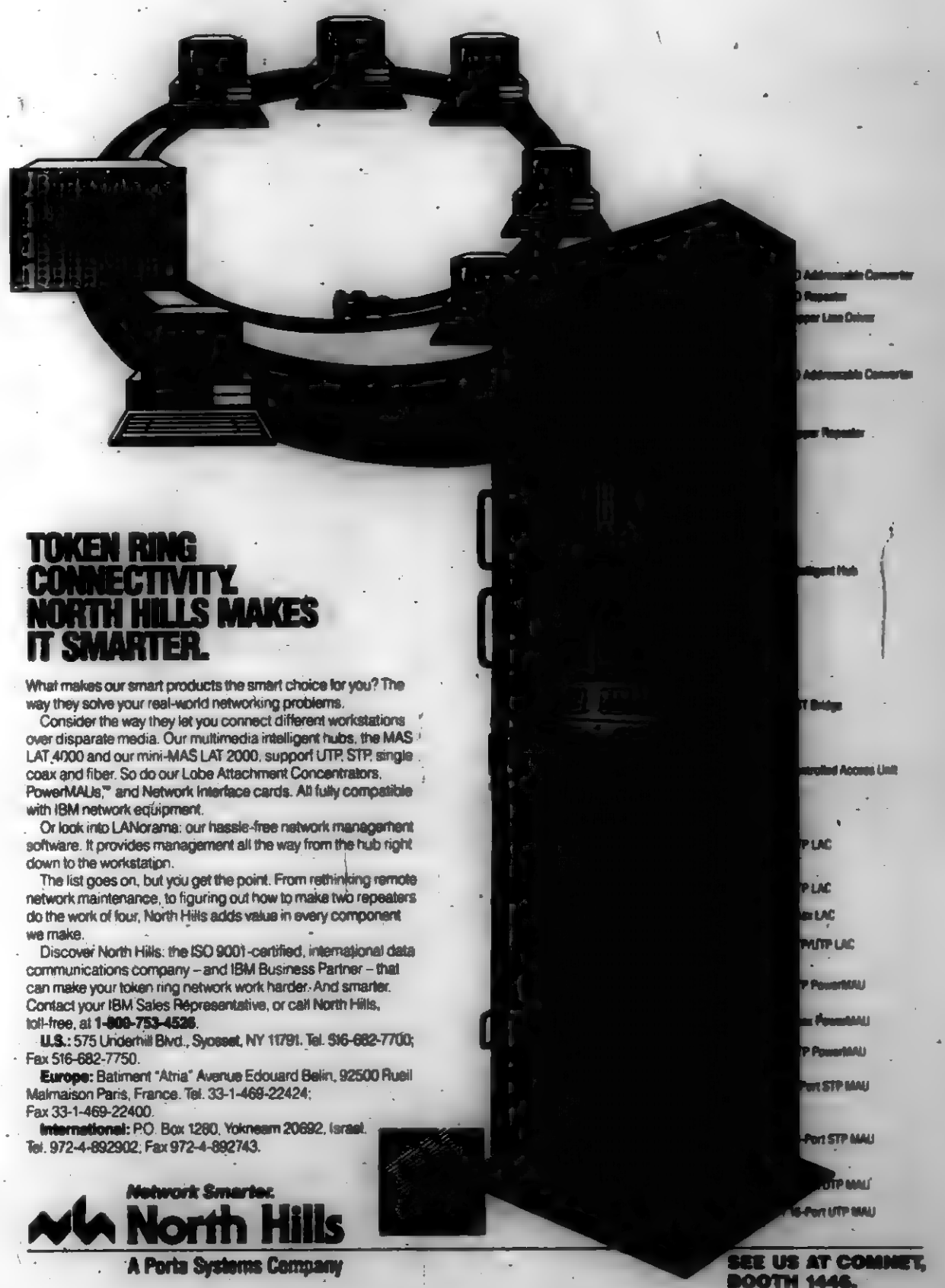
System software

Platinum Software Corp. has announced new modules for Sequel to Platinum and Platinum Premier Financial Applications.

A scalable architecture that uses the advanced features of Microsoft Corp./Sybase, Inc. SQL Server is incorporated in Sequel to Platinum. These features include a suite of accounting applications, remote stored procedures and database triggers.

Accounts payable and accounts receivable modules are available for Sequel to Platinum, with prices ranging from $10,000 to $100,000 per module. Pricing for Platinum Premier Financial Applications starts at $3,000 and includes currency translation, consolidations and intercompany processing.

➤*Platinum Software*
Suite 300
15615 Alton Pkwy.
Irvine, Calif. 92718
(714) 727-1250



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CPWADV0201

In Brief

XVT Partners adds new members

User interface tools vendor **XVT Software, Inc.** in Boulder, Colo., announced that 10 companies have recently joined its XVT Partners Program.

Charter members of the program include the following: **CASEworks, Inc.** in Atlanta; **Object Design, Inc.** in Burlington, Mass.; **Unisys Corp.** in Blue Bell, Pa.; and other companies.

The partners will share technical and marketing information with the maker of portable user interface design tools.

Visual Edge port

Visual Edge Software Ltd. has made its UIM/X 2.0 interface development tool available for use with object-oriented database applications.

The Montreal-based company said UIM/X can now be used to develop interfaces for the Objectivity/DB object-oriented database from **Objectivity, Inc.** in Menlo Park, Calif.

CASE tool ups productivity 50%

By Garry Ray

The Japanese Fifth Generation project of the 1980s may have fallen into obscurity, but a development tool spawned by the effort is marking productivity gains at the U.S. Patent and Trademark Office in Arlington, Va.

According to Kevin Petrucelli, a computer specialist at the agency, development efforts are reaping 50% productivity improvements with an integrated computer-aided software engineering (CASE) workbench called Daisys from S/Cubed, Inc. in Stamford, Conn.

The tool, he said, "takes a totally new approach to building systems" for the agency's jump into client/server application development.

The patent office decided about a year ago to consider new tools for its planned Patent and Trademark Copy Sales Order Entry Management System.

The system was needed to process the 2,000 to 4,000 daily requests for patent and trademark information. The requests are made primarily by patent attorneys.

Development of the system was initially launched using Oracle Corp.'s SQLForms development tool. However, the patent office also became acquainted with S/Cubed's Daisys at about the same time and decided to launch a pilot project of parallel development.

"We thought it was smoke and mirrors, so we brought it in for a working evaluation," Petrucelli explained. "One person built the system in Daisys and another in SQLForms."

Even with the learning curve of four months, the Daisys programmer was able to complete a working application at the same time as the Oracle coder.

Having proved the concept, the patent office decided to redevelop its older Appeals Case Tracking System (Acts) using Daisys.

According to Petrucelli, Acts is used to track about 40 previously denied patents that are appealed every month.

Out with the old

But Acts had become dated over the years. Originally written for the patent office by a contractor using Ashton-Tate Corp.'s dBase III+, it had become difficult to maintain. A prime candidate for a redevelopment project, it became the second working test of Daisys, Petrucelli said.

After about three weeks of development, the new Daisys version of Acts is now complete. It includes 15 Oracle database tables and 87 processes, including updates, adds and deletes, and it consists of 4M bytes of C and SQL source code, Petrucelli said.

The code will be compiled and executed on a Sun Microsystems, Inc. SPARCstation. An upcoming host-based project using Daisys will eventually support 1,700 users, he added.

Petrucelli said that many of the expert systems features derived from the Japanese Fifth Generation computer project are noticeable in the workbench. "It draws diagrams, develops documentation and does qualitative workflow analysis for you."

Analysts have also praised the little-known development tool. "I see it as visionary," said Mickey Williamson, editor of "CASE Strategies," an Arlington, Mass.-based industry newsletter. "It captures the roles of people, the jobs they carry out and the forms they use."

But, like Petrucelli at the patent office, Williamson was initially quite skeptical. S/Cubed "claimed a great deal that no one else was claiming. It would be better if they made mistakes in their demos," she said.

On Site

U.S. Patent and Trademark Office
Arlington, Va.

Challenge: To redevelop older applications and design new ones, using CASE tools and client/server technology.

Technology: The Daisys CASE workbench from S/Cubed, Inc. in Stamford, Conn.

Results: An estimated 50% increase in productivity after one pilot project and a production application now ready for deployment.

Object-oriented databases

Objectivity/DB 2.0 ships

By Melinda-Carol Ballou
MENLO PARK, CALIF.

Objectivity, Inc. has introduced a new version of Objectivity/DB, the company's object-oriented database that offers easier administration for distributed databases and ad hoc query capabilities using SQL, company officials said.

Other features that are new with Version 2.0 include distributed schemas that can now be shared by application developers for easier development of related applications, detachable databases for more flexible distribution of data and on-line incremental backup

"Detachable databases let users take a database that has links to other databases, like a component library, detach and move it somewhere else," said Craig Woods, director of marketing at Objectivity. "And with the backup, you don't have to bring down the entire system to back up a network of databases."

Previously, users made queries using C++, but now they can use SQL, he added. Version 2.0 of Objectivity/DB also lets users upgrade deployed applications via schema evolution and object migration capabilities, new administrative tools and programmatic interfaces so that developers can include database administration functions in their applications, officials said.

Objectivity/DB Version 2.0 is shipping now, and pricing ranges from $9,000 to $18,000 for a developer's version and from $200 to $500 for a runtime license. It runs on Unix workstations from Digital Equipment Corp., Hewlett-Packard Co., IBM, Silicon Graphics, Inc. and Sun Microsystems, Inc., as well as on DEC's VMS.

Get a Grasp on multimedia

By Christopher Lindquist

Computer-based training, kiosks, electronic publications and advertisements: These are but a few of the "real-world" applications for multimedia that get mentioned when you ask, "What is multimedia good for?"

And, users said, if you want solid multimedia performance from even low-end hardware combined with robust development tools, Multimedia Grasp by Paul Mace Software, Inc. in Ashland, Ore., may be the way to go.

Grasp has existed for several years, starting as a shareware package, and has recently been "split" by Mace into high- and low-end versions: Multmedia Grasp for large-scale, commercial-grade projects and Visual Grasp for "point-and-click" presentation creation.

Multimedia Grasp is aimed at developers who want to create "bulletproof" multimedia applications for commercial settings. It includes a paint program, file conversion tools, sound, picture and animation support, a font editor and a code library for C programmers.

"Nothing else even comes close in DOS-based multimedia," said Don Magnusson, a contract programmer in Atlanta who has written a variety of multimedia applications using several tools, including Multimedia Grasp. "If you want the monitor to get up and dance around the room, it'll do it."

And that's not an exaggeration, he said. One of Grasp's most powerful features is its abilities as a complete development language, right down to controlling the serial ports on a PC. That capability could even control a robot that could make the monitor do a jig, a polka or whatever else you might desire.

Such control also allows developers to fine-tune programs to make sure they will run on a variety of hardware configurations without crashing or speed problems. Control comes at the cost of ease of use, however.

"You pay a price for the power," said Steve Glauberman, president of Enlighten in Ann Arbor, Mich. "There is a learning curve."

Multimedia Grasp is scheduled to be available by the end of next month for a list price of $1,195. Visual Grasp is due within the same time frame for $149.95.

Adabas gets Fed's OK

SQL Server certified for ANSI SQL compliance

By Gary H. Anthes
RESTON, VA

Software AG of North America, Inc. announced that its Adabas SQL Server, which allows SQL access to the company's database management system from applications running under MVS or Unix, has received the federal government's certification for ANSI SQL compliance.

Certification required that the software pass some 300 tests administered by the National Institute of Standards and Technology (NIST) for compliance with Level 2 of ANSI SQL89. Certification for both MVS and Unix ensures portability of applications and databases across those environments, Software AG said.

The announcement marks the logical conclusion in a change in thinking about SQL at Software AG. The company had rejected the database access method as too simple and too inefficient but was ultimately forced by users to support it.

According to John Logan, an analyst at Aberdeen Group in Boston, the announcement is important for Adabas users contemplating downsizing from MVS to Unix and for anyone not sure of Software AG's commitment to SQL. "They wanted to show the world, 'We were wrong, and we want to show you how wrong we were. We are absolutely, positively 100% SQL-compliant according to the NIST standard.'"

Mike Schiff, director of the data management program at Software AG, said the announcement should also help lay to rest the image of the company as a mainframe-only firm. "Adabas is ... a truly portable database."

Schiff said users should see a large increase in the number of third-party software packages generating SQL commands that can be used with Adabas.

Adabas SQL Server was certified for Cobol and C. It complies with the government's Federal Information Processing Standard 127-1, which Software AG said is becoming a de facto standard in the commercial world as well.

On Unix, the product costs between $400 and $20,000; on MVS, it is priced between $37,800 and $89,800.

Tool connects seamlessly

By Garry Ray
WALTHAM, MASS.

A recently unveiled software development environment could provide a seamless connection between the design, documentation and coding of C and C++ programs, according to the environment's makers.

ParaSet, which was announced last month by Software Emancipation Technology, Inc. in Waltham, Mass., is intended to link the components of the software life cycle and "describe all of the relationships in the source code," according to Peter Weyman, vice president of product development.

The ParaSet tools, which comprise structured and object-oriented designers, editors, browsers and documentation aids, are linked to one another so relationships are maintained throughout the software life cycle, the firm said.

For example, changes to a variable in program source code would automatically be reflected in the program documentation; adjustments made in the debugger would be added to the entire program. An optional interpreter allows execution of code under development; another optional tool provides analysis and restructuring of existing source code.

Unlike many integrated computer-aided software engineering tools, ParaSet does not mandate the software engineering methodology, said Vladimir Geisberg, the firm's president. "I don't know whether it's programmer psychology, but it's improbable that [programmers] would use any methodology."

Currently in beta testing, the $7,500 environment will ship for Unix platforms next month, the company said.

DECforms update adds OSF support

Digital Equipment Corp. announced the next release of DECforms, the company's forms presentation software. The product will add support for the Open Software Foundation's Motif on OpenVMS for development and runtime environments, as well as a converter to ease the task of adding Motif support to existing DECforms applications.

DECforms currently offers developers a set of software tools and a runtime environment for implementing friendlier interfaces for character cell VT-class platforms on OpenVMS VAX and Ultrix reduced instruction set computing platforms. The upcoming VT terminal-to-pixel layout converter will enable users of DECforms on VT terminals to facilitate the transition to more easily access graphical user interfaces. It will also be available on Alpha AXP machines running OpenVMS.

The update will be released during the second half of 1993, and additional features will include multiline text fields, support for Adobe Systems, Inc.'s PostScript printing using Digital Data Interchange Format files and integrated support for Asian languages.

—Melinda-Carol Ballou

[redacted]

Code libraries

EMS Professional Software has added 66 new products to its PD/Shareware C/C++ Utility Library.

According to the company, the library consists of 854 products written for C/C++ language users by an assortment of authors.

The products are compressed with Pkzip and are optimally stored on a single CD-ROM or 39 1.44M-byte disks. The library includes a database that describes and indexes each file. Users can type in vendor, name or free search to find a specific type of C/C++ routine or program.

The library costs $99.50 on CD-ROM and $149 on disks.

➤*EMS Professional Software*
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

Application development tools

Information Builders, Inc. has announced Release 5.8.1 of Focus for IBM's Application System/400.

According to the company, the product incorporates Modify, a data maintenance facility for the OS/400 database with an SQL Read/Write interface.

Focus offers capabilities such as formal statistical analysis functions, a Focus "windows" feature and the automatic conversion of a report into graphics.

Multiple users can simultaneously maintain data with the Focus Modify for OS/400. Features include an automatic referential integrity that updates related files automatically. A full screen editor, a dialog manager, extended matrix reporting and an automatic window-driven report writer called TableTalk are also offered.

Focus for AS/400 Release 5.8.1 prices range from $3,000 to $100,000.

➤*Information Builders*
1250 Broadway
New York, N.Y. 10001
(212) 736-4433

Blackboard Technology Group, Inc. has announced GBB for Franz, Inc.'s Allegro Common Lisp Version 4.1, running on Hewlett-Packard Co. Apollo 9000 Series 700 workstations.

According to the company, GBB is a complete development framework for constructing intelligent software applications based on the blackboard approach.

The product offers knowledge modules that can be written in Common Lisp, Fortran and C languages; they use inferencing techniques that target the problem the knowledge modules are trying to address.

Blackboard applications and distributed blackboard applications can be built with GBB's knowledge source representation languages, graphics facilities and flexible control mechanisms, the company said.

GBB costs $10,000.

➤*Blackboard Technology Group*
401 Main St.
Amherst, Mass. 01002
(413) 256-8990

Scientific and Engineering Software, Inc. has introduced the SES/objectbench, an object-oriented analysis tool set.

The product consists of a graphical modeling tool for designing object-oriented analysis models, plus an animated simulator for studying the dynamic behavior of object-oriented analysis models, the company reported.

A range of static and dynamic verification is provided with a designing capture capability. Users can characterize execution behavior and "see" messages moving among objects.

The product is available on Sun Microsystems, Inc. Scalable Processor Architecture platforms.

Pricing begins at $4,900.

➤*Scientific and Engineering Software*
Building A
4301 Westbank Drive
Austin, Texas 78746
(512) 328-5544

Viking Software Services, Inc. has introduced Portal, a multiplatform software product.

According to the company, Portal was designed to dramatically reduce application development time for users.

A character-based user interface tool kit and application generators are provided. Full-screen displays, pop-up menus, cursor navigation and data fields are included for applications that do not require a graphical user interface, the company said.

A number of screen and data field attributes are available, such as word-wrap text fields, table look-ups, field-edit routines and scrolling windows.

The base price for Portal is $700.

➤*Viking Software Services*
Suite 100
4808 E. 67th St.
Tulsa, Okla. 74136
(918) 491-6144

Dynamics Research Corp. has announced a new version of AdaMat, the company's Ada measurement and analysis tool.

According to the company, the product is a source code analyzer and metrics tool that is integrated with the Verdix Ada Development System (VADS).

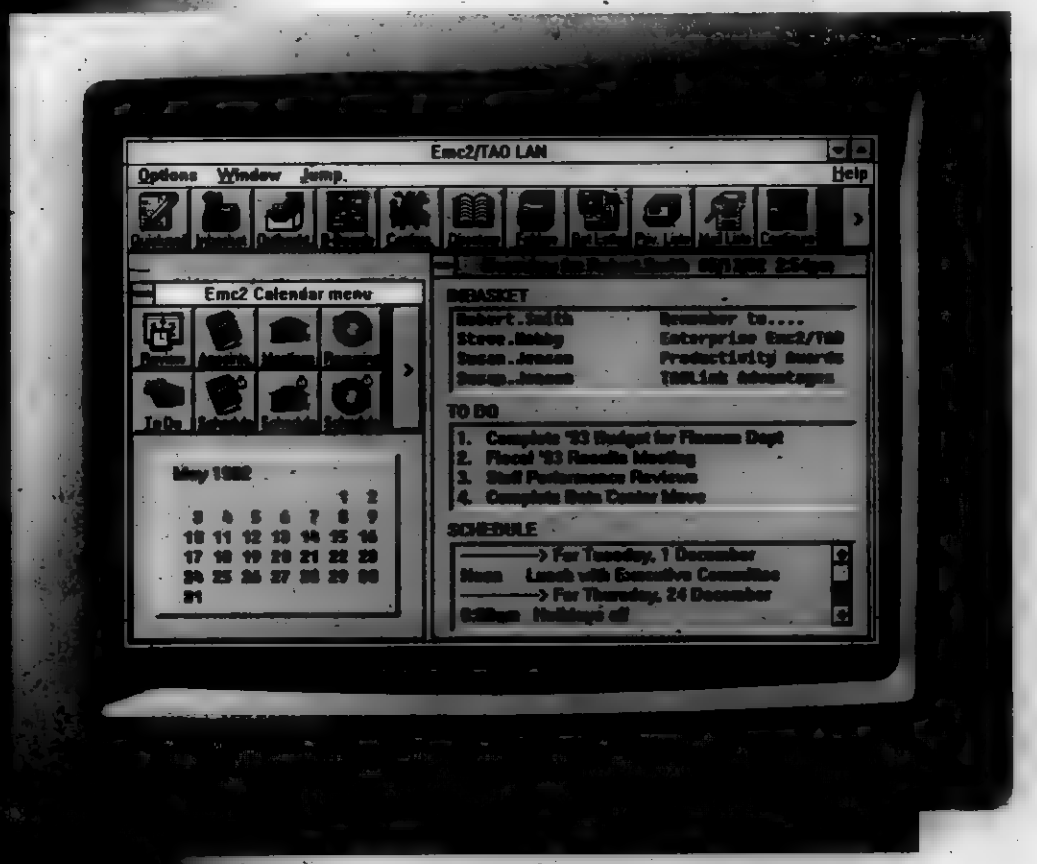
AdaMat assists users in measuring code to see if it adheres to good Ada programming practices and quality software engineering principles, the company reported.

Code can be analyzed directly off the baseline development system because of AdaMat's integration with the VADS program library.

An initial license costs $9,995. Additional seats cost $5,000. Network licenses start at $18,000.

➤*Dynamics Research*
60 Frontage Road
Andover, Mass. 01810
(508) 475-9090

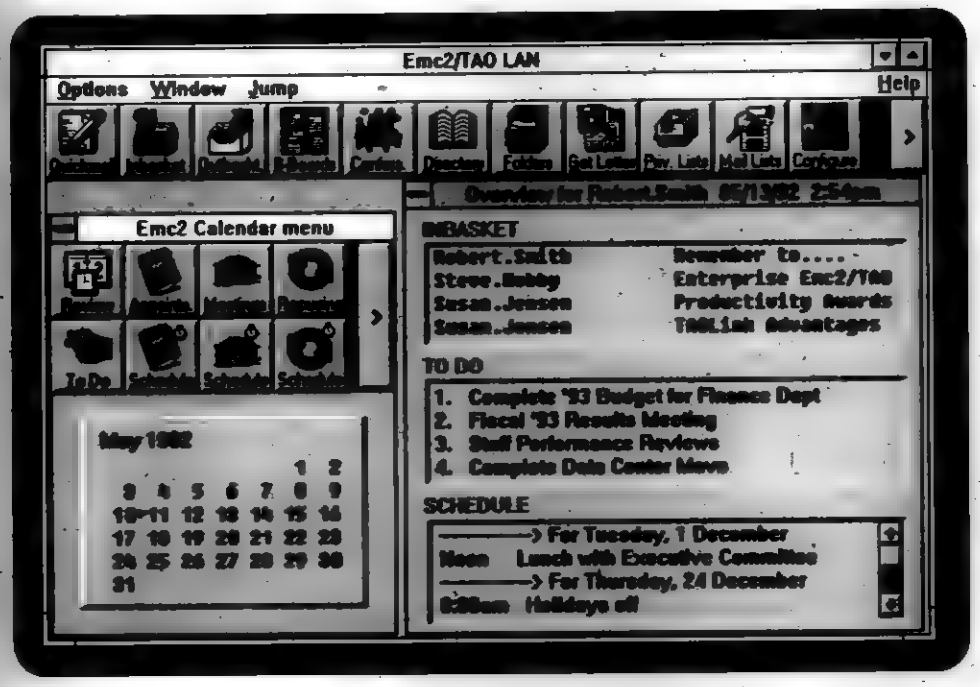
or Both Mainframe And LAN
s A Huge Headache...



Not!

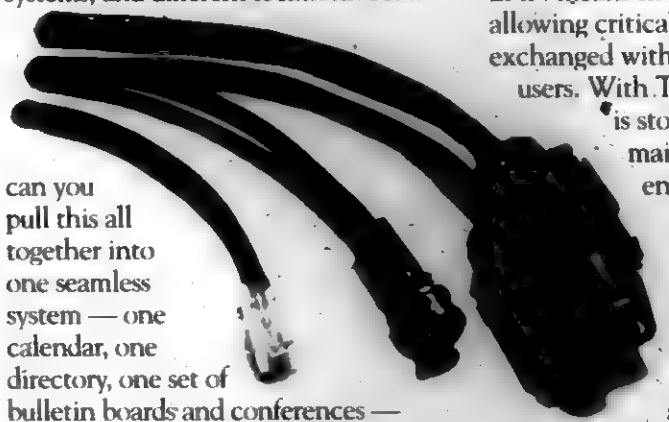
O® runs on the mainframe, AS/400, and LAN alike — one directory, one database, one calendar, one onic mail and office automation system, one solution. End of headache.

RNATIONAL SYSTEMS CORPORATION



directory. Moreover, one set of gateways is made available for all users, host and LAN.

Imagine for a moment that you have mainframe users on CICS and VTAM; you have 5250 users on AS/400; and you have Windows users everywhere who are demanding a user friendly GUI mail system. You now have different hardware, different operating systems, and different locations. How



can you pull this all together into one seamless system — one calendar, one directory, one set of bulletin boards and conferences — and still have a manageable system?

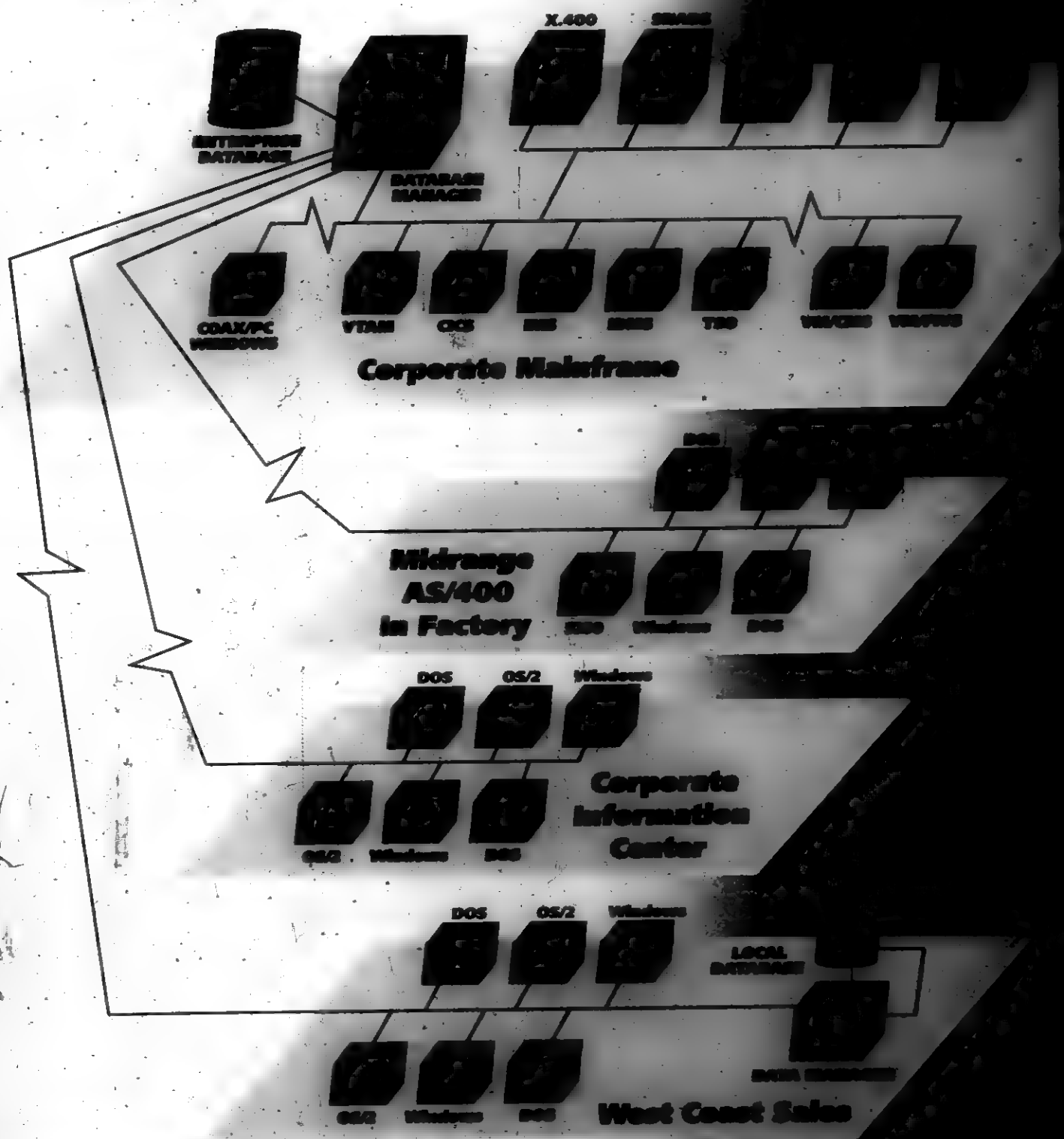
With TAOLink.

TAOLink is your insurance policy for the future — a world of constantly changing technology, a world of downsizing, rightsizing, new operating systems, and innovations as yet undreamed of. In this atmosphere, organizations are almost forced into becoming a veritable patchwork of technologies — often wildly different technologies.

And with TAOLink, there is no need to worry about data integrity on LANs. No data residing on the LAN means no anxiety about allowing critical data to be exchanged with host and LAN users. With TAOLink all data is stored in the secure mainframe environment.

Finally, TAOLink conserves mainframe CPU cycles with the use of TAOLink MVS, an LU6.2 application that links the host based **Emc²/TAO** Database Manager with the distributed mail application on the LAN. What this means is that users can take advantage of the computing power on their

Emc²/TAO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desktop for tasks such as word processing and Dynamic Data Exchange (DDE).

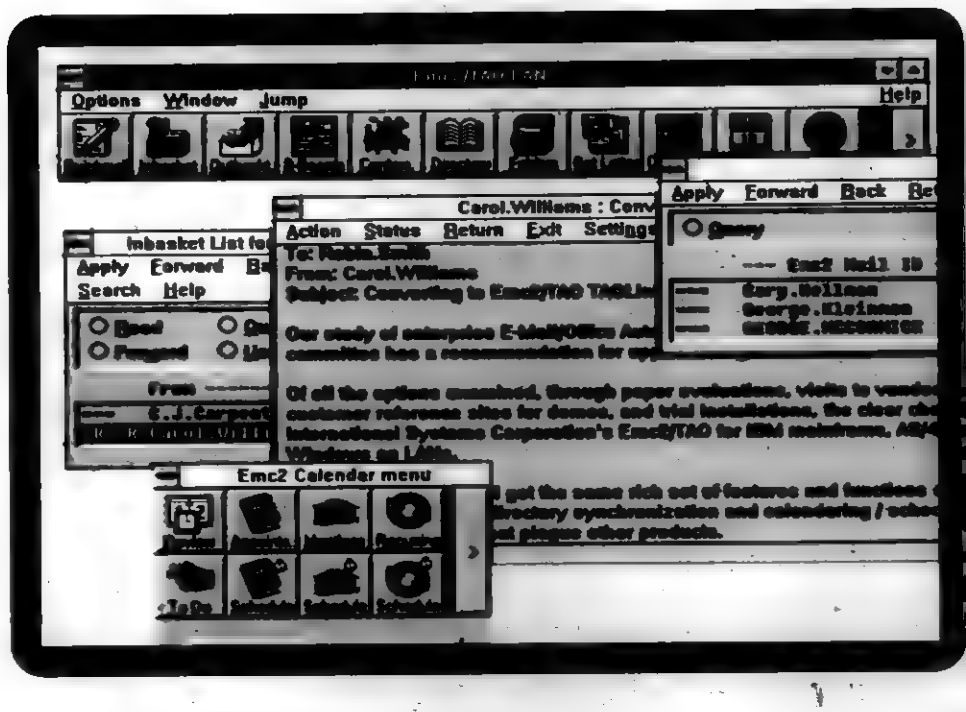
FULLY DISTRIBUTED DATABASE:

The Fully Distributed Database approach to **Emc²/TAO LAN** distributes the **Emc²/TAO** Database and Database Manager to the LAN environment allowing true workgroup processing for LANs. The **Emc²/TAO** networking feature, also an LU6.2 application, allows seamless exchange of mail between host and LAN users, as well as preserving functionality often lost with gateway connections.

Emc²/TAO LAN consists of the server PC and the client PCs communicating via Novell IPX or IBM NetBIOS. And, unlike other LAN mail systems, **Emc²/TAO LAN** doesn't require file server resources — that is, it doesn't burden the file server to provide mail transport. The database manager program runs under OS/2 EE and accesses the physical **Emc²/TAO** database located on that PC's hard disk. The client PC Mail program runs under Microsoft Windows or textual DOS.

MIX AND MATCHABILITY:

Another unique feature of **Emc²/TAO LAN** is the ability to "mix and match" the TAOLink option with a fully distributed database option. What does this mean to you? It means that if you have more than one LAN, you can choose to use TAOLink for one LAN and Fully Distributed **Emc²/TAO LAN** for another — you can even choose to use both on one LAN. You can "mix and match" secure in the knowledge that you have just the level of electronic mail services you need for that LAN — without buying expensive options you don't need.



MAIL SERVICES WHERE YOU NEED THEM:

Emc²/TAO LAN gives direct access to multiple mainframe and LAN environments via a central database. That means you get the same mail services, the same calendaring, and the same directory — whether you are connected to a LAN, a midrange, or a mainframe.

SCALABILITY:

Emc²/TAO LAN can meet present workgroup needs — and as your requirements grow and expand, you can extend **Emc²/TAO** to other LANS and mainframes. **Emc²/TAO LAN** can "scale-up" from serving a single workshop to supporting enterprise-wide operations. You can also downsize or migrate from one platform to another — and take your data with you! No other product can make such a claim.

SECURITY:

Worried about the confidentiality of your communications on the LAN? No need to worry with **Emc²/TAO LAN**. It has the same security features expected of a true enterprise system and that are inherent to **Emc²/TAO** such as confidential mail, use-restricted mail, password protection, and mainframe security protection with TAOLink.

CENTRAL BACKUP/ RECOVERY:

Afraid you might lose critical information and man hours with LAN hard disk crashes? Don't worry. Through TAOLink and **Emc²/TAO**'s Advanced Recovery Facility all your work will be saved in the event of a hardware failure.

ENTERPRISE CALENDARING/ SCHEDULING:

Emc²/TAO LAN provides the identical, full-featured calendaring and scheduling capabilities that are found in the mainframe version of **Emc²/TAO**. **Emc²/TAO LAN** users have complete access to all of the calendaring and scheduling functions via the central server. Now users on any platform share the same calendaring system. Other electronic mail LAN products available today require separate calendars for every distributed database — an inefficient and frustrating way to do business.

AT&T, MCI, Sprint, and IIN. **Emc²/TAO LAN** accomplishes this using gateways such as X.400, SNADS, MHS, SMTP and many more, including Fax.

ENTERPRISE BULLETIN BOARD/ CONFERENCING:

The bulletin board and conferencing capabilities available with **Emc²/TAO LAN** provide enterprise-wide central filing and forums for group discussion with automatic tracking of new messages. Again, other products require duplicating bulletin board and conference information.

CENTRAL GATEWAYS TO THE WORLD:

Want to communicate with somebody in Australia — or anybody anywhere? **Emc²/TAO LAN** allows users to be linked to other users anywhere in the world either directly or through value added networks like

CENTRAL DIRECTORIES:

You have one enterprise — why have more than one electronic mail directory? With TAOLink, directory synchronization issues disappear. Mainframe and LAN users see the same single directory.

THE Emc²/TAO API MAIL ENABLED APPLICATIONS:

The robust **Emc²/TAO** API provides a full set of subroutines that allow easy links to important line-of-business applications vital to your everyday business. Now your electronic mail system can easily exchange important data with any application. DDE allows for desktop integration and enables you to mail quickly and simply within applications like Word, Excel, and Pilot Lightship.

Free!

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FISCHER INTERNATIONAL SYSTEMS CORPORATION

She SHALL OVERCOME

Despite lower pay than men and slim hopes of becoming top managers, growing ranks of women are eagerly exploring growth paths in "IS . . . the most open of all professions."

By Mitch Betts

Women in the information systems field are buffeted by salary discrimination, a glass ceiling and the stress of juggling work and family responsibilities. So the IS world is a pretty bleak place for women, right?

Wrong. *Computerworld*'s latest survey on job satisfaction finds women every bit as satisfied with their IS careers as men are. So everything is hunky-dory for women in IS, right?

Wrong again. The portrait of women that emerges from several recent studies of the IS work force is, like life itself, more complicated than that. Some women get so disenchanted they bail out for self-employment, some are on the "Mommy track" and some have broken through the glass ceiling.

"Every situation is different," says Elaine R. Bond, senior technology consultant and former senior vice president for systems at The Chase Manhattan Bank NA. Balancing the work load at home and at work is "very hard for most women, but some find a way to master it, and some find the pressure gets to be too much," says Bond, one of a handful of high-profile women in the IS world.

Clearly, generalizations on this topic are risky business. For example, defying all odds against women in male-dominated manufacturing industries, Mary Jo Burnes is the corporate director of IS at machine-tool company Cincinnati Milacron, Inc. And defying experts who say women refuse to relocate, Laraine Rodgers is an MIS director who moved to 19 cities in nine states while raising two children.

The city of Phoenix's Laraine Rodgers: *'I see lots of possibilities . . . so I keep going forward'*

Higher job satisfaction

Computerworld's most recent surveys on IS demographics, salaries and job satisfaction paint a rich portrait of just how women in the IS field are doing and who they are. The study reveals such statistical niceties as the fact that, on average, women in IS are college educated, politically liberal and late-thirtysomething; have been in the IS field 11 years; and read *People* magazine (see chart page 68).

More importantly, the research also points out many similarities between men and women in IS. For example, all are finding their jobs more stressful in today's harsh, "do more with less" business climate.

Still, when it comes to IS job satisfaction, women are actually happier with their work, according to the survey. Some 78% of the women polled say they are "satisfied," compared with 75% of their male counterparts.

Judging from those figures alone, you'd think IS departments must be fairly comfortable places for women to work. "IS is probably the most open of all professions because the focus is on technical skills, which are gender-blind," says Carol L. Covin, author of computer job guides for the Washington, D.C., and New England markets.

Indeed, *Computerworld*'s survey also confirms that both men and women believe IS offers an excellent career track. Further questioning, however, reveals that although women are eager for more "opportunities for advancement," they are only mildly optimistic that they will ever reach the executive level.

Glass ceiling still exists

"IS is a very good career track for women. They can progress as easily as men can," says Kathleen V. Leamon, director of network management at Coastal Corp., a major energy producer in Houston. "But

Women in IS, *page 68*

Women in IS

CONTINUED FROM PAGE 67

it's hard when you try to get to the very top."

Indeed, the studies confirm the existence of a glass ceiling that keeps women bunched up, statistically speaking, in the midlevel jobs in the IS department (such as database administrator) and sparsely represented in the executive suite.

If you rounded up 100 of the nation's top IS executives — chief information officers or vice presidents of IS — only seven would be women, according to *Computerworld*'s October 1992 survey of 1,383 IS professionals. The same survey shows that women make up about 18% of the IS work force overall.

Furthermore, *Computerworld*'s annual salary survey confirms the existence of a salary gap [CW, Sept. 7, 1992]. The average salary of women IS managers is 21% lower than the average salary for men, and the gap occurs even in the same job title. For example, women with the title of IS director make, on average, 18% less than men do.

These disparities occur even though men and women in IS rank evenly in the standard Morrow-Goetz test of "professionalism," according to a study by researchers Saroj Parasuraman, Magid Igbaria and Jeffrey H. Greenhaus at Drexel University in Philadelphia. The test rates 24 measures of professional involvement, such as systematically reading professional journals.

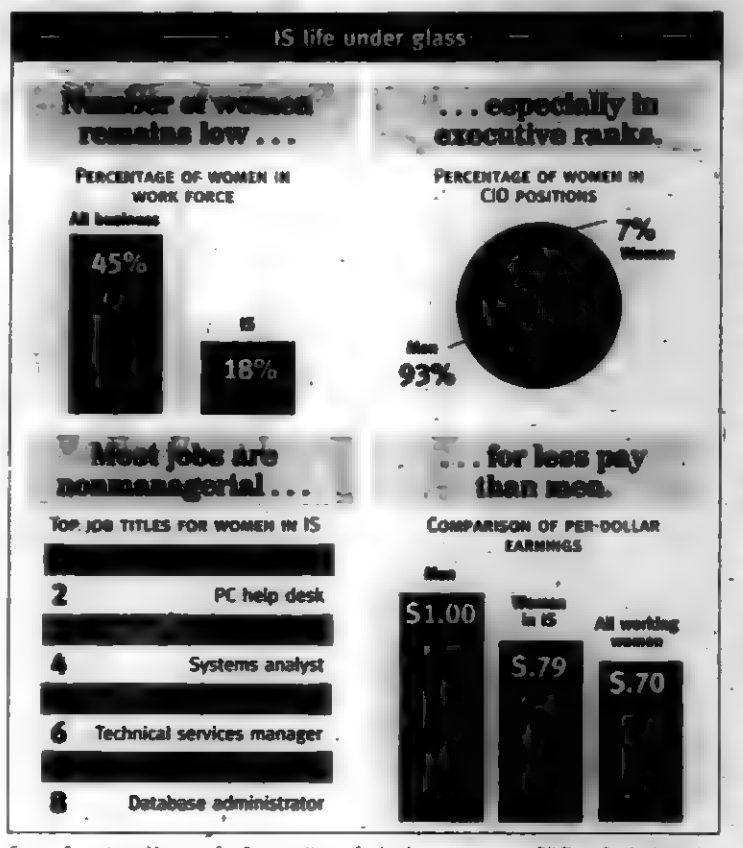
Part of the reason for the pay gap is that women did not enter the IS field in large numbers until the early 1980s, so they have not been in the field as long as men have or had time to move into higher paying management jobs, says Igbaria, professor of MIS at Drexel.

Yet there's another reason, according to the women interviewed for this article: old-fashioned discrimination.

Mobility also an issue

"Women top out sooner than men, just below the CIO level. The CIO level reports to the chief financial officer or the chief executive officer, and that's still an old boys' club — the bastion of white men," says Beverly Lieberman, owner/manager of Halbrecht Lieberman Associates, Inc., an IS executive search firm based in Stamford, Conn.

Still another reason for the differences is that some women pass up the chance to take higher paying jobs because they choose not to relocate, says Shirley Bascom, owner/manager of the North Canton, Ohio, office of CompuSearch, a division of Management Recruiters International.



Source: *Computerworld* survey of 1,383 computing professionals — CW Chart: Stephanie Faucher

Bascom says she often presents career-boosting job opportunities to well-qualified women and is rebuffed. "I am frequently told that it would be very difficult for her to relocate because her husband's career is too important to get disrupted. That's a personal decision about priorities."

Of course, Rodgers, the 45-year-old MIS director for the city of Phoenix, is a definite exception. "I advanced because I'm a good package. I'm knowledgeable technically and businesswise, I'm articulate, I focus, I schmaltz — and I'm willing to relocate," Rodgers says.

Many experts say that, in addition to hard work and talent, the women who make it into the executive suite also benefit from a corporate culture that encourages the advancement of women.

Indeed, some of the well-known companies that have had female IS executives include Xerox Corp., Eastman Kodak Co. and Du Pont Co., which are ranked among the 100 best companies for working women, according to *Working Mother* magazine.

"The glass ceiling is a corporate culture issue," explains Mary Cirillo, formerly an IS director and now a managing director in the executive suite at Citicorp in New York. "Most advancement occurs due to raw achievement, but at the most senior levels of management, advancement also requires a level of comfort working with those [male] colleagues," she says.

Simply put, "the company has to foster an environment where the decision-making process does not exclude people because they can't go into the men's locker room after golf," Bascom says.

Advancement for go-getters

The women who have climbed in corporations, Bascom says, "have been willing to travel a great deal, work very long hours and leave their children with other people. Sometimes they have extremely supportive spouses who modify their careers . . . and some of the female CIOs have never been married."

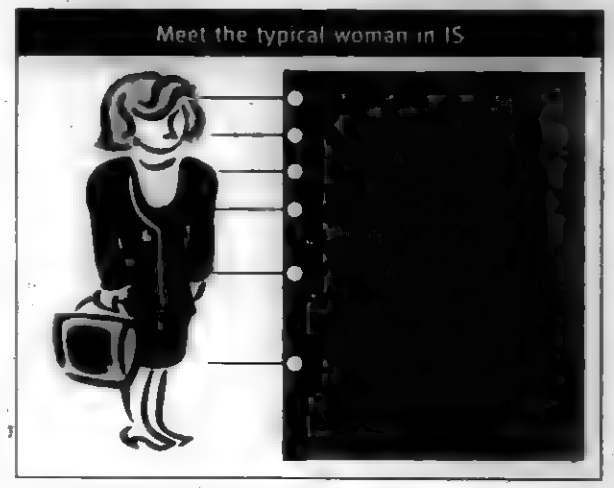
Some women reach the top while raising young children, while others become executives after their children are grown or do not have children.

Bond says women use a wide variety of techniques for balancing their work and family responsibilities.

Each woman has a different set of circumstances and tolerance for complexity and pressure, she says, so "I don't think there is a cookie-cutter solution to these issues."

As for her own rise to the top at Chase Manhattan, Bond says: "I didn't have the responsibility for children, and I think that makes a huge difference."

Women in IS, *page 70*



Source: *Computerworld* survey of 1,383 computing professionals

Voices of women at work

Patricia Wellington, CIO of the U.S. marketing group of Xerox Corp., Rochester, N.Y.

"IS is a terrific field to be in because it gives you the opportunity to see the whole company and all of its different parts.

"I encourage people in my organization to go out and take a job in a business unit and then come back to IS. If you want to be an executive, do some zigging and zagging on your way up.

"The glass ceiling is certainly there, but sometimes it's overplayed. Men probably have just as many obstacles to making that major step from middle management to an executive role. Today's corporate downsizing trend really limits opportunities and creates a glass ceiling for everyone."

Isabelle Castillo, MIS director at HCA Wesley Medical Center in Wichita, Kan.

"I got to my position when my son was a teen-ager. It would be very hard to be a director or vice president when you have younger children because of the long hours, sick kids, all of their school plays, sports and activities. I worked nearly 40 hours straight here a couple of weeks ago — you couldn't do that with small children."

Women have to fight . . .

Women are generally more than welcome in the IS field, our study found, and many businesses do more aggressively hire, promote, compensate and train women than men. But a majority of women polled say they run afoul — including some who say they've been passed over for a job despite their qualifications — when they attempt to "play corporate."

[illegible] through informal networks [illegible] . . . [illegible] . . . [illegible] . . .

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Women in IS

CONTINUED FROM PAGE 68

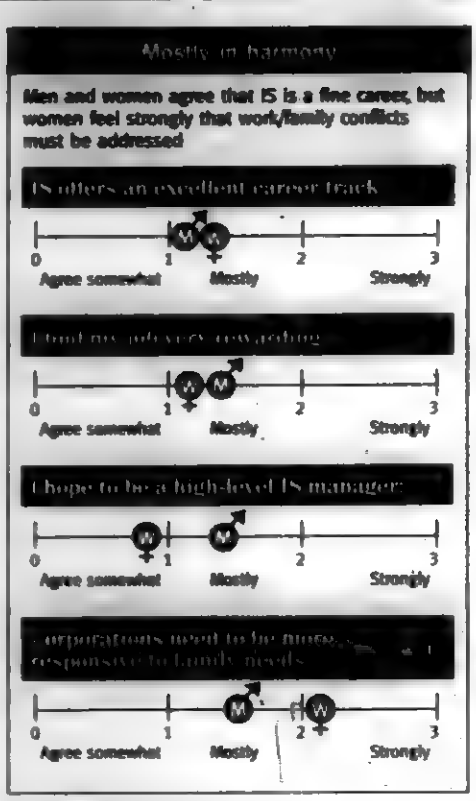
Drexel's study of 464 members of the Association for Computing Machinery found that the women were less likely to be married than the men, and the married women were less likely to have children.

"The large proportion of women professionals and managers who are single or divorced and have no children suggests these women attempt to minimize career/family conflicts either by not marrying or by remaining childless," the authors say.

Some women remain on a technical track or so-called "Mommy track" to accommodate their family needs rather than to pursue a management career, Igbaria says.

Others leave the corporate world to run their own small businesses and thus create their own corporate culture and accommodations for family life, according to experts.

"A lot of women have [left], and they will continue to do so until the [male] executives at large corporations retire and their successors turn the corporate culture around," Bascom says.



Source: *Computerworld* Database Division's IS demographics survey, October 1992

So the question remains: Why are so many women satisfied with their IS careers when they also face salary discrimination, a glass ceiling and work/family conflicts? The answer seems to be that job satisfaction entails more than money and promotions.

More than money

"What really makes people satisfied at the end of the day is the gratification they get from day-to-day work, the completion of projects, the tangible results," Cirillo says.

Robert A. Zawacki, professor of management and international business at the University of Colorado in Colorado Springs, says his IS personnel studies show that "the biggest single motivator for both men and women is the work itself. You provide them with meaningful work, and they'll work too much."

The most encouraging finding of the Drexel study is that both men and women feel they have the opportunity to work on significant and challenging projects with competent colleagues, build a professional reputation and be respected by peers and management.

While it is clear from the demographics study that women want employers to adopt pro-family policies that make the work/family juggling act a bit easier, it also appears that "gender issues" have not put women into some sort of blue funk that distracts them from their IS work.

Or, as Rodgers put it: "I see lots of possibilities rather than obstacles, so I keep going forward." •

Profiles of women at work

Mary Jo Bonnis, corporate director of IS at manufacturer Cincinnati Milacron, Inc.

"Our company is very, very conservative. There are very few high-ranking women — only two women (including me) at the director level. I'm very fortunate to have gotten this far in this company, and I attribute that to my skills. Also, I've grown up through the ranks with other mid- and senior-level managers.

"In my situation, the increased stress is due to the poor state of the economy, business conditions, downsizing, continual changes and the fact that we have to do more with less. I don't have any children. If somebody had children, they would be worse off."

A female IS manager at a California bank who asked to remain anonymous.

"I am reluctant to move someone into a super-critical position if I know she's planning to start a family because I know she'll be out for maternity leave, sick kids, etc. If I had two equally qualified people, I would choose the one I knew would be available.

"There is no way women will ever get past that. We know the discrimination is wrong, but the reality is that we have a business to run. One of the reasons I do well is that I am past child-bearing age."

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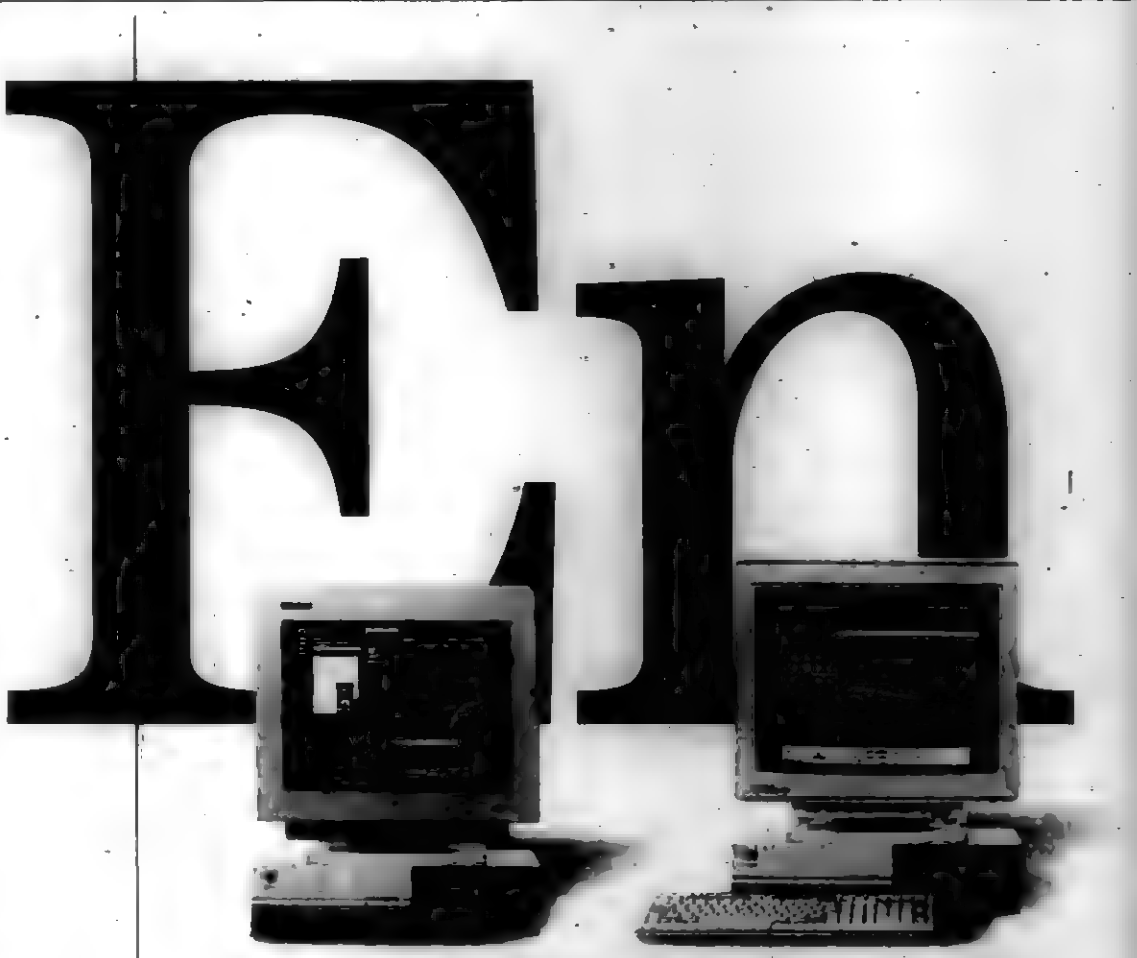

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Executive Track

Corporate redistricting at **ITT Hartford** in recent weeks has spun out information management as a separate department, which is headed by **John T. Crawford**, vice president and director of information management.

ITT's information management function was previously bundled with operations, processing and planning, which was — and continues to be — headed by Senior Vice President **William L. Harrison**.

With Harrison's recent promotion to the additional role of president of the **ITT Specialty Risk Services** business of ITT subsidiary **Hartford Specialty Co.**, information management was given separate statehood.

Crawford, who formerly reported to Harrison, now reports directly to **Donald R. Frahm**, chairman and chief executive officer.

At **Norfolk Southern Corp.**'s Transportation Logistics Division, former accounting systems and administration director **Bruce L. Haddan** is settling into his new position as assistant vice president of systems. Haddan, who joined the Norfolk, Va.-based railroad company in 1975, is stationed in Fort Wayne, Ind.

Edward A. Hopkins, former vice president of IS at Blue Cross/Blue Shield of St. Louis, has taken his experience to the bank. Effective this past fall, Hopkins is now serving as an administrative officer at the Banking Supervision and Regulation Division of **The Federal Reserve Bank of St. Louis**.

Promotions recently announced by **Dollar Savings and Trust Co.** in Youngstown, Ohio, include that of **Jewell Klumpp** to the position of assistant vice president.

With her new title, Klumpp, who most recently served as senior vice president and secretary at **Potters Bank and Trust Co.** in East Liverpool, Ohio, assumes responsibility for Dollar Savings and Trust's wire transfer area and central information files. In addition, the bank named **Deborah Morgan** to the position of senior data processing officer.

Have you, or a colleague in the information systems field, recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at 1-800-343-6474 to pass the news along.

Calendar

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

International Society for Hybrid Microelectronics (ISHM). Advanced Technology Workshop: Advanced Materials, Processes and Interfaces. Ojai, Calif., Feb. 15-17 — Contact: ISHM/IEEE Workshop Registration, Reston, Va. (703) 471-0066.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Downsizing Expo. Chicago, Feb. 16-18 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Adobe Technology Exchange Expo (ATXPO) Conference and Exhibition. Santa Clara, Calif., Feb. 16-19 — Contact: ATXPO '93, Santa Clara, Calif. (408) 562-6104.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

The Software Development Exhibition and Conference '93. Santa Clara, Calif., Feb. 22-26 — Contact: Software Development Conference '93, Carrollton, Texas (214) 245-6012.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1299.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7200

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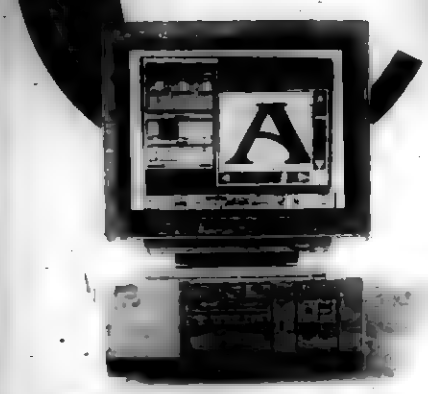

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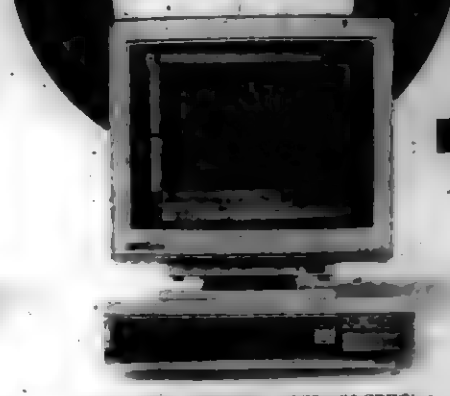

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sooner or later, it is going to happen to your company.

Management is going to discover the importance of close and continuous communications between functional areas that have never interacted before, such as sales and manufacturing or marketing and engineering. Or new business conditions will mandate an organizational shake-up that suddenly has a manufacturing plant in Germany and a distribution center in the Netherlands reporting to a product group manager in St. Louis. And you will have to figure out how to effect the necessary linkages among all the separate system enclaves.

If you're lucky, you'll only be trying to bring a couple of renegade proprietary systems and an ad-hoc local-area network or two into the companywide network. If not, you may have to cut over to an entirely new network architecture in order to achieve something open and fully tolerant of heterogeneity. Needless to say, the second route is an order of magnitude or so harder. But in no case should you expect a cakewalk. Throw out any vendor who promises you one.

Corey McCormick, senior network engineer at Citgo Petroleum Corp. in Tulsa, Okla., would know because he realizes just where the easy part stops.

"We've gotten as far as wire management, being able to tell if the physical wire is there," McCormick says. "But it pretty much stops below Level 4. Perhaps 10% to 20% of the tools we need are available but not across the different platforms."

Graham Morrison has also hit his share of ruts in his role as project leader on a 16-month network integration project for Blue Cross/Blue Shield of Connecticut. Take, for instance, the sticky little problem he's wrestling with right now — the inability of X Window System terminals to access file servers. Currently, he says, "we can only get access to big iron."

Eventually, though, if you watch your step, keep your head (and guard your wallet), you'll come through fine. The following stories — of adventures in progress — tell about some scrapes and missed opportunities, but they are all tales of survivors and offer some hard-won lessons about how to make similar trips with even less mishaps.

Words to the wise

Here's a quick look at some of those points:

- Take small steps, and whenever possible, work with standards and technologies that have been around long enough to have their jagged edges smoothed. (55% of information systems shops surveyed by *Computerworld* say they'll be using Transmission Control Protocol/Internet Protocol for integration.)
- If business re-engineering is involved, don't get out ahead of that process.
- Don't rush and don't ignore warning signs to make deadlines. Problems are magnified when they occur in a live network.
- Build some bridges between network designers and application developers.
- Make sure you have enough of the right talent, either on-board or on-call, before you get started. Forty-nine percent of the respondents to the *Computerworld* survey say the biggest problem they have encountered is lack of in-house experience.
- Think long and hard about how you are going to divvy up administrative responsibility for the network and deal with the power issues that will crop up.
- Prepare yourself for the fact that, as soon as you finish one stage, the tools you needed to do it better and more easily will hit the market for a price you could afford. •

Mobil net exec preaches patience

By Mark Mehler

■ If there's one piece of advice that Ted Lumley would offer to anyone trying to create a networking infrastructure to support new business strategies, it's: Don't get ahead of the business re-engineering process.

Lumley, chief of technical computing at Mobil Oil Corp.'s Exploration and Production Division in Fairfax, Va., has spent the past seven months implementing the first phase of what will be a major architectural revamping of Mobil's network. With only two months to go on this project, things seem to have gone pretty well, he says, but they could have been even smoother if the choreography had been better.

"There were times we were out in front of the business initiatives, and that can create antagonisms among the people who have to support [the infrastructure] who weren't yet conversant with the business strategy," Lumley says. "I'd advise anyone laying in new enabling infrastructure not to get there too early."

What's happening in Lumley's division is part of a gradual companywide transition to a standards-based network infrastructure capable of supporting a truly open exchange of information on a worldwide basis.

Mobil is not exactly coming out of the Dark Ages. The giant oil company has had a functioning multiprotocol global network supporting its technical activities and an IBM Systems Network Architecture (SNA) network on the commercial side. But there were gaps and breaks in the communications structure that reflected recently jettisoned functional divisions and prevented some kinds of information exchange.

For example, while the company had a proprietary electronic-mail system, users around the world could not easily access graphical applications or transparently exchange and share documents. Regional local-area networks had sprung up in great number and variety, separate from each

Mehler is a free-lance writer based in Jackson Heights, N.Y.

Closeup

Mobil Oil

Task: Install a TCP/IP-based WAN backbone to unify departmental LANs standardized around Novell Unix servers.

Purpose: Create a worldwide standards-based network infrastructure to support new business plans.

other and from the network.

This group of technologies — Novell, Inc.'s LMX, Banyan Systems, Inc.'s operating systems, PCs and Unix boxes — did not fit with Mobil's plans for global operation and distributed open systems.

The answer: a gradual transition to conformity with an architectural blueprint completed in mid-1992. This consisted of a Transmission Control Protocol/Internet Protocol (TCP/IP)-based wide-area network backbone (moving to an Open Systems Interconnect standard when that technology matures) tied into departmental LANs standardized around Novell Unix servers.

The initial nine-month implementation is expected to encompass about one-third of the exploration component of Lumley's division. The project is expected to be completed by the end of March. Mobil is spending approximately $5 million on this first leg, and a large chunk of that will be spent on retraining.

"The [networking initiative] has caused us to accelerate our PC upgrading," Lumley notes. "We've scrapped some 286 machines and brought in more 486s that can support the kind of networking applications we're doing. Along with the new Unix servers and desktop tools, our people have a big job getting up to speed."

WAN woes wither

The WAN issues, Lumley says, are pretty much resolved, with the existing technical corporate network integrated into the new TCP/IP Monet (Mobile Network), and the integration of Mobil's commercial SNA network is expected to occur somewhere down the line.

The biggest remaining near-term challenges, Lumley adds, are on the LAN side, not the least of which is coping with a glaring lack of standardization.

"It's a constantly moving target," he says. "Whenever Unix hits DOS, for example, we have a problem. We got an object-oriented GUI on the PCs provided by Hewlett-Packard [NewWave], but standards for information sharing aren't out yet. We had hoped they would have evolved more quickly. Right now, if a Unix user wants to get his hands on data generated in DOS, he's got to do a lot of manipulation."

Lumley laments the polarization between the Unix and PC communities. "The Unix [world] wants total abandonment of the PC, but we see Windows NT as something that is going to be an important consideration in our business, and we plan to [stay with both]," he says.

Similarly, Mobil has run up against the lack of standard policies and procedures for receipt of compound technical documents. Here, the Exploration and Production Division has been forced to undertake some internal development, a strategy at odds with its reliance on off-the-shelf products.

Still other problems include the lack of a robust Lotus Development Corp. Notes implementation in Unix and the absence of a native TCP/IP implementation by Novell.

"That is a major requirement," Lumley says. "Performance suffers when Novell has to use an IPX tunneling approach . . . but there are still lots of unknowns."

There are also some unresolved gray areas of how network management will be handled.

Mobil's centralized support organization will take on the difficult job of maintaining the high-level applications riding on top of the network, but beyond that lie a lot of unresolved questions.

"We're still working out all the details on which network components will be managed centrally and which should be distributed," Lumley says. •

Inside

More Integration tales from:
- BASF. Page 78.
- NASA Ames Research Center. Page 78.
- Maytag. Page 81.

Plus: What you've wanted to know about network integration but were afraid to ask. Page 81.

EXCLUSIVE CW SURVEY: NETWORK DECISIONS

What IS professionals are saying

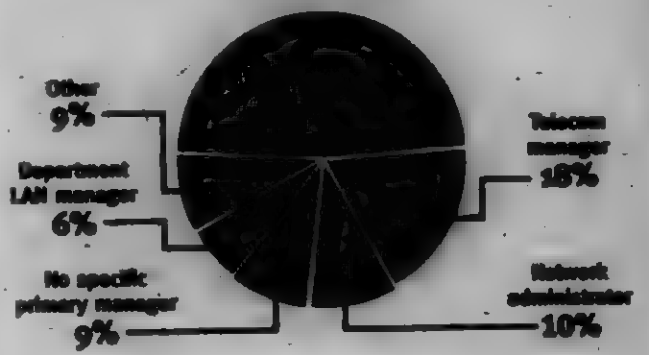
A recent Computerworld survey of 294 IS organizations on network integration found 88% of them are running SNA

Lack of in-house experience tops product incompatibility as the biggest problem for IS organizations when running multiprotocol networks.

PERCENT OF RESPONDENTS (RESPONSE BASE: 277, MULTIPLE RESPONSES ALLOWED)

The primary responsibility for managing enterprise networks is falling on IS managers

PERCENT OF RESPONDENTS (RESPONSE BASE: 294)



TCP/IP, the tried-and-true distributed network protocol, still dominates

PERCENT OF RESPONDENTS (RESPONSE BASE: 294, MULTIPLE RESPONSES ALLOWED)

Source: Computerworld Database Division

Net Terms

ATM: Asynchronous Transfer Mode. A gigabit-speed, scalable switched network. ATM is emerging to rival FDDI technology (see below) as a highway for aggregating traffic from lower speed networks.

FDDI: Fiber Distributed Data Interface. A 100M bit/sec. LAN most common now as a backbone for integrating traffic from multiple, lower speed LANs, such as 10M bit/sec. Ethernets.

Gateway: A device connecting two dissimilar communications networks by converting one type of protocol to another. For example, E-mail gateways allow various vendors' messaging systems to merge into an enterprise-wide mail system.

SNMP: Simple Network Management Protocol. Today's most far-reaching standard for integrated network management, though limited in the depth of information it provides.

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Speed is the key at NASA Ames

By Alan Radding

■ At NASA Ames Research Center in Mountain View, Calif., connecting high-powered workstations to remote supercomputers at very high speeds created special integration problems.

The challenge was to connect scientists at dozens of remote sites through a backbone linking five major network hubs across the country at T3 speeds to permit efficient exchange of complex models and simulations.

A point-to-point bridged wide-area network had been in place since 1986, connecting research scientists at leading aerospace and defense firms with NASA Ames' supercomputers.

Although capable of speeds ranging from 56K bit/sec. to 1.344M bit/sec., the network was struggling to accommodate simulations that typically transfer 32M bytes of data in 10 minutes. NASA Ames' goal was to run interactive, real-time graphic simulations transferring 32G-byte files in less than one hour, says Eural Authement, network development manager.

NASA Ames began building a new network called AEROnet in 1989. The network was designed not only to accommodate escalating demand for greater bandwidth but also to improve the availability, security and management of the network. AEROnet, however, would push the limits of available network integration technology.

Cost concerns

Ideally, the agency wanted to deploy T3 lines between its major hubs, but $6 million per year for a coast-to-coast T3 circuit in 1990 was prohibitive. Instead, the agency settled for four parallel T1 lines to create the equivalent of a T2 line at a cost of $1.2 million.

To squeeze the greatest performance out of the network, NASA Ames opted for routers rather than bridges. One key advantage, Authement says, is that routers can handle more than seven hops, making local-area network interconnections more feasible.

It didn't take long, however, for the agency to discover the outer limits of routers. For instance, it specified Open Shortest Path First (OSPF), a protocol that allows the network to respond to failures within three seconds rather than the 30 to 90 seconds required by conventional routing protocols.

OSPF promises to be an important protocol in building large networks that can quickly respond to failures, but now, OSPF is neither widely available nor as dependable as Authement would like.

The NASA Ames team did find two suppliers — Cisco Systems, Inc. and Wellfleet Communications, Inc. — with products that offered both OSPF and proprietary load-balancing schemes close to another protocol on its list. The agency had been looking for that protocol, called Equal Cost Multipath, so that it could balance loads across multiple circuits and "make four parallel T1 lines look like a T2."

So far, however, OSPF has been something of a disappointment. Authement complains that the protocol isn't efficient and is still in need of considerable tuning. For example, OSPF consumes a lot of CPU and router resources.

"We experienced CPU starvation on our routers," Authement says. This occurs because OSPF lacks a mechanism to establish priorities and, thus, performs CPU-intensive chores at times when NASA Ames wants it to send information packets instead.

The network team compensated for the problem by upgrading the router hardware, specifically dedicating a processor to protocol handling, installing a new release of OSPF software and tuning the router to ensure nothing bothered OSPF.

Another problem cropped up at the point where AEROnet touches the corporate networks of organizations accessing the supercomputers. NASA Ames used an approach called Exterior Gateway Protocol to create a boundary between AEROnet and the networks where the researchers reside.

"The nature of the protocol was such that it took 20 minutes to set up any changes," Authement says.

Today, there are other protocols, such as intermediate system to intermediate system (IS-IS), that promise to do the same thing faster, "but no one has really implemented IS-IS yet," Authement adds.

Securing the premises

NASA Ames needed strict security at the boundaries between systems. Because each user on the system is involved in highly proprietary research, "we had to protect ourselves from the users and the users from each other." The agency implemented security at the routers using multiple filters which allow information from certain addresses to go to selected addresses and prevent users from going where they shouldn't.

Looking back, Authement says NASA Ames might have rushed things: "Our biggest mistake was deploying the network components too quickly." When AEROnet was one-third deployed, the staff noticed the OSPF instability, "but we continued to deploy it anyway," he acknowledges.

In hindsight, it would have been easier to solve the problem then, before it became a crisis later on. "We should have put time into the plan to stop and assess what was happening and solve problems," he concludes.

Having come in on budget, at about $4 million, for the first year of AEROnet, Authement's only real disappointment is in not having achieved his primary goal of T3 speed throughout the network. •

Radding is a free-lance writer based in Newton, Mass.

Closeup

NASA Ames Research Center

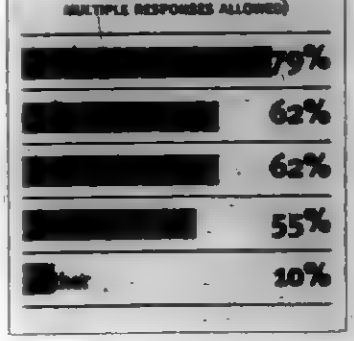
Goals: Link high-powered workstations to remote supercomputers at very high speeds and permit efficient exchange of complex models and simulations.

Purpose: Connect scientists at dozens of remote sites throughout the country and improve security and management of the network.

EXCLUSIVE CW SURVEY
NETWORK DECISIONS

Eighty-seven percent of the IS organizations surveyed have no plans to outsource any networking operations. However, the 10% that said they were likely to outsource some functions were mostly interested in assistance with integration.

PERCENT OF RESPONDENTS
(RESPONSE BASE: 29, MULTIPLE RESPONSES ALLOWED)



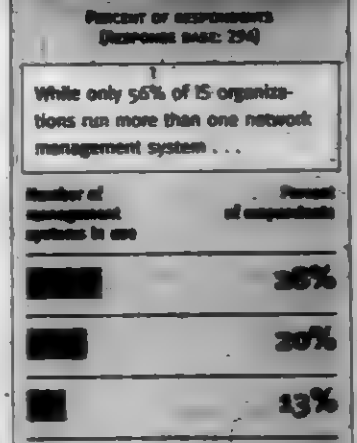
Source: Computerworld Database Division

NASA Ames' Eural Authement *advises others to deploy networks slowly*

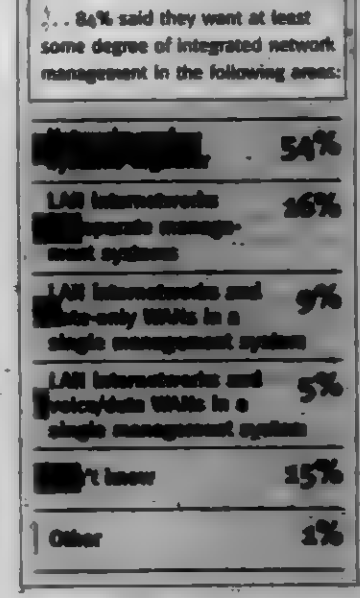
EXCLUSIVE CW SURVEY
NETWORK DECISIONS

PERCENT OF RESPONDENTS
(RESPONSE BASE: 294)

While only 56% of IS organizations run more than one network management system . . .



. . . 84% said they want at least some degree of integrated network management in the following areas:



Source: Computerworld Database Division

Two years, millions later

Worldwide BASF makes compromises along the way

Closeup

BASF

Task: Integrate various LANs into a worldwide network that can support open systems and client/server, Windows-based applications.

Purpose: Connect various departments across 40 U.S. sites; improve global E-mail communications.

Wish List

IS managers have a number of technologies and procedures that need refining to help ease the challenge of large-scale network integration:

- Directory standards such as X.500 for E-mail directory services.
- Database access standards such as Microsoft's Open Database Connectivity interface, which promises to smooth the connection between any database front end and back end.
- Open Shortest Path First. When interconnecting LANs and WANs, this is an industry-standard way for a router to choose the shortest, most economical communications path from among several going to the same destination.
- Equal Cost Multipath protocol. This would allow balanced loads across circuits.

By Alan Radding

In 1990, management at BASF Corp. in Parsippany, N.J., took a hard look at the company's network and saw something very close to chaos.

"We had a mishmash of technology — islands of IBM, DEC and Novell," says Ameet Patel, who analyzes emerging technologies at the diversified, worldwide chemical manufacturer.

It is not uncommon for organizations to find themselves saddled with multiple, incompatible systems and protocols after years of ad hoc, incremental systems development.

And that's exactly what had happened at BASF, where individual departments built systems and local-area networks for specific tasks such as manufacturing, engineering and administration — around one or another proprietary technology.

What company management wanted and what the business demanded was a network that connected these various islands across 40 U.S. sites. Even more than that, BASF needed a running start toward an even more ambitious vision — distributed, integrated networks running client/server applications across the entire far-flung organization.

In 1990, the company could only integrate its Digital Equipment Corp. and Novell, Inc. LANs. "Systems Network Architecture [SNA] isn't routable, and there was no Advanced Peer-to-Peer-Networking then," Patel explains.

Global communications consisted of 800 employees using public electronic-mail services.

Clearly, getting to that ideal level of connectivity and information sharing was not going to be easy. In fact, it turned into a two-year, multimillion-dollar project involving not only the U.S. operations but also BASF's German headquarters and worldwide operations.

SNA support

Today, the BASF integrated worldwide network is up and running along with a separate SNA network. The company has established anywhere-to-anywhere connectivity, integrating its various LANs into a network able to support open systems and client/server, Windows-based applications. In the U.S. alone, the BASF network currently embraces 40 sites, 600 servers and more than 6,600 workstations. A worldwide E-mail application on an X.25 network now supports 30,000 mail users.

The integration has been accomplished by Patel's 15-person team, which handles product evaluation, specification, creation and implementation.

The absence of standards in several key areas has made the job considerably tougher. With E-mail, for example, BASF selected X.400 as its worldwide standard but had to create its own directory service because the X.500 directory standard wasn't ready.

Constructing the directory service, using an Oracle Corp. database and an application written with Nantucket Corp.'s Clipper, required the efforts of three people for the equivalent of one man-year.

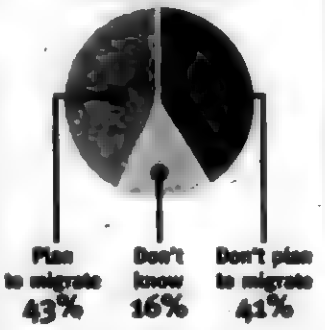
BASF also would have embraced Open Systems Interconnect if it were readily available. Instead, it turned to Transmission Control Protocol/Internet Protocol (TCP/IP) as its companywide integration protocol.

Using a variety of third-party and Novell add-in modules, it was able to add TCP/IP support to its Novell, IBM and DEC servers. It also introduced a new element, Hewlett-Packard Co., Sun Microsystems, Inc. and IBM Unix servers, into its network.

EXCLUSIVE CW SURVEY: NETWORK DECISIONS

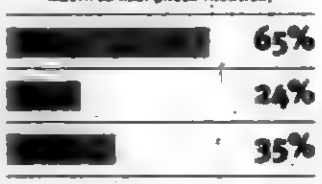
IS organizations surveyed are split evenly on their plans to migrate to a peer-to-peer network scheme

PERCENT OF RESPONDENTS (RESPONSE BASE: 104)



LU6.2 is the most popular protocol managers are using or planning to adapt in the next 12 months

PERCENT OF RESPONDENTS (RESPONSE BASE: 104, MULTIPLE RESPONSES ALLOWED)



Source: Computerworld Database Division

BASF's Ameet Patel: *'We had a mishmash of technology'*

Accommodating diversity was an absolute necessity because the company wasn't about to replace the existing IBM, DEC and Novell networks. But the need to be this ecumenical forced the company to move closer to the technology edge than would normally feel comfortable. For example, they had no choice but to use multiprotocol routers, which were still a relatively immature technology.

Patel and the manager of the technical services group evaluated all products against a matrix of features and spent three months viewing vendor demonstrations. But the team didn't bother with any pilot projects because BASF already had a similar network running in Germany. However, Patel says, "If I had to do it again, I'd probably use pilots and prototypes. You can't really tell how routers behave in a lab. You have to grow the networks."

The proliferation of protocols created another crisis: a memory crunch on the users' PCs.

With DOS and protocol stacks for IPX and TCP/IP, memory was very tight. This led to widespread debate among the group over whether and how to load all the necessary protocol stacks into the users' DOS workstations. "We wrote what seemed to be a Ph.D. thesis on memory management," Patel says.

One rough patch for the team was devising access paths across different databases, including Oracle and DB2.

"It was difficult trying to get Oracle and DB2 to talk to each other. There were plenty of gateways, but every vendor does it differently," Patel says.

The team wrestled with creating various front and back ends to connect users and applications to different databases. "We could have used some standard application programming interfaces like [Microsoft Corp.'s Open Database Connectivity]," he explains.

Such interfaces promise to smooth the connection between any front and back end.

Missing management

Probably the biggest cloud, however, was one that still lingers — lack of robust network management. Although there are many more products available now than there were two years ago and BASF has adopted several Simple Network Management Protocol tools, Patel remains wary.

"I have warned our vendors that they must provide management as good as or better than we had on the mainframe," he says.

And that's the next giant step: applications or, more specifically, re-engineering applications to take advantage of the network. "We believe in the model of one integrated system where, say, a salesperson or manager anywhere in the world can get on the network and see what is being produced, what's been shipped or what's going on with a particular customer."

Reworking applications to permit that is no snap, Patel says. "It's a steep learning curve and a process that can take years." •

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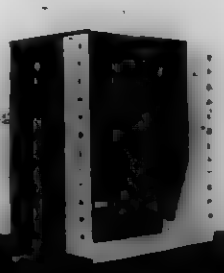

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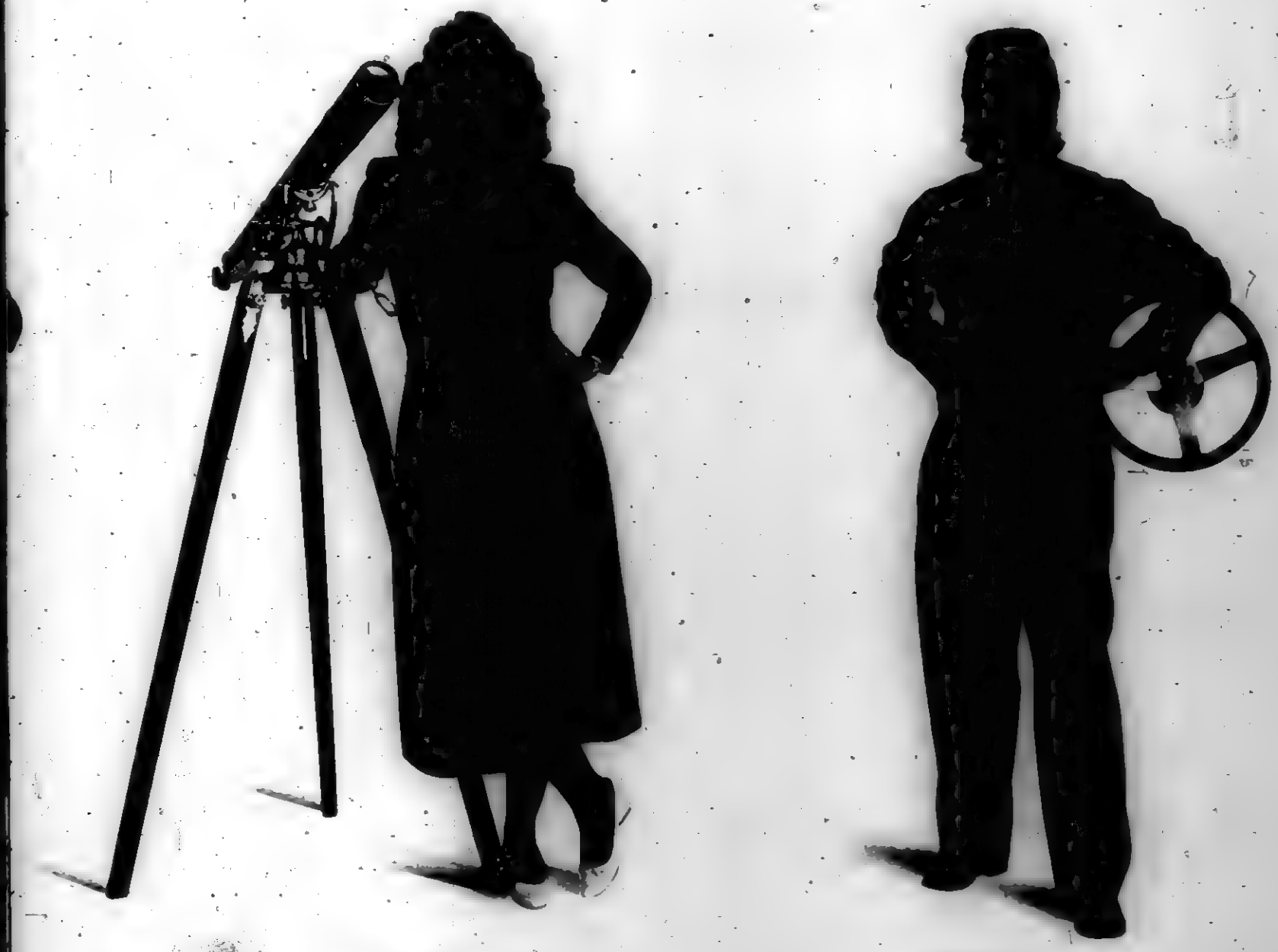

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Track 1 - Rightsizing the Enterprise
- Rightsizing in the Data Center: Choices and Opportunities
- Evolving Network Architecture
- The Services Industry Gold Rush
- Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems
- Tomorrow's Trends in the PC Systems Market
- PC Software Confronts the Enterprise
- Messaging and Advanced Group Applications
- Channel Management in the 90s

Track 3 - Winning the Midrange Wars
- Rightsizing for Technical Computing
- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with MIT Looms
- Midrange Contradictions

Track 4 - Networking
- Customer Directions: Managing Networking Investments
- Network Applications: Mobile Data, Networks, and Another Dimension
- Local Area Networks: The Platform for Distributed Processing
- The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets
- The New Europe: Opportunities and Obstacles for IT
- Latin America's New IT Markets
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Advice

Integration in YOUR terms

Thomas Wm. Madron answers some common questions that frequently trouble users attempting large-scale network integration:

Why do products purchased from integrators cost so much more than those purchased through mail order?
Although the answer to this question may seem obvious, customers often will not recognize that the profit made by an integrator is a combination of product sales and consulting services. Frequently, the higher profit margin is from the sale of products rather than the sale of services.

When someone purchases through an integrator, at least some services will flow from that purchase, whereas a purchase of hardware and software by mail order (or from the corner computer store) carries no implied services with it. The integrator should add value to the products purchased in some fashion or another, but a customer should not expect to obtain only the added value without the product purchase.

Can I make do with a peer-to-peer local-area network rather than investing in one that requires an expensive server?
The answer to this question is not clear-cut. Peer-to-peer LANs are now being sold with the argument that they are much less expensive than server-based LANs, and sometimes that is true. In a small group setting, peer-to-peer LANs can be perfectly adequate. Unfortunately, it is usually difficult to get an integrator to sell and install such a LAN, so it frequently becomes a do-it-yourself project, whether that was the plan or not.

There are several reasons why integrators are reluctant to deal with peer-to-peer LANs. These include low profit margins, technical conservatism, unfamiliarity with the peer-to-peer products and some genuine technical drawbacks.

Probably the most frequent cause of distress with peer-to-peer LANs is the fact that while there may be no dedicated servers, there are shared server mechanisms whereby resources on the workstations are shared by all the members of the workgroup. This means that if someone turns off his machine during a coffee break or at the end of the day, the server functions of the machine will no longer be available.

Moreover, if one user is performing a resource-intensive chore, everyone on the network may have to put up with less than satisfactory network performance.

Answers to some questions your network integrator and/or product vendors may not want to answer.

Why would I want to use a peer-to-peer LAN "on top of" my company's large server-based LAN?
Peer-to-peer network operating system vendors such as Artisoft, Inc. (LANtastic), Novell, Inc. (Novell Lite) and Microsoft Corp. (Windows for Workgroups) frequently stress that their products are Novell NetWare 3.X-compatible. One good reason for using one of these peer-to-peer network operating systems along with NetWare 3.X is to further integrate specific workgroups.

Sometimes a workgroup will have specialized equipment, such as a plotter, that is used heavily by several group members but not used at all by others. In such an instance, the peer-to-peer network operating system will be using the same wiring, network interface cards and workstations used by the corporate LAN.

Do I have to acquire leased lines or network services from an X.25 or Transmission Control Protocol/Internet Protocol network vendor to integrate my central and remote offices?
There is no single, straightforward answer to this question. One of the variables is the extent of connectivity required. If there is a high load passing from one remote site to another, it may be that the services from a network vendor or even leased lines will prove to be cost-effective. In many cases, dial access will provide equal service at considerably lower costs than the more traditional approaches.

In most small and medium-size businesses, the actual amount of on-line use between remote and central sites is minimal, thus not requiring 24-hour-per-day, 7-day-per-week service. I have one client that estimates it can reduce communications costs to remote offices from about $120,000 per year to less than $60,000 per year by using dial access. At the same time, the client will be able to improve and expand the services offered. Part of what makes this possible are newer, higher speed modem technologies.

The newer dial-up, low-cost modems include data compression and error-correction protocols that allow data transmission over voice-grade lines with fewer problems. •

Madron is the author of several networking books, including *Peer-to-Peer Networks* (John Wiley & Sons, Inc., 1993). He is also the president of a Dayton, N.J.-based networking consultancy.

Maytag: No more lonely employees

Closeup
Maytag

Task: Downsize from mainframes to mostly IBM AS/400s and link several divisions via a wide-area Token Ring network.

Purpose: Improve the communications flow among its nine domestic divisions.

By Mark Mehler

■ Maytag Corp. is using downsizing as an occasion for improving communications flow among its operations. As part of a move from a mainframe-centric setup to one in which IBM Application System/400s play the lead role, the Newton, Iowa-based appliance manufacturer is attempting to link its nine domestic divisions via a wide-area Token Ring.

Howard Buck, Maytag's network operations analyst, has begun implementing the new network and expects to have approximately 15 remote locations integrated into the wide-area network by mid-1994. Making the task somewhat easier, he notes, is the fact that 80% of the existing local-area network midrange traffic is IBM's Systems Network Architecture (SNA), while NetBIOS dominates on the PC side.

"We wanted to get rid of the big iron, and the alternative to [putting SNA on Token Ring] was a traditional APPN connected with an SDLC-type of line, which would have added a great deal of complexity," Buck says.

A few complications may be unavoidable. A number of divisions have yet to make their final platform decisions, and Buck says he foresees some integration headaches as local requirements begin to introduce diversity into his monochromatic network scheme.

"We haven't yet faced a lot of protocol issues," he says, "but there may be some situations where the AS/400 can't pick up the engineering load, and we would need to integrate DEC platforms, say, into Token Ring."

Maytag's Howard Buck: *'We wanted to get rid of the big iron'*

But the biggest potential problems by far, Buck says, relate to the management of the network. The network currently has eight servers and about 1,000 workstations. Buck estimates that by the end of this year, Maytag will add three or four more servers and 500 to 700 workstations.

In this case, it isn't the technical issues that have Buck worried but the prospect of political wrangling among Maytag's autonomous divisions.

To be sure, Buck would love to see an integrated set of network management tools that would be compatible with existing platforms and allow monitoring from one station, but he says he can get by with the tools he has. Besides, unless the divisions agree to cooperate, central management won't work. Right now, each division has its own information systems staff and some may want to maintain dominion over distributed computing.

Rather than trying to seize control, Buck has concentrated on diplomacy. "What we did to soothe their concerns was to examine all the commonalities across the divisions and publish a standard package identifying different protocols and platforms and setting up address guidelines," Buck explains.

This standards package has been helpful in establishing naming conventions that eliminate duplication and simplify administration.

Buck's group is also working with the divisions to pinpoint responsibility, enabling each IS group to begin staffing and training key personnel.

"It's a daunting challenge for the divisions," he says, "which a couple of years ago were dealing with a bunch of dumb terminals and are now faced with intelligent workstations and a slew of networking problems." •

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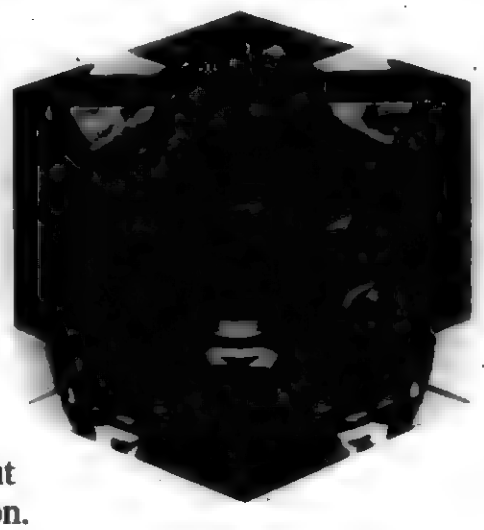

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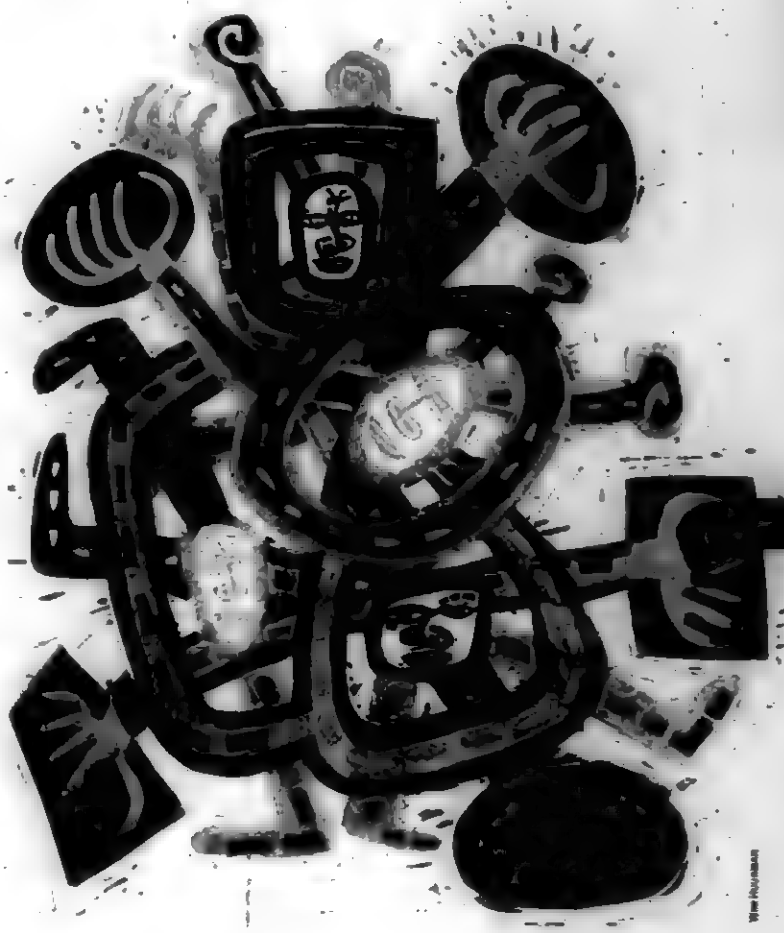

Do you want a snazzy GUI?

Interested in some quick prototyping?

Does building across platforms turn you on?

Client/server development tools are not all created equal

By David Baum

Say "client/server application development" out loud. Just try it. Then quickly look around at your information systems staff. Watch as their eyes bug out, their faces turn bright red and they run screaming from the room.

Not an encouraging response. But you can avoid the fear and loathing that comes from development tools that don't do the job. Make your life easier by doing some up-front work: Educate yourself on the types of tools available and what they're good for. You'll save yourself and your development crew a lot of pain.

Most application development products fall into two categories:

- **"Bottom-up" or homogeneous products.** These visually oriented tools are designed for PCs, favoring quick development of in-house applications over data modeling.

A sampling of tools includes Microsoft Corp.'s Visual Basic, Borland International, Inc.'s ObjectVision, Powersoft Corp.'s PowerBuilder, Easel Corp.'s Easel Workbench, Gupta Technologies, Inc.'s SQL Windows and Matesys Corp.'s ObjectView.

- **"Top-down" or heterogeneous products.** Designed for larger systems and multiple hardware environments, top-down products begin with an analysis of system requirements, leading to the design of a logical data model.

Top-down tools consist of high-end workbenches for writing complex applications. Examples include Uniface Corp.'s Uniface, The ASK Group, Inc.'s Ingres/Windows4GL, Oracle Corp.'s SQL*Forms, Miles Burke Associates' Procept application generator and SmartStar Corp.'s SmartStar Vision.

There is a place for both bottom-up and top-down types of products at most firms, depending on need.

Glitzy, glittery GUIs

If your plans call for building a graphical user interface, your best bet is a bottom-up tool. These tools have many features for window creation and object management. Their strength lies in developing client applications that maximize the use of windowing operating environments such as Microsoft's Windows.

These PC tool sets support features such as dynamic Object Linking and Embedding (OLE), making it possible for users to invoke one application within another and to create hot links among the data. Many of these products also offer multimedia capabilities.

Visual Basic and ObjectVision, for instance, are geared to build MS-DOS and Windows applications quickly. Developers draw the user interface and attach code that responds to events in the GUI. Features such as rapid form designers and tool kits of commonly used window components make developers productive quickly.

Sun Hydraulics Corp. in Sarasota, Fla., uses Visual Basic for its user interface-intensive jobs, says Chris Barlow, a software engineer at the company. "We have used it to create very sophisticated front ends for our order entry and order processing applications."

Developers at Sun Hydraulics have involved casual users in the development process, turning them loose on screen design and basic GUI logic. By setting up Dynamic Link Libraries (DLLs, or libraries of preprogrammed functions users can link to) for more complex functions, such as network connectivity and database indexing, they can shield users from these more technical aspects of development. Visual Basic users can choose add-on components, quickly attaching them to new applications in the form of DLLs.

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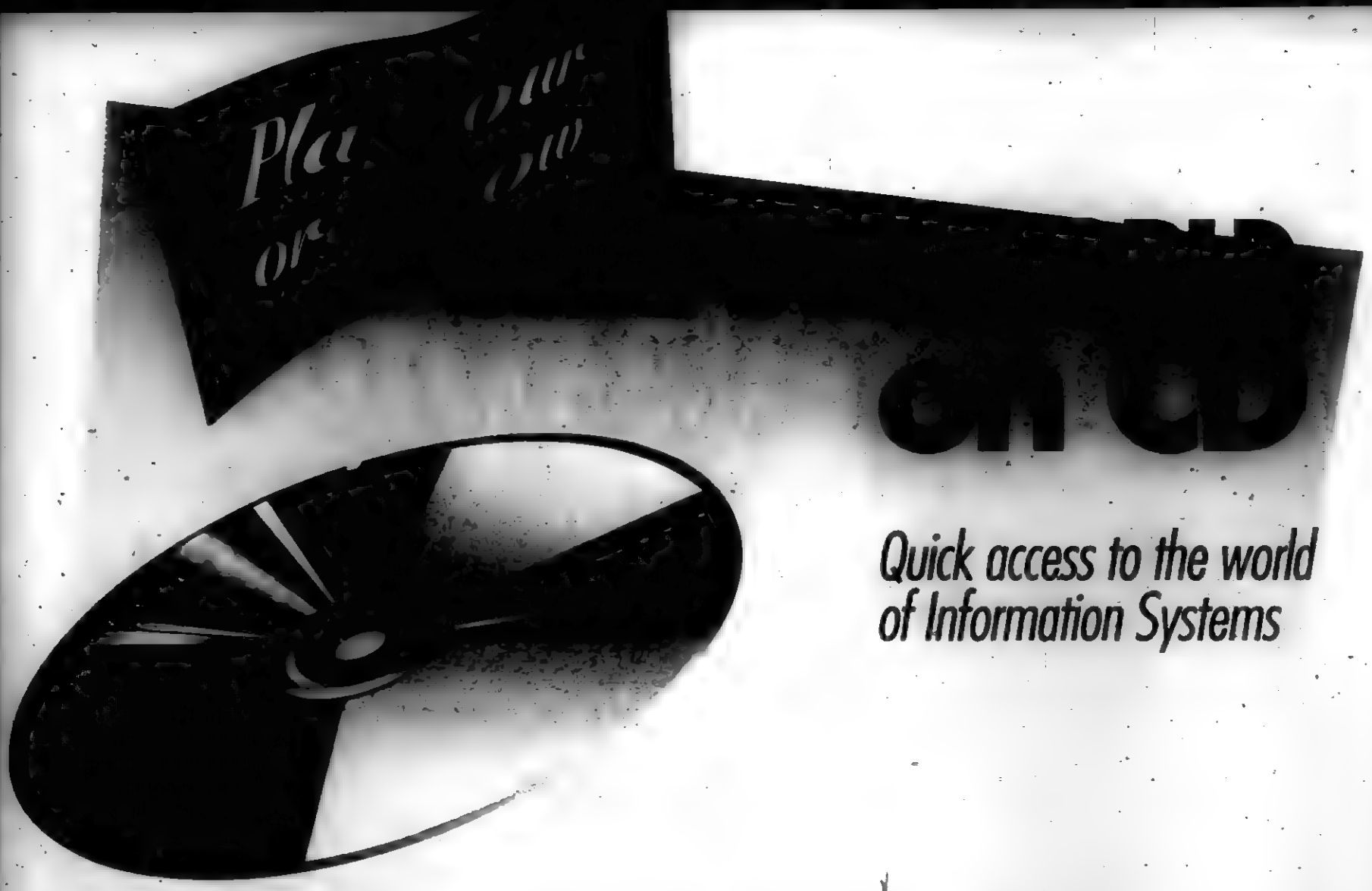
Baum is a free-lance technology writer in Santa Barbara, Calif., who specializes in application development issues.



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Client/server tools

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"In three minutes I can create a full-blown, text-editing window with mouse control, buttons, save functions, etc.," Barlow says.

Ode to the code

You build it fast, users love it and it gets the job done. What else is there?

"The GUI has the glitz and glitter and thus tends to garner the lion's share of attention," says Judith Hurwitz, founder of the Hurwitz Consulting Group in Newton, Mass. "But some of the [bottom-up] tools lack depth" for groups that need to create complex SQL database management system applications in heterogeneous environments and to build applications from an enterprisewide data model.

In terms of building database and database connections, bottom-up products automate the creation of the user interface but force you to write code for database transactions. This is not a problem in a simple application that accesses a few database tables, but it can get extremely time-consuming for more complex relational applications that might involve 50 or 100 tables with numerous joins among them.

"Unless you have tried it, you can't appreciate the effort required to create applications that include both graphical user interfaces and SQL database processing," says Ralph Dunlap, project manager at Georgia-Pacific Corp. in Atlanta. "Just to create a simple invoice application that allows for a one-to-many relationship with standard SQL operations, even with a GUI builder, is a three-week programming task."

SQL grew up on mainframe and minicomputers, but today it is increasingly being implemented in client/server networks as a way of enabling PCs to access the resources of corporate databases. SQL can be used with a wide variety of DBMS packages.

Development tools differ widely in their implementations of SQL. For example, Visual Basic queries are coded in Basic; a translator turns queries into SQL for processing by an SQL database server, such as Microsoft/Sybase's SQL Server. Many bottom-up tools, such as Visual Basic, have no knowledge of back-end server activities.

In contrast, a top-down product such as SmartStar Vision uses SQL as the foundation for all development activities, from data modeling to reporting. This enables more sophistication when it comes to client/server database processing. It can query multiple, heterogeneous database tables within a single transaction without requiring any coding.

Often referred to as client/server development environments, many of the bottom-up tools are in fact client-only products. They run on a client PC and connect to a client/server database through low-level gateways. These products provide access to SQL databases but don't allow any SQL processing as part of the application. They rely on third-party database servers to process SQL queries, so they are best suited for applications that don't have intense relational database processing requirements.

Still need to code

Both Borland and Microsoft have announced plans for database dictionaries based on the specifications of the SQL Access Group, a consortium of database vendors. These dictionaries define application programming interfaces to make it easier for developers to interface applications with various databases. But developers must still code the transactions in the application.

By contrast, newer, top-down products such as SmartStar Vision integrate complete SQL transaction models within the development environment. This makes it easier to create applications because developers don't have to code database transactions. Such tools have payoffs in terms of maintenance as well.

Keith Therrien, senior architect at Arkwright Insurance Co. in Waltham, Mass., says integrating SQL transaction models within the environment has benefits in terms of flexibility.

"Consider, for example, an application that has been created to process customer claims through a GUI window or character cell form," Therrien says. "In most bottom-up evirom-

Client/server tools, page 86

Utility firm wants to beat productivity blues

WHAT DO YOU DO when your management demands a tenfold increase in application development productivity? For Todd Powell, senior systems analyst at TransAlta Utilities Corp. in Calgary, Alberta, it was precisely such a request that started him thinking about new approaches to software development.

TransAlta relies on a cluster of six mainframe DEC VAX 9000 computers as the hub of its widespread information network. Not so long ago, these computers supported TransAlta's work force of 70 remote locations in a time-sharing environment of character mode terminals. But as more desktop computers began popping up, TransAlta decided to turn to client/server applications.

Most bottom-up development products generate C or Basic code for the GUI shell, but developers have to customize it manually. But the work doesn't stop there. For a client/server environment, once the user interface is in place, developers must connect it to the database and create database access logic.

"This takes an awful lot of coding — often very complex coding," says Powell, who had been working with a bottom-up tool. "Even simple things that you probably take for granted if you have used a fourth-generation language, such as edit masks for a field, have to be programmed manually."

To reach their goal of increasing productivity, Powell and his colleagues become a beta-test site for SmartStar's SmartStar Vision, a top-down, object-oriented application development environment.

Instead of just creating GUI objects and positioning them on-screen, developers could control the behavior of these objects without coding. They could tie database operations such as read and write updates to the fields.

Coders could manually associate fields with a database column or automatically import them from a database table. Fields could be represented by a wide variety of objects, such as text fields, label fields, scroll fields, radio fields, list fields, buttons, scroll boxes and menu bars.

Powell and others are developing an industrial customer billing system that includes dozens of variables and rate options. Users work with pull-down menus, push buttons and uniform colors to get the information they need, making use of a mix of intelligent desktop devices and character mode terminals based on the Open Software Foundation's Motif.

Powell admits that productivity increases have not been as dramatic as expected because it's taken time for developers to become proficient with the environment. But he says the goal of tenfold improvement is in sight.

"We're witnessing a departure from the time-sharing mode of large, centralized computers as workhorse machines," Powell says. "Developers can now take advantage of the CPU capacity of the client as well as the capacity of the server. They can build applications quickly. Once they gain an understanding of object-oriented technology, a whole new world of possibilities opens up."

Client/server tools

CONTINUED FROM PAGE 85

merits, the capabilities of that window are fixed. If a user says, 'I only want to retrieve records from the state of Massachusetts,' then the application has to be recoded to deal with that one situation."

But top-down products handle this type of query qualification through querying shortcuts known as "wild cards," Therrien says. "Developers don't have to foresee all that complexity. It is built into the transaction model."

Arkwright uses a top-down development tool because it fits best with its heterogeneous information architecture. Developers can use Digital Equipment Corp.'s Ultrix, Unix, DEC's VAX/VMS and, eventually, Microsoft's Windows NT to develop applications.

"You don't even have to recompile a SmartStar Vision application to move it from one environment to the next," Therrien says. "You just copy it over with the database attached, and it will run unchanged."

Cross-platform development is a key distinguishing factor between top-down and bottom-up tools. Top-down provides for it, while bottom-up doesn't.

Top-down tool Uniface, for instance, enables users to mix and match hardware platforms, DBMSs, GUIs and networks, nearly eliminating the need for redeveloping applications. It lets developers create large, distributed relational applications.

Developers at software firm Encompass in Cary, N.C., are using Uniface to

Client/server tools, *page 89*

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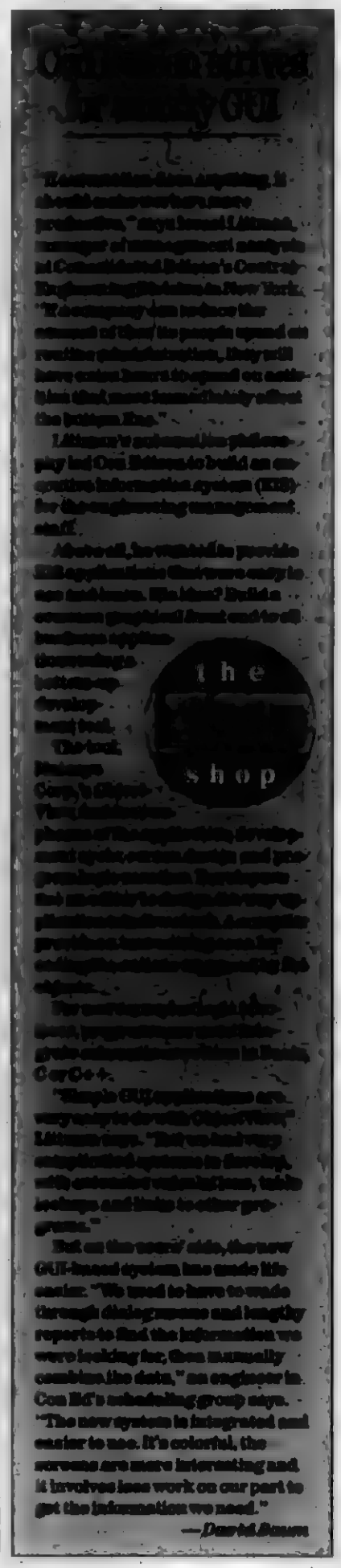

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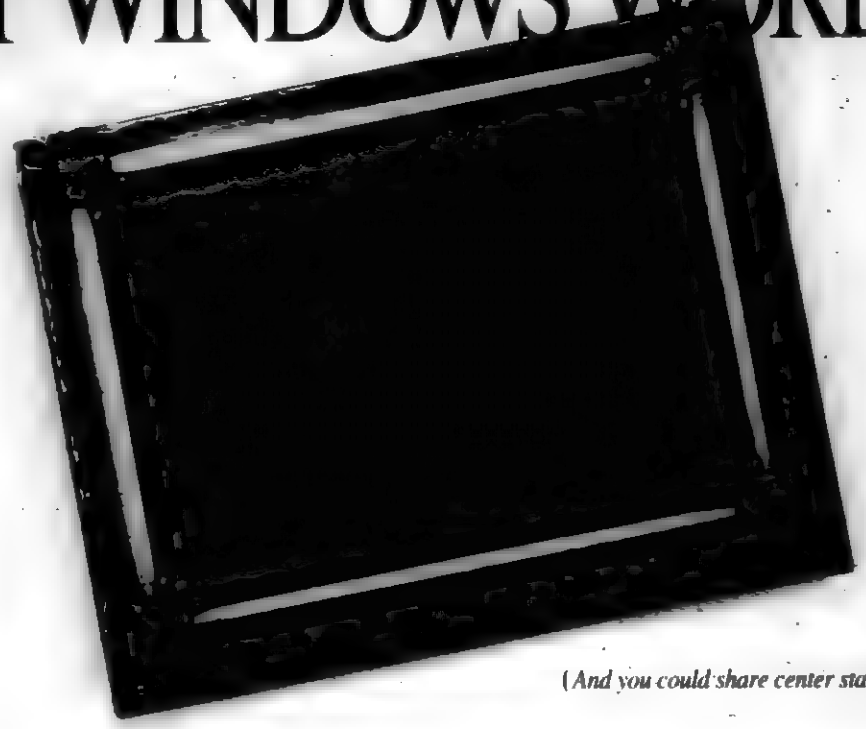

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Client/server tools

CONTINUED FROM PAGE 86

create a logistics management system. The system's aim is to help firms with global shipping requirements establish electronic links with trading partners and service suppliers.

Users won't need to be concerned about the networking protocols, database engines or operating systems, instead accessing Encompass applications through the native modes of their desktop systems, right along with the applications on their local-area network.

Uniface's Universal Presentation Interface enables applications to be deployed on multiple platforms running Windows, the Open Software Foundation's Motif, OpenLook, IBM's OS/2 Presentation Manager and character mode systems simultaneously.

But products such as Uniface aren't right for firms that want to throw applications together fast, says Ken Blood, vice president of development at Satellite Computing, Inc., a value-added software reseller in Virginia Beach, Va. "It may be overkill for simple applications."

The case for CASE

Many developers look for products that enable working from a data model for mission-critical systems, in which all objects and attributes have been carefully defined.

Top-down products, such as the Procept application generator, provide connections to front-end computer-aided software engineering (CASE) tools, enabling business requirement analysis before developers build any application objects. Developers can automatically import the data modeling information into a logical repository, from which they can construct specific applications.

Procept's enterprise model defines all objects and attributes, providing a framework of application "assets" that can be tailored to fit business needs. Developers map business requirements onto the existing asset base rather than developing application-specific objects and programs for each requirement.

Some bottom-up products, such as Powersoft's PowerBuilder, can make use of a logical data model as the foundation for applications, but developers must type in the data definitions by hand. Products with connections to front-end CASE tools, on the other hand, can populate a repository with information for a previously defined data model.

Assessing your needs

The bottom line is that the low-cost ($100 to $1,000), fast development cycle and short learning curve of bottom-up tools make them worthwhile for corporate developers working in homogeneous environments of PCs and PC LANs, where Xbase database products (such as Fox Software, Inc.'s FoxPro and Borland's Paradox and dBase) abound.

Bottom-up tools create GUIs, work well with third-generation languages and offer sophisticated program-to-program interfacing. As corporate IS departments downsize to PC networks, these homogeneous development tools become more and more attractive.

For their part, top-down tools are expensive ($2,000 to $200,000) and have a steep learning curve. They can't provide developers with the level of sophisticated graphical environment a bottom-up tool can, nor do they take full advantage of the powerful PC operating environments for activities such as OLE.

Their strength lies in cross-platform development. Also, top-down tools contain internal SQL engines, front-end CASE tool support and the ability to do heterogeneous database processing. •

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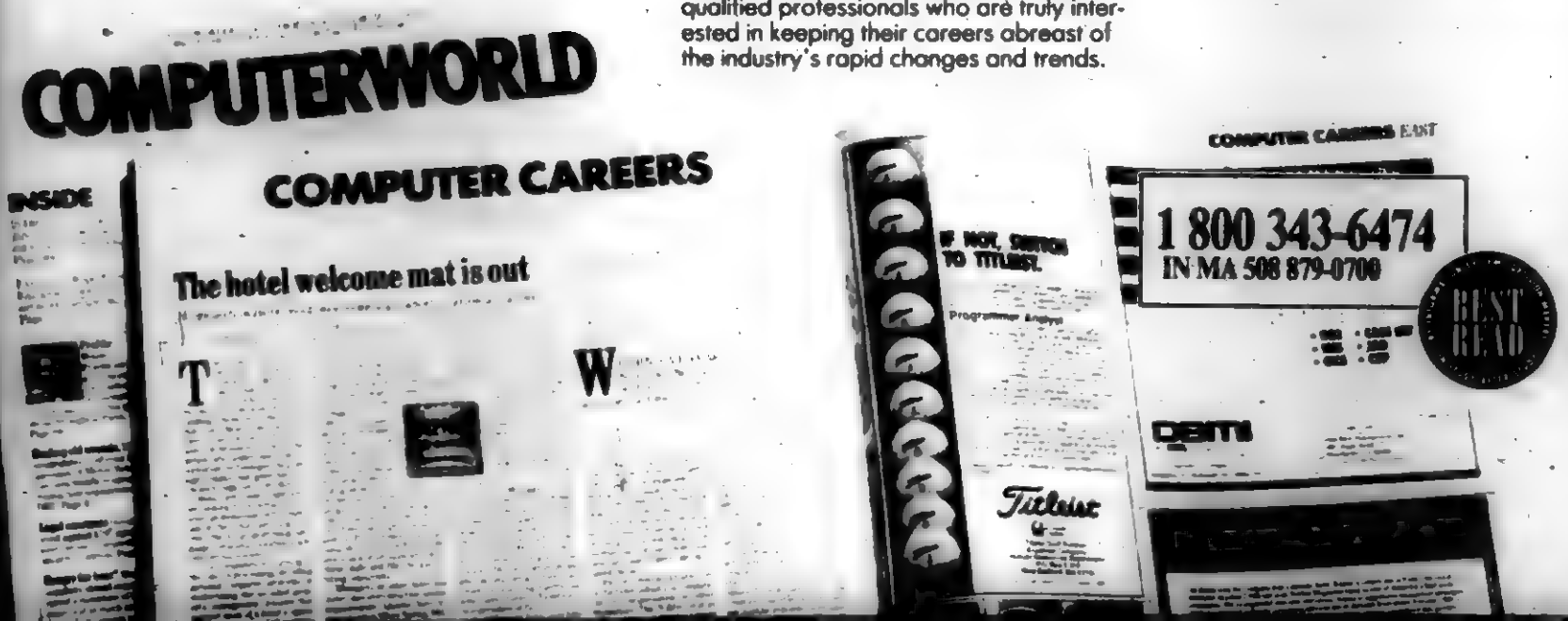

How to get that needed PC experience

By Kelly E. Sewell

MAINFRAMERS WANTING TO make the move into the PC arena are faced with a scenario that college seniors know all too well — nobody wants to hire them without experience, yet they can't get experience if nobody will hire them.

"No matter what I do, it isn't right," says Greg Ritsul, a Bridgeport, Conn., mainframe programmer/analyst trying to move into the Novell, Inc. networking arena. "I feel like a leper."

If you continually find yourself running into walls, recruiters and former mainframers who have been successful in making the switch suggest you try a different approach.

Self motivation

Wayne Robinson, manager of software systems at Prudential Investment Corp. in Newark, N.J., used to be a mainframer. "I got some books, put together an environment and taught myself [PC skills]," he recalls. Soon after, there was a reorganization, and he ended up in the group that did PC and local-area network work.

Not everyone can be lucky enough to be in the right place at the right time, however.

Bridging the mainframe-to-PC gap

- Lead the efforts at your company to consider PCs as an alternative.
- Get involved in PC projects. Look for opportunities to learn skills gradually on the job.
- Focus on acquiring skills in technologies such as open systems, client/server, Unix, fourth-generation languages, relational databases, C, C++ and RPG III.
- Demonstrate your ability to learn. Teach yourself PC skills. Learn less common PC skills such as C and C++.

Stanley Durbas, president of Data Careers in Middletown, Conn., says mainframers should try to get involved in PC projects at their current company. "The people I know who have successfully gone from mainframes to PCs have been in departments where they could do it," he explains.

If you're not in a company that's making the transition, find one that is by looking through the papers and identifying firms that have had PC openings in the past, he says.

One problem mainframers encounter is that their PC skills are often self-taught.

Many potential employers don't take this experience seriously because it wasn't acquired through formal channels and was probably learned on DOS-using common software, notes Shirley Bascom, owner/manager at the North Canton, Ohio, office of CompuSearch, a division of Management Recruiters International.

"Those skills aren't all that valuable," Bascom says.

Durbas agrees. He says if learning on your own is your only option, choose what you teach yourself wisely.

According to Bascom, companies are moving to open systems with client/server setups and Unix systems. Additionally, they want people who know fourth-generation languages.

Recruiters and mainframers have found that the catch-22 is intensified by the fact that many colleges aren't yet offering courses in newer technologies. Bascom suggests that if you can't find a school with courses in such areas as relational databases, Unix, C and RPG III, put pressure on your local community college and get them added to the curriculum.

Additionally, she says, be instrumental in having your company evaluate alternatives to mainframes. "You can benefit your company by showing it ways it can save money," she says. The payoff will be that you'll be able to bring yourself up to speed in the newer areas.

"I was consulting two people last summer who wanted to know if they should learn Lotus' 1-2-3," Durbas says. "I told them, 'Everybody and their brother knows that'" and recommended they learn C, C++ and Paradox. Both now work in jobs using C and C++, he says.

And if potential employers turn you away because you gained that experience on your own, you probably don't want to work there anyway.

Dedication should count

"Managers should be saying, 'This person has taken time out of his personal life and has shown a dedication to it and an interest in it,'" Durbas says. If you have good mainframe skills, managers should recognize that they can be transferred to a PC environment.

Ritsul, who has yet to use his Novell training, wishes that was the case with him.

"I figured since I've been in the business for eight years it would count for something," he says. "I'm confused. Problem-solving in a data processing environment is problem-solving in a data processing environment."

Robinson concurs. "Some of the implementations are different, some of the vocabulary is different, but you've still got boxes and pipes and something doing something to data and producing something. It has much more in common than is different."

Sewell is assistant editor, features.

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SOURCE: Skill Survey of Computerworld's Audience, August 1992

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Industry currents

Construction opportunities are building up

By Emily Leinfuss

WHILE THE CONSTRUCTION industry has been hard hit by the weak economy, it may actually turn out to be a promising market for IS professionals in a few years.

The combination of the projected upturn in the economy, with the advent of networking and the development of electronic data interchange (EDI) standards for the industry, give information systems career prospects a boost in the long term, says Joe Winston, corporate director of IS at Gilbane Building Co. in Providence, R.I.

Winston says EDI will be useful because it will allow construction companies to communicate with clients or customers for cost schedule data and with architects and consulting engineers for contract drawings and specifications.

Leaders of the pack

Construction companies that are wise to the uses of information technology are pulling ahead of the pack. In fact, there are pockets of IS opportunities, particularly in firms that have targeted niche markets, for self-motivated, flexible professionals with client/server skills.

For example, The Turner Corp. in New York is expanding its IS department by hiring network management people. Project manager Bill Lodge says client/server technologies and networking are hot areas, overall, in the field.

"Network management is huge, and anybody who knows Microsoft Windows, networks and SQL is in demand [in this field]," he says.

He says that when searching for a construction engineer, the company competes with five firms. But when looking for network management experts, the company is up against New York's financial services organizations and cannot offer them a competitive salary.

However, opportunities get better outside of the Big Apple, says IS manager Timothy Minahan at J. A. Jones Construction Co. in Charlotte, N.C. Minahan has just hired an RPG programmer for IBM's Application System/400 platform and a technical support person who will be responsible for PC troubleshooting.

"People looking for jobs should concentrate on client/server technologies. They are the most appropriate [skills] for construction companies that need information at distributed sites but also need centralized information for business applications," Minahan says.

The job sites can remotely access historical cost information, which provides a base for them to project their future costs on a job, Minahan says. Because this requires the use of laptops, network experts are in demand.

People who have the ability to change and be flexible, such as someone who has a networking background and gateway or Token Ring experience, can handle some PC support and can also function in the AS/400 environment, will go far, he says.

> Construction firms are realizing that IS can supply them with technology to run their businesses better.

Lodge says he looks for professionals who have people skills and the ability to interact with end users. This wasn't always the case, but his firm has downsized and is moving into PCs with a vengeance.

But all of this will take time. Construction industry watchers are hopeful that the Clinton presidency will translate into jobs if he is successful in reviving the real estate market and the economy. This doesn't help those trying to find an IS job in the field right now, though.

"The construction industry is facing poor economic conditions, and the consolidations in the financial services industry left a lot of people out of work. That doesn't leave much in the way of IS opportunities in this industry [right now]," Winston says.

Winston says he has recently replaced some employees, but the firm is not expanding its IS department.

Mitchell Draper, micro support manager at Lewis Homes Management Corp. in Upland, Calif., says the construction industry is way behind other industries in IS implementation and career possibilities. For example, while Lewis Homes has almost 1,000 employees, the data processing staff consists of only five people.

In the beginning

Draper says the problem may lie in a firm's history. Many construction companies evolved from a single contractor that expanded into a larger firm, and the environment is not technology-oriented.

But Draper holds strong hopes for the industry's future. "It is going to get better," he says, because the industry is realizing how it can use information to a competitive advantage.

Draper says construction firms are starting to realize that IS can supply them with information and technology that they can use to run their businesses better. In addition to making use of historical information to project job site results, Draper has set up automated fax bidding to reach a larger number of subcontractors with competitive bids.

Leinfuss is a free-lance writer based in Sarasota, Fla.

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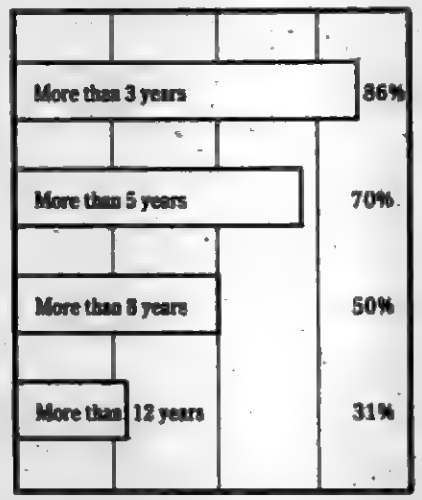

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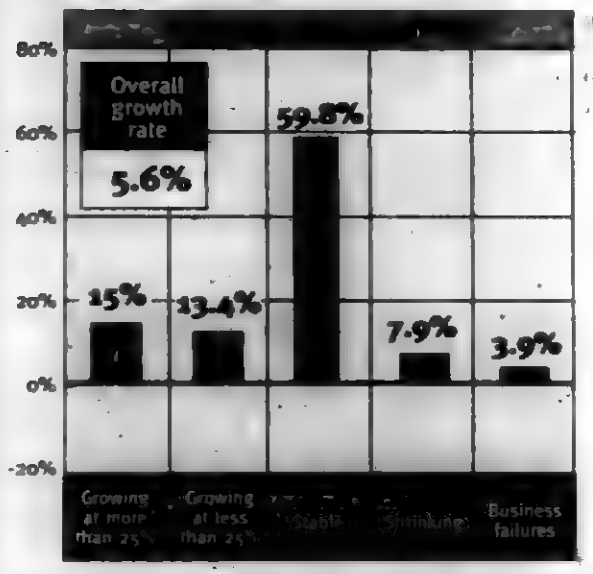

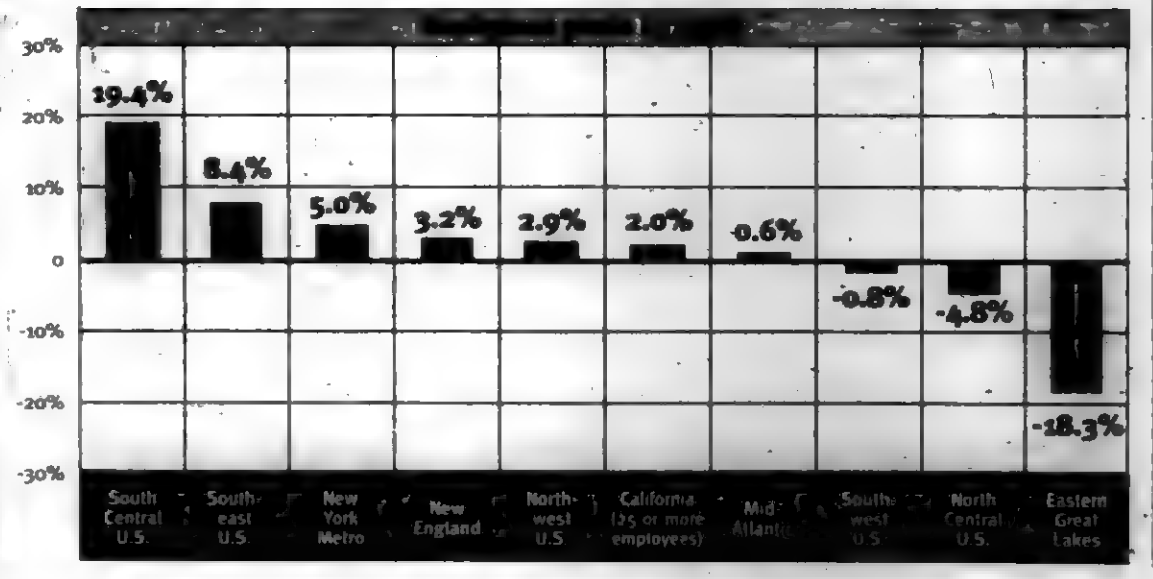

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Gray market 'deals' aren't always a deal

By Daniel Lyons

THE GRAY MARKET. THE WORDS conjure up images of shadowy deals taking place in back alleys with suitcases of cash changing hands. OK, that may be an exaggeration, but the risk of buying PCs from this group of unauthorized dealers is not.

Dealers in the gray market tempt buyers with their reduced prices. However, buyers run a number of risks, the biggest of which is warranty protection. Some manufacturers — notably IBM and Compaq Computer Corp. — will not honor a customer's warranty unless the machine was bought from an authorized dealer. Other companies, such as Toshiba America Information Systems, Inc. and Hewlett-Packard Co., will often honor warranties no matter who sold the machine.

Gray marketeers also jeopardize manufacturer warranties by adding used or off-brand components to a name-brand computer. Even if the substitute parts are good, some manufacturers won't honor their warranties once the PC has been altered.

"The main issue is on disk drives and memory — whether it's the original manufacturer's disk drive and memory or it's someone else's jury-rigged in there," says John Murphy, editor and publisher of "The PC Street Price Index," a monthly newsletter that tracks computer prices.

How can you tell up front whether a dealer is authorized? Start by simply asking the dealer and keeping in mind that he might not tell the truth. The issue gets muddied by the fact that dealers can be authorized to sell some products and not others.

Therefore, the best thing to do is call the manufacturer whose product you're evaluating and check out the dealer's authorization. If the dealer is unauthorized, ask the vendor about its policy on gray-market machines.

"You have to see a gray marketeer around for at least six months before you do business with him. Otherwise, you can place an order and just wave goodbye once the check clears," says John Murphy, editor and publisher of the "PC Street Price Index."

Products most likely to be sold by gray marketeers are name-brand equipment. Off-brands are already inexpensive, and it's not as difficult for dealers to get authorization to sell them.

Be aware, too, that gray marketeers generally don't carry the cutting edge of a vendor's product line. You may be getting a discontinued model or configuration — which might not be a bargain at all. "A lot of what's going through the gray market is product that the authorized dealers are having a hard time moving. You might save a bundle, but it won't be the latest technology," says Brian Clarke, PC pricing analyst at International Data Corp. in Framingham, Mass.

Telltale signs

You can tell that a PC is from the gray market when it's either missing its warranty card or the dealer neglected to stamp it, which makes it useless. Also, some gray marketeers will alter or remove the machine's serial numbers to make it more difficult to track the source of the unit.

Although vendors don't like to admit it, you do have recourse if you've bought a gray market unit. Vendors that claim they don't honor warranties will often provide coverage if badgered.

The trouble is that authorized service centers won't want to touch your machine unless they are certain the manufacturer will reimburse them. So you'll have to haggle with the manufacturer and then get it to persuade the service center to handle your problem.

Is it worth it to buy from the gray market? You can save 10% to 15%, cross your fingers and hope that the machine doesn't ever need service. "After all, how often does a PC break down?" Murphy says.

For the corporate buyer, however, the gray market probably makes sense only for single purchases. On big purchases, where the volume discounts are already good and where peace of mind is important, it's worth it to go through legitimate channels, Murphy says.

Lyons is a free-lance writer based in Ann Arbor, Mich.

Buyer beware

Recently, a customer shopping for a notebook computer found a good price on a Compaq Computer Corp. Contura 3/20, but the computer arrived with a blank warranty card. To get service on a Contura, Compaq officials say, the card has to be stamped and filled out by an authorized dealer.

The reseller insisted his store was authorized. A call to Compaq revealed that it was not. The store manager gave explanations from "We bought from an authorized dealer, so you're OK," to "We're authorized to sell some, but not all." He was wrong on all counts.

Finally, the dealer promised to have a legitimate Compaq dealer ship one out.

A replacement machine arrived a week later without a receipt or packing slip and with another unstamped warranty card. The reseller said the receipt was coming and arranged to have the warranty card stamped.

The whole process took three weeks. The morale of the story: Scope out your dealer before you buy.

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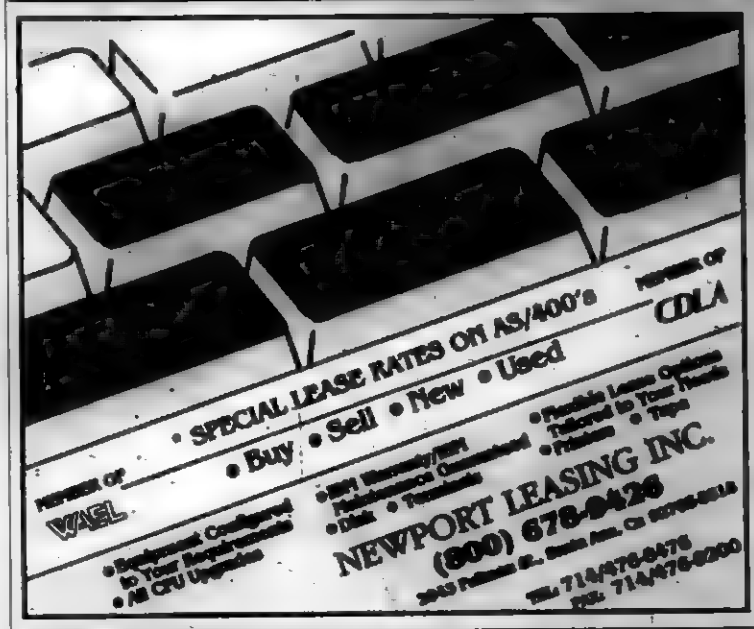

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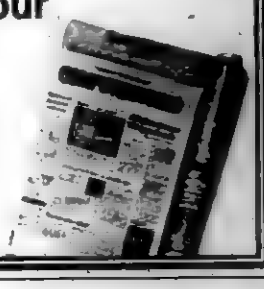

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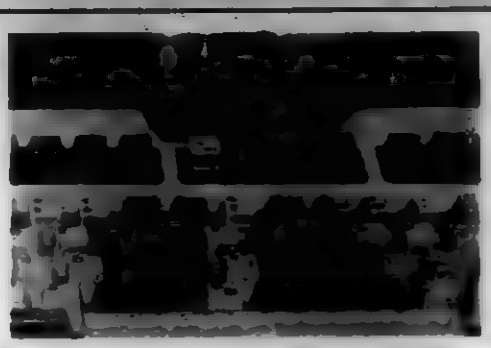

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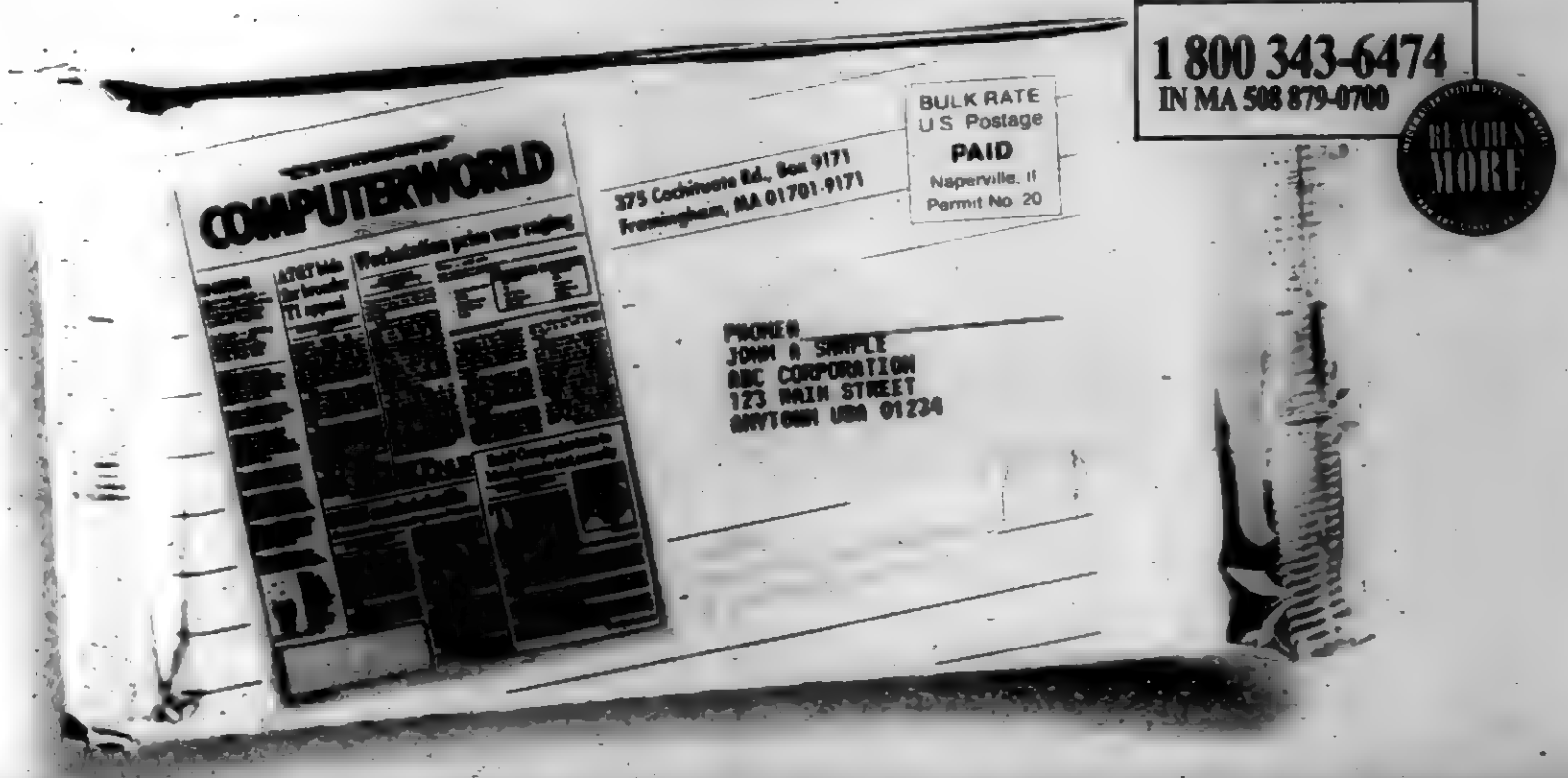

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Wandel & Goltermann Technologies, Inc. 12
Wang Laboratories, Inc. 2
Washington Post 1
Wellfleet Communications, Inc. 12,24,81,107
Wilke 153
WordPerfect Corp. 26,41

X

Xerox Corp. 67
XVT Software, Inc. 66

Gainers Losers

Percent

[illegible]	237.5	Emulex Corp.	-23.5
Boole & Babbage	24.1	Walker Interactive Systems(L)	-22.4
Advanced Logic Research	24.1	Scientific Atlanta Inc. (H)	-20.9
Applied Communication Corp.	21.9	Phoenix Technologies	-19.2
Sierra Semiconductor	20.7	Spectrum Software	-18.7
Computervision Corp.	18.5	AST Research Inc.	-18.1
Checkpoint (H)	15.3	Symantec Corp.	-17.6
Data Switch Corp.	13.2	Motorola Inc.(H)	-16.7

Dollar

Boole & Babbage	-5.25	Motorola Inc.(H)	-10.00
Computer Sciences	4.25	Scientific Atlanta Inc. (H)	-6.13
3Com	3.88	Synoptics Communications	-6.00
Matsushita Electronics	3.63	Cisco Systems Inc. (H)	-5.50
CompSoft (H)	2.50	Intel Corp.	-5.38
Peoplesoft (H)	2.25	Cabletron Systems (H)	-4.25
Northern Telecom Ltd.	2.25	Wellfleet Communications	-4.25
Sierra Semiconductor	2.25	Southwestern Bell Corp.	-4.25

[redacted]

Turnaround candidates

Computer industry companies have been quick to point fingers at the soft economy for losses suffered during the past couple of years. However, according to a report by Donaldson, Lufkin & Jenrette Securities Corp., desktop software vendors have their destinies firmly in their own hands.

In the report, Scott Smith, vice president at Donaldson, Lufkin, said product cycles matter more than overall economic conditions in determining the success or failure of these companies. Smith said that because selective software purchasing can improve employee productivity and cut costs, the recession has not significantly hurt sales of desktop software. A corollary, though, is that an uptick in the economy will not have a dramatic positive effect on the software sector.

Donaldson, Lufkin noted that favorable product cycles and large installed bases helped **Computer Associates International, Inc.** (CA) and **Oracle Corp.** (ORCL) stage significant turnarounds in the past calendar year. Candidates for similar improvements this year include **Lotus Development Corp.** (LOTS), **KnowledgeWare, Inc.** (KNOW), **Symantec Corp.** (SYMC) and **Easel Corp.** (EASL), although each company has crucial competitive challenges ahead:

- Lotus dropped 25% of its share value last year. Its chances this year are bolstered by an increasingly strong set of Microsoft Corp. Windows products, including Ami Pro, Freelance Graphics and the forthcoming Version 2.0 of 1-2-3 for Windows. The innovative Improv spreadsheet is also in the pipeline, and Lotus' Notes is expected to prosper as the groupware market picks up steam. Donaldson, Lufkin rated Lotus as Moderately Attractive.
- Computer-aided software engineering (CASE) vendor KnowledgeWare will face continued stiff competition in the CASE arena, according to Donaldson, Lufkin. However, the firm has just released a new generation of its CASE tools and has announced a Unix-based software line scheduled for midyear availability. Donaldson, Lufkin also assigned KnowledgeWare a Moderately Attractive rating.
- Symantec's fortunes will rest on second-quarter delivery of upgraded Windows versions of its Norton products, plus a Windows release of Q&A. Though Donaldson, Lufkin said Symantec will likely report a loss for the first quarter of 1993, the stock is rated Moderately Attractive.
- Client/server supplier Easel has repositioned its two lines of application development tools and cut costs. It faces a grueling marketplace battle with such companies as Powersoft Corp., Microsoft and KnowledgeWare but also earned a Moderately Attractive rating from Donaldson, Lufkin.

— Derek Slater

Exch	52-Week Range			Jan. 29 $ Per	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORKING						
OTC	34.63	9.63	3 COM Corp. (H)	31.00	-3.38	-9.8
NYS	74.75	56.25	American Info Techs Corp. (H)	71.75	-2.63	-3.5
NYS	55.25	36.63	AT&T (H)	53.00	-1.00	-1.9
OTC	4.25	0.75	Artel Communication Corp.	2.44	0.44	21.9
OTC	24.50	10.25	Banyan Systems Inc.	21.75	-2.00	-8.4
NYS	53.88	40.25	Bell Atlantic Corp.	51.50	-1.88	-3.5
NYS	55.50	43.38	Bellsouth Corp.	51.75	-2.75	-5.0
NYS	6.75	3.63	Bolt, Beranek & Newman	5.00	0.38	7.0
OTC	17.25	10.00	Brooktrout Technology	16.13	0.13	0.8
NYS	92.25	42.13	Cabletron Systems (H)	85.50	-4.25	-4.7
OTC	34.25	17.75	Chipcom Corp. (H)	30.25	-0.50	-1.6
OTC	94.00	33.00	Cisco Systems Inc. (H)	88.00	-5.50	-5.9
OTC	28.13	5.50	Compression Labs Inc.	12.00	-1.50	-11.1
OTC	3.38	0.88	Data Switch Corp.	2.88	0.31	12.2
NYS	23.50	13.75	Digital Comm. Assoc.	19.00	-0.38	-1.9
OTC	16.75	7.50	Digital Systems Int'l Inc.	9.13	-0.38	-3.9
OTC	28.00	4.00	DSC Communications (H)	27.25	0.75	2.8
OTC	10.88	4.75	Fibronics Int'l Inc.	8.38	0.88	11.7
OTC	37.50	10.50	Fibernet Corp.	15.25	0.25	1.7
OTC	4.38	1.50	Gandalf Technologies Inc.	3.75	0.13	3.6
OTC	2.25	0.69	Gateway Communications	1.38	0.06	4.4
NYS	30.00	2.88	General Datacomm Inds. (H)	9.13	0.00	0.0
ASE	5.88	1.75	Go Video	2.94	0.13	4.4
NYS	35.75	28.88	GTE Corp.	35.00	-0.38	-1.1
NYS	75.25	57.63	ITT Corp. (H)	71.88	-2.50	-3.4
OTC	43.38	29.50	MCI Communications Corp.	39.75	-2.00	-4.8
OTC	14.25	2.25	Microcom Inc.	5.75	0.38	7.0
OTC	22.00	12.00	Netrix Corp. (H)	22.00	1.50	7.3
OTC	16.75	9.63	Network Computing Devices	16.00	0.75	4.9
NYS	10.25	8.13	Network Equipment Tech.	10.50	1.13	12.0
OTC	25.25	8.00	Network General	16.38	1.25	7.1
OTC	17.38	8.50	Network Systems Corp.	11.00	-0.13	-1.1
OTC	68.25	11.88	Newbridge Networks Corp. (H)	45.25	-2.88	-6.0
NYS	69.25	30.50	Northern Telecom Ltd.	63.50	2.25	5.5
OTC	33.50	22.50	Novell Inc.	30.75	-0.50	-1.6
NYS	88.50	69.13	Wang Corp.	82.38	-2.63	-3.1
OTC	37.50	14.50	Octel Communications Corp.	26.25	1.50	5.4
OTC	9.38	3.38	Pengo Data Comm Networks	5.25	-0.25	-4.5
OTC	53.00	10.25	Picturetel Corp.	26.00	-3.75	-12.6
OTC	18.75	7.00	Proteon Inc.	10.63	-0.25	-2.3
NYS	38.38	30.16	Scientific Atlanta Inc. (H)	23.25	-6.13	-20.9
NYS	75.63	56.63	Southwestern Bell Corp.	69.13	-4.25	-5.8
NYS	28.13	20.75	Sprint Corp. (H)	27.00	-1.13	-4.0
OTC	27.00	7.50	Standard Microsystems Corp.	19.75	-2.50	-11.2
OTC	18.50	6.88	Stratacom Inc. (H)	16.50	-0.50	-2.9
OTC	95.50	18.75	Synoptics Communications	85.88	-6.00	-6.5
OTC	7.13	4.38	Telebit Corp.	5.88	-0.13	-2.1
OTC	9.38	2.13	Telematics Int'l Inc.	8.25	0.63	7.0
OTC	25.50	13.38	US Robotics (H)	22.00	-1.50	-6.4
NYS	40.00	32.88	U S West Inc.	38.50	-0.63	-1.6
OTC	46.00	13.00	Wellfleet Communications	40.75	-4.25	-9.4
OTC	22.00	7.00	Xircom	8.25	-0.50	-5.7
PCS AND WORKSTATIONS						
OTC	8.50	3.13	Advanced Logic Research	4.19	0.81	24.1
OTC	70.00	41.50	Apple Computer Inc.	59.50	-0.50	-0.8
OTC	24.25	11.25	AST Research Inc.	18.13	4.00	-18.1
NYS	16.25	6.13	Commodore Int'l.	6.50	-0.75	-10.3
NYS	58.50	22.25	Compaq Computer Corp.	51.88	3.00	-5.5
OTC	49.88	15.00	Dell Computer Corp. (H)	46.75	-0.13	-0.3
NYS	38.63	26.63	Harris Corp.	35.25	0.00	0.0
NYS	85.00	50.25	Hewlett Packard Co.	71.75	-1.38	-1.9
NYS	33.00	14.13	Silicon Graphics (H)	31.00	-2.00	-6.1
OTC	61.00	22.50	Sun Microsystems Inc. (H)	39.00	0.50	-1.3
NYS	32.13	22.25	Tandy Corp.	26.50	-0.75	-2.8
NYS	11.13	5.00	Zenith Electronics	6.13	0.25	4.3
OTC	25.50	2.75	Zeos International Ltd.	6.13	-0.50	-8.9
LARGE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	8.50	0.63	7.9
NYS	36.38	6.75	Convex Computer	7.00	-0.38	-5.1
OTC	9.50	1.88	Cray Computer	4.75	-0.25	-5.0
NYS	46.50	19.00	Cray Research Inc.	27.63	0.38	-1.3
NYS	13.00	7.13	Data General Corp.	11.50	-0.25	-2.1
NYS	65.50	30.38	Digital Equipment Corp.	42.13	0.75	1.7
NYS	100.38	45.88	IBM	51.38	2.88	5.9
OTC	19.50	5.50	Kendall Square Research	18.00	0.00	0.0
NYS	117.00	83.00	Matsushita Electronics	91.38	2.63	3.0
OTC	17.50	6.00	Pyramid Technology	14.50	1.25	9.4
OTC	24.00	11.13	Sequent Computer Sys. (H)	20.38	-2.50	-10.9
OTC	16.38	1.38	Sequoia Systems Inc.	1.75	0.06	3.7
NYS	54.25	29.50	Stratus Computer Inc.	32.25	1.25	3.7
NYS	16.88	9.88	Tandem Computers Inc.	13.75	0.13	0.9
NYS	13.75	7.25	Unisys Corp.(H)	12.38	-0.50	-3.9
ASE	7.50	0.06	Wang Labs Inc. (H)	1.69	1.19	237.0
SOFTWARE						
OTC	65.00	25.25	Adobe Systems Inc.	41.25	-3.75	-8.3
OTC	35.00	10.25	Aldus Corp.	14.50	-1.25	-7.9
OTC	19.75	7.00	American Software Inc.	8.63	0.00	0.0
OTC	25.38	9.75	Ask Computer Systems (H)	23.25	0.88	3.6
OTC	36.50	23.25	Autodesk Inc.	46.75	2.13	-4.3
OTC	17.75	7.50	Bachman Info. Systems (L)	8.88	0.38	0.0
OTC	61.00	34.00	BGS Systems Inc.	40.25	0.75	1.8
OTC	84.13	37.25	BMC Software Inc.	76.25	2.50	3.2
OTC	27.00	16.75	Boole & Babbage	27.00	5.25	24.1
OTC	87.50	37.50	Borland Int'l, Inc.	71.38	1.38	6.9
OTC	10.50	3.00	CE Software (L)	1.75	0.38	11.1
ASE	35.00	9.38	Cheyenne Software Inc. (H)	31.38	2.63	7.7
OTC	19.00	8.25	ChipSoft (H)	19.00	2.50	15.2
OTC	11.88	5.63	Cognos Inc.	7.63	0.38	5.2
NYS	27.38	10.88	Computer Associates (H)	25.63	1.00	-3.8
NYS	12.38	6.00	Computervision Corp.	6.13	1.00	19.5
OTC	18.50	6.75	Comshare Inc.	10.00	-0.75	7.0
OTC	37.25	11.38	Corel Corp.	13.63	0.13	-1.3
OTC	46.50	6.00	Easel Corp.	11.00	-0.50	-4.3
OTC	76.50	11.75	Frame Technology	17.00	1.88	-9.9
OTC	25.00	12.50	Group I Software	13.00	0.50	4.0
OTC	8.25	3.50	Hogan Systems Inc. (H)	7.88	0.00	0.0
OTC	25.75	13.75	HMS	16.00	2.50	15.2
OTC	36.25	18.50	Information Resources	30.00	-1.25	-4.0
OTC	42.00	33.88	Informix Corp. (H)	36.63	-1.38	-3.6
OTC	21.25	11.00	Intergraph Corp.	11.75	-1.25	-9.6

Exch	52-Week Range			Jan. 29 $ Per	Wk Net Change	Wk Pct Change
OTC	15.00	7.75	Interleaf Inc.	11.25	-0.38	-3.2
OTC	19.75	10.25	Intersolv Inc.	13.00	-1.00	-7.1
OTC	21.38	9.50	Knowledgeware Inc.	12.75	-0.25	-1.9
OTC	54.00	28.75	Legent Corp. (H)	51.25	0.00	0.0
OTC	38.75	14.75	Lotus Development	23.00	-0.75	-3.2
OTC	23.25	13.00	McAfee Associates	15.13	-0.75	-4.7
OTC	8.38	1.88	Meca Software (H)	7.50	-0.63	-7.7
OTC	22.25	5.25	Mentor Graphics	10.00	0.63	6.7
OTC	46.00	27.25	Micro Focus (H)	43.63	0.88	2.0
OTC	20.50	6.50	Micrograph Inc.	11.00	-1.00	-8.3
OTC	95.00	65.50	Microsoft Corp.	86.75	-3.00	-3.3
OTC	36.38	12.00	Oracle Corp. (H)	31.50	-2.25	-6.7
OTC	63.25	25.25	Parametric Technology (H)	59.38	-0.13	-0.2
OTC	38.50	22.50	Peoplesoft (H)	36.75	2.25	6.5
OTC	11.00	3.50	Phoenix Technologies	5.25	-1.25	-19.2
OTC	25.00	11.25	Platinum Technology (H)	21.75	-1.75	-7.4
OTC	61.50	29.00	Progress Software Corp.	55.75	-0.79	-1.3
OTC	24.50	3.13	Quarterdeck Office Sys.	3.94	0.00	0.0
OTC	32.75	11.75	Random Technologies Inc.	18.50	0.00	0.0
OTC	22.75	4.00	Rasterops	8.00	0.75	10.3
OTC	17.25	5.63	Ross Systems	9.50	-0.50	-5.0
OTC	27.25	8.50	Sapient USA Inc.	23.50	-1.00	-4.1
OTC	26.25	6.75	Software Publishing Corp.	12.00	-0.50	-4.0
OTC	8.88	2.00	Software Toolworks Inc.	8.88	0.75	9.2
OTC	7.25	0.75	Spinnaker Software	1.50	-0.34	-18.7
OTC	36.50	3.25	State of the Art	9.25	0.50	5.7
NYS	25.25	13.75	Sterling Software Inc.	22.63	0.00	0.0
OTC	25.25	8.00	Struct. Dynamics Research	13.13	-0.13	-0.9
OTC	56.75	21.00	Sybase Inc. (H)	55.25	0.50	0.9
OTC	68.75	5.88	Symantec Corp.	10.50	-2.25	-17.6
NYS	13.50	5.25	Systems Center Inc.	7.63	0.38	4.7
OTC	25.50	11.88	System Software Assoc.	18.50	0.25	1.4
OTC	13.25	3.50	Timeic Corp.	6.38	-0.75	-10.6
OTC	23.75	11.25	Walker Interactive Systems(L)	11.25	3.25	22.6
OTC	4.38	1.38	Wordstar	2.63	0.19	-6.7
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	18.63	-1.25	-6.3
NYS	17.38	8.63	Analog Devices Inc. (H)	16.63	-0.25	-1.5
OTC	20.13	7.63	Atmel Corp. (H)	18.00	-0.88	-4.6
OTC	14.13	3.25	Linear Technologies	4.25	0.25	5.6
OTC	16.88	7.38	Cypress Semiconductor Corp.	10.88	-1.00	-8.4
NYS	16.13	7.00	Dallas Semiconductor (H)	14.38	-0.38	-2.5
OTC	110.00	46.50	Intel Corp.	108.25	-5.50	-4.8
NYS	12.25	6.88	LSI Logic Corp. (H)	10.88	-0.88	-7.4
NYS	21.63	12.88	Micron Technology	22.25	-0.13	-0.6
NYS	63.00	36.44	Motorola Inc.(H)	50.00	-10.00	-16.7
NYS	14.13	7.50	National Semiconductor	11.75	0.38	3.3
OTC	25.50	8.25	Sierra Semiconductor	13.38	2.25	20.2
OTC	38.50	22.25	SynOpsys	33.75	-1.25	-3.6
NYS	59.25	31.50	Texas Instruments	53.50	-1.50	-2.7
OTC	10.50	6.00	VLSI Technology	7.75	-0.25	-3.1
OTC	7.63	2.13	Weitek	6.25	-0.88	-12.3
ASE	9.63	3.50	Western Digital Corp.	8.88	0.38	4.4
OTC	33.25	14.50	Xilinx (H)	29.50	-3.25	-9.9
OTC	37.13	17.50	Zilog Inc.	37.13	-2.00	-5.1
PERIPHERALS AND SUBSYSTEMS						
OTC	28.75	10.38	American Power Conversion	25.50	-1.00	-3.8
OTC	30.25	17.75	Barcrec Inc. (H)	27.25	-2.50	-8.4
OTC	23.50	9.25	Cambex Corp.	14.00	0.00	0.0
ASE	17.88	6.00	Cognitronics Corp.	17.88	0.75	4.4
NYS	25.50	16.75	Conner Peripherals (H)	23.75	0.25	1.1
OTC	36.75	10.75	Creative Technologies Inc.(H)	32.25	-1.25	-3.7
OTC	30.75	14.25	Data Race Inc. (H)	27.50	-0.75	-2.7
ASE	19.66	4.75	Dataram Corp.	10.50	0.75	-6.7
NYS	28.00	7.25	EMC Corp. (H)	25.75	0.75	-2.8
OTC	10.50	5.38	Emulex Corp.	6.50	-2.00	-23.5
OTC	20.75	13.25	Evans & Sutherland	18.75	0.75	4.2
OTC	40.63	12.00	Exabyte	14.63	0.00	0.0
OTC	78.00	19.00	Intelligent Info. Systems	70.00	0.00	0.0
OTC	11.25	4.75	Iomega Corp.	6.25	-0.25	-3.8
OTC	34.75	9.25	IPL Systems Inc.	9.25	-1.25	-11.9
OTC	23.25	10.75	Kodak Inc.	19.88	2.13	12.0
OTC	19.63	8.38	Maxtor Corp.	10.63	-1.25	-10.5
OTC	12.63	7.13	Micropolis Corp.	8.88	-0.13	-1.4
NYS	107.00	85.50	3M Corp.	98.25	-0.50	-0.5
OTC	7.75	4.00	Pinnacle Inc. (H)	7.25	0.75	11.5
NYS	16.38	6.88	Qms Inc. (H)	14.63	-0.63	-4.1
OTC	38.00	12.13	Quantum Corp.	16.00	-0.38	-2.3
OTC	12.75	3.75	Radius Inc.	5.38	0.13	2.4
NYS	36.75	7.50	Recognition Equipment	14.88	-1.00	-6.3
OTC	13.88	6.50	Reson Inc.	7.00	-0.88	-11.1
OTC	32.38	12.00	Seagate Technology	18.50	0.13	0.7
NYS	78.00	18.38	Storage Technology	20.13	0.38	1.8
NYS	23.25	16.50	Tandberg Inc. (H)	23.25	0.75	3.3
NYS	87.50	66.75	Xerox Corp. (H)	84.00	1.13	1.4
SERVICES						
OTC	23.50	12.16	American Mgmt. Systems	22.25	1.00	-4.3
NYS	5.38	3.00	Analogic Inc.	4.13	0.25	-5.7
OTC	35.75	16.00	Analysts Int'l. (H)	32.00	-1.50	-4.5
NYS	59.63	38.75	Auto Data Processing	51.00	-1.13	-2.2
NYS	17.25	8.97	Candela Corp.	15.25	0.25	1.7
NYS	30.00	12.50	Compusco Inc.	14.13	0.13	0.9
OTC	13.50	6.75	Computer Horizons	10.50	-1.50	-12.5
NYS	84.88	57.00	Computer Sciences	79.63	4.25	5.6
NYS	10.13	7.13	Computer Task Group	8.00	0.88	9.9
NYS	60.50	22.00	CompuSA Inc.	30.75	-3.25	-9.6
OTC	19.25	6.00	Corporate Software	12.13	-1.25	-9.3
OTC	30.75	7.75	Egghead Discount Software	10.00	0.50	-4.8
NYS	35.88	25.25	General Motors E (EDS) (H)	33.88	0.88	2.7
OTC	21.25	9.25	Inacom Corp. (H)	21.00	0.50	2.4
OTC	30.38	6.25	Intelligent Electronics	14.50	0.38	2.7
OTC	16.88	6.63	Meridex	12.25	0.38	3.2
OTC	15.75	5.75	Microdyne Inc.	12.50	0.00	0.0
OTC	60.00	21.00	Paychex	35.75	0.00	0.0
NYS	113.50	59.75	Policy Management Sys.	79.25	0.38	0.5
NYS	29.63	16.81	Reynolds and Reynolds (H)	29.50	1.00	3.5
OTC	32.00	22.00	SEI Corp.	28.75	-1.63	-5.3
OTC	24.38	16.88	Shared Medical Systems	23.38	0.75	3.3
OTC	14.38	5.75	SHL Systemhouse	7.13	-0.13	-1.7
OTC	29.75	18.25	Software Spectrum Inc.	25.25	-1.25	-4.7
OTC	32.25	20.25	Sungard Data Systems (H)	31.88	1.88	6.3
NYS	3.63	1.13	Ultimate Corp.	1.88	-0.25	-11.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Note: Motorola Inc. completed a 2-for-1 stock split

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Cautious optimism for Q1 '93

Analysts express high hopes for large-systems software companies

By Derek Slater

Calendar fourth-quarter results offer mixed omens for the near-term future of the computer industry. While Microsoft Corp. and Compaq Computer Corp. (see story below) showed no signs of slowing their breakneck profitability, a grim IBM made it clear it will be some time before its turnaround efforts bear fruit.

Not surprisingly, the analyst community also posted mixed expectations for the coming year. Gartner Group, Inc., on the optimistic side, predicted exceptional growth for 1993, with sales volume for the whole industry expected to jump to $449 billion, up from $314 billion in 1992. That represents a growth rate that is roughly seven times the industry average for the past four years.

Selected firms are expected to do well in the first quarter, particularly in the large-systems software and networking sectors.

Large systems

Data center software suppliers have surprised industry watchers with excellent recent results in spite of the trend toward smaller systems. These firms should continue to fare well, analysts said.

On the other hand. . .

Other analysts were careful when projecting key companies' results for the current quarter. The first calendar quarter is historically weak for all high-tech sectors. "People tend to sit on their budgets for the first and sometimes second quarters," said Terence Quinn, a senior technology analyst at Wall Street firm Furman Selz, Inc.

Terence Quinn, a senior technology analyst at Wall Street firm Furman Selz, Inc., pointed to Computer Associates International, Inc. and utilities supplier BMC Software, Inc. as companies to watch in 1993. "CA is coming back from mistakes they made about two years ago — they've changed the rules of the game in software licensing, which differentiates them from the competition and helps them repair some old relationships with customers," Quinn said.

CA and BMC Software are also hedging their bets with product rollouts for Unix and other lower end platforms.

Legent Corp. and Platinum Technology, Inc. should have solid first-quarter results as well, Quinn said.

On the hardware side, prospects remain particularly gloomy in the near term for IBM, recently humbled by the largest loss in U.S. corporate history. IBM is expected to post operating losses for the first quarter and possibly the second as well.

Digital Equipment Corp. earned mixed forecasts. William Milton Jr. at Brown Brothers Harriman & Co. said DEC may return to profitability by the June quarter. Other analysts, however, said fluctuations in foreign currency may begin to hurt DEC's results around that time period. Things look brighter for Unisys Corp., which can increase profits on flat revenue as it pares down long-term debt and cuts its interest expenses.

1992 to 4th-quarter earnings

Cost-cutting appears to be paying off as many technology companies showed a larger increase in income than revenue

	$116.7M	20%	$19.1M	51%
	$246M	(1)%	$14.6M	152%
	$55.1M	11%	$.468M	102%
	$88.7M	44.3%	$6.3M	509%
	$270M	15%	$24M	42%
	$134.9M	5%	$17.2M	(2)%
	$1.05B	16%	$34.3M	(26)%
	$83.2M	64%	$10.7M	143%

Source: Company reports

PC hardware

The first quarter for PC makers will likely be deja vu: The rich will get richer while the poor wrestle with Chapter 11.

Compaq, Dell Computer Corp. and AST Research, Inc. all carry healthy order backlogs, analysts said. According to Stephen Dube, an analyst at Sherwood Research Group, Compaq's next results may even exceed its last, record-setting quarter.

PC sales should continue at a robust pace — International Data Corp. estimates that the total market will jump to $57.1 billion in 1993, up from $51.1 billion — but there will be less for the bottom-tier vendors to distribute.

PC software

Among desktop software firms that have floundered of late, Symantec Corp.'s impending product rollouts will help but not until the June quarter, according to Quinn.

Similarly, Borland International, Inc.'s release of Paradox for Windows and unbundling of its Win/DOS Quattro Pro package will help stabilize the company. However, recent problems have saddled Borland with several long-term disabilities.

For example, the company has drastically cut pricing for several of its key products, including Paradox for Windows, in order to counter pressure from Microsoft. Quinn said Borland has also curtailed its spending on research and development.

Workstations

Analysts expect continued momentum in the first quarter for Sun Microsystems, Inc. and Silicon Graphics, Inc. Both workstation companies reported record revenue for the December quarter.

Compaq posts 25% sales uptick

By Michael Fitzgerald

HOUSTON

Compaq Computer Corp. made the biggest splash in last year's price wars and managed to ride that price wave back to profitability.

Compaq, the nation's third-largest PC maker behind the IBM PC Co. and Apple Computer, Inc., last week said 1992 sales soared by 25% to $4.1 billion, reversing a decline suffered in 1991. The company's profit for the year was $213 million, 63% higher than 1991's earnings, though lower than its $455 million profit in 1990.

Users said they were pleased that Compaq appears to have turned around.

At the same time, some expressed concern that Compaq may no longer place as much emphasis on leading the field in technology.

"I'm seeing things from companies like AST Research, Inc. that are more innovative than what's coming from Compaq," said Glen Jurmann, section manager of office technology at one of Compaq's largest customers, Baxter Health-Care Corp. in Deerfield, Ill.

Gian Carlo Bisone, Compaq North America's vice president of marketing, bristled at the suggestion that Compaq is no longer a technology leader.

"One of the key pillars in our success was technology, and while we won't be able to repeat being the sole supplier of 386-based systems again, we are not going to relinquish our technology leadership," he said. Bisone pointed to Compaq's status as the only vendor selling a notebook with a monochrome active-matrix display.

Perhaps more significant to Compaq's long-term health is reduced operating costs. For the fourth quarter of 1992, Compaq operating expenses were 16.4% of total sales, down from 25.7% in the year-earlier quarter. Compaq's high cost of doing business has been slammed by major competitors such as Michael S. Dell, chairman of Dell Computer Corp. in Austin, Texas.

Since then, Compaq has laid off roughly 21% of its work force, adopted new manufacturing techniques and wrung far better pricing out of its component suppliers.

FINANCIAL UPDATE

Compaq

Compaq posted record-setting revenue in 1992

	4Q '92	Year-end 1992
	$1.42B	$4.10B
Percent change from same period 1991	63%	25%

Source: Company reports

"A year ago . . . I would've agreed [with Dell] a lot more, but today we've changed [our structure] so dramatically that we could go out and do another round of pricing," said Eckhard Pfeiffer, Compaq's president and chief executive officer.

Pfeiffer said Compaq will "optimize" its pricing, and this may well include further price cuts.

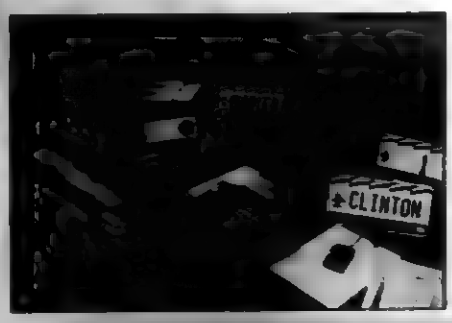
Analysts such as Leslie Fiering at Gartner Group, Inc. in Santa Clara, Calif., said Compaq "is definitely out of the woods, but they can't afford to rest on their laurels."

Wysiwyg

Kiss those red envelopes good-bye

Consumers shopping for valentines will find fewer cards with passionate red envelopes this year. The U.S. Postal Service is asking greeting-card makers to phase out dark-colored envelopes because its computers have difficulty reading the ZIP code and bar codes on them.

Source: The Atlantic, February 1993



◄Vanity (plates), thy name is . . .

NCR 3170 notebooks are being used to take orders for personalized commemorative 1993 presidential inaugural license plates. The plates can be displayed until March.

WINDOWS WEIRDNESS

By Jeff McGreary

Microsoft's Word for Windows Version 2.0 contains an undocumented feature that shows the triumph of "good" (Microsoft) over "evil" (WordPerfect). Follow these steps:

1. Make sure the paragraph marks are toggled on. If they are not, use the "Tools" menu to open the "Options" dialog box. Set the paragraph marks on and click "OK."

2. Use the "Tools" menu to open the "Macro" dialog box. Enter the name "Split" in the edit box and click the "Edit" button.

3. Delete everything in the document editing window except the middle paragraph marker.

4. From the "File" menu select "Close." Save the changes.

5. Using the "Help" menu, open the "About" dialog box.

6. Click on the Word for Windows icon and watch as the icon crushes the green WordPerfect monster. Following the monster's defeat, you'll be treated to a fireworks display and the names of the Word 2.0 development team.

Find any interesting, undocumented features in your applications? If so, please contact Lory Bix or Jodie Haas at (800) 343-6474. If we use your ideas, we'll send you a gift.

The Fifth Wave

"IT WAS BETWEEN THAT AND NEW CLASSROOM COMPUTERS."

InsideLines

Another software spin-off

IBM is set to announce its much-rumored Unix database next month, according to industry analysts. DB2/X, as the Unix version might be called, is said to have mainframe DB2-level power and security [CW, Nov. 9]. Being alpha-tested at selected RS/6000 sites, it is reportedly a cousin to the just-announced DB2/2, a 32-bit OS/2 database that understands DB2-style commands and file structures (see story page 12). No plans are in the works to create and unbundle a DB2-like database for the AS/400 line, which, like early iterations of OS/2, uses a database built into the operating system.

That empty feeling

Word has been getting around that Microsoft's Windows NT software isn't all it's been cracked up to be [CW, Jan. 25]. According to a source at Bankers Trust, a big Windows shop, the bank recently completed testing NT, and the reaction was lukewarm. Now, the bank is testing a beta-test version of IBM's OS/2 2.1 operating system, which the source said is more feature-rich than NT. Bankers Trust is reportedly pleased with the ability to run its Windows applications in a native mode under OS/2 2.1.

Rose-colored glasses?

Although Microsoft has yet to deliver DOS 6.0, independent software developers who have been briefed by Microsoft report that DOS 7.0 will have some preemptive multitasking capabilities under Windows 4.0. The development effort, scheduled for 1994, was designed to improve Windows' ability to function in a client/server environment.

Getting tight

DEC and Microsoft are expected to further solidify their relationship later this month by announcing a version of Microsoft's Software Developers Kit for NT on Alpha AXP and platforms on which to run the kit. While DEC has demonstrated only a desktop version of its Alpha PC for NT, which is likely to ship with a 150-MHz chip as early as this month, the company has also tested NT on its higher end platforms and is expected to announce them as well, sources said. Announcements of DEC products targeting the commercial Unix market will occur next month at Uniforum, the sources added.

No thanks

Vice President Albert Gore won't assume the role of communications czar, as many had expected and hoped, his chief of staff, Roy Neel, said last week. At a conference hosted by the Center for Strategic and International Studies in Washington, Neel said Gore will act in the "traditional role of adviser to the president" and will seek to make existing organizations work better rather than establishing new ones, as some techno-lobbyists have urged.

Tech-savvy aide

President Clinton has asked campaign worker Jonathan Gill, a software developer from Medford, Mass., to stay on as his E-mail czar. Gill will be the director of electronic publishing and public-access E-mail at the White House, working with media affairs director Jeff Eller [CW, Jan. 18].

Looks like Lotus' Notes is getting enough critical mass together to form a global user group. Daniele & O'Keefe Associates, Inc., a management consulting firm in Sudbury, Mass., has been hired to put the infrastructure for the organization in place. Kevin Brown at Corporate Software in Canton, Mass., is serving as acting president until a formal election of officers is held. Brown, who said he does not intend to run for president of the national organization, currently heads the Boston Notes User Group. The new group expects to be called Worldwide Association of Lotus Notes Users and Technologists (WALNUT). Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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Tim Treneff, VAX Systems Manager, Kaiser Aluminum & Chemical Corporation, Rod, Bar & Wire Division.

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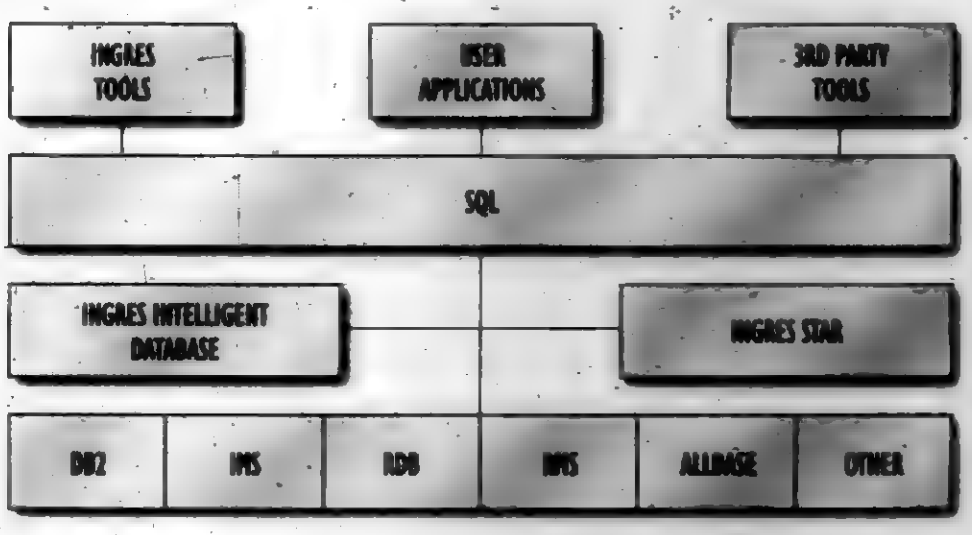

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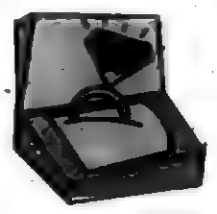
COMPUTERWORLD

Outsourcing contracts

Jeweler finds Chapter 11 to be negotiating gem

By Mark Halper
IRVING, TEXAS

You probably will not find it in any outsourcing primer, but Chapter 11 is an effective vehicle for renegotiating outsourcing contracts.



Just ask financially strapped jeweler Zale Corp., which is about to win a major concession from its outsourcer, IBM's Integrated Systems Solutions Corp. Zale's Chapter 11 status requires a review of this type of contract.

Moreover, the renegotiation will mark a customer coup because it comes as the terms of the original long-term contract were beginning to shift in ISSC's favor, sources said.

Zale is just the latest in a series of companies where information systems departments are discov-

Jeweler, *page 20*

32-bit fisticuffs

NT knockout sought with Portable OS/2

By Michael Vizard

While Microsoft Corp. plows ahead with the second phase of its beta test for Windows NT, IBM officials are targeting a midyear beta-test release of Portable OS/2, with general availability on the PowerPC RISC platform slated for first-quarter 1994.

"We already have some sites doing early alpha work with Portable OS/2, and we expect to be rolling out product by the end of this year or the first part of next year," said Larry Loucks, an IBM fellow who is director of software architecture for the Personal Systems Group.

For IBM, the arrival of Portable OS/2 is critical to its efforts to derail Microsoft's Windows NT, whose beta-test version runs on Intel Corp. platforms and a variety of reduced instruction set computing systems.

"Intel boxes will continue to be the majority of our systems, but we see a real opportunity developing for powerful

NT knockout, *page 12*

MANY SIMILARITIES BUT SOME BIG DIFFERENCES

Preemptive multitasking	Yes	Yes	Yes
[illegible]			Yes
Symmetric multiprocessor support	Yes (in some versions)	Yes	No
Security	[illegible]	[illegible]	No
Multiuser support	Yes	No	No
Portability	Yes	Yes	No

CW Chart: Nancy Kowal

Promises fly in OS market share battle

By Christopher Lindquist and Maryfran Johnson

The chase for the perfect 32-bit desktop operating system is on.

IBM, Microsoft Corp. and Novell, Inc. are all in frantic pursuit, intent on matching one another feature for feature as they present users with an increasingly ambitious list of functions and capabilities. The one certainty is this: The desktop is Microsoft's to lose.

It was not long ago that the only choice for a high-performance, multitasking operating environment was Unix. Now, however, IBM's OS/2 and Microsoft's Windows are maturing into products capable of competing with that old favorite.

In its new form as UnixWare — a blend of Unix System Laboratories, Inc.'s Unix System V Release 4.2 and Novell's NetWare and other variants, Unix is rising to meet the challenge with slicker, easier to use versions.

The contest starts in earnest this year with Novell putting

Market share, *page 12*

IBM mainframes negotiable

Set price to vanish

By Johanna Ambrosio
SOMERS, N.Y.

Drastic times call for drastic measures, and an aggressive IBM will try to show it means business when it unveils 18 new or upgraded mainframes tomorrow without any printed prices. Instead, IBM will negotiate with customers based on their total needs for hardware, software and services.

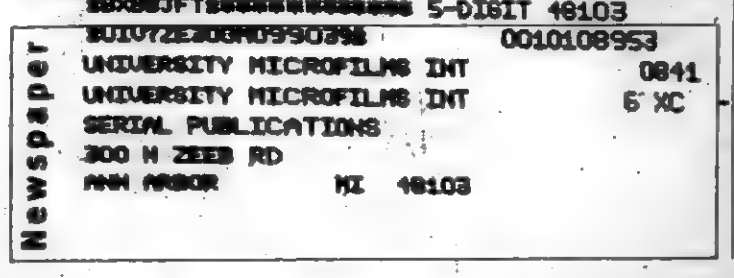
The newly unwrapped Enterprise System/9000 models, which include a Model 982 top-of-the-line eight-processor computer, will boost performance by at least 28%.

Additionally, IBM is said to be cutting memory prices by at least 40% and may even cut prices on existing ES/9000 mainframe computers by as much as 20%.

Current list prices are roughly $100,000 per million instructions per second, although discounts often bring the price to between $50,000 and $55,000 per MIPS.

The dramatic pricing tack adopted for the new computers will actually formalize a practice that has already been going on in many of the largest user shops. It works like this: IBM sales representatives and the customer sit down and figure out the total pack-

Set price, *page 4*



Frame relay pumped up

MCI price reductions may prompt further rate cuts

By Joanie M. Wexler
WASHINGTON, D.C.

Disappointed with the meager cost savings trickling in from their frame-relay networks, some users gained renewed hope last week at the Com-Net '93 show.

MCI Communications Corp. told attendees it has slashed rates by 20% to 70% and introduced an option to let users pay only for the data they send.

Dataquest's Joe Noel says AT&T will be forced to cut prices

Marketing claims have had users expecting to see 30% to 40% savings over leased-line networks. But savings are averaging just 10% to 15%, explained Steve Sazegari, chief analyst at San Francisco consulting firm Ryan Hankin Kent, Inc. "And users are complaining," he said.

Under MCI's new pricing structure, current MCI frame-relay customers should save an extra 20% to 30%, said Paul Weichselbaum, MCI vice president of data product marketing.

In addition, the MCI move, targeted at eroding AT&T's $7 billion-a-year private-line market, "should cause AT&T to lower prices and push frame relay aggressively," predicted Joe Noel, principal analyst at Dataquest, Inc., a consulting firm in San Jose, Calif. He indicated this could result in more widespread use and acceptance of the technology.

To date, Noel said, AT&T has been largely in a reactive sales mode with frame relay because it

Frame relay, *page 14*

Source: MCI Communications Corp.

NEWS

Fallout continues in the wake of IBM's poor financial performance and cutbacks. Some of the company's biggest customers haven't seen great changes in support but want to be ready for what they say is an inevitable downturn. *Page 47.* **IBM will throw away** the price book on new mainframes introduced this week. Instead, it will negotiate with customers based on "total packages" of software, hardware and services. *Page 1.* **On the product side,** IBM will introduce a slew of new mainframes this week in an attempt to boost sagging revenue, but it may also dramatically alter host pricing schemes. *Page 1*

At ComNet, it became apparent that users disappointed with their frame-relay cost savings could see the market dynamics shift and prices drop in the wake of a price restructuring by MCI. While Asynchronous Transfer Mode networking was the lip-service winner at the show last week, many users are facing facts with the incomplete technology's current barriers. *Pages 1, 14*

RDBMS

Be careful in your selection of an RDBMS for client/server configurations. While some progress has been made, the leading RDBMSs are still adapting slowly to the new challenges of this environment, and there are significant differences among products. Nevertheless, users surveyed in Buyers' Scorecard give market leaders Oracle, Sybase, Informix and Ingres high marks for meeting their needs. *Page 59*

Our Firing Line product evaluation of Gupta's SQLBase 5.1 reveals that the vendor has moved the product closer to meeting its promise of being a fully functional client/server platform. *Page 65*

MANAGEMENT ISSUES

Outsourcing can be gut-wrenching. But appropriate preparation, intelligent contracting and vigilant monitoring can help you avoid problems such as escalating costs and staff lawsuits. *Page 67*

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Some delays seen

DME trips on object orientation

By Elisabeth Horwitt
WASHINGTON, D.C.

The Open Software Foundation (OSF) is having trouble fitting the object-oriented piece into the Distributed Management Environment (DME) puzzle. As a result, users may have to wait longer than they expected for the fully functional multivendor distributed system management standard, according to vendors close to the project.

OSF officials at last week's Communication Networks Conference and Exposition (ComNet) cited a September ship date for DME services, which include event logging and use the OSF's Distributed Computing Environment protocols to interconnect various management nodes and managed devices. The original ship date was to have been June 1993.

. This delay will not affect the product rollout schedules of vendors that have announced DME-compliant products, OSF officials said.

Meanwhile, the OSF said the DME framework will ship by year's end. The framework defines how vendors fit together the various pieces of DME: data engine, data collection platform, graphical user interface and object-based management architecture.

However, vendor spokesmen said the OSF has been struggling with its job of getting all of DME's pieces to function effectively as a single unit. In particular, the OSF has had trouble integrating object-oriented architecture from Tivoli Systems, Inc. with Hewlett-Packard Co.'s OpenView piece that collects the data from various networked systems, said Wim Roelandts, vice president and general manager of HP's Computer Systems Group.

At a ComNet briefing, OSF President David Tory said DME can get along without its object technology, at least for a while. "The whole object-oriented technology [industry] is changing, a lot of independent software vendors are not there yet and users are terrified of objects," Tory said.

Mix and match

Even so, while users may not want to do object-based programming themselves, they "really want object-oriented system management," said Bob Herwick, an analyst at San Francisco investment banking firm Hambrecht & Quist, Inc. That is because it will enable them to mix and match their favorite applications with whatever multivendor systems installations they happen to have, he said.

The OSF recently began working directly with key vendors such as HP and IBM instead of trying to fit DME together all by itself, "so we're making progress now," Roelandts said.

Users should be able to get their hands on products with some DME attributes within months, vendor spokesmen said. For example, IBM's NetView/6000 Version 2, due out in the next few months, will support DME's Consolidated Management Application Programming Interface (CM/API), an IBM spokesman said. CM/API is one of the earlier pieces of DME to become available.

CM/API, in combination with the DME data collection architecture, promises integrated management across the Common Management Information Protocol world, which includes telecommunications devices and circuits, and the Simple Management Information Protocol world of local-area networks and routers.

Pentium delay could be a blessing

By Michael Fitzgerald
SANTA CLARA, CALIF.

Intel Corp. confirmed last week what the industry essentially knew: Pentium chip-based systems will not be available in the first quarter of 1993. Not so obvious, however, is that the delay may provide the extra time needed to address two key issues: heat dissipation and the need to recompile software for the Pentium chip.

Intel has denied that heat dissipation is a problem, though many vendors said the design issues presented by the high-heat chip are significant.

The compiler issue is one Intel has acknowledged and addressed from the start. While Pentium will run all Intel-based software, the chip gets much of its performance from a superscalar architecture that allows it to run two instructions per clock cycle vs. the single instruction per cycle in prior Intel chips.

"I don't know if the industry is going to be disappointed [in Pentium's performance] or not," said Gary Stimac, senior vice president of systems at Compaq Computer Corp. Stimac said early predictions of double and triple the software performance may not materialize without recompiled software, particularly because these early claims were made before Intel introduced its 50-MHz and 33/66-MHz 1486 chips.

Stimac said the software compiling issue would affect vendors more than users, "except that users will want to have Pentium-optimized software."

Although Intel still plans to publicly discuss technical details of the Pentium chip in late March (March 22, according to sources), systems vendors will not announce systems until late May.

Desktop system vendors had expected to announce Pentium-based systems at the same time the chip was announced.

"I'm pleased they're not doing the same kind of fiasco they did with the 386 and 486 introductions," said Bruce Bohuslav, president of Systems Integration Associates, Inc. in Chicago. He referred to Intel's announcement of chips months before vendors could ship them in systems.

Analysts shrugged off the news.

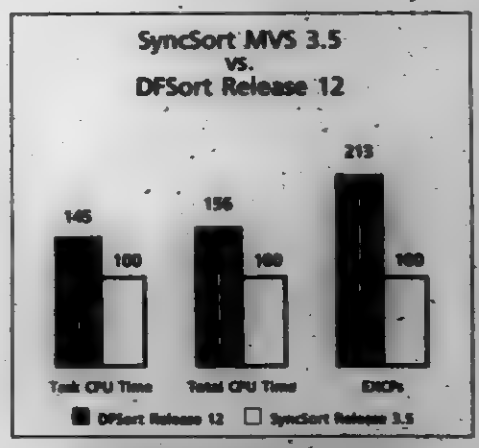
"The big deal is the 486," said John Joseph, an analyst at Kidder Peabody & Co.

Research firm Computer Intelligence/Infocorp predicted that no more than 200,000 Pentium systems will ship in 1993, a tiny portion of the market.

UMI

SOME PAGE(S) MAY NOT HAVE REPRODUCED WELL DUE TO A LACK OF PHOTOGRAPHIC CONTRAST BETWEEN TEXT AND BACKGROUND.

IF IT WERE GREASED, IT WOULD BE ALMOST AS FAST AS SYNCSORT.



syncsort

201-930-8200

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Set price to vanish

CONTINUED FROM PAGE 1

age needed — software, hardware and services — and then arrive at a price based on those needs and the upgrade plans going forward a year or two.

"It's going to simplify the dealings and negotiations, avoid a lot of the back and forth and allow IBM to put packages together fairly quickly and easily," said Doug Underhill, vice president at CSX Technologies, Inc. in Jacksonville, Fla. And, he said, "IBM is trying to find a way to differentiate its offerings from the competition. There's really no difference anymore except price."

Even without the pricing bombshell, the large midlife price/performance improvements are a first, observers said. IBM traditionally boosts each new generation by about 20%. Part of the reason behind the dramatic improvements is the time between the last major mainframe announcement in September 1990 and this one, as well as the fact that IBM is fighting to keep its share of a slow-growing market.

"We're off all historical precedents right now," said Jay Stevens, an analyst at Dean Witter in New York. "IBM will do what they have to do."

On the way

IBM will introduce tomorrow at least 18 new or improved models of its ES/9000 line. The most powerful computer, the eight-processor Model 982, will run at about 410 MIPS and will have up to 16 byte of main memory — twice the memory capacity of the current top-of-the-line Model 900. IBM is also cutting memory prices in half.

The company will also cut memory prices by 40% to 50%, sources said, to between $1,000 and $1,200 per megabyte. This will help users accommodate the vastly increased memory capacity of the new Model 982, which will hold a minimum of 1G byte of main memory — twice the amount of the former top-of-the-line Model 900. About a dozen 982s have already shipped to user beta-test sites.

Other pieces of the announcement are expected to include the following:

- A total of 18 new or improved ES/9000 models — eight water-cooled and 10 air-cooled. Some, such as the seven- and eight-way water-cooled machines, will be entirely new; others will be upgraded versions of existing models.
- Performance boosts of roughly 28% for the water-cooled computers and 40% to 50% for the air-cooled machines. The new processors will run at about 50 MIPS vs. the old 40-MIPS engines in the existing ES/9000 models.
- A new uniprocessor called the 711, on which the whole water-cooled family will be based.
- Field upgrades for existing ES/9000 models.
- A specialized data-compression engine based on an ES/9000 chip set. This will be the first of many specialized engines to come, including one for DB2 queries expected later this year.
- Availability by March of the new high-end mainframes, although some of the software to optimize the new hardware may not be available until later this year.
- An add-on feature to the MVS operating system, called OpenEdition Services, that joins MVS with the Posix set of standards. IBM will try to position MVS and the ES/9000 family more as an open system.

Still early in the game

Users and analysts applauded the pricing moves and new products but said it is too early to tell how much they will help stem IBM's bleeding mainframe revenue, which in 1992 fell by 12% from the year before.

"Clearly, this will help slow the erosion, but I wonder what [machines] customers are going to send back to IBM when they order the eight-way," Stevens said. For example, if customers swap out two older machines (such as a Model 720 and a Model 900) for one new one, IBM could suffer a net loss on both hardware revenue and software license fees.

Susan Gannon Middleton, an analyst at Technology Investment Strategies Corp., said the introductions will likely help IBM's first- and second-quarter revenue figures.

PCM comeback

Amdahl Corp. and Hitachi Data Systems Corp. are already making noises about how they will respond to IBM's mainframe announcements tomorrow (see story at left).

HDS, which lists its six-way 9000 mainframe at $20.5 million, plans to bring out its own eight-way machine.

It will match IBM's power boost of 28% to 50%, said Bill Tudor, director of HDS systems product marketing. He did not say how soon this would happen, however.

Amdahl's director of processor marketing, Henry Cassel, said Amdahl's eight-way 5995-8MXM processor, which is listed at $30 million, has been on the market since September 1992. Between 10 and 20 such machines are installed worldwide.

The 8MXM is rated at about 300 MIPS, but that could change when Amdahl gives its response to IBM's announcement later this week.

Cassel said he had expected IBM would "tear up the price list" in the U.S., as it did in some European countries in the late 1980s.

Cassel did not say whether Amdahl would match that, too. Discounting for IBM-compatible mainframes has been commonplace for more than two years, he said.

Historically, IBM was able to "freeze" the mainframe market for months preceding a big announcement. Users know Amdahl and HDS were forced to respond, but they also realized the vendors often failed to ship products for a year or more.

However, IBM's recent troubles have changed the rules about freezing the market, the two Silicon Valley vendors said.

Amdahl posted record fourth-quarter mainframe sales, and fourth-quarter sales of HDS mainframes edged out quarterly sales of its peripherals for the first time since Hitachi Ltd. and Electronic Data Systems Corp. formed HDS in May 1989.

—Jean S. Bozman

Doors shut on supercomputer start-up

Employees petition Clinton

By Ellis Booker

EAU CLAIRE, WIS.

Playing on President Bill Clinton's campaign promise to support start-up companies and develop high technology in the U.S., a group of employees from Supercomputer Systems, Inc. wrote to the new president for help last week.

IBM pulled the plug on the company two weeks ago, withdrawing its financial support from the 5-year-old venture. As the principal backer, IBM had invested between $100 million and $200 million in the venture, analysts said. The shutdown affected 320 employees.

The letter to Clinton, which was also released to the press, challenged the president to lend his support to their effort to salvage the supercomputer maker but shied away from asking for money.

"What we seek from you is not taxpayer money but support: Your public support could help us gain the time and financing we need to save our company," the letter stated.

There was no response from the White House as of press time.

The employee group said it hopes to raise $20 million to $30 million in "immediate, short-term funding." Prior to losing IBM's support, company founder Steve Chen had begun a worldwide search for $60 million and new investors (CW, Feb. 1). Chen was not one of the letter writers, nor did he give his approval to the group, a company spokesman said.

Sources close to Supercomputer Systems said the company's four industrial partners — The Boeing Co., Ford Motor Co., Du Pont Co. and Electronic Data Systems Corp. — have indicated their wish to help the venture but within their own financial constraints.

In their letter to Clinton, Supercomputer Systems employees reiterated Chen's claim two weeks ago that the firm had successfully tested and benchmarked its next-generation supercomputer, the SS-1. "We did it! We built the world's fastest supercomputer. We built it in America, as a start-up, on limited funds.... This was our 'American Dream.'"

For the past two weeks, many Supercomputer Systems employees have been wearing T-shirts emblazoned with the phrase: "If you build it, they will come."

Meanwhile, it is not the only woe-struck supercomputer maker. Market leader Cray Computer Corp. continued to suffer from the difficulties of getting a complex product to market. The company reported a fourth-quarter loss of $12.6 million. The deficit was slightly less than the previous year's $14.6 million fourth-quarter loss; company officials attributed the improvement to tighter expense controls.

For the year ended Dec. 31, Cray lost $50.5 million, compared with $52.2 million in 1991.

The supercomputer company, founded by Seymour Cray, records nominal-only revenue because its first product, the Cray-3, is still under development.

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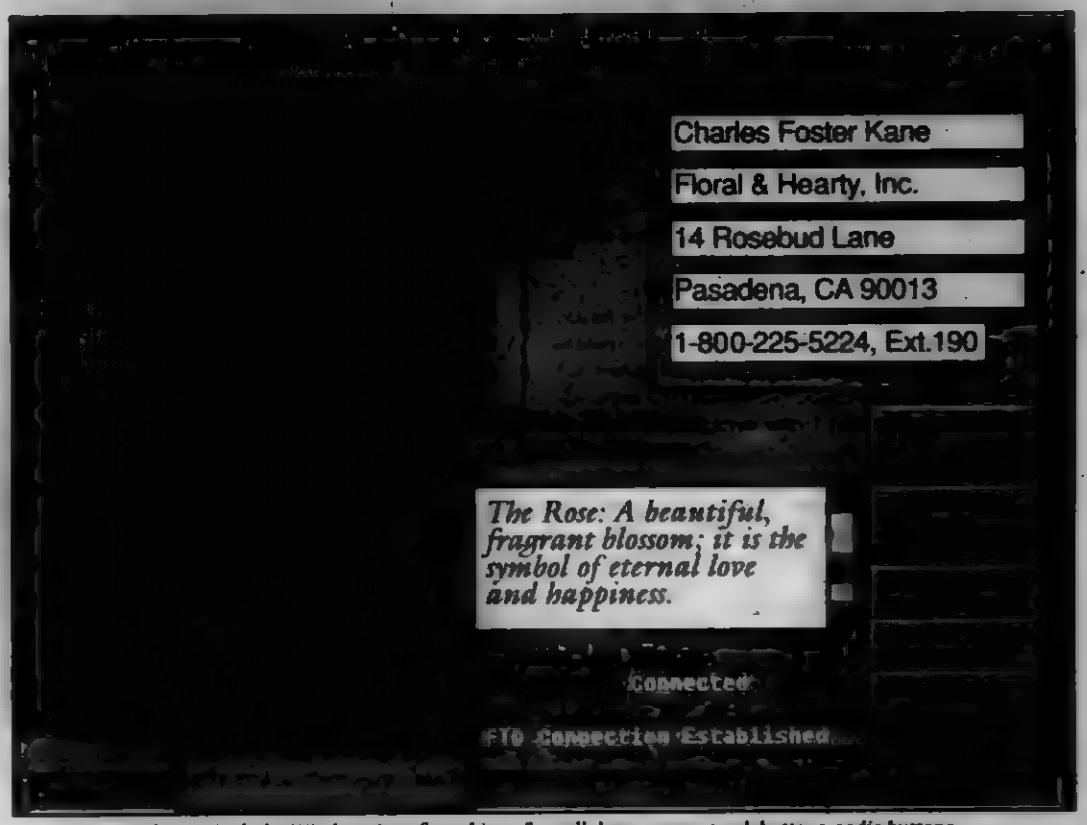
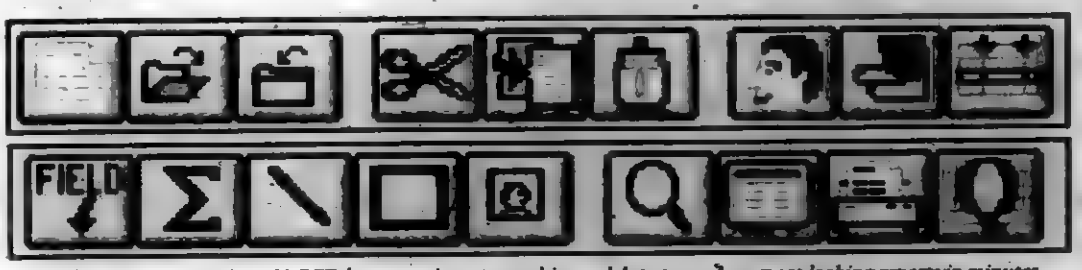


CA-dBFast includes Windows interface objects for pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes, bit-mapped graphics and more.



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News Shorts

FBI shutters Ohio bulletin board

Rusty & Edie's, the fourth-largest bulletin board in the U.S., was shut down last week by the FBI over alleged software piracy. The FBI and the **Software Publishers Association** claimed Rusty & Edie's has allowed and encouraged illegal copying of numerous copyrighted business and entertainment software packages by the board's 14,000 subscribers. This is the first raid since October, when Congress raised software piracy from a misdemeanor to a felony. Convicted pirates now face up to five years in jail and $250,000 in fines.

Dell to expand service plans

Dell Computer Corp. is expected to cut prices 6% to 21% and expand its service offerings this week. Sources said Dell will introduce SelectCare, a mix-and-match service package that includes options for extended warranties, training for information systems personnel, cheaper on-site service and expanded third-party service agreements. Dell will also expand its support to 24 hours a day, seven days a week.

HP ups benchmark battles

Hewlett-Packard Co. fired another salvo in the battle of on-line transaction processing benchmark results last week when it reported that its Unix-based HP 9000 Series 800 Model H40 outperformed the competition on the **Transaction Processing Performance Council**'s new TPC-C test. Running **Informix Software, Inc.**'s Informix 5.0, the HP system scored 406.65 transactions per minute with a cost of ownership of $2,786 per transactions per minute, HP said. HP also said its machine exceeded the RISC System/6000 Model 570, which IBM introduced last week.

Lotus ships OS/2 applications

Lotus Development Corp. last week shipped a 32-bit version of its 1-2-3 spreadsheet and Freelance Graphics software that is tightly integrated under the Workplace Shell interface on OS/2 2.0. Lotus said it expects to ship 32-bit versions of its Ami Pro word processor and CC:Mail products for OS/2 by midyear. The packages are priced at $495, the same as Lotus' 1-2-3 for Windows. Lotus also announced that it has acquired **Vanguard Business Solutions, Inc.**, a San Francisco consultancy.

Zenith Data wins Desktop IV — again

The U.S. **Department of Defense** made its third contract award in the ill-starred Desktop IV procurement to **Zenith Data Systems** and **Government Technology Systems, Inc.** for up to 300,000 PCs and office-automation software packages. The first award, made in November 1991, was thrown out after an experimental "fast-track" selection process when numerous bidders protested that their proposals were unfairly rejected for minor flaws.

SHORT TAKES **CompuAdd Computer Corp.** said it is shipping the 456SLC2, the first product of its relationship with **IBM**'s Electronic Card Assembly and Test unit. The unit uses IBM's 50-MHz SLC2 processor and includes a 170M-byte hard drive, 4M bytes of random-access memory and a 14-in. color monitor at a base price of $1,695.... **Advanced Logic Research, Inc.** released PCs that use a local-bus architecture as part of a 16-product rollout that included two multimedia machines.... **Zeos International Ltd.** released Contenda, a $1,495 subnotebook that weighs 3.9 pounds, is based on Intel Corp.'s 25-MHz 80386SL chip and comes with 2M bytes of RAM, an 80M-byte hard drive and a built-in trackball.

News shorts, page 16

San Diego Gas to re-engineer

Technology unit will be used as test bed for processes changes

By Thomas Hoffman
SAN DIEGO

When the California Public Utility Commission blocked a planned merger between San Diego Gas & Electric Co. and Southern California Edison Co. in May 1991, the action dashed three years of planning between the two utilities intended to merge their information systems operations.

Following the aborted merger and fueled by competitive changes and deregulation in the utilities industry, San Diego Gas realigned its organization into sets of functional teams in an attempt to improve support of common operating goals and strategies.

Last week, the $1.87 billion utility launched a major companywide re-engineering initiative to augment the company's reorganization.

Unique approach

Though San Diego Gas is not the first utility to embark on re-engineering, industry analysts said the company's approach is unique, if not commendable, because San Diego Gas will launch its effort by using its IS and technology division as a test bed.

"What works and what doesn't work is an important part of the learning process, and we expect to be able to transfer this knowledge to other projects," said Lynn H. Congemi, director of IS at the utility.

Business process re-engineering is key to San Diego Gas, which must become more competitive in a deregulated market, Congemi said.

Last December, San Diego Gas' chairman and chief executive officer, Thomas A. Page, announced that as of Jan. 1, the company would consolidate into five teams consisting of customer service, energy and projects, external affairs, financial services and human resources. Executives said departmental "teams" would enable divisions to work more closely toward achieving common objectives.

Results-oriented

The utility has worked hard to earn its high marks. At San Diego Gas, the number of customers per employee is among the highest in the nation. The utility went from 200 customers per employee in 1984 to the current figure of 425 customers per employee.

Starting this month, the IS division will begin overhauling its IS processes. According to Congemi, members of each corporate functional unit will work with IS staff members on project teams to determine the platforms necessary to support the business requirements of each division.

The IS division — whose budget was close to $40 million in 1992, according to San Diego Gas — comprises six departments, with four of those providing services to San Diego Gas users independent of one another. The re-engineering initiative, Congemi said, will help improve integration of project activities between IS service teams and functional units. "Our goal is one-stop shopping for our customers," Congemi said.

San Diego Gas' Lynn H. Congemi: *'Our goal is one-stop shopping for our customers'*

Three of the six IS departments currently in place focus on providing users with services in telecommunications, PCs and PC training. Some of the project goals include possibly consolidating three help desks into one and building an integrated system to provide follow-up help.

"We're trying to make that process invisible for the end user" by providing users with a single point of contact for all help desk services, Congemi said. Currently, IS uses several isolated systems to support telecommunications and PC support inquiries.

Despite these efforts, no IS staff cuts are expected.

Another benefit anticipated from re-engineering the IS division's processes is to refocus staff members now providing skill and training sessions on systems on providing additional client/server and local-area network services.

Congemi said it is too early to tell what, if any, cost savings may result from the IS overhaul. However, she added that by gaining the flexibility to reallocate its IS staff freely, San Diego Gas will be able to avoid hiring additional IS staff members.

IS cost savings last year were targeted at reducing expenses in the glass house. By renegotiating equipment leases and installing more effective systems management tools, Congemi estimated, San Diego Gas was able to save almost $1 million in 1992 on combined capital and operational costs.

A downsizing 'revolution'

To get more information out to customers faster, San Diego Gas & Electric has caught the downsizing wave.

According to Susan Fratamico, manager of customer and operating service systems at San Diego Gas, the utility last summer kicked off a re-engineering project — aimed at revolutionizing its gas systems environment — with an evaluation of 15 functional areas tied to the natural gas business.

Pushing the project, according to Fratamico, was the need to use incentive rate-making to provide gas as inexpensively as possible. Buying more than half the gas it sells "enables us to pass along rate savings to our customers, and we end up saving money by having an automated system across the company," Fratamico added.

Following the evaluation of the functional requirements, San Diego Gas is now in the process of installing a variety of Intel Corp. 486-based PCs and servers under a client/server architecture, which will be linked over Banyan Systems, Inc., Novell, Inc. and a large concentration of IBM Token Ring local-area networks.

All application software for the new gas environment is being developed in-house, as are the graphical user interface front ends to the system. The system replaces nonintegrated spreadsheets and handwritten reports.

Fratamico said she expects the hardware to be installed in the next few months. During that time, she said, San Diego Gas hopes to standardize on one of the three networking platforms. Overall, Fratamico estimated the project will save the utility "millions of dollars" in increased efficiencies. —*Thomas Hoffman*

DISTRIBUTED QUERY COMPARISON

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
CREATE PROCEDURE la_qty
/* for use on WESTCOAST server */

/* returns count for one part only */
@partno char(6),
@la_count int output
AS
SELECT @la_count =
(SELECT qty FROM la_parts
WHERE partno = @partno)

DECLARE @cnt int
DECLARE @counter int
DECLARE @la_count int
DECLARE @partno char(6)
SELECT @cnt = COUNT(partno) FROM ny_parts

/* ny_parts is the parts master; need count
for sequential comparison with la_parts
to simulate a distributed join */

SELECT @counter = 0

/* create temporary table for part numbers
and quantities from ny_parts */
CREATE TABLE #allparts1
  (partno char(6) NULL,
  ny_qty int null)

/* create temporary table for row numbers
for sequential call of la stored procedure */
CREATE TABLE #allparts2
  (seq int)

/* create temporary table for
sequential build from first two temp tables */
CREATE TABLE #allparts3
  (partno char(6) NULL,
  ny_qty int null,
  la_qty int null,
  seq int)

/* build sequence numbers for each ny row */
while @counter 1> @cnt
begin
  select @counter = @counter + 1
   insert into # all parts 2 (seq) values ( @ counter )
end

/* populate temp table with ny parts and quantities */
insert into #allparts1 (partno, ny_qty)
select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

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In Ontario or Quebec call 1-800-263-8973, elsewhere in Canada call 1-800-263-8869.

Desktop to data center

RS/6000s span spectrum

By Maryfran Johnson
NEW YORK

IBM spread the wings of its Unix-based RISC System/6000s over new territory last week, introducing nine new models that swoop down to $3,995 for an entry-level workstation and stretch up past $300,000 for an eight-processor parallel computer.

Company officials showed no lack of confidence in the RS/6000's future. Pointing out the machine's recently profitable status, executives vowed to unseat Sun Microsystems, Inc. from its No. 1 spot in the workstation market by 1994. With its 18% market share, IBM now trails third behind Sun and Hewlett-Packard Co.

Users must wait until midyear, however, for the most significant RS/6000 news. That is when IBM will unveil the first low-end systems based on the PowerPC architecture, which the computer giant is jointly developing with Motorola, Inc. and Apple Computer, Inc.

Scheduled for delivery still later this year is a higher performance round of Unix systems based on the next generation of the RS/6000 CPU — the so-called RIOS-2 chip set.

No real change

Analysts viewed last week's announcement as mainly a realignment of the price/performance of various models accomplished by trickling down technology from high-end products into the mid-range.

At long last

IBM's RS/6000 line reached profitability in the last fiscal quarter of 1992. Officials said that while revenue growth of 50% in 1992 did not materialize, RS/6000 income did grow 30% to 35% worldwide.

"They seem to have a sense of urgency about maintaining their competitive position," said Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. The company installed 10 RS/6000 midrange machines recently as part of a client/server rollout of IBM, NCR Corp. and HP Unix systems.

"We're looking for two things: vendors committed to maintaining competitive price/performance with others in the market and [companies] willing to extend the state of the art in open systems," Lester said.

"IBM is in the game," agreed Duane Elms, program manager of technical computing at General Electric Co. in Fairfield, Conn.

"My motto is, 'palmtops to teraFLOPS,' " said Phil Hester, vice president of systems technology at Advanced Workstations and Systems, the Austin, Texas-based IBM unit responsible for Unix systems and software.

"We have two parallel road maps evolving. One is the PowerPC single-chip, high-volume multiprocessor technology. And positioned above that are multichip implementations of the architecture with a lot higher levels of performance and much better scalability beyond a single-chip design," Hester said.

Sandwiched between last week's announcement of the $3,995 M20 diskless color workstation and the high-end Power Parallel System (see story page 4), IBM unveiled a high-capacity Network File System server that claims to be three to five times faster than standard Unix file servers. Three new technical graphics workstations, an X Window System terminal and new midrange and high-end server models filled in the other gaps in the line.

Prices skydiving

Although there was no new performance or functionality added to the graphics arena, IBM did cut prices on its current low-end graphics adapters and repackaged an entry-level, three-dimensional graphics product to fit the RS/6000 Model 220 box.

IBM is also honing its sales force expertise, company officials said, by placing specially trained Unix teams in each of its 60 U.S. sales territories.

"This is a turning-point year for them," said George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn. "There are a lot of reasons to feel a little bit of skepticism about IBM pulling it all off. They're going to have to make sure they understand the PC world, the Unix world and how to sell into both."

AS/400 users feeling pinch from IBM staff cuts

By Johanna Ambrosio and Kim S. Nash
ROCHESTER, MINN.

As if IBM does not have enough problems, customers of one of its hottest systems, the Application System/400, have stumbled on a dent in the much-heralded armor of IBM service. Some AS/400 shops feel they are getting lanced when it comes to support calls, and there is a sneaking suspicion that IBM's early retirement programs may carry some of the blame for this.

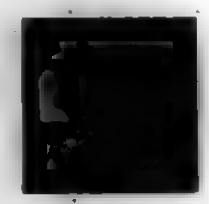
Ron Taylor, manager of computer operations at Dominion Textile, Inc. in Montreal, said his firm recently experienced a two-day outage with its Model D45 because of a microcode snag. "I don't ever recall a problem where a machine has been down for that long," he said, "and I've been working with computers for 30 years."

The local Montreal field support office had experience only in hardware, and the field engineer could not pinpoint the problem, Taylor said. The problem eventually went to a main IBM office in Vancouver, British Columbia, all the way across the country, before being shifted over the border to the AS/400 support staff in Rochester, Minn., where the issue was finally resolved.

In theory, that should not have happened, said Bob Summers, IBM's market development manager for AS/400 services. "The support structure has been beefed up over the years. We used to have two tiers of support: one in Chicago and one in Rochester. Now we have one tier, and everything's in Rochester."

Blue ballyhoo

In September 1992, IBM announced seven for-fee services targeted at the AS/400 user base. These included telephone support and consulting, on-site assistance, an assigned technical expert to talk to, electronic conferences and performance monitoring, trend analysis and management reports. So far, "thousands" of customers have signed up, according to an IBM manager.



The realignment, completed late last year, was to "make sure customers have access to experts," Summers said. "It's always difficult to make sure that the right people are in the field-support office, no matter if you have 10 or 20 support engineers in the office. Our objective was met independent of any downsizing in IBM." Additionally, users can sign up for optional services for a fee.

Free hardware and software support come with warranties, Summers said. After the hardware warranty runs out, support is included in maintenance charges. There is currently no warranty limit on software support, he added.

Top service ratings

IBM's loss of support personnel may affect the company's high service and support rating among AS/400 users

Vendor	Service and support rating
IBM AS/400	8.9
HP 3000	8.4
DEC VAX	8.4
DG MV/Eclipse	8.1

Ratings are based on a scale of 1 to 10, where 10 is best

Response base: 30 users of each product

Source: Computerworld Buyers' Scorecard, Nov. 30, 1992

Shipments slipping

Still, customers and others have noticed some differences at a time when IBM is preparing to introduce new AS/400 models with significant performance boosts. Then, too, AS/400 shipments have slowed lately; 1992 revenue from the AS/400 family fell by about 2% compared with that of 1991.

Some observers, such as J. Rodger Peck, president of Peck Systems Group Ltd., a consulting firm in Bridgman, Mich., attributed the shortcomings to IBM's downsizing efforts.

"IBM has lost a number of quality people through retirement, attrition or redeployment," Peck said. "Local branches are doing as good a job as they can, but IBM lacks the quality people they had a couple years ago." One theory holds that AS/400 specialists may be particularly willing to take early retirement because their skills are in great demand outside of IBM.

Especially tricky for new users, Peck said, is acquiring the programming knowledge needed to perform certain communications jobs.

Support has been "questionable" for Jos. A. Banks Clothiers, Inc., according to Frank Black, vice president of information services at the Hampstead, Md., firm. "They just don't have qualified [software] people locally. We just avoid them, using outsiders like Computer Task Group," he said.

Chuck Hagadorn, manager of AS/400 technical services at Playtex Family Products in Dover, Del., recalled a time when it took more than two hours to talk to a support person in Rochester. "We talked to a person who transferred us to a computer. Usually it's the other way around."

Playtex, a former mainframe shop that downsized, "is just used to a different level of support," Hagadorn said. "There's been a breakdown in our ability to communicate with IBM. There's been no serious impact on us, but it is an annoyance."

Still, he said, IBM's responsiveness has improved since Playtex registered a complaint about six months ago.

REFERENTIAL INTEGRITY COMPARISON

SYBASE

200 LINES OF PROPRIETARY CODE

```
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @rows int
        select @rows =@@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
        key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @rows
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

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Candle loosens licensing options

Follows trend toward tiered pricing and more flexible payment terms

By Thomas Hoffman
SANTA MONICA, CALIF.

Candle Corp. last week ushered in a new suite of licensing and maintenance alternatives for its predominantly IBM mainframe customer base that appears strikingly similar to the plan outlined by Computer Associates International, Inc. last April [CW, April 20, 1992].

Under Candle's "Flex Pricing" initiative, users will have the option of licensing their software based on enterprisewide contracts tied to use, millions of instructions per second-based pricing and other alternatives. Candle is also offering several new maintenance models.

Candle executives said they expect the licensing options to help the firm increase sales of its automated performance management products. However, some analysts said they are part of a broader move by mainframe software vendors seeking to stem the flow of users who have been moving off their legacy systems onto cheaper yet powerful client/server architectures.

AS/400 on tap

Candle has been developing performance management products for IBM's Application System/400 minicomputers, which IBM will market and introduce later this month, Candle executives said.

However, one analyst said Candle's announcements go beyond its rivals' practices. "We like Candle's approach [to alternative licensing options] better than most other vendors, including CA, because it provides long-term predictability on software costs while lacking many of the 'gotchas' that some vendors have employed," said Bill McNee, vice president and service director at Gartner Group, Inc.'s Software Asset Management Services in Stamford, Conn.

For example, McNee said, Candle's strategy was not designed to lure customers into expensive enterprisewide agreements for the sake of retaining customers for lucrative long-term agreements, unlike the tack taken by other vendors. "Many other vendors have the carrot-and-stick approach. This is more of a carrot," McNee said.

Myriad options

Candle, which has negotiated private licensing options with more than 50 customers, formalized several of those arrangements. Along with tiered pricing, which is based on the type of CPU the software runs on, the company has added nontiered pricing for a single price for software, regardless of CPU group. Other options include the following:

- Enterprise licensing, based on software use.
- Perpetual licenses with a onetime fee.
- Installment purchases.
- Rental or leasing options.
- Credit for trade-ins of rival products.

"This makes it very easy for customers to pick up some of our new products," said Vince Niezielski, Candle's vice president of information systems management. Candle hopes the new licensing initiatives will prompt customers to purchase more of Candle's automated performance products, including AF/Operator, AF/Performer and AF/Remote, which currently constitute a combined 7% to 10% of Candle's revenue. "Twenty percent of our installed base have these automation products. We'd like to double that over the next year or two," he said.

Analysts added that vendors such as Candle have a vested interest in offering flexible pricing to retain their customer base. "Now that mainframes are not selling that well, vendors have to make it attractive for customers to buy their goods, and Candle is primarily a mainframe vendor," said Shaku Atre, president of Atre, Inc., a consultancy in Rye, N.Y.

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NT knockout sought with Portable OS/2

CONTINUED FROM PAGE 1

RISC systems that will function as concentrated E-mail servers and database servers," said Cary Serif, manager for applied technology at Huntington National Bank in Columbus, Ohio. "Having a portable OS/2 is extremely important to maintain compatibility with existing applications."

However, in its race to deliver a portable OS/2 on a RISC platform, IBM is definitely trailing behind Microsoft. By the time of NT's expected launch in June, it will have been ported to RISC systems from Digital Equipment Corp., Mips Technologies, Inc. and Integraph Corp.

"The second phase of NT is very stable and very fast. You don't see any of the slowdown you would expect to see in a new, large operating system. And it's as easy to load as Windows."

Common interface

IBM plans to provide its three major desktop system environments with a common graphical environment via OS/2's WorkPlace Shell utility.

This effort will result in extending the WorkPlace Shell's support to DOS, AIX and the object-oriented operating system currently under development by IBM and Apple Computer, Inc.'s Taligent joint venture, said Larry Loucks, director of software architecture of Personal Systems at IBM.

Driven by IBM's need to create a common interface across its DOS, OS/2 and AIX operating systems, the company has been working with the OSF to integrate its WorkPlace Shell utility with the Motif graphical user interface (GUI).

This project was designed to provide the Motif GUI with an object-oriented desktop manager that will allow Unix users to access files in a manner similar to the one employed by Apple's Macintosh file system.

Currently, Unix sites that opt for Motif applications are required to purchase desktop manager software as a separate product from vendors such as Visix Software, Inc. in Reston, Va., and IXI Ltd. in England. — *Michael Vizard*

said John Donovan, an industry analyst at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

Layer by layer

To compete with NT and variants of Unix on RISC platforms, Portable OS/2 takes the current file system used on Intel processors and layers it on top of the Mach micro kernal developed by Carnegie Mellon University in Pittsburgh. The Mach micro kernal is the operating system technology IBM intends to use to make OS/2 an open system available on both Intel and RISC system platforms.

"Initially we'll support the PowerPC, with support for other RISC platforms determined by customer demand," Loucks said.

Once OS/2 is moved to the Mach micro kernal, IBM will add support for symmetrical multiprocessing, multiple users and higher levels of security, Loucks said.

Working in conjunction with the Open Software Foundation (OSF), which is also using Mach as the basis of a future iteration of its OSF/1 operating system, IBM has developed a micro kernal that can support multiple file systems concurrently, Loucks said.

Nearing fruition

One of the fruits of the IBM/OSF collaboration is that the next major release of the OSF's Motif graphical user interface will incorporate many of the attributes of IBM's WorkPlace Shell utility and become a true desktop manager for Unix systems.

Last year IBM demonstrated DOS, Windows, OS/2 and its AIX operating systems running concurrently on top of a Mach micro kernal. That work has progressed to the point where IBM has completed the "de-Unixification" of the Mach micro kernal, Loucks said.

"Mach was originally developed out of Unix research, so Unix was the dominant personality. Working with OSF, we've made it more personality-neutral," he said.

As part of that effort, the micro kernal supports only interprocess communications, threads, address space, low-level virtual memory and I/O objects, while supporting elements such as default anonymous pagers and device drivers residing in user space above the kernal, Loucks said.

By keeping the base functions of a multitasking operating system to a minimum in the kernal, IBM can layer any file system on top of a Mach micro kernal, which is now smaller and more storage-efficient than the original Mach micro kernal developed by Carnegie Mellon.

Loucks declined to speculate on the impact a separate portable version of OS/2 would have on IBM's current OS/2 offering for Intel systems. He said IBM will support both Portable OS/2 and the current version of OS/2 on Intel concurrently. Version 2.1 of OS/2, which is slated for general release this quarter, is now in beta testing.

No problem

Suppliers of application software for OS/2 noted that moving a 32-bit OS/2 application to the portable version of OS/2 should be a straightforward process. "We expect moving to Portable OS/2 will be a relatively simple recompile and run. It won't be a major port," said Hilmi Ozguc, senior product manager at Lotus Development Corp. for its 1-2-3 spreadsheet on OS/2.

Loucks added that he expects to compete with NT at about the same time NT becomes a viable offering at end-user sites because many of the initial applications for NT will not take advantage of the operating system's multithreading and security features.

Many NT developers are focusing their efforts on a subset of the Win-32 Application Programming Interface (API) that lets their applications run under both NT and Windows 3.1.

In order to accomplish this, the subset of the Win-32 API provided by Microsoft allows developers to create NT applications that do not support multithreading and security in the first iteration of their NT applications.

Promises fly in OS share battle

CONTINUED FROM PAGE 1

its muscle behind UnixWare, IBM making significant upgrades to OS/2 and both IBM's Portable OS/2 and Microsoft's Windows NT finally shipping.

"I do think it's going to be a battle royale this year, and users will see IBM, Microsoft and Novell throwing enormous market clout into the process," said Kevin O'Neill, vice president of Business Research Group in Newton, Mass.

Each product has strengths and weaknesses and varying levels of importance to users.

Larry Waibel, systems software technical specialist at Cubic Automate Revenue Collection Group in San Diego, said that while his company is moving to OS/2, Unix still has some abilities that make it useful. Some of the company's projects, for example, require multiple user interfaces to one box — a capability OS/2 does not have yet and one that NT will provide only through a third-party software vendor. "That's where Unix is still ahead," he said.

However, putting Unix in front of end users is something Waibel said he would rather avoid because it requires systems administration tasks that many users deplore. "With OS/2, you just install it and configure your desktop," he noted.

Another user said he sees different battle lines developing.

"When we start putting mission-critical stuff in the client/server world, I suspect it's going to be a Unix vs. NT thing," said William R. Conley, manager of information systems services at Loral Aerospace Corp. in Newport Beach, Calif. "I think IBM has really dropped the ball on the direction for OS/2."

Race for heart share

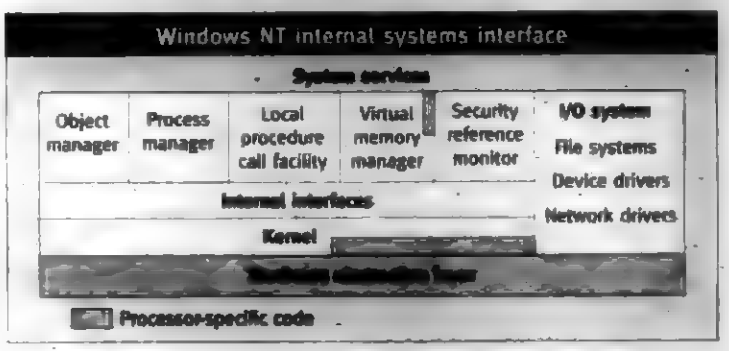
Application support for the three platforms, which Conley said is key, is still an evolving scenario. "Whoever wins the hearts and minds of the software developers wins the game," he said. "I think it's probably a '93 or early '94 decision for most people."

Unix boasts several thousand applications, but few match up to the personal productivity applications DOS users enjoy. Microsoft claims that hundreds of mainstream Windows NT applications will be available this year, but the performance of the existing thousands of 16-bit applications under NT emulation remains a question mark. And while IBM brags of more than 1,200 OS/2 2.0 applications, sales have yet to make more than a blip on the charts.

As NT makes the transition from rumor to reality, the Unix industry in particular is paying close attention.

"I don't know of a single Unix [independent software vendor] that isn't considering or evaluating NT now, and that's at least partly out of fear," said D. J. Long, director of marketing at Applix, Inc., a Unix software vendor in Westboro, Mass.

Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif., agreed. Kirzner recently did a feature-by-feature comparison of UnixWare and NT and concluded that the differences were negligible. "If I were to redesign Unix, putting in all the strengths and getting rid of all the weaknesses, NT is what I'd come up with," she said.



Still, NT's domination is far from guaranteed, as questions about its release schedule and functionality continue to surface [CW, Jan. 25].

Maturity levels will be vital for any of the new operating systems to wind their way into the inner sanctum of corporate management IS.

Michael Packer, Bankers Trust Co.'s managing director of technology strategic planning, ticked off a list of "industrial strength" features that are essential for any next-generation operating system running mission-critical applications: monitoring and management tools, recovery tools and security administration.

Packer echoed the wait-and-see attitude of most users these days when asked which desktop contender had the necessary qualities. "They're getting close, but none of them are there yet," he replied.

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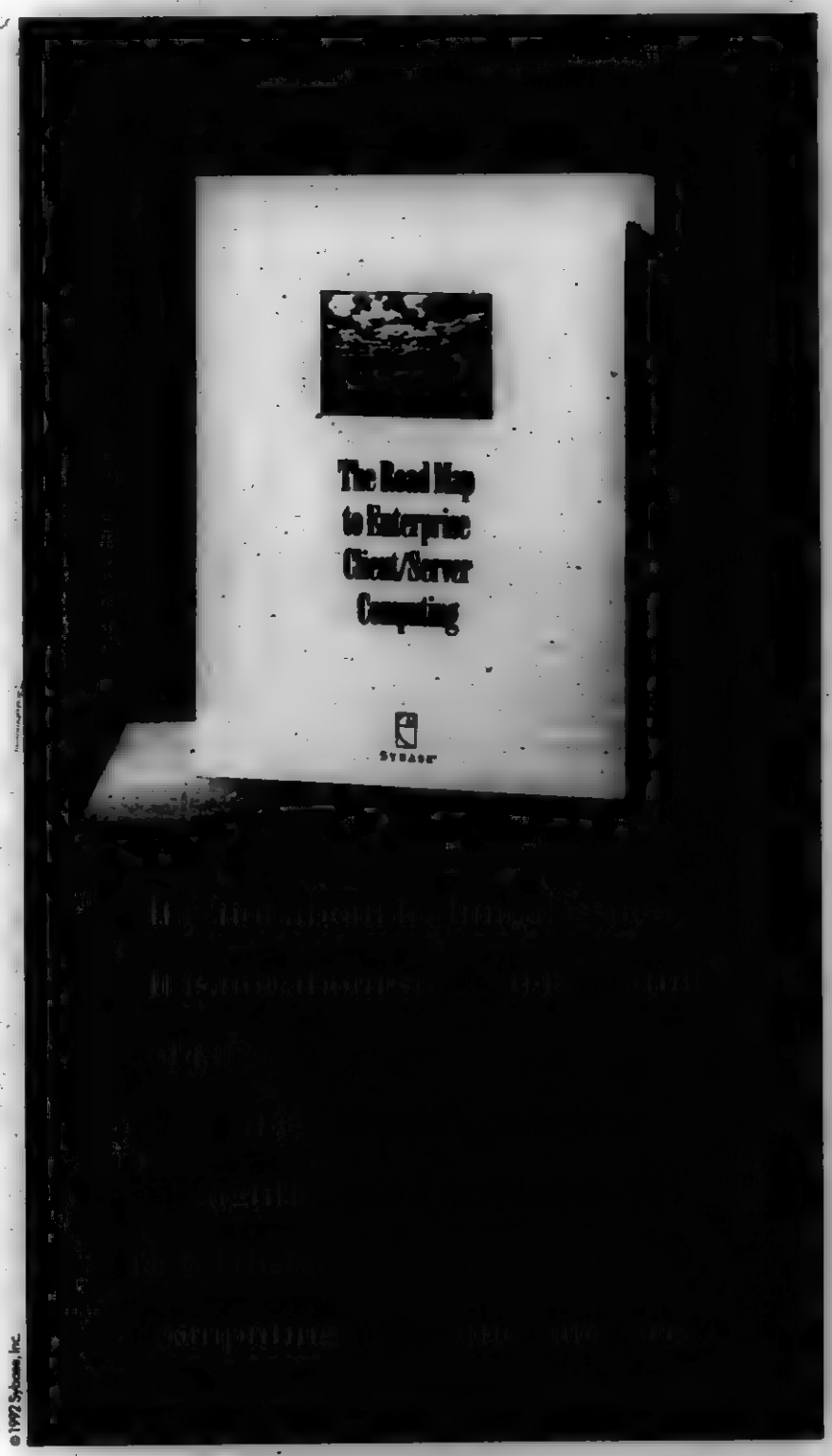

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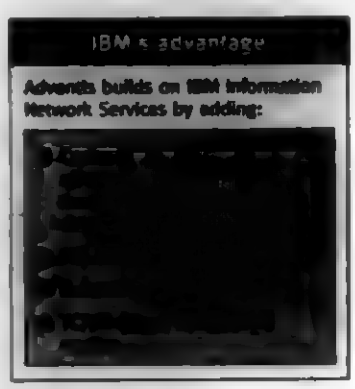
Advantis' expands service menus; serves up First Interstate contract

By Elisabeth Horwitt
WASHINGTON, D.C.

Advantis, the IBM/Sears Communications Co. joint network outsourcing venture, last week announced "full-blown network outsourcing" services that will include the design, operation and management of customers' voice, data and video networks.

The Tampa, Fla., company also announced its second network outsourcing customer, First Interstate Bank. Under a three-year contract, Advantis will manage and operate the bank's leased-line network, which connects 993 branch offices in 13 western states to First Interstate's two data centers. The network consists of StrataCom, Inc., Network Equipment Technologies, Inc. and Ascom Timeplex switches.



Source: Advantis

First Interstate will retain management of its logical IBM Systems Network Architecture (SNA) network, while Advantis will "deal with the vendors and make decisions about new technology in concert with them," an Advantis spokesman said.

Advantis announced its first contract — with Ford New Holland — late last year.

Value-added services

Along with its Custom Network Solutions offering, Advantis added some services to the portfolio of value-added services previously offered by IBM Information Network. Those services are the basis for the joint IBM/Sears venture.

The most significant of the new offerings is a local-area network internetworking service. Its main targets are IBM customers that are moving down to LANs and want high-speed networks to interconnect those LANs to one another and to SNA installations, a spokesman said.

The new services will help Advantis go after the huge installed base of U.S. companies that are migrating from SNA to distributed networking, said Berge Ayvazian, a vice president at Boston research firm The Yankee Group.

This is an area where Advantis — made up as it is of two companies with extensive SNA expertise — has a big advantage, Ayvazian added.

The new service will link devices on Ethernet and Token Ring LANs and will support popular LAN protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP), Novell, Inc.'s IPX and NetBIOS, as well as SNA. The network will run on leased lines now, with migration to Asynchronous Transfer Mode at an undisclosed date.

The service will also provide gateways between TCP/IP and SNA environments. Advantis is planning conversion services to enable applications on different systems to communicate.

Advantis will offer network management services for LAN internetworks based on Cisco Systems, Inc., Wellfleet Communications, Inc. and IBM routers as part of a packaged offering, plus customized management of other types of backbone devices, the IBM spokesman said.

ATM hype yields to market reality

By Joanie M. Wexler
WASHINGTON, D.C.

■ Asynchronous Transfer Mode (ATM) skeptics took center stage at last week's Communication Networks Conference and Exposition (ComNet) '93 when AT&T became the second long-distance carrier to announce ATM service rollout plans.

Users and analysts remained bullish on the concept of the high-speed, switched data network and its eventual usefulness and longevity. However, ATM is following a similar pattern of other technologies, such as Integrated Services Digital Network (ISDN) and frame relay, that were hyped in the early stages: a heavy buildup followed by technical and economical limitations.

ComNet

As a result, outstanding unknowns of what the service will cost, what it will be used for and where its vulnerabilities lie are tempering its promise for the near future.

Frightening speeds

"ATM's very high speeds are scary if something goes wrong," considering standards are not yet in place for dealing with dropped cells, said Thomas J. Reilly, director of communications at Toys R Us, Inc. in Rochelle Park, N.J. "And I don't see a lot of people hawking ATM test gear here on the floor. ATM is so new; maybe it's not the one to catch the arrows on, though I like its concept of blending LANs and WANs and its scalability."

"ATM is not fully developed enough yet for us to use it, and we need to know when it will be," added David W. Siebert, technical support manager at Boeing Computer Services in Seattle, who attended the show. Boeing already has applications that justify the need to run more than 140 T3 (45M bit/sec.) links today.

"We got involved early with ISDN, and it fell through," which the company would prefer not to experience again, he said.

Some information on availability was forthcoming. AT&T said last week it would have "controlled ATM service availability" by the first half of 1994.

Competitor Sprint Corp. has already said it will offer general ATM service by early 1994.

AT&T's cautious announcement was in sync with such concerns, analysts said. The carrier said it is establishing an ATM Customer Advisory Council, to be made up of a cross-section of industries such as manufacturing, health care, retail and transportation, to set priorities and run trials for making ATM a "useful service, not just a technological novelty," said JoAnn Patrick-Ezzell, director of data communications services at AT&T.

For example, desktop-to-desktop video "would have to play some part in ATM [cost] validation," said Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "But we don't know yet if these applications would even make us more productive" without experience with the technology.

The catch-22, he said, is that testing the service could be too expensive for most users. CIMI studies, Nolle said, indicate that the average company's network applications cost about $1,500 in monthly recurring charges for two end points. ATM, which will at a minimum add an overlay to already pricey T3 links, "could cost $12,000 before you do much of anything with it."

A new study on ATM by Infonetics Research, Inc., a consultancy in San Jose, Calif., agreed that price is the greatest barrier to ATM acceptance.

Frame relay pumped up

CONTINUED FROM PAGE 1

has been making plenty of money with leased-line contracts.

In addition, AT&T does not publish its frame-relay rates and requires customers for whom it prices a frame-relay network to sign a nondisclosure agreement on the information.

Some observers argue that this procedure has slowed competition and stalled frame relay's progress.

Nondisclosure challenged

In fact, these tactics were challenged in one ComNet conference session on public frame-relay pricing. Users, AT&T, MCI and public frame-relay market share leader WilTel butted heads about the effect keeping price lists close to the vest has on costs.

Carriers WilTel and AT&T explained that they do not post price lists on every street corner because pricing matrices are too confusing for users and because users need carrier input to optimize network design.

However, "I find it hard to believe it would be detrimental to users to reveal pricing," said session attendee John Capetanakis, director of network engineering at Science Applications International Corp. in McLean, Va. "On the contrary, I would think prices would come down and volume would go up."

About 90% of leased lines run less than 1,500 miles — the distance where frame relay becomes more economical, according to Paul Welch-Colburn, vice president of data product marketing at MCI.

"Pricing shouldn't be a mystery," agreed Ray Kang, senior frame-relay product manager at MCI. "We think users are smart" and will know what to do with the information, he said.

This is a turnaround for MCI, which Dataquest estimated has about an 8% frame-relay market share behind WilTel, AT&T, Sprint Corp. and CompuServe, Inc. Until it uncloistered its price schedule last week, MCI had the same policy as AT&T.

While WilTel does not publish general price lists, neither does it follow the AT&T practice of requiring potential users to sign nondisclosure forms.

Not alone

Pricing is not the only issue giving users pause in a frame-relay market that brought in barely $20 million in its first year, according to calculations by Boston consultancy The Yankee Group.

"Most users are confused about where frame relay and ATM fit and are worried about frame relay already being obsolete," said show attendee Robin Layland, a telecommunications engineering consultant at The Travelers Corp. in Hartford, Conn. "In reality, frame relay is very reliable at T1 speeds and below for just running data."

Travelers, an AT&T Tariff 12 customer, however, looked at frame relay, and "our vendor said leased lines were the way to go," Layland said.

However, "if we weren't a Tariff 12 customer and didn't already have a T1 multiplexer network," Travelers might be using frame relay, he said.

Contractual pitfalls

Outsourcing hits human snag

By Elisabeth Horwitt
WASHINGTON, D.C.

The biggest potential pitfalls to network outsourcing are not technological but human, according to network outsourcers and would-be outsourcers attending a session at Communication Networks Conference and Exposition last week. But if those pitfalls can be surmounted, there are financial gains to be realized.

"It is more difficult than you would expect" to make the changeover from an internally managed network to one that is operated by an external organization, said panelist Katherine Korostoff, director of research at Newton, Mass., research firm Sage Network Research. "Human [issues] are the No. 1 complex issue."

Revenue uptick
A Frost & Sullivan study predicted that revenue from the network outsourcing market will more than triple, from $2.6 billion in 1992 to $8.4 billion in 1997.

Korostoff cited the famous case of Eastman Kodak Co., whose employees filed suit a couple of years ago claiming that they did not receive the benefits and job security they were promised as part of Kodak's network outsourcing contract with Digital Equipment Corp. That suit is still pending.

Panelists confirmed audience members' fears that network outsourcing can cause trouble. Among the problems cited were employee discontent because of job insecurity or salary inequities, data security risks and long-term vendor relationships that cannot be severed without financial penalties.

Marty Colburn, director of data communications at the Federal National Mortgage Association (Fannie Mae), noted that pay inequities — and, therefore, employee dissatisfaction — can result when in-house telecommunications staff members must work alongside an outsourcing vendor's people.

One audience member veered off in another direction by asking how the panelists prevented users from buying their own systems if they felt that an outsourcing vendor was not doing a good enough job. Some of Colburn's users in fact did that, but "their systems were up 40% of the time, and ours were up 99%," he said.

Network security issue

A greater concern was reflected by one network manager who noted that network outsourcing poses data and system security risks. "If you outsource your transport network or network management, they get into your system," the audience member said.

Fannie Mae's solution is to have six security levels and to put outsourcing vendors "under nondisclosure and noncompete agreements for 18 months after the contract ends," Colburn said.

The Environmental Protection Agency (EPA), which has to rebid its outsourcing contract periodically under federal law, is "more concerned about willful destruction by an angry incumbent employee who is leaving when a new outsourcing vendor is hired," said panelist David Bittenbender, the EPA's chief of telecommunications. "It hasn't happened, but how do you protect yourself? I just cross my fingers."

The panelists also addressed the difficulty of breaking relations with an outsourcer once the contract has been signed. Korostoff cited a firm that was penalized for breaking a contract with Electronic Data Systems Corp. when it moved from mainframes to client/server systems.

The EPA, like all government agencies, puts an escape clause into its outsourcing contracts as a matter of course, Bittenbender said.

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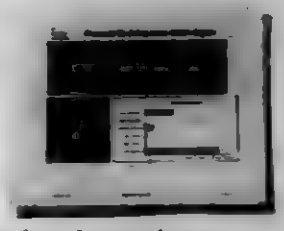

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News Shorts

FTC holds off on Microsoft decision

The **Federal Trade Commission** (FTC) issued a statement last Friday, saying it had not reached a final decision in a "nonpublic law enforcement matter" that is widely believed to be the **Microsoft Corp.** antitrust investigation. The FTC said it will reconvene "in the near future," although no further details were available. While previously published reports indicated FTC lawyers were seeking an injunction against Microsoft, it appears that commission members were either unable to reach an agreement or could not come up with the three votes needed to take such measures. For its part, Microsoft will continue to cooperate with the FTC and the business will continue as usual, according to a spokeswoman. Meanwhile, **Novell, Inc.**, which is believed to be preparing an antitrust class-action suit against Microsoft, declined to comment on the FTC statement. Microsoft's stock price, which had been slipping earlier in the week, rebounded four points in reaction to the commission's statement.

Rollwagen gets No. 2 Commerce post

Cray Research, Inc. Chairman John A. Rollwagen has been tapped for the No. 2 post at the **U.S. Department of Commerce**, which President Clinton has said he wants to strengthen and give a key role in boosting U.S. technological competitiveness. As a member of the Computer Systems Policy Project, Rollwagen has advocated a strong role for the government in helping the industry establish a high-speed national data internetwork and has said the government should shift billions of dollars in defense research to "commercially relevant activities" that foster advances in semiconductors, high-speed communications and software.

Sequoia, Ultimate settle suit

Sequoia Systems, Inc. and **The Ultimate Corp.** settled their pending lawsuit out of court last week when Ultimate agreed to a nonexclusive reseller pact for Sequoia's fault-tolerant system products. Ultimate, a New Jersey-based hardware and software distributor, filed suit last November alleging Sequoia had interfered with Ultimate's dealer and customer relationships. No financial terms were disclosed, but Sequoia is now free to sell its products directly to Ultimate's customers.

Armco Steel outsources to ISSC

IBM's Integrated Systems Solutions Corp. outsourcing subsidiary last week chalked up its seventh outsourcing contract in two months, signing Middletown, Ohio-based **Armco Steel Co.** to a 10-year deal. Neither side disclosed the value of the contract except to say that Armco expects to save $100 million. ISSC is offering jobs to all 90 Armco information systems employees; the shop had 200 staff members until recent layoffs. The outsourcer also picked up an unspecified amount of excess mainframe capacity that it will use to process other customers from Armco facilities.

Tuxedo enhancements expected

Unix System Laboratories, Inc. will announce new features for its Tuxedo enterprise transaction processing software next week, boosting the product's appeal to users with Unix on-line transaction processing needs. Among the new features expected in Tuxedo Release 4.2 are reliable message queuing, extensions to the Tuxedo/Workstation product and dynamic linked libraries for Microsoft Windows and IBM OS/2, which allow developers to use familiar desktop software as clients to the Tuxedo system.

DEC plays cluster card

GigaSwitch hub groups VMS systems across an FDDI network

By Melinda-Carol Ballou
and Michael Vizard

Digital Equipment Corp. is expected to fundamentally revamp its VMSclusters next month when it delivers its GigaSwitch hub, according to sources briefed by DEC. The hub makes it feasible to group systems in clusters across a 100M bit/sec. Fiber Distributed Data Interface (FDDI) network that can span 2 kilometers between nodes.

GigaSwitch will extend VMSclusters by providing virtual circuit links among nodes in the cluster over a 100M bit/sec. FDDI link. Because of its switching capabilities, it will allow DEC users to build clusters in which individual nodes can send traffic directly to each other across the network using virtual circuit technology usually associated with telecommunications equipment. Moreover, users will be able to dynamically make any node in one cluster a member of any other cluster attached to the GigaSwitch.

"What [GigaSwitch] with FDDI will give you is 10 times the potential throughput of an Ethernet backbone," claimed Gailyn Casaday, product manager at DEC.

Currently, VMSclusters are not linked over FDDI but are either hard-wired together in a single location or linked over a 10M bit/sec. Ethernet using DEC's local-area VMScluster software.

From DEC's perspective, GigaSwitch functionality is important because VMSclusters are a key foundation block that DEC uses to compete against IBM mainframes.

By grouping VMS systems in clusters that share disk storage in a configuration that is managed as a single logical entity, DEC has been able to deploy clusters that offer the equivalent horsepower of an IBM mainframe in an easily upgradable system package.

However, DEC is also targeting non-DEC sites with the technology, which was designed to bring standard high-speed switching capabilities to a range of environments, according to the firm.

Matrix management

GigaSwitch is a crossbar switch, which means it manages a 36 by 36 port matrix. Each port can send and receive at the same time. The switch acts as a traffic cop to make the connection between the ports. When all ports on the matrix are sending and receiving simultaneously, they can achieve a rate of 6.25 million packets per second.

The switch is used with multiple FDDI links, where each port offers 100M bit/sec., a forwarding rate of 290,000 packets per second, per port, Casaday said. Such speeds will satisfy the requirements of high-bandwidth applications such as the visualization and multimedia projects that New York University is examining.

"We're definitely interested in the technology — it strikes me as one of the most innovative and flexible products in its market niche," said Stephen Tihor, research scientist at the university.

Tihor is currently interested in supporting multiple FDDI links and ultimately in bringing in Asynchronous Transfer Mode (ATM) as an interface for GigaSwitch.

Users have been bombarded by the notion that ATM is the coming revolution for carrying real-time information and packet data, as well as for uniting local- and wide-area networks, and they are worried about making the transition. With GigaSwitch, "we are not buying an infrastructure that locks us in," he said, suggesting that that technology will allow users to switch to ATM.

Industry sources said a plain GigaSwitch with CPU and time module is not expected to exceed a price of $30,000; a two-line FDDI card will be priced at $9,000; a GigaSwitch systems module will be priced at $16,000; fiber attachments are expected to be $900 for a multinode and $3,200 for single node, the sources said.

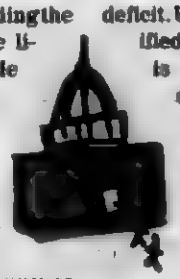
Faulty systems hinder GAO audit of troubled pension insurance fund

By Gary H. Anthes
WASHINGTON, D.C.

Flawed information systems have undermined the ability of the government's pension insurance agency to manage its multibillion-dollar portfolio, the U.S. General Accounting Office (GAO) told Congress last week.

Testifying before a House oversight panel, Joseph F. Delfico, director of income security issues at the GAO, cited estimates by the Pension Benefit Guaranty Corp. (PBGC) that the private pensions it insures are underfunded by $61 billion — up from $30 billion two years ago.

This includes some $12 billion owed by financially troubled companies that are "reasonably possible losses" to the agency. At the end of 1991, PBGC had $8.75 billion in assets.



However, Delfico said the GAO had been unable to audit PBGC's books because of weaknesses in its financial systems, including the software used to estimate liability for future benefits. He added that the PGBC did not have an operational general ledger system for six months in 1990.

Delfico also cited "serious problems" with the system used to account for collection of pension insurance premiums, PBGC's principle source of revenue. That system has not been fully operational since 1988, when the agency tried unsuccessfully to modify it to handle variable premiums.

Others likened the plight of PBGC, which insures the pensions of 41 million Americans in 67,000 private pension plans, with that of the now-defunct agency that insured savings and loan deposits.

"The federal pension insurance system has accumulated a sizable deficit. Unless the program is modified, this financial imbalance is expected to deteriorate significantly... resulting in a costly bailout of PBGC by U.S. taxpayers," said Robert D. Reischauer, director of the Congressional Budget Office.

Despite his criticisms, Delfico said the pension insurance agency had made substantial progress in correcting its management and systems problems, and the GAO would probably be able to conduct a full audit of its 1992 balance sheet.

However, "Even with improved management, PBGC has limited ability to control its exposure to losses from underfunded plans," he said.

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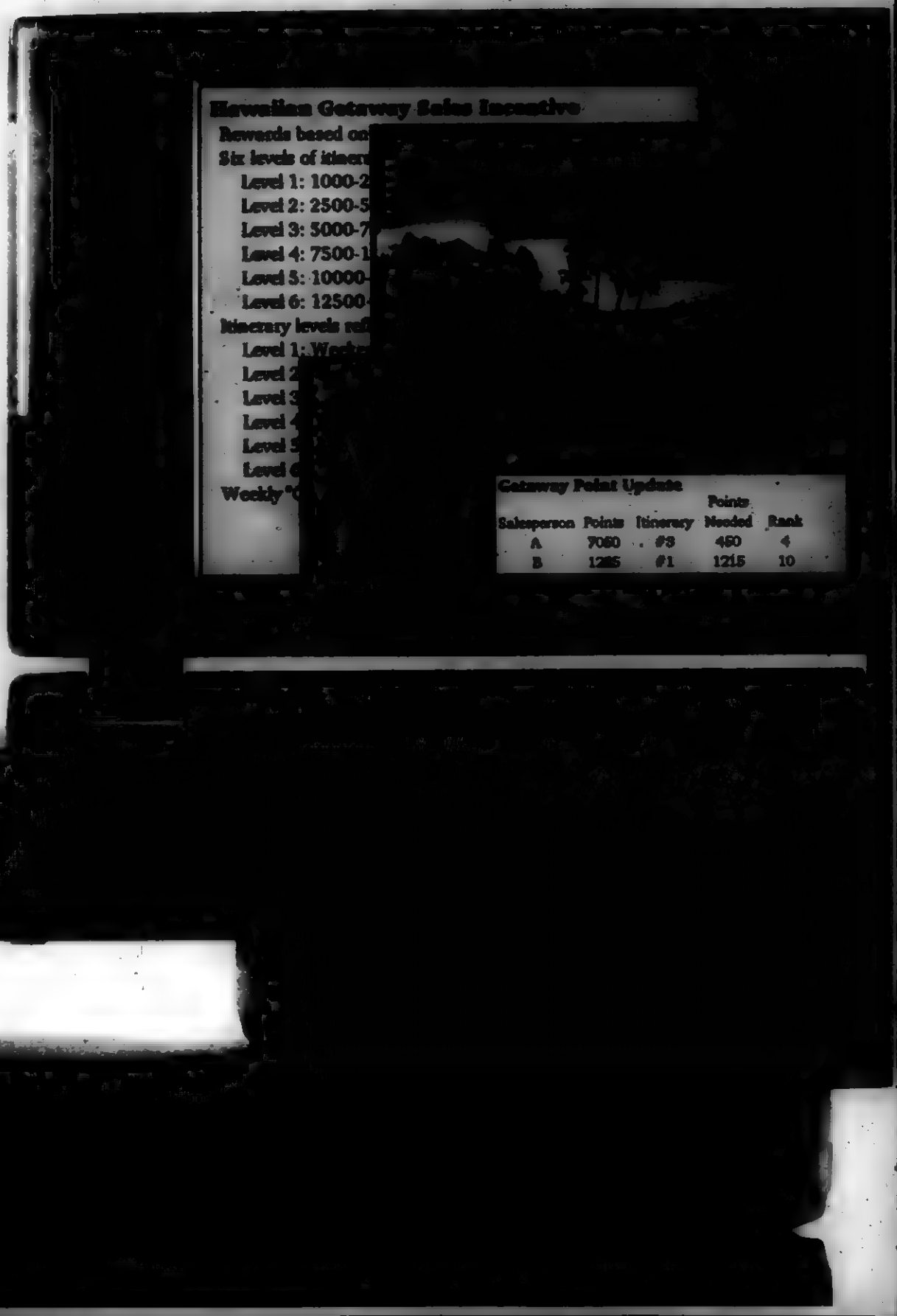

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Jeweler finds Chapter 11 to be a gem

CONTINUED FROM PAGE 1

ering the silver lining in Chapter 11: the chance to find innovative ways to cut costs, in some cases by renegotiating contracts (CW, Dec. 21).

"There would have been no renegotiation without Chapter 11," said Zale IS chief David Karney.

"Chapter 11 created a forum for renegotiating the contract that did not exist before," agreed Pat Caldwell, a partner at the Gordian Group LP, a New York firm that represents a group of Zale creditors.

ISSC paid cash to enter a 10-year deal with Zale in May 1991 — half a year before Zale entered bankruptcy protection. However, the outsourcer will soon agree to shorten its stay when the two parties sign a revised contract.

Karney would not reveal the length of the new fixed term, except to say it is no longer than five years, with renewal options.

Giving a clue that the new deal could be even shorter, Karney said Zale plans to begin migrating to client/server technology during the next three to five years. As a possible precursor to the client/server move, the new contract will shift PC and local-area network support staff back to Zale.

Charles Ansley, ISSC's vice president of marketing, also would not specify the new length.

Karney said Zale wanted the term reduction for maximum flexibility in adjusting data processing to match the size of the restructured company. That flexibility includes implementing a client/server scheme to offload the company's mainframe structure, he noted.

Karney said he expects to submit the revamped contract to bankruptcy court for approval later this month.

Zale's David Karney: *There would have been 'no negotiation without Chapter 11'*

Both Karney and Ansley confirmed that the new deal, by virtue of its shorter duration, will cost Zale less, although neither would say by how much. The two were also mum on whether the new deal will reduce annual or unit processing fees. But retail industry analysts and sources close to Zale's creditors said Zale has indeed negotiated a better unit price. Analysts' estimates of the original deal have reached as high as $286 million.

Perfect timing

The revision could not have come at a better time for Zale, as the current contract was believed to be following a typical long-term pattern in which fees increase over time. Zale had already benefited from the undisclosed cash infusion and from favorable first-year terms but was soon going to pay increasing rates it could have ill afforded.

Analysts and sources in the creditors' community said creditors insisted on restructuring the deal when they learned that Zale had originally agreed to exorbitant later-year charges out of a desperate need for up-front cash.

"IBM basically gave them a year's free rent and cash up front, but the remaining terms were fairly out of line with what some people would have expected them to pay," observed Jeff Middleswart, a research analyst at Dallas securities firm Barre & Co. "The old contract had become too expensive."

Karney denied that assessment. He added that Zale considered two options other than restructuring the ISSC deal: changing outsourcers and bringing operations back in-house.

The company decided against switching vendors because that would have entailed the long process of familiarizing the new vendor with Zale's business, an ordeal with which ISSC was already far along.

Furthermore, Zale had already transitioned IS employees to ISSC, making the staffing issue problematic.

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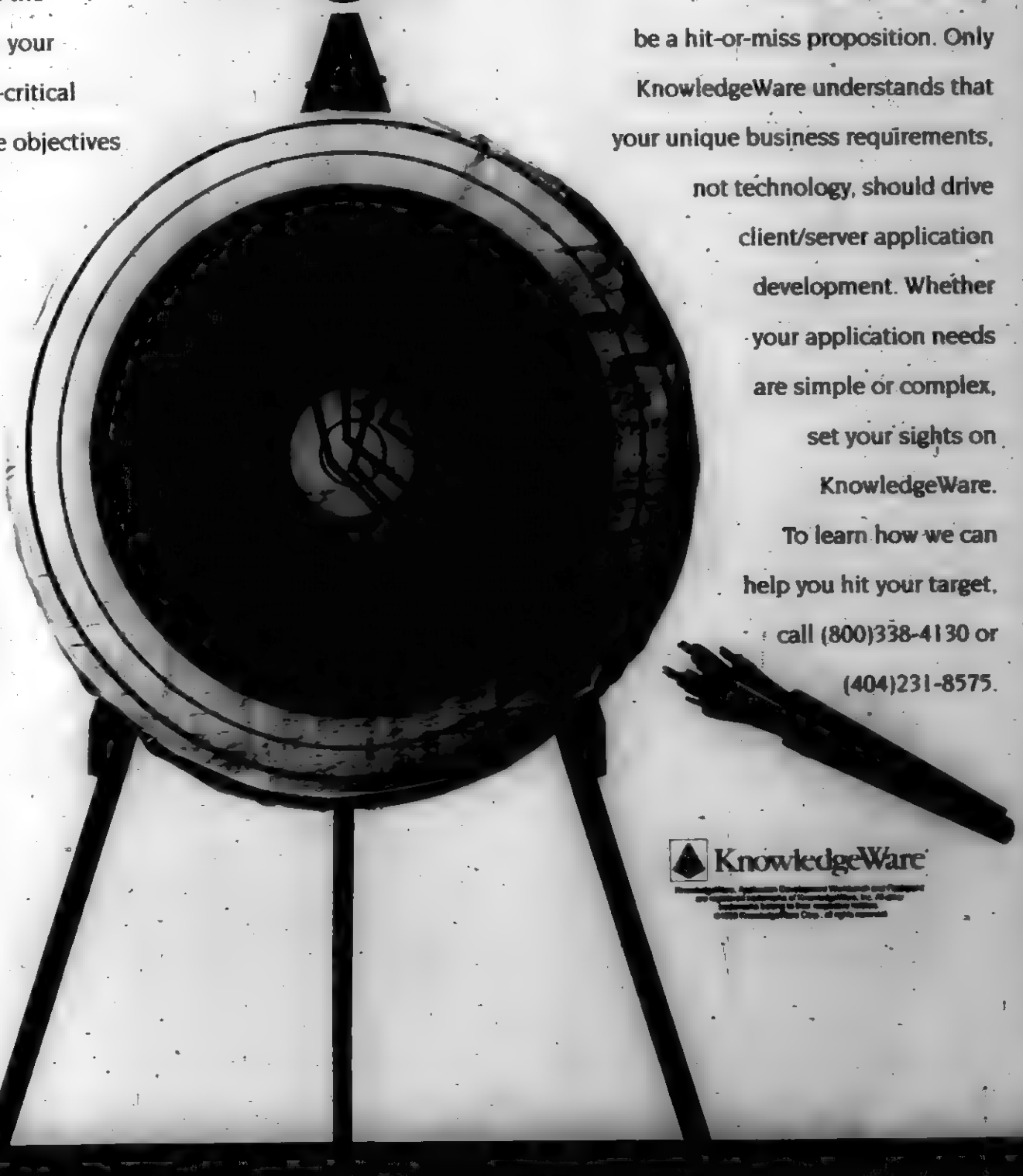

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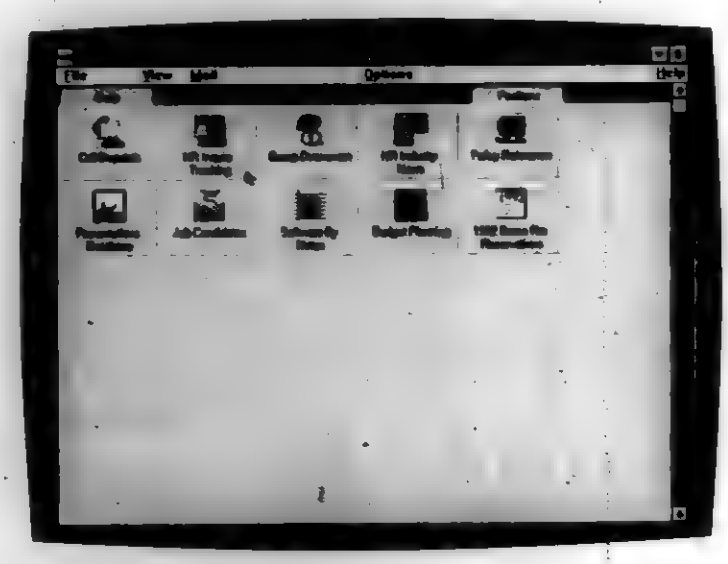
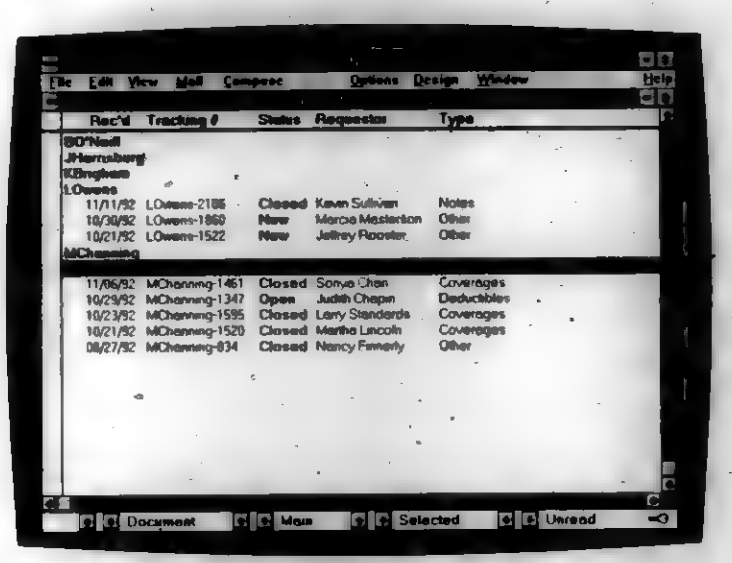
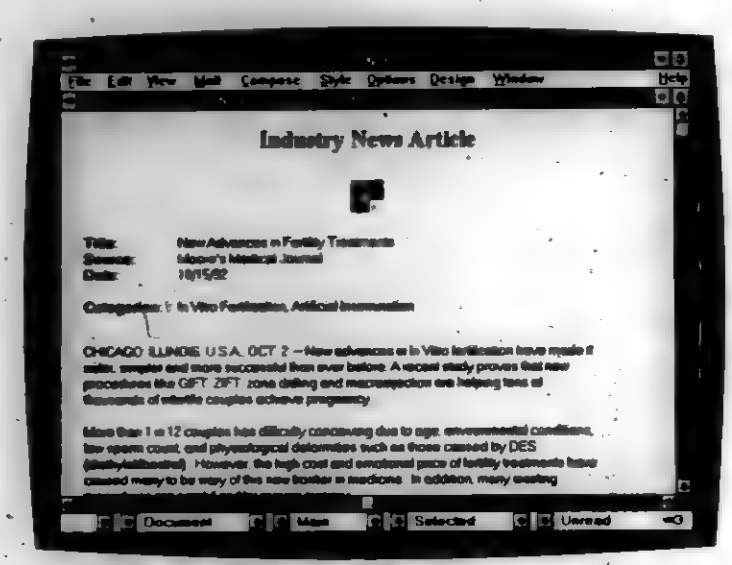


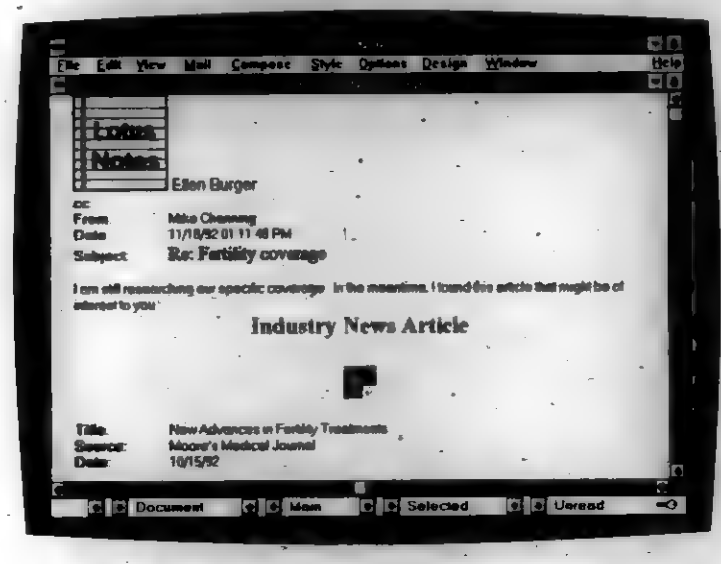
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, these are the ones he uses most frequently. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the HR INQUIRY TRACKING icon



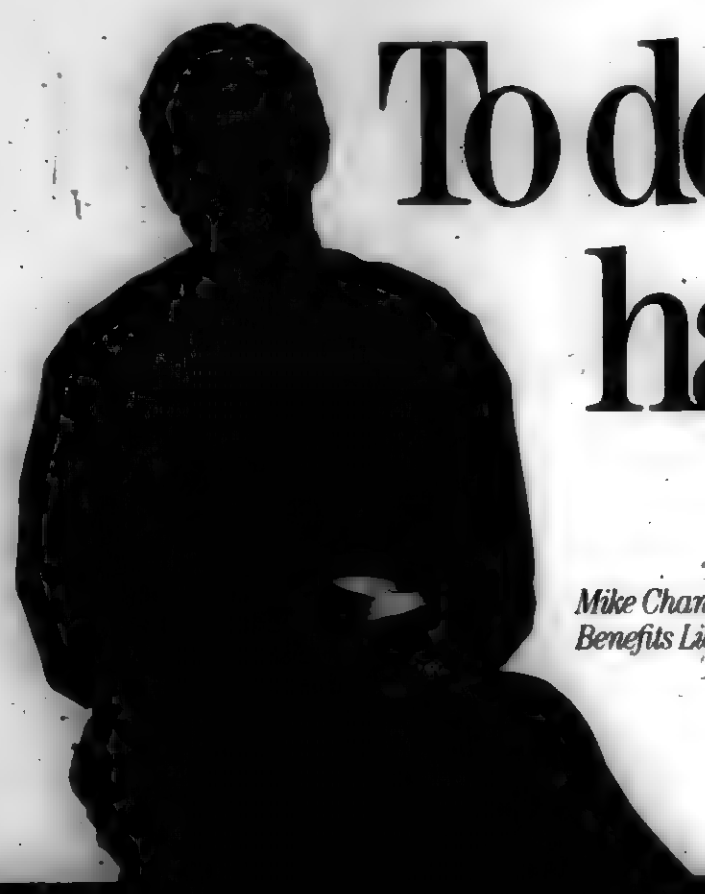
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note and forwards this document directly to Ellen. That done, he gets himself a cup of coffee.



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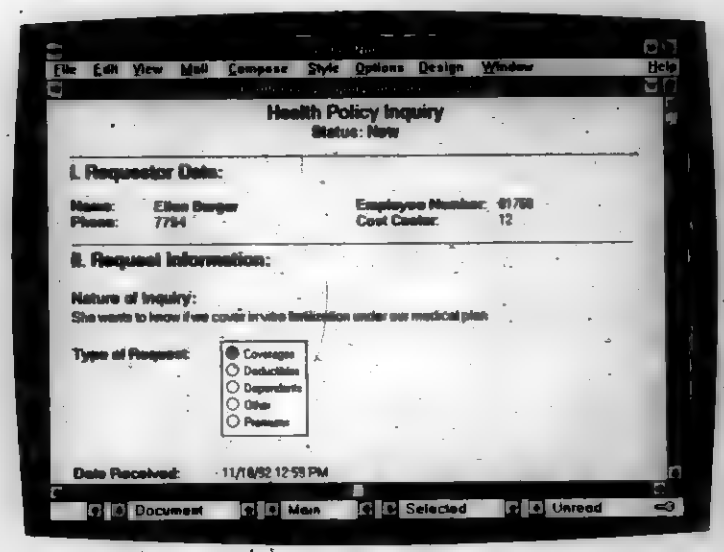
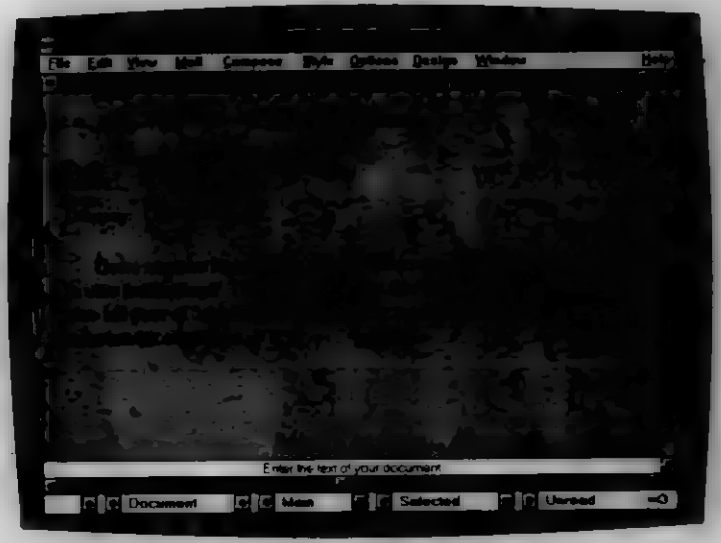
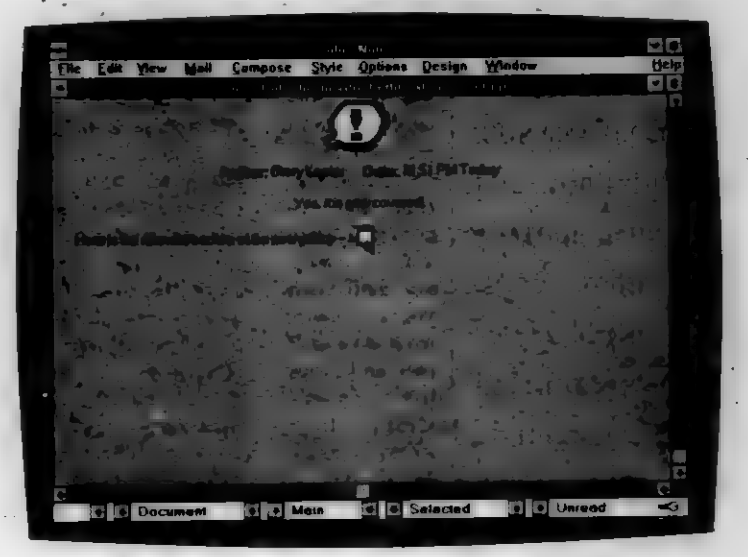


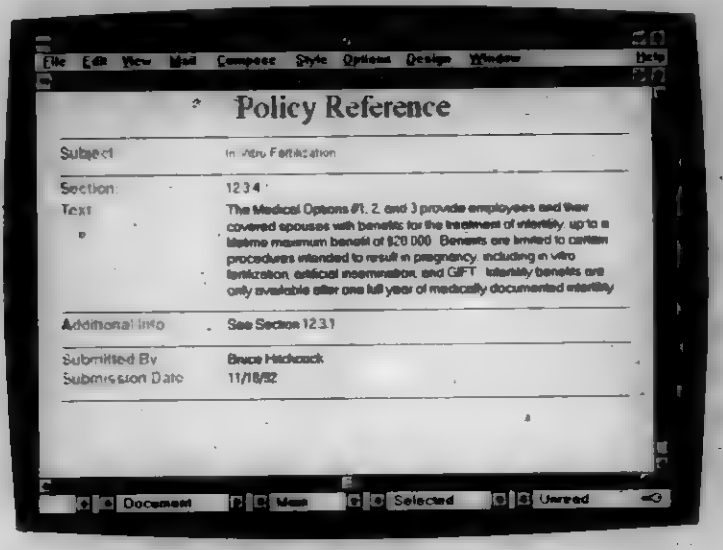
3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.



7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

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Outsourcing can cure health care IS ills

By Nell Margolis

In the multimillion-dollar annals of outsourcing, the $70 million deal recently announced by IBM's Integrated Systems Solutions Corp. (ISSC) and five regions' worth of Oakland, Calif.-based health care giant Kaiser Permanente Health Plan, Inc. is no bigwhoop. But it could signal the beginning of a health care outsourcing boomlet to come.

A well-documented national health care crisis of gargantuan proportions [CW, Aug. 3, 1992] and a presidential administration committed to taming it are converging to whip health care into "one of the year's biggest growth areas," said Dataquest/Ledgeway Group outsourcing analyst Julie Schwartz.

More important to outsourcers, "it's a boom area that's technologically behind," Schwartz said. Dataquest/Ledgeway projected that health care expenditures on outsourcing will hit roughly $900 million annually by 1996.

"Health care is an industry that badly needs to lose its historical reluctance to outsource IS," said Charles Singer, president of Charles J. Singer & Co., an information systems/health care consultancy in Cambridge, Mass.

Singer noted that the more IS activities can be outsourced, the more IS professionals can focus their time and attention on initiatives that relate directly to providing a higher quality of care to a greater number of people.

That is the kind of priority-setting that spurred Blue Cross/Blue Shield of Massachusetts in Boston to sign on with Electronic Data Systems Corp. in January 1992 for the record-setting price of $800 million.

One year later, Blue Cross views its hefty outlay as money well spent, said Martin C. Joyce Jr., senior vice president of operations.

"We outsourced primarily because we had a model of delivering information that we couldn't live with: costly, not agile, two years away from managed care and about five years away from world class," Joyce said.

So far, he said, the deal is living up to — and at times surpassing — expectations.

Moreover, the deal may be about to expand. Last fall, Blue Cross finalized a merger with Bay State Healthcare, a 150,000-subscriber health maintenance organization.

A task force is studying the pros and cons of bringing Bay State's systems into the EDS fold and will present its conclusions in April. The task force's nod could be worth $4 million to $6 million to EDS, Joyce said.

Health notes

Key health care outsourcing pacts include the following:

January 1992 — Blue Cross/Blue Shield of Massachusetts outsourced its IS operations to EDS for an estimated $800 million over 10 years.

August 1992 — IBM subsidiary ISSC won an approximately $52 million, five-year outsourcing and development deal with Blue Cross/Blue Shield of New Jersey.

January 1993 — ISSC, in a joint venture with Policy Management Systems, landed the Kaiser Permanente deal.

Outsourcing optimism

At Blue Cross/Blue Shield of New Jersey, IS director Al Sturzione had a similarly upbeat assessment of his organization's 6-month-old outsourcing contract with ISSC and its technology ally, Policy Management Systems Corp.

New Jersey Blue Cross outsourced to give its constituent doctors and patients the benefit of electronic sophistication well beyond in-house resources.

Of course, outsourcing is not a panacea, even for heath care organizations.

"If you have reasonably current technology, a lean, efficient IS shop and an open, flexible architecture, then you probably shouldn't outsource," Joyce noted.

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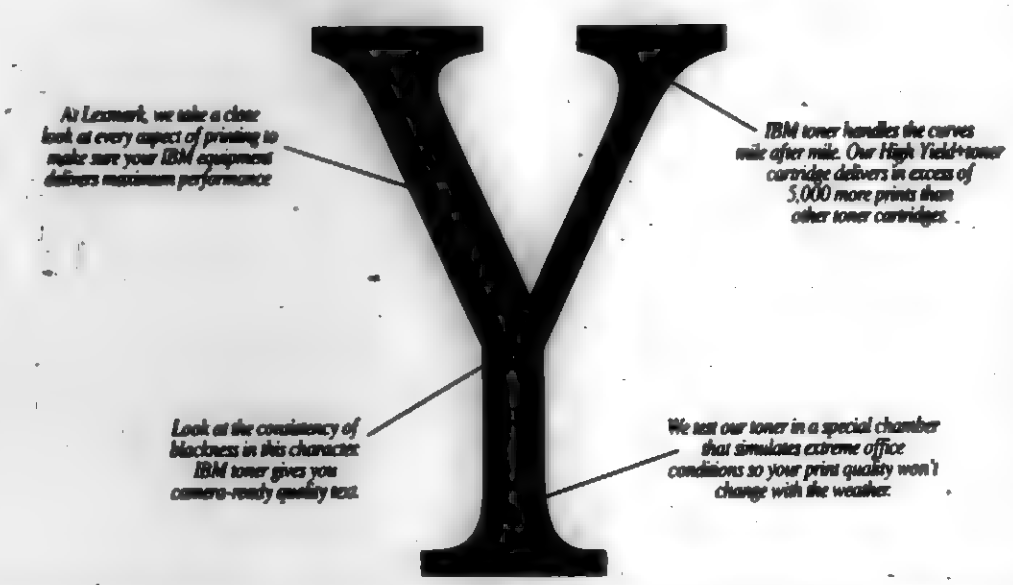

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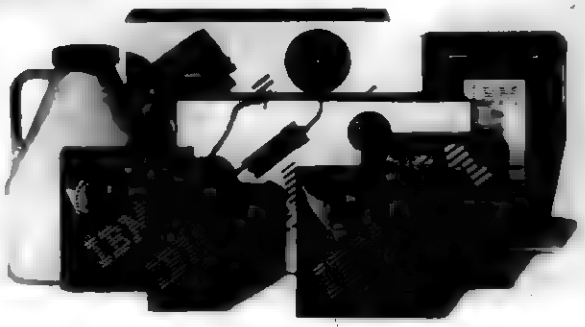

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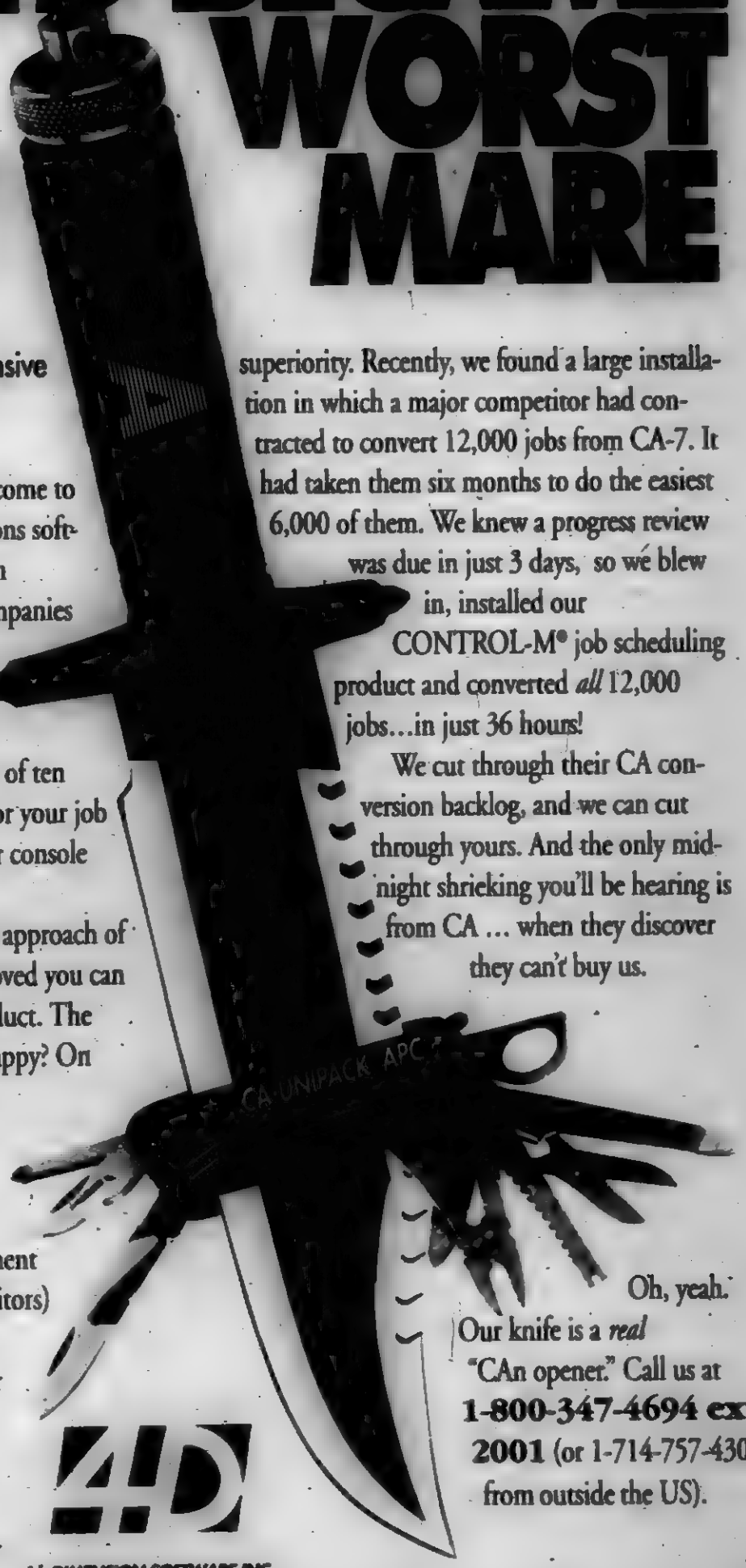

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TRBA

James Unruh

Face to Face

Unisys' president and CEO speaks out about the merger that created his company

Q. Was the merger of Burroughs and Sperry a good idea, all things considered?

A. There's a tendency to blame the financial difficulties we had [on the merger]. I don't believe that is cause and effect. If there was any negative to the merger, it is that we couldn't have been preoccupied with it at a worse time. It was almost coincident with that period in this business when things really started to change in a fundamental way. We lost some time recognizing these changes because we were so focused on the merger. But over the long term, we will reap many benefits from it. You just can't answer that question with a clear yes or no.

Q. How difficult was the turnaround process?

A. Getting the ship to turn around was a lot harder and slower than I thought it would be. We did have a genuine loyalty factor with our customers. I sensed they wanted us to succeed almost more than we did. But we also had a situation where the customers couldn't exercise a total change instantaneously simply because they had no option. There was a certain amount of patience they had to have. That gave us a chance to demonstrate it was all going to turn around. What we told them would happen did happen.

Q. Why have so many smart companies run by smart people screwed up so badly?

A. A former associate of mine studies business history as an avocation. His conclusion is, "Those who should, don't." We all have a huge investment in the status quo and in our own paradigm of what we think the world looks like. American businessmen in general are guilty of this. Take the auto industry. How long did they try to deny small cars? We seem to have to face a crisis in order to step back and fundamentally reassess our businesses.

Q. How are you positioning Unisys?

A. One part of our business is the traditional mainframe. But that is not the growth of our new business. Its value is that it is a very important contributor to our financial performance. But it is also important to the customer relationships and the foundation one can build upon for expanding our role with those customers. I am not ashamed of our mainframe business.

Unfortunately, too many people still think of us mostly as a mainframe company.

Paramax [Unisys' defense entity] is a complex systems and software development organization. They do not build weapons. The core of that business is not growing. We are focusing the attention of that organization on the civilian parts of government, like air traffic control and weather systems.

The core of our business is software and services, workstations and servers. That's going to have to grow on a secular basis if we are to succeed. The other two are good businesses, but they are not growth businesses.

Q. Is Unisys going to grow?

A. You'll never hear me focus on growth for the sake of growth. I'm only interested in profitable growth. We can't succeed unless we start to grow again. [Growth] is a reflection of whether we are participating in where the business direction is at.

Q. Overall, industry growth has slowed.

A. A big reason for the slowdown in the revenue growth in our industry is that we took care of all the easy automation jobs. The CEOs are now saying, "Hey, wait a minute. Where's the return?" We have to focus today on that part of our customers' business that they haven't previously attacked where they can apply technology and get a return on it. We've got to do things differently than we used to. We used to go out and sell boxes. No more. You win a customer today because he sees some solution to a problem. And the solution rarely will be a box. It may have a box contained in it.

Q. But traditional proprietary vendors have not typically provided integration services.

A. There are some perception issues. Can we be objective? That's a customer concern. Are we going to always try to shoehorn Unisys equipment into the system regardless of what the problem is? That's less of an issue if we have a true open systems commitment.

Q. How much more difficult is the IS manager's job today?

A. Probably at least a couple of orders of magnitude more complex because the technology is far more complex. It is beyond their ability to stay on top of it. The open systems direction complicates their lives greatly. There's a dark side to the open systems world.

Q. Do customers accept the realities of open systems, like no "free" or bundled support?

A. The reality sinks in more as each day passes. But a lot of people still think they can compare the price of the box in open systems against the price of a proprietary box. The thing that is still not fully accepted is that open systems does not mean that all things work automatically when you plug them in. It's not to the point of your stereo system. I see organizations where there is someone who is shopping for the lowest price in catalogs and they are not well-equipped to understand all the intricacies of the technology; they don't understand why it doesn't work.

Q. When you took the CEO job two years ago, a colleague offered to buy your golf clubs. . . .

A. Well, my handicap has doubled since I took this job. But when I do play, it's important to me to advertise the company. So I try to spray as many Unisys balls around the course as I can.

Q. You've had success turning Unisys around. What if IBM calls and asks you to do the same there?

A. I'd say I'm enjoying Blue Bell [Pa.]. It's a very nice area.

Q. What if they say, "Jim, name your price?"

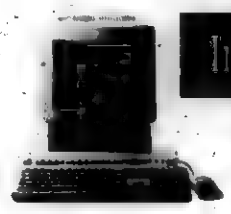
A. That's too hypothetical.

Q. You never think about this possibility?

A. I think about the challenge IBM has. I don't think in terms of waiting for a phone call. Not at all.

Interview by Bill Laberis, *Computerworld*'s editor in chief.

"Why's Apple talking to me about UNIX?"



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Misplaced trust

I grew up in Poughkeepsie, N.Y. In many ways, it is the prototypical, small American city: miles of middle-class suburbs sprawled comfortably among grassy hills that roll down to the Hudson River.

At the intersection of South Road and Route 9 in Poughkeepsie stands an imposing stone edifice: the clock tower of IBM's South Road plant. Since I was a kid, it's stood like a sphinx — solid, stoic and always there.

Many of the kids I went to high school with were "IBM brats." Their families weren't rich, but they resided in comfortable homes with two cars and a power lawnmower in the garage. Their parents had birthday parties for them and hosted backyard barbecues when we graduated. They lived the American dream: As employees of the grandest American company in the proudest of American industries, they had deposited their retirement funds in the safest of American investments — IBM stock.

The fathers (they were mostly fathers) worked on products I hadn't heard of and cared little about — things like MVS and VSE and thermal conduction modules. They railed against the Japanese and talked tough about the competition. In 1975, the future was so bright they had to wear shades.

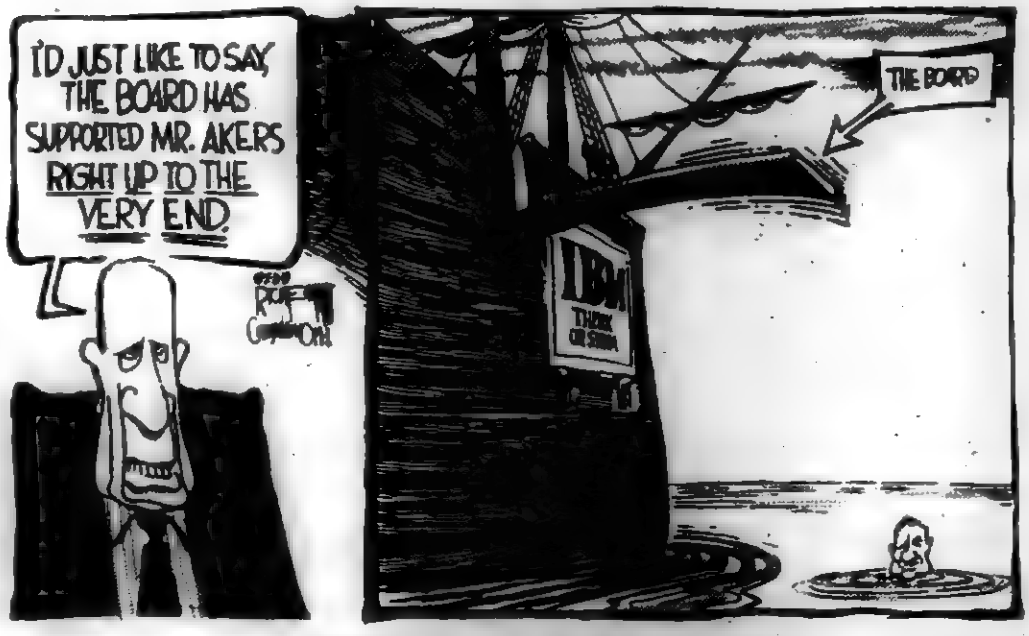
Well, the future is here. The Japanese didn't do that much damage after all, but MVS operating systems and Escon channels didn't amount to a hill of beans against 486s, Ethernet and Windows — stuff my friends' dads had never even heard of. The world's greatest company got caught flat-footed by a band of bright, young software nerds from Washington and RISC engineers from Sunnyvale. The stock my friends' dads invested their retirement money in is off 70% from its all-time high. Some cynics say IBM won't survive.

The fathers at those backyard barbecues didn't care much about RISC vs. CISC or who took who to the cleaners when PC software licenses were negotiated. They were proud of their work and fiercely loyal to IBM. They expected to be rewarded with a decent salary, a comfortable retirement and job security. I'm not sure what they'll get now.

In the coming months, we will read a lot about how IBM gave away its leadership in the computer industry. There'll be stories about high-level buffoonery, political gamesmanship and calcified management. We'll hear many people say, "Told you so."

I don't excuse IBM for the mistakes it made. But I do respect it for being the kind of institution that inspired blind loyalty from its employees. We may never again see that kind of shared commitment between an American company and the people who work for it. The loss of that trust because of the myopia of a few misguided executives is the real tragedy of this whole episode.

Paul Gillin, *Executive editor*



Overdue

Your editorial on Unisys [CW, Jan. 25] and its recent and continuing recovery was the first bit of in-depth and fair coverage I have seen on Unisys by *Computerworld* in quite a few years. I want to thank you for confirming what our Japanese counterparts have known for quite some time.

Users of Unisys equipment have been seen as renegades in our industry during the years. I can only imagine this was because of the enormous number of IBM employees who could not imagine using anything other than the "safe" IBM solution, regardless of cost to their organization.

The Japanese, as well as many U.S. companies, have found Unisys solutions to be effective, reliable and affordable. We also have bought into the broadest code-compatible platform that the industry offers.

Jack W. Reid
Lexington, Ky.

Lighten up

I read with horror Scott Shinberg's letter to the editor [CW, Jan. 18] regarding Michael Cohn's Viewpoint article "The 'Ize' have it" [CW, Dec 21, 1992].

When I receive my *Computerworld*, one of the first things I look for is the Viewpoint page to see if there's an article by Mr. Cohn. As a computer professional, I can't believe there are any *Computerworld* readers who took his advice seriously; we're much too adult for that. We simply enjoy poking fun at ourselves and our industry.

A little levity goes a long way to lighten the load that we all carry and to boost morale. So, Scott, lighten up or you'll stress yourself into an early grave — or at the least, an ulcer!

Emily Rambo
Jacksonville, Fla.

Nothing wrong with monopoly

John Chisholm provided me with a moment of respite with his op-ed article "Stop whining and leave Microsoft alone" [CW, Jan. 18]. Survival of American businesses depends on someone's defense of business as moral.

"Microsoft bashing" is part of the more generic attack by uninformed people on business in general. Achieving a monopoly in a competitive environment is good: good for the monopolist and good for users.

After all, no one forces you to buy goods from a particular supplier (unless it is the government in its role as postal service provider, for example).

The author scored a bull's-eye.

F. William Ballou
Williamsburg, Va.

Different sense of humor

I just read the Jan. 11 issue of *Computerworld*, and I am truly sorry I did.

Your "Humor" piece on OS/2, "Easy as 1-OS/2-3," was the most biased, ignorant, uninformed attack on OS/2 I've seen. I'm accustomed to some publications — notably those whose ad revenue is dominated by Microsoft — doing "hit pieces" on OS/2, but I never expected it from *Computerworld*.

OS/2 takes a large step forward from the legacy of DOS and Windows and yet still maintains compatibility with the past. DOS and Windows applications run on OS/2 without trouble.

I use a broad selection of DOS, Windows and, yes, even OS/2 apps on OS/2 2.0. It has been more stable and trouble-free than DOS or Windows could ever hope to be.

What I don't understand is why you would spread Microsoft's lies and disinformation. What's in it for *Computerworld*? Do you receive a large part of your ad revenue from Microsoft? It doesn't appear so from the page count. Or are your columnists so lazy and ignorant that they pick up their themes from other articles?

Computerworld has just distinguished itself as having the same journalistic integrity and independence as *The Star*. I've had a lot of experience with OS/2 and was able to see for myself how slanted your reporting is.

Humor? Who thought this piece was funny?

Joe Barnhart
Santa Rosa, Calif.

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DEC must pick an operating system identity

Michael Vizard

The good news for DEC is that it is beginning to inch its way back to profitability following the shipping of its Alpha AXP RISC systems. But while the arrival of these systems will satisfy the pent-up demand for additional horsepower at VAX/VMS sites, there is another issue facing DEC and its customers: the possible impact of Microsoft's Windows NT on DEC's installed base during the next few years.

Today, DEC presents IS directors with a classic picture of a patient with multiple personalities as it bills three major operating systems for Alpha AXP systems — OpenVMS, DEC's OSF/1 and NT — as relative equals.

DEC's core constituency is looking for the company to articulate a more focused direction. They want DEC to provide some leadership by helping them plan for a decade that will be dominated by desktop systems linked together by client/server applications.

Adapting to the new requirements of its customers won't be easy for DEC because its OpenVMS operating system has been brutally — and perhaps unjustifiably — tarnished in the open systems wars with Unix vendors. After all, none of the more than 25 flavors of Unix available today is a particularly open system.

And today, with the belated arrival of Alpha, OpenVMS is now one of the fastest, least expensive 32-bit preemptive multitasking operating systems available. In fact, when you take into account the journaling and recovery features of OpenVMS with a RISC processor, DEC has put in place one of the best client/server development platforms available today.

Of course, the tragedy of OpenVMS on Alpha AXP systems is that while VMS diehards are excited by it, the dominant operating system in the market today is Windows/DOS, which will be shortly supplemented by NT.

At DEC sites, NT has the potential to become a juggernaut because it provides a preemptive multitasking operating system that supports the ubiquitous Windows interface.

Already, users and application developers within the Digital Equipment Computer User Society are speculating about what it will take to make the transition from OpenVMS to NT.

It may be the fourth quarter before Microsoft irons out the support issues for NT. But for DEC, getting staunchly behind NT today as the company's primary strategic focus is critical to the company's survival in the 1990s.

OpenVMS and DEC OSF/1 might be two of the most technically elegant operating systems ever developed, but the reality facing DEC is that it needs a strong desktop partner like Microsoft to fend off IBM and Apple on one front, while also competing with Novell's Unix foray.

DEC must demonstrate how its knowledge of 32-bit operating systems and RISC system development can add a significant value to the NT development effort. Otherwise, the company is in danger of becoming one more reformed purveyor of midrange systems chasing after a market that will be dominated by an army of Intel clones running NT.

And if that comes to pass, DEC's restructuring efforts, which have already claimed an estimated 10,000 jobs, will only be a small taste of the downsizing agony to come.

Vizard is *Computerworld*'s senior editor, personal computing.

Metrics: The art of the well-supported lie

COUNTER-INFORMATION *by* Michael Schrage

No doubt you've heard the saying that figures don't lie, but liars figure. When it comes to software productivity, that epigram should be: Metrics don't lie, but liars metric.

No single issue in computerdom has burned out more good neurons in more bright minds than how best to measure programmer/software productivity. The cult and culture of software metrics remain relentlessly powerful and persuasive. Even the best-managed organizations have cracklike cravings to lash their developers to productivity metrics. Virtually any quant nerd with even a glimmer of a metric can get a serious hearing.

The dirty little open secret that barely a handful of metrics yield benefits that — ahem! — measurably outweigh their costs doesn't much seem to matter.

Of course, it's always cheap and easy to knock software metrics. There's a terrific scene in the new Bill Gates bio where the budding boy billionaire witheringly dismisses IBM's "K-LOCs" (thousands of lines of code) productivity metric as a "masses of asses" approach to software programming. Gates just can't understand why IBM's top management thinks there's any kind of correlation between quantity of code and quality. Indeed, one of the book's implicit messages is that IBM's metrics theology consistently undermined its efforts to compete effectively in the PC marketplace.

Part of the problem is that software is as much a medium as a tool, and we've never come to grips with measuring the productivity of media.

Consider paper, which is simultaneously a business medium and a tool. We can design paper forms that make it easier for the clerks to be more productive, but these also manage to waste everybody else's time. (Does the phrase "expense report" ring a bell?) So where's the productivity gain?

The paper paradox highlights the difficulty in creating meaningful software productivity metrics: It's easy to purchase programmer productivity at the expense of the rest of the organization.

Some companies have simply decided to junk traditional productivity metrics. American Airlines reportedly won't fund any software projects that can't demonstrate at least a 10-to-1 *financial* return on investment. So much for K-LOCs and function point analysis.

Similarly, it's far from clear what metrics object-oriented languages and reusable code will inspire. If it takes you a little longer to figure out how to reuse existing code effectively, does that mean you've become more productive over time? Or less? The answer — "it depends" — is why metrics will always be a hot button.

Indeed, these issues are so hot that I'm surprised *Computerworld* doesn't feature a "metric of the month" and run reader call-in surveys to determine the programmer's best-loved/most-hated productivity metrics. I'm sure several companies are already busy turning out benchmarks or "meta-metrics."

It's true that Lord Kelvin (of thermometer fame) once remarked that we can't really speak intelligently about something unless we can measure it in some way. It's also true that the eminent philosopher, Lord Whitehead,

once commented that we should seek simplicity — and distrust it.

Let's be honest and settle for the unhappy medium. We should seek software metrics — and distrust them.

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990).

Charles Babcock

Brave new world

The resignation of IBM's John Akers is being greeted as the epitaph for the mainframe era, which opens the way for the coronation of desktop computing. This view underestimates the forces that eroded IBM's position. User-driven winds of change propelled companies such as Microsoft, Novell and Intel toward the top, but those same forces could eventually displace these companies as well, without granting them the benefit of IBM's 29-year reign.

These days, leading-edge technology is no guarantee of anything. User organizations scrutinize technology for its competitive advantage, and once they find it, they deploy rapidly. Technology as a competitive factor has become democratized, with formerly computer-illiterate workers far down in the ranks eagerly seizing new automated tools.

The pattern is strongly PC-based — Intel's Andrew Grove estimates 40 million PCs were sold in 1992 alone. But the change is more than just a PC phenomenon. The initial strength of relational database systems was on minicomputers. In the midst of drastically slowing sales in that market, Oracle is selling $1.2 billion worth of software a year, with the growth coming from Unix workstations and servers as well as PCs.

The late Thomas Watson Sr. believed that if you dressed up a salesman and sat him down in a customer vice president's office, you could sell IBM computers. And for his era, he was right. Today, the expanding base of users makes it impossible for any one firm to predict what they will need next or even who those users are likely to be.

In the business press, there are frequent references to the winners and losers of this new era, with those who follow "open" standards getting the most accolades. But even here, user-driven change threatens the ground beneath the newly anointed. We live, not in an age of standards set by ANSI committees, but in one of de facto standards set by the marketplace. Driven by the democratization of technology, innovations that make information more useful win early acceptance. Users watch and wait, with little regard for originators or brand loyalty, to see who puts an innovation into the best price/performance package.

The quality innovator must somehow end up as the low-cost producer, a characteristic that used to form the dividing line between companies in the industry. Compaq was a quality innovator, but its survival was undermined until it also became a low-cost supplier. None of today's PC hardware or software companies can claim a sure grasp on this process, with the exception of Intel.

There is still another user-driven force loose on the landscape. Any emerging standard must remain open enough to potential competitors to attract outside brain power and capital. If a product does not attract widespread investment, users reserve the right to turn to some competing technology that promises to move forward more quickly.

This force phenomenon is baffling to old-line companies such as DEC and IBM because they have learned to expect some return on R&D. But since the PC revolution, users understand the difference between multiple parties driving a technology forward and proprietary technology. Their needs are too varied and too great for any one firm to satisfy anyway, so they avoid a technology that is controlled by a vendor's self-interest.

In this brave new world, the ultimate user test of a successful technology company is timing. Are its innovations in step with what the user community wants? Has it put the right resources into developing a useful package? And does it have the guts to snatch profits out from under an aging technology and plow them into an innovation that will vie to become a standard?

Babcock is *Computerworld*'s technical editor.

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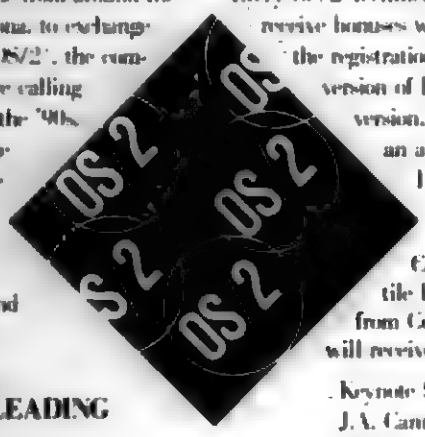

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Apple readies slew of low-cost computers

High-end Quadra and first color PowerBook systems are expected at Macworld Japan this week

By James Daly
TOKYO

■ Apple Computer, Inc. will unveil a half-dozen aggressively priced Macintosh computers this week at Macworld Japan in what looks like the next chapter of the PC price wars, sources close to the company said.

The introductions will refresh and add depth to a broad portion of the Macintosh line. They range from a new high-end Macintosh and some speedy midline additions to long-awaited color versions of Apple's Classic and Portable machines.

The best news for information systems managers is that Apple is continuing to abandon its strategy of pricing its computers at a premium comparable to IBM PC clones. "For a long time, Apple has used the ease-of-use argument to lure people away from buying Windows, but that just doesn't work anymore," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif. "These days, everyone is looking at price."

Apple is expected to face additional pricing pressure later this year from a new crop of low-cost IBM-compatible machines that are due to follow in the wake of Intel Corp.'s introduction of a new version of its 1486 chip.

On the high end, Apple will unveil a new version of its sophisticated Quadra computer, the Quadra 800, that is expected to target complex networking and high-powered graphical applications. The floor-standing Quadra 800 will be built around Motorola, Inc.'s speedy 33-MHz 68040 microprocessor and is expected to cost about $3,500, sources said. It will also offer built-in color and monitor support and 8M bytes of random-access memory.

The Quadra 800 introduction is another piece in Apple's plan to get its customers moving along the path to a client/server environment. The strategy is expected to come to fruition by midyear, with the expected shipment of the first true dedicated Macintosh server.

Although the Quadra computer certainly has the power to work as a server, Apple never positioned it as such and hence added on a lot of the gadgets and functionality expected in a more general-purpose machine.

Keep 'em coming. This week's rollouts continue Apple's rapid-fire product introduction strategy. The company unveiled three computers in September, six systems in October and three printers and a scanner last month at Macworld in San Francisco.

Also on tap this week will be the debut of a midrange product line called Macintosh Centris. The $2,000 Centris 610 will use the 20-MHz 68040, while the $3,000 Centris 650 will use a 25-MHz chip. Both will provide Nubus and built-in monitor support and offer 4M bytes of memory expandable to 64M bytes.

The Centris 610 is designed to replace the older Macintosh IISI, which employs a less powerful Motorola 68030 chip. Comparable IBM clones are priced in the $2,500 to $4,000 range.

Fans of color computing will get Apple's first color notebook computer, the PowerBook 165C. The model is a color version of the PowerBook 165, with a passive-matrix 640-by-400 color LCD and a 33-MHz 68030 processor. It is expected to cost about $4,000. A color version of the PowerBook 185 is slated for this year and expected to sell for less than $5,000, sources said.

Apple is also expected to introduce a color version of the Macintosh Classic that will sell for around $1,250. The company will also replace the color Macintosh LC II with the LC III, which will sport the faster 25-MHz 68030 chip.

James Daly

Get thee some security

One ringy dingy ... In tight economic times, probably the last thing you want to hear is someone you've never met and don't know (me) telling you new ways to spend your money. But here's an outlay worth considering.

With the growing number of telephone hackers, businesses that want to protect themselves from those bent on stealing access to their phone lines might investigate the handful of insurance companies now providing coverage against toll fraud.

Why? Now that many users own the equipment penetrated by the thieves, long-distance carriers assert that liability for such losses rests exclusively with the user or owner. In other words, if unauthorized calls are discovered on your phone bill — whether for $100 or $100,000 — you will be the one who ultimately pays. Not AT&T. Not Sprint. Not MCI.

Most of the policies extend coverage to $1 million worth of long-distance calls — about equal to the largest single loss to date. We know of at

Daly, *page 32*

VDT vision problems may affect 10 million

By Mitch Betts
BERKELEY, CALIF.

Computer vision syndrome. It sounds like a topic for the next edition of the Oprah Winfrey show, but a study recently published in the *Journal of the American Optometric Association* indicates it is a serious problem for nearly 10 million Americans.

The study by James E. Sheedy, chief of the VDT Eye Clinic at the University of California at Berkeley, surveyed 1,307 optometrists nationwide and found that 14% of their patients had symptoms such as eye strain, headaches and blurred vision from the use of VDTs.

When that figure is projected to the whole U.S. population, it suggests that there are nearly 10 million people per year who get an eye checkup primarily because of vision problems related to computer use, the study said. The biggest culprits are screen glare and improper lighting.

The survey found that the vast majority of optometrists recommend changes in the VDT work environment, including use of anti-glare filters. About 40% of the patients need eyeglasses designed specifically for VDT work.

The prevalence of "computer vision syndrome" has triggered a flurry of products claiming to alleviate the problem, from stick-on screen films and specially coated eyeglasses to software that leads the user in eye exercises.

Sometimes the claims go too far, according to regulators. The Federal Trade Commission (FTC) recently charged a firm called Site for Sore Eyes, Inc. with making unsubstantiated claims that its "UV400" coating for eyeglasses would protect consumers from "harmful" ultraviolet (UV) rays emitted by computer terminals.

The Hayward, Calif., company and the FTC have settled the charges in a consent agreement that prevents the company from making such claims without scientific backup.

Sheedy said UV-absorbing eyeglasses might be useful for outdoor work, but they are unnecessary for VDT work because there are "almost zero" UV emissions from VDTs. Eyeglasses with antireflective coatings are mildly helpful for VDT users but should not be sold as cure-alls, he added.

The most common product in this field, an antiglare filter that fits over a computer screen, is available from vendors such as Polaroid Corp. in Norwood, Mass., SunFlex Co. in Novato, Calif., and Optical Coating Laboratory, Inc. in Santa Rosa, Calif.

The American Optometric Association in St. Louis recently awarded Optical Coating Laboratory's GlareGuard filter with its seal of acceptance for meeting the association's guidelines for glare reduction. Sheedy said he expects that other vendors will be able to meet the guidelines, too.

Tips for reducing computer vision syndrome:

- Position the center of the screen about 20 degrees below eye level; viewing distance should be 18 to 30 inches.
- Use a high-resolution monitor.
- Position the VDT so that the office window is at a right angle to the screen. If that is not possible, close the window blinds.
- Reduce overhead lighting to cut glare. If glare persists, use a high-quality antiglare filter.
- Clean the screen and/or filter to remove dust and fingerprints.
- Use an adjustable document holder that puts reference material at the same height and plane as the computer screen.
- Rest your eyes occasionally.
- Get regular eye checkups; mention VDT work.

Sources: Center for Office Technology; Library of Congress; Optical Coating Laboratory.

Daly

CONTINUED FROM PAGE 31

least four companies that offer such insurance: The Travelers Corp. in Hartford, Conn.; Chubb Corp. in Warren, N.J.; National Union Fire Insurance Co. in Pittsburgh; and Aetna Life and Casualty Co. in Hartford, Conn., which limits its policy writing to financial institutions.

Coverage can be expensive — up to $50,000 for the million-dollar policies. But consider the alternative: U.S. businesses are expected to pay more than $4 billion for unauthorized long-distance calls this year, according to Telecommunications Advisors, Inc., a Portland, Ore.-based consultancy.

And mull over these words from Don Delaney, a senior investigator with the New York State Police, who said that last year he received 150 complaints of toll fraud, with losses ranging from $40,000 to $500,000: "It's not a matter of *if* people will be hit, but *when*."

No charge for crashing your system...

There's a handy, if controversial, little program out there called "Virus Simulator" that simulates hundreds of viruses, including file-infectors, boot sector viruses and memory-resident viruses. It enables users to check out a scanner or their company's antiviral procedure without playing with live ammo. For copies, send $25 to inventor Doren Rosenthal at Rosenthal Engineering, P.O. Box 1650, San Luis Obispo, Calif., 93406.

A better endorsement can't be found...

The latest group to get turned on to RSA Data Security, Inc.'s public key data encryption method is hackers. RSA's brand of cryptography is now being used to scramble messages on dial-up bulletin boards by hackers who fear the boards are monitored by law enforcement personnel.

Hack attack...

An investigation conducted by the FBI and experts at the University of California at Davis has uncovered computer hackers who have breached the systems of the CIA, the Department of Defense and the National Security Agency, school officials said.

Hackers were apparently able to hack into the university system and then hook into networked lines in government agencies, according to John Crowell, the manager of workstation support at UC-Davis. Crowell said no sensitive data was accessed, but at the height of the penetration, as many as 100 computer users from as far away as Japan and Czechoslovakia were using decoded UC-Davis passwords to illegally enter the government systems.

"We left enough of a security hole so that we could see what they were doing," Crowell added. "We wanted to see if they were malicious, and if they were malevolent we would have cut them off immediately." Although one perpetrator was tracked down, he was a minor and hence will probably be let off with some mild wrist-slapping. The FBI is still investigating the case.

Security on the fly...

Scratching your head over a puzzling security problem? You might want to get in touch with Protection Experts, a call-in service that provides immediate (and, they claim, unbiased) answers about computer security policies and practices, electronic eavesdropping and countermeasures, malicious software, network protection and the like.

The service is run by Fred Cohen and Charles Preston, two noted security experts, who will give you answers based on an extensive library of security literature and their years of knowledge. Calls are $20 for the first 10 minutes and $3 per minute thereafter. Visa and Mastercard are accepted. Cohen is in Pittsburgh and his number is (412) 422-4134; hours are 8:30 a.m. to 2 p.m. EST, Monday through Friday. Preston is way up in the frosty confines of Anchorage, Alaska, and can be reached at (907) 344-5164 from 2 p.m. to 7:30 p.m. EST, Monday through Friday. Fax requests are processed for $20 each but must be sent on their official "Fax information Service Request Form." Call them for a copy.

Daly is a *Computerworld* West Coast senior correspondent.

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Applications

Tool makes drawing easy

By Christopher Lindquist

Anyone who has ever tried to draw a floor plan, network diagram or flowchart, either by hand or with a traditional drawing package, knows the meaning of the word tedious.

Several companies, including Softsync, Inc. with its Expert line, have tried to address the situation by creating project-specific software for creating such drawings. Now the Seattle-based firm Shapeware Corp. has released Visio, a Microsoft Corp. Windows-based product that falls somewhere between a general-purpose drawing package and one that is task-specific.

PRODUCT test DRIVE

Visio comes with a large assortment of "SmartShapes" that can be used in floor plans, organizational charts, flowcharts or just about any other drawing. These shapes are organized into "stencils," or sheets that are arranged according to function.

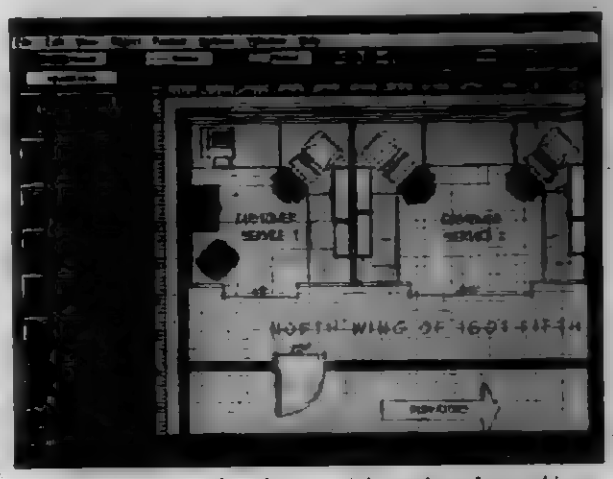
To use Visio, the user calls up the appropriate stencil and drags the needed shapes onto a representation of a sheet of paper. SmartShapes can be rotated, resized and snapped to alignment. They can also be customized or created using "ShapeSheets" that contain both the shape's image and information about its behavior, including what happens when it is resized and where its connecting points are.

Visio is certainly easy to use. I put together a quick representation of my office network in about 15 minutes, and it certainly looks better than anything I could have done with a pencil and ruler.

Like all software, however, Visio is not perfect. But my problems with it were fairly minor, particularly for a first version of a product.

While Visio's shapes are "smarter" than the average collection of lines on a screen, they still have a few things to learn. If two SmartShapes are connected by a line, the line will stretch and move as you reposition the shapes. However, the line is not smart enough to be aware that it is running through another shape or even through one of the shapes to which it is connected. It would be preferable if the lines were designed to avoid running through shapes.

Secondly, Visio's text handling leaves something to be desired. Text that is applied to lines appears superimposed on the line, making it hard to read. And when placed underneath shapes, text that is more than one line long can also bleed into the connecting lines. The text can be moved independently of its attached shape or line, but the process is a bit cumbersome. It would be a big plus if Shapeware would make the lines and shapes smart enough to leave space for text.



The Visio drawing package's *'SmartShapes' can be used in floor plans, flow charts or other drawings*

Despite these small quibbles, Visio is a worthwhile, well thought out product for people who find themselves having to draw diagrams of nearly any type on a fairly regular basis. At $249 list, it may be a bit pricey for someone who is going to use it only a few times a year. But for anyone who finds himself reaching for a template and ruler or drawing package regularly, Visio will give more time to deal with reality itself rather than making pictures of it.

Spreadsheets gain shared data through OS/2 server

By Michael Vizard
SANTA CLARA, CALIF.

Arbor Software Corp. has improved the performance and extended the reach of its ESSbase application server for spreadsheets.

Using an OS/2 system as a server, ESSbase provides a shared data resource that is used to populate either Lotus Development Corp. 1-2-3 or Microsoft Corp. Excel spreadsheets running on Microsoft Windows clients.

Arbor improvements to ESSbase performance have resulted in a 150% increase in calculation and consolidation speed. An application programming interface (API) and planned support for SQL will give ESSbase the ability to access data stored in other applications or databases.

"We use ESSbase to do organizational rollups of spreadsheets," said David Lammlein, manager of the business support group at the oil and gas subsidiary of Pennzoil Corp. in Houston. By rolling up data from one set of spreadsheets into a single spreadsheet, Pennzoil can create a master spreadsheet that can be sent off to corporate headquarters or distribute a single set of data to multiple spreadsheets across the network, Lammlein said.

Other users include Microsoft, which late last month announced that it will use ESSbase as part of its Budget Workbench, an internal budgeting system.

ESSbase is based on a proprietary database architecture that arranges data in arrays instead of in the traditional table format found in a relational database. These arrays can then be accessed by spreadsheet users over the network to arrange that data in any dimension they like within their spreadsheet.

This capability is similar to the next-generation multidimensional spreadsheets under development at Lotus and Computer Associates International, Inc. However, while these spreadsheets provide multidimensional viewing capabilities, they require users to adopt a new spreadsheet format that is not linked to a sharable data resource on a network server.

The latest enhancements to ESSbase include major improvements to the retrieval and calculation speed of the database, an API to link ESSbase with a wider variety of applications, a format conversion mechanism for loading data from other systems into ESSbase and support for the SQL interface and the Open Database Connectivity (ODBC) interface from Microsoft. Support for SQL and ODBC is scheduled for the third quarter.

"With SQL support, we can now access data from relational databases and then use that data to populate cells in spreadsheets," said James Dorrian, president and co-founder of Arbor Software.

Later this year, Arbor intends to add support for Apple Computer, Inc. Macintosh clients and Unix and Windows NT servers. Network operating systems currently supported include Novell, Inc.'s NetWare, Microsoft's LAN Manager, Banyan Systems, Inc.'s Vines, Digital Equipment Corp.'s Pathworks and IBM's LAN Server.

Pricing for ESSbase starts at about $25,000.

Software application packages

Smart Software, Inc. has introduced SmartForecasts Version 3, business forecasting software for PCs.

The product has an automatic forecasting expert system that can forecast elements including product demands, budget line costs, sales and revenue. Increased data capacity, faster processing and a new "point-and-shoot" user interface are offered.

Version 3 also has high-resolution Video Graphics Array graphics with full annotation capabilities and support for PCX graphics files, an Eyeball utility and new S-curve models.

The standard edition of SmartForecasts Version 3 costs $595.

➤*Smart Software*
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Caere Corp. has started shipping PageKeeper, information management software.

According to the company, the product was designed to let users search and store information on stand-alone or networked PCs. PageKeeper offers unattended input, data compression and intuitive search capabilities. Information can be automatically indexed without users having to manually input key words, and the company's advanced optical character recognition technology is used. PageKeeper also has a visual user interface and built-in electronic mail.

The product costs $995.

➤*Caere*
100 Cooper Court
Los Gatos, Calif. 95030
(408) 395-7000

Looking Glass Software, Inc. has announced Version 1.0 of HyperWrite.

HyperWrite allows Microsoft Corp. Windows users to create and play back full-color hypertext presentations. HyperWrite has hypertext features that permit users to hyperlink characters, words, paragraphs and whole documents. Users can "bookmark" and index documents and import graphics or sounds to documents.

A 100,000-word dictionary and spell check is included along with standard cut, paste, copy and drag-and-drop capabilities. A full what-you-see-is-what-you-get working environment is provided.

HyperWrite is compatible with Microsoft Word and most word processing and graphics programs.

HyperWrite costs $149.

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Gupta on downsizing with DB2.

These days when people talk about downsizing they're usually talking about client-server and PCs. But that shouldn't mean throwing out mainframes. Particularly if you already have a powerful transaction processing system like DB2.

What downsizing really means is letting DB2 do what it does best: manage central corporate data on the mainframe. And letting PCs do what they do best: off-load applications from the mainframe.

Gupta was founded in 1984 because no leading DBMS company, not then and not now, understood the full complement of products needed to make downsizing with client-server a reality.

When it comes to downsizing with DB2, the choice is simple. Mix and match piecemeal products from other companies or call Gupta. Gupta has the tools and connectivity software you need to put client-server to work with DB2 today.

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DEC designs yet another Unix plan

By Maryfran Johnson

The director of scientific computing at Dana Farber Cancer Institute in Boston was in the middle of a recent discussion about Unix with his Digital Equipment Corp. salesman when the DEC salesman abruptly steered the conversation to Microsoft Corp.'s Windows NT.

"I am very bothered by that," said Mohamed el Lozy, the Dana Farber official in charge of computing for the biostatistics laboratory, which runs about 60 DECstations. "I'm a Unix shop, and I don't want my salesman talking about upscale PC operating systems. I shut him up the minute he mentioned NT. We have a huge investment in Unix."

El Lozy's experience highlights DEC's conflicted heart and congenital lack of focus on Unix, an operating system that for years played the role of unwanted second cousin to VAX/VMS. These days, DEC's enthusiasm for NT — still a late 1993 or early 1994 phenomenon for users — seems likely to push Unix even further down the family tree.

This week, however, DEC officials hope to dispel some of the more dismal predictions about the company's Unix commitment during a briefing for press and industry analysts at corporate headquarters in Maynard, Mass. DEC President Robert Palmer will be on hand to lend some high-powered credibility to the re-varnished Unix strategy, which centers on DEC/OSF/1 running on new Alpha AXP machines.

Hold slipping

If one measure of success in the Unix sector is market share in the workstation market, DEC may have some problems. Dataquest, Inc. in San Jose, Calif., reported that DEC's share of the $9 billion worldwide workstation market slipped from nearly 12% in 1991 to 9% last year.

Prime-time player

Based on the Open Software Foundation's OSF/1, DEC/OSF/1.2 will be formally launched on the Alpha platform late next month. More than 500 early users have been experimenting with DEC/OSF/1 on Alpha machines for the past few months, and the company feels it is finally ready for prime time.

Also next month, at the UniForum Unix trade show in San Francisco, DEC will unveil another batch of Unix applications committed to the Alpha line. So far, some 300 applications have been promised to DEC/OSF/1 by independent software vendors, a company spokesman said.

What users can expect to hear from DEC in the coming weeks are details of how the company will support and develop its three strategic operating systems — VAX/VMS, DEC/OSF/1 and Windows NT — as well as its commercial Unix directions.

Also on DEC's agenda are plans surrounding the Unix System V operating system, which will belong to Novell, Inc. as soon as Novell's acquisition of Unix System Laboratories, Inc. is completed.

But for a company that has altered its Unix plans as frequently as Madonna changes her hair style, persuading users to buy into the latest version of the strategy may prove extraordinarily difficult.

"The signal I would like from DEC is really something they cannot provide too easily," el Lozy said. "I would like to be sure they're here to stay. Can they make money in today's market?"

That may be a problem. DEC's history with Unix during just the past few years is a textbook study of missed opportunities and mangled marketing schemes.

"You name it, they didn't do it right," said John Morrell, an analyst at International Data Corp. in Framingham, Mass. "They didn't put the right functions into the operating system or set up the right sales structure or distribution channel. And they were always afraid of cannibalizing their VMS business."

Three-front campaign

DEC's next move, Morrell said, will be to aim its marketing efforts at three distinctly different user audiences. "They will push VMS in the data center community, use NT as their low-end distributed client/server platform and sell Unix to the technical market," he said.

The 64-bit structure of DEC/OSF/1.2 may hold sharp appeal for the technical market, despite the case of whiplash DEC has given those users

DEC, *page 38*

Mission-critical applications

Low-cost approach brings fault tolerance to Commerce agency

By Gary H. Anthes
KANSAS CITY, MO

The term "fault tolerant" conjures up images of ultrareliable but enormously expensive computer systems. At the U.S. Department of Commerce's National Logistics Support Center, that is half right.

For a few thousand dollars, the center has equipped its mission-critical shipping system with mirrored removable disks and redundant disk controllers. The center also installed a backup server that can take over processing in about half an hour if the primary unit fails.

The center warehouses and ships supplies for a half-dozen or so federal customers including the National Weather Service and the U.S. Department of Agriculture. It processed 75,000 orders last year, including a number of emergency shipments in the wake of Hurricane Andrew — 99% of them within 48 hours, according to George Lambert, a computer specialist at the center.

"If we lose our shipping system, everyone can go home," Lambert explained. "If we don't ship, we may have a radar station that's not running or a weather station not working or an airport that's not up." An unreliable earlier system, in addition to being "maxxed out," occasionally did cause problems like that, he said.

Palatable price

For about $100,000, which included custom development of the shipping application, the Commerce Department last year installed a nearly fail-safe local-area network connecting two user workstations and two servers — a primary and a backup unit — and Intel Corp. 80386-based PCs running DOS. The LAN runs the LANtastic Ethernet operating system from Artisoft, Inc. in Tucson, Ariz.

The server uses Immunity software for disk mirroring, which is available for $249 from Unitrol Data Protection Systems, Inc. in Vancouver, B.C. Every write operation simultaneously updates both hard disks in the server.

The servers are also fitted with two 212M-byte Small Computer Systems Interface (SCSI) hard disks and controllers in removable trays, which are available for less than $1,000 each. If the primary drive fails, it is removed for repair and its twin is swapped in to replace it. Then, a new twin is pulled from the backup server to replace the old twin.

Lambert said that when the primary server is rebooted, the Immunity software recognizes that the new disk does not contain the same data as its twin, and it pauses to write all files onto the new disk, which brings the disks into exact conformance.

If the primary server goes down because of some problem other than the disk failure, both disk units can be moved to the backup server. That was required recently when the motherboard on the primary server failed. The system was up and running on the backup within 30 minutes, Lambert said.

No worries

Darrell Wallace, manager of operations, said the real comfort comes from not having to worry about lost data. "If the system went down and we had to recreate the data, it could take days, if we had the information at all," he said.

Keith Sitter, a value-added reseller who installed the hardware, said the Commerce Department bought a lot of protection at a bargain price, but it would be possible to get a reasonable level of fault tolerance by spending even less.

"You can take a system with a 40M-byte hard drive and buy another by mail order for $200 or so and the [Immunity] software for $250. So for less than $500, you could have a 40M-byte mirrored system. That gives you an on-line safety net instead of the traditional backup in which you have to restore."

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XTree unveils NetWare management tools

By Elisabeth Horwitt
SAN LUIS OBISPO, CALIF.

A suite of software products recently introduced by XTree Co. is said to address many of the tasks associated with managing Novell, Inc. NetWare local-area networks at a comparatively low price.

Among the capabilities provided by different XTree Tools for Networks modules are the following:

- Running tests of network and workstation performance according to user-defined thresholds.
- Changing and documenting NetWare server configurations, including user profiles, groups, queues and system files.
- Monitoring server performance in areas such as CPU and disk utilization.
- A help system to guide users through common tasks such as adding memory to the machine and using graphic depictions.

The product is "about six things rolled into one," said Aldon Hynes, vice president of mortgage trading systems at Union Bank of Switzerland in New York. He has been testing the product for a couple of months.

With the WatchLAN module, he said, the administrator can set thresholds so "anytime the network does something out of the norm, you get a message at the bottom of your screen."

For example, "if you've got 18 people logged onto a 20-node Novell server, it alerts you that you're about to run out of connections," Hynes said.

In addition, the system monitors areas such as how many files are open, how many cache buffers have data waiting to be written to disk and network utilization levels, Hynes said.

XTree Tools for Networks, Novell Edition, is priced at $695 per server, with each additional server priced at $395.

DEC designs yet another Unix plan

CONTINUED FROM PAGE 35

in the past, the analyst suggested. Many technical users bought into the DECstation/DECsystem line of workstations and servers, which ran DEC's own Unix implementation, Ultrix.

Then DEC put its Unix eggs in the OSF/1 basket and halted development work on Ultrix.

Unix confusion

A once-promised migration path from Ultrix to DEC/OSF/1 on the DECstation line fizzled last summer.

DEC's Unix strategy became increasingly murky as various officials — such as David Stone, former head of all software development at DEC, who now works at AT&T — informed Ultrix customers that they should start planning to move to Alpha workstations running DEC/OSF/1 in 1993.

That, in essence, told DEC customers that the DECstation line was a dead-end platform running a doomed operating system.

In the meantime, the other OSF sponsors — both IBM and Hewlett-Packard Co. — continued to improve their own AIX and HP/UX operating systems while cautiously pulling back from their original vows to adopt the entire OSF/1 kernel.

"Yes, they've lost ground with technical users, but if DEC can be the first company to jump on the 64-bit bandwagon, the techies may follow," Morrell said. "For users who want to get more satellite data into their machines in real time, 64-bit will make a big difference."

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Fluent announces NLM for motion video

Fluent, Inc., a video networking company in Natick, Mass., has announced FluentLinks 1.0, a NetWare Loadable Module (NLM) that enables multiple users to retrieve and play motion video segments on local-area networks running Novell, Inc.'s NetWare v3.11 operating system.

FluentLinks provides shared storage, efficient video distribution and access. It turns full-motion video and synchronized audio into digital data that can be created, stored, edited and networked in the same way text and graphic files can.

The largest stumbling block to using video on LANs has been the high-bandwidth requirements of video. Fluent claims to have solved this problem by using a scalable video architecture that dynamically adjusts video rates with minimal impact on perceived image quality while delivering all audio data intact and accurately synchronized to the video.

FluentLinks servers must be 386- or 486-based with clock speeds of at least 33 MHz. The servers must have 8M bytes of random-access memory, an Extended Industry Standard Architecture (EISA) system bus, at least one Small Computer Systems Interface hard disk and a high-performance 32-bit EISA network card. FluentLinks costs $5,995 for a 10-user license and $9,995 for a 20-user license.

— Michele Doutert

FolioViews upgrade features WYSIWYG

Folio Corp. last week released a major upgrade to its Folio Views electronic publishing software that features what-you-see-is-what-you-get display and output, cross-platform compatibility and real-time editing and updating.

The company, a subsidiary of Mead Data Central, Inc., said those features were among 10 key enhancements in Folio Views 3.0, which is a tool designed to create, manage and access electronic reference information on floppy disks, CD-ROMs and local-area networks.

The product will be available initially on MS-DOS, Microsoft Corp. Windows and Apple Computer, Inc. Macintosh systems. Other new features include multi-user editing and shadow files for modification and annotation.

The DOS and Windows versions will be available during this quarter, while the Macintosh version will be available during the third quarter.

The full-function Folio Views 3.0 costs $495 per user; a limited-function version costs $195 per user. *— James Connolly*

OSIWare announces X.400 gateways

OSIWare, Inc. announced software that translates proprietary electronic-mail protocols to the X.400 protocol for companies that use X.400 as their central E-mail highway.

The software "gateways" include a X.400-to-CC:Mail gateway that runs on major Unix platforms. It differs from current DOS-based CC:Mail-to-X.400 gateways — which some users complain are congested — because it runs on the Unix's multitasking platform.

OSIWare also announced an X.400-to-Microsoft Corp.'s Mail gateway that runs on Unix workstations and a new version of Message 400 for MS-DOS software that lets DOS-based PCs run X.400 over a Transmission Control Protocol/Internet Protocol network. The products require users to have OSIWare's Message 400 messaging system.

Prices for the CC:Mail and Mail gateways will start at $6,500. Prices for stand-alone DOS software will start at $1,000.

— Lynda Radosevich

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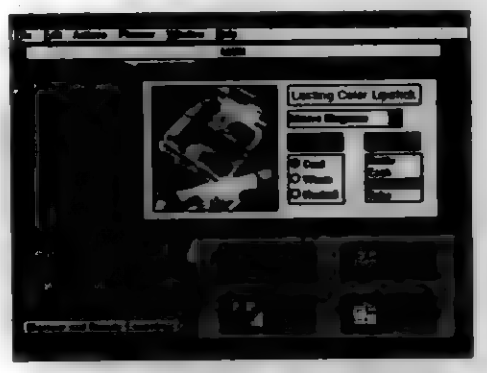

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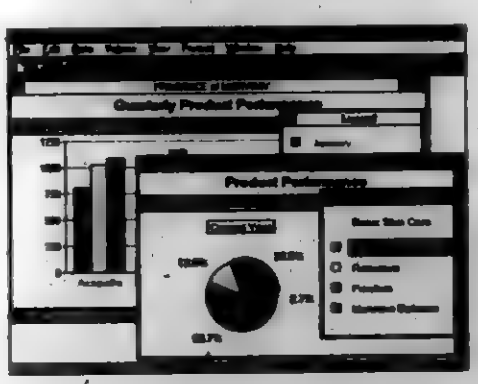

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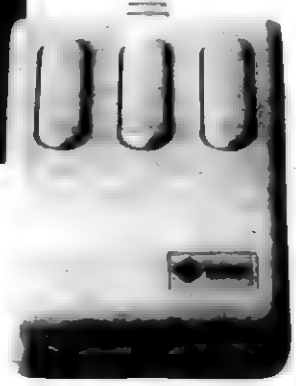

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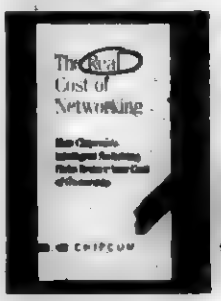

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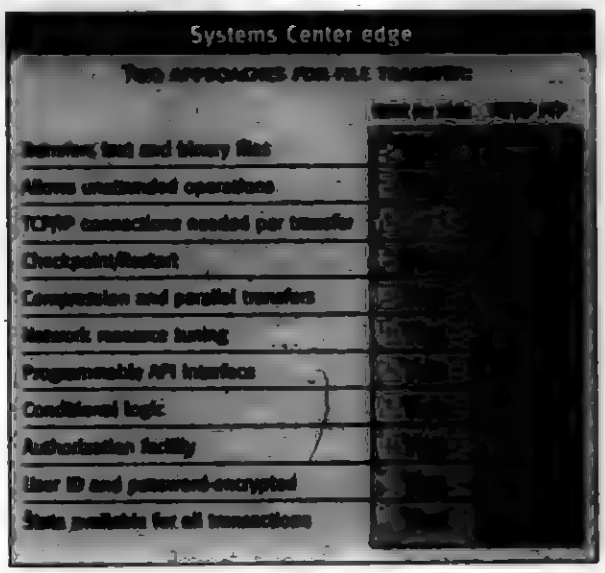
Unix, MVS tighten ties

DataMover enables data transfer over 'open' protocol

By Gary H. Anthes
RESTON, VA.

Systems Center, Inc. has extended its data-transfer product line, Network DataMover (NDM), to enable Unix-to-MVS and Unix-to-Unix file transfers over Transmission Control Protocol/Internet Protocol (TCP/IP) networks.

DataMover incorporates a "process language" by which users can control its action. For example, it can be set up to do a data transfer every day at a certain time, verify the success of the transfer, initiate an application to process the transferred data and notify an MVS or Unix user of transfer status.



CW Chart: Stephanie Faucher

The product also incorporates security features that allow user authentication without sending passwords over the network. It allows users and nodes to be given different levels of authority and keeps a detailed audit trail of activity in a statistics file.

For Unix variants

The product, NDM for Unix, operates on the IBM RISC System/6000, the NCR Corp. 3000, the Hewlett-Packard Co. 9000, Sun Microsystems, Inc. SPARCstations and Digital Equipment Corp. reduced instruction set computing-based computers. Additional Unix offerings are in the works, the company said.

Simultaneously, Systems Center announced Release 7 of NDM-MVS, which allows IBM MVS-to-MVS and MVS-to-Unix file transfers over TCP/IP.

NDM for Unix is geared for distributed systems in which remote, Unix-based applications must be coordinated with headquarters systems, which are typically MVS. It is also intended for intercompany data exchange as, for example, when credit unions swap loan histories with banks or when long-distance telephone companies exchange billing data with local carriers.

Dar Busa, director of product management at Systems Center, said any user of a TCP/IP network can do data transfers using the embedded File Transfer Protocol (FTP) facility. "But our customers have told us FTP is a commodity file-transfer package. It moves a file from A to B — end of story." He said NDM for Unix offers much more.

In particular, Busa said, customers want more security than is offered by the "commodity" solutions. "About 65% of our customers use NDM for intercompany transfers, for [electronic data interchange]-type applications. Security is a concern because they don't have control over both ends of the transfer."

According to Rick Villars, director of networking architectures at International Data Corp., the product will be of substantial interest to traditionally mainframe-centric firms that are deploying Unix applications and also to Unix shops that have discovered they need more features and safety than is offered in FTP.

"It's another confirmation that there really are a lot of large companies doing significant file transfers. People are starting to do some critical downloads and transfers, not just on a casual basis."

Happy customer

AT&T, a beta-test user that guided Systems Center in the development of NDM for Unix, said it plans to deploy the software throughout the company as its standard for file transfer.

Louis DeTroia, file-transfer product group manager at AT&T's Information Management Services Division, said the division had been evaluating NDM for Unix for a month and found that it works well.

He said AT&T asked Systems Center to develop the product in order to provide "one consistent file-transfer base software to run against multiple platforms" for the company. It will replace homegrown file-transfer software, he said.

DeTroia said AT&T is moving mainframe applications to Unix-based local-area networks, but it still retains many files on MVS mainframes. That requires, for example, regular transfer of accounting data from a centralized general ledger system to sales offices on Unix LANs, he said.

DeTroia said NDM for Unix will be a key to AT&T's plan to replace networks that use proprietary protocols such as IBM's Synchronous Data Link Control with less costly TCP/IP networks throughout the corporation.

The product is slated to be available March 31. It will be priced between $1,500 and $18,000 per server and between $375 and $4,500 per client machine.

Firms choose single backbone for SNA, LAN internetworks

By Elisabeth Horwitt

A hefty percentage of Fortune 500 companies have pretty much decided to integrate their IBM Systems Network Architecture (SNA) and local-area network internetworks, according to a recently published study by Salomon Brothers, Inc. The primary reason: the cost savings to be garnered from having one internetworking backbone instead of two.

However, while some companies reported that they are already enjoying the cost benefits of the move, others are still sitting on the fence, waiting for the right multiprotocol router with all the features they are looking for.

For example, Metro Toronto, the Canadian civic government organization, installed Cisco Systems, Inc. routers last May to handle a bevy of networking protocols, including Apple Computer, Inc. AppleTalk, Novell, Inc. IPX, Transmission Control Protocol/Internet Protocol (TCP/IP), Digital Equipment Corp. DECnet and SNA, according to Charles Peyton, a consultant to Metro Toronto.

The Cisco routers handle traffic across a Fiber Distributed Data Interface backbone at Metro Hall, the seat of Toronto civic government, and send it out across T1 and 56K bit/sec. links to five remote sites, Peyton said. The routers handle the SNA traffic by encapsulating it in TCP/IP packets, he added.

By using the same router backbone instead of two sets of private lines to connect SNA and inter-LAN traffic, Metro Toronto is "probably saving between $2,000 and $3,000 a month on line costs," Peyton said.

Single port

In addition, the routers can concentrate transmissions from SNA devices in different buildings or floors into a "virtual multidrop" circuit that feeds into a single port on an IBM front-end processor, Peyton said. Ordinarily, each physical unit in a different location would need a separate front-end port. This router feature is expected to enable Metro Toronto to get rid of one front-end processor this year and save $14,000 per month in leasing costs, Peyton said.

Peat Marwick Main & Co.'s Toronto branch installed a similar configuration of Cisco routers last summer so that a 256K bit/sec. slice of the corporate T1 backbone could be used to support TCP/IP.

Backbone, page 42

Gary H. Anthes

A U.S. 'infostructure'

Information "infrastructure" is the buzzword du jour. Everyone says the country needs one, but exactly what is it? Try this quiz:

The future U.S. information infrastructure will be:

A. A broadband fiber-optic network linking every office, classroom and home in the land.

B. A government network allowing supercomputers at remote labs to collaborate at gigabit speeds on problems in quantum physics and climate modeling.

C. A natural scale-up of the existing Internet.

D. A mosaic of copper, fiber and wireless technologies cobbled together by telephone, cable television, computer, satellite and other companies.

If you picked A, you probably work for a telephone company. With a little help from Washington — regulatory relief, tax incentives and the like — you will find the $300 billion needed to get the network installed early in the next century.

If you said B, you are either a supercomputer bigot or you have been asleep for more than a year. This was an early concept for the

Anthes, page 42

Firms choose single backbone for SNA

CONTINUED FROM PAGE 41

AppleTalk, IPX and SNA encapsulated in TCP/IP, according to Kevin Byrne, a senior technical adviser at the accounting firm.

"All our major sites already have SNA traffic from the mainframe, so we wanted to have all those [LAN] protocols over one link, not separate ones," he added. The rest of the T1 lines are used for voice.

Cisco's TCP/IP encapsulation feature has worked fine so far; indeed, "users report that printer jobs actually function better" than the original pure SNA links, primarily because of a TCP/IP error-checking feature that minimizes job interruptions, Byrne said.

Peat Marwick chose Cisco partly for its name and partly because at the time competitors did not have SNA support, Byrne said. Now, however, most major multiprotocol routers can handle SNA.

The Travelers Corp. and 3M Co. are still trying to find the ideal router candidate for their critical corporate backbones. During the past few years, Travelers has evaluated IBM's 6611, Network Equipment Technologies, Inc.'s version of a Cisco router and Crosscomm Corp.'s product, according to Steve Simon, senior telecommunications engineer at the insurance company.

Demanding shoppers such as 3M and Travelers pointed to functional gaps that could cause network managers trouble over the long haul. 3M, for example, wants a router that can handle IBM's Advanced Peer-to-Peer Networking (APPN) protocols, according to Chris Amley, a lead analyst in telecommunications at 3M.

Last week, IBM was about to start shipping APPN support on the 6611; however, other router vendors' schedules for implementing the peer-to-peer SNA protocol are vague at best.

Another serious gap in the SNA-to-LAN internetworking industry is the lack of a standard for managing SNA devices, or SNA traffic on a router, via Simple Network Management Protocol (SNMP).

The Internet Engineering Task Force meeting next month is likely to set up a working group to develop SNMP management information bases to manage SNA [CW, Feb. 1]. In the meantime, however, users are basically stuck with using IBM's NetView to manage SNA devices and SNMP-based systems to manage routers and other LAN networking devices.

While Metro Toronto is still using NetView to manage logical SNA links on its backbone, the organization is "definitely interested in SNMP management of SNA," Peyton said. "Ultimately, we want to run TCP/IP on the host."

In Brief

WilTel adds services

Long-distance carrier WilTel said it will deploy a suite of value-added products and services in 1993. These include network design and testing, collocation of user equipment in its central offices and network management. WilTel business units can reportedly coordinate through a single point of contact for support.

Prioritizing traffic

Cascade Communications Corp. in Westford, Mass., announced that its STDX family of frame-relay switches can now make use of a traffic prioritization feature offered by Cisco Systems, Inc. routers. This feature is said to avoid session loss for systems using time-sensitive protocols.

NetWare support added

Attachmate Corp.'s Extra PC-to-mainframe software will support Novell, Inc.'s NetWare for SAA local-area network-to-host communications platform, the Bellevue, Wash., vendor announced. The support is scheduled to start rolling out early this year.

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Anthes

CONTINUED FROM PAGE 41

National Research and Education Network (NREN), championed in the late 1980s by then-Sen. Albert Gore. The NREN is becoming politically correct by agreeing to serve the needs of real-world people, some of them in kindergarten.

If you chose C, you are in sync with folks such as Steve Wolff at the National Science Foundation, who said, "We feel intuitively that the domestic Internet and the distributed collaboration that it facilitates are rapidly creating a national workplace without walls."

Finally, if you picked D, you share a concept held by Michael Roberts, networking vice president at Educom, an association of colleges. He said telephone companies will have extended fiber to 80% of all neighborhoods by 1995 — without help from the government — in order to meet their own cost and service goals.

Then, Roberts said, users in homes and offices could get broadband digital access via smart hubs in the neighborhood connected to existing wires from the local cable television company. Or they could tap into the digital infrastructure via an area radio transmitter.

In the early days, the infrastructure was seen as solving the so-called "grand challenges" in science. In the latest twist, the emphasis has shifted to economic goals, specifically job creation. It is these shifts in goals and priorities that make it hard to say precisely what the infrastructure will look like.

So let's turn to another question: Who needs the infrastructure? It is nice to know your third-grader will be able to download all the works of Shakespeare from the Library of Congress in less time than it takes her to find Stratford-on-Avon on a map, but what is in it for us corporate types?

The Electronic Frontier Foundation (EFF) argues for deployment of ISDN as a relatively quick, inexpensive step on the way to fiber optics, with the first step already having been taken by many companies.

That is just the thing for telecommuting. Under the Clean Air Act, employers in Los Angeles, New York and six other cities must reduce car commuting by 25%. Calling ISDN a "LAN extender," the EFF said it would let workers at home access E-mail, applications and files with only slightly slower response times than they get at the office.

Craig Fields, head of the Microelectronics and Computer Technology Corp. (MCC), points out that a number of large companies have lowered costs and improved quality by building their own data superhighways linking their operations with suppliers and customers. A national public infrastructure would offer the same benefits to smaller companies and would create jobs, he said.

For Fields, it is more than just a nifty concept. The MCC has established the Enterprise Integration Network (EINet), which it calls "the first national internetwork infrastructure for business." EINet is a layer of services — so far including directory services, security features, E-mail and electronic remittance — on top of the commercial Internet services of UUNet Technologies, Inc.

What makes EINet attractive is that it provides a standard for interconnection between companies, which is essential as a cost-saving measure for smaller firms.

It is too early to judge the success of EINet, but it and similar services suggest that the information infrastructure — at least for commercial users — could evolve from the ad hoc growth of the Internet rather than from some grand strategy from some segment of the communications and computer industries.

Anthes is *Computerworld*'s senior correspondent in Washington, D.C.

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- Evolving Network Architecture
- The Services Industry Gold Rush
- Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems

- Tomorrow's Trends in the PC Systems Market
- PC Software Confronts the Enterprise
- Messaging and Advanced Group Applications
- Channel Management in the 90s

Track 3 - Winning the Midrange Wars

- Rightsizing for Technical Computing
- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with NT Looms
- Midrange Contenders

Track 4 - Networking

- Customer Directions: Managing Network Investments
- Network Applications: Mobile, Data Warehousing, and Another Dimension
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- The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets

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Stuck between IBM and a hard place?

By Johanna Ambrosio

In this time of transition for the entire computer industry, nothing is certain anymore — not even IBM's once-vaunted reputation for providing superior technical support and service. Although many mainframe customers say things are still fine on the support front, others report some glitches, which they are handling in different ways.

What is a customer in the midst of a technical crisis to do?

IBM still has an impressive array of technical talent in its ranks, most observers said, but the early retirement programs have taken their toll. It is not always easy to find the person who is most knowledgeable in a specific technical arena, customers said. This situation will likely be worsened by the continued thinning of the IBM employee ranks, which will decrease by 25,000 people this year, and by a heightened internal sense of chaos following the recent resignation of IBM Chairman John Akers.

Some customers are faring better than others. Rino Bergonci, vice president at United Parcel Service, Inc. in Mahwah, N.J., said, "We have an account team here with specialists in different technical areas. Their purpose is to support us, no matter how IBM is set up internally, and they do. I'm pretty sheltered from all the changes going on."

Others are not as lucky. Jonathon Palmer, chief information officer at Barnett Banks, Inc. in Jacksonville, Fla., said, "There has been a dilution of technical talent in the company. I've witnessed this not only here in Jacksonville but at other companies in other locations."

So what is a customer in the midst of a technical crisis to do? A couple of techniques have been used effectively by some customers. If you have tried the usual channels and a reasonable amount of time has passed without a response, call the local sales office or your sales team and demand to speak to the person in charge. Presumably, that person should be able to cut through some of the internal red tape and at least tell you where to call to locate the technical gurus in a specific subject.

After the crisis — depending on the severity of the outage — notify your management that there has

IBM, *page 48*

Big Blue support report card

How is IBM support and service faring in large shops?

- Rino Bergonci, vice president at United Parcel Service in Mahwah, N.J. "Things are just fine."
- Jonathan Palmer, CIO at Barnett Banks in Jacksonville, Fla.: "There has been a dilution of technical talent in the company."
- Joseph Giannetti, commissioner of the Computer and Data Communications Services Agency for the city of New York: "I wouldn't say the impact has been devastating, but there has been significant change. People have to make more phone calls, ask more questions." He has used IBM's Information Network to cut through some of the telephone tag.
- Al Smith, deputy director at the Tools Data Center in Sacramento, Calif., the state of California's largest data center: "A lot of their better people have left over the last several years and have taken jobs with other companies or consulting groups. Some of them do work for us on a consulting basis."
- Irwin Bernstein, vice president of planning and administration at Maidenform, Inc. in Bayonne, N.J.: "I've been dealing with IBM since 1969. Back then they were mother — you'd go to them for everything: hardware, software, chicken soup, Band-Aids — everything. Now the world has changed."

Looking ahead

Unisys outlines Unix strategies for 1993

By Thomas Hoffman

Unisys Corp. executives recently outlined the company's Unix strategies and product plans for the year ahead, which users and analysts have praised for meeting the demands of the open systems market.

"What makes the Unisys strategy exciting is it's the right products at the right time," noted Rikki Kirzner, principal analyst at Dataquest, Inc., a San Jose, Calif., market research firm (see story, page 26).

Unisys plans to roll out the following products in the coming year:

- A mainframe transaction processing monitor designed to downsize IBM CICS applications to Unix. Slated for April delivery.
- A port of the CA-Unicenter systems management tool kit onto the Unisys U 6000 Unix-based servers, which Unisys is negotiating with Computer Associates International, Inc. for the spring.
- Late 1993 delivery of a microkernal-based modular operating system technology designed to allow communication among Unix systems as if everything resided on the same machine. The microkernal would also enable users to run MS-DOS 5.0 and IBM's OS/2 2.0 operating systems simultaneously with Unix platforms. The product was developed with French developer Chorus Systems.
- Plans to provide Novell, Inc./Unix System Laboratories, Inc.'s (USL) UnixWare on the U 6000 servers in April.
- Use of Intel Corp.'s Pentium microprocessor in U 6000-

Unix, *page 49*

Data centers must work smarter

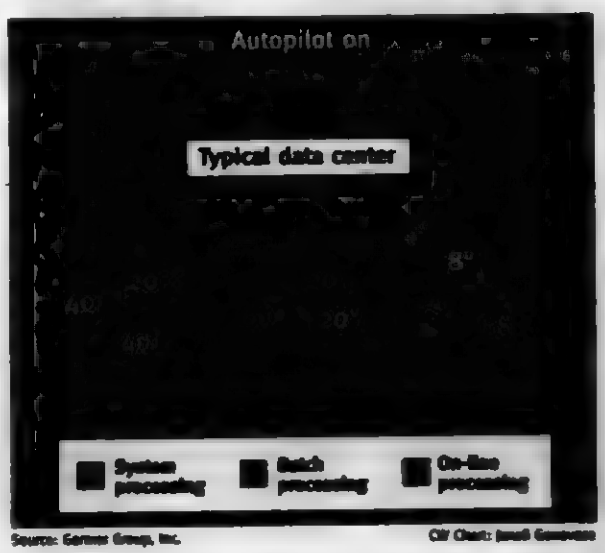
By Kevin Burden

With the demand for information technology growing in the face of budget cuts, the data center's contribution to profits will come not only through consolidation but also through automation, according to a recent report by Computer Technology Research Corp. in Charleston, S.C.

Doing more with less mandates that data centers operate smarter. But this is becoming increasingly difficult as systems with complex technologies continue to make inroads, the report said. Automation tools will allow managers to concentrate more on managing and less on daily operations.

The job of data center manager/network manager "is becoming sort of a hybrid position," report author Barbara Francett said. "As more client/server and distributed systems are implemented, it's going to be the data center manager who will need to become familiar with them."

Francett noted that automating a data center can be demanding in lean budget times: Automated tools can be a heavy investment, and the gains are achieved only over time. This has made consolidation a sensible first step for many firms when they discover that banding several scattered data centers into one can have an instantaneous effect on the bottom line.



Source: Gartner Group, Inc. CW Chart: Jonell Genovese

While consolidation cuts the cost and complexity of running multiple sites with dedicated staffs, it is automation and integrated operations that will help manage increased work loads.

Dealing with employee reactions to the automation news is where data center managers might feel the most challenged. They must reassure those left to work on the project that they will be retrained for more rewarding positions, Francett said.

The study concluded that the future of data center management is not data center operations, but management. The focus will be more on managing the distributed networks and less on running operations.

So while only a few companies may achieve the absolute "lights out, machines running machines" operation, it makes sense to head in that direction anyway, according to the report.

Ross moves ahead with flexible product strategy

By Melinda-Carol Ballou

Ross Systems, Inc., purveyor of accounting, human resource and process manufacturing software, is forging ahead with a strong product set and secure financial results.

Revenue for the company's second fiscal quarter increased 17% over the same period last year, and revenue for the previous six months increased 13%.

The company previously focused its applications on the Digital Equipment Corp. market, but during the past year and a half, the firm has diversified both the range of its products and the platforms on which they run.

Ross has made a series of company acquisitions over the past few years, including that of Pioneer Computer Corp. in 1991 and its Promix process manufacturing software and Gembase fourth-generation language (4GL). In addition, the company has announced support for platforms from Hewlett-Packard Co. This strategy has served Ross well, according to J. Pat Tinley, executive vice president of the company.

A new client/server-based product line, dubbed Renaissance CS, is based from the "ground up" on the Gembase 4GL. This 4GL development environment "gives us database and platform independence," Tinley said.

The environment is also proving to be attractive to users. Gary Klawans, controller at Nobelpharma USA, Inc., a Chicago-based distributor of dental implants, said his firm opted for Renaissance CS because of its 4GL support.

"We wanted the flexibility of a 4GL RDBMS. We took a look at the applications and tools and how they fit together in our environment and were integrated into the Gembase 4GL, and that made the decision for us," Klawans said.

Competitors on scene

A number of accounting vendors, such as PeopleSoft, Inc. and Oracle Corp., have announced client/server implementations, and announcements from others such as The Dodge Group and Dun & Bradstreet Software are imminent.

Ross' announcement of Renaissance CS is therefore timely. The products will also allow processing to be distributed across both the client and the server, according to Claire Gillan, manager of applications at International Data Corp., a research firm in Framingham, Mass.

Server versions are now available for Digital Equipment Corp.'s Open VMS and Ultrix and HP's HP/UX; client support for Apple Computer, Inc.'s Macintosh, Microsoft Corp.'s Windows and the Open Software Foundation's Motif is slated to ship in the fall. Ross will also provide support for HP-MPE/IX, OSF/1 and Windows NT.

And while Ross' financial results for 1992 dipped in the first two quarters, they rebounded as a result of Promix sales in the process manufacturing arena for Unix-based platforms, according to Tinley. He said 43% of Ross' software revenue resulted from Promix licensing revenue.

"Promix has done very well," agreed Peter Kastner, a vice president at Aberdeen Group, a market research firm in Boston. "Promix helped turn Ross' financial results around and gave them a shot in the arm. Not a lot of companies have focused on process engineering. It looks as if [it] is doing very well and has an opportunity to become a big player in the application downsizing market."

Speedy Cray prototype due

Cray Computer Corp. said recently that a working prototype of its Cray-3 had achieved a performance of 2.06 nsec.

The Colorado Springs company was spun off from Minneapolis-based Cray Research, Inc. in 1989 so that Cray founder Seymour Cray might pursue his work on a computer architecture based on gallium arsenide integrated circuits.

Cray Computer reaffirmed last week that a Cray-3 demonstration system will be available to the National Center for Atmospheric Research in Boulder, Colo., by the end of the first quarter.

The initial Cray-3, with four processors, will sell for about $10 million, according to Cray Computer.

—Ellis Booker

Stuck between IBM and a hard place?

CONTINUED FROM PAGE 47

been a problem, ask for a meeting with IBM and ask what assurances IBM will give you so this will not happen again. If your top executives are in the meeting, or at least represented, chances are good that you will get some response.

A midsize IBM customer recently took this tack and received, in writing, information on how IBM was changing its internal structure to meet his technical needs more effectively.

Joseph Giannotti, commissioner of the Computer and Data Communications Services Agency for the city of New York, said he has also seen differences in IBM's service levels. "I wouldn't say the impact has been devastating, but there has been significant change. People have to make more phone calls, ask more questions."

E-mail answers

One thing that has helped with getting effective technical support, Giannotti and others said, is using IBM's Information Network to ask questions electronically and get responses back from technically savvy IBM employees. "This can save days," Giannotti said.

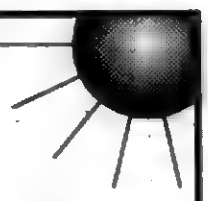
Al Smith, deputy director at the Teale Data Center in Sacramento, Calif., the state of California's largest data center, said he has taken a tried-and-true tack with his IBM field-support team: He hires the better IBMers as consultants. "A lot of their better people have left over the last several years and have taken jobs with other companies or consulting groups," he said. "Some of them do work for us on a consulting basis."

Things will likely get even more confusing for customers as they fight their way through an ever-changing IBM bureaucratic maze. Some long for the good old days.

"I've been dealing with IBM since 1960," said Irwin Bernstein, vice president of planning and administration at Maidenform, Inc. in Bayonne, N.J. "Back then they were mother — you'd go to them for everything: hardware, software, chicken soup, Band-Aids — everything. Now the world has changed."

Senior editor Elisabeth Horwitt, senior correspondent Jean S. Bozman and correspondent Thomas Hoffman contributed to this story.

The sun never sets over CICS...



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In Brief

Unisys wins part of the outsourcing pie

Unisys Corp. has been awarded a piece of the recent $47 million, 10-year outsourcing agreement between IBM's Integrated Systems Solutions Corp. and McDonnell Douglas Corp. Under the agreement, Unisys will provide outsourcing services for Unisys 2200 series mainframe computer systems as well as other services, hardware and software to McDonnell Douglas' aircraft unit in Long Beach, Calif. Unisys will offer jobs to McDonnell Douglas data center staff members who currently operate and maintain some Unisys computer equipment.

VMark Software reports strong quarter

Software vendor VMark Software, Inc. reported a 75% growth in net income to $356,000 and 58% growth in revenue to $5.8 million during the fourth quarter. It also reported annual income of $2.8 million and revenue of $18.8 million, up 61% and 52% respectively, over 1991.

Unisys outlines Unix strategies

CONTINUED FROM PAGE 47

based systems by midyear.

Kirzner and other analysts said they have witnessed a growing demand among IBM CICS users to download mainframe-based applications onto Unix platforms.

"Clearly, the vast majority of Legacy user sites are running applications in CICS," said Kevin O'Neill, vice president of research at the Business Research Group, a Newton, Mass., market research firm. The challenge in migrating CICS applications onto distributed environments such as Unix, O'Neill said, is to convince users that the downloaded applications will be secure and manageable because Unix "has a negative reputation for security and ease of use."

But the planned CA-Unicenter to Unix systems management port for the U 6000 servers should help ease those concerns, O'Neill noted. "CA-Unicenter will help that robustness. It makes an interesting combination," O'Neill added.

Users seemed excited over the planned CA-Unicenter port. "A strong systems management product is needed on these systems, especially as more commercial applications are moved to Unix platforms," noted Fred Komoroski, director of MIS at the Automobile Club of New York in Garden City, N.Y. Last summer, the organization added a U 6000/65 server to its Unisys 2200 mainframe system to support its emergency road service.

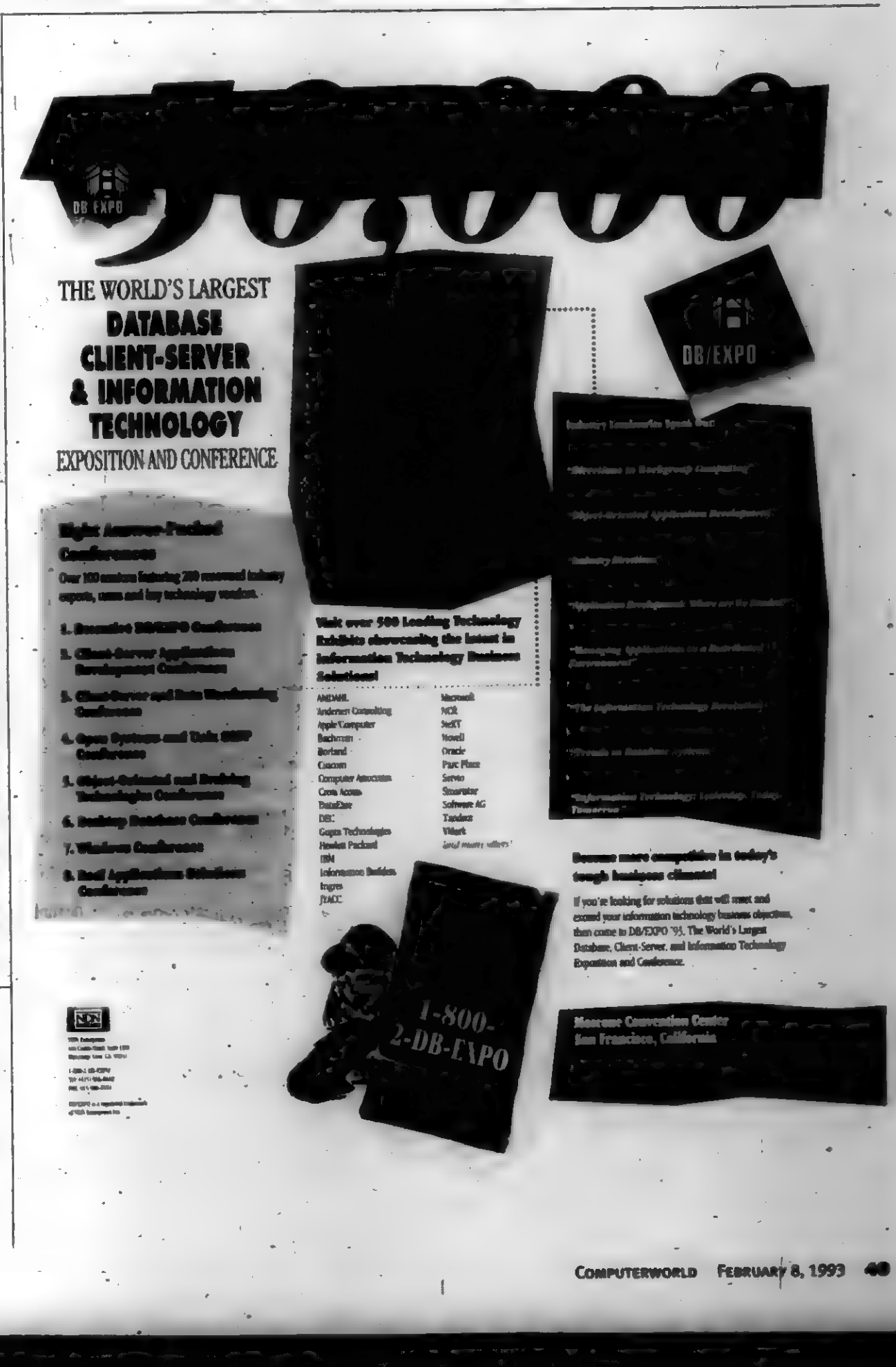
The addition of the U 6000/65 server enabled the auto club to eliminate a 2200/200 mainframe, which helped the organization slash its information systems budget by 15% in annual hardware, software and maintenance costs. The auto club downloads membership information from its 2200/400 mainframe to its U 6000/65 server each day. When customers call in for emergency road service, the system checks the customer database on the U 6000 to verify membership and then examines a Unisys Mapper fourth-generation language database to determine which service station is physically closest to the motorist.

An electronic order is then sent over an X.25 network to the service station, which dispatches a tow truck. Komoroski said the auto club has experienced a six- to seven-times improvement in response time using the U 6000 server.

In fact, Komoroski said the auto club plans to replace its mainframe with more cost-effective servers in the next four years, so Unisys' plans to unveil Pentium-based U 6000 servers fit right into the auto club's strategy. "If you look at what we're doing now with the U 6000/65, the mainframe would cost us two to three times [as much] to run our emergency road service. [Pentium] would make the mainframe almost obsolete."

Joseph G. Brown, vice president of marketing for Unisys' Unix Systems group, said the vendor also plans to adopt the USL/Tivoli Systems, Inc. Distributed Systems Management Framework standards initiative, in addition to announcing its support for the Open Software Foundation's Distributed Computing Environment/Distributed Management Environment framework. "One important thing Unisys has been doing is being a leading implementor of industry standards," Kirzner said.

Glen W. McLean, manager of data processing at American Commercial Barge Line in Jeffersonville, Ind., agreed. "The more standards-oriented [the Unix] area becomes, the easier it's going to become to use multiple solutions," said McLean, whose shop uses a network of U 6000 servers to schedule its fleet.



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Miller finds Paradox brew tasty

Can Division beta-tests Paradox for Windows to track materials orders

By Christopher Lindquist

Reynolds Metals Co. wanted to provide one of its customers, Miller Brewing Co.'s Can Division, with a system that would let it more closely monitor orders for raw materials as part of an expanded quality management program.

But there were two requirements. Miller, based in Reidsville, N.C., had established Borland International, Inc.'s Paradox 3.5 for DOS as a database platform, and the system needed to keep in mind that both Miller and Reynolds were moving toward the Microsoft Corp. Windows environment. That did not leave many choices, according to Brent Kannady, team leader at Reynolds' Mill Products Division, and Rick Losco, team lead supporting manufacturing systems. They soon found themselves on the beta-test program for Borland's recently released Paradox for Windows.

The need for the application came about when Miller asked Reynolds, based in Richmond, Va., to help reduce its inventory of aluminum coils used at the can manufacturing plants and monitor the quality of the aluminum it received. The result was a Paradox for Windows application that let Miller perform tasks including tracking remote, in-transit and in-house inventories; materials forecasting and ordering; and quality control monitoring.

The entire project was completed over the course of six or seven months by Losco, Kannady and two part-time programmers brought in to help with the electronic data interchange (EDI) link to the application. Additional help came from Miller's information systems department and the Can Division.

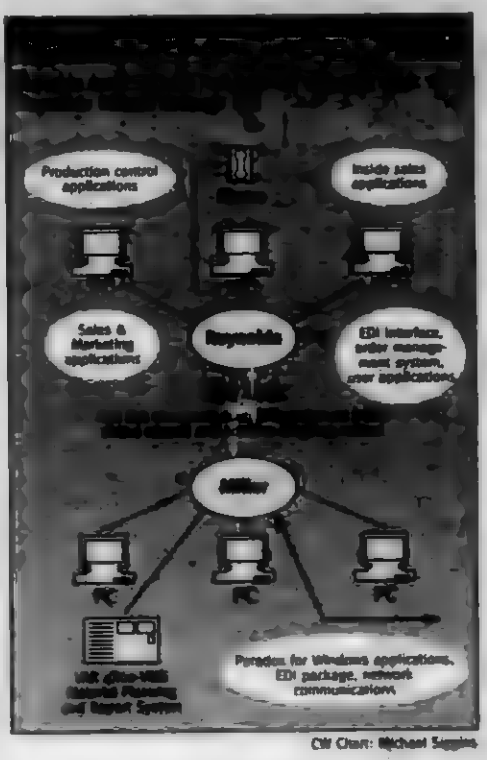
The most important feature the project team found in Paradox for Windows was its ability to efficiently create and modify screens and forms. Kannady would have users critique an interface. Then, because of the product's development tools, he could tell them, "Go back to your desk and it'll be ready in five minutes."

The tools in Paradox for Windows include Object Inspectors that let the developer point at an object and click the right mouse button to bring up a menu of properties that can be modified. The product also includes point-and-click relational table linking.

"We normally spend 20% of our time getting specifications and 80% of our time coding," Kannady said. However, with tools such as those in Paradox for Windows, he said he foresees a time when he will spend 80% of his time being "a good business analyst," with minimal time spent coding.

Another important feature in Paradox for Windows was the ObjectPAL language. ObjectPAL, despite its name, is not the PAL found in Paradox for DOS, and team members said there is a learning curve. The team spent five or six weeks adjusting to the event-driven programming methods used in ObjectPAL. Having crossed that hurdle, however, the power of ObjectPAL became more apparent.

Indeed, one of the part-time programmers who had worked with mainframes told Kannady it appeared ObjectPAL had the flexibility and robustness to do everything common languages can do.



CW Chart: Michael Siggins

The language had sufficient power to write an interface to the EDI translation software and also the flexibility to let the team produce query screens that let users move through relevant data without being exposed directly to Paradox for Windows' Query By Example feature.

The application is running on only two systems at Miller because the team did not want to distribute it until the final version of Paradox for Windows shipped. Plans include moving it to the shop floor so managers can input and view data on aluminum shipments directly.

Kannady said the team is convinced that because it has overcome the learning curve on ObjectPAL, the project could be completed in half the time it took originally. And even in taking six or seven months, Kannady said, the project took about one-fourth as long to finish as similar projects he had seen put together in more traditional languages.

Paradox for Windows is available now for a list price of $139.95.

Distributed objects take step forward

By Garry Ray

The movement toward distributed object computing took another step forward with separate announcements made last week by Hewlett-Packard Co. and Digital Equipment Corp. The companies — both leading contributors to the Object Management Group's (OMG) Common Object Request Broker Architecture (Corba) — made the announcements in conjunction with the Object World conference in Boston.

Corba is an industry-standard mechanism that lets object-oriented tools and applications be integrated across a variety of operating systems, networks and platforms.

An HP spokeswoman said the company had completed a SmallTalk-based application development environment that uses the Corba framework and SmallTalk programming language. Tentatively dubbed HP Distributed SmallTalk, the environment is based on the OMG's Corba framework and ParcPlace Systems, Inc.'s SmallTalk language and VisualWorks development tools, according to HP officials. It will not be released as a product until later this year.

"The environment was developed for internal testing and prototyping," said Mike Matthews, product marketing manager of HP's distributed computing program in Cupertino, Calif. "If we decide it's of the right quality, we might announce as a product later."

But Matthews said the environment had already answered many of HP's questions about the OMG's spec. Using it, he said, HP's distributed computing group had gained practice developing SmallTalk objects within the Corba environment, establishing interfaces among those objects and testing the object services defined by the OMG. "Having the core technology gave us a realistic picture of how things could go wrong in the evolving OMG standards," he said.

DEC also announced that its Application Control Architecture (ACA) Services will be made available for four new operating systems: IBM's AIX, HP's HP/UX, Apple Computer Inc.'s Macintosh System 7 and DEC's OpenVMS AXP. ACA Services — an object request broker that allows software integration across disparate platforms — had been available for DEC's OpenVAX/VMS and Ultrix, Sun Microsystems, Inc.'s SPARCstations and Microsoft Corp.'s Windows.

A foundation architecture for Corba, ACA Services is also a foundation for Hyperdesk Corp.'s HF-DOMS, which will be integrated with Novell, Inc.'s NetWare later this year.

Scott H. Koehler

The scoop on OOP

Despite its popularity, the large-scale use of object-oriented technology is still far from common, particularly in applications that address a company's "business logic."

One of the problems for managers is the choice of an appropriate object-oriented development language. To make that choice clearer, here is an overview of the options that are currently available.

Koehler, page 82

Koehler

CONTINUED FROM PAGE 51

The tool route: The new visual programming tools are often seen as an easy way to introduce personnel to new technologies, as the implementation details are hidden. Unfortunately, these tools can be used as a substitute for learning the object paradigm. And in business logic, they fall short in key areas.

Tool use does not promote the paradigm shift necessary for thinking about enterprisewide objects and their interactions. In many instances, tool-produced applications are recoded for production use, resulting in additional cost. Tools are often limited in functionality.

Tools can be appropriate for part of the solution, such as the user interface, but implementation of the business logic requires use of an object-oriented programming (OOP) language.

Languages: The migration to object technology is not really a language or syntax issue. It is a fundamental change in the way software is developed. To enact that change in the minds of experienced software developers requires a radical break from past methods.

Object Cobol: The primary reasons for support of Object Cobol are the presence of Cobol-based legacy systems and personnel skill sets. Clearly, these are big considerations, but this path will not yield the full benefits of object technology. Providing a familiar syntax and environment will likely encourage program designs and implementations that resemble prior solutions.

Also, Object Cobol is unlikely to be available on multiple platforms soon, prolonging your transition.

SmallTalk: Proponents of SmallTalk say it is a "pure" OOP language. Thus, it is better at forcing the dreaded paradigm shift and is appropriate for many applications. The knock on SmallTalk is that while it is a good prototyping tool, it is inappropriate for large, multideveloper projects or production version systems.

But SmallTalk can be used as a training vehicle to radically alter a developer's surroundings. Even so, it probably won't emerge as the winner in the corporate IS market. The reasons why SmallTalk will not be the winner are precisely the reasons why C++ will be.

C++: Here are some of its benefits:

- While it is not a pure OOP language, C++ is sufficiently different from Cobol to discourage familiar solutions.
- A large, expanding user community ensures increased availability of supporting tools and environments, class libraries, publications, expositions and trained resources.
- There are many C++ compilers on multiple platforms, and the language is compatible with all C-supported architectures via the cfront translator.
- C++ provides a migration path from procedural-based development.
- C++ is efficient and has proven industrial strength.
- C++ offers a good balance between control and productivity.
- C++ is "open," thereby providing an environment that can readily interface with modules written in other languages.

The main drawback to C++ is that it is seen as too low-level and complicated for the average corporate IS programmer. There is some truth to this argument. It is unlikely that you will be able to convert your entire staff into C++ gurus — nor should you want to.

Fortunately, there is a middle ground. One approach is to build an infrastructural layer that insulates the application code from the low-level aspects of the language. Building the infrastructure is not a trivial exercise, however, and it requires the appropriate up-front commitment.

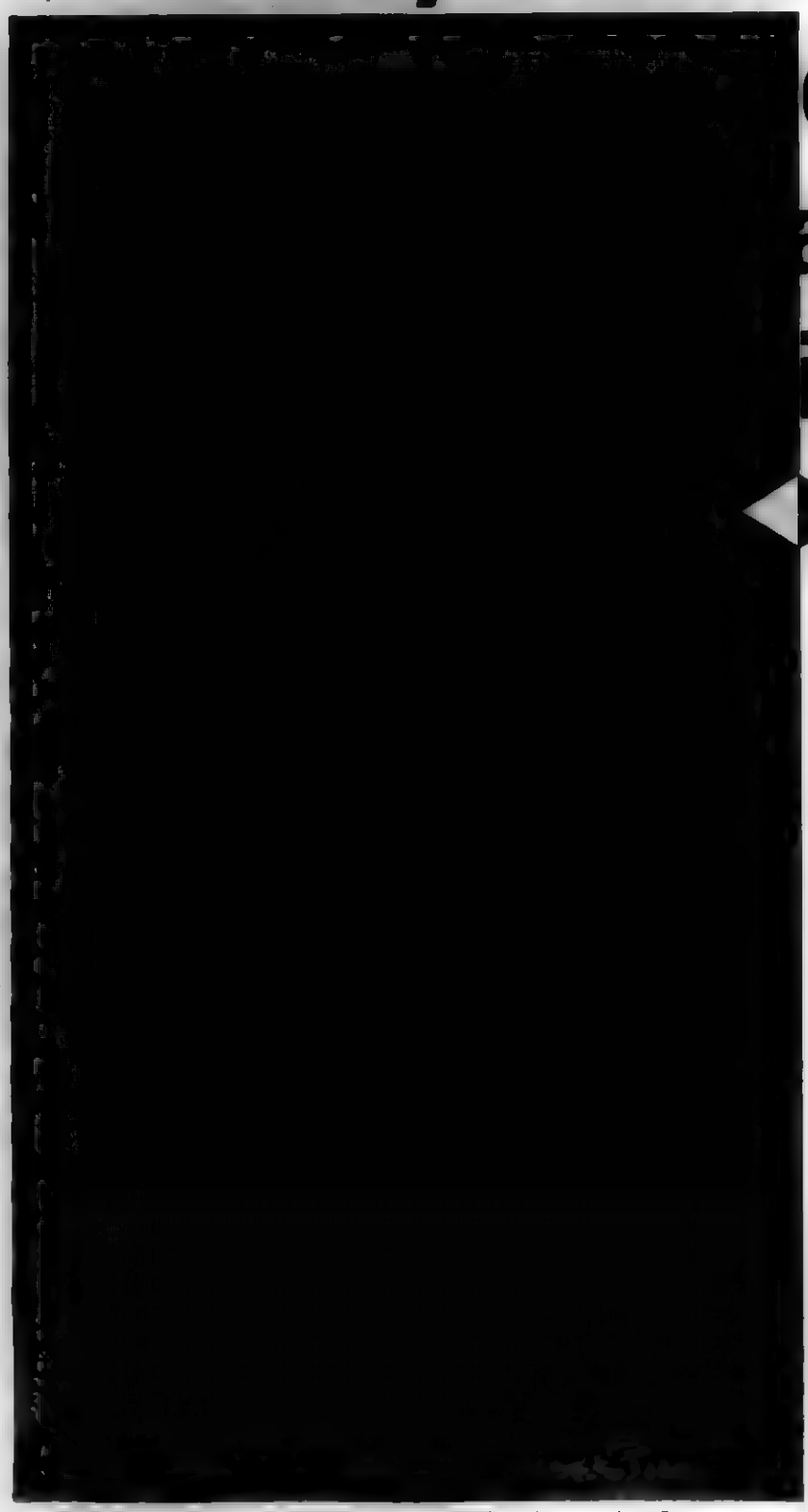
Also, it is unnecessary to use all of the features available in C++. For example, operator overloading is not necessary to achieve desired functionality.

The choice facing corporate IS management is a difficult one. For many, continuation of the present method of software development is undesirable. Object technology offers the promise of improving this situation, but the path to harnessing this new technology is unclear.

Although no option is perfect, C++ offers the best longer term solution for the corporate IS community. Waiting offers no solution.

Koehler is a principal at Koehler Consulting in Holliston, Mass.

The Key to Business



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[redacted]

Computer-aided software engineering

Caseworks, Inc. has announced CASE:PM for CTOS.

The product is a development tool that assists in the construction of graphical user interfaces for Unisys Corp. CTOS user interface applications. CASE:PM for CTOS has the ability to produce the source code needed for an interface, once an interface design is finished. Generated code can be modified to a chosen functionality, and when built, CASE:PM for CTOS applications use the CTOS Microsoft Corp. C 6.1 compiler.

CASE:PM for CTOS costs $2,995 and can be purchased through Unisys or Caseworks.

➤*Caseworks*
Suite 130
1 Dunwoody Park
Atlanta, Ga. 30338
(404) 399-6236

Application development tools

Software Control Corp. has released Hypersource Maintenance.

The product is a static analysis tool designed to reduce the research time spent maintaining Cobol programs. Research tools are provided to simplify the complex interrelationships within the Cobol program and comprehensive analysis capabilities for data, logic and error-related problem finding. Hypersource's analysis engine runs on either the PC or mainframe.

Hypersource costs $1,375 per workstation. For the mainframe analysis version, it costs $20,000, plus an additional $375 per workstation.

➤*Software Control*
Suite 315
2200 Corporate Blvd. N.W.
Boca Raton, Fla. 33431
(407) 998-0415

California Software Products, Inc. has introduced Release 1.3 of Baby 4XX, its RPG 400 software system.

Improved debugging facilities and enhanced physical and logical file support with a JOIN file capability are a few of the highlights provided, according to the company.

The product was designed to downsize IBM's Application System/400 native code from a midrange to a PC, enabling it to be recompiled and used in single-user or multiuser mode or on a network. Running under OS/2, Baby 4XX offers the ability to integrate AS/400 applications with Microsoft Corp.'s Windows, DOS and OS/2 software.

Prices start at $3,500 for an entry-level Development System and $750 for an entry-level Runtime Support System.

➤*California Software Products*
525 N. Cabrillo Park Drive
Santa Ana, Calif. 92701
(714) 973-0440

Compilers

Financial Technologies, Inc. has announced VS/Presto-400.

VS/Presto-400 is said to ease the migration of the Wang/VS applications to the IBM Application System/400. The product consists of three components: a Wang/VS Cobol compiler designed for the AS/400 that lets Wang Cobol code run on the AS/400 by recompiling, which eliminates the need for any conversion of the code; a Procedure tool that converts 90% of Wang Procedures to the AS/400 Control Language; and Wang-to-AS/400 data file conversion.

VS/Presto-400 prices begin at $10,000.

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The Computer Museum's 1993 Computer Bowl: Presented By: The Association for Computing Machinery (ACM): Date: May 14, 1993: Place: The San Jose Convention and Cultural Facilities, San Jose, California: Satellite broadcast to: The Computer Museum, Boston, Massachusetts.

EAST COAST TEAM: Mitchell E. Kertzman, Captain, Powersoft Corporation; John F. Burton, LEGENT Corporation; Neil J. Colvin, Phoenix Technologies Ltd.; Alain J. Hanover, Viewlogic Systems, Inc.; Patricia B. Seybold, Patricia Seybold Group. WEST COAST TEAM: Harry J. Saal, Captain, Network General Corporation; Jean-Louis Gassée, Be Incorporated; Jerry Kaplan, GO Corporation; Michael A. McConnell, SuperMac, Inc.; Lisa G. Thorell, Dataquest Incorporated. "THE EXAMINER," Bill Gates, Microsoft Corporation. JUDGES: Dr. David L. Nelson, Fluent, Inc.; John F. Shoch, Asset Management Company.

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The Computer Bowl

Welcome to THE UNKNOWN ZONE

Don't be afraid of question marks in big system development projects. Instead, court and conquer chaos. Here's how.

By Gary H. Anthes

At first glance, the systems development schedules taped to the walls at the U.S. Patent and Trademark Office are just like those found anywhere in the Washington, D.C., area. But there is a significant difference: These are studded with decision points missing from the project plans of most conventionally managed development efforts.

The decision points, which explicitly state when various questions must be answered and issues resolved, explode "the myth of certainty," says Thomas Giammo, assistant commissioner for information systems.

Large, complex development efforts often flop, Giammo says, because project managers believe — or are forced by organizational cultures to behave as if they believe — that uncertainty can be wrung out of a project at the beginning by doing very careful requirements analyses. "I believe that to be fundamentally erroneous," he says.

Giammo is the driving force behind an emerging body of principles and practices he calls Managed Evolutionary Development (MED).

In the gospel according to MED, if you are embarking on a large development project, you need not, and indeed cannot, resolve all uncertainties and eliminate all risks up front.

Rather, by explicitly recognizing and documenting the unknowns, it is possible to proceed safely with the project while the uncertainties get resolved in a carefully managed way.

Thomas Giammo *of the U.S. Patent and Trademark Office: Exploding the 'myth of certainty' by carefully documenting the unknown*

Denying risks

Rona Stillman, chief scientist at the U.S. General Accounting Office's Information Management and Technology Division, says she has not yet studied the MED methodology. But she says Giammo has put his finger on a fundamental flaw in the way most complex projects are managed.

"On very large projects there is a tendency to deny that risks exist," Stillman says.

"There is a pretense at the front end that you can budget accurately when you cannot, that you can schedule accurately when you cannot. [Developers] treat it as if it is a turn-the-crank task; if you just do it carefully, everything will be OK," she says.

Stillman says the belief stems in part from the erroneous notion that management techniques and tools that work well on small projects also work on large ones. "They do not scale up," she asserts.

Instead, Stillman advises project managers to carefully identify uncertainties up front but not to fool themselves into thinking they can resolve them all right away. "You should say, 'I don't know a lot about this, but here's what I'm going to do to find out and this is when I'm going to do it. Then I'll come back and tell you what the project really looks like.'"

True, there is a potential problem with that approach, Stillman concedes. "In many organizations, the program manager who did that would be punished. He'd lose his project in favor of someone who claimed to have all the answers but who had in fact 'invented' them."

But Giammo argues that that risk, like other project risks, can be managed by MED.

Unknowns, *page 56*

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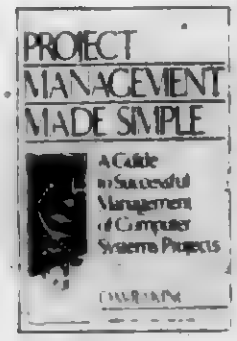
Intelligence Files – Page 57.

Project helpers

These new books can help keep your software projects on track.



Yourdon Press
(201) 592-2000
112 pages
1992
$30

Hands-on cookbook walks the prospective project manager through a step-by-step analysis of a software development project, as well as providing guidelines to managing a project team successfully. Includes checklists, progress reports, questions and answers.

Amacom Books
(800) 538-4762
198 pages
1991
$49.95

General approach covers range from hard technical skills to soft political issues. Readers will learn how to plan a project using five-step models, as well as how to manage schedules, costs and resources and deal with the inevitable changes a large-scale project entails.

Welcome to the unknown zone

CONTINUED FROM PAGE 55

"It allows users, builders and management to all agree that risks are acceptable rather than lying to each other that there are no risks," Giammo says. "Your management will allow you to go forward with uncertainty if they feel you have your arms around it, if you have an explicit plan to deal with it."

Lessons from 'shambles'

Giammo is an ideal crusader for a better way of handling systems development. In more than 30 years as an IS professional, most of it in the federal government, he has seen more than a few systems development fiascos.

One of the earliest was a U.S. Air Force logistics system that crashed and burned in the 1970s after the Air Force had spent a whopping half-billion dollars on it.

"They realized they had to do a process redesign, and they put together a massive team to do it," Giammo recalls. "But it was so huge they couldn't think it through. They couldn't get it started."

The first attempt to overhaul the systems at the Social Security Administration, which began in 1976, fared no better, Giammo says.

"My first task when I came in in 1979 was to kill the project. They had spent millions of dollars and produced nothing. They could never drive it down to a level of detail needed to go forward," he says.

To the rescue

In 1985, Giammo was tapped by the deputy secretary of commerce to rescue a $289-million effort to automate operations at the U.S. Patent and Trademark Office.

"It was a genuine collapse of a very large project, a recognizable shambles," he says. "The problem was it was being managed in a linear fashion. We locked things in that shouldn't have been, and in lockstep we kept producing the wrong things."

"I began to see patterns in these projects," Giammo says. "I thought, 'by and large these are not stupid or slothful people. There must be something stopping them from doing what is expected of them.'"

The fundamental problem, Giammo concludes, was that these huge projects were being managed with techniques more appropriate to an earlier era in which discrete, relatively simple processes, such as payroll or personnel, were automated.

"Now, we are moving up the org chart, we are integrating at higher and higher levels," Giammo says, "to get that degree of certainty implicit in the traditional development methodologies."

Formal plan needed

Yet as compelling as MED's concepts are, Giammo has learned they are not enough; there must be a written framework for implementing them.

"I tried to implement this at [the patent office] two years ago by word of mouth," he says.

"It didn't work. I realized it had to be formalized, written down and taught as a methodology," Giammo adds.

MED was recently codified in a 2-in.-thick draft document by the Software Productivity Consortium in Herndon, Va., and The Mitre Corp. in McLean, Va., under Giammo's direction and drawing on previous work by those organizations.

Rockwell International Corp., a member of the consortium, uses a similar methodology in developing complex communications software. Art Gemmer, a software process engineer at Rockwell, says the key to the method lies in formal, organizationwide methods for identifying and analyzing risks.

"In the past, it was up to the project leaders to identify risk based on their experience and perception of the situation, so you were really at the mercy of whatever their experiences and perceptions were," he says. "And the alligator that was closest to you was the one you worried about the most. You didn't look at the other gators in the swamp, even though they were bigger and meaner."

Growing interest

Although Giammo seems to have pushed the concepts further than anyone else in the government, his is hardly a voice crying in the wilderness.

Testifying last month at a Senate hearing on "high-risk areas" in government management, U.S. Comptroller General Charles A. Bowsher said, "The demand for certainty in the system development process leads project managers to downplay risks and problems, resulting in missed benefits and misspent money."

He called on federal agencies and Congress to experiment with new ways of deploying information technology.

Plus, a new "Life Cycle Management Guideline" was published in December by the U.S. Department of Commerce's Office of Information Resources Management.

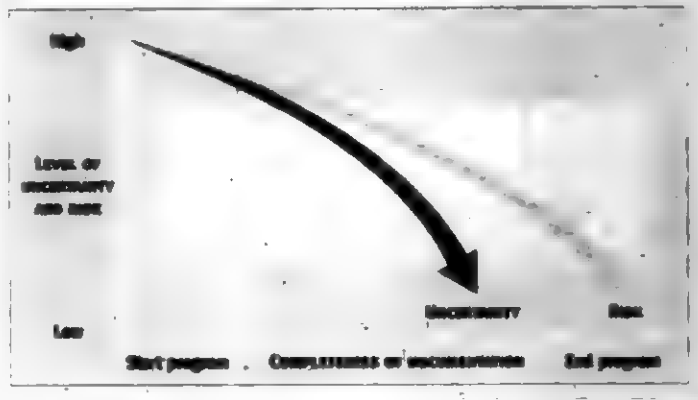
The new guideline supplements the "traditional approach" with an "evolutionary approach" to life-cycle systems management. According to the guide, the traditional method is OK for dealing with problems of complexity but not of uncertainty.

Giammo has not been impressed with the federal government's campaign to move away from "grand-design" megaprojects by breaking them into smaller, less risky chunks.

"Obviously things that are big and complicated are hard to do," Giammo says. "The alternative of breaking them down into tiny chips and doing them individually is easier to manage, but what have you got? A lot of random things happening."

Good documentation equals peace

As documentation becomes more complete toward a project's end, uncertainty and risk diminish



Source: U.S. Patent Office

CW Chart: Tom Monahan

Executive Track

Robert Hans, head of information systems at **Federal Home Loan Bank of New York**, has been promoted to the position of senior vice president at the Manhattan-based financial institution. For Hans, 43, the new title caps two decades of service to the bank.

It also proved itself a fruitful career path for the bank's new chief operating officer. Although he worked his way up through the bank's executive ranks in economics and finance, **Harold Fletcher**, who was recently named executive vice president and COO, joined Federal Home Loan in 1973 as a night computer operator.

Bruce L. Haddan has been named assistant vice president of systems at **Norfolk Southern Corp.**'s Transportation Logistics Division. Haddan, who joined the Norfolk, Va.-based railroad company in 1975, is headquartered in Fort Wayne, Ind.

Colin Laughlin is the new assistant vice president of computer information services at Canada's **North West Trust Co.** The Edmonton, Alberta-based financial institution is currently in the midst of developing its own PC-based client/server banking system.

Leading the charge will be among the highest priorities for Laughlin, who formerly served as systems development manager at Shell South Africa.

In Herndon, Va., **The National Automated Clearing House Association** has elected **Sam S. Cerverizzo** as the chairman of the board of directors.

Cerverizzo has served on the board for four years as representative of Chemical Banking Corp., where he is currently a senior vice president and the business manager of collection and disbursement services for the bank's Geoserve cash management division.

He is responsible for product management, operations, customer service and technology that serves some 5,000 clients.

Cerverizzo will start his two-year stint at the head of the board in June, replacing outgoing Chairman **Michael W. Paulette**.

Have you, or a colleague in the information systems field, recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at 1-800-343-6474 to pass the news along.

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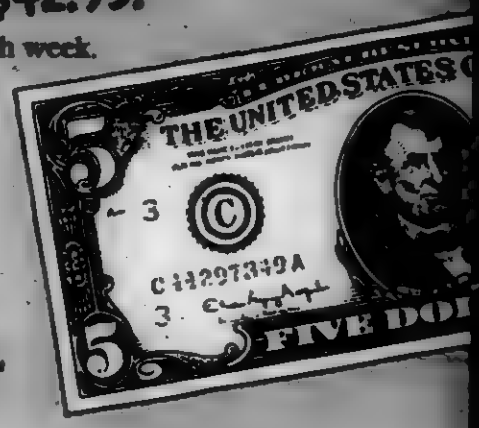

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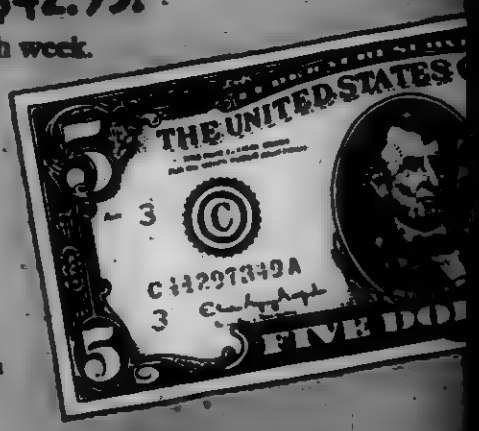

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   - 20. Finance/Insurance/Real Estate
   - 30. Medical/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government -State/Federal/Local
   - 65. Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Dist./Retailer
   - 95. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   - 10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
   - 28. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Programming Management, Software Developers
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   CORPORATE MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer

   DEPARTMENTAL MANAGEMENT
   - 51. Sales & Mktg. Management
   - 70. Medical, Legal, Accounting Mgt.

   OTHER PROFESSIONAL MANAGEMENT
   - 80. Educator, Journalists, Librarians, Students
   - 90. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/information systems/data processing/communications systems?

   (Please check only one)

   ☐ YES ☐ NO

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Technical briefing

How MED works . . .

Managed Evolutionary Development (MED) is intended to overcome some of the shortcomings inherent in conventional life-cycle development models. In MED, all system documentation is written in draft form at the beginning of the project. Uncertainties, which take the form of gaps in the documents, are carefully noted and recorded in a process called "deficiency analysis." The same documentation is reviewed periodically and used for the whole project.

The project is allowed to proceed as long as deficiencies do not prevent the formulation of rough cost estimates and schedules. Draft documentation is updated as uncertainties are resolved and as pieces of the system are developed.

Project management specialists lay out a blueprint for resolving the deficiencies, taking special care to note when each must be resolved. All deficiency correction efforts must be explicitly scheduled and staffed, and no part of the system may be developed until only "tactical" uncertainties, such as report format details, remain.

A "system boundaries document," one of five basic documents that define the organization's "target vision," receives special emphasis in MED. It says what the system will and will not do and is intended to curtail project killers such as "gold plating" and "requirements creep."

The document can be likened to the U.S. Constitution, the overarching arbiter of all that is and is not permitted. It can be used by either user or development organizations to enforce adherence to project scope. Any significant changes must be approved by the highest levels of management. — *Gary H. Anthes*

. . . compared with other approaches

MED is an evolutionary step up from several popular approaches to life-cycle development.

Many models are variations of the so-called "waterfall" approach. Under this model, projects are divided into discrete, linear phases, with work in process flowing from one phase to the next. The model assumes that all uncertainties in one phase are resolved before the next is begun.

Critics, however, say this is inappropriate in projects with high degrees of complexity, risk and uncertainty. "The waterfall model is risk-averse," says Rona Stillman, a computer scientist at the U.S. General Accounting Office. "It encourages unrealistic cost and schedule estimates and the appearance of problem-free development."

In contrast, MED assumes a project that spans organizational boundaries in an information-intensive organization. Its successful use requires the organization to incorporate business-process re-engineering — a task omitted from most conventional development models.

Supporters say approaches that attempt to address risk as an integral part of the methodology — such as the so-called "spiral model" — either have no clearly defined method for resolving risk or fail to establish a clear, fixed system boundary.

"MED is an attempt to combine the best of what the spiral model has and the best of the waterfall approach," says Paul Gonzalez, a department head at The Mitre Corp. "People have thought of all of these things before, but it is the first time that it's been codified into a unified approach."

— *Gary H. Anthes*

Conferences

The Kerzner Approach to Project Management: A systems approach to planning, scheduling and controlling
April 7-8, Boston
(800) 325-1583; (212) 900-0577

This cross-disciplinary conference presents front-line lessons from major corporations. The focus is on getting line managers, project managers and senior managers to work together.

The two-day curriculum covers organizational structures, building teams, defining authority, leadership, concurrent engineering, communicating with managers and customers, costing and more.

Instructor Harold Kerzner is head of the Project Management/Systems Management and Research Center at Baldwin-Wallace College.

Software Project Management
The Center for Software Development
March 9-12, July 26-29, Boston
(800) 732-3593, ext. 255

This course covers all aspects of project management in software development. The emphasis is on mastering tools and techniques to produce accurate, reliable project plans. It is aimed at managers of large projects or multiple small projects.

The instructor, William R. Duncan, is director of standards at the Project Management Institute.

Also of interest are the following:
The Software Development Exhibition and Conference '93. Santa Clara, Calif., Feb. 22-26. Call (214) 245-6012.
Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25. Call (301) 718-1288.
First Workshop on Object-Oriented Design '93. Snowbird, Utah, March 8-10. Call (414) 769-6256.
The Ninth International Conference on Engineering Information Systems. Fort Lauderdale, Fla., March 24-26. Call (617) 232-3090.

Intelligence Files

Graphic evidence

The legal profession is on the brink of a major evolution in courtroom evidence: the routine use of computer graphics as an instrument of persuasion. The value of demonstrative evidence to help jurors understand complex issues has long been recognized by experienced trial lawyers, but until recently it has been primarily limited to hand-drawn charts, graphs and diagrams. With the cost and complexity of computer graphics plummeting, presentations that once took months to create can now be done in days or hours.

Source: *ABA Journal*, December 1992. Roy Krieger, author.

Hacking from abroad

During the Persian Gulf war, hackers from the Netherlands were able to penetrate U.S. Department of Defense computers. Although the hackers were identified and their intrusions violated U.S. law, they were not prosecuted because the Netherlands have no laws against computer hacking.

The stark lesson for businesses and government agencies is that domestic laws neither deter nor punish international hackers. Companies should cast aside the foolish notion that government action will protect them from foreign hackers and concentrate on developing and maintaining operational security.

Source: "Hacking from Abroad," a draft paper by Joseph Williams at Colorado State University.

R_x for health care costs

Doctors who use computers instead of paper to order drugs and tests for hospital patients significantly reduce their patients' medical costs, researchers at Indiana University say.

In a study of physicans' treatment of roughly 5,000 patients at an Indianapolis hospital, researchers found that charges for patients treated by computer-using doctors were nearly 13% lower per hospital admission than charges for patients treated by doctors who used manual billing techniques. The findings bolster claims that more aggressive use of computers can reduce waste and inefficiency in the health care system.

Source: "Computers helping doctors match care with costs can lower bills, study says," *The Wall Street Journal*, Jan. 20, 1993. Ron Winslow, author.

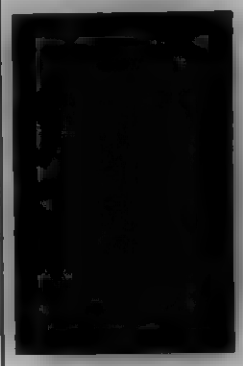
Bureaucracy busting

One reason corporate bureaucracies blossom is that, in the name of efficiency, companies create centralized departments to handle tasks such as photocopying and fleet management. The problem is that these departments focus on their own narrow function, regardless of how it affects the total business mission or customers.

To bust the bureaucracy, disband these functional departments and redeploy the people into line units where they will be mission-driven. Some units to consider for dispersal: purchasing, personnel, fleet, copying, training and information systems.

Source: *Busting Bureaucracy* by Kenneth Johnston, published by Business One Irwin, 1992.

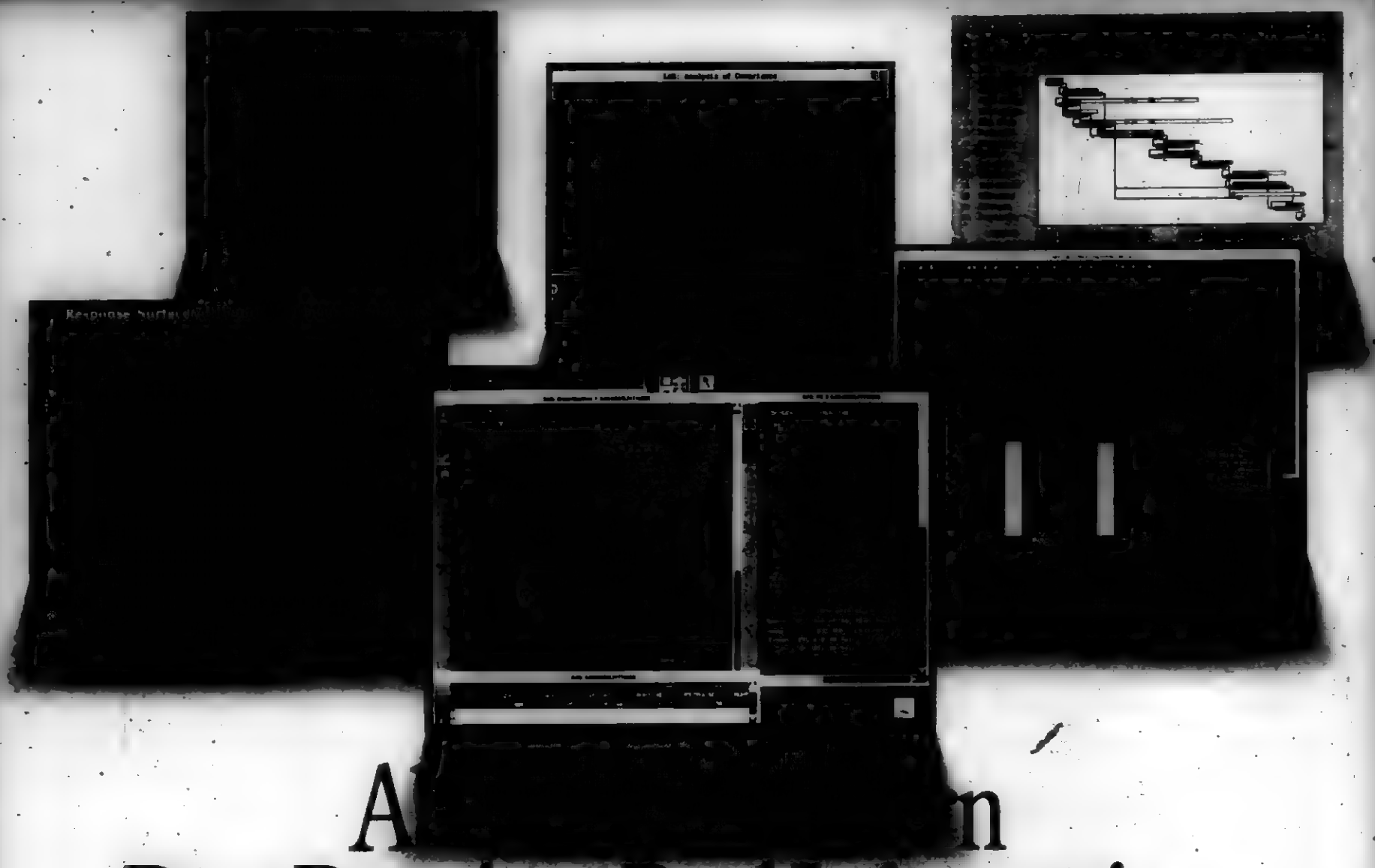
Project helpers (continued)



John Wiley & Sons, Inc.
(212) 850-6000
287 pages
1993
$42.95
Applies total quality management principles to software; provides seven basic tools, including checksheet, Pareto charts, control charts.

Bantam Books
(212) 765-6500
320 pages
1992
$49.95
An invaluable guide to maintaining high data quality *after* systems are built.

Dorset House Publishing
(212) 620-4053
226 pages
1991
$28.95
Not strictly hands-on but raises provocative questions about the long-term effects of software development, including possible payoffs and pitfalls.



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RDBMS for Client/Server:

They don't quite measure up

By Richard Finkelstein

For the most part, relational database servers have done a good job of supporting client/server applications. Many organizations have migrated mainframe and network applications to client/server environments, and some have even rightsized mission-critical applications with great success. Chevron Canada, for example, replaced its mission-critical mainframe systems with PC-based client/server applications.

Most typical, though, are organizations deploying small departmental systems with low transaction volumes or decision support systems that read the database but do not update it. Applications supporting a large number of users or ones handling a large volume of transactions are more difficult to implement; consequently, there are very few real-life cases where this has occurred.

All in all, experiences with this environment have been varied, and not all attempts have achieved their initial goals.

One important reason for this is the quality and reliability of database server products. Vendors, in their rush to beat the competition to the market, frequently release products before they are properly tested. It is, unfortunately, all too common for a vendor to promise a product that either never materializes (evaporated-ware?) or is many years late. This plays havoc with project schedules.

Relational database management system servers are not as mature as mainframe RDBMSs, which have superior monitoring, auditing and performance-tuning tools. Transaction processing (TP) monitors such as IBM's CICS are commonly used with mainframe RDBMSs for better transaction control and recovery. On the other hand, TP monitors are rarely used on minis and PCs, although recent interest in TP monitors may change this situation.

Excessively high user expectations, often fueled by vendor hype, have caused some organizations to embark on large and critical client/server projects before the organization has been sufficiently prepared for these types of applications. The cost of deployment is frequently way underestimated. Part of this cost is the unpredictability and instability of client/server software.

But it's not all the fault of the databases. PC networks contribute to the chronic instability of this environment. The fact that thousands of component parts are supplied by hundreds of vendors leads to unpredictable software or hardware problems, which are almost impossible to trace and resolve. Another reason is the unreliable operating system platforms such as Microsoft Corp.'s Windows and Novell, Inc.'s NetWare, which were designed without proper application protection. System crashes on these platforms are frequent and inevitable.

Client/server development and RDBMS servers are still in an embryonic stage. The situation is analogous to the transition that took place when organizations moved from batch-oriented to on-line applications in the '70s and '80s. While many in the 1970s predicted swift movement from sequential batch files to on-line DBMSs, it actually took more than a decade before a significant number of applications were running on-line.

Migration to client/server will also take time, but now is the time to start. •

Finkelstein is president of Performance Computing, Inc., a DBMS consulting firm in Chicago.

INSIDE:

RDBMSs for client/server configurations have their weaknesses. Page 60. But the major database vendors are adding essential features to master the challenges of this environment. Page 63. There are also major differences among available RDBMSs and the front-end tools that work with them. Pages 60 and 64.

Despite these issues, users surveyed in Buyers' Scorecard give high marks to the market-leading Unix RDBMS they have installed. Page 62. Early users of Gupta Corp.'s SQLBase 5.1 also say the product meets their expectations. Page 65.

RDBMS for Client/Server

No two are alike

As database servers become more varied, users would do well to check out several requirements

What servers need

Two universal areas of weakness that must be addressed by RDBMS vendors to make mission-critical client/server applications a reality for mainstream customers:

Locking: Certain RDBMSs, especially Sybase and Oracle, depend on programmers and end users to correctly lock data records and check for data consistency in their programs. This is a major divergence from mainframe RDBMSs. The problem in client/server environments is that locking creates a lot of network overhead and negatively impacts performance and response time. But ignoring data integrity to achieve better response time is a dangerous path.

Administration: Client/server database servers are lacking good monitoring and administration tools. It is difficult to tune systems because there is not much information about resource utilization and transaction bottlenecks. In this area, products such as Digital Equipment Corp.'s RDB/VMS and IBM's DB2 are far ahead of mini and

By Richard Finkelstein

Some people say database servers have become so much alike, they have become "commodities." Actuality, nothing could be further from the truth. The manner in which a database server implements a set of functions can make a huge difference in the cost and time requirements for a client/server project.

Database servers are actually becoming *more* dissimilar, as competitive pressures force relational database management systems vendors to try adding more advanced features into their products. Following are some major purchase requirements that you should check into.

Performance

IT IS VERY DIFFICULT to accurately judge the performance of an RDBMS in a client/server environment because there are so many variables. The standard Transaction Processing Council (TPC) benchmarks are too simple to provide much help.

With the cooperation of hardware vendors, RDBMS vendors have learned to tune their engines so that they record high benchmarks of hundreds of transactions per second, when actually they can barely achieve a fraction of this number.

So how does one judge RDBMS performance? One way is to talk to other users who have implemented applications similar to the ones you hope to build. Some database servers have excellent resource utilization so that they can handle a large number of users or complex transactions. Sybase, Inc. pioneered the concept of a single-process multithreaded architecture, which appears to make the best use of available memory and CPU resources. The same method has been adopted by The ASK Group, Inc. with Ingres and Gupta Corp. with SQLBase.

Other RDBMSs are more resource-hungry. Oracle Corp., for instance, uses a process/user architecture that tends to use more resources than the single process/multithreaded architecture. Oracle 7 is supposed to address this problem with "shared SQL" capabilities and a new transaction dispatcher mechanism. But the new dispatcher architecture will be disabled until SQLnet 2.0 is released for Oracle.

Another way to judge performance is to run a limited benchmark using a prototype. This does not always provide accurate predictions of real-life behavior, but it will be of a magnitude better than the vendor-supplied TPC numbers.

Because benchmarks cannot simulate real-life work loads, it is best to give yourself a nice margin of error by halving the prototype benchmark and using that number as the expected level of performance. When running the benchmark, make sure the network is reasonably exercised because overhead often becomes the performance bottleneck.

Reliability

THE RELIABILITY of database servers varies from platform to platform, depending on how important a particular platform is to the vendor. When a vendor claims to support dozens of platforms, many of these platforms are likely running older and poorly maintained versions of the RDBMS.

Under OS/2, Microsoft Corp./Sybase's SQL Server still uses a 16-bit architecture and is at Release Level 4.2, even though on many of its Unix platforms, Sybase has 32-bit versions at Release Level 4.9.

Similarly, Oracle announced Oracle 7 in 1989 yet only last month released part of it on VAX/VMS. It still has not announced general availability dates for Oracle 7 on any of its other platforms. ASK and Informix Corp. are selling ancient PC versions of their databases.

Development productivity

ONE WAY TO SPEED application development is to use specialized software for building different parts of a system. Sybase and Oracle have the largest number of third-party front-end tools, but database servers such as Borland International, Inc.'s Interbase and Empress Software, Inc.'s Empress have very strong tools for developing applications that manage complex data.

ASK's Ingres database sports a highly integrated tool set that includes a graphical user interface development environment that is portable across many platforms. Progress Software Corp.'s Progress is another database server with a highly integrated tool set that is favored by many value-added resellers because of its reliability.

Each server has a unique set of application interface functions. SQL Server and Gupta's SQLBase support backward and forward row fetches. Oracle has a special SQL function that can be used to decode table values and explode tables for assembly/subassembly types of problems.

For its part, XDB Systems, Inc.'s XDB closely replicates IBM DB2's SQL syntax and behavior so that programmers used to building DB2 applications will be able to easily transfer their knowledge to XDB.

RDBMS AND CLIENT/SERVER

OF 200 RESPONDENTS, MOST ARE AT LEAST EXPERIMENTING WITH THEIR RDBMS IN A CLIENT/SERVER ENVIRONMENT

YES:	57%
NO:	41%
DON'T KNOW:	2%

(PERCENT OF RESPONDENTS)

Source: Buyers' Scorecard survey

Locking technique

THERE ARE MANY subtle differences between database servers that greatly impact application design. Both Sybase and Oracle use a record-locking scheme that requires users to check for changes before updating records. This user-controlled "optimistic" locking method is complex; done improperly, it could lead to a corrupted database.

That is why database servers such as Interbase implement RDBMS-controlled optimistic locking, which guarantees that no transaction will overlay the updates of another.

Other products, such as Informix, Ingres and IBM's Database Manager, implement a more traditional, "pessimistic" locking method, where records are locked as soon as they are retrieved.

Gupta's SQLBase provides users with the option to use user-controlled optimistic locking or RDBMS-controlled pessimistic locking.

. . . . . .

EACH DATABASE SERVER has its own individual characteristics that make it more or less suitable for a given application. Even if two look very much alike, there are often major differences in the way features have been implemented.

It is therefore very important to talk to current users to better understand the nuances of a given feature implementation. Understand the database server before you make monetary commitments. •

...micro database servers. Database recovery is also far better automated and reliable on the mainframe.

Transaction management: Transaction managers recover transaction message queues, deliver finer levels of security, support multisite updates and let the systems administrator assign transaction priorities. Without these controls, it is very difficult to provide predictable response time and reliable transaction processing (TP). In the future, TP monitors have to be better integrated into the client/server applications on minis and micros if these applications hope to approach the reliability of the mainframe environment.

Query optimization: Database servers also have to do a better job of processing queries that read large tables or join many tables together. Most database server query optimizers are still sluggish and not very intelligent in how they process data. Consequently, users have to spend substantial time and money to manually optimize SQL retrieval commands. Large query processing has always been a problem with RDBMSs. The problem is magnified by the difficulty of writing an RDBMS that can optimize queries across a wide breadth of applications and on a wide variety of hardware and software platforms.

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RDBMS for Client/Server

Buyers' Scorecard: Unix RDBMS market leaders engaged in heated battle

By Derek Slater

They may not be fully optimized for true client/server computing yet, but leading Unix relational databases boast a fairly satisfied user base.

Buyers' Scorecard respondents — roughly 60% of them reporting some form of client/server implementation — rated the four relational database management systems vendors within four points of one another.

Oracle Corp.'s Oracle and Sybase, Inc.'s Sybase RDBMSs finished with equal scores of 72, with Informix Corp.'s Informix-OnLine at their heels with 71. The ASK Group, Inc.'s Ingres RDBMS earned a 68 overall.

Oracle took the highest score in the three categories most important to users: quality of vendor support, responsiveness of vendor service and support for standard SQL. Users also said they liked Oracle's analysis and reporting tools.

However, as with all the other products surveyed, Oracle's application development tools were found lacking by users. Most of the respondents said they use third-party development tools in addition to the RDBMS tool sets.

Sybase users said they like the product's speed and efficiency. Sybase earned the top score in performance in on-line transaction processing, finishing just ahead of Informix-OnLine in user satisfaction in that area. Sybase also scored well in its ability to handle complex tables and processing requests. In verbatim responses, a number of users cited weak front-end development as the product's biggest weakness.

Informix-OnLine earned consistently solid scores in most of the key categories and shared high-score honors with Oracle in system administration/functionality and system monitoring capability, though users said its error messages are often difficult to understand. Users praised the RDBMS' stability but also said it can be overly complex.

Ingres scored roughly on par with its competitors in the key areas, lagging slightly behind in responsiveness of vendor service. It also received low ratings in security features. However, a number of users said their primary complaints dealt with the vendor's marketing of the RDBMS and its add-ons, as well as the difficulty of integrating Ingres with third-party tools and other databases.

According to research firm Dataquest, Inc., Oracle dominated the open RDBMS market with 47% of all licensing revenue in 1992. That represents a decrease from a 54% share in 1991. Ingres followed with 17% of the 1992 market; Sybase held 13%; and Informix garnered a 12% share. Following the four leaders, there was a big dropoff, with no other firm holding more than 5% of the market.

Dataquest pegged the total open RDBMS market value in 1992 at more than $1.5 billion.

The survey respondents reported a wide range of hardware platforms, including workstations, fault-tolerant servers and small minicomputers. All variations of Unix were accepted in the response base.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their Unix RDBMS in 15 specific categories.

All categories were factored into the final scores. The scores for each relational database product in the seven most important categories are listed in the tables below. (See the methodology on the next page for a description of the scoring process.) •

RDBMSs for Unix

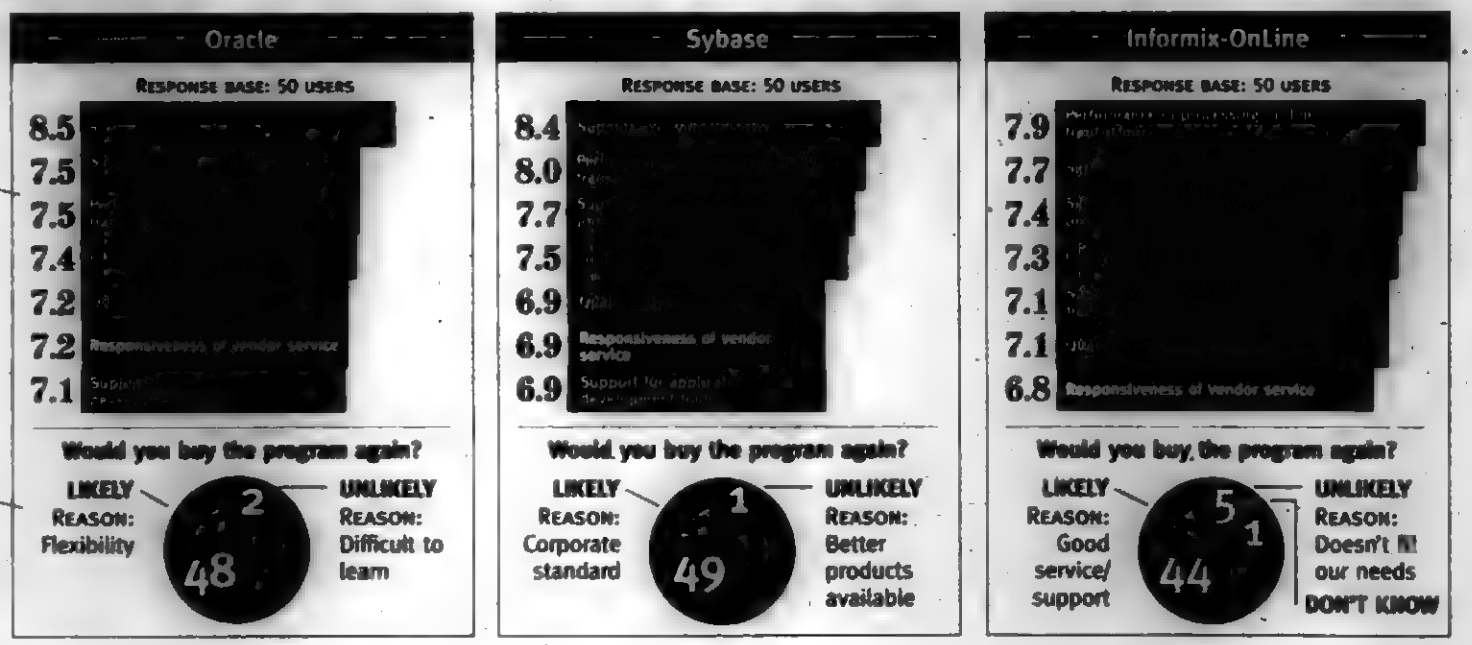
Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 50 users for each product.

TOTAL POSSIBLE SCORE 100 MEAN SCORE 71

PRODUCT	PROS	CONS
Oracle Corp.'s Oracle — SCORE 72	"GOOD TRANSACTION PROCESSING SPEED, AND IT'S AVAILABLE ACROSS MULTIPLE PLATFORMS."	"IT IS SO COMPLEX THAT IT ISN'T EASILY LEARNED."
Sybase, Inc.'s Sybase — SCORE 72	"IT DOES A HIGH NUMBER OF TRANSACTIONS PER SECOND AND HAS A GOOD CLIENT/SERVER ARCHITECTURE."	"SYBASE'S OWN FRONT-END TOOLS ARE LACKING."
Informix Corp.'s Informix-OnLine — SCORE 71	"IT IS EASY TO CREATE SIMPLE APPLICATIONS." "IT'S VERSATILE AND EASY TO USE."	"THERE'S NOT ENOUGH BREADTH OF TOOLS AND PRODUCTS."
The ASK Group, Inc.'s Ingres — SCORE 68	"IT HAS A CLEAN, WELL THOUGHT-OUT DESIGN AND IMPLEMENTATION OF THE DATABASE ENGINE."	"INTERFACES FROM OTHER VENDORS ARE LACKING — INTEGRATION IS A PROBLEM."

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.



RDBMS for Client/Server

Care, feeding for client/server

Database server vendors have done a lot of work to incorporate features specifically for client/server computing. Early on, vendors of these products realized that special functions were needed to support the wide breadth of client applications and users who were going to access database servers.

Triggers

An immediate concern was how to ensure data integrity if users read and updated data from spreadsheets and other decision support tools. None of these tools have any mechanism to edit data or enforce business rules.

Instead of relying on applications to enforce business rules, many database servers have "trigger" mechanisms that automatically and consistently enforce rules.

Triggers are database server-resident procedures that are executed whenever the database is updated. Triggers can edit data, perform calculations, update related data and enforce special database security needs. With triggers implemented, organizations can allow greater database access without fearing loss of data reliability.

Stored procedures

Related to triggers is the concept of stored procedures. Stored procedures are programs that reside in the database server and can be called from any application program. They increase performance by allowing client applications to execute a remote program with a single request to the database server, thereby minimizing network overhead.

Stored procedures also make it easier to share and maintain common application code.

Complex data management

Database servers have also taken the lead in the area of "complex data" management. Long text documents, images, graphics, audio and arrays are examples of complex data that are increasingly being used in PC- and workstation-based applications.

In order to manage complex data, relational databases must support specialized data types such as binary large object (Blob) fields capable of storing up to 2G bytes of data.

It is also necessary to have programming functions that can be used to store, retrieve and manipulate complex data.

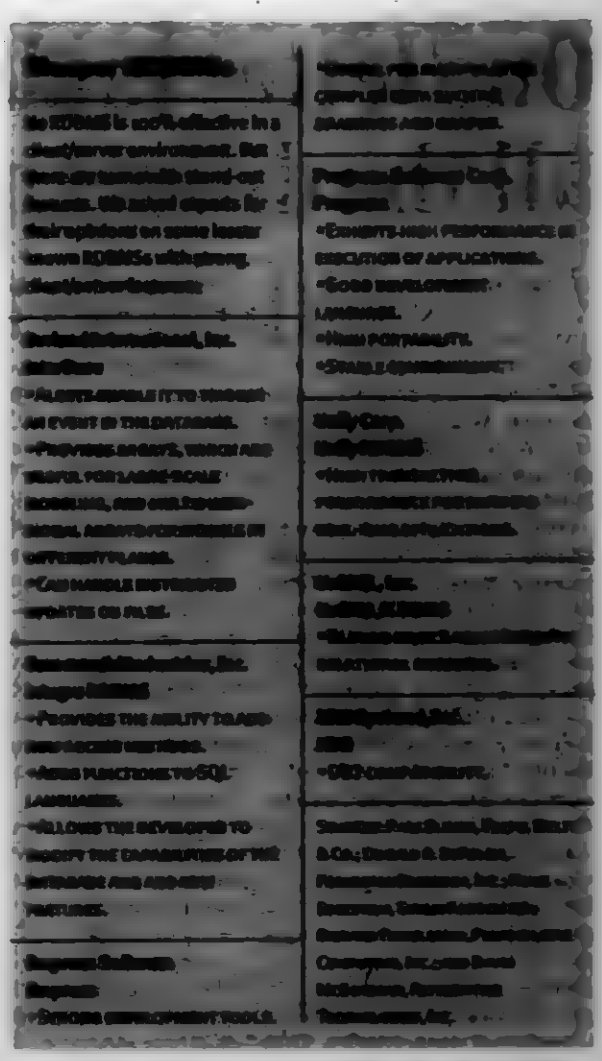
Storage architectures

Furthermore, the database physical storage architecture has to be modified to accommodate very large fields. For example, Sybase, Inc. uses a 4-byte pointer for linking records to Blob data. This helps maintain an organized and high-performance data storage structure.

Products such as InterBase (now owned by Boriand International, Inc.) and Sybase, Inc.'s Sybase included triggers, stored procedures and Blobs.

The ASK Group, Inc. and Informix Corp. subsequently introduced similar capabilities in their products. Most recently, Oracle Corp. has made these features available in Oracle 7.

—Richard Finkelstein



Vital statistics

What is your position?	
CIO/VP/IS director	21
IS manager	34
Operations manager	13
Database administrator	16
Systems analyst	40
Other	76

What is your responsibility for your Unix RDBMS?	
Evaluate or recommend vendors	178
Determine need	157
Select vendors	148
Set standards for your organization	135
Buy for end-user department	98
Approve or authorize purchase	89

How long have you worked with your RDBMS?	
Five or more years	122
3-4 years	44
1-2 years	27
Less than 1 year	7

RESPONSE BASE: 200

Platforms

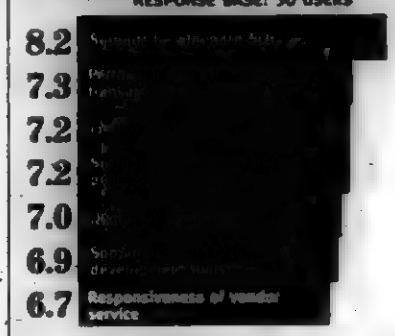
RESPONDENTS REPORT A WIDE VARIETY OF HARDWARE PLATFORMS FOR THEIR UNIX RDBMS:

Unix workstations	57
IBM RS/6000 server	36
Tandem or other fault-tolerant server	17
Sun server	14
AT&T system	14
Other/No answer	103

RESPONSE BASE: 200

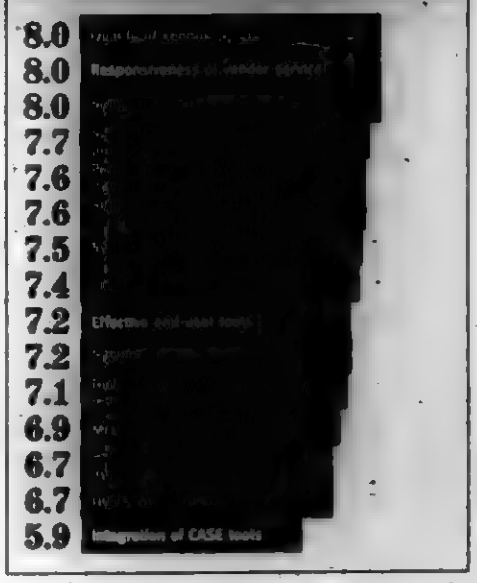
Ingres

RESPONSE BASE: 50 USERS



Would you buy the program again?

Ratings in order of importance



METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp. in Austin, Texas, conducted the survey and tabulated the results. The response base was 50 users for each product.

Users rated their satisfaction with their installed products and were not asked to rate one product directly against another.

To compute the overall score for each product, we performed the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Dataquest, Inc.; David McGoveran, Alternative Technologies, Inc.

One letter makes all the difference

By Alan Radding

Just when you thought you had on-line transaction processing (OLTP) figured out, they changed the game. When it comes to relational database management systems and client/server computing, OLTP is out and OLCP is in.

On-line complex processing (OLCP) is a type of processing common in client/server environments — that is, applications that involve long-duration transactions consisting of both reads and writes.

As with OLTP, OLCP users need to query an on-line database; unlike OLTP, they will browse, query, aggregate data and make updates all in a single transaction.

A good example of an OLCP-type application is an inventory application. While order takers need to move in and out of the database quickly to make updates (OLTP), the company's buyers need to linger to analyze inventory status in a variety of ways (OLCP). They may even make changes to the database.

Radding is a free-lance writer based in Newton, Mass.

This poses a problem for the database administrator. He wants the order takers to continually take orders, but he also wants the buyers to have an accurate view of the data.

And it puts pressure on the RDBMS to effectively be all things to all people. It must support a lot of users accessing the database simultaneously (called high concurrency) while ensuring the integrity of the data in such a way that a repeatable function delivers the same result each time (called consistency).

Weak performance

So while OLCP is something that RDBMS vendors — particularly Oracle Corp. and Borland International, Inc. with InterBase — are hyping, "it also addresses a significant user problem," says Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. That problem is the unexpectedly weak performance of RDBMSs when running client/server-based applications involving a moderate amount of transaction processing along with decision support activities.

The basic problem is contention among users, which negatively impacts the performance of the RDBMS, says Judith Davis, an industry consultant in Lexington, Mass. The database, in the name of consistency, locks all other users out of data while a single OLCP user merrily goes about a long-duration transaction. If, on the other hand, the RDBMS allows the users unfettered access to the data, some users will be updating data while others are using that data in their long-duration transactions.

The solution comes down to a different approach to RDBMS locking, Hurwitz says. In the standard approach, data that is being used is locked, preventing others from accessing it. This approach maintains consistency at the expense of concurrency, especially during lengthy transactions. But it's perfect for databases that were designed for peak OLTP performance because each transaction lasts only a brief time.

OLCP databases, on the other hand, use an approach called "versioning." Versioning gives each user a snapshot of what the database looked like at the precise instant the transaction began. Each snapshot, then, is a different version of the database.

With Borland's InterBase, for instance, readers never block writers, and writers never block readers. Locks are applied to prevent multiple writers from writing over the same data simultaneously.

The versioning approach could potentially get out of hand as the database saves proliferating versions of the changing data. However, InterBase saves only the changes and automatically throws out versions when the corresponding transaction is finished and a more recent version of the data exists.

Blob support

Another key requirement of OLCP is support for nonconventional data types, such as images, graphics and other large, nonconventional types. This is typically handled through the use of binary large objects (Blob).

Support for nonconventional data types attracted the Public Broadcasting Service (PBS) in Alexandria, Va., to The ASK Group, Inc.'s Ingres RDBMS for its OLCP database of programming information. "Ingres lets us define new data types using C programming," says Frank Pellegrino, associate director of computer services.

PBS created a data type for its complex key that would otherwise involve three columns in a standard table. "This lets us use much neater SQL queries," he notes.

While InterBase has supported OLCP from its inception, it is no longer unique. Oracle's Oracle 7, Ingres and the others are catching up, adding some kind of versioning and support for Blobs, says Mitch Kramer, an independent analyst in Sudbury, Mass., who handles database issues for Datapro Information Services Group. Sybase, Inc., however, has focused primarily on OLTP performance, he adds. •

Typical applications

OLCP-type applications include financial risk management, bill of materials processing in manufacturing and insurance claims adjustment, according to David McGoveran at Alternative Technologies, Inc.

OLCP in action

Matis Systems, Inc. in Evanston, Ill., is building an OLCP-type application with Borland's InterBase RDBMS. It is a library automation application that is essentially an inventory control system for books. Library staff and library users often perform long, browsing transactions, while books are continually checked in and out of the library. "Eighty-five percent of the transactions are reads," says Cindy Wichman, team leader on the project.

Front-end tools

Close to or far from SQL

Hand in hand with the database server decision is choosing which front-end tool to use. There's a large variety of products that develop full client/server applications. These products have not only query and reporting facilities but also forms-development tools, which are coupled with full programming languages.

Each database server vendor also has its own set of such tools, which are usually highly tuned for the vendor's database server and make optimal use of the RDBMS capabilities.

Third-party vendors try to outdo the DBMS vendor's tools by providing better functionality, productivity and portability. For instance, Gupta Technologies, Inc.'s SQL-Windows and Powersoft Corp.'s PowerBuilder give developers a very fine level of control over applications, but in order to use these products, developers have to learn complicated languages and sophisticated programming techniques. These packages offer object-oriented capabilities and team development facilities, which make them appropriate for large projects.

> Of the two, Access is easier to learn, but Uniface excels in functionality.

Uniface Corp.'s Uniface and Microsoft Corp.'s Access are two products that try to make application development and database access more transparent to the user.

These products automatically manage common application functions, such as linking and synchronizing multiple tables on a form; providing built-in multirow retrieval and scrolling capabilities; and automatically issuing the necessary SQL commands for updating and retrieving rows in the databases. These functions shorten the learning curve.

Of the two, Access is easier to learn, but Uniface excels in functionality. Uniface has also done a much better job of optimizing its product for different target database servers. For example, it will automatically generate stored procedures and triggers if the target database server supports these functions.

Uniface has also provided customized transaction management and locking techniques that are tuned for the target RDBMS but are transparent to the developer.

Access has a very weak database server link. It does not directly support specialized features such as stored procedures and triggers. Very often, it will even resort to record-at-a-time processing instead of much more efficient multirow processing (set-level processing) when retrieving and updating records.

This type of interface yields very poor performance and is sure to disappoint almost anyone who is looking to use Access as a client for database server applications.

At the lower end, there are very simple tools intended for end-user database querying. Two of these, Approach Software's Approach and DataEase International, Inc.'s DataEase Express, hide SQL from the user. The user is asked to specify the tables that will be accessed and the criteria that will be used to select rows. The software then translates the specifications into equivalent SQL commands.

—Richard Finkelstein

Too much of a good thing?

Look for front-end products that are optimized for your database server. It is unlikely any vendor could build drivers that work well with more than a few database servers, so a vendor who claims support for "50" RDBMSs must be looked on with suspicion. But if the tool is simple or is only reading the DBMS, it may be possible to build interfaces to a larger number of RDBMSs.

RDBMS for Client/Server

Gupta SQLBase 5.1:
Users laud price/performance, compatibility, improved reliability

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

Gupta SQLBase 5.1

■ Users of Gupta Corp.'s SQLBase Server 5.1 said it is the first viable release of Version 5.x of the database server. While Version 5.0 — which was released in early 1992 — was fraught with problems, users concurred that Version 5.1 is fairly solid and delivers on the promises made by Gupta.

■ Users also said applications written for SQLBase Server Versions 3.x and 4.x were easily ported to Version 5.1, with performance improvements of 50% to 200%.

Gupta's SQLBase Server 5.1 may not be the most dramatic upgrade ever made to a database server, but it represents a big improvement over Version 5.0, which began shipping in early 1992.

When SQLBase 5.0 arrived last year, Gupta officials said it included all of the features found in pricier, industrial-strength databases such as Oracle Corp.'s Oracle and Sybase, Inc.'s Sybase. For sites using Novell, Inc.'s NetWare, the biggest news was that SQLBase 5.0 would be offered as a NetWare Loadable Module (NLM), promising better integration with the network operating system.

All versions of SQLBase 5.0 were to include other features: referential integrity; compatibility with IBM's DB2 syntax and semantics; a bevy of performance improvements, including a query optimizer that would dramatically boost database response; and enhanced database features for better windowing applications.

Unfortunately, success was not to be. Instead, the company faced a torrent of bug reports and complaints from customers. Chastened company officials halted shipment of SQLBase 5.0 and began an intensive repair effort that included a "Gupta SWAT Team," according to a company spokesman. After months of effort — which included interim releases of SQLBase Server Versions 5.0.1 and 5.0.2 — the company finally shipped Version 5.1 in September.

The four users who participated in this evaluation — all of whom worked with 5.0 — concurred that Gupta's technical personnel worked valiantly to repair earlier deficiencies. That was all to good effect. Version 5.1 of SQLBase Server — sans bugs — is said by Firing Line evaluators to be the first viable release of the product.

The evaluators had each deployed SQLBase 5.1 in departmental production environments with 20 to 250 users. Platforms used for SQLBase Server ranged from multiple 486-based machines from various manufacturers (one user had 20 such systems) to Tricord Systems, Inc. superservers.

Among these users, applications ranged from traditional order-entry and decision support databases to a binary file-retrieval system demanding a high-performance indexing system.

Installation

Evaluators said installation presented no particular difficulties. NetWare needed a few adjustments to handle SQLBase NLM.

Systems integrator: "I expected [the installation] to be troublesome, but we installed it in about half an hour and had it running in the same time."

Consultant: "If they could pick up an existing configuration file, it would be a little bit better."

Reliability

Users rated the reliability of Version 5.1 as slightly better than average. They agreed that the earlier problems — ranging from SQLBase anomalies to full NetWare crashes — had been repaired. Bugs had been whittled down to a minimum.

Systems integrator: "When the NLM first came out, we had tremendous problems. But almost all have been addressed."

Retailer: "We had problems with the database not being a recoverable entity, but with 5.1, these problems seem to be resolved."

Performance

None of the users had run formal benchmark tests on SQLBase 5.0 or 5.1. However, they agreed that average performance boosts ranged from 50% to 250%. Most of this increase occurred at the lower end of the scale, although a limited number of very specialized operations had produced a magnitude of performance improvement.

Systems integrator: "We were hoping to get a 200% to 300% increase in performance. It was about 74% to 100%."

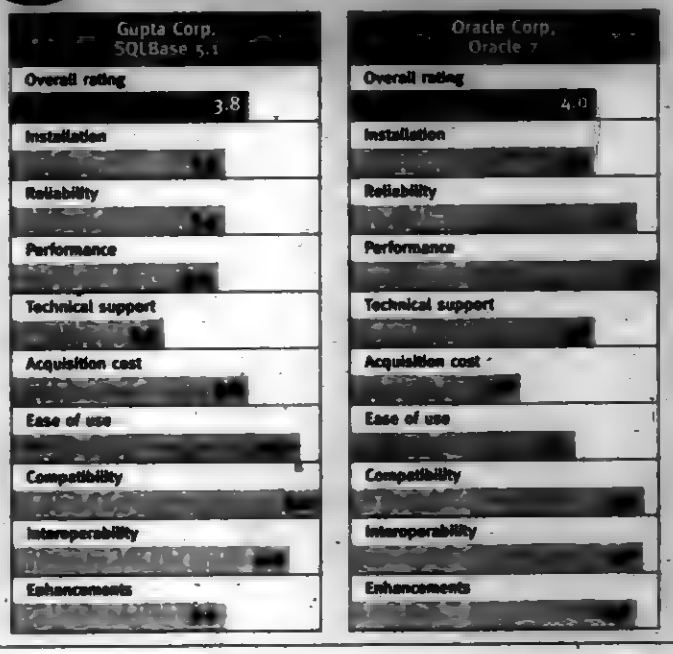
Retailer: "When we went from 4.x to 5.1, we saw a 25% to 30% improvement in large updates."

Gupta SQLBase 5.1, *page 66*

Facts about Gupta's SQLBase 5.0

- 67 transactions per second, using Transaction Processing Council's TCP-B Benchmark tests and audited by Codd & Date Consulting.
- Available for Sun Unix, DOS, OS/2 and as a NetWare Loadable Module (NLM).
- Supports partitioned databases across multiple disk drives.
- Scrollable cursor support for windowing applications.
- Referential integrity, which is compatible with IBM's DB2 syntax and semantics.
- Available as an NLM for NetWare LANs.

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users. Oracle 7 ratings are based on a previous evaluation by four different users (CW, Sept. 14, 1992).



SQLBase users say network monitoring and configuration are improved, but tech support lacking

CONTINUED FROM PAGE 65

Consultant: "I expected my applications to go twice as fast, but it's more like five times as fast."

Installation descriptions for users who evaluated Gupta's SQLBase 5.1 database

	Computer services	Insurance	Retail	Consultant
Server hardware	4 TriCord SuperServers	4 Advanced Logic 486/33s	1 HP Vectra, 2 Compaq SystemPros	2 486/33 Systems
Network	Novell NetWare	Novell NetWare	OS/2 LAN Manager	Novell NetWare
Number of users	250*	80	40*	20
Number of applications	7	3	8	3
Application type	Complex mixed	Complex mixed	Complex decision support	Complex decision support
Read- or write-intensive	Read-intensive	Read-intensive	Read-intensive	Both
Time using SQLBase 5.1	4 months	7 months	3 months	7 months

Technical support

Gupta took its biggest hit on technical support. Although evaluators said support is now satisfactory, below-average ratings reflect the grueling experience of 1992. One user said Gupta's support options were overpriced and inflexible.

Systems integrator: "The support was stellar, but we had to go to the vendor more often than we should have."

Retailer: "I use the bulletin board for support. They have gotten back to me on everything I've asked."

Consultant: "Even though they have good technical people, their bulletin board software absolutely stinks. They should throw it away."

Cost

SQLBase is one of the least costly database servers available. At prices of $995 to $9,995, it is more affordable than offerings from other high-profile database vendors. For an organization based on a desktop and superserver information systems strategy, SQLBase can cost as little as one-quarter that of the competition.

Retailer: "The costs of ownership and operation are much, much less" than a minicomputer database product.

Insurance company: "The pricing was very good compared to the prices of some of the other products."

Ease of use

All of the evaluators agreed that administration of SQLBase 5.1 was far easier than that of previous versions. They cited network monitoring and configuration as big improvements. However, one user said better integration with third-party administration tools is still needed.

Systems integrator: "In comparison to Version 4.x, we can monitor server space and configuration parameters and use the remote console. It's very enabling."

Insurance company: "It's not for the faint of heart or the novice user. You have to spend time with it."

Compatibility

All of the evaluators had placed SQLBase applications into production with Version 3.x or 4.x. They said converting these applications to Version 5.1 was painless and presented no problems. Conversion times ranged from half an hour to half a day.

Insurance company: "It's basically converting the database and maybe changing the routers. It's pretty straightforward."

Interoperability

Users were almost exclusively operating in SQLBase environments and did not have a tremendous need for interoperability with other database products. One user was transferring tables from IBM's DB2 to SQLBase on a nightly basis but did this through an indirect file-transfer mechanism rather than a direct link between the databases.

Insurance company: "We've had almost no problems with multiple [SQLBase] platforms running. There was a little tweaking of NetWare parameters for our remote [SQLBase] sites."

Enhancements

Although enhancements made to SQLBase 5.x were significant compared with Version 4.x, users did not consider those improvements to be much greater than expected. While they had anxiously awaited features such as referential integrity and scrollable cursors for windowing applications, they also noted that similar features were offered by other database vendors. They considered most of these improvements competitive but not futuristic.

Systems integrator: "We're more interested in performance than enhancements at the server end."

Insurance company: "Password encryption and release-lock isolation were very important to us. Partitioned databases will be."

Consultant: "I like what they added. The referential integrity and query optimization are very high on my list."

Written and compiled by Garry Ray, senior editor, application development.

Gupta responds

These are Gupta's responses to the issues raised in this evaluation:

Q: Why did Gupta release SQLBase Server 5.0, which was so clearly unready for market?

A: When we released Gupta SQLBase Server, it had successfully completed Gupta's rigorous beta-test program. Once the product began full production shipment, we began receiving bug reports. We took immediate and strong action, including the appointment of a Gupta SWAT team to address the technical problems and the immediate halt to SQLBase Server shipments around the world until all problems were resolved. We apologize for any inconvenience suffered by our customers during this time. During the final quarter of 1992, we shipped nearly 5,000 SQLBase Server 5.1 single and multiuser engines, including upgrades.

Q: How will Gupta accommodate trends toward increased client/server and distributed computing while maintaining high user ratings for compatibility and interoperability?

A: Gupta has a three-pronged strategy to meet most user needs: providing a world-class database server with unbeatable price/performance; the best graphical end-user and professional programmer tools; and highly functional middleware if a customer chooses other products besides SQLBase Server.

Q: How will Gupta address the perception among its customers of average technical support?

A: During the past year, we've more than doubled our technical support staff; initiated Pay Per Incident support for the smaller customer; introduced Strategic Technical Account Representation for the enterprisewide customer; and installed an automated technical support phone system. We have begun mail surveys and outbound calling of customers to continually assess how we are doing.

COMPUTERWORLD PRODUCT EVALUATION COUNCIL

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- Alliant Techsystems, Inc.
- Amarada Hess Corp.
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- American Greetings Corp.
- American Industries, Inc.
- American President Cos.
- AT&T
- Avon Products, Inc.
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- C. R. Bard, Inc.
- Bell Atlantic Corp.
- Bergen Brunswig Corp.
- Borg Warner Corp.
- Bradley University
- Carolina Freight Carriers Corp.
- Carolina Power & Light Co.
- The Chase Manhattan Bank NA
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- Clark Equipment Co.
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- Consolidated Financial Corp.
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- Electronic Data Systems Corp.
- Federal Express Corp.
- First National Bank of Chicago
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- Guilford Mills, Inc.
- Harsco Corp.
- International Paper Co.
- Kmart Corp.
- Lever Brothers Co.
- Long Island Lighting Co.
- Mars, Inc.
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- Metropolitan Life Insurance Co.
- New Mexico State University
- Northeast Utilities
- People's Bank
- PNC Financial Corp.
- Preston Corp.
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- Ryder System, Inc.
- SCM Office Supplies Group
- Sprint Corp.
- Tribune Broadcasting
- Unum Life Insurance Co.
- Vitro Industries
- Worldcorp

OUTSOURCING *confessions*

Revealing talk about why partnerships sour

By Louis Fried

YOUR OUTSOURCING contractor is not your friend. No matter how much it talks about customer service, treating you like its only client and inviting you to customer appreciation days, the contractor is in it to make money. After all, business is business.

The outsourcer's needs and yours may not always match, and in cases of conflict, guess whose needs come first?

Before you sign a contract, make sure the outsourcer is legally bound to take care of your company's needs, not its own. Appropriate preparation, intelligent bidding and contracting procedures and vigilant monitoring of your contract go a long way toward making sure your company's outsourcing experience works out.

Because when it doesn't, it can get pretty ugly. Below you'll find some (fictional) confessions from information systems managers who wish they had never heard the word "outsourcing." Their tales of woe will reveal problems with outsourcing, and we'll provide you with ways to avoid the same fate:

Confession

"The first couple of years we were outsourcing, we saved money, like everybody said we would. But then costs started to escalate rapidly. We got hit for increased transaction volumes. When our vendor added computer capacity and upgraded equipment, guess who had to dig deeper into its pockets? Our sweet deal cost us more than we'd thought. My problem? Escalating costs."

Prescription

Outsourcing vendors want to protect their profits. Watch for contract clauses that let them charge for additional items.

If service requirements change, they may add charges for new or expanded services. If transaction volumes go up beyond the baseline mentioned in the contract, you may have to pay the difference. Contractors may also pass along costs for adding computer capacity or upgrading equipment.

That's not to say that contractors will upgrade equipment and adopt new technology when *you* need it, especially if such moves are going to threaten their profits or revenue stream. If your firm is on the technology edge or expects

Outsourcing, *page 68*

Outsourcing

CONTINUED FROM PAGE 67

to save money by adopting technologies such as client/server, you must be very careful in delineating responsibilities under the outsourcing contract. Otherwise, you risk a delay in adopting these new technologies. In the end, not only might you fail to achieve any cost reductions, but your total costs may increase.

Companies with distributed environments should be especially wary of escalating costs. Contractors like to take advantage of economies of scale, such as combining the work of several customers into one facility. In this way, they can handle work with less equipment and fewer staffers than customers had at their own sites. Distributed setups don't jibe with centralized control. To make their profits, outsourcers may charge fees for managing and controlling a distributed environment.

Some organizations incur additional costs in unusual places. In a recent study, the U.S. General Accounting Office (GAO) reported that some banks had to pay their outsourcers because the contractors bought the banks' computers at book value rather than the usually lower market value. The banks will likely pay the difference in their outsourcing agreements, says Stephen White, an electronic data processing review examiner at Federal Deposit Insurance Corp.

Other costs to bird-dog include those associated with moving your software systems to a contractor's facilities. In recent lawsuits, for instance, software package suppliers have required increased license fees to move their software. Also, don't forget that even though taxes or inflation adjustments may not be part of a vendor proposal, they will likely turn up in the final contract.

Treatment Plan:

Your firm's only protection against escalating costs is a thorough specification of the services you expect to receive. Review all contract clauses that permit the contractor to bill additional amounts over the agreed-on price.

Any contract you sign for computer or network operations outsourcing should contain optional renewal clauses after the first year or two. Any contract for systems development or integration should be segmented in phases. Chopping up contracts in this way gives you breathing room. It lets you continue the contract only if you're satisfied with costs and performance at each time interval.

[redacted]

"There was not much we could do about having our outsourcing contract. After all, when our company merged last year with a competitor whose IS division also had an outsourcing contract, we needed to rethink things. We ended up dropping our contract and had to pay a stiff penalty. My problem? Contract termination fees."

[redacted]

A couple of Pittsburgh banks can empathize with this confession. Integra Financial Corp. and Equimark Corp. merged in late 1992. At the time, each had its own outsourcing agreement. When the newly merged company decided to drop one of its contracts, it had to pay the losing vendor $4.5 million for contract termination.

Also, last May, Freeport-McMoRan, Inc., a $1.5 billion per year mining and petroleum company, canceled its 10-year, $200 million agreement with Electronic Data Systems Corp., signed in 1988. Freeport coughed up a large penalty, the exact amount of which was not disclosed.

Outsourcing contract termination penalties can be severe unless there is an established reason for getting out. Even in such a case, the dispute may wind up in court.

[redacted]

This one goes under smart contract management. You've got to have escape clauses in your contract that let you terminate or scale back the agreement under certain circumstances, such as a sale or merger. You want to limit your penalties only to costs incurred in the termination.

You also want to make sure you don't have to pay termination penalties if you cancel the contract because of vendor misconduct or poor performance, which happens more often than you would think. A GAO survey of 240 banks released in 1992 found that between 20% and 30% of the banks' outsourcing contracts contained some sort of "hanky-panky."

In a recent situation, for example, the Environmental Protection Agency (EPA) accused Computer Sciences Corp. (CSC) of fraudulently billing them for $13 million (about 20% of the contract value). The EPA has refused to renew the contract with CSC.

Staff members at one major financial institution played it smart. They had escape clauses that came in handy when they began to have problems with their multimillion-dollar outsourcing deal for all systems development and mainframe operations. After one year of dismal vendor performance, the financial company scaled back its contract, letting the outsourcer only consolidate the client's multiple data centers and operate the resultant site. Systems development work reverted to the in-house IS group.

To keep things straight in case of a dispute, clearly indicate who owns the information and materials and who owns the rights to use the information and processing if there's a disagreement. Try to avoid court if you can by establishing arbitration rules for disputes.

Confession:

"I went to an outsourcer to cut costs, but I didn't think I would end up sacrificing performance to save money. Today, I'm looking for a job. My problem? No performance evaluation."

Professional Opinion:

It is impossible to know everything that will happen during an outsourcing business relationship. But one thing is important above all else: making sure you get the performance you need. The only way you can make sure a vendor will and does provide you with adequate performance is by measuring its performance.

Treatment Plan:

What our poor confessor should have done is specified, to whatever extent possible, the performance he wanted from his outsourcer and how he expected performance to be measured and reported.

Outsourcing systems development or integration can be risky if your firm does not have the technical and management capability to monitor the contractor's progress and technical decisions.

The development team's poor technical decisions are said to be at the core of the collapse, in August 1992, of the project to build the Confirm airline reservation system. The result has been hundreds of millions of dollars in lawsuits and countersuits between Hilton Hotels Corp., Marriott Corp., Budget Rent A Car Corp. and the contractor, a subsidiary of AMR Corp. Each wants to salvage something of the $125 million invested.

At minimum, you should specify your performance expectations and measurement methods for the following:

- Transaction volumes.
- Critical needs for timeliness and/or response time.
- Critical needs for security.
- Critical needs for business resumption in the event of catastrophe.
- Needs for local processing (e.g., PCs, local-area networks, client/server systems, etc.).
- Anticipated new applications development and resulting system work load.
- Expected adoption of new technology.
- Measures of performance and frequency of performance audits.

If you don't have a plan of your own on how to monitor a project, you should consider the Department of Defense's technique of independent validation and verification. This approach entails hiring an independent contractor to conduct periodic reviews of project progress and technical decisions made by the prime contractor.

[redacted]

"We farmed out some systems development to a vendor. We got back the system, set it up in our business unit, and it didn't work. Now we've got to put in place some costly fixes. My problem? Inadequate systems acceptance testing."

[redacted]

To outsource systems development or integration requires that your company lay down some rules about when a system is acceptable.

[redacted]

Before you go into any systems development outsourcing deal, work up a detailed requirements definition to avoid increased costs or poor performance.

Crash course in contracts

Here are key areas that outsourcing bidders should address in their proposals or outsourcing companies should include in their contracts:

For systems integration or systems development:

- Basis for additional charges.
- Phased approvals.
- Storage of weekly progressive development results.
- Progress reporting and monitoring.
- Right to use independent validation and verification.
- Performance expectations and measurement methods.
- Acceptance test procedures.
- Final acceptance conditions.
- Warranties.

For outsourcing operations:

- Capacity or upgrade approval requirements.
- New technology expectations and approvals.
- Distribution of operations.
- Software lease implications.
- Renewal options.
- Acceptable performance and measurement methods.
- Disaster recovery and backup.
- Disaster recovery and backup testing.
- Information security provisions.
- Right to audit information security practices.
- Provision for contingency operation.
- Storage of information copies.

In requests for proposals:

- Dispute resolution.
- Tax implications.
- Inflation implications.
- Proprietary information safeguards.
- Termination for cause.
- Requirements specification.
- Partial or full termination conditions and penalties.
- Rights in ownership of data and programs.
- Bid evaluation methods.
- Proposed agreement terms and conditions.

The requirements definition must address not only the functions and features of the system but also expected performance characteristics and the business and technical environment in which the systems will operate.

Most critically, you've got to have a plan for acceptance testing, procedures and scenarios that is based on your requirements specifications.

The acceptance test period may be limited to a single "volume stress test" or may be extended to include a pilot operation or even a specified time during full implementation. Always update your acceptance test to reflect any changes you request or the vendor recommends.

Many companies withhold a percentage of the contract price until they are satisfied with the system.

In the case of Florida's Department of Health and Rehabilitative Service, the group is withholding its payment to EDS because of defects the agency says exist in an EDS-developed system. EDS has filed a $46 million suit to collect money it says the agency owes for the new system.

[redacted]

"It broke my heart, but I had to lay off several people on my IS staff because we outsourced some of our data processing functions. Next thing I know, we have to go to court. My problem? Staff lawsuits."

[redacted]

If you anticipate having to reduce staff because of outsourcing, plan such reductions carefully or you may find yourself in court. Former IS employees sued Nashville Electric Service, for instance, on the grounds that the company didn't follow proper procedures for a regulated utility. In the case of Midwestern bank, transferred IS staffers brought suit, claiming that the benefits they received from the contractor weren't equal to those they got from the user firm.

[redacted]

It is not enough to reassure employees that their jobs are "secure." Your planning may have to include early retirement offers and/or extended layoff benefits. Employees have to know what awaits them, or you'll sabotage your efforts to plan, evaluate and migrate to an outsourced environment.

Besides, unhappy employees won't be willing to help you get through the outsourcing process.

Make sure you examine all the options for your employees early in the stages of an outsourcing decision. During request for proposals, require bidders to explain what they will do with "extra" employees. Get detailed information about the bidders' salary ranges and benefits programs to pass on to staff.

Share as much information as possible with the affected employees, soliciting their opinions and comments. Don't ignore their problems; deal with them head on.

Fried is vice president of information technology at SRI International in Menlo Park, Calif.

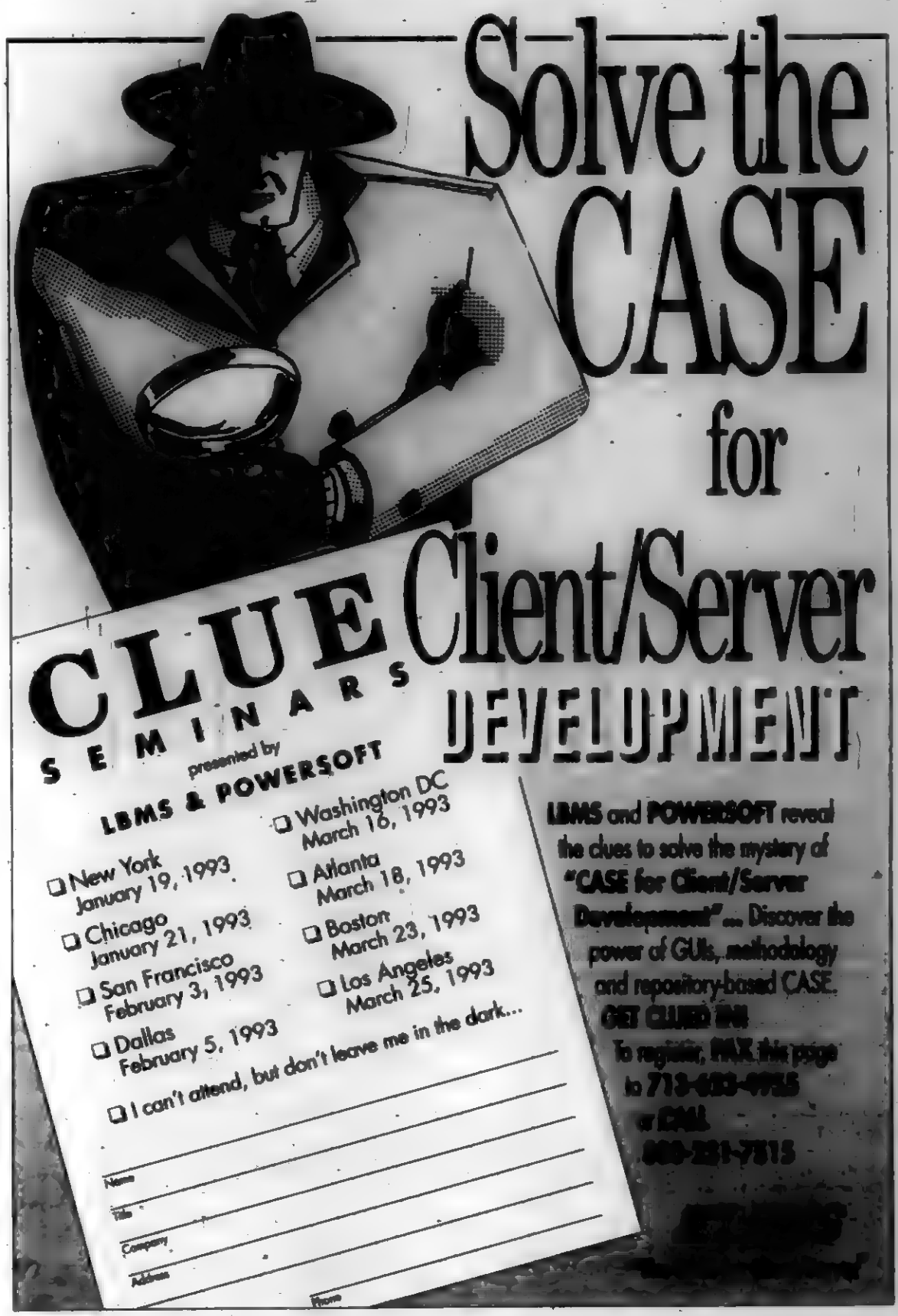
Are you practicing safe outsourcing?

It's up to you to make sure your outsourcing experience is a good one. What follows are some steps for safe outsourcing:

For operations outsourcing:
- Store copies of data and programs at your site.
- Periodically audit contractors' information security practices.
- Periodically test backup-and-recovery capabilities.
- Regularly monitor performance to contract specifications.

For systems development outsourcing:
- Control requirements specification changes.
- Regularly monitor progress, design and technical decisions.
- Plan and control acceptance testing.

For all types of contracts:
- Develop a comprehensive requirements specification and request for proposals.



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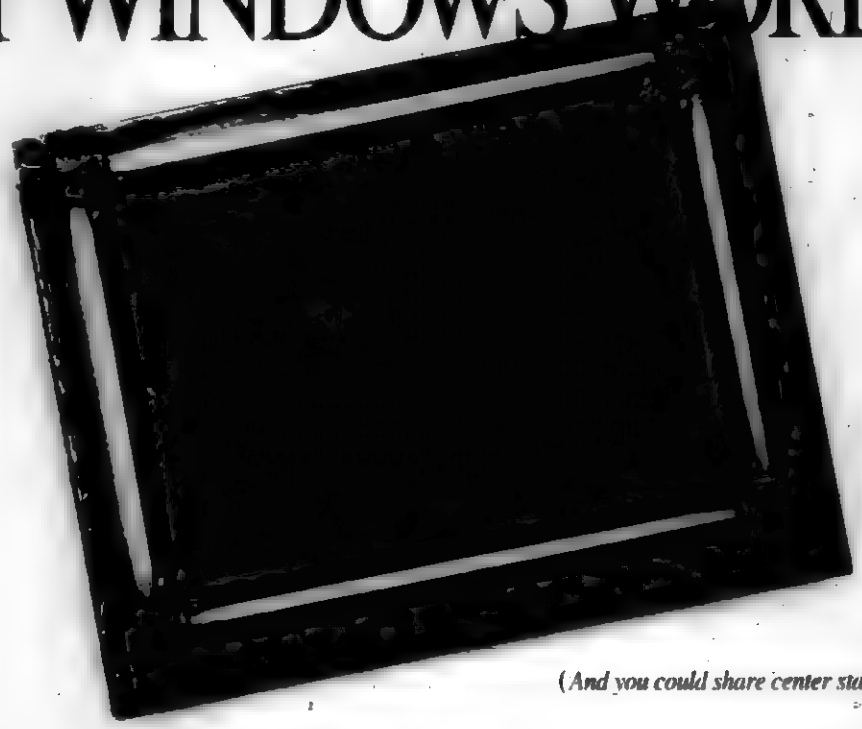

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Job searching on-line

Databases aid IS job seekers

By Kelly E. Sewell

IF YOU'RE ITCHING TO DO SOMEthing else with your life, a new job in information systems may be as close as your fingertips: Several companies have sprung up that offer job listings on-line.

Some services require users to pay a fee, but most don't cost more than what the phone company charges to dial in. These services allow IS professionals to post their resumes for potential employers to access, and some allow the job seekers to view job openings and apply for positions on-line.

James Gonyea, a former career counselor who will go live with his own database, Help Wanted USA, next week, says IS professionals have an edge over other job-searchers because they have computers at their disposal. Many firms post positions electronically because they know competent IS people will use what they know best — computers — to find jobs.

On-line services vary in the way they work. Some, such as Job Bank USA, are a one-way exchange: Applicants send in resumes and companies can choose from among them, but there are no employer listings.

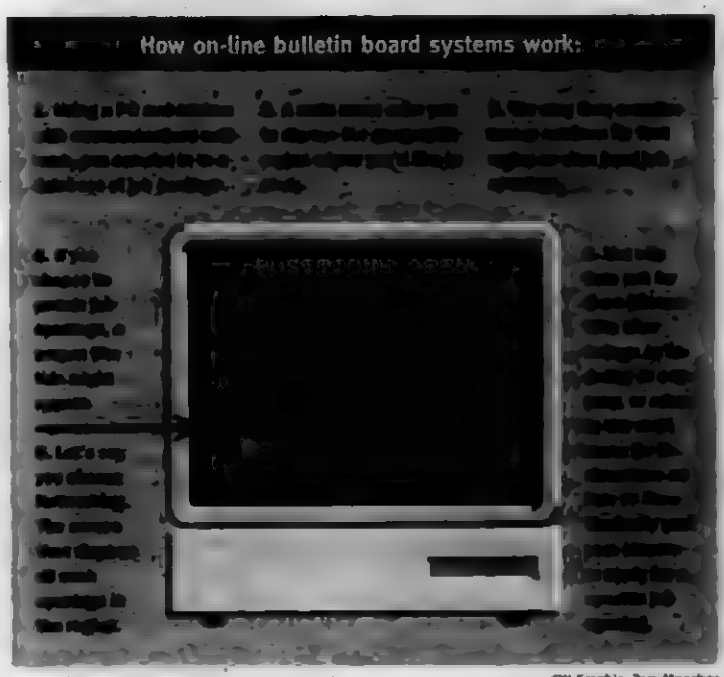
Others, such as On-Line Career Fair and *Computerworld* Careers On-Line, are two-way exchanges where applicants browse through on-line job postings and pick only the ones they're interested in.

No guarantees

Of course, posting your resume doesn't guarantee that potential employers will come knocking. Kelly Foster, a Lisle, Ill.-based user of on-line databases, posted his resume on two such services for more than a month and did not get any response.

All of the services contacted keep resumes posted for one year, and most let you update them.

Sewell is assistant editor, features.



CW Graphic: Tom Monahon

On-line job-search services

- **Affinity.** Data Processing Management Association (DPMA) and DQIS, Inc. (708) 825-8124. Database of skills profiles; available in April. $7.50/year for DPMA members; $12.50/year for nonmembers.
- **Computerworld Careers On-line.** (508) 879-4700 (modem). Job seekers can view *Computerworld*'s recruitment ads and upload their resumes. No charge.
- **Job Bank USA.** (800) 296-1USA or (703) 847-1706. Applicants' resumes are posted on-line. Employers contact Job Bank USA to interview applicants.
- **JobNet.** (609) 683-9191 or (609) 683-4422 (modem). At "log-in" prompt, type "Datapipe." Program walks you through menu system. No charge.
- **Help Wanted USA.** Gonyea Associates, Manchester, N.H. (603) 622-5587. Available in mid-February. Database of U.S. help wanted ads. $7.95/month.
- **On-Line Career Fair.** Response Technologies Corp. (603) 726-3344 (modem). Hit return twice, enter password "new job." Features technology jobs. No charge. Applicants can apply for positions on-line.
- **E-Span** and **America On-line's Career Center** are available through **CompuServe** and **Prodigy**. Limited to subscribers. $7.95/month.

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Career advice for the '90s

Fighting misperceptions about age

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Steven B. Fogle, a managing director at the Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q: I work at a $500 million company as a manager of systems development. IS is a second career for me, and I have only been in the field 10 years. At 53, I am ready for my next job opportunity, but when headhunters call, I feel I am being passed over because of my age. Do you think there is any truth to my concerns?

A: A recruiter may be hesitant if he is not aware of your career history. By no means is 53 the end of your career, and I advise that you continue developing your own network and creating your next job opportunity on your own. Not all companies are looking for the young rising star. Some are looking for solid, experienced middle managers.

Q: I am a vice president of MIS at a Fortune 1,000 company and have been working toward assuming additional responsibility. My boss has asked me to put together my thoughts on my future career development and expanded responsibilities. What areas would complement my current role?

A: You are wise to assume more responsibility and take a greater role in line management. A natural extension would be to assume a role in total quality management, corporate administration and quality assurance and customer service, depending on the industry you choose. You may also want to serve on corporate committees and work toward being on the senior management team to gain wider exposure.

Q: I live in the Southeast, and I am currently being recruited for a management position at a growing company in Los Angeles. When negotiating my employment package, how much of a salary increase should I ask for, and what should I expect in relocation expenses?

A: You have to consider the overall career opportunity. In making a move to a higher cost-of-living area such as California, you should consider the cost of real estate. Determine the market price for your position and what peers in other companies are earning. I usually recommend that an individual expect a salary increase of 10% to 15% when a relocation is required.

Relocation packages vary from one company to another, but most companies will pay for the cost of moving household goods and will also pay for one or two trips to look for housing.

Q: My employer supplies parking only for car pool vehicles. In order to carpool with others, I am forced to work the same hours every day. My boss complains that I never work as late as others do. I have suggested that I can work on my PC at home when needed. However, he won't allow it for security reasons. What do you recommend?

A: Commitment to a company sometimes comes with hardship. I would recommend that you take another form of transportation so that you can control your hours or drive yourself. Unfortunately, this responsibility is yours, and you should be prepared to create goodwill with your employer by being accessible and flexible.

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Rick Paulsen, assistant data processing manager/analyst
Levi Strauss & Co., Henderson, Ken.

■ We rewarded an employee who went in and changed our applications around to accommodate our hotel's job-processing application. This application works during the night to get the system ready for the next day. Employees can accumulate "duck bucks" (play money named after the ducks residing on the hotel premises) until they have enough to make purchases from a catalog of prizes.

TIPS from the TIMES

Jennifer Netherland, manager of IS Peabody Hotel, Orlando, Fla.

■ I always acknowledge an employee who takes the initiative to fix a problem without waiting for direction from a supervisor to fix it. Even if the employee did not take the correct path, at least he took action.

Edgar Smith, manager of IS Harbison-Fischer Manufacturing, Fort Worth, Texas

■ If an employee pulls an all-nighter in a conversion, then he needs to be rewarded. I can't usually give him a cash bonus, but I reward the employee with time off.

Duane Johnson, manager of management information services
Petrobenke Soaica, Johannesburg, SA.

Compiled by Stefanie McCann, assistant researcher

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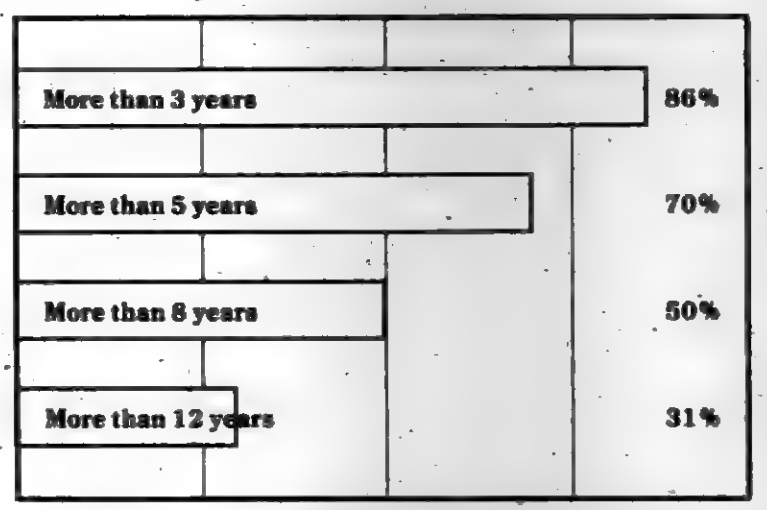

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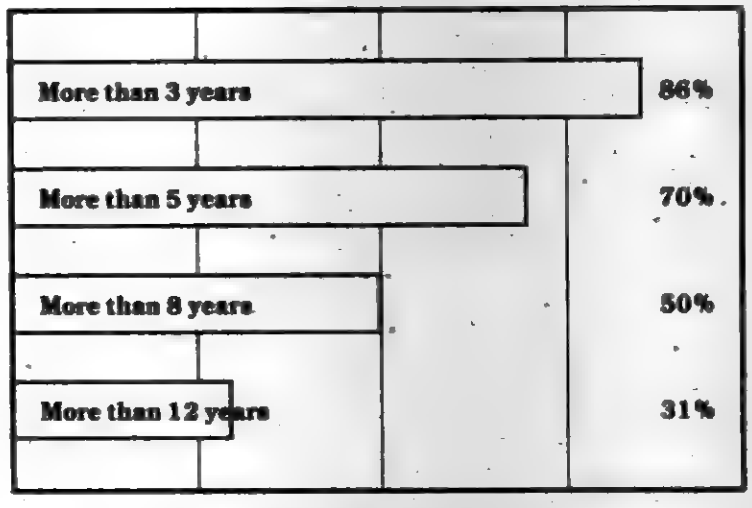

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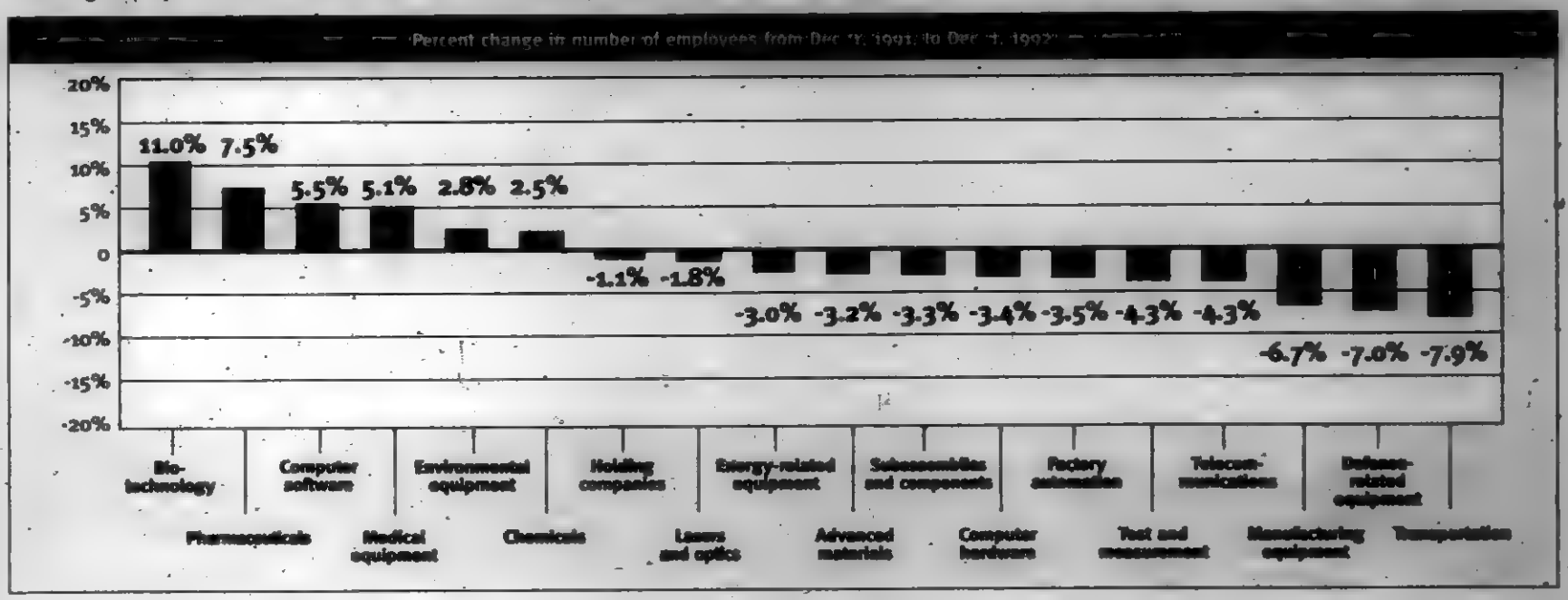
Computerworld/CorpTech Career Index

Of the 4,834 technology manufacturers surveyed by CorpTech during the past three months, 20% expanded their work force, while 19% experienced either shrinking employee counts or business failure. The remaining firms indicated stable employment.



Source: Corporate Technology Information Services, Inc.

VARs repackage to stay in vogue

By Alice Bredin

THERE ARE ONLY TWO kinds of customers: Happy ones and not so happy ones. Value-added resellers (VAR) want more of the former and are adding new services in hopes of getting them.

At one time, most VARs relied on offering hard-to-find technical expertise to set themselves apart. But because of lower revenue, things such as better service and creative payment plans are now in vogue. These may not be new for hardware vendors, but they break new ground in the VAR arena.

"The average amount of money taken from any given sale of technology has dropped," says Lee Levitt, director of distribution channels research at International Data Corp. in Framingham, Mass. "VARs have to better approach every opportunity."

One example of improved services: priority technical support systems, which allow customers to log their problem as "priority one," "priority two" and so on. Long used by software vendors, these systems are making their way into the VAR market, says Mary Margaret Gibson, senior partner at Channel Strategies, Inc., a Palo Alto, Calif.-based distribution channel consultancy.

For instance, when calling into Atlanta-based Brock Control Systems, Inc.'s system, priority one guarantees that a Brock technician will call back within two hours. Priority two or three will produce a call within four or eight hours, respectively.

Cap Schwartz, a database administrator at Telebit Corp. in Sunnyvale, Calif., says the priority system is one reason he stays with Brock. Schwartz recalls an instance before the priority system when a technical problem prevented his entire telemarketing group from doing its job. When he left a message with Brock's support line, he had failed to indicate the severity of the situation.

"It didn't occur to me that Brock wouldn't know that the whole department was down because of this particular problem. Now, with the new system, I automatically relay this information when I call in," Schwartz says.

> For most VARs, service and support have become more than marketing slogans.

Other VARs extend a special service to their most lucrative customer base. Coin Dealership Systems, an Atlanta-based systems integrator specializing in the automotive market, offers free satellite communications to all General Motors Corp. dealers.

According to Chairman Mark Singleton, the satellite system allows GM dealers to order cars and parts, put in warranty claims and send sales reports directly to the manufacturer. In turn, the system allows GM to update dealers on orders and delays.

Some services actually launch the VAR into a whole new area of business. Business Systems Solutions, Inc., a VAR in Buffalo Grove, Ill., offers a disaster recovery program called Rescue, which costs $3,000 a year. If a customer's server goes down, the program guarantees that another server will arrive in four hours, loaded with software and ready to work.

For companies with financial concerns, some VARs offer creative payment plans. Advance Software Technology, an Emoryville, Calif.-based VAR specializing in integration in the real estate, health care, legal and aviation markets, offers buyers a lease-type situation. Instead of paying a lump sum, buyers pay monthly as if renting the equipment, but they get full service and support.

"We used to approach a customer with a $150,000 solution. Now we offer the solution at $1,500 dollars per month," says Advance Software manager Jack Sandel.

For most VARs, service and support have become more than marketing slogans. Some make sure their service is up to par by sending out rate cards.

Brock also ensures problems are being handled efficiently by listening in on service calls. Surveys are then sent out to callers and mailed directly back to Brock's president. Survey feedback has resulted in the implementation of Brock's priority system, as well as the revision of product documentation.

"There are several good solutions today to do a good job, so we have to differentiate on the other end, which is customer service," says Richard Brock, chairman and founder. "The transition in the industry has to do with Americans wising up."

Bredin is a free-lance writer based in New York.

Buyer beware

VARs might be getting so good at showcasing their offerings and expertise that buyers could be fooled into believing that what appears to be a new service is actually old wine in a new bottle. Rather than offering steep discounts the way large vendors do, VARs are packaging themselves and their expertise better than ever before, says Mary Margaret Gibson, senior partner at Channel Strategies. It's not as though they want to pull the wool over customers' eyes; VARs just have to toot their own horn a little louder these days.

"We're making a bigger to-do of things we would not have highlighted in the past so customers know we are doing things for them and don't take us for granted," says Mark Singleton, chairman of Coin Dealership Systems.

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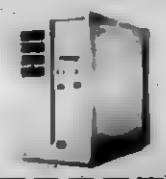

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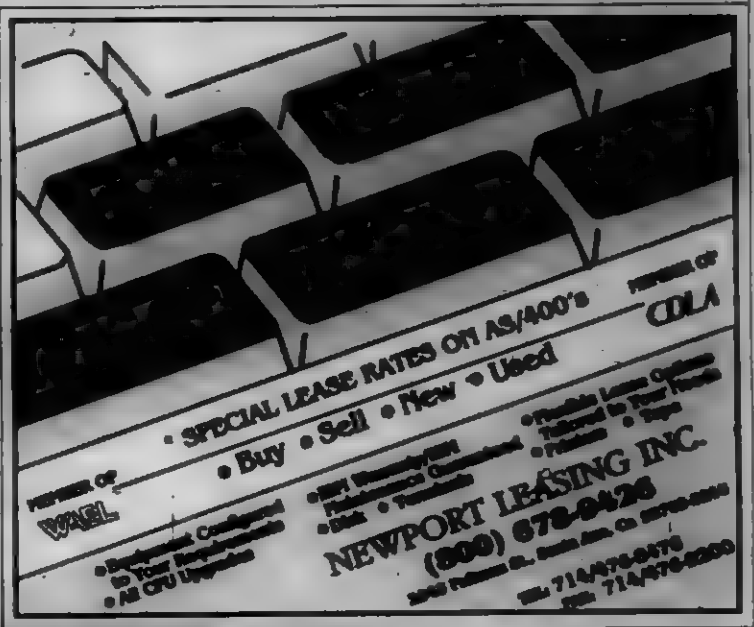

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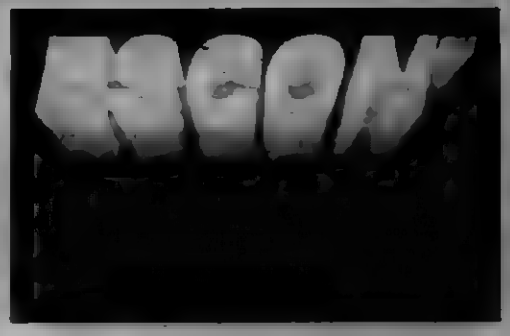

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Santa Cruz, CA ..... (408) 261-7880
GE Consulting Services, Inc.
Rockville, MD ..... (301) 340-5100
Metra Datavision, Inc.
Tewksbury, MA ..... (508) 640-0940
Micro-MRP
Foster City, CA ..... (415) 345-8000
Racal-Redac, Inc.
Westford, MA ..... (508) 692-4900
Software Horizons, Inc.
Burlington, MA ..... (617) 273-4711
SPECTRUM ASSOCIATES
Woburn, MA ..... (617) 932-0932
Symmetrix, Inc.
Lexington, MA ..... (617) 862-3200
The Peak Technologies Group, Inc.
Columbia, MD ..... (410) 992-9922
Waters
Marlboro, MA ..... (508) 624-8450

MANUFACTURING SOFTWARE

Effective Management Systems
Milwaukee, WI ..... (414) 359-9600
North Coast Automation, Inc.
Cleveland, OH ..... (216) 473-3800

NETWORKING

A-net
Eugene, OR ..... (800) 444-9796

RETAIL

Comtek Systems, Inc.
San Antonio, TX ..... (512) 340-8253
Concept Systems, Inc.
Philadelphia, PA ..... (215) 563-1425
Data Management Facility Co., Inc.
Irwindale, CA ..... (818) 813-1620
Retail Store Systems, Inc.
Warwick, RI ..... (401) 732-3323

SECURITY

Z-Lock Mfg. Co.
Redondo Beach, CA ..... (310) 372-4842

SOFTWARE DEVELOPERS

Cadre Technologies, Inc.
Providence, RI ..... (401) 351-5950
Stepstone Corp.
Sandy Hook, CT ..... (203) 426-1875
Vanguard Software
Hudson, MA ..... (508) 562-7711

SCHEDULING/PLANNING

Summit Solutions, Inc.
Chesterton, IN ..... (219) 929-4189

TRAINING

Carl A. Argila, Ph.D., Inc.
Los Angeles, CA ..... (800) 347-6903

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale ..... (305) 587-2270

UTILITIES

Kaye Instruments, Inc.
Bedford, MA ..... (617) 275-0300
OASIS Technology, Inc.
Oxnard, CA ..... (805) 988-1020

WHOLESALE DISTRIBUTION

Daly & Walcott, Inc.
W Warwick, RI ..... (401) 823-8400
Dynamic Data Systems, Inc
Westminster, CO ..... (303) 426-8048
Arthur Ellingsen & Co.
Arlington Heights, IL ..... (708) 506-0555
National Distributor Systems, Inc.
Stratford, CT ..... (203) 378-8010
SI Handling Systems, Inc.
Easton, PA ..... (215) 252-7321

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Percent

Symantec Corp.	67.9
Exabyte Corp.	38.7
State of the Art	21.6
Informix Corp. (H)	21.4
Zenith Electronics	18.6
Data Switch Corp.	18.4
Symantec Corp.	14.7
Altera Corp.	13.5

Dollar

3Com Corp.	9.25
Symbol Inc.	4.75
Informix Corp. (H)	4.38
Apple Data Processing	4.13
Policy Management Sys.	3.75
Motorola Inc. (s)	3.25
STI Corp.	3.13
Oracle Corp.	3.00

Losers

Percent

Wang Labs Inc. (s)	-37.0
Informix Inc.	-28.8
IPL Systems Inc.	-21.6
Prime Technology	-19.1
Cray Computer	-18.4
Compuadd Corporation	-17.9
Bull Computer Corp.	-16.0
Software Publishing Inc.	-15.5

Dollar

Bull Computer Corp.	-7.50
Sun Microsystems Inc.	-3.88
Compaq Computer Corp.	-3.88
Informix Inc.	-3.75
Prime Technology	-3.50
Cray Research Inc.	-3.25
Autodesk Inc.	-3.00

Powersoft, MathSoft IPOs hot

Powersoft Corp. (PWRS) made a big splash in the market with its initial public offering (IPO) last week. The Burlington, Mass., software supplier opened trading at 20 on Wednesday. The stock value rocketed immediately, came within a whisker of doubling its share price and then settled back slightly to close at 38 ¼.

Powersoft's PowerBuilder is a leading tool set in the hot client/server application development software arena. The IPO put slightly more than $71 million into the company's coffers.

Whether the stock will drift down from its lofty perch is anyone's guess. "By most reasonable measures, you'd have to say it's an overvalued stock," said Frank Michnoff, vice president at Needham & Co. in New York. "However, there is a lot of demand for client/server companies' stocks and a low supply of them in the market."

Powersoft eased ½ of a point on its second trading day, finishing Thursday at 38.

Powersoft's offering benefited from good timing. In addition to the client/server computing boom, the decline of certain blue-chip stocks has made more investment dollars available.

The outflow of cash from stocks such as **IBM** and **Borland International, Inc.** has helped recent IPOs as investors look for other opportunities in the technology sector.

Cambridge, Mass.-based **MathSoft, Inc.** (MATH), another software supplier, had its stock debut on Wednesday with similar success. MathSoft issues opened at 13 and finished the first day at 22.

On Thursday, MathSoft slid back ¾ of a point to close at 21¼. MathSoft's flagship product is Mathcad, a calculation software package aimed at technical professionals.

Dell stock hammered

The stock market was less kind to **Dell Computer Corp.** (DELL) last week. Dell dropped more than 7 points during the course of two days.

Two factors contributed to the falloff. First, the company announced that fourth-quarter results will fall short of general Wall Street estimates. Second, Dell officials noted that the Securities and Exchange Commission (SEC) is still investigating Dell's foreign currency trading practices. The SEC has not yet ruled whether the PC manufacturer will be required to restate its earnings.

—Derek Slater

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	34.63	9.63	3 COM Corp	30.50	-0.50	-1.6
NYS	74.75	56.25	American Info Techs Corp.	72.75	1.00	1.4
NYS	55.25	36.63	AT&T	53.63	0.63	1.2
OTC	3.88	0.75	Aptec Communication Corp.	2.25	-0.19	-7.7
OTC	24.50	10.25	Banyan Systems Inc.	19.00	-2.75	-12.6
NYS	53.88	40.25	Bell Atlantic Corp.	52.75	1.25	2.4
NYS	55.50	43.38	Bellsouth Corp.	52.63	0.88	1.7
NYS	6.75	3.63	Bolt, Beranek & Newman	4.75	-0.25	-5.0
OTC	17.25	10.00	Broadcast Technology	17.25	1.13	7.0
NYS	92.25	42.13	Cabletron Systems	87.13	1.63	1.9
OTC	34.25	17.75	Chipcom Corp.	32.00	1.75	5.8
OTC	94.75	33.00	Cisco Systems Inc. (H)	88.38	0.38	0.4
OTC	27.75	5.50	Compression Labs Inc.	13.63	1.63	13.5
OTC	3.44	0.88	Data Switch Corp.	3.44	0.56	19.6
NYS	23.50	13.75	Digital Comm. Assoc.	19.38	0.38	2.0
OTC	14.75	7.50	Digital Systems Int'l, Inc.	9.25	0.13	1.4
OTC	28.38	4.00	DSC Communications (H)	26.00	-1.25	-4.6
OTC	10.88	4.75	Fibronics Int'l Inc.	9.00	0.63	7.5
OTC	37.50	18.50	Filenet Corp.	13.50	-1.75	-11.5
OTC	4.38	1.50	Gandalf Technologies Inc.	3.84	0.09	2.5
OTC	2.25	0.69	Gateway Communications	1.56	0.19	13.7
NYS	10.50	2.88	General Datacomm Inds. (H)	9.38	0.25	2.7
ASE	5.88	2.00	Go Video	3.06	0.13	4.3
NYS	35.75	28.88	GTE Corp.	35.25	0.25	0.7
NYS	75.25	59.00	ITT Corp.	75.00	3.13	4.3
OTC	43.38	29.50	MCI Communications Corp	40.00	0.25	0.6
OTC	14.25	2.25	Microcom Inc	6.88	-0.88	-15.2
OTC	24.25	12.00	Motor Corp. (H)	20.75	-1.25	-5.7
OTC	18.25	9.63	Network Computing Devices (H)	18.25	2.25	14.1
NYS	17.13	8.13	Network Equipment Tech.	10.25	-0.25	-2.4
OTC	24.88	8.00	Network General	14.88	-1.50	-9.2
OTC	16.75	8.50	Network Systems Corp.	11.38	0.38	3.4
OTC	48.25	11.88	Newbridge Networks Corp.	47.88	2.63	5.8
NYS	49.25	30.50	Northern Telecom Ltd.	42.50	-1.00	-2.3
OTC	33.50	22.50	Novell Inc.	30.25	-0.50	-1.6
NYS	88.50	69.13	Nynex Corp.	85.00	2.63	3.2
OTC	37.50	14.50	Octel Communications Corp.	27.75	1.50	5.7
OTC	9.13	3.38	Peirce Data Comm Networks	5.25	0.00	0.0
OTC	53.00	10.25	Picturetel Corp.	26.63	0.63	2.4
OTC	18.25	7.00	Proteon Inc.	9.75	-0.88	-8.2
NYS	30.38	10.36	Scientific Atlanta Inc.	24.13	0.88	3.8
NYS	75.63	56.63	Southwestern Bell Corp.	69.88	0.75	1.1
NYS	28.33	20.75	Sprint Corp	28.00	1.00	3.7
OTC	27.00	8.13	Standard Microsystems Corp	21.50	1.75	8.9
OTC	18.50	6.88	Stratacom Inc.	17.13	0.63	3.8
OTC	95.50	18.75	Synoptics Communications	86.75	0.88	1.0
OTC	7.13	4.38	Telebit Corp.	5.63	-0.25	-4.3
OTC	9.38	2.13	Telematics Int'l Inc.	9.00	0.75	9.1
OTC	25.50	13.38	US Robotics	20.50	-1.50	-6.8
NYS	40.00	32.88	U S West Inc.	39.75	1.25	3.2
OTC	46.00	12.00	Wellfleet Communications	41.50	0.75	1.8
OTC	22.00	7.00	Xircom	7.75	-0.50	-6.1

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	8.50	3.13	Advanced Logic Research	3.97	-0.22	-5.2
OTC	70.00	41.50	Apple Computer Inc.	57.63	-1.88	-3.2
OTC	24.25	11.25	AST Research Inc.	17.50	-0.63	-3.4
NYS	14.25	5.50	Commodore Int'l	5.50	-1.00	-15.4
NYS	58.50	22.25	Compaq Computer Corp.	48.00	-3.88	-7.5
OTC	49.88	15.00	Dell Computer Corp	39.25	-7.50	-16.0
NYS	38.63	26.63	Harris Corp.	35.25	0.00	0.0
NYS	85.00	50.25	Hewlett Packard Co.	68.25	-3.50	-4.9
NYS	33.00	14.13	Silicon Graphics	30.50	-0.50	-1.6
OTC	41.00	22.50	Sun Microsystems Inc.	35.13	-3.88	-9.9
NYS	32.13	22.25	Tandy Corp.	28.00	1.50	5.7
NYS	11.13	5.88	Zenith Electronics	7.38	1.25	20.4
OTC	22.75	2.75	Zeos International Ltd.	5.88	-0.25	-4.1

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
ASE	20.63	6.63	Amdahl Corp.	8.00	-0.50	-5.9
NYS	16.00	4.75	Convex Computer	5.75	-1.25	-17.9
OTC	9.50	1.88	Cray Computer	3.88	-0.88	-18.4
NYS	46.50	19.00	Cray Research Inc.	25.00	-2.63	-9.5
NYS	13.00	7.13	Data General Corp.	11.88	0.38	3.3
NYS	65.50	30.38	Digital Equipment Corp.	42.50	0.38	0.9
NYS	100.38	45.88	IBM	52.00	0.63	1.2
OTC	19.50	5.50	Kendall Square Research	10.00	0.00	0.0
NYS	113.00	83.00	Matsushita Electronics	89.50	-1.88	2.1
OTC	17.00	6.00	Pyramid Technology	14.50	0.00	0.0
OTC	24.00	11.13	Sequent Computer Sys.	21.38	1.00	4.9
OTC	16.38	1.38	Sequoia Systems Inc	7.94	1.19	67.9
NYS	54.25	29.50	Stratus Computer Inc.	34.38	2.13	6.6
NYS	16.88	9.88	Tandem Computers Inc.	13.63	-0.13	-0.9
NYS	13.25	7.75	Unisys Corp.	12.13	0.25	2.0
ASE	7.50	0.06	Wang Labs Inc. (s)	1.06	-0.63	-37.0

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	63.50	25.25	Adobe Systems Inc.	41.50	0.25	0.6
OTC	34.25	10.25	Aldus Corp.	16.75	2.25	15.5
OTC	19.75	7.00	American Software Inc.	8.13	-0.50	-5.8
OTC	25.63	9.75	Ask Computer Systems (H)	24.00	0.75	3.2
OTC	56.50	23.25	Autodesk Inc.	43.75	-3.00	-6.4
OTC	37.75	3.50	Bachman Info. Systems	4.13	0.25	6.5
OTC	43.00	34.00	BGS Systems Inc.	40.25	0.00	0.0
OTC	84.13	37.25	BMC Software Inc.	73.50	-2.75	-3.6
OTC	28.25	16.75	Books & Baggage (H)	26.25	-0.75	2.8
OTC	78.00	17.50	Borland Int'l Inc.	30.25	-1.19	-5.3
OTC	10.25	3.00	CE Software	3.88	0.13	3.3
ASE	35.00	9.38	Cheyenne Software Inc.	28.13	-3.25	-10.4
OTC	19.50	8.25	ChipSoft (H)	17.88	-1.13	-5.9
OTC	11.88	5.63	Cosmos Inc.	7.38	0.25	3.3
NYS	27.38	10.88	Computer Associates	24.25	-1.38	-5.4
NYS	17.38	4.00	Computervision Corp.	5.25	-0.88	-14.3
OTC	18.50	6.75	Comshare Inc.	9.25	-0.75	-7.5
OTC	17.25	10.75	Cowl Corp. (L)	11.88	0.25	2.2
OTC	44.25	6.00	Easel Corp.	13.50	2.50	22.7
OTC	26.50	11.75	Frame Technology	13.75	3.25	19.1
OTC	25.00	12.50	Group I Software	14.00	1.00	7.7
OTC	8.50	3.50	Hogan Systems Inc.	8.50	0.63	7.9
OTC	25.75	13.75	HBO	15.25	1.25	8.9
OTC	36.25	18.50	Information Resources	29.75	-0.75	-2.5
OTC	42.00	12.13	Informix Corp	38.38	1.75	4.8
OTC	21.25	11.00	Intergraph Corp.	11.88	0.13	1.1

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	15.00	7.75	Interlean Inc.	11.00	-0.25	-2.2
OTC	19.00	9.25	Intersolv Inc.	9.25	-3.75	-28.8
OTC	21.38	9.50	Knowledgeware Inc.	11.50	-1.25	-9.8
OTC	54.00	28.75	Legent Corp.	53.25	1.00	2.0
OTC	38.75	16.75	Lotus Development	24.50	1.50	6.5
OTC	33.25	13.00	McAfee Associates	14.00	-1.13	-7.4
OTC	8.38	1.88	Meca Software	6.63	-0.88	-11.7
OTC	23.25	5.25	Mentor Graphics	10.13	0.13	1.3
OTC	46.00	27.25	Micro Focus	42.63	-1.00	-2.3
OTC	80.50	6.50	Microgate Inc.	10.50	-0.50	-4.5
OTC	95.00	65.50	Microsoft Corp.	88.38	1.63	1.9
OTC	36.38	12.00	Oracle Corp.	31.38	-0.13	-0.4
OTC	63.25	25.25	Parametric Technology	58.13	-1.25	-2.1
OTC	40.25	22.50	Peoplesoft (H)	36.13	-0.63	-1.7
OTC	11.00	3.50	Phoenix Technologies	5.50	0.25	4.8
OTC	25.00	11.25	Platinum Technology	19.50	-2.25	-10.3
OTC	61.50	29.00	Progress Software Corp.	55.25	-0.50	-0.9
OTC	24.50	3.13	Quarterdeck Office Sys.	3.63	-0.31	-7.9
OTC	32.75	11.75	Rainbow Technologies Inc.	17.00	-1.50	-8.1
OTC	22.75	4.00	Rasterops	8.25	0.25	3.1
OTC	17.25	3.63	Ross Systems	9.75	0.25	2.6
OTC	27.25	8.50	Sapiens USA Inc.	23.25	-0.25	-1.1
OTC	26.75	6.75	Software Publishing Corp.	12.38	0.38	3.1
OTC	8.88	2.00	Software Toolworks Inc.	7.50	-1.38	-15.5
OTC	6.13	0.75	Spinnaker Software	1.47	-0.03	-2.1
OTC	16.50	3.25	State of the Art	11.25	2.00	21.6
NYS	24.75	13.75	Sterling Software Inc.	23.00	0.38	1.7
OTC	25.25	8.00	Struct. Dynamics Research	13.88	0.75	5.7
OTC	60.00	21.00	Sybase Inc.	60.00	4.75	8.6
OTC	48.75	5.88	Symantec Corp.	12.25	1.75	16.7
NYS	13.50	5.25	Systems Center Inc.	8.25	0.63	8.2
OTC	25.50	11.88	System Software Assoc.	15.88	2.63	14.2
OTC	13.25	2.50	Trimble Corp.	4.13	-0.25	-5.7
OTC	23.75	11.00	Walker Interactive Systems(L)	11.75	-0.50	4.4
OTC	4.38	1.38	Wordstar	2.63	0.00	0.0

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
NYS	21.50	7.38	Advanced Micro Devices	19.63	1.00	5.4
NYS	17.50	8.63	Analog Devices Inc.	17.50	0.88	5.3
OTC	20.13	7.63	Atmel Corp.	16.75	1.25	6.9
OTC	14.13	3.25	Chips and Technologies	4.88	-0.25	-5.9
NYS	16.88	7.38	Cypress Semiconductor Corp	11.50	0.13	1.1
NYS	16.13	7.88	Dallas Semiconductor	10.88	0.50	3.5
OTC	118.00	46.50	Intel Corp.	106.75	1.50	1.4
NYS	12.25	4.88	LSI Logic Corp.	10.50	-0.38	-3.4
NYS	24.38	12.88	Micron Technology (H)	23.50	1.25	5.6
NYS	63.00	36.44	Motorola Inc.(s)	53.25	3.25	6.5
NYS	24.13	8.25	National Semiconductor	10.50	-1.25	-10.6
OTC	25.50	8.25	Sierra Semiconductor	12.50	-0.88	-6.5
OTC	38.50	22.25	SynOptics	30.88	-2.88	-8.5
NYS	59.25	31.50	Texas Instruments	53.75	0.25	0.5
OTC	18.50	6.00	VLSI Technology	7.38	0.38	4.8
OTC	7.63	2.13	Weitek	5.88	-0.38	-6.0
ASE	9.63	3.50	Western Digital Corp.	8.88	0.00	0.0
OTC	33.25	14.50	Xilinx	29.75	0.25	0.8
OTC	41.75	18.75	Zilog Inc. (H)	37.00	-0.13	-0.3

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	28.75	10.38	American Power Conversion	24.25	-1.25	4.9
OTC	30.25	19.00	Banctec Inc.	28.00	0.75	2.8
OTC	23.50	9.25	Cambex Corp.	13.00	-1.00	-7.1
ASE	18.38	6.88	Cognitronics Corp. (H)	17.38	-0.50	2.8
NYS	25.50	16.75	Comdisco Inc.	21.75	-2.00	-8.4
OTC	36.75	10.75	Creative Technologies Inc.	31.50	-0.75	-2.3
OTC	30.75	14.25	Data Race Inc.	25.25	-2.25	-8.2
ASE	19.66	4.75	Datapoint Corp.	10.50	0.00	0.0
NYS	28.38	7.25	EMC Corp. (H)	25.38	-0.38	-1.5
OTC	10.50	5.38	Emulex Corp.	7.25	0.75	11.5
OTC	20.75	13.25	Evans & Sutherland	18.00	-0.25	-1.4
OTC	40.63	12.00	Exabyte	14.13	-0.50	-3.4
OTC	78.00	20.38	Intelligent Info. Systems	71.50	1.50	2.1
OTC	11.25	4.75	Ionics Corp.	6.25	0.00	0.0
OTC	34.75	7.25	IPL Systems Inc.	7.25	-2.00	-21.6
OTC	23.25	10.75	Komag Inc.	20.75	0.88	4.4
OTC	19.63	8.38	Maxtor Corp.	9.75	-0.88	-8.2
OTC	12.63	2.13	Micropolis Corp.	8.75	-0.13	-1.4
NYS	108.00	91.50	3M Corp	108.00	9.75	9.9
OTC	7.75	4.00	Printronix Inc.	6.75	-0.50	-6.9
NYS	17.13	6.88	QMS Inc. (H)	15.00	0.38	2.6
OTC	18.00	12.13	Quantum Corp.	17.38	1.38	8.6
OTC	12.75	3.75	Radius Inc	5.38	0.00	0.0
NYS	16.25	7.50	Recognition Equipment	14.50	-0.38	-2.5
OTC	13.88	6.50	Reton Inc.	6.63	-0.38	-5.4
OTC	32.38	12.00	Seagate Technology	18.50	0.00	0.0
NYS	77.00	18.38	Storage Technology	19.38	-0.75	-3.7
NYS	24.50	16.50	Tektronix Inc. (H)	24.50	1.25	5.4
NYS	87.50	68.75	Xerox Corp.	86.00	2.00	2.4

Exch	52 Week High	52 Week Low		Feb.05 $ Mn	Wk Net Change	Wk Pct Change
OTC	23.50	12.16	American Mgmt. Systems	21.63	-0.63	-2.8
NYS	6.38	3.00	Arascorp Inc.	3.88	-0.25	-6.1
OTC	35.75	16.00	Analysts Int'l	31.75	-0.25	-0.8
NYS	55.63	38.75	Auto Data Processing	55.25	4.25	8.3
NYS	37.25	8.87	Ceridian Corp.	14.75	-0.50	-3.3
NYS	19.41	12.50	Comasco Inc.	14.00	1.88	13.3
OTC	13.25	6.75	Computer Horizons	10.75	0.25	2.4
NYS	84.88	57.00	Computer Sciences	79.00	-0.63	-0.8
NYS	10.13	7.13	Computer Task Group	7.88	-0.13	-1.6
NYS	40.50	22.00	CompuSA Inc.	29.63	-1.13	-3.7
OTC	19.25	6.00	Corporate Software	12.38	0.25	2.1
OTC	30.75	7.75	Egghead Discount Software	9.13	-0.88	-8.8
NYS	35.88	25.25	General Motors E (EDS)	34.25	0.88	2.6
OTC	25.50	9.25	Inacom Corp. (H)	25.50	4.50	21.4
OTC	30.38	6.25	Intelligent Electronics	14.75	0.25	1.7
OTC	14.88	6.63	Medisel	12.63	0.38	3.1
OTC	15.75	5.75	Microage Inc.	12.00	-0.50	4.0
OTC	40.00	21.66	Paychex	35.75	0.00	0.0
NYS	83.50	59.75	Policy Management Sys.	83.00	3.75	4.7
NYS	31.38	16.81	Reynolds and Reynolds (H)	29.88	0.38	1.3
OTC	32.00	22.00	SEI Corp.	29.00	0.25	0.9
OTC	24.00	16.88	Shared Medical Systems	23.63	0.25	1.1
OTC	14.38	5.75	SHL Systemhouse	7.25	0.13	1.8
OTC	29.25	18.25	Software Spectrum Inc.	25.25	-2.00	-7.9
OTC	32.25	20.75	Sungard Data Systems	31.00	-0.88	-2.7
NYS	3.63	1.13	Ultimate Corp.	2.13	0.25	13.3

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Brief

IPOs profit pluses . . .

The IDEA group of companies in Billerica, Mass., reported record 1992 profits of $40.9 million. However, sales slipped 6% to $170.3 million .... 1992 profits at Banyan Systems, Inc. in Westboro, Mass., increased by 189% to $8.2 million on a 13% revenue increase from 1991 to $113.5 million .... Sterling Software, Inc.'s expansion into electronic data interchange continues to pay off. First-quarter revenue rose 17% to $65.6 million, and profits rose 41% to $3.8 million. ... Revenue at Wallace Interactive Systems, Inc. in San Francisco soared 41% to $62.6 million for 1992, with net income jumping to $10.7 million, a 206% increase from 1991. ... Sybase, Inc. in Emeryville, Calif., closed out a record year with 1992 revenue up 65% to $264.6 million and profits up 209% to $23.7 million. Operating margins during the fourth quarter reached a record 21%.

... and minuses

Aldus Corp. closed the books on 1992 revenue of $174.1 million, but that was only a 4% increase over the previous year. Income fell 71% to $6.8 million. ... Troubles continue at Intellicorp, Inc. in Mountain View, Calif. The developer of object-oriented tools lost $1.6 million in the second quarter on a slight decline in revenue to $2.89 million. ... A change of distribution strategies and the PC price wars hit earnings at Advanced Logic Research, Inc. in Irvine, Calif. The PC maker lost $915,000 in its first fiscal quarter on a 14% decline in sales to $42.5 million .... The slowdown in the mainframe market dampened quarterly earnings at Comshare, Inc., a software firm in Ann Arbor, Mich. Sales fell 19% to $20.9 million, and profits were off 60% at $333,000.

Revamped DG on revenue rebound

Open systems, leaner staffing boost firm's profits for second straight quarter

By Melinda-Carol Ballou

■ A restructured Data General Corp. seems to be rebounding somewhat, having posted its second consecutive profitable quarter last month. Analysts attributed the slight rise in DG's fortunes to dramatic staff cuts completed last year and more recent gains achieved in the open systems arena.

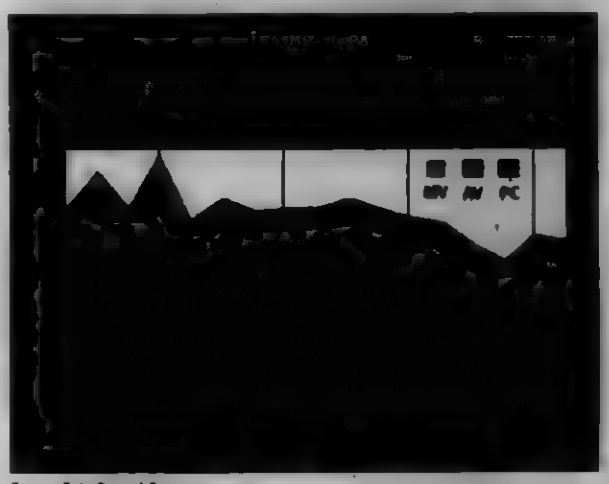
Analysts expect DG to continue to generate revenue by pursuing sales in open systems areas via its Aviion line of workstations and Clariion redundant arrays of inexpensive disks (RAID) technology.

"Their future growth will rest on Aviion and Clariion as their proprietary systems decline," said Fara Yale, senior industry anlayst at Dataquest, Inc., a market researcher in San Jose, Calif.

While DG's financials have been "perched on the knife's edge of break-even," the company is likely to make a dent in the market with Clariion because it is the first large company to move forward with RAID for Unix, said John Adams, chairman of Adams, Harkness & Hill, Inc., a Boston consulting firm.

"Users like the price of open systems, but they've found as they downsize that some of the things that mainframes had were pretty important — like data integrity," Adams said. "RAID is the likely answer."

DG's Clariion storage systems are available on DG systems as well as Unix-based platforms from IBM and Sun Microsystems, Inc. Ports to Unix systems from Hewlett-Packard Co., Unisys Corp. and ICL are slated for availability later this year, officials said. The next generation of Clariion products will be announced next month at Uniforum 1993, they added.



Source: Data General Corp.

DG meanwhile is bolstering its success in the open systems sphere by expanding Clariion's distribution and through software partnerships centered around Aviion.

Moving forward for DG also hinges on the successful outcome of a lawsuit against Grumman Systems Support Corp., which was ordered to pay DG $86.4 million in damages and $15.9 million in additional interest for software copyright infringements and trade secrets. Grumman is expected to appeal.

Any damages collected will supplement DG's operating income for fiscal 1992, which ranged from a gain of $5 million in the first quarter to a loss in the third quarter of $10 million related to restructuring costs. For the fourth quarter of 1992 and the first quarter of 1993, the company announced profits of $3 million and $4 million, respectively. Total fiscal 1992 revenue was $1.1 billion, with an operating loss of $8 million and a net loss of $63 million.

Helping those profits is the reduction of head count — from a high of 18,000 in 1985 to the current number of 6,900.

"We were able to achieve profitability in the first quarter despite continuing weakness in the worldwide economy and very competitive industrywide pricing pressures," said President and Chief Executive Officer Ron Skates. He added that while other companies, such as IBM and Digital Equipment Corp., are in the midst of downsizing and restructuring, DG has completed its reorganization and is moving forward.

Everex sells business units in effort to get back in black

By Michael Fitzgerald
FREMONT, CALIF.

Loss-ridden Everex Systems, Inc., which is trying to climb out of Chapter 11 bankruptcy, has started its journey back to profitability by shedding some weight. But analysts said the company still has a long way to go.

Exabyte Corp., the Boulder, Colo., concern that makes high-level tape backup products, said it has offered $5.5 million for Everex's Mass Storage Division, which has done well in the low end of the market.

(Exabyte also announced the purchase of Tallgrass Technologies Corp., another tape backup supplier.)

Separately, the unit responsible for Esix, Everex's version of Unix, went to the James River Group for $210,000.

Analysts were neutral about the deals.

"Strategically, it makes sense for them to get rid of that stuff, but it won't help their bottom line much," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Henning pointed out that although it is small, Everex's tape backup division is considered by the industry to be relatively successful.

"It's like they're selling a good part of the company," Henning said.

The two deals must be approved by Everex's creditors committee, its secured lender (C.I.T. Group) and the bankruptcy court. Everex is also expected to attempt to sell more significant units.

As if to show it is still alive, Everex also announced that under a contract with the U.S. Department of Defense — one of several government contracts Everex holds — it is expediting 11 file servers to Kuwait.

Balancing the load

Everex, which lost $48M last year and could lose $120M this year, has received letters of intent for the sale of two business units while also striking a sales deal with the Department of Defense

Business sold	Buyer	Technology	Sale price
Mass Storage Division	Exabyte Corp.	SCSI tape drives; DC 2000-based 1/4-in. cartridges	$5.5M
Product sold	**Buyer**		**Quantity sold**
486 extended industry standard architecture file server	Department of Defense		11

Trends Handling system outages

Are data centers prepared to face complete outages of their mainframe service? IS professionals at 869 mainframe sites fielded questions about system outages and recovery plans. Here are some of their thoughts:

The majority believe they could provide an adequate replacement service **within two to four days.**

Approximately 68%
have a disaster recovery plan in place. Most were put together in mid-1987 and last updated in early 1992.

The recovery time for a 2-year-old recovery plan is **more than twice that** for a recent one.

On average, during a four-year span, recovery plans are tested **five times.**

37 hours
is the average recovery time for plans tested one or more times a year.
72 hours
is required for those tested every one to two years.

56%
have a stand-by site in case of disaster.

Average stand-by site contracts for different industries:

$334,000 for government.

$150,000 for finance and banking.

$117,000 for insurance.

Base: 553 U.S. mainframe sites, 316 international sites

Source: Xephon/WPWS, Oviedo, Fla.

The Fifth Wave

Inside Lines

Dear Mort:

In the wake of a system crash that caused NationsBank to lose track of account balances in two states for four days last December, sources said the company recently sent its outsourcer, Perot Systems, a "shape up or ship out" letter. The country's fourth largest bank can boast Ross Perot as a major depositor but is believed to have grown impatient with his namesake company after a series of incidents. For instance, Perot Chairman Mort Meyerson at one point yanked star performers off the account to tend to other trouble spots. He reportedly returned them and may be saving the relationship.

Dear John:

One of IBM Chairman and CEO John Akers' last pieces of correspondence as head of IBM came from Ken Pentikes, who founded Comdisco. The two companies are currently embroiled in a bitter legal dispute over Comdisco's alleged theft of parts from IBM mainframes. After potential damages in the case were set at a minuscule $2 million, Pentikes sent a "Dear John" letter suggesting the two CEOs get together and settle the case themselves because each company has spent far more on legal fees than the proposed damages. No word on Akers' response.

The kettle's e-boil

Yes, Virginia, there is something cooking between HP and Next, Inc. A top HP official confirmed last week that the rumored talks are indeed happening, and the subject is a possible port of the NextStep environment to HP's PA-RISC line. "But we have reached no agreement in that area," stressed William Roelandts, vice president and general manager of HP's computer systems organization. He said the snag so far is that Steve Jobs, president and founder of Next, is balking at HP's insistence that NextStep comply with certain open systems standards, namely the OSF's Distributed Computing Environment and the Object Management Group's Common Object Request Broker Architecture. "Steve is dancing around the table," Roelandts said. "But he needs us more than we need him."

Even more people are talking

High-level discussions between DEC and Microsoft are continuing, according to internal sources, who said DEC's vice president of engineering, Bill Strecker, is negotiating with Bill Gates to ultimately support Cairo, Microsoft's object-oriented, follow-up operating system to Windows NT.

Boom boxes

Separately, and closer on the horizon, is a family of OSF/1-based Alpha AXP workstations that DEC is expected to unveil at Uniform next month, sources said. These include a 200-MHz workstation priced to compete with IBM and HP machines.

NetWare soaks up some Sun

Novell and Sun Microsystems Computer Corp. will be announcing an "expanded business relationship" next week at a press conference in Santa Clara, Calif. Industry watchers speculate that development of native NetWare for Sun's SPARC chip, or perhaps the release of NetWare for Sun's Solaris operating system, could be in the works.

At least one seriously bummed-out PC user has found that hell hath no fury like a divorced man. According to an Associated Press report, a Santa Rosa, Calif., man has admitted to sabotaging his ex-wife's computer with a disk that erased all her files. All that was left was a "taunting limerick." But she may yet have the last laugh: He's been ordered to stand trial on a felony computer-tampering charge. If convicted, her disk-corrupting ex-husband could face a maximum of three years in prison. If you want to drop a dime on a computer crime, phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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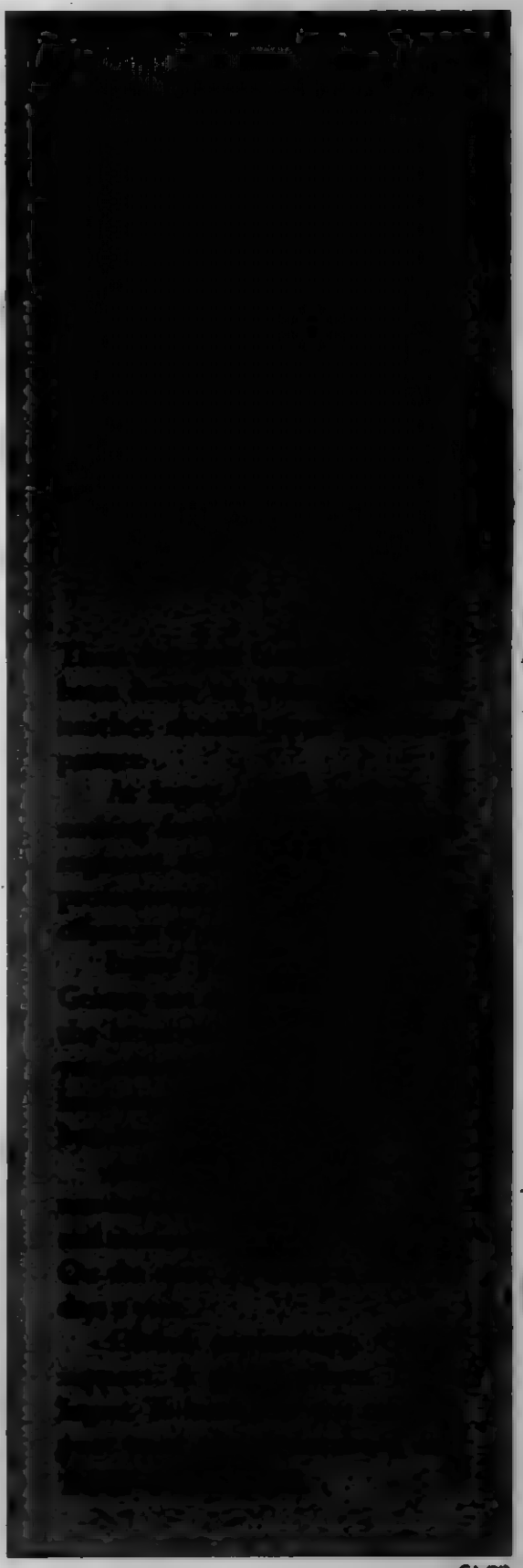
Tim Treneff, VAX Systems Manager, Kaiser Aluminum & Chemical Corporation, Rod, Bar & Wire Division.



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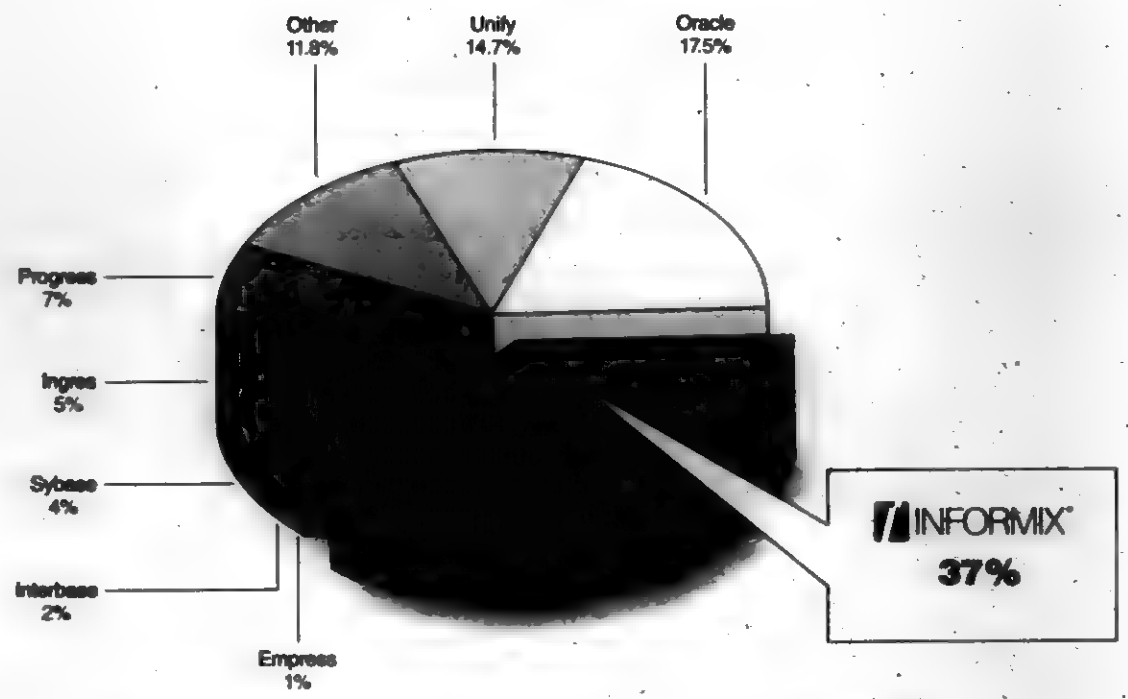
The UNIX Database Leader Now Does NetWare.



Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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COMPUTERWORLD

Belt-tightening

OSF restructures as member firms cut back

By Maryfran Johnson
CAMBRIDGE, MASS

Taking a cue from its struggling industry sponsors, the Open Software Foundation last week streamlined itself into two main business units, underscoring the importance of its "middleware" software technologies.

Eight jobs were eliminated from support and operations in the restructuring of the 300-employee foundation. Among them was the recently created post held by Chief Operating Officer Gary Bard, who has been reassigned to the task of creating a multivendor interoperability laboratory at OSF headquarters.

Another crucial bit of business will be resolved by the end of this month, when the board of directors is expected to finally reach an agreement on the 1994 funding for the $50 million organization (see story page 15).

> The changes could allow DCE and DME to be better integrated.

"Some board member companies are losing a lot of money right now," said Kurt Friedrich, an OSF board member and general manager at the Open Systems Software Division of Hewlett-Packard Co. "As these companies have had to adjust funding for their own internal engineering, OSF should have its funding adjusted — like any other project."

The restructuring funneled roughly 75% of the OSF's re-

OSF, *page 16*

Networking standards

APPN tackles TCP/IP

By Elisabeth Horwitt
RALEIGH, N.C.

■ IBM Networking Systems technicians last week detailed the company's strategy for knocking Transmission Control Protocol/Internet Protocol off its perch as the industry's favorite internetworking protocol. The plan: Replace it with a renovated version of IBM's Advanced Peer-to-Peer Networking.

However, that strategy may have difficulty making a dent in the Systems Network Architecture population already planning its exodus to TCP/IP.

The next phase of IBM's strategy, due within 18 months, centers around APPN+, or APPN High Performance Routing. "We'd like to position it as a premium version of TCP/IP, with the same traits as TCP/IP, only faster and better," said Rick McGee, IBM's director of architecture and telecommunications.

APPN+ will offer three to 10 times the throughput of regular APPN, primarily by minimizing the overhead it takes for each network node to handle data packets, according to Marcia Peters, chief APPN architect.

APPN+'s other big advantage will be dynamic rerouting around failures, according to McGee. TCP/IP already has this feature, in con-

APPN, *page 12*

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Compaq hatches plan to loosen IBM's PC grip

Aggressive product rollouts, direct sales key to strategy

By Michael Fitzgerald
HOUSTON

March will see a remade Compaq Computer Corp. roar in with new products and distribution strategies, including a long-awaited move into true direct sales. The plans are part of a major push by Compaq to wrest leadership of the PC industry from the IBM PC Co.

On March 8, Compaq will refresh its ProLinea and Contura families and tweak the DeskPro/I family. ProLinea will gain local-bus graphics, while the Contura line will receive active-matrix displays. The addition of faster processors will beef up the DeskPro/I line, sources said.

A week later, on March 15, Compaq will officially go direct, following up on its recent feint of using direct marketers as a separate reseller channel. Sources said Compaq will establish a toll-free phone number to allow customers to buy its entire product line directly.

Compaq declined to comment on the product or distribution initiatives. A spokesman said only, "Our challenge is to win back customers who prefer to purchase directly from the manufacturer, and you can count on us to address this in the first half of this year."

Commenting on his firm's bid to catch up with a stumbling IBM, Compaq President and Chief Executive Officer Eckhard Pfeiffer said, "IBM hasn't had technology leadership since 1984, and we have a shot at volume leadership."

"He thinks that?" asked Kimball Brown, vice president at Computer Intelligence/Infocorp in Santa Clara, Calif. "IBM is out for blood, and if he thinks he's going to take share from IBM, he's made a mistake."

At the same time, Brown and

Compaq, *page 7*

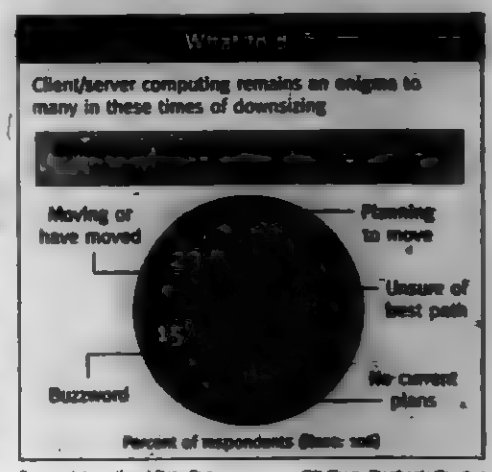
Client/server caveats

By Michael Vizard

■ Information systems departments looking to build client/server applications around networked PCs are discovering that each of the four major operating system platforms has critical shortcomings that impact the robustness of the applications and the length of time it takes to deploy them.

Currently the most popular approach is to build client/server applications that run under Microsoft Corp.'s Windows and DOS as clients attached to OS/2 or Unix servers. However, the drawback is that IS must pay particular attention to how an application behaves on a DOS client because it can crash easily (see story page 16).

The need for a multitasking operating system is beginning to push some IS departments to look at 32-bit options such as IBM's OS/2 2.0, Unix or Microsoft's upcoming Windows NT on both the client and the server. By adopting a multitasking operating system, they expect to create faster, more robust applications that will be easier to maintain in a homogeneous client/server environment.



However, the 32-bit platforms are not without drawbacks: Some are missing key features,

Client/server, *page 16*

NEWS

A number of client/server products and issues were detailed last week. Developers attempting to build cooperative client/server applications on desktop platforms face a host of daunting integration issues. *Page 1.* Making their pitch for the high end of the LAN server market are Netframe Systems, with a family of multiprocessing superservers, and Sun, which is teaming with Novell to build a processor-independent version of NetWare 4.0 that will run on Sun's SPARC-based servers. *Page 4*

Large systems customers have plenty to keep a close eye on as IBM formally introduces its new mainframes — sans list prices. *Page 10.* DEC also showed its hand, articulating a mixed VAXcluster strategy due later this spring as well as its most enthusiastic embrace of Unix to date. *Page 14.* However, minicomputer makers, including DEC, are also evaluating Windows NT and developing strategies for using that operating system as an enterprisewide environment. *Page 71*

Unix and Windows NT may be gathering some steam, but the Open Software Foundation, under pressure from its sponsors, restructured its business, eliminated eight jobs and is set to establish a new funding model. *Page 1 and 15.*

The intensity of the battle for the desktop turned up a few notches as Compaq grabbed at IBM's PC mantle with aggressive product rollouts and distribution shifts. *Page 1.* DEC, meanwhile, turns to the PC market. *Page 14*

VIEWPOINT

Software licensing practices are out of step with the times, columnist Elaine Bond says. It's time to abandon tradition and rethink the whole structure. *Page 27*

IN DEPTH

Want to know the naked truth about IS performance? By concentrating on trouble spots, you can come up with an action plan to align IS and the business. *Page 89*

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A PUBLICATION OF IDG

Next KOs workstation line

By James Daly
REDWOOD CITY, CALIF.

Steve Jobs, Next, Inc.'s chairman and Apple Computer, Inc.'s co-founder, acknowledged last week that he could not make lightning strike twice. Jobs announced plans to scrap his slow-selling workstations and focus solely on software.

Saying he could not allow the struggling firm to remain "a second-tier hardware company," Jobs unveiled a radical restructuring that included the dismissal of 280 of Next's 536 employees. The metamorphosis from a workstation maker to a software supplier should be complete by May 25, the first date of the annual NextWorld show in San Francisco.

Next is currently hammering out details to sell its hardware business and state-of-the-art automated manufacturing plant in Fremont, Calif., to Canon, Inc., the Japanese electronics giant that has invested $165 million in the company.

A long struggle

Next's object-oriented NextStep environment has been available for more than four years but has struggled for both mind share and market share. However, it is expected that the late May release of a version for Intel Corp. platforms — the NextStep 486 — will widen its appeal for users who are looking to quickly develop custom in-house applications.

NextStep users have long praised a design that makes it easier to reuse large chunks of software code, saying it delivers today the kind of object-oriented programming environment potential rivals such as Taligent, Apple and IBM's joint venture, or Microsoft Corp.'s Cairo project will not deliver until next year. But that may not be enough.

"NextStep is a superb way to build apps quickly. So if they can make NextStep fly, that would be a great thing," said Charles Mayer, manager of computer systems and services at Mobil Corp.'s offices in Fairfax, Va. "But I question whether they will be able to do that against competition as tough as Microsoft, Apple and IBM."

Additional competition comes from smaller competitors that are also shipping product. Already, companies such as ParcPlace Systems, Inc. and Digitalk, Inc. offer similar well-regarded platforms for crafting customized applications for corporate developers.

Steve Jobs' *Next workstations faced huge hurdles*

Tough sell

The price and proprietary nature of the Next workstation made it hard for founder Steve Jobs to find a market. He first targeted the university market. When that did not work, he followed with an equally unsuccessful strategy of selling to corporate America.

"We're buying commodity workstations — we don't need, and don't want to pay for, the level of robustness the Nextstation affords," said Mike Adelson, project manager at Chrysler Financial in Southfield, Mich.

Unlikely scenario

Analysts agreed that the chances of Next's taking over this object-oriented development market are slim. "Being early with a good OS will help, but Microsoft and Taligent will probably be the two real powerhouses in systems OS in the future," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif. "At best, Jobs can hope to gain a loyal following where creating custom apps fast is a priority."

NextStep 486 also presents significant financial hurdles. In addition to shelling out $995 for the user version, users may need extra circuit boards, memory and disk drive capacity to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next workstation — adding several thousand dollars to the cost of an already expensive machine.

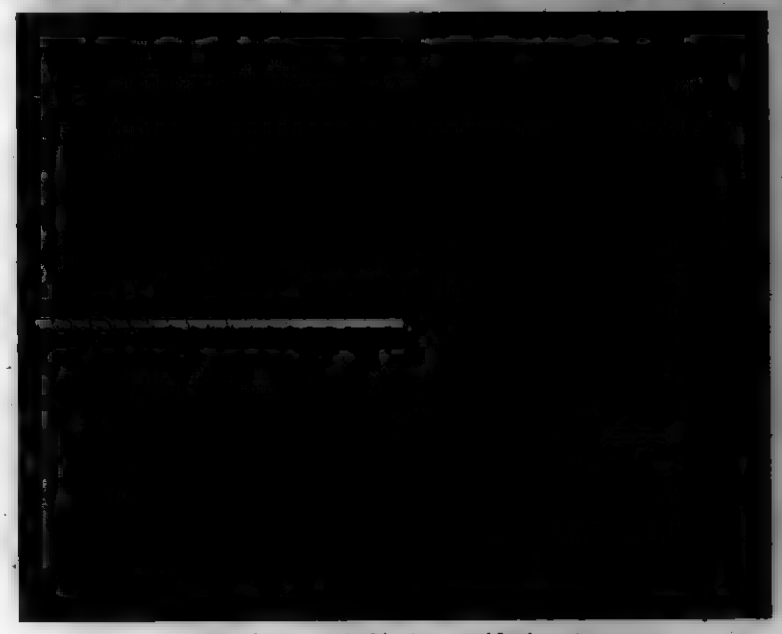
At stake is nothing less than the survival of the company. "If they have another year where they do not make money with this [software] strategy, it could be tough for them to survive," Bajarin added.

In general, Next's customers did not seem overly disappointed by the firm's sudden withdrawal from the hardware world. "I don't think it's a failing; I think it's a smart move," said Tom Campbell, who supervises 325 Next workstations as senior vice president at First National Bank of Chicago.

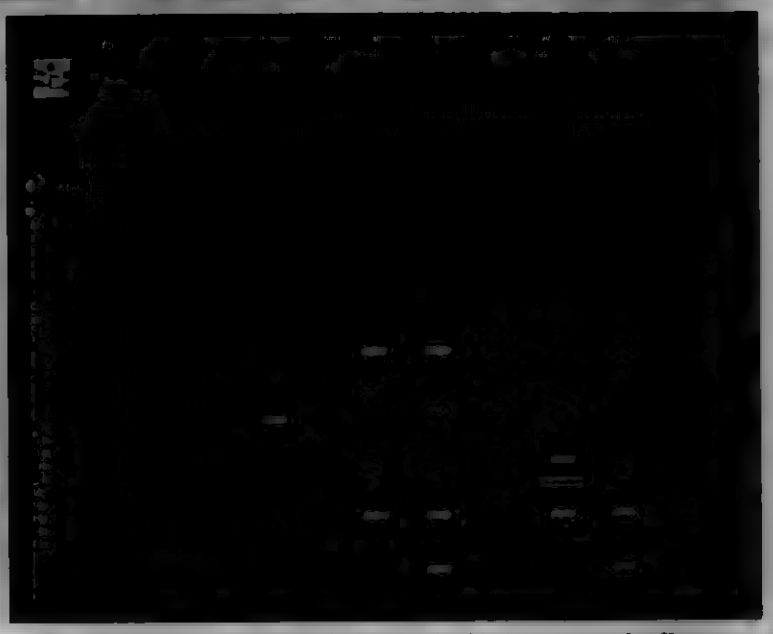
APPLE TOPS OS SURVEY

Next week's CW Guide on desktop operating systems features user survey results on the major products and a Firing Line evaluation of Windows NT. The Buyers' Scorecard results (at right) are based on user ratings across 16 categories with scores weighted by factors indicating the importance of each category to the users surveyed.

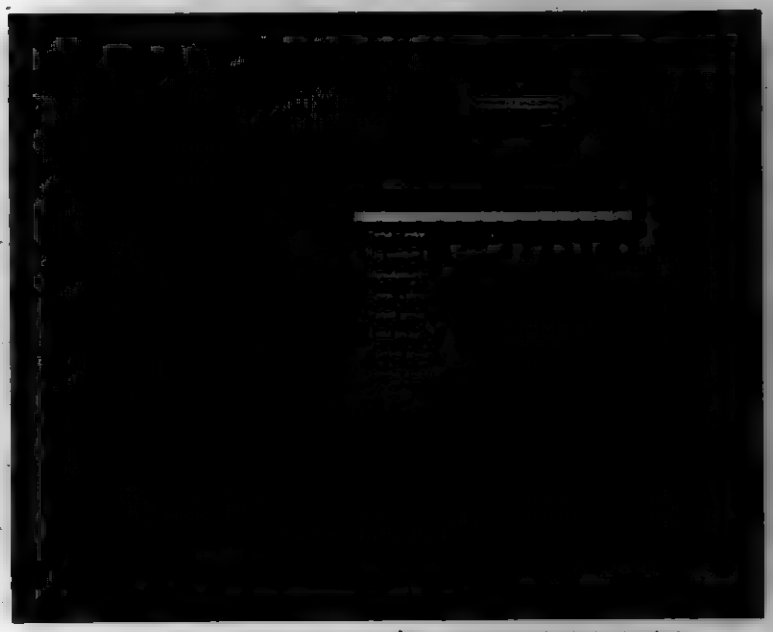
INTRODUCING NEW CA-UNICENTER: MAKING THE WORLD SAFE FOR UNIX.



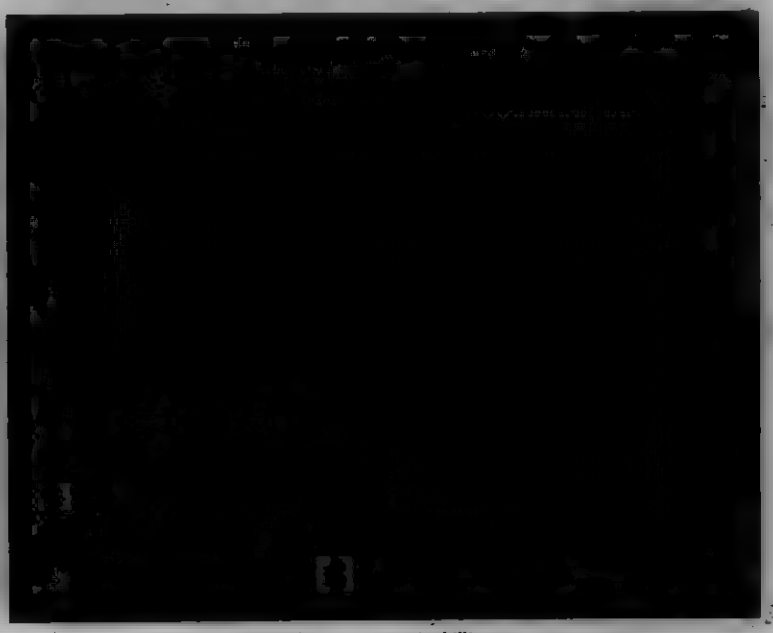
Security Control gives you single-point control for the entire system. It provides the first and only method for limiting authority of superusers.



Storage Management ensures files are backed up and archived. Frees space when file systems become full and keeps backup and archived files safe from accidental or intentional destruction.



Help Desk includes Machine Generated Problem Tracking and Priority Escalation– so people are immediately notified of critical problems.



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Client/server development

Netframe expands line

By Kim S. Nash
MILPITAS, CALIF.

Netframe Systems, Inc. last week confirmed that it intends later this month to ship a new superserver family that offers improved application processing and built-in remote software management — features pivotal to users wanting to build robust client/server applications.

Shops interested in downsizing or consolidating local-area networks are most likely to consider multiprocessing as several factors coalesce to make the boxes more appealing and affordable, users and analysts said.

The impending Pentium chip from Intel Corp., Microsoft Corp.'s Windows NT multiprocessing operating system — and the many applications expected to be written for it — and advances in data storage make multiprocessing "seem real and doable," according to Lynn Berg, program director for midrange computing strategies at Gartner Group, Inc. in Stamford, Conn.

Year for trials

However, all this activity does not mean the market will soar, Berg cautioned. She said 1993 will be a year of experimentation, with users discovering that superservers can make sense in some client/server scenarios.

Some companies have already forged ahead. "Networks built on machines that can do more than one thing at a time are absolutely the way to go," said Michael West, MIS director at Henredon Furniture Industries, a large furniture maker and retailer in Morganton, N.C.

The company is four to six months away from unplugging a high-end IBM Application System/400 and about a year away from ditching an IBM 4381 mainframe, according to West, who installed four older Netframe superservers several months ago.

Collapsing data processing from the two proprietary platforms to a single wide-area network anchored by multiprocessors serving PC clients gives end users more functionality and better performance, he said.

Henredon has been able to reallocate 30% to 40% of its information systems staff's time from hardware maintenance to new software development, West said.

Netframe's new CS series — four models due within two weeks — promises high-performance application handling by way of dedicated application processors, separate from I/O processors. The 486-based systems scale from one to seven processors and are priced between $29,950 and $74,950.

The goal was to build a single box capable of simultaneously running programs geared for different operating systems. For example, a user might decide to install a Unix manufacturing application and a Windows NT-based human resources program on one Netframe CS server.

Other features include improved fault tolerance via redundant cooling and control systems and the option of a redundant CPU and easier systems administration via the ability to install, diagnose and maintain software remotely from any point on the network.

NetWare coming to SPARC

By Michele Doucet
MOUNTAIN VIEW, CALIF.

Managers of Novell, Inc. NetWare networks whose Intel Corp.-based servers are running out of steam may soon be able to replace them with powerful, inexpensive SPARC-based servers from Sun Microsystems Computer Corp.

Sun and Provo, Utah-based Novell last week disclosed an agreement to develop a processor-independent version of Novell's forthcoming NetWare 4.0 network operating system that will run natively on Sun's Scalable Processor Architecture (SPARC)-based servers.

To network users and managers, the NetWare on SPARC servers will look and feel just like their familiar Intel-based servers. But unlike Novell's NetWare for Unix products, which run as processes on top of Unix, NetWare for SPARC systems will run directly on the SPARC chip, just as it does now on the Intel chip.

Novell and Sun would not disclose the targeted shipping date for NetWare on SPARC, but they promised that software developer kits for the product would ship by the end of 1993. The agreement is similar to one struck between Novell and Hewlett-Packard Co. in December 1991 to build native NetWare for HP's Precision Architecture-RISC servers, which HP said will ship by the end of 1993.

"Since Novell has such a huge installed base in that market, it's a good move for them," said Bill Sines, vice president of midrange strategies and server research at Technology Investment Strategies Corp. in Framingham, Mass.

The power of SPARC may be overkill for file-and-print serving for spreadsheets, word processors and the like, but it will be welcomed by users running databases and graphically based applications, Sines said.

Sun will target its SPARC servers at NetWare users with high-demand applications, such as Wayne Robertson, network administrator at St. Agnes Medical Center in Fresno, Calif. Some of Robertson's applications use 800M bytes of data and are accessed by hundreds of users. "Our current 486/50-MHz servers are just running out of horsepower," he said. "I've been really impressed with the SPARC boxes I've seen, and I'd love to be able to use them as NetWare servers."

Currently, SPARC servers are priced from $5,295, which includes Sun's Solaris operating system. Scott McNealy, Sun's chief executive officer, intimated that SPARC boxes sold as NetWare servers without the Solaris operating system will be even cheaper.

To build NetWare 4.0 for SPARC, Novell will provide what it calls a "NetWare System Interface" to NetWare 4.0, to which Sun will then write its processor and device controllers. Third-party developers of NetWare Loadable Modules (NLM) for NetWare 4.0 will be able to port their NLMs to the SPARC platform by recompiling their code, according to Bob Young, Novell's director of marketing for NetWare.

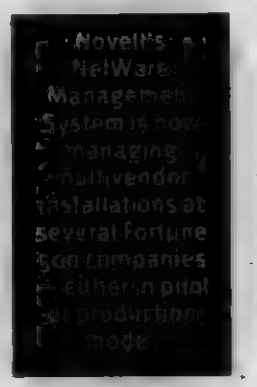
UPS makes network management choice

By Elisabeth Horwitt
MAHWAH, N.J.

■ After deliberating for a year over products from some 50 vendors, United Parcel Service, Inc. (UPS) has tapped Novell, Inc. and Applied Computing Devices, Inc. to supply and help design its integrated, corporatewide network management system.

A third vendor, Software Artistry, will provide help desk applications such as problem tracking and asset management.

UPS expects to get back its multimillion-dollar investment in the system — which will support new services and applications — within 18 months, according to Marc Dodge, the package handler's telecommunications manager.



The new services include a cellular network that will provide real-time package tracking.

While UPS' rivals may be able to field similar customer services, "the differentiator is keeping those services up and running," Dodge said.

Another driver for UPS' network management strategy is the expansion of its local-area network installations from zero to 1,400 NetWare-based Token Ring LANs in the past six years, Dodge said.

"It all boils down to our stand-alone networks and PCs all coming together into one big whole, and we're recognizing we also have to do network management as a whole," Dodge explained.

UPS has about $1 billion in hardware, software and applications in the field that it has to protect, he added.

The vendors will be working with UPS' information systems and networking people to design a system that distributes network management and user support to corporate sites and yet allows scattered LAN and wide-area network managers to share data about network problems and statistics, Dodge said.

Performance uptick

The system should boost IS field support people's effectiveness by at least 20%, according to talks with UPS network managers, said Mark Latham, a UPS regional IS manager who worked on the project. "That's significant bucks with 1,100 field people."

UPS' IS budget for 1992 and 1993 is $500 million for each year.

A key component of UPS' strategy is moving user support functions out from a data center to localized help desk support at each of the company's 83 operating regions, Latham said. "Right now we have 2,000 people in 1,400 buildings calling one spot for help on 118 different applications."

UPS decided to decentralize help desk functions "when a lot of companies are going the opposite way [because] we don't want users to have to make a long-distance call to New Jersey" for each problem, Latham said.

Software Artistry will provide the tools to enable local users at the 83 operating regions to "fix their own problems instead of calling central IS all the time," Latham said. These tools include an "expert adviser" that suggests the best action to try and "visualization" tools that provide graphic presentations of the equipment being fixed, he added.

Software Artistry will also supply a common database for LAN and WAN problem tracking so managers on both sides of the house and in different parts of the country can compare notes on what problems came up and how they were handled, Latham said.

More efficient

While Applied Computing Devices' software will correlate problems between WAN devices and Novell's NetWare Management System for LANs, "sharing data between the LAN and WAN folks [via a database] will save at least 80 phone calls to the data center right off the bat" for each major network problem, Dodge said.

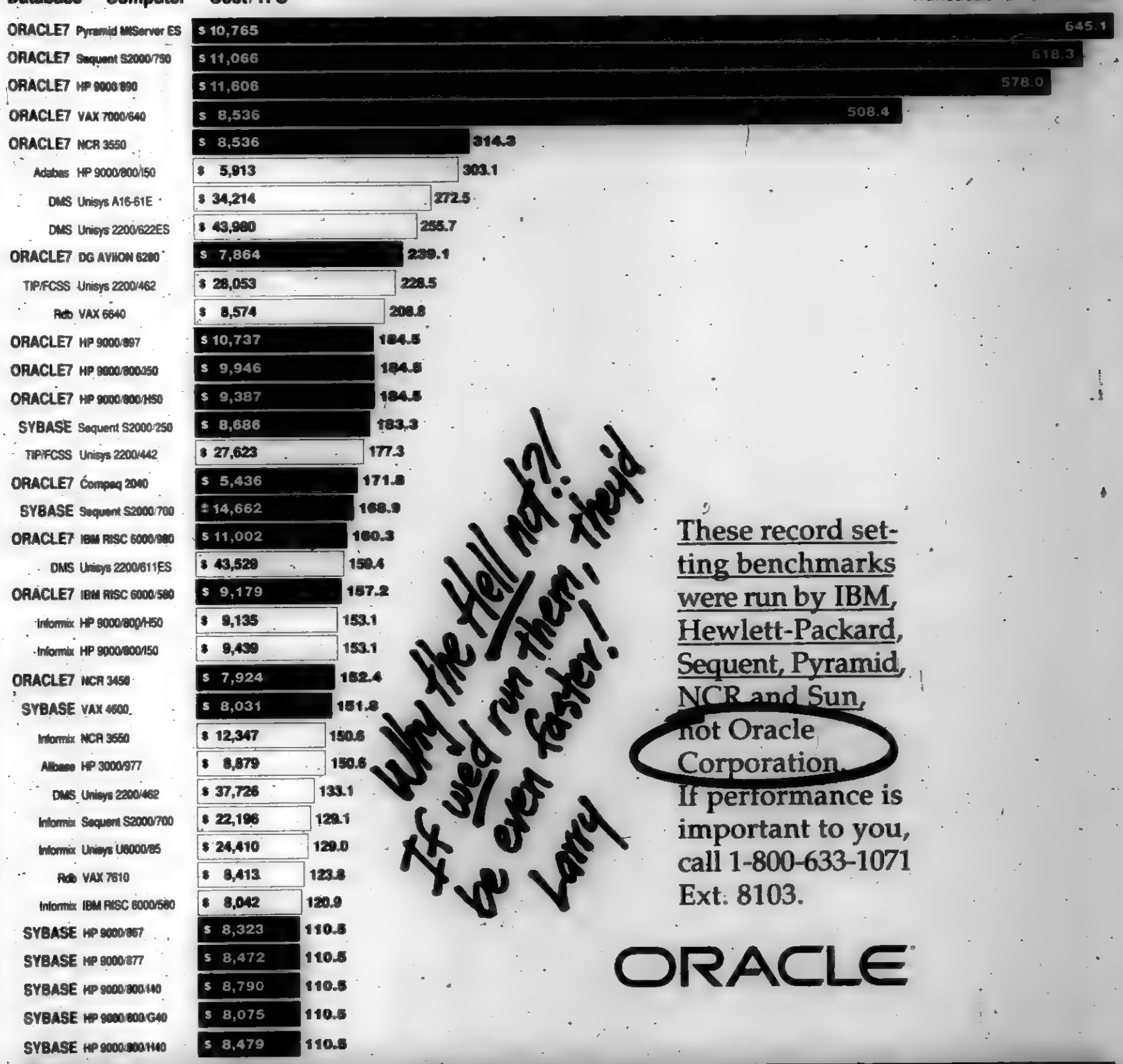
UPS originally hoped to have just one integrated network management system but soon settled for "two primary vendors working together," Dodge said. The company looked at all major so-called integrated network management platforms but concluded that the traditional ones were mostly telecommunications- and carrier-oriented, with "little grasp of LANs and PCs," Dodge said.

Novell's NetWare Management System still has a lot of holes in terms of supporting UPS' multivendor LAN installations, Dodge said. "Novell has the best chance of attracting third-party support to pull this thing off."

PERFORMANCE COMPARISON

SYBASE BEST: 183 TPS

ORACLE7 BEST: 645 TPS



Why the Hell not?! If we'd run them, they'd be even faster!
Larry

These record setting benchmarks were run by IBM, Hewlett-Packard, Sequent, Pyramid, NCR and Sun, not Oracle Corporation. If performance is important to you, call 1-800-633-1071 Ext. 8103.

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News Shorts

Lotus answers licensing move

Lotus Development Corp. last week countered **Microsoft Corp.**'s latest licensing foray aimed at large information systems shops. As part of its Lotus Flex sales program, the company is offering customers with 250 units of PC software from Lotus or another vendor the ability to purchase all upgrades for Lotus software during a two-year period. Microsoft implemented a similar program earlier this month. Separately, Lotus announced that it has begun shipping Version 2.0 of Freelance Graphics for Windows, which brings several enhancements to Lotus' presentation graphics software.

Beyond the 'three R's'

Vendor profits and product quality will suffer unless the math, computer and language skills of entry-level workers are upgraded, according to a committee convened by the **American Electronics Association** (AEA) last week. Working under a federal grant, the AEA committee plans to identify the key worker skills needed to make U.S. vendors more competitive, update school curricula and develop a voluntary standard for worker training in the electronics industry.

UPS wireless net arrives on time

A $150 million data-over-cellular network for **United Parcel Service, Inc.** goes into operation today. The network, plans for which were announced last year, extends UPS' private land network to some 50,000 trucks in the field. The parcel company will now be able to monitor bar-coded and air and ground deliveries almost immediately.

Sun, Microsoft work together

Microsoft and **SunSelect**, the PC unit of Sun Microsystems, Inc., last week announced support for enhanced interoperability and full integration among Windows for Workgroups, Windows NT and SunSelect's PC Network File System (NFS) software for PC-to-Unix integration. Users of any Windows operating platform will be able to use PC-NFS products to access Unix networks and open systems resources. SunSelect also confirmed its commitment to ship a new PC-NFS for Windows NT in the third quarter.

UI maps out 1993 Unix plans

Unix International released its "1993 Roadmap for Unix Systems and Related Technologies" with the stamp of approval from 50 major user companies. Unix International chose **SunSoft**, a Sun subsidiary, as its reference technology supplier and selected Sun's Open Network Computing distributed computing services as one of the requirements.

SHORT TAKES **Sun** settled out of court for $30 million on two separate securities class-action lawsuits brought by a group of shareholders.... **Silicon Graphics, Inc.** last week cut by 13% the entry model prices of its Iris Indigo R3000 reduced instruction set computing PC, from $7,995 to $6,995.... **Syncordia Corp.** has gained yet another customer: **Firmenich International SA**, the Geneva-based fragrances and flavorings company, which Syncordia will provide with a network backbone to interconnect six sites in Europe and Princeton, N.J.... **BlueLine Software, Inc.** in Minneapolis has purchased **Phaser, Inc.** as a way to extend its IBM Systems Network Architecture network performance monitoring software down to Novell, Inc. local-area networks.... **ITT Datacom** will introduce to the U.S. this week copper-based network cabling that the firm "guarantees will support 100M bit/sec. Ethernet," a spokesperson said.

News shorts, *page 16*

Hospital proves IS can help cut health care costs

By Mitch Betts
INDIANAPOLIS

■ Memo to Hillary Rodham Clinton: Hospital information systems that make doctors more cost-conscious when they order drugs and tests could slash the nation's bloated health care bill by an estimated $30 billion.

One such information system is already in use at Wishard Memorial Hospital in Indianapolis, where a rigorously controlled study showed that it slices an average of 13% (or $887) off a patient's hospital bill — without degrading the quality of care.

> The system could cut U.S. health care costs by roughly $30 billion.

"This is very consistent with the Clinton administration's plans for health care reform, where the goal is to squeeze out unnecessary and inefficient services," observed Charles J. Singer, president of Charles J. Singer & Co., an IS consultancy in Wakefield, Mass., that specializes in health care.

Indeed, the system's developers have fired off a letter to make sure Clinton's health care task force is aware of the pioneering study, according to William M. Tierney, a professor of medicine at Indiana University, which manages the hospital. So far, there has been no response to the letter, he said.

Cost cure

The order-writing system employs approximately 60 Intel Corp. 80386-based PCs linked by an Ethernet local-area network running Novell, Inc.'s NetWare.

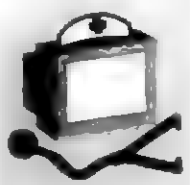
More importantly, the custom software was designed specifically to steer doctors toward more cost-effective decisions when ordering expensive drugs and medical tests.

For example, the system leads doctors through a menu of ordering choices and lists the patient's charge for each item. "That's important because most doctors don't have the foggiest idea of the costs of the tests they are ordering," Singer said.

The menus list the most cost-effective tests, discourage some expensive ones, display only reasonable testing intervals (such as three times a week rather than daily) and warn about drug interactions.

In addition, the software uses a technique called "counter detailing," which gives recommendations not to use specific expensive drugs in certain circumstances in an effort to counter the sales pitches of drug companies.

The system lowered patient costs by 13%, according to a study published last month in the *Journal of the American Medical Association*. This would amount to an annual savings of $3 million at Wishard.



Of course, those savings will be offset by the price of the system, which cost about $20,000 per ward for the hardware. The system is now used in 10 wards, three intensive-care units and the emergency room, Tierney said.

If the cost savings are extrapolated nationwide, the ordering system could cut the nation's health care costs by roughly $30 billion a year, said Tierney, the lead author of the $1.3 million study.

The order-writing system will work on a stand-alone basis, Tierney said, but it gains added power from its link with the university's Regenstrief Medical Record System, a 20-year-old database of records for 720,000 Wishard patients.

The link to electronic medical records — still very rare in a world of paper medical charts — means the ordering system can warn doctors about patients' previous test results and drug allergies, for example.

A key question is whether making doctors more cost-conscious degrades the quality of patient care. The study said that although quality is difficult to measure, a review of postdischarge records showed no quality problems, and the computerized warnings about drug complications presumably improved care.

"Cost control and quality improvement need not be mutually exclusive," the study stated.

Moreover, the system provided nurses, technicians and pharmacists with either printed or electronic orders, which are far easier to read than doctors' handwritten orders.

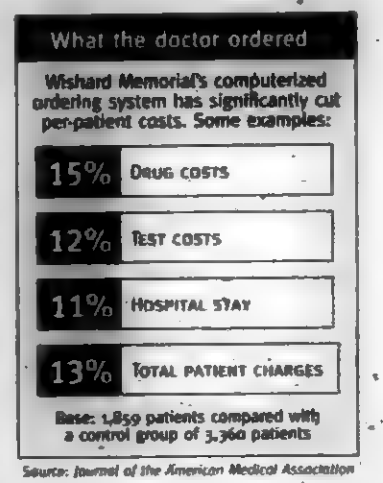
"Legibility is a quality and timeliness issue," said John Page, executive director of the Healthcare Information and Management Systems Society in Chicago. Most hospital pharmacists now get carbon copies of a handwritten order sheet, he said.

The biggest problem the study uncovered was that doctors complained it takes longer to write orders using PCs than it does with paper.

Tierney said the software has since been streamlined to speed up the process and that in the future, the use of portable pad computers could be beneficial.

The study's authors warned that while their software is biased toward reducing costs, software could be developed that goes the other way.

"Hospitals might be tempted to build menus using protocols that would allow users to order batteries of tests and treatments with one keystroke, which would result in higher costs," the study claimed.



At a glance

The software was custom-written by three full-time PC programmers using Advanced Revelation, a menu-driven application builder from Revelation Technologies, Inc. in New York.

The system came on-line for one inpatient service in August 1988 and by October 1991 had been implemented throughout the hospital's six inpatient services.

The $30 billion nationwide cost savings figure is a rough and conservative estimate derived by taking 10% off the hospital half ($300 billion) of the nation's $600 billion health care bill in 1991 (the year the study was conducted).

Compaq plan

CONTINUED FROM PAGE 1

other analysts said Compaq looks well-positioned to grow rapidly in 1993. Brown predicted the PC maker will sell 2.5 million units this year, up from 1.5 million in 1992. The growth will come at the expense of smaller companies, though, as IBM matches Compaq by selling 4.5 million units in 1993, up from 3.4 million in 1992, Brown predicted.

Still, Pfeiffer's comments are not without support. Compaq has surpassed IBM in several European markets and is poised to do so in Japan. BIS Strategic Decisions in Norwell, Mass., said Compaq's unit sales grew 75% last year.

BIS analyst Jeffrey Henning said selling direct would help Compaq's business model. "Compaq now makes less money per PC sold than Gateway because Compaq has to go through the distribution channel. If I'm Compaq, I can't really putz around with these mail-order companies; I have to go direct myself," he said.

Compaq has driven its overall costs down dramatically, and Pfeiffer hinted that the company plans another dramatic price cut [CW, Feb. 1]. Sources said Compaq will cut prices on its 386 and 486SX systems early next month.

Ross Cooley, Compaq's senior vice president, North America, promised the firm will double its number of distribution outlets by June, largely by adding retail and mass merchant channels. The company also plans to introduce a new low-end family of PCs that fit in below the ProLinea line. This line is expected to appear in the April/May time frame.

Compaq's move to push budding industry standards will probably make users happier.

"We've yet to see a pen-based computer, a wireless computer, the PDAs — any machines taking advantage of PCMCIA cards," said Glen Jurmann, section manager of office technology at Baxter Healthcare Corp. "We have seen very good equipment offered at great prices."

Compaq executives defended this lack of product, saying the company does not want to release technology for technology's sake, ahead of market demand. Compaq has stated it will ship pen computers and personal digital assistants (PDA) in 1993, both of which will likely support Personal Computer Memory Card International Association (PCMCIA) cards.

Compaq's revamped DeskPro/M line, expected to be unveiled May 20, should produce some technological innovation.

At the same time, some said Compaq is vulnerable in its bread-and-butter notebook market. Notebooks generated a quarter of Compaq's sales last year, but the vendor has ignored the market for the 486SX to focus on Intel's now dead-ended SL processor.

Sources said Compaq will unveil new notebook products in May or June, including its first sub-5-pound product.

Associate editor Carol Hildebrand contributed to this story.

Fighting back

The IBM PC Co. is not standing still in the face of a Compaq onslaught.

IBM last week announced price cuts of up to 14% on its Personal System/ValuePoint 325T, 425SX and 433DX and its ThinkPad 360 products. In early April, sources said, IBM will refresh its low-end ValuePoint line, adding a Video Electronics Standards Association VL local bus to the line.

This underscores IBM's newfound aggressiveness, as the new products will appear only seven months after the initial ValuePoint announcement, observers said.

IBM is also expected to revamp the PS/1 line in the same time frame. IBM will add a tower format to the line and two new desktops.

Sources said a broad move on the PS/1 and ValuePoint lines will probably go hand-in-hand with a major move on the PS/2 side of the product line. Other sources said IBM will add PCMCIA slots to its ThinkPad notebooks.

IBM declined to comment on the announced products.

—Michael Fitzgerald

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General Magic debut offers only illusion

By Michael Fitzgerald
NEW YORK

General Magic pulled no rabbits from its hat and made no newfangled communications products appear, but a full house at the Hudson Theatre applauded anyway at the debut of the most-hyped technology since pen computing.

Perhaps the audience liked the sleight of hand because the Mountain View, Calif., company held its coming-out party to discuss two software products that do not yet exist but that could fuel a market for personal intelligent communicators.

Personal intelligent communicators, construed broadly, will serve as a communications Swiss army knife. They will offer a mix of functions, acting as handheld cellular phones, wireless data/fax modems, personal organizers, data-retrieval centers, pagers and other devices that have yet to be invented.

General Magic already has licensees for its Telescript programming language and communications protocol. For instance, Apple Computer, Inc. has said it will use Telescript for its Newton Personal Digital Assistant, and AT&T-backed EO, Inc. is using Telescript embedded in Go Corp.'s PenPoint operating system on its now-shipping personal intelligent communicator.

General Magic will also license Magic Communicating Applications Platform (CAP), an object-oriented operating system. Currently, Sony Corp., Motorola, Inc. and Philips Telecommunications N.V. have licensed Magic CAP.

Nothing definite yet

Neither product is finished after two years of development, though Marc Porat, General Magic's president and chief executive officer, said the company would provide concrete product details starting this summer. A reference mock-up with a pen-input device and a phone was shown. This is expected to be based on a Motorola processor initially.

Users responded positively to the basic premise of General Magic's plan but said the company has a lot to prove and faces numerous pitfalls ahead.

Joseph Barrett, a technology analyst at Whirlpool Corp. in Benton Harbor, Mich., said Whirlpool may be able to make use of Telescript-capable products in the next two to three years. "This matters to us just because of its concepts about sharing information — products that use this, if they work, will give more people access to more information. That's why it could be valuable," Barrett said, citing the software's ground-up focus on improved communications.

The impact on information systems is hard to measure, but the prospect of seamless wireless communications among highly mobile workers presents a paradigm shift, according to General Magic and its allies.

"In the current wired world, [communications] services are provided disjointly by a number of different vendors. They're saying this can be consolidated [behind their standard, Telescript], and if that happens, it will have a tremendous impact on the adoption of messaging technology, information access and information services throughout the consumer and business world," said Walter Ulrich, a director at Arthur D. Little, Inc. in Los Angeles.

While the first systems using General Magic's technology will probably be used in a stand-alone environment based on PC operating systems, Andy Hertzfeld, senior vice president and software wizard, said that in late 1994 the company hopes to build books for mainframes and local-area networks into Magic CAP and Telescript and after that plans to work with database vendors to build additional hooks.

Still, the vision of providing anywhere, anytime communications will "take us at least a decade and perhaps two biological generations," Porat estimated.

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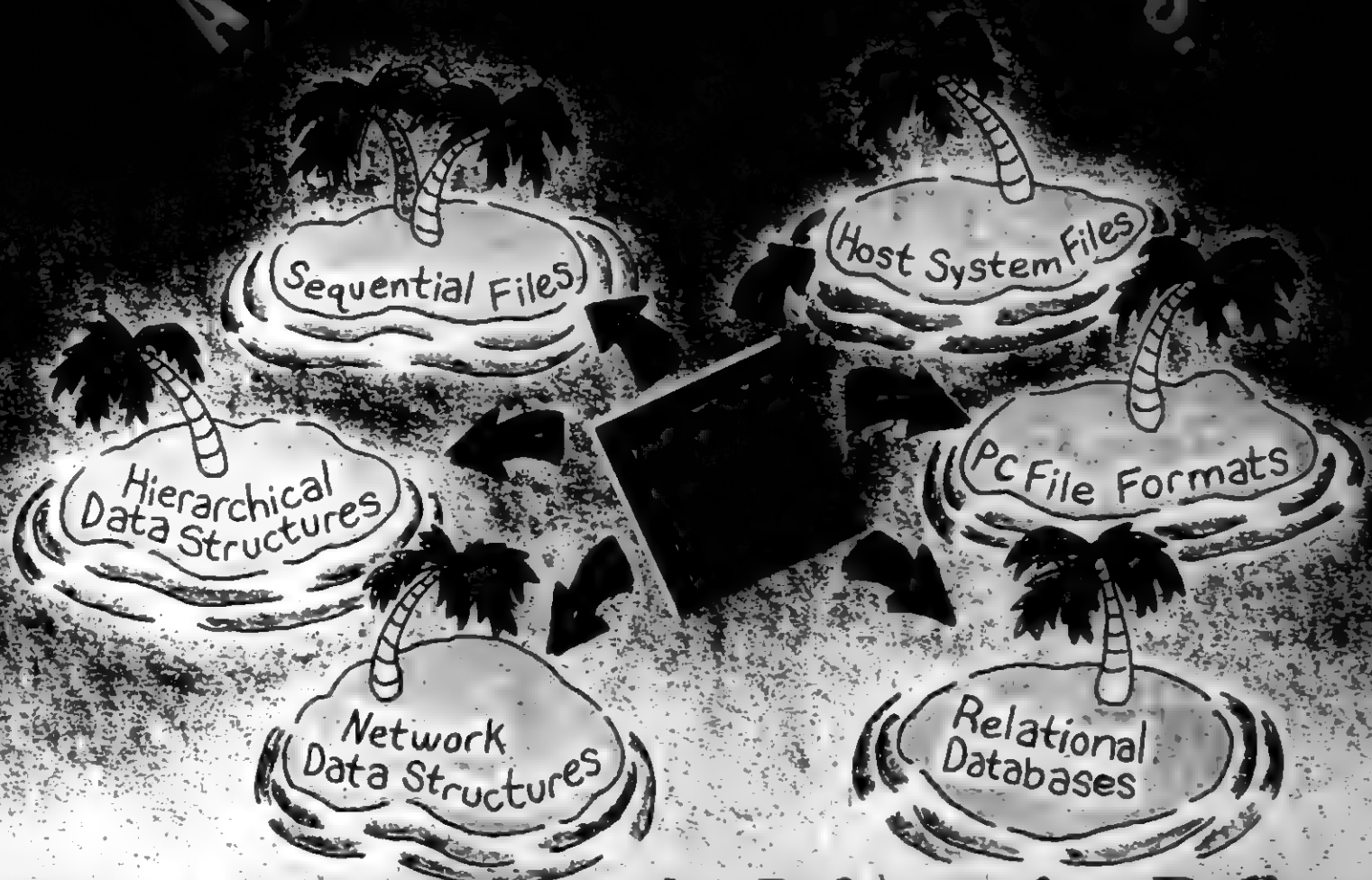

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What's it gonna cost?

Customers uncertain as IBM drops host price lists

By Johanna Ambrosio
NEW YORK

"Let the games begin." That was the reaction by most large customers to IBM's decision to introduce its new mainframes last week without list prices.

Users do not necessarily rue the passing of list prices that have become mostly meaningless during the past two years because of rampant discounting. But they said that negotiating with IBM without some sort of understood starting point will add some unwanted complexity, if not confusion, to their dealings.

Under the new "customer value pricing," IBM will negotiate with each user based on the total package of hardware, software and services needed [CW, Feb. 8]. And, unlike the current contractual requirement for many customers, users will no longer have to sign nondisclosure agreements on pricing.

"List prices have become irrelevant," said Bill Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y. "This muddies the water a little bit, although not for very long. It will take us a little while to sort out what the real costs are, and then they'll have to decide what they want to do."

Tom Loarer, IS vice president at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla., agreed. "Let's not kid ourselves; there is a price. It's just harder to get, and it will just confuse people for a little longer."

Nicholas Donofrio, general manager of IBM's Enterprise Systems business, said that confusion was not the motivation. "We're not trying to pull the wool over anyone's eyes, but list prices are just not relevant in this world."

He added that IBM will accommodate customer requirements by listing prices of specific components on a customer-by-customer basis.

Donofrio said that instead of starting with list prices, IBM has for some time been working with its customers on a deal-by-deal basis. "People say, 'I have these many millions of dollars, and I need this much stuff. We quit when you give me all of that for all of this,'" he said.

Analysts and others said this new tack is an attempt to stem the revenue erosion in a slow-growing mainframe business and to inject a bit of confusion into the bidding process for rivals Amdahl Corp. and Hitachi Data Systems Corp. (see story below).

Another motivation is perhaps to disguise some of the extreme price changes expected by the end of the decade, when IBM switches over to a wholesale System/390-based parallel processing architecture (see story right). At that point, prices are expected to be about one-tenth of the most recent mainframe list prices, and IBM needs to find a way to get there.

Not any cheaper

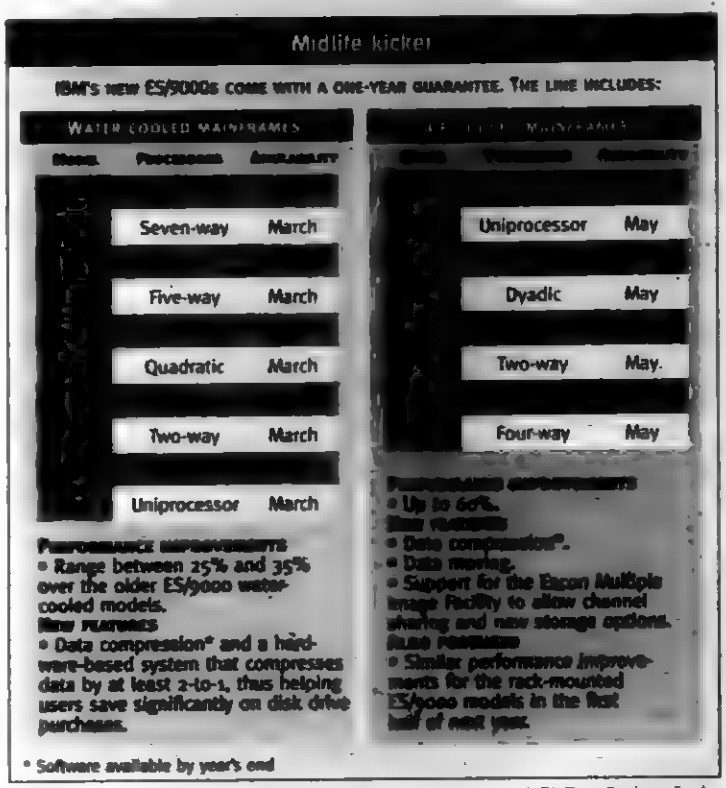
Reports from the UK, where this customized bid system has been in place for at least a year, are mixed. "The clever users have been paying what they would have been paying," said Barry Graham, a consultant at Xephon Group in Newbury, England, who tracks actual prices paid by European customers. "Other users, who are not quite as aware, have paid more money. Nobody has paid less."

According to some users, however, no one has paid more under the new structure.

"Of course there are winners and losers, and some people will negotiate better than others, but I don't believe anyone has paid more for a product as a result of the policy," said Alec McHale, current chairman of the IBM Computer User Association in Hilford, England. Association members raised objections when IBM initiated the policy, he said, but concerns have subsided. "People shouted and screamed at first, but no one mentions it now. IBM has got good business morals and ethics and is not out to cheat the customer," McHale said.

On this side of the Atlantic, however, users are decidedly skeptical. "With all the discounts and mystery, buyers have always wondered if they could have done better," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh. "Now we'll be comparing different things, and we'll see how it plays out. We'll learn as we go."

IDG news correspondent Ron Condon contributed to this story.



Source: IBM

CW Chart: Stephanie Faucher

On the horizon

Nick Donofrio, general manager of IBM's Enterprise Systems business, last week detailed how the firm's large systems will evolve.

- **Donofrio vowed IBM will be the price/performance leader of all host vendors and will not follow the traditional 15% price/performance curves.**
- **By the second half of the decade, IBM will switch over wholesale to a much-less-expensive, 390-on-a-chip architecture for its parallel commercial computers. At the same time, he said, MVS and customers' applications will be brought over to the new architecture without users having to do any significant work themselves.**
- **In the meantime, he added, IBM will bring out specific targeted machines for market niches such as database access. The company's first parallel processing computer, a database query engine, will be introduced later this year, Donofrio confirmed; a transaction-processing implementation will follow next year.**
- **IBM will continue to add software to MVS and the mainframe family to enable it to play in the open systems and client/server worlds.**

—Johanna Ambrosio

PCMs ready response as IBM shifts gears

By Jean S. Bozman
SAN FRANCISCO

For plug-compatible manufacturers Amdahl Corp. and Hitachi Data Systems Corp., the old game of beating IBM's list price is over: There is no IBM price book anymore.

"It is now mano a mano," said Jim Cassell, director of Gartner Group, Inc.'s large computer systems service. "They can't bid the software and services IBM can."

"The original idea of the plug-compatible manufacturer as a provider of a hardware alternative to IBM is still alive," said Bob Djurdjevic, president of Annex Research, Inc. in Phoenix and a longtime watcher of the plug-compatible market. "But it's going to be redefined, just as the mainframe has to be redefined."

Djurdjevic said vendors need to customize mainframes much as some auto makers allow customers to order customized cars before the vehicle is assembled.

From now on, the two IBM competitors — which together own 25% of the world mainframe market — will have to break out the components of an IBM-bundled bid to evaluate the hardware pieces separately, analysts said. They will have to deduce the street price of new IBM machines from reported sales to government agencies and from leasing companies that finance the IBM machines, noted Gartner Group analyst Mark Hess.

But, before any of the just-announced IBM mainframes ship, Amdahl and HDS will have to respond. Of the two, HDS — a joint venture between Japanese computer maker Hitachi Ltd. and Electronic Data Systems Corp. — is considered better prepared to ship comparable machines, although it made no announcement.

"They were ready to go in September," Cassell said. "They have had a lot of experience with their Japanese line of coprocessors for data compression and databases." That means HDS is ready to counter IBM coprocessors as they are shipped, Cassell explained.

Last week, Amdahl revised its product line; it will add four models in June and boost performance by up to 29% next month. It reduced the list price of its eight-way 5995-8650M from $30 million to $21 million.

Amdahl had beaten IBM to the punch with its eight-way machine, shipping it in September.

But Amdahl placed only about a dozen units around the globe — just about as many eight-way machines as IBM placed at beta-test sites worldwide, analysts said.

Amdahl also had manufacturing problems with 5995Ms last fall and lost months of lead time fixing them.

Freeze

Historically, IBM was able to "freeze" the mainframe market for months preceding a big announcement. Amdahl and HDS were forced to respond but often failed to ship product for a year or more. But IBM's recent troubles have changed the rules: Amdahl posted record fourth-quarter mainframe sales, and fourth-quarter sales of HDS mainframes eclipsed the firm's peripherals sales for the first time.

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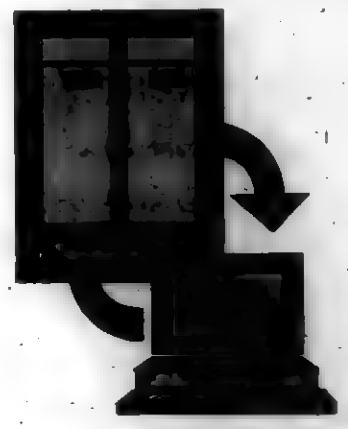

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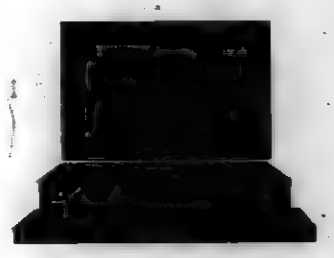

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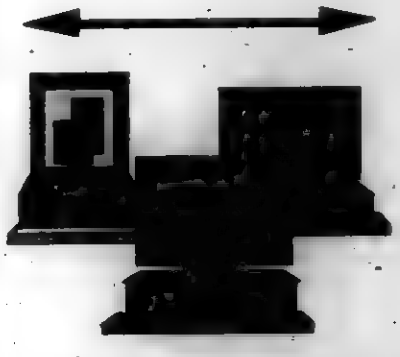

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AT&T slaps rivals with lawsuit

Seeks back damages for business lost to secret deals

By Joanie M. Wexler

WASHINGTON, D.C.

A paradox in long-distance regulatory policy has reared its head in the wake of a lawsuit AT&T filed last week against competitors MCI Communications Corp., Sprint Corp. and WilTel.

The interexchange market leader is suing the three carriers for back damages "in the millions of dollars," which AT&T claimed it could have gleaned in business during the past two years if all carriers had been forced by the Federal Communications Commission (FCC) to file tariffs on common carrier service contracts.

But while Joseph P. Nacchio, president of AT&T's Business Communications Services unit, said that "secret deals deny customers the advantages of competition," AT&T does not apply the same philosophy — nor does the FCC — to "enhanced" long-distance services. Such services include X.25, emerging frame-relay and Asynchronous Transfer Mode (ATM) networks, where the carrier adds some value to or manipulates networked data.

In fact, at a *Computerworld*-moderated session on frame-relay pricing at the recent Communication Networks Conference and Exposition '93, AT&T was the only carrier that refused to price publicly a mock frame-relay bid on a component-by-component basis [CW, Feb. 8]. AT&T is also the only long-distance carrier that requires enhanced-service customers to sign nondisclosure agreements.

This is because "we prefer to come and assist users in designing networks rather than just giving them price lists," Kevin Brand, frame-relay product manager, said at the session. The same policy will be in place when AT&T's ATM service kicks in next year, AT&T said.

Users were divided in their opinions as to whether opening up price lists would benefit customers. Some said posting prices would result in the natural price-lowering effects of competition. Others said secret deals give them more negotiating power.

"Deals should be kept secret. Why would I want someone to know what I did if it was giving me a competitive advantage?" said John Faccibene, vice president of telecommunications at Garban Ltd. in New York.

"We're seeing a paradox because of the way [two separate] markets are defined by the FCC, which really no longer makes economic sense," acknowledged AT&T spokesman Bob Nersesian. "We'd be open to both markets being deregulated or regulated, but until then, everyone should follow the rules."

The AT&T suit follows a Nov. 13, 1992, ruling by the U.S. Court of Appeals that all common carriers must file tariffs for basic interstate transport services in accordance with The Communications Act of 1934. The FCC, however, has required only AT&T, as a dominant carrier, to file tariffs since its 1984 divestiture.

"AT&T has said, and the court has agreed with them, that the FCC had no statutory authority to allow that anomaly to occur," said Brian Moir, legal counsel to the International Communications Association user group in Dallas. "Clearly, AT&T has the leeway" to seek retroactive damages, he said.

MCI, Sprint and WilTel brushed off the lawsuit as an AT&T attempt to cling to market share in the face of stiff competition.

Financial applications to do battle

By Kim S. Nash

Dun & Bradstreet Software and PeopleSoft, Inc. set delivery dates last week for the next wave of their client/server financial applications, invigorating a horse race started with initial product shipments last year.

But being first out of the gate matters less than the functionality delivered over the long haul, users and analysts said.

The stakes continue to climb with financial application product plans from new entrants such as San Francisco-based Walker Interactive Systems and deliveries from established vendors such as Oracle Corp.

"Everyone's under the gun to follow through on ship-date promises, but the real battle is about functionality," said Clare Gillan, an analyst at International Data Corp. in Framingham, Mass.

The two companies' timetables for releasing the next wave of packages are roughly similar.

PeopleSoft already has a mainstream financial module — general ledger — installed at user sites, while D&B Software has thus far shipped a decision-support module.

Timing is nearly everything for at least one division of Ontario Hydro, a large utility in Toronto, where an internal battle is brewing over whether to go with D&B Software or PeopleSoft products.

While the utility's Energy Management branch enthusiastically backs PeopleSoft's general-ledger package, other larger groups in the utility have "invested heavily" in D&B Software's mainframe-based Millennium line, "and the corporate tide is leaning toward a complete D&B client/server solution down the road," said Jeff Goddard, financial systems project leader. He said those divisions are more comfortable dealing with a vendor they know — in this case, D&B Software.

Indeed, customer loyalty does play a role in software acquisition. If D&B Software's mainframe applications are entrenched at a company, the company will likely look at D&B's client/server goods first, according to Gillan. "That definitely works in D&B's favor," Gillan said.

On the way

D&B Software
Ajax: FlexStream, a human resources-related tool.
Juno: SmartStream Decision Support 2.0; FinancialStream, a set of standard finance modules.
Prices: SmartStream: $73,000; others not available.

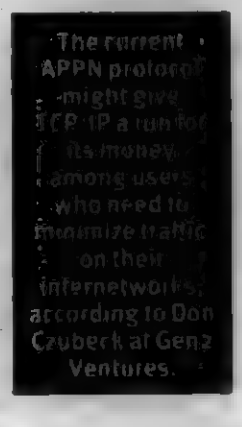
PeopleSoft
Qin: PS/Accounts Receivable, PS/Accounts Payable.
Qin: PS/Asset Management.
Prices: $100,000 to $300,000 per module.

APPN tackles TCP/IP

CONTINUED FROM PAGE 1

trast with the current APPN, which can lose sessions before it has a chance to redirect traffic to a backup route, according to Don Czubeck, president of Saratoga, Calif., research firm Gen2 Ventures.

Further down the line — by 1995 — IBM plans to offer APPN++, a gigabit/sec. multivendor protocol that will support Asynchronous Transfer Mode (ATM)-based networking, Peters said.



IBM is doing research into "combining variable and fixed-cell benefits" — i.e., the advantages of frame relay and ATM — according to Warren D. Sovereign, IBM consulting support representative.

IBM has also been working on an ATM switch for more than a year and plans to offer ATM switching about the same time as vendors such as Cisco Systems, Inc. — creator of APPN rival Advanced Peer-to-Peer Internetworking — and Cisco partners AT&T and StrataCom, Inc., McGee said.

APPN+ will be positioned as an easy, intermediate step to ATM, McGee said. Unlike ATM, migration to APPN+ requires no hardware upgrade, he added.

While ATM as an architecture can support TCP/IP or any other networking protocol, IBM is working with the ATM Forum to implement some APPN-based features, such as multinode resource directories in ATM, McGee said.

The current APPN protocol might give TCP/IP a run for its money among SNA users who need to minimize traffic congestion on their internetworks, Czubeck said.

While TCP/IP works fine on an uncongested network, one application can gobble up most of the bandwidth, killing everyone else's response time, he added.

APPN today guards against this happening and also prioritizes which applications get the most bandwidth, Czubeck said.

3M Co. may use APPN as one of its primary worldwide internetworking protocols, according to Kevin Maher, a lead analyst at the St. Paul, Minn., manufacturer. "TCP/IP's connectionless environment can be a problem, particularly for our international sites that are just starting to scale up their LAN applications," he said. "When a [TCP/IP] link gets overloaded, it starts throwing away frames" of data.

3M also likes the directory services that enable an APPN network to "take care of itself in terms of dynamic path [definitions] and finding resources," Maher said. TCP/IP lacks these features.

However, "TCP/IP is our current platform for multivendor interoperability," Maher said. "Time will tell how well APPN is accepted."

Rather than force users into an APPN straitjacket, IBM is developing MultiProtocol Transport Network software that will enable applications written to network protocols such as TCP/IP and NetBIOS to ride on top of an APPN backbone, McGee said.

However, all this may be too little too late to prevent some SNA users from defecting to TCP/IP.

"SNA will probably be on our network for another five or 10 years just because our legacy mainframes will be there, but [APPN] is not part of our strategic direction at this time," said John Bubb, a senior engineer at Southern California Edison Co. in Rosemead, Calif. "We're encouraging more conversion at the desktop to more prevalent open standards, such as TCP/IP."

Senior editor Joanie M. Wexler contributed to this story.

Prepped protocols

Here is a rundown of how APPN and TCP/IP compare on key internetworking criteria:

Effective addressing for large networks:
- APPN: Yes.
- TCP/IP: Coming in future release.

Congestion control; class of service prioritizing:
- APPN: Yes.
- TCP/IP: No.

Dynamic rerouting around network failures:
- APPN: Future release.
- TCP/IP: Yes.

Multivendor support:
- APPN: IBM, 3Com, Cross-Comm Corp. and Netlink, Inc. have license; Novell, Inc. and Systems Strategies, Inc. have formally committed to supporting.
- TCP/IP: Near ubiquitous support.

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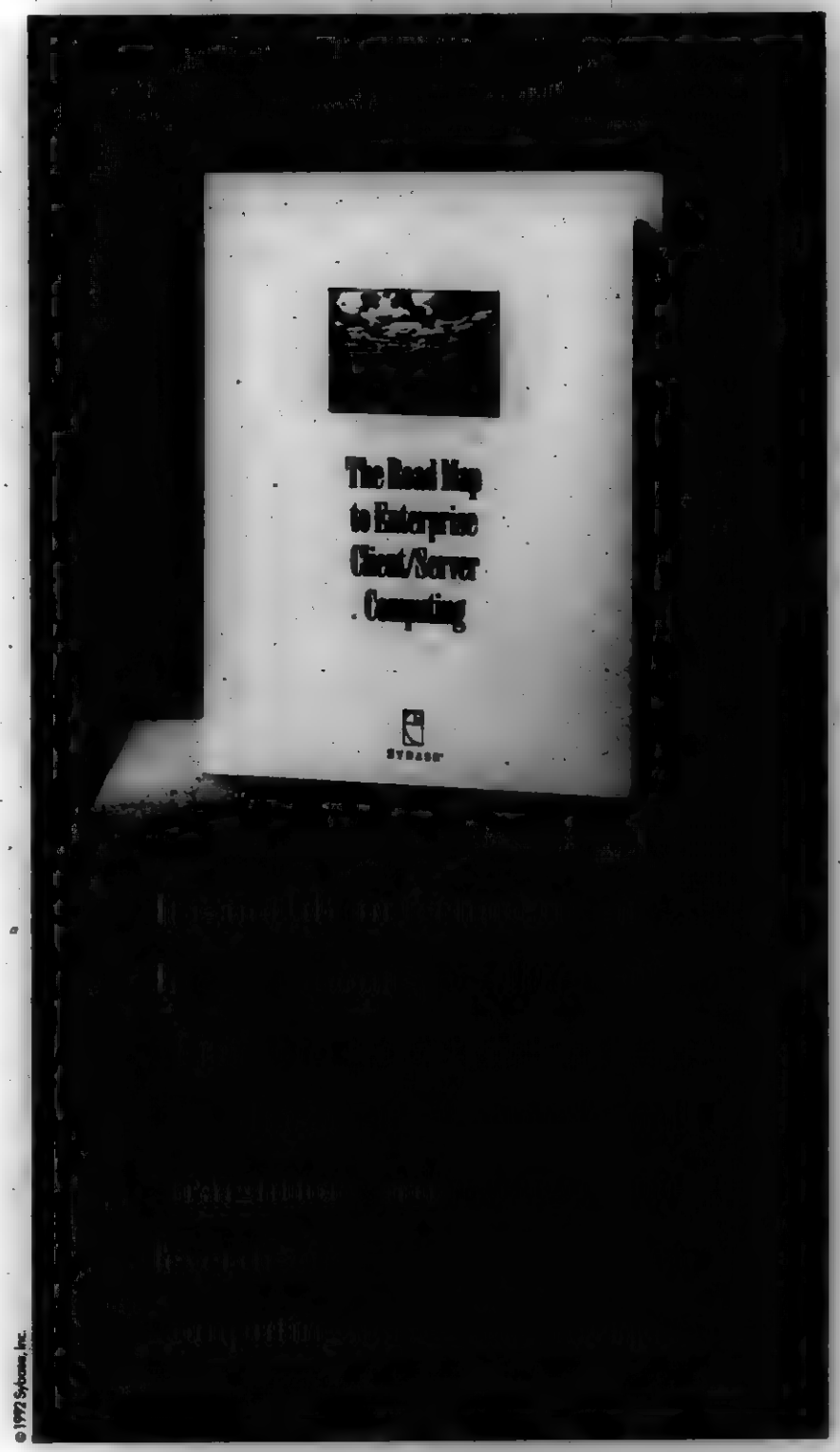

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DEC nears mixed VMScluster support

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. is ahead of schedule in its efforts to provide mixed VMScluster support, but several holes remain, according to analysts and users.

DEC users seeking to bring in Alpha AXP machines with VAXs on VMSclusters will be able to do so when the company ships OpenVMS AXP Version 1.5 in May. This will help many sites make a smooth transition to Alpha and gain performance and consolidation advantages.

By deploying Alpha AXP systems that are three to four times faster than their comparably priced VAX predecessors, users will be able to consolidate the number of DEC systems running at their site. However, they will initially be restricted in what they can do and in how they can configure the mixed clusters.

Some restrictions

For example, in the new release, VAXs will not be able to access Alpha tapes and vice versa; cross-architecture booting is not possible; and, as expected, volume shadowing and disk striping will not be available until later — by year's end at the earliest, according to some sources.

Fiber Distributed Data Interface (FDDI) support will also be unavailable in this release. While cross-booting and lack of cross-tape access are annoying, the lack of volume shadowing and FDDI support is more critical for large sites that run production applications across clusters.

These and other restrictions likely to be announced were specified in confidential DEC documents distributed to partners last week.

What it will have

According to those documents, OpenVMS AXP Version 1.5 will offer the following clustering capabilities:

- Under the company's Computer Interconnect protocol, OpenVMS AXP 1.5 will allow a maximum of three DEC 7000/10000s in a VMScluster with a maximum of eight VAX and Alpha AXP systems in a mixed-mode cluster.
- Up to two Computer Interconnect adapters and a maximum of one Star Coupler for linking HSC storage devices to the cluster will be supported. This initially limits the number of systems in the cluster as well as the number of available disk forms.
- Under the company's Digital Systems Storage Interconnect (DSSI) protocol, users will be able to deploy clusters that consist of either one or two VAX systems or DEC 4000 AXP hosts for a maximum of three systems per DSSI cluster. Customers will not initially be able to build DSSI clusters around the high-end 7000s or 10000s, however.

American Airlines will bring in Alpha machines only in a limited context until full VMScluster production capabilities are available, according to one systems analyst at the company. "We need high availability products to come out before we put them into our production environment," he said.

DEC 3000s are not directly supported in VMSclusters, but up to 12 DEC 3000 satellites can be attached to the cluster over Ethernet. For users seeking to bring the lower cost DEC 3000 AXP systems directly into a cluster, such as Stephen Tihor, assistant research scientist at New York University, this initial restriction is somewhat burdensome.

Beat the clock

Even so, Tihor said he is generally satisfied with the initial capabilities expected from DEC and said the company is beating its product schedule.

"They are meeting reasonable limits of what they are able to test and certify to handle core customer needs," Tihor said.

Both analysts and users were positive in their assessment of DEC's progress.

"While there's still a slew of restrictions here and a few administrative headaches, they've done a fine job of getting it out earlier," said Chris Christiansen, an analyst at IDC Financial Services Corp. "Mostly, people will be installing Alphas in ones and twos and won't be anxious to add many [machines] right away."

A DEC spokeswoman refused to comment on the details but said the porting process for clusters is ahead of schedule.

Aggressive push targets PCs

It is not just the Unix market that will see a more aggressive DEC. Last week, Enrico Pasetori, recently appointed vice president of DEC's new PC business unit, said the company will push harder to reduce production costs and broaden the PC product line and distribution.

"DEC has made a number of stupid starts because top management [at that time] did not seriously believe in PCs," he said. "We need a focused product strategy."

DEC, which nonetheless has managed to move from 22nd place to ninth place in terms of PC sales during the last year, hopes to secure the No. 5 slot by the end of the next year, he said.

Toward that end, DEC will soon be shipping PCs equipped with Intel Corp.'s Pentium processors — a family of Extended Industry Standard Architecture- and XT/AT bus-based systems — as well as PCs that are Alpha AXP-based systems. But Pasetori said he thinks the relationship with Intel ought not to be viewed "antagonistically."

Source: Computer Intelligence PC Market Monitor

While Pasetori's organization will initially be responsible for the Intel line, it seems likely that the Alpha PC running Microsoft Corp.'s Windows NT will ultimately come under his umbrella.

The delay in shipment of Intel's Pentium may boost Alpha's prospects, according to Randy Guisto, senior analyst at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H. But DEC has to do a better job of getting the Alpha message across to an Intel-oriented PC audience, he said.

Doing that will be a key goal for Pasetori, who will also push the establishment of new distribution channels for the company.

Cutting manufacturing costs is another area of focus.

But foremost, Pasetori will seek to "play by the rules" of the PC market and succeed in that sphere on its own terms. "If, in addition, you have something better to offer [than competitors do], such as distributed computing, then you can bring that in," he added.

—Melinda-Carol Ballou

DEC dishes out Unix to serve technical users

By Maryfran Johnson
MAYNARD, MASS.

Digital Equipment Corp. put its best face on a beleaguered Unix strategy last week, vowing first to reawaken the interest of the scientific and technical community and then to persuade commercial customers to buy its DEC/OSF/1 "Unified Unix" on Alpha AXP hardware.

The company's three-headed operating system strategy will offer all customers a choice of OpenVMS, DEC/OSF/1 or Microsoft Corp.'s Windows NT on Alpha AXP platforms.

Emphasizing the growth path and longevity of a 64-bit Unix operating system running on Alpha's 64-bit processor, company officials said this 64-bit story will give the DEC product line a compelling edge over competitors.

William Strecker, DEC's vice president of engineering, characterized Unix as "the major growth opportunity for DEC" and said early users of DEC/OSF/1 on Alpha have been pleased with the "robustness and commercial quality" of this new Unix version.

"There is a good deal of user interest [in the OSF/1 systems] because of their power and portability," said Kurt Reisler, chairman of a Unix special interest group in the Digital Equipment Computer Users Society. "The port to 64-bit isn't that difficult since there are tools that point out the stupid [inconsistent] things done with the code. But users are concerned about whether they have the money to buy the new hardware."

Targets three areas

DEC's Unix product strategy is geared to three areas: scientific and technical computing, client/server workgroup computing and distributed production applications in commercial accounts.

For Intel Corp.-based platforms, DEC will continue to offer The Santa Cruz Operation's SCO Unix (see story at left).

For an estimated 100,000 users of DEC's Ultrix Unix variant, however, migration to the Alpha platform running DEC/OSF/1 is virtually their only choice for moving forward with the vendor.

Late next month, DEC will begin shipping DEC/OSF/1.2 on Alpha AXP workstations, but there are no firm commitments for providing that Unix version on the current DECstation/DECsystem line, which is based on Mipe Technologies, Inc. processors. The DEC/OSF/1.0 release runs on the DECstation line now.

DEC said it will try to ease the transition from Ultrix to DEC/OSF/1 by offering a range of tools, including binary code translation tools.

Company officials also said they would introduce an Alpha AXP workstation this quarter in the $5,000 to $10,000 price range.

"We've heard the commitment. Maybe a year from now there will be a credible story," said John Jones, an analyst at Salomon Brothers, Inc. in New York.

Senior writer Melinda-Carol Ballou also contributed to this report.

OSF restructures as firms cut back

CONTINUED FROM PAGE 1

sources in engineering and business management into a new business unit called Interoperable Technologies, which covers the Distributed Computing Environment (DCE), Distributed Management Environment (DME) and the Motif graphical user interface. An Operating Systems unit was also created for OSF/1 and its interface to the next-generation microkernel.

"We're asking them to run [the OSF] like a business," said Mike Saranga, president of the OSF board of directors and IBM's assistant general manager of systems, structures and management. "This will be a little bit leaner organization, getting products to market faster."

Saranga said the abrupt removal of the COO job, established only three months ago, was no reflection on Bard's abilities. "We brought in the COO, but it was just the wrong time and the wrong place," Saranga said. "We made a mistake."

No time to waste

Users familiar with the OSF's operation viewed the management restructuring in a hopeful light but stressed the importance of the OSF getting its technologies into users' hands as soon as possible.

"I think this [restructuring] will aid the communication flow among the interoperable technologies so that DCE and DME will be as integrated as they can be," said Ted Hanss, president of the OSF's end-user steering committee and director of the University of Michigan's Center for Information Technology Integration in Ann Arbor.

Before the changes, the engineering groups and business-area management teams had separate and sometimes conflicting missions. The DCE and DME groups, for example, were each developing different security services for their respective products — with no guarantees they would work well together.

"A lot of end users have been saying it was time to stop this playing around and get the security models integrated," said Tony Carrato, a member of the OSF's end-user steering committee. "One hopes this gives them the opportunity to do that now."

Project management teams for DCE and DME will be reporting via one management stream to Jeanette Horan, vice president of interoperable technologies.

OSF/1-engineers and business managers will report to Roger Gourd, vice president of operating systems. Microkernel work will remain with Ira Goldstein, vice president at the OSF Research Institute.

Under pressure

Still unsettled after months of debate, 1994 funding for the OSF must be resolved by the end of this month or key software development could suffer, OSF board members said last week.

"There is tremendous pressure to close on this," said Kurt Friedrich, an OSF board member and general manager at Hewlett-Packard Co.'s open systems software division.

That pressure comes mainly from the outside contract work — underway now at IBM, HP, Tivoli Systems, Inc. and others — on the DME technologies.

Since its 1988 founding, the OSF has relied largely on contributions from its six key sponsors: IBM, HP, Digital Equipment Corp., Hitachi Ltd., Siemens Nixdorf Informations Systeme, Inc. and Groupe Bull.

But several of the sponsors' companies are struggling through tough economic times, the "non-profit" model holds little appeal.

One budget proposal under consideration would allow sponsor financing to count as royalty "prepayments" on OSF technologies. "Instead of just giving them money to do what they want, we'd say, 'Here's 8X million to cover my OSF/1 royalties,'" Friedrich said.

—*Mary Lynn Johnson*

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News Shorts

CC:Mail gains Unix connection

Lotus Development Corp. last week began shipping new software for connecting its CC:Mail electronic-mail package to the Simple Mail Transport Protocol (SMTP) used in Unix-based mail systems such as Internet. CC:Mail Link to SMTP Version 2.0 still requires a dedicated DOS-based PC, which does not have multitasking capabilities, but Lotus said the new version was written so it can send and receive mail simultaneously.

HP expected to expand SNA links

Hewlett-Packard Co. is expected this week to announce Release 2 of the HP SNAplus family of products that connect Unix-based HP business systems, servers and workstations to IBM Systems Network Architecture (SNA) networks. SNAplus Release 2 enhancements include support for Token Ring and SNA over X.25 connections and support for IBM 3270 Motif interface.

New president at Epoch Systems

Epoch Systems, Inc., purveyor of network data management systems and software, last week named Robert Davoli as its new president, replacing Christopher Robert, who is leaving to pursue private investment opportunities. Davoli was previously co-founder and president of SQL Solutions, Inc., a supplier of tools and integration services for relational database management systems.

NetWare Lite revamped

Novell, Inc. announced NetWare Lite v1.1 for DOS and Microsoft Corp.'s Windows, a new release of its peer-to-peer, local-area network operating system. The new release adds full support for Windows 3.0 and 3.1. This mean users will no longer have to exit to DOS to perform network management functions. The new release, available now, also adds Single Network Login, allowing users to access shared resources via a single Login from any connected workstation.

NetWare manager enhanced

Novell also announced Version 1.1 of its NetWare Communications Services Manager, its Windows-based communications management application. NetWare Communications Services Manager manages multiple NetWare servers for NetWare-to-IBM host or remote communications services. The new release, available now, can run with Novell's NetWare Management System or as a stand-alone application.

Sequoia suffers more losses

Sequoia Systems, Inc. announced more losses for its second fiscal quarter, which ended Dec. 27. The company's net loss was $19.6 million, compared with a net income of $2.5 million for the restated 1992 comparable period. These results include a restructuring charge totaling approximately $15.2 million. Excluding the restructuring charge, the loss was roughly $4.4 million.

Spanning the spectrum

SHL Systemhouse, Inc. said it signed a multiyear transitional outsourcing pact with Computerland Corp. The deal calls for SHL Systemhouse to take over Computerland's mainframe processing and to migrate the computer reseller to a client/server system. Terms of the deal were not disclosed. Meanwhile, on a different end of the computing spectrum, SHL Systemhouse said it will provide supercomputer processing as well as network operations for HPC High Performance Computing, a Canadian supercomputing consortium.

Client/server caveats

CONTINUED FROM PAGE 1

and most are still in the beta-test phase.

For example, while OS/2 is a multitasking, multithreading operating system that supports Windows applications, it is currently too large and unwieldly for most end users.

Meanwhile, as a server, it is tied to Intel Corp. platforms and lacks high levels of security, symmetric multiprocessing and multiuser support. Most of these issues will be addressed by Portable OS/2, which is scheduled to go into beta testing sometime midyear.

Unix, meanwhile, has made significant strides in terms of ease of use for end users, but it does not support Windows. Moreover, most implementations require users to have a significant amount of systems management knowledge and do not currently support robust recovery or have a journaling mechanism to recover data lost in a system crash.

To circumvent this issue, most client/server applications built using Unix rely on the database to maintain data integrity on the server.

Where does your firm fit?

The transportation, communications and utilities industries appear to be moving fastest to embrace client/server computing, according to a survey of 1,606 IS managers conducted by International Data Corp. (IDC) in Framingham, Mass. Business services, health care and manufacturing firms were next. Laggards included wholesale/retail and financial services companies, according to IDC.

NT enters the fray

Challenging OS/2 and Unix will be Windows NT, Microsoft's high-end distributed operating system aimed at client/server applications. And while both OS/2 and Unix currently maintain an edge in terms of availability, NT was designed to be a highly portable, multitasking, multithreading, multiuser operating system that will reportedly support high levels of security, journaling and recovery, as well as symmetric multiprocessing.

Meanwhile, to ease conflicts associated with developing applications for both Windows and Windows NT, many developers have been focusing on a subset of the Win-32 Software Developer's Kit that will allow an application to run in 32-bit mode on NT and 16-bit mode on Windows 3.1, said Dave Solomon, president of Solomon Software Technologies, a Nashua, N.H., consulting firm.

The trade-off to this approach, however, is that developers have to go back and add support for multithreading and security to their 32-bit application at a later date, said John Calahan, chief executive officer at Timeline, Inc., a supplier of financial accounting software in Bellevue, Wash., that is developing Windows applications.

Making do for now

In the short term, developers are either working with beta-test versions of NT or plowing ahead on projects focused on versions of OS/2 2.0 or Unix.

Among the companies making the move to one of the 32-bit options is Pepsi International in Purchase, N.Y., which is evaluating these operating systems for use with IMRS, Inc.'s Hyperion business reporting application. Pepsi will use Hyperion to link its bottlers to company headquarters.

Because Pepsi is heavily committed to Microsoft's SQL Server database, the company is leaning strongly toward Windows NT on both the client and the server.

According to Chris Kalish, program manager for technical support at Pepsi, having the same operating system on the client and the server will increase performance and simplify maintenance of the applications. Pepsi already has a beta-test copy of NT and will start evaluating competitive Unix proposals in the coming weeks.

Previously, Pepsi was committed to OS/2, but because Microsoft is now pushing Windows NT, the company has decided to move off OS/2.

Taking a course similar to Pepsi's is the 17th Judicial Court of Broward County in Fort Lauderdale, Fla., which has decided to standardize on OS/2 for both clients and servers. Broward County chose OS/2 because it is the only multitasking operating system available that currently supports Windows applications, according to network administrator Eric Lebow.

Regardless of which environment organizations decide to adopt, all three of the major 32-bit multitasking platforms have major issues to address before they become contenders for the next dominant platform for client/server applications.

Clarification

An article in the Feb. 8 issue of *Computerworld* said that MCI Communications Corp. had cut its frame-relay rates by 20% to 70%. The company actually cut prices by 20% to 30%; the 20%-to-70% range referred to savings users might expect with an MCI HyperStream frame-relay network compared with an AT&T leased-line network.

DOS limitations problematic

IS departments struggling to build client/server applications are running right up against the limitations of DOS.

DOS imposes strict memory allocations on applications that, when exceeded, result in system crashes and data loss.

And although Microsoft has made substantial improvements to the memory management capabilities of Windows 3.1 and DOS 6.0, "there's a lot of kludgy stuff to get around when you're developing client/server applications with Windows. DOS just doesn't deliver multitasking and support for multiple I/O paths," noted Noah Rose, director of technical solutions at CAP Gemini USA, a systems integrator in New York.

"You have to remember that DOS has resource limitations, and every little button you put on a screen takes some of that resource," added Diana Bauer, product marketing manager at Powersoft Corp., a supplier of client/server application development tools in Burlington, Mass.

To shore up its Windows/DOS platforms, Microsoft is working on enhancing the memory management and compression capabilities of DOS 6.0 and is working to add some preemptive multitasking support in a 32-bit Windows application that will run on top of Version 7.0 of DOS.

—Michael Fitzgerald

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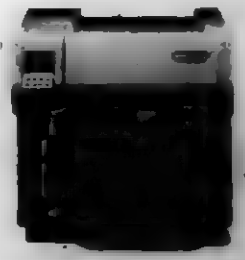

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Legent goes to flexible licensing policy

By Gary H. Anthes
BOSTON

Legent Corp. last week revealed flexible licensing options aimed at taking some of the pain out of contracting for software.

The formalization of Legent's software licensing policies comes on the heels of a similar set of announcements from Candle Corp., which two weeks ago revealed a set of flexible pricing and contracting options [CW, Feb. 8], and similar moves by Computer Associates International, Inc.

Saying it was simply codifying de facto policies, the Vienna, Va., company disclosed a set of price caps, claiming it will guarantee not to boost prices by more than 20% when a customer moves from one mainframe CPU group to the next. It also pledged, in one option, not to raise maintenance fees by more than 15% per year for a given license type and configuration. In a second option, increases would be set at a flat 10% per year.

Legent said it will embed a grace period in its authorization software so that users will have 30 days to resolve any administrative or billing issues when moving Legent software to a new environment.

Authorization codes, which can be used by a vendor to disable software in a dispute with a customer, will be eliminated within a year, President and Chief Executive Officer John F. Burton said at a briefing.

Free license transfers

Burton said Legent will also guarantee a no-cost transfer of Legent products within a company — even across international borders — as well as to outsourcing vendors when only the original licensee is to be served by the product.

He also affirmed a willingness to offer site licenses and to write multiyear, enterprisewide contracts.

Observers said the policy manifesto carried real significance for some users.

"Only people who asked for [simplified licensing terms] got them heretofore," said Anthony Picardi, director of systems software research at International Data Corp., a research firm based in Framingham, Mass.

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New 'Endevors'

Legent last week said it will port its Endevor family of software management tools to Hewlett-Packard Co. HP 9000 computers.

It will be available in about one year, at the same time as a port to Sun Microsystems, Inc. systems will be ready. Prices have not been set.

As part of the port, Legent and HP will integrate Endevor with HP's SoftBench application development framework, which provides a common interface to and communications among software development tools from HP, IBM, Sun and others.

"The HP announcement is important because we are in the process of looking at HP for a future generation of products from the bank. If those efforts continue positively, the HP Endevor product would be very interesting to us," said Salvatore Giordano, a vice president at Citibank/Citicorp, which uses Legent's Endevor on MVS.

Legent also said it will license the Tivoli Management Framework, an object-oriented environment for managing computer systems under Unix, from Tivoli Systems, Inc. in Austin, Texas.

The framework will aid Legent's development of products that comply with standards such as the Open Software Foundation's Distributed Management Environment and Unix System Laboratories, Inc.'s Distributed Manager.

— Gary H. Anthes

There's no arguing that when it comes to a portable DBMS for managing enterprise data, Oracle has one of the world's most powerful products.

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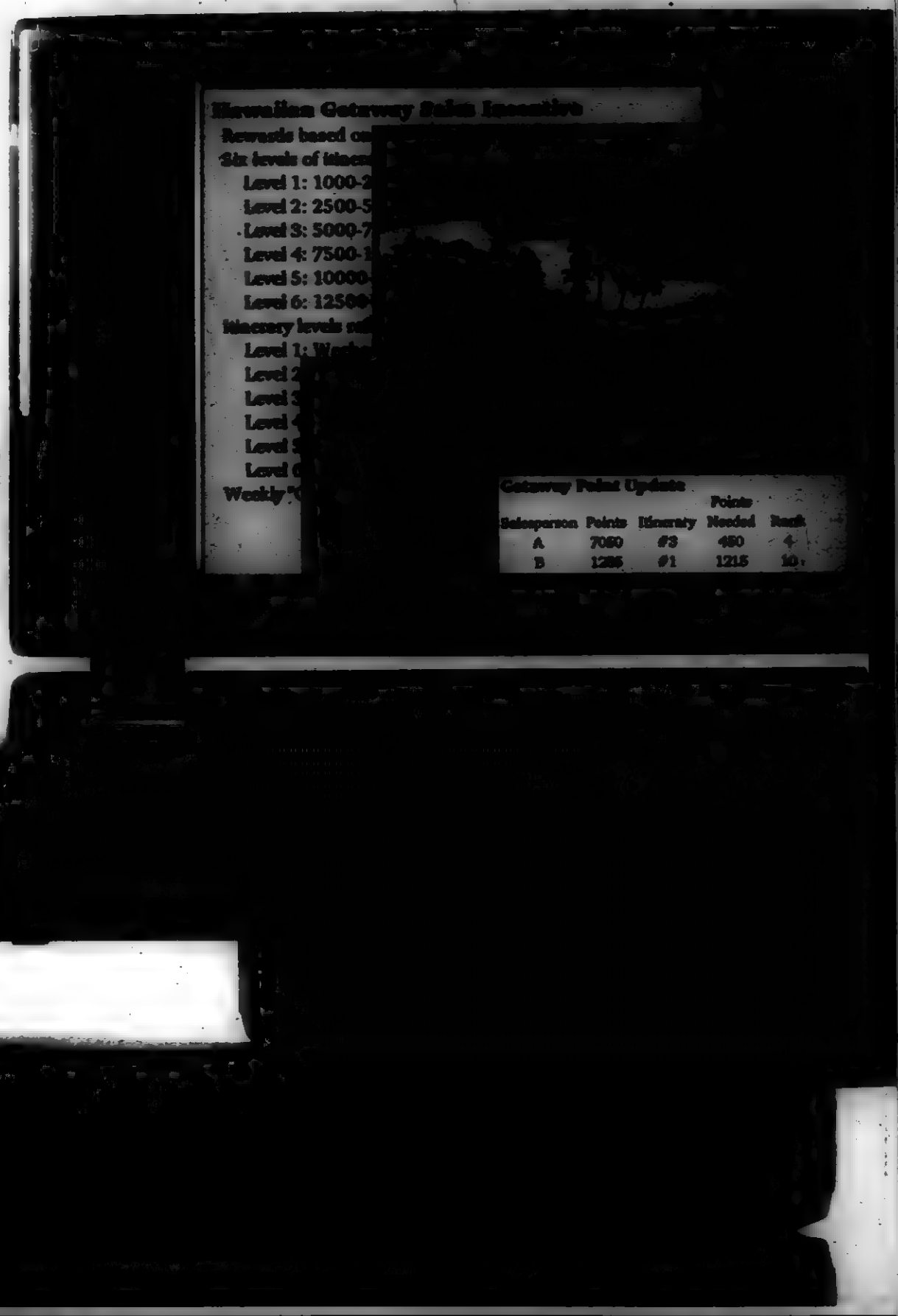

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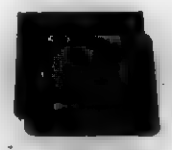

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Mac slowly gaining corporate respect

Apple has made great strides but is still struggling to meet the needs of users, IS management

By James Daly

Fans and foes alike say that while Apple Computer, Inc. has made significant strides improving the Macintosh's ability to function in enterprisewide computing environments, the company still desperately needs to turn lofty promises into viable products and do a better job of scoping out user needs.

"Apple is getting there, but they're not there yet," said Brian Comnes, who supervises a mixed shop of Macintoshes and IBM PC clones as information center manager at DHL Airways, Inc. in Redwood City, Calif.

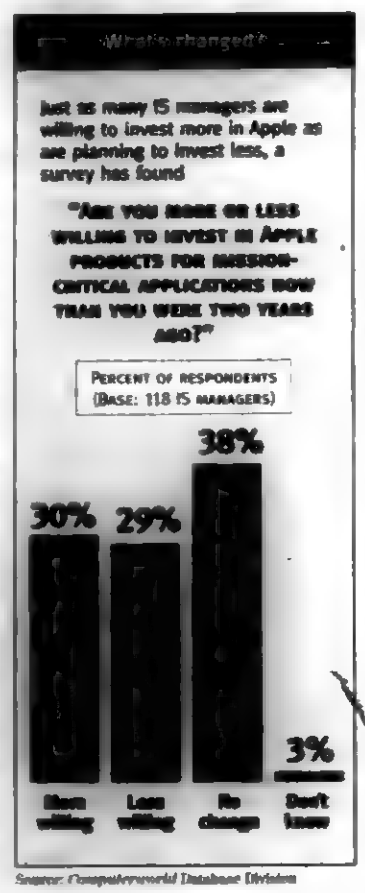
After a decade of paddling upstream against corporate enthusiasm for DOS and Microsoft Corp.'s Windows, Apple last year launched an intense game of catch-up to win the hearts and wallets of Fortune 1,000 customers.

To have a well-balanced offering, users said, the Cupertino, Calif., company needs to address major shortcomings in mixed-platform compatibility while improving interapplication communications and connectivity offerings.

The company also needs to open up its operating system, a sore point for users. "Apple is not in line with what is happening with open systems," one user said. "Mission-critical applications seem to be moving toward open systems, and I'm not sure Apple is there."

Apple's move toward open systems will not get under way until next year's introduction of PowerOpen, a version of Unix developed between Apple and IBM.

The result: In a recent *Computerworld* Database Division survey, less than 40% of the respondents — which included Apple and non-Apple users — said the company addresses the needs of the corporate customer. However, 62% said they feel more confident in Apple's ability to provide timely business-oriented products today than they did two years ago (see chart above).



For its part, Apple does seem to be getting the message — it has just been slow to react. A server introduction slated for sometime during the next few weeks (see story at right) is seen as a step in the right direction, as was last week's update of the Quadra Model 800, which targets complex networking tasks (see chart below).

Apple gets the highest marks, however, for last year's release of its Virtually Integrated Technical Architecture Lifecycle document, an internally developed comprehensive blueprint for building a complete mixed-environment client/server architecture. "A lot of our folks have been scared off about going to client/server because there was no one there to show them how," said David Lustig, manager of technical services at Bose Corp. in Framingham, Mass. "Apple is showing us how."

The daunting challenges of client/server will provide a perfect Trojan horse for selling the Macintosh's traditional ease-of-use strongpoint into corporate America, said Morris Taradalsky, vice president and general manager of the Enterprise System Division.

Addressing problems

But there are hitches. For instance, Macintosh users have long screamed for Apple to backfill its connectivity options.

Taking the hint, Apple moved to address its connectivity deficiencies last June by announcing a Token Ring extension for its Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity package. Users said Apple needs to continue in this direction. "If Apple is going to start playing with the big boys, they've got to connect to everyone," said Rob McPhee, a development engineer at Wilmington, Del.-based Du Pont Co., who now links his Macintoshes into a TCP/IP network via public domain software.

Another bugaboo is interapplication communications. "I go through holy hell trying to have [Macintosh applications] interact with IBM apps," said one Apple critic. To rectify this, Apple has teamed up with Symantec Corp. to unveil Bedrock, a framework for building cross-platform applications. A beta-test version is expected in the first half of this year.

It is a move that has already been greeted with enthusiasm. "Apple needs to recogize that they have to coexist in an IBM-dominated world," said Frederick Morsheimer, information systems director at the South Pasadena, Calif., headquarters of the Trader Joe's Co. chain of 49 wholesale warehouses.

"We've come to accept the fact that most of the world is non-Apple; I'm not sure we always did," Taradalsky said.

Despite Apple's shortfalls, IS managers who have integrated the Macintosh into their mixed environments remain a singularly devoted breed, lavishly praising Apple's ability to innovate.

Moreover, Apple officials and Macintosh users said they feel that corporate respectability is within Apple's grasp. "We're not kidding anyone," Taradalsky said. "We've got our work cut out for us."

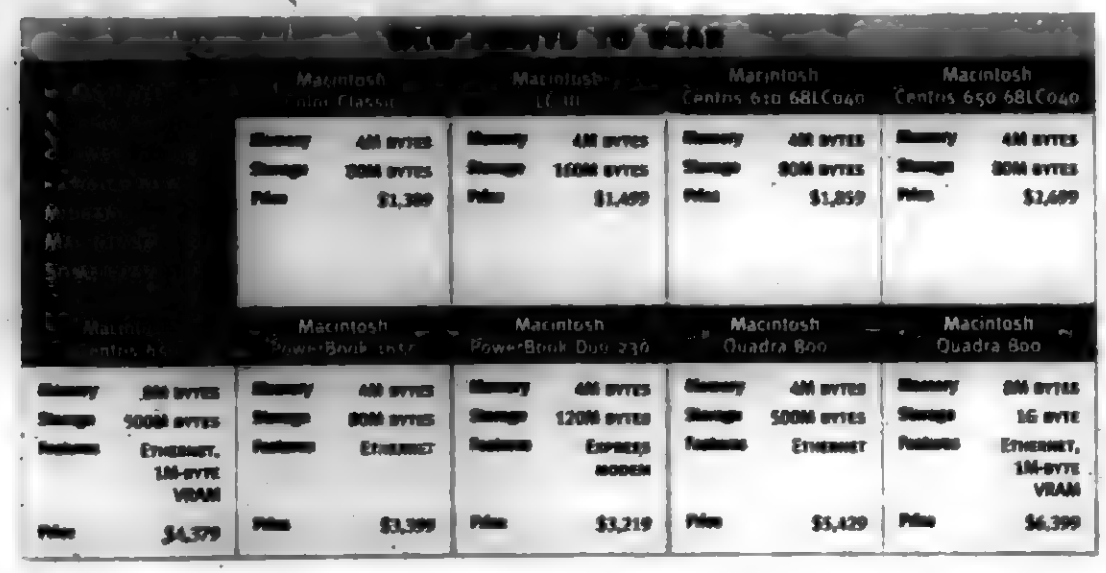
Keeping users happy

Apple's much-ballyhooed co-development plans with IBM and Motorola, Inc. should yield additional innovative fodder for corporate customers. Key elements include their joint venture, Taligent, which has been charged with formulating an object-oriented operating system that will facilitate the development of custom enterprisewide applications.

Overcoming prejudice

Morris Taradalsky, vice president and general manager of Apple's Enterprise System Division, spends much of his time trying to convince corporate America that the Macintosh and IS are not mutually exclusive. He has developed the following five-point plan for Apple to address IS needs:

- **Kick off a line of servers with the introduction of a Motorola 68040-based model in the next few weeks. Attendees at next month's CeBit in Germany are expected to be the first to view Apple's new server. This product family will eventually be driven by the PowerPC chip under development by Apple, Motorola and IBM.**
- **Offer more cross-platform connectivity tools resulting from a recent interoperability pact with IBM. Early fruits already harvested include Apple's Data Access Language for the IBM Application System/400, an Internet router offered by Apple, and IBM support for AppleTalk in its OS/2 LAN Manager. Apple also plans a 3270 emulation product.**
- **Move toward open systems with the 1994 introduction of PowerOpen, a version of Unix developed by Apple and IBM that promises complete backward-compatibility with Macintosh applications. Apple's AUX currently enables Macintosh applications to run on top of Unix.**
- **Finish up the Apple Integration Architecture (AIA), Apple's grand scheme for multiplatform systems architecture interoperability. Early parts of AIA's larger whole are the Data Access Manager, which is already available, and the Open Collaboration Environment set of network services.**
- **Continued evolution of Vital, which provides users with a blueprint for designing a mixed-platform client/server system. — *James Daly***



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Information technology patriot

This week in Indianapolis, Butler W. Lampson will be named winner of the A. M. Turing Award, the highest honor given annually by the Association for Computing Machinery in New York. He was interviewed recently by senior editor Ellis Booker.

Currently a corporate consulting engineer at Digital Equipment Corp., Lampson was principal scientist and senior research fellow at the Xerox Palo Alto Research Center (PARC) in the 1970s and '80s. At Xerox PARC, Lampson and his colleagues pioneered in the building of distributed PC environments; high-performance, single-user workstations; graphical user interfaces; and a half-dozen other technologies now routinely used by millions of computer users.

Q: Some consider Xerox PARC's work seminal to the PC revolution. Is this reputation deserved?
A: Well, naturally I think it is. The computer industry spent most of the 1980s making industrial-strength applications of the work done at PARC in the '70s.

Q: At the time, did you think these ideas would become as pervasive as they have?
A: Absolutely. We thought the obvious thing, and that was that everyone would want it.

Q: Was there a grounding philosophy to the work?
A: The whole idea was of [one's] own computer with an interface [resembling] pencil and paper. The driving conception at PARC was that computers are communications devices, not calculation engines. We needed the old-style computers in order to build the new ones.

It was a while before the Altos [PARC's PCs] were powerful enough to take over. We relied on a fake [DEC] PDP10. . . . We needed to build it ourselves because Xerox had just bought a competitor [to DEC's minicomputer business].

Q: High-performance laser printing was another PARC innovation, yes?
A: People often overlook the laser printing. We saw that as all part and parcel of the same thing. The game was a computer able to work with paper, just like in the real world. So the printer was just as important as the bit-mapped screen.

Q: How about document imaging?
A: We played with imaging . . . but didn't build any serious prototypes. In those days, it was reasonably difficult to muster the storage and computing power you needed.

Q: Did you expect then that paper would "go away" by 1993?
A: It's fair to say we were overly optimistic that all the information available on paper would be available on computer. It *is* happening but much more slowly than we predicted in 1975. We never thought paper would go away.

Q: What about portable machines?
A: One of the driving ideas behind the Alto was the Dynabook, which was conceived as a laptop. But we felt it was beyond our capabilities to engineer a device like that. So we concentrated on the software, with the expectation that the hardware would catch up. There was one attempt at PARC to make a portable machine. It failed because it was too big, too heavy and didn't have enough memory.

Q: How about the mouse as an interface device?
A: No, the mouse was invented by Doug Englebart, who directed the Augmentation Research Center at the Stanford Research Institute.

Q: What about pen computing?
A: I don't think anybody ever did serious work on pens. I think we were intimidated by the limitations of handwriting recognition, and that's still true. We did spend time on voice recognition. We definitely thought within 20 years we would have this. There wasn't work on wireless [computing]. Again, there's not much motivation if you don't have a portable machine.

Q: What about voice recognition?
A: In many ways it is a great input modality. Also, I think there's a fair amount of value in having the computer be able to read to you. [However], the charm of storing audio in the machine somewhat escapes me.

Q: What else surprised you? What hasn't taken hold the way you had thought?
A: Today, there still isn't one standard for inputting and printing a document on demand. I would have expected that to be pretty solidly accomplished by now. I do think this will happen; I do expect over the next few years there will be industrywide agreement on a format for documents in a computer, based on [Adobe Systems, Inc.'s] PostScript. [Xerox's device-independent document description language, Interpress (the direct precursor of PostScript) was developed at Xerox PARC by Lampson.]

Q: I've always wondered, why is the phrase "client/server" and not "server/client"?
A: The emotional answer is that the client is much more important. The server is just a stupid box over in the corner. I think the people who developed that approach to computing definitely had that point of view — a focus on the desktop machine.

Q: Were you surprised by how long it took for computer vendors to pick up the microcomputer mantle?
A: Yes and no. It wasn't a surprise, since it's a normal thing that companies continue to do X instead of Y.

Q: What enabling technology will have the biggest impact on the way people work and live in the future?
A: My slogan is: The computer revolution has only just begun. The impact has just barely begun to be felt in daily life and across the economy. If you break the economy into sectors, you find that most of the technologies go back before World War I. Computers were invented in the 1940s but only really in the '80s began to have impact.

What's likely to happen under the general rubric of computing is that the publishing industry will go entirely electronic. It will be possible to get everything on-screen: the Library of Congress behind your screen. We're far away from this from a systems standpoint but fairly close from a component standpoint.

Q: How important is multimedia going to be?
A: My personal bias is the most important [piece] is still images. It's video that's flashy, [but] I think still images have the greatest value. Take the step from text and line drawings to still images. This first step is the biggest. Also, video is much more expensive to deal with and to source.

Q: What about productivity? Studies indicate that for all the investments in information systems, office professionals are only marginally more productive today. Will future technologies change this scenario?
A: That presumably means it wouldn't matter if we took away all of the computers. Does anybody believe that? I think these studies are bull, based on my reflections. I really think the people who generate these numbers should go back and answer my question.

Q: What should users keep in mind as they prepare for the future?
A: They shouldn't allow themselves to be bulldogged by technology bigots. The job of the computer is to adapt to the user's convenience, not the other way around. The time to buy the next gadget is when you think it will help you do something you want or need to do, not because you just read an article saying it's the latest thing.

Bridge too far

A few years back I visited software developer SAS Institute, Inc., touring its programmers' bullpens, among other things. I was steered over to its advanced Unix programming group, where people with longish hair and Birkenstock earth shoes made it look more like a slice of Berkeley or Cambridge than Cary, N.C.

They carried out their development work on a plethora of high-performance workstations, all of which looked pretty similar. Except for one sleek, black beauty tucked in a corner, intentionally out of sight.

"That's my Next," this fella said. "It's an incredible machine," he noted, adding that he didn't mind if its existence was kept quiet, lest he have to share some of the valuable programming time on it. He remarked he'd never worked on anything quite like it.

So at least one person was greatly saddened by the news that Next is getting out of the hardware business (see story page 2), and no doubt there are many others. For company founder Steve Jobs, there are two lessons: First, it's really hard to have two independent successes in the computer industry (Apple being his first). Second, the inexorable force of hardware standardization has a downside that excludes innovative alternatives from the marketplace.

I suppose in the truest sense, this exclusion is vested purely in economic realities. To stay ahead of the game, chip maker Intel is pouring an amazing $2.5 billion into capital and R&D expenditures this year, better than 40% of last year's revenue. How can Next compete with the Intel standard? Now it knows it can't and will port its operating system to Intel platforms.

And downstream, PC makers such as Compaq and Dell are squeezing razor-thin margins from their wares, while the workstation makers are in the throes of their own low-ball price wars.

All this leaves no room for a premium-price, proprietary approach to desktop hardware, apparently irrespective of how good it is. Next's chief investor, Japan's Canon, has bought the hardware rights and maybe can revive Black Beauty. Good luck to them.

Some people might say that the Next machine was just one "bridge too far" for Steve Jobs and his bountiful ego. What it may end up representing is the last gasp of entrepreneurialism and individual idealism aimed at delivering some unique innovations to the desktop.

Bill Laberis

Bill Laberis, *Editor in chief*

More myths

"Question everything" [CW, Dec. 28, 1992/Jan. 4, 1993] was a correct article with a few exceptions.

The statement regarding the significant reduction in maintenance costs when using C/C++ compared with Cobol could not be further from the truth.

Another myth is that C/C++ is the only solution to downsizing and client/server problems. Downsizing and client/server applications exist today in a multilanguage environment. Microcomputer-based Cobol compilers, online transaction processor file systems and relational databases play a large role.

Still another myth is that graphical interfaces and object-oriented programming are unique to C/C++. Many other languages, including Cobol, have adopted these capabilities.

The world's data processing future is one where downsized, client/server graphical applications will remain mixed-language, multiplatform applications.

Given proper and well-managed development, each language and tool is used for what it does best in order to reach an acceptable solution to a specific data processing problem. No one product meets all development requirements.

Odds are that anyone putting all his eggs in C/C++ for downsizing, cross-platform and client/server applications either doesn't know any better or has been led to believe that there is only one solution to a problem.

Michael L. Hicks
mbp Software and Systems Technology, Inc.
Alameda, Calif.

Ray of sunshine

I've always said that a big problem with the high-tech industry is a lack of humor. Just when winter is its darkest, along comes Joe Maglitta's commentary to bring on the laughter [CW, Jan. 25]. "Outsource for better living" had some gems. Here's my contribution: Checksourcing: Oh, do I hate to write checks. It's probably because I'm never quite sure what's in the bank account.

Hire someone to write checks, keep Quicken up-to-date, and even better, find me some money.

Jean Young
Rockville, Md.

Losing out

After reading "Borland's crunch time" [CW, Feb. 1], I am compelled to respond by stating that it is perhaps the buyer who is ultimately winning as a result of Borland and Microsoft's DBMS price war, but it is the user who is losing.

In the Windows database market, I have talked to many users who find the Revelation Technologies' product, as well as products by other small database vendors, to be more in line with their requirements but who are being pressured by ever-tightening MIS budgets to go with "promotionally priced" products. From this perspective, I will not argue that the price wars have not been an effective marketing tool for these companies, but I will argue that they have not benefited the end user.

I have also seen some innovative database products, which were under development in small entrepreneurial PC DBMS shops, that never made it to market. Such developers could not afford to sell product at the nonprofit levels set by the price wars. Once again, the loss goes to the database user and developer communities.

The buyer is winning, but the user is ironically paying the price.

Chris Miller
Revelation Technologies
Stamford, Conn.

Not laughing

The fact that "Easy as 1-OS/2-3" [CW, Jan. 11] was published as humor does a great disservice to a fine product. The article is full of misinformation and inaccuracies. True, there have been a number of problems installing and using OS/2 2.0, but this should be expected by anyone who has worked with any product's .0 release. I urge you to have your writers, when writing "humorous" articles, to stick to the truth.

Humor is fine when it stays within the realm of reality. But this article, published by what I used to consider one of the better computer publications, is not humor but trash.

Jack Hiatt
Atlanta

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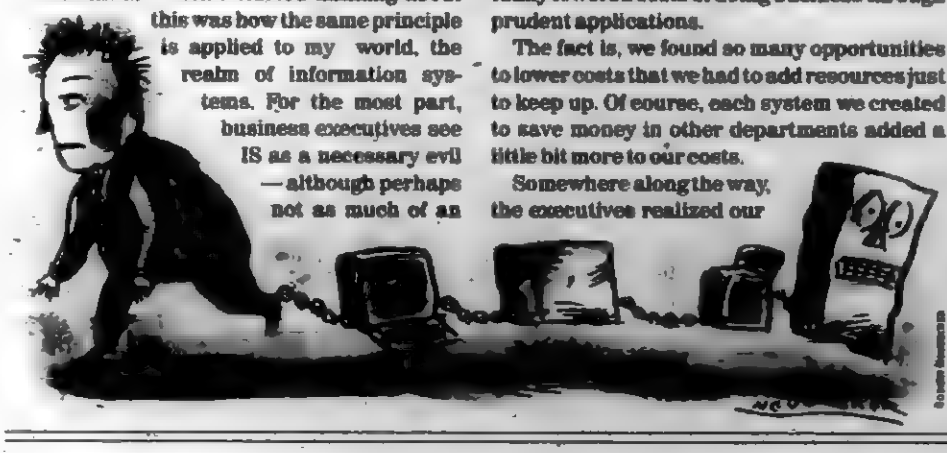
Don't let IS become your CEO's ball and chain

Rick Marshall

Have you ever heard or read something that didn't strike you at the time but hit you like a truck later? That happened to me the other day as I read about the fines General Motors has to pay for not meeting federal mileage, emissions and safety standards. In essence, GM sees these fines as a cost of doing business.

GM executives understand that with today's cost to build cars, it's cheaper to pay the fines than to meet the standards. So every time they plan their budgets, they take that amount off the top. It can't be returned to the shareholders, reinvested in the business or even passed on as a savings to customers. It's worse than my car insurance. At least if I have an accident I get something back.

What hit me when I started thinking about this was how the same principle is applied to my world, the realm of information systems. For the most part, business executives see IS as a necessary evil — although perhaps not as much of an evil as car insurance.



This view persists despite all the effort senior IS managers have expended trying to get executives to see things differently. We point to how much competitors are spending on IS to persuade our leaders to spend more. We gnash our teeth every time the finance department tells us to cut our expenses. We defy consultants who prove that we create competitive advantage.

But even though some companies have created CIOs, when it comes right down to it, most IS departments are just another cost to be incurred on the way to doing whatever it is a company does.

Was it always that way? Seems to me there was a time when IS was an investment. We put dollars in and saved dollars elsewhere. We actually lowered costs of doing business through prudent applications.

The fact is, we found so many opportunities to lower costs that we had to add resources just to keep up. Of course, each system we created to save money in other departments added a little bit more to our costs.

Somewhere along the way, the executives realized our costs weren't going away. In fact, as our budgets increased, we started spending more just to maintain the systems we had and less developing new systems. Demand didn't slack off, so backlog grew, too. The IS department started becoming a bottleneck, sometimes even a cork.

Is it any wonder senior management finds it hard to view IS as anything other than a cost of doing business?

So what do we do about this? Nothing. Don't whine about it. If there is one thing an executive can't stand it's a whiner — even if the whiner is the CIO. Instead of wringing our hands trying to describe how much we could accomplish if we had more resources or new technology, we have to focus on cutting costs.

Consider outsourcing anything you do that isn't strategic before top executives consider it. Give a dollar reason to invest in programmer productivity tools, CASE, lights-out operations and so on. Find the cost reduction of making infrastructure changes and tell them again and again and again.

Sooner or later, top executives will get the message. Someday they'll wake up and wonder why it never hit them before. Maybe they'll even look up to see who was driving the truck.

Marshall is director of information technologies at Ameritech Publishing, Inc. in Troy, Mich.

Software licensing: Let's go back to Square 1

LISTEN UP! *by* Elaine Bond

Want to get an IS manager's attention? Just say "software licensing."

It may also be a good idea to practice ducking as you say it because this is a phrase that usually evokes about the same reactions as the word "politician" — scorn, distrust and hopelessness.

For corporate users of software, the licensing issue carries a host of unpleasant associations including lawsuits, eyestrain (those fine-print disclaimers), price inflation and endless procurement negotiations. All of this adds up to anger and frustration, and perhaps even more importantly, it tends to result in a disregard for contractual agreements.

Authors and creators have a right to make a profit. They need to be encouraged to take on the risks of developing and servicing their creations. They have a right to be protected from theft of their intellectual property.

The fact is, however, that current software licensing schemes aren't protecting vendors any more than they are satisfying users. This is because licensing practices have not kept pace with other changes taking place in the industry. Software is designed, delivered and used in very different ways now than it was even a few years ago. We need fresh thinking, experimentation, new models. And we need them fast because we can expect even more change in the future, when it becomes possible to move "objects" from node to node at will.

For the most part, today's practices have their origins in the mainframe mentality, which said that software that ran on bigger machines was worth more to customers. In earlier times that was true — or at least true enough. Greater speed did sometimes yield more throughput, and throughput was often valuable to customers. If the system was fast enough, the user could cut back on CPUs.

But more speed and the ability to run on a faster processor does not always translate into greater value. Besides, in this wonderful era of personalized, networked, distributed, portable and multiplatform computing, the old equations just don't work.

I have no illusions that creating these new models will be a cakewalk. Responsible users are willing to pay a fair price for perceived value. But perceived value is not very tangible or measurable, and therefore, not easy to determine or predict. Also, value will vary from customer to customer.

Does this mean everything will have to be based on individual negotiations? I hope not, because that route is almost certain to lead to the same kind of confusing mess we have now.

One thing we can do is try to get at some basic concepts about software types and potential service measures and then develop models from the practical combinations. For example, we could define different categories of software such as operating systems, distributed applications and personal-use products and create service measures that are countable and appropriate for each category.

In some instances, the appropriate service measure might be the CPU on which the software resides, but in other cases, it could be the number of managed devices, the number of transactions or the number of users.

There is no single answer to the software licensing issue, but at least by concentrating on important underlying concepts, the debate can be narrowed and made to focus on what matters most.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank NA. She is a founder of the user advocacy group Open User Recommended Solutions, or OURS.

Charles Babcock

PC power plays

PC hardware is rapidly climbing the price/performance curve, but there are PC applications in the works that could easily gobble up available power. Today's memory-hogging, CPU-demanding application is tomorrow's Bud Light compared with the software to come.

Some of this new breed of software was on display earlier this month at Demo '93, a tire-kicking show for upcoming PC products held near Palm Springs, Calif. Although many of the products on view were still in development and could turn out to be desert mirages, some strong patterns were evident:

•Demonstrations repeatedly emphasized that what used to be done on specialized systems will soon be done on standard PCs at a much lower cost, albeit in somewhat truncated form.

•Powerful new personal productivity and decision-making tools that used to reside on hosts are being pushed onto PCs and thus closer to end users.

•Stand-alone desktop activities, such as creating and editing documents, are being converted into group activities with many simultaneous participants.

The most dramatic examples of PCs taking over jobs previously considered out of their league were in multimedia presentation. For the most part, combining voice, video and text has required too much CPU power and storage to make it feasible for more than training programs produced on large systems.

At Demo, however, applications on display used new compression techniques to break this barrier by reducing the amount of data processed. Apple's QuickTime, a Macintosh product that handles audio and video data through software with no hardware assist, ran on a Windows PC. ShareVision in San Jose, Calif., demonstrated how a phone line can transmit video and audio data to a PC for capture and manipulation.

One example of how decision support is migrating to the desktop is a 10,000-word English-language vocabulary from Natural Language in Berkeley, Calif., now available for Windows PCs. Equipped with a vocabulary of this size, a user can query a database without specialized knowledge of SQL.

In the meantime, complicated group tasks are simplified by new applications that adapt and expand the conventions of the graphical user interface. Watermark Software in Burlington, Mass., demonstrated how its document manager, Watermark, allows several users to simultaneously edit a document, drawing arrows to words or adding color-coded comments. The system organizes and separates these changes, treating each user's editing marks as if they resided on a separate acetate overlay.

Sheer technical power is being pushed closer to the end user with tools that simplify the development of challenging applications. For example, GainMomentum from Gain Technology in Palo Alto, Calif., makes it possible to generate an object-oriented application without knowledge of Smalltalk or C++.

Using this product, a user can prototype an application by viewing an object on-screen. The attributes of the object are captured in a properties screen, which can be colored, resized or otherwise modified and stored in an object database. Various editors allow text, graphics, audio or video to be added to the object, while a viewer allows the developer to go back through different versions, examining alternatives.

During the next 12 months, the average PC purchased is likely to be a Windows-based 486 PC with at least 8M bytes of RAM and 120M to 360M bytes of storage. By yesterday's standards, such hardware would be overkill. But judging from Demo's display, we'll soon have applications that not only can use, but deserve, that power.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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In Brief

On Atlas' shoulders

The task of marketing products and services in the still-diverse European Community (EC) may get a little easier with desktop mapping software that includes economic and demographic data for all members of the 12-nation bloc. Strategic Mapping, Inc. in Santa Clara, Calif., and the EC's statistical office, Eurostat, last month announced the release of Atlas Software: Eurostat Edition to help marketers spot business trends. Prices for the PC software start at $475.

Slash 'n' earn

SunSelect, a business unit of Sun Microsystems, Inc., announced price cuts ranging from 20% to 50% on its SunPC emulation software and hardware acceleration products. The Chelmsford, Mass.-based subsidiary also unveiled a new version, SunPC 3.1, which will ship next month. The SunPC software enables Sun workstations to run MS-DOS and Microsoft Corp.'s Windows. A single-user license for SunPC 3.0 was cut from $595 to $295, and the 25-user license was slashed from $11,900 to $5,900.

Leaving security

Xtree Co. in San Luis Obispo, Calif., is discontinuing publishing and developing antivirus and security products, ending its association with ViruSafe, ViruSafe/LAN and AllSafe. All users will be supported through the end of 1994, Xtree said. The firm will continue to develop system and network management products.

Joining the race

IMSI in San Rafael, Calif., which makes PC-based TurboCAD computer-aided design software, entered the Apple Computer, Inc. Macintosh and Unix markets by acquiring IGC Technology in San Francisco, maker of the Pegasus CAD program.

Doing the Windows two-step

WordPerfect 5.2 offers interim, DOS-compatible step, but it's 6.0 that's a true GUI

By Michael Vizard

After making a less than stellar entry into the Microsoft Corp. Windows application software market, WordPerfect Corp. appears to have a stable product in Version 5.2 of WordPerfect for Windows that is compatible with DOS versions of the software, according to user reports.

But the company will not take full advantage of the graphical environment provided by Windows until it releases Version 6.0 of WordPerfect for Windows at the end of this year.

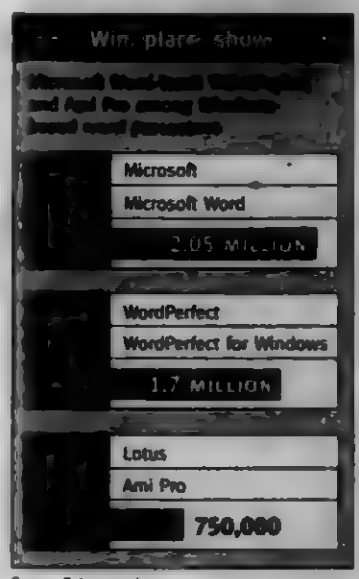
Since the company released Version 5.2 of its WordPerfect for Windows word processing package two months ago, its drive to recover its dominant position in the word processing market has been picking up steam.

Of the 1.7 million units of WordPerfect for Windows that shipped in 1991, about 200,000 were Version 5.2, according to market research firm Dataquest, Inc. in San Jose, Calif. For WordPerfect, the delivery of that version helped lay to rest a number of user complaints concerning the erratic behavior of previous versions.

But WordPerfect's inability to initially deliver a stable version of its word processor for Windows, coupled with its decision to focus heavily on compatibility with its DOS product, has taken a heavy toll on the company's position among customers formally commited to the DOS version.

"The instability of the first release of WordPerfect led us to choose Microsoft Word. We discounted the other players in the market because they didn't have enough market share," said Dave Ness, consulting services manager at the *Washington Post*.

Gene Hemrich, market manager for Sears Roebuck and Co. in Buffalo, N.Y., is another Word user.



Source: Dataquest, Inc.

"Word is significantly easier to run than WordPerfect. Microsoft has taken more advantage of the GUI environment and provides more of a desktop publishing environment. For example, if you want to make an envelope in Word, all you have to do is click on the envelope icon," he added.

6.0 'completely different'

A spokeswoman for WordPerfect said Version 5.0 was developed in under 18 months and represented only the company's initial foray into the Windows market. Version 6.0 will be a 32-bit implementation of WordPerfect that will take full advantage of the Windows graphical user interface on DOS and the Workplace Shell on OS/2 to create a true desktop publishing environment, she said.

"Version 6.0 of WordPerfect is completely different from Version 5.0. It will be an unbelievable change," said Bill Kesselring, industry analyst for PC software at Dataquest. "Moving to Windows is essentially a two-step process for WordPerfect."

And for some users, a phased approach that maintains compatibility with DOS versions of WordPerfect is an attractive idea.

"Word for Windows is an excellent package, but most of our people already knew WordPerfect so staying with WordPerfect for Windows was the wiser choice," said Jay McKinney, network services manager at Complete Health, a health maintenance organization

WordPerfect, *page 32*

Turnaround

According to estimates from the Software Publishers Association, sales of word processing packages for Windows in the third quarter totaled $118.4 million, compared with $74 million in the DOS market and $31.4 million in the Macintosh market. In the same period in 1991, sales of word processing packages for Windows were only $37.6 million, compared with $119.7 million in the DOS world and $22.7 million in the Macintosh market.

Operating systems

2.1 better be good, OS/2 users say

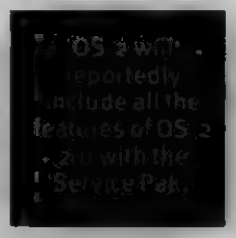
By Christopher Lindquist

■ The beta-test version of IBM's OS/2 Version 2.1 has been available since Dec. 19, and users generally seem happy with its performance. However, some said they hope IBM makes sure this version goes out rock solid in order to silence OS/2 critics.

"Somehow IBM has gotten themselves into this position of people expecting a lot more from them than they ever did from Microsoft," said Larry Waibel, systems software technical specialist at the Cubic Automated Revenue Collection Group in San Diego. He said he hopes IBM makes this version of OS/2 bulletproof, though he conceded it is not quite there yet.

"I've had a couple hang-ups in the two months I've been using it, which is certainly better than anybody got in Windows," Waibel said.

Other users exchanging messages on CompuServe voiced similar sentiments that IBM must make OS/2 2.1 a stable product if it is to succeed. Several CompuServe users even requested that IBM release another beta-test version before shipping the product.



"We're all on your side here — we want OS/2 to succeed," said one developer on CompuServe. "Another rush job is exactly what it doesn't need."

Currently, beta-test users are still reporting problems with installation, applications that ran under OS/2 2.0 "breaking" under OS/2 2.1 and "memory leaks" that force users to reboot the machine every so often. However, reports of dramatic improvements are also cropping up.

Graphics, speed enhancements

According to Waibel, the best features of the OS/2 2.1 beta-test version are improved graphics handling and support for higher resolutions and Windows 3.1. He also cited enhanced performance/speed, which he said may help silence critics who have complained that OS/2 was too slow on normal hardware configurations.

IBM has reportedly been swamped with requests to become part of the beta-test program, and users said that IBM is even back-ordered on getting the beta-test disks out.

OS/2 2.1 will reportedly include all the features of OS/2 2.0 with the Service Pak, which includes the 32-bit graphics engine plus Adobe Type Manager Version 2.5 font support under Windows and support for Windows 3.1 applications.

Portable computers

Are luggables going extinct?

By Michael Fitzgerald

Set up at the press table at a recent Houston Rockets home game was an original Compaq Computer Corp. Portable. You can bet that whatever cash-strapped user is getting arm-sore with that 31.3-pound beast will buy a notebook, not Compaq's Portable 486 luggable, when there is room in the budget for a new PC.

Heavyweight, heavy-duty portables are still around, more than 10 years after Compaq's first portable, which followed Osborne, the first portable ever, to market. Today's versions run the fastest microprocessors available from Intel Corp. or reduced instruction set computing vendors. They generally offer active-matrix color screens as an option, feature hard drives larger than 200M bytes and offer expansion slots. They do not run on batteries.

They are also becoming an endangered species in some minds. In 1992, a year when most categories of personal computing hardware saw double-digit growth, the luggable market shrank, according to International Data Corp. (IDC), a market researcher in Framingham, Mass.

IDC projected that 71,000 units were sold in 1992, down from 86,000 units in 1991, a steep drop from the 145,000 units sold in 1990.

Still, IDC sees the market holding near 60,000 units as far in the future as 1996, though some luggable vendors dispute its numbers.

Volker Dolch, president of Dolch Computer Systems in Milpitas, Calif., predicted his company will grow 60% in 1993, putting it at $30 million in sales. He claimed that the privately held company is seeing profits grow, despite offering the most expensive portables money can buy.

He said performance, not weight, is the key factor for customers.

"We go to the threshold of pain where you can still call it portable and put as much computing resources on it as we can, and we do not see the market going away in favor of a notebook," Dolch said. He also said some market researchers show stable growth in the near term for luggables.

Still, some customers are opting out of the big systems.

"They're just too heavy," said a PC administrator at a U.S.-based multinational firm who asked not to be identified. The user said his company has 20 luggables from Dolch and 20 from Broadax Systems, Inc. in El Monte, Calif. He said his budget this year will go to 486DX-based notebook computers with hefty hard drives, probably with a docking station for expansion purposes.

closer look: Luggable PCs

Even the luggable market leaders, Compaq and Toshiba America Information Systems, Inc., wonder aloud how much longer they will stick with the hefty portables that once were their staple portables.

"It's a fairly niche market now, and we see it being cannibalized by mainstream markets [down the road]," said Bob Bauer, director of marketing for Compaq North America. While saying "I wouldn't write [luggables] off as a product category," Bauer said Compaq was not sure it would produce a new version of the product.

"The growth is not there anymore, but there will always be a place for a [portable] that will take [an expansion] card," said Kyle P. Walls, senior brand manager at Toshiba. Walls said that what remains unclear is whether that place will in the future be filled by notebooks with Personal Computer Memory Card International Association capability.

"Will these machines largely replace ISA cards for expandability options?" is the question, according to Walls.

At 12 pounds, the Toshiba T6400 series comes in at the low end of the market as a sort of luggable/laptop hybrid. While AC-powered, it has only one expansion slot. "An awful lot of users buy [the T6400 series] for the big hard drive, and now they can get that in the notebooks," Walls said.

Multimedia: A fertile area

All the players in the market see multimedia as a potential growth area for luggables (see story at right). Toshiba positions its systems as multimedia devices, and Bauer said Compaq is considering building local-bus graphics and its Business Audio sound capabilities into the Portable 486.

"Portable multimedia solutions are difficult to do in notebooks right now," Bauer said.

Dolch agreed, saying that in the future there will be Presentation Computers, which are essentially multimedia road shows built into a portable package. He said he thinks, though, that substantial growth will come not from multimedia but from portable engineering workstations.

"There is a section of the market that is not understood by outside [our niche]: the user who needs a mobile workstation, the more power the better," Dolch said.

The bigger portables do benefit from a lack of competition: Pricing does not suffer as much, so the machines can generate a solid profit.

Luggables sampler

	Compaq Computer	Toshiba America Information Systems	Dolch Computer Systems
	Portable 486	T6400 family	P&E 486 SDE
Processor	486DX chip Up to 33/66 MHz	486DX chip Up to 50 MHz	486DX 33/66 MHz
Display	Optional active-matrix color screen	Optional active-matrix color screen	Optional color screen
Disk	525M-byte hard drive	200M-byte hard drive	1.2G-byte hard drive
Expansion slots	Two	One	Three
Weight	17.6 pounds	11.7 to 12.9 pounds	18 pounds

CW Chart: Michael Siggins

Last frontier

Multimedia may be the last bastion of growth for the luggable market.

"Multimedia applications require booking systems with internal CD-ROMs and things," said Ted Julian, an analyst at IDC in Framingham, Mass.

Toshiba has positioned its AC portable series, the T6400, as a portable multimedia device.

"We've gone into multimedia in a big way," said Kyle P. Walls, senior brand manager at Toshiba. "One of the reasons for looking at multimedia as an application for AC portables is that there are things we can do now with an AC portable that you simply can't do with a notebook and probably won't be able to do anytime in the near future."

Walls cited full-motion video and high-quality sound as two examples.

Some users say there are ways around these issues that can save them from getting arm-weary.

"We think we can run multimedia presentations off of a notebook, using the appropriate hardware and pulling our output from the parallel port," said J. Briscoe Stephens, data and information systems manager at NASA's Earth Science and Applications Division in Huntsville, Ala. — *Michael Fitzgerald*

On-the-go brass do the FOCS Trot

By Gary H. Anthes

For years, U.S. Navy radio operators have used the term "Foxtrot" for the letter "F." Now, Navy admirals and other military staff will carry the FOCS Trot over their shoulders when they travel by land, sea or air.

The FOCS (Flag Officer's Command System) Trot is an "office in a box" intended to keep the Navy brass on top of their office chores anywhere in the world. It is a 15-pound package containing a laptop computer, telephone, radio transmitter, printer and fax/copier. It comes with Navy software for word processing, spreadsheets, communications and satellite tracking.

FOCS Trot allows users to establish a satellite link to the Defense Data Network, a secure network used for electronic mail and document transfer. The satellite-tracking software helps the user locate communications satellites to aid in establishing contact with them. Another option sends a continuous signal to a Global Positioning Satellite, allowing headquarters to pinpoint an admiral's location at all times.

FOCS Trot was commissioned by Vice Adm. J. O. Tuttle, the Navy's director of space and electronic warfare. Navy Cmdr. Austin Boyd, an aide to Tuttle, said Tuttle wants senior Navy officers, who now usually travel without even a portable computer, to set an example for the military. "We're usually behind in the use of technology; we want to be ahead this time," Boyd said.

Boyd said FOCS Trot is intended to relieve officers from the avalanche of mail awaiting them when they return from a trip. He said Tuttle and his staff recently returned from a 10-day, 35,000-mile tour during which a test version of FOCS Trot processed 92 messages of two to five pages each.

FOCS Trot, which can work off a single 12V DC source, was built entirely from commercially available products from more than 10 sources by Microcomputer Power, Inc. in Houston.

Fed de Gastyne, manager of government programs at the value-added reseller, said the immediate market for FOCS Trot is 225 admirals, or Navy flag officers. The firm also hopes to sell it to other military officers and to civilian emergency response teams.

The laptop is an NCR Corp. 3170 with an Intel Corp. 80386 20-MHz processor. Boyd said FOCS Trot, with all software loaded, costs about $10,000.

Portable office

Although military officers travel a great deal, they have not yet caught on to the idea of carrying portable computers. Result: E-mail goes unanswered and office work languishes. Now, a Navy admiral has a plan to change all that; he wants admirals to take their offices with them — electronically.

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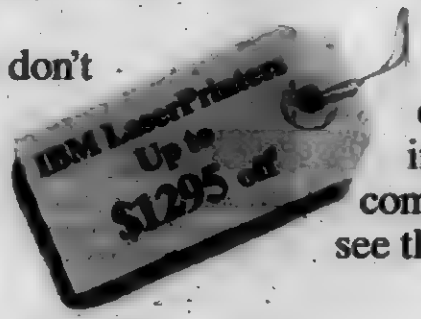

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Paul Gillin

OS/2 — no jokes

I've contacted the FBI's Federal Witness Relocation program for help following the backlash from all you OS/2 fans over my Jan. 4 column poking fun at our favorite underappreciated operating system. Sheesh, you all are as bad as Unix people. OK, here's the straight, unfunny version of what I think of the OS/2-Windows battle and why I think OS/2's prospects aren't so good.

First of all, understand that OS/2 is a vastly superior operating environment to Windows. It should be. It doesn't have to live with DOS.

Comparing a 32-bit multithreaded, multitasking, protected-mode operating system to a 16-bit, single-tasking real-mode operating system is like pitting a hare against a tortoise in a foot race. On a straight features comparison, Windows doesn't stand a chance. Unfortunately for IBM, the tortoise is winning this race. Why? Marketing.

Windows is running rings around IBM in the retail stores and on the desktops of Mr. and Ms. Typical Corporate User because it meets a simple set of expectations and does it pretty well. Windows is not fancy, but it is easy to install and use and it doesn't expect its users to understand CONFIG.SYS and dual boot options unless they want to get fancy. And it is enough of an improvement over character-mode DOS to justify its upgrade expense.

> IBM's biggest mistake with OS/2 was positioning it as a system for the everyday PC user.

In contrast, OS/2 is overkill. IBM's biggest mistake with OS/2 was positioning it as an operating system for the everyday PC user. It isn't. OS/2 is very difficult to install (even IBMers will admit that), it eats up an acre of disk space, and it requires that the user understand concepts such as what a DLL file does or the difference between startable and installable partitions.

I'm a reasonably savvy PC user, yet I was completely baffled by whole sections of the OS/2 installation manual. I can't imagine my next-door neighbor trying to figure it out.

OS/2 is an extremely powerful operating system for client/server applications, which is where the corporate world is going. But IBM set the bar way too high by positioning it as an operating system for the rest of us. It is impossible for OS/2 to compete with Windows under those conditions.

IBM's second big mistake with OS/2 was saying that it was "a better Windows than Windows." It's not. A lot of Windows programs don't migrate or install easily under OS/2. If they did, IBM wouldn't have to devote so much of its bulletin board to instructions for getting Windows applications running.

The Windows applications that do run tend to be slow because so much system overhead is needed to support them. Strike two.

IBM shot OS/2 in the foot with "better Windows than Windows" by eliminating much of the incentive for developers to write native OS/2 applications. The only reason left to do that is to take advantage of 32-bit addressing, which most mainstream applications don't need anyway.

Sure, there are OS/2 applications available — DeScribe, Inc.'s DeScribe word processor and Symantec's Norton Commander for OS/2 are great products. But ask any software company executive how excited he is about the OS/2 market and you'll get a yawn. Believe me, I've asked.

An operating system without applications is like a car for which you can't get spare parts: Enthusiasts won't care, but the mass market will reject it. And remember that IBM wants OS/2 to be a mass market operating system.

Microsoft has used Windows as a place holder long enough to get everyone excited about Windows NT. I expect Microsoft will have a very tough time selling NT as a multiuser server operating system, but I have no doubts NT will be a huge hit with Windows power users who are tired of looking at that hourglass icon. That's not good news for OS/2, which is currently having its greatest success playing to that audience.

The biggest mistake Microsoft could make with NT would be to not provide backward compatibility to Windows applications. But I don't think it would do that. If NT is a hit on the power user's desktop, then OS/2's only room to maneuver will be with true Blue corporate accounts, and there are fewer and fewer of those left.

Don't get me wrong: OS/2 is a great product, and I hope it does very well. But anyone who takes on Microsoft in desktop operating systems these days is pushing a boulder up a mountain. Even IBM isn't that strong anymore.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

WordPerfect

CONTINUED FROM PAGE 29

in Birmingham, Ala.

"We did experience quite a number of intermittent problems with Version 5.1, but we haven't had any problems to date with Version 5.2. WordPerfect has always had superior customer service," he said.

But whether that reputation for superior service will be enough to blunt the efforts of Microsoft and Lotus Development Corp. remains to be seen.

"We were late to the Windows word processing arena, but we were not the first player in the DOS market, either. We believe that our customer service capabilities will also make us the leading supplier in the Windows market," said Devin Durrant, marketing director for WordPerfect for Windows.

"This is a huge market that is still up for grabs. And we are definitely targeting WordPerfect users with Microsoft Word," countered Julie Bick, a Microsoft product manager. "For example, we have a facility that allows users to use WordPerfect keystokes that we then convert into Word keystrokes."

"Our biggest sales challenge is selling to WordPerfect for DOS users," said Bill Jones, director of product market for Ami Pro at Lotus.

"You have to go through a weaning process, so we give people the ability to pen a WordPerfect file directly and a facility that does automatic conversion between formats," he added.

Desktop mapping

Computer maps help cops catch crooks

By Mitch Betts
SAN BERNARDINO, CALIF.

■ A first-of-its-kind desktop mapping program helps the San Bernardino Sheriff's Department visualize crime patterns and allocate resources in the nation's biggest county.

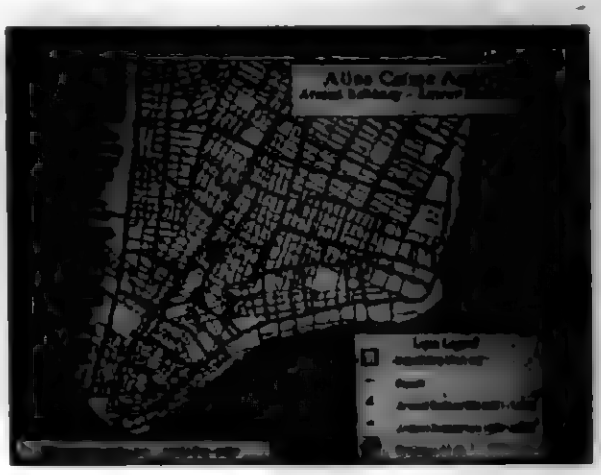
"We're in the midst of a major budget crunch, so we have to distribute our personnel efficiently. We use [the mapping system] to determine the best places to patrol," said Tim Miller, a research analyst at the San Bernardino Sheriff's Department. The county covers 20,000 square miles.

The PC software package, called Atlas Crime Analysis and priced at $12,250, takes standard database files of crime incidents and automatically matches them with computerized street maps.

Users can then generate maps showing the criminal activity in a specific location or the geographic pattern for certain types of crime (such as burglaries or rapes) and the time of day when they occurred.

The software was developed by Strategic Mapping, Inc. in Santa Clara, Calif., with significant help from the San Bernardino Sheriff's Department.

The department runs the software on Intel Corp. 1486-based PCs at 15 stations, which download crime data from a Digital Equipment Corp. VAX.



Atlas Crime Analysis *plots crime locations on computerized street maps to help police track crime sprees and compile evidence to bring suspects to court*

"For us, the key to this program is its interface, which uses plain English commands that our patrol deputies or clerks can use," Miller said.

For example, to display burglaries on a map, a user simply picks "Burglaries" from a menu using the mouse or keyboard.

Police officers have a hard enough time keeping up with their reports and police training, he added, so they do not have time for computer training to learn query languages.

Arresting proof

The mapping system has already been used to track several crime sprees, including the strange case of a man who was shooting out car windows at a rate of 70 a night, according to Miller.

The software can also help build a court case — such as showing how a series of rapes occurred on the suspect's route from home to work — or identify a suspect. Miller said officers plotted the address of a recent parolee and found that nearby burglaries tripled after his release.

In the future, the department wants to enhance the system so it will automatically generate reports that alert officers when certain thresholds are crossed, such as 10 crimes in a half-mile radius. As Miller put it: "We want the system to tell us where our problems are."

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HELP LINE

Microsoft Excel

This is another instalment in a series of articles containing questions commonly asked by users and responses from vendors' support lines. This week's focus is on Microsoft Corp.'s Excel spreadsheet.

Q: How can I change an overlay chart without affecting the main chart?
A: You can change the chart type of the overlay chart without affecting the main chart type by selecting one of the series that is in the overlay chart and holding down the Shift key while you choose a chart type from the Format menu. You can change the chart type of the main chart without affecting the overlay chart in the same way.

Q: How can I add data from a worksheet to an existing chart?
A: You can paste data from a worksheet into an existing chart. First, make sure both the worksheet and chart documents are open. Select the worksheet data you want to add and click the Copy tool or choose Copy from the Edit or shortcut menu. Switch to the chart window and choose Paste from the Edit or shortcut menu.

To add data and control the way it is plotted, follow the above procedure but choose Paste Special from the Edit menu instead. Select the options you want in the Paste Special dialog box and choose OK.

Q: How can I add a picture or an object to a chart?
A: You can copy a picture from another application or a graphic object drawn using Excel drawing tools and use that picture or graphic object as the data marker in an existing bar, column, line or radar chart.

First, switch to the document that contains the picture or object you would like to use. Generally, you should try to match the width of the picture or object to the width of the data marker it will replace.

Copy the picture or object by selecting it and choosing Copy from the Edit menu or the shortcut menu (or, if you are copying from another application, follow that application's procedure for copying).

Switch to the Excel chart in which you want to use the picture or object, select the data marker or chart data series you want replaced and choose Paste from the Edit menu. Once it is in place, you can double-click the picture marker to bring up the Format Patterns dialog box and choose whether to stretch, stack multiple copies or stack scaled copies of the picture.

Q: If I want to create a report in Excel, can I print a specified number of pages?
A: For example, if your worksheet is three pages wide by four pages tall, you can select Fit To and use the default of one page wide by one page tall, and your worksheet will shrink to the width and height specified. You can also specify print options by choosing Print Preview from the File menu and selecting Setup.

Q: How can I create a worksheet template?
A: If you frequently design worksheets to be used as models, you should create a worksheet template. The method used is similar to that described in "Setting a new default chart type" under the "Charting" section.

First, create a worksheet with the headings and the formats you need. Next, choose Save As from the File menu to save the worksheet as a template. Save the template in your Excel Startup directory and its name will appear in the New dialog box, which appears when you choose the New command from the File menu.

Q: I need to do "what if" scenarios that include optimization formulas. Is there a way to use Scenario Manager with Solver to make this easier?
A: You can solve or optimize a problem and then save the various inputs and results for future review by choosing Scenario Manager and Excel Solver from the Formula menu. If you do not see these commands on the Formula menu, run Setup to install them.

The changing cells you specify with Scenario Manager will be suggested automatically as the changing cells in Solver and vice versa. Solver can save its solutions as scenarios for display in Scenario Manager. Scenario Manager can also be used to set up initial cell values for Solver's solution process.

[redacted]

Software application packages

MapInfo Corp. has introduced Maps&Data, a desktop mapping package.

The product was designed for visual analysis and presentation. According to the company, Maps&Data runs under Microsoft Corp.'s Windows and offers presentation and analytic features that display site analysis, availability and distribution of inventory, population trends and prospect locations and demographics, among others. Maps&Data can import American Standard Code for Information Interchange and import/export data files in Borland International, Inc.'s dBase, Microsoft's Excel and Lotus Development Corp.'s Lotus formats.

Maps&Data costs $395.

➤*MapInfo*
200 Broadway
Troy, N.Y. 12180
(518) 274-8000

Looking Glass Software, Inc. has released the Looking Glass Cheetah 3D for Microsoft Corp.'s Windows 3.0.

Cheetah 3D is a 24-bit color rendering program that provides a file navigator, multiple object rendering and support for complex objects, the company reported. Standard rendering features include four viewing modes, basic animation capabilities, a Quick Mode for fast proof of concept rendering and multiple light sources, among others.

Cheetah 3D costs $349.94.

➤*Looking Glass Software*
Suite 300
8227 6th Ave.
Inglewood, Calif. 90305
(310) 348-8240

TimeValue Software has released the network version of File in Time, a task management program for tax professionals.

Multiple users receive access to capabilities such as updating tasks and adding client information. Setup files can be saved by individual users on the network, including printer and color setup, the company reported. Progress made on each task can be followed, and users are alerted to due dates. The product runs on PCs with 512K bytes of memory using DOS 2.1 or higher.

Prices start at approximately $300 for one to four users.

➤*TimeValue Software*
Suite 100
4 Jenner St.
Irvine, Calif. 92713
(714) 727-1800

Saratoga Systems, Inc. has introduced its SPS account management and sales information software package for the Microsoft Corp. Windows environment.

According to the company, multilevel customer profiles and sales-related information can be accessed and updated. Icons and pull-down menus are featured, and tool bars are available for operations such as activity scheduling and report generation.

SPS for Windows costs $1,250 per PC copy.

➤*Saratoga Systems*
Suite 230
1550 S. Bascom Ave.
Campbell, Calif. 95008
(408) 371-9330

Microsoft Corp. has released the second version of Multimedia Word & Bookshelf, Video and Sound Edition.

According to the company, it is the first and only available word processor on CD-ROM. Designed as a multimedia-enhanced version of Word for Windows, the product allows users to implant sound effects into documents and play and edit videos. Version 2.0 of Microsoft Word for Windows with WordPerfect Corp.'s WordPerfect file converters is also included.

Multimedia Word & Bookshelf, Video and Sound Edition costs $595.

➤*Microsoft*
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Advanced Graphics Software, Inc. has introduced Version 5.0 of its technical presentation graphics software, SlideWrite Plus for DOS.

An assortment of nonlinear, linear and weighted curve-fitting functions are furnished along with drawing and text capabilities and statistical analysis, the company said. Pull-down menus access Version 5.0's sizing, text formatting and on-screen drawing. A what-you-see-is-what-you-get user interface is provided.

SlideWrite Plus for DOS Version 5.0 costs $445.

➤*Advanced Graphics Software*
Suite 105
5825 Avenida Encinas
Carlsbad, Calif. 92008
(619) 931-1919

Macintosh products

Dantz Development Corp. has introduced Version 2.0 of Retrospect and Retrospect Remote, backup programs for the Apple Computer, Inc. Macintosh.

A new interface is offered in Release 2.0 that divides all functions into five logical areas. A "Retrospect Directory" provides five icons that display each function and give a short description. Macintosh users backed up on Retrospect Remote are informed if a backup has occurred or if one has not happened after a predetermined number of days.

Retrospect 2.0 costs $249, and Retrospect Remote costs $449.

➤*Dantz Development*
1400 Shattuck Ave.
Berkeley, Calif. 94709
(510) 849-0293

Relax Technology, Inc. has announced a high-peformance optical storage and file-finding package for Apple Computer, Inc. Macintosh users.

Sierra MO, the company's 3½-in., 128M-byte rewritable optical disc, drive is being bundled with On Location, On Technology, Inc.'s file-finding software.

According to the company, Sierra MO's average seek time is 33 msec, and the optical drive has a sustained data transfer rate of 563K byte/sec. The product has an embedded Small Computer Systems Interface.

Sierra MO costs $899.

➤*Relax Technology*
3101 Whipple Road
Union City, Calif. 94587
(510) 471-6112

Utilities

Fifth Generation Systems has introduced Version 1.0 of Direct Access Desktop, a Microsoft Corp. Windows-based desktop utility.

According to the company, the product enables users to create multiple desktops, simplify Windows, protect data and optimize their work. Direct Access Desktop offers a variety of features such as an applications menu, control panel and a tool bar of functional icons.

It also offers nine virtual desktops that provide nine individual Windows desktops for tasks using applications such as desktop publishing software and spreadsheet software for accounting reports.

The product costs $129.

➤*Fifth Generation Systems*
10049 N. Reiger Road
Baton Rouge, La. 70809
(504) 291-7221

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OS/2 Professional Magazine,
November 1992

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Computer Reseller News,
February 3, 1992

"Lexmark offers the best combination of price and performance for printers used for desktop publishing."

Windows Magazine,
February 1992

"With the IBM LaserPrinter 6, Lexmark proudly comes into its own on the laser printer turf by paying special attention to paper handling and resolution quality. This workhorse prints on both delicate stationery and card stocks, and can deliver a jaw-dropping 600-by-600 dpi resolution."

ComputerLand Magazine,
April 1992

"The 4079 is a watershed color printer. The list of features, low pricing, solid warranty... all combine to make this a color inkjet printer against which others will be measured."

BIS Strategic Decisions,
October 1992

"The low prices and numerous features of these printers for the Mac make for an unbeatable deal, indeed."

BYTE Magazine,
July 1992

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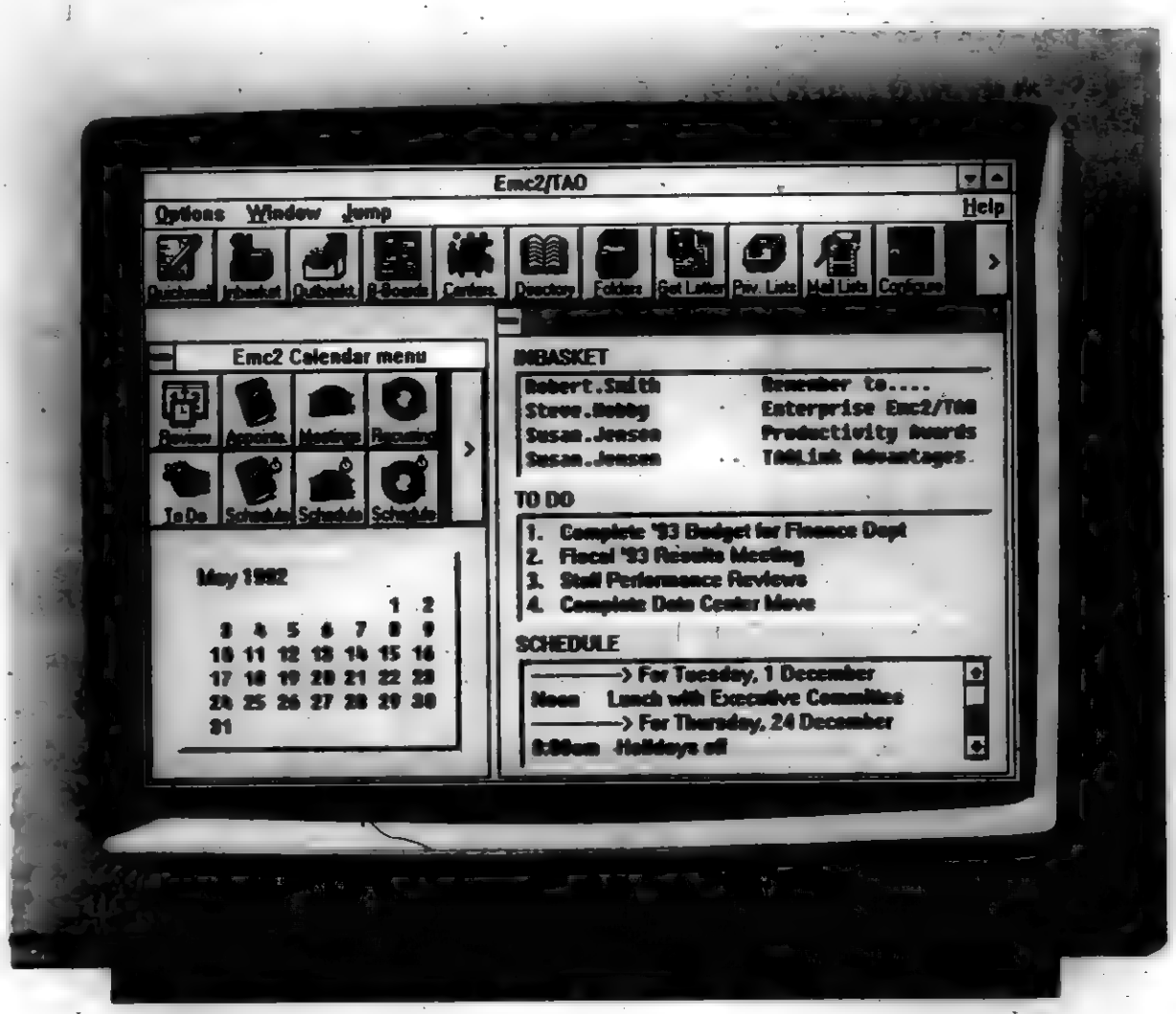

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PC LAN imaging

Integration expertise key

By Michele Dostert

Two of the hottest technologies of the 1990s — imaging systems and PC-based local-area networks — are being combined to form cost-effective, robust information management platforms. But users warn that careful planning — both on the technology side and the business side — is necessary for a successful rollout.

"Buying LAN-based imaging is not like buying a turnkey solution from a minicomputer vendor like DEC or Wang. You need a good systems integrator because if something goes wrong, there is no single vendor to call," said Bruce Silver, director of image management at BIS Strategic Decisions, a consulting firm in Norwell, Mass.

Users who choose PC LAN platforms for their imaging systems, rather than Unix-based or minicomputer-based systems, cite company standards, scalability and price as their reasons. Connie Hiestand, regulatory information coordinator at Pacific Corp., a utility in Portland, Ore., said her company is standardizing on PC LANs, so that was where she looked for an imaging system. "We were also impressed by the scalability of the LAN-based systems; we could get what we need today for a low cost but still allow for rapid growth in the future," she said.

LAN Imaging

Growing popularity

The total number of PC LAN-based, image-enabled seats will grow from 36,500 in 1992 to 451,000 by 1997, according to research firm BIS Strategic Decisions.

Price a factor

According to Silver, minicomputer or Unix imaging systems can cost up to $20,000 dollars per seat, while LAN-based imaging is only $4,000 to $5,000 per seat — most of that cost is hardware that is getting cheaper. "PC LANs will continue to gain a larger share of the total imaging market in the next five years, primarily because of price," he said.

Although image files are large — typically 50,000 byte/page — users report no bandwidth problems in running imaging on their existing wiring. "You don't need fiber to the desktop; you'll get all the speed you need from 10M-byte Ethernet or 16M-byte Token Ring," said Jane Landon, an information systems vice president at The Chase Manhattan Bank NA in New York who has installed four separate PC LAN imaging systems.

The PC LAN/imaging bottleneck arises when accessing the image files on the server. Typically, only 5,000 documents can be stored in a gigabyte, making a magnetic-only storage system impractical. But because the robotics of the optical jukebox systems commonly attached to PC imaging servers are too slow for constant file access, PC LAN-based imaging typically uses a combination of the two.

Jim Wall, coordinator of the Continuing Professional Education Program that handles teacher certification in Madison, Wis., said, "All of the documents in the file of a teacher currently being certified or recertified are stored on magnetic — typically for three months or so. When the certification is issued, the file and documents are then archived back to the optical jukebox."

There are many ways to handle document retrieval, such as combined magnetic/optical storage, caching at the server or segmenting and adding another server to the system. "It takes a high level of expertise to set up these solutions, integrate them with the LAN operating system and the applications and tune them for optimum performance," Silver said.

When planning an imaging system, users need to study their business processes as well as their technical requirements. Wall said, "Our systems integrator studied our needs from both a technical and from a business work-flow standpoint, suggesting optimal routing paths and automation of some processes. You need to do that to get the most for your imaging dollar."

Notes 3.0 on course; Unix support, add-ons delayed

By Michael Vizard

■ As Lotus Development Corp. moves closer to its long-awaited rollout of Version 3.0 of Notes, the relationship is becoming apparent between the core components of the release and the layered software that runs on top of it.

Scheduled to ship next month, the new version of Notes, Lotus' groupware software package, will include a wide range of features designed to enhance groupware application development across Microsoft Corp. Windows, MS-DOS, Unix and Apple Computer, Inc. Macintosh systems.

However, users looking for Notes 3.0 on Unix platforms will have to wait until the second quarter, and the company has yet to commit to a delivery schedule for two key add-on products for Notes.

Macintosh support

In its initial release, Notes 3.0 will add support for Macintosh clients to its support for Windows and DOS clients. Lotus will deliver Unix server and client support, beginning with support for two to three different platforms, in the second quarter, said Cliff Conneighton, Lotus' director of marketing for communications products.

Although Conneighton declined to identify which Unix systems Notes 3.0 would support first, he did say it would support up to six Unix platforms by the end of the year.

In addition to working on Unix implementations, Lotus is expanding its IBM OS/2 focus for Notes. In the second half of the year, the company is scheduled to deliver a 32-bit version for OS/2 that supports the Workplace Shell utility.

Notes 3.0, *page 61*

Mexican real estate firm 'goes Hollywood'

By Maryfran Johnson

GUADALAJARA, MEXICO

At RE/Max Mexico's real estate headquarters, the curtain is rising on what sales agents call "The Hollywood Show" as a network of Sun Microsystems, Inc.'s SPARCclassic workstations take center stage.

This week, the real estate franchise corporation will announce a $4 million contract with Sun for the installation of more than 600 SPARCstations and SPARCservers to run a custom-built, multimedia application that showcases property listings via color pictures and walk-through videos.

"When customers come into a RE/Max office, they'll be given 'The Hollywood Show,'" said Peter Bowthorpe, general manager of RE/Max Mexico. "We believe this is the way real estate offices in general will be going. The human eye is so much more useful in absorbing information than the ear."

Saves a lot of time

The multimedia application is called CLI/Max, which in Spanish is the acronym for *Consolidacion de Listados Interactiva/Maxima*. The system was developed for RE/Max by one of Sun's distribution partners, Cromasoft SA de C.V., here. It uses database query capabilities to search for a customer's ideal property, then displays a series of photos or videos in windows on the computer screen.

"This is a tremendous time-saver for buyers and sellers. It can take all day to see three houses here," said Steve Tirado, general manager and director of Sun Microsystems of Mexico.

When RE/Max test-marketed the software in one resort area office and a Guadalajara shopping center, the reaction to it was gratifyingly intense, Bowthorpe said. "It nearly stopped the traffic, and we realized we were on to something," he said.

RE/Max's first 30 franchises will have the application up and running by June 1, with a SPARCclassic set up in each office's trademark red, white and blue reception room. RE/Max plans to sell 300 franchises in Mexico and next year will expand into Latin America.

The company is also replacing its PCs, which run financial and administrative applications now, with SPARCclassics, Sun's lowest priced color workstation (see story page 38).

"We're telling everyone in the network to put any existing machines to the side and invest in the Sun technology with us," Bowthorpe said. "Essentially, each office has to buy about $20,000 worth of new equipment."

On Site

RE/Max Mexico

Guadalajara, Mexico

Challenge: To allow potential buyers to view properties and surrounding neighborhoods via on-screen color pictures and walk-through videos.

Technology: Network of Sun Microsystems SPARCstations and SPARCservers running custom-built real estate application from Cromasoft.

Lofty aspirations

RE/Max has bigger ambitions for CLI/Max as well. The company plans to submit the software system to the Mexican government as a proposed standard for the country's first national electronic multilisting service.

And while Sun's deal initially

Real estate, *page 38*

Real estate firm

CONTINUED FROM PAGE 37

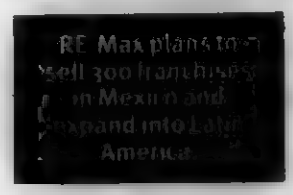
calls for $4 million worth of equipment during the next five years, the relationship could mushroom as RE/Max rolls the listing application into Latin America.

Eventually, several thousand SPARCstations could end up in RE/Max offices throughout the Americas, Bowthorpe said.

Market hurdles

At this point, however, the real estate profession in Mexico is decades behind its counterparts in the U.S. and Canada, the manager noted. There are no licensing or certification procedures for real estate brokers, he said, and the public is extremely leery of setting foot in most real estate offices.

"That is a real problem with both the national and the foreign public," Bowthorpe said. "Most people don't tend to believe the real estate agent. We have a reputation for exaggerating and putting a spin on stuff. But the camera does not lie, particularly in moving video. If the neighborhood is rough, it's rough."



Before RE/Max opened for business in Mexico last month, the company spent 18 months analyzing real estate sales and pinpointing problem areas.

"We found that what causes people not to buy is the cost of financing and a basic lack of information," Bowthorpe explained. "We had to find the tool that would enable us to overcome this problem."

The search for that tool led RE/Max to discussions with IBM, Hewlett-Packard Co. and Sun. The key factor in securing the deal for Sun was the SPARCclassic's low-cost yet sophisticated multimedia capabilities, Bowthorpe said.

The database of property images will be filled by the sales agents themselves, who will take their own photos and video footage and then ship it to "transfer centers" in Mexico City, Guadalajara or Monterey for processing and editing. Each transfer center will be anchored by one of Sun's high-end servers.

"The only limitations we see are how complicated it may be for our people to use," Bowthorpe said. "We believe we've made it pretty simple, though. It's much less complicated than one might imagine."

SPARC power

Sun Microsystems introduced the SPARCclassic in November 1992 as the first color workstation to break the $4,000 price point — $3,995 when purchased in "12-packs."

The SPARCclassic rates 59 million instructions per second of processing power and comes equipped with a 207M-byte disk drive, 16M bytes of memory, 8-bit audio, a microphone and a built-in speaker.

It is based on Texas Instruments, Inc.'s MicroSPARC 50-MHz microprocessor, which is a highly integrated, low-cost reduced instruction set computing chip.

The MicroSPARC processors are now shipping in the "tens of thousands" of units per quarter, TI officials said last week. In quantities of 10,000, TI sells the MicroSPARC at $179 per chip.

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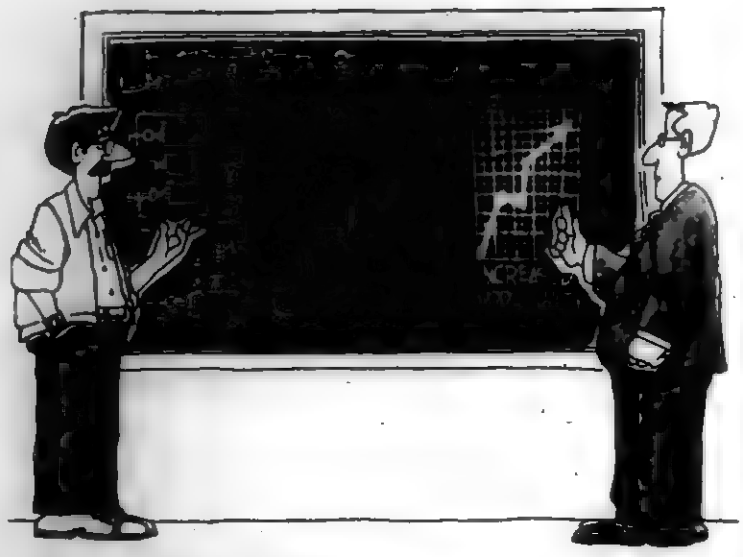

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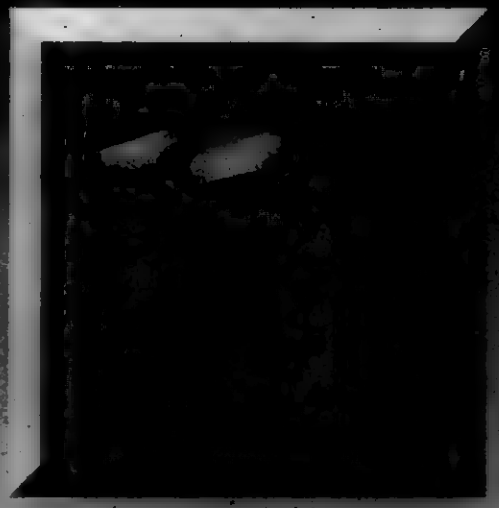
The Yankee Group



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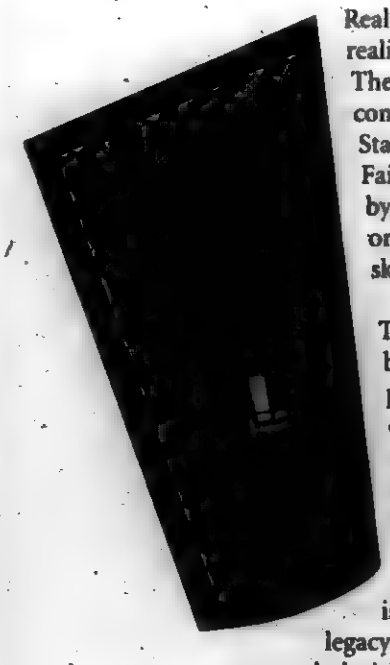
Introduction

"Power to the User" is a familiar rallying cry, even though it is more frequently written than spoken. Users, however, usually assert themselves more with actions than with words. When PCs became widely available in the early 1980s, users implemented them throughout their organizations while nervous MIS managers pleaded for order. And when LANs became available as a means of linking PCs a few years later, users moved ahead, buying and implementing while IS managers again sounded dire warnings.

This user-driven technology evolution constantly bumps the technology curve forward even as it threatens the popular notion of "Information as a Corporate Asset." Sitting high above the fray, chief information officers realize that the only way to productively harness the energy of this push-pull process is through the implementation of enterprise integration. They also know that open systems are the key to that integration.



Reality dictates that truly open systems can only be realized when vendors and users agree on what they are. The most likely vehicle for bringing about such a consensus is standards, both de facto and official. Standards are somewhat like Santa Claus and the Tooth Fairy: if you believe in them, they are real. Thus the rush by a dizzying array of vendor- and user-sponsored organizations to promulgate their ideas of reality to a skeptical and confused IS world.

This welter of would-be standards may be confusing, but the basic characteristics of standards-based products in the emerging open systems market are clear: they must be portable, scalable and interoperable. This means they must be compatible with the multi-vendor environments that dominate today's IS landscape.

The migration path from proprietary to open systems is a perilous one, as users strive to maintain their legacy systems while moving into a more open world. There are tough decisions to make and harrowing political battles to fight. Despite the risks involved, however, the only sure way to lose in this dynamic environment is not to play. The power is waiting for users, but they must grasp it.

This White Paper was written independently of the Computerworld *editorial department by Susan McGarry, Vice President of Computer Research with the Yankee Group.*

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Whether it is Goldman Sachs accessing world-wide trading information, Shell communicating the price of crude oil, or Nissan starting a design change that will affect facilities in Japan, India, England and the United States, today's business environment is global and distributed. This competitive atmosphere demands more responsiveness and flexibility than ever before. It also demands open systems.

Successful companies must possess the ability to give customers what they want, when they want it. This requires changes for everyone who directly supports the customer or the back office. There must also be changes in the ways companies deal with their suppliers and their customers. Open systems will play a major role in enabling these changes.

Since open systems imply more effective links among current corporate platforms, implementing them results in new access to information, common user interfaces — which save training

costs — and a new corporate philosophy of openness. This new "open philosophy" increases speed-to-market while empowering users and customers. It also creates closer ties to the outside, offering new possibilities for networked corporate alliances.

OPEN SYSTEMS: BEYOND UNIX AND OSI

Open systems can be defined as a set of standards applicable across all platforms and vendors that enables networked users, workgroups, departments, and even enterprises, to work together. This definition emphasizes multivendor, multiplatform capability and user orientation, rather than technology.

A true open system, then, will:

- provide a set of standard relationships
- be relevant across all platforms and vendors
- allow networked groups to work together
- support components from multiple vendors
- be portable
- be scalable
- be interoperable.

The Yankee Group believes that to be truly effective, open systems must also be based on business needs and facilitate the integration of related future systems.

The dividing line between proprietary and open systems is not a distinct one (Exhibit 1). The identity of an open system depends on how many major platforms and vendors it supports and how close it is to universal interoperability. With enough interoperability and access to applications from other systems, a proprietary system can become open; most proprietary systems are moving in this direction. Simultaneously, however, open systems enablers such as Unix are steadily becoming even more interoperable with other systems, so evolving proprietary systems are playing a catch-up game.

ENTERPRISE INTEGRATION AND STANDARDS

The Information Technology world has been gaining in complexity, a complexity that is multiplied for most users by their need to support existing systems while adding client/server and mobile computing. By 1995, close to half of the chief information officers (CIOs) in the Yankee 100 expect that 25% of their software development will be done by users. There will be tremendous power on the desktop and plenty of users to implement it.

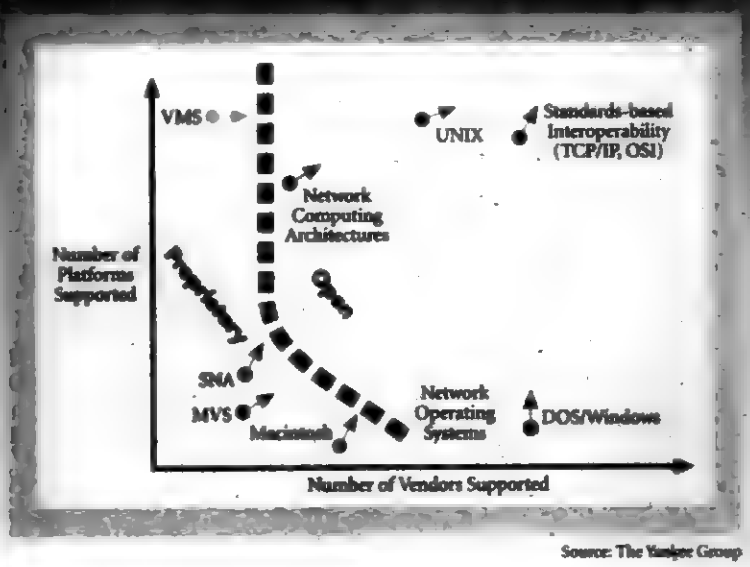
By 1996, only very large commercial on-line transaction processing systems such as those used for airline reservations will be too complicated to exist on a desktop, in a briefcase or a back pocket.

Currently, "Power to the User" and "Information as a Corporate Asset" are two opposing viewpoints. The CIOs in the Yankee 100 know that these two viewpoints have to be reconciled because of their strategic goal of enterprise integration. It won't be easy.

In fact, these CIOs tell us their number one problem is achieving enterprise integration, and the greatest barrier to that integration is the lack of standards (Exhibit 4). They cite multivendor, multiplatform processing as one of their two most important meanings of enterprise integration (Exhibit 5). The CIOs' first choice in this category is the ability of any authorized person to access and manipulate data from anywhere in the corporation. No matter which definition is used, standards are clearly central to users' IS strategies.

In fact, many IS managers view industry standards as a basis for bridging their disparate systems. Unix is easily the most-discussed open systems enabler. In a series of six seminars sponsored by the Yankee Group across the U.S. in 1992, executives mentioned Unix at least four times more often than any other standards-related entity, including Structured Query Language (SQL) or the Open Systems Interconnect (OSI) model.

When it comes to architectures, today's IS managers want flexibility above all. They are seeking rapidly adjustable frameworks to meet unforeseen changes. Ashok Malik, vice president of operations and systems for American Express, says adaptability is a major goal of his company's open systems efforts. "We are looking for flexibility so that we



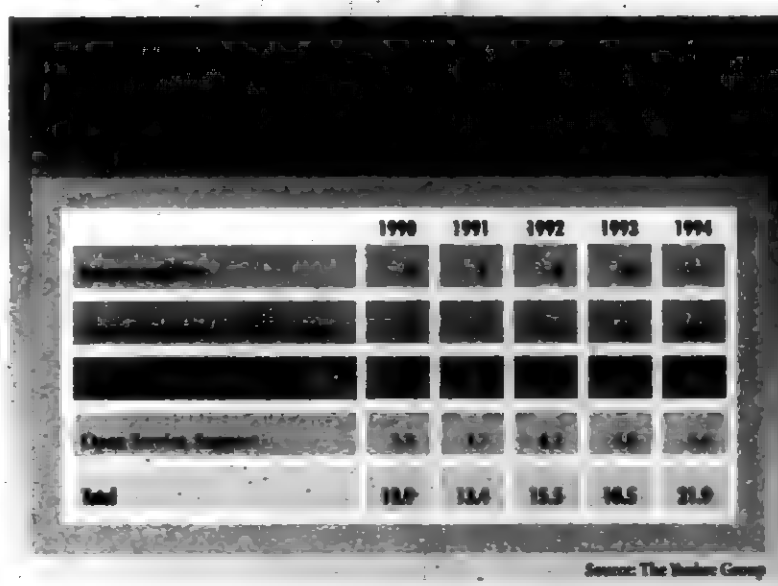
Source: The Yankee Group

have an option to change with business needs," Malik explains.

Standards for Open Systems

The need for new types of standards is driving diversification in the way they are created. The neat world of one national standards body and one overarching international standards body has disappeared. The formal standards process does not move fast enough to keep pace with technological developments. Dating back to the 1960s, published and accepted standards have fallen farther and farther behind the state of the art.

On this fast track, open systems products fall into two standards categories: "de facto" and "leading edge." A de facto standard is software that works on multiple platforms from multiple vendors, and which has become so widespread that most vendors make their software compatible with it. Some of these products become so entrenched that standards bodies feel compelled to embrace them.



Source: The Yankee Group

A leading-edge standard doesn't codify technology, it creates it. More specifically, it establishes a high-tech target ahead of current vendor offerings and encourages, and often helps, vendors to close that gap. The Object Management Group's (OMG's) work is a good example of this phenomenon. OMG has spent much time defining the interaction of objects across networks, and deriving an Object Request Broker (ORB) paradigm. It has also helped vendors resolve differences in ORB functions.

The triumphs of Transmission Con-

DCE – DCA	September 1991 – released	(OSF) IBM, Digital, HP, other OSF members	1993
DME – Net & Systems Management	1993	(OSF) IBM, Digital, HP, other OSF members	Late 1993-94
POSIX – OS Portability	1992 – VMS "POSIX-compliant" (first major non-UNIX OS)	Major vendors have committed to it	POSIX subcommittees have had trouble completing their work; however, modifications by vendors for "POSIX compliance" are making OSs more open
SGML (mark-up language)	1992 – Significant implementations	Major vendors (CALS)	1993 or beyond
EDIFACT	1992 – European customs implementation	Major vendors have committed to it	1992
X.400/X.500 – E-Mail	1992 – Definitive X.500 standard	Mostly gateways	1993 or beyond
X/Open – TP Standard	1992	Unisys has anticipated the final standard	
SQL Access API	Early 1991 – Standard completed	None	1992-93
UI-ATLAS – NCA	1993-94 – Released	UI/USL members, AT&T-NCR, Sun, others	1995 or beyond
ANDF (OSF)	Delayed, expected 1993	OSF	1993 or beyond
ORB (OMG)	1992 – First implementations	Hyperdesk, Sun/HP, Digital, others	1993-94
OSF/1	Mid-1991 – Released by OSF	(OSF) Digital and some others	1993

Source: The Yankee Group

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We recently used the lab to help Ametek Corporation build an open system that's in synch with the company's re-engineering plan. Says Bill Lawson, Director of Business Systems, U.S. Gauge division of Ametek, "IBM's design work was absolutely outstanding. So good, in fact, we're having them implement the whole system. Everything's getting connected—IBM, DEC,® HP,® all kinds of PCs and PC LANs—in a timely manner and well within our budget. IBM truly is our partner in networking and open systems. We got much more than we expected."

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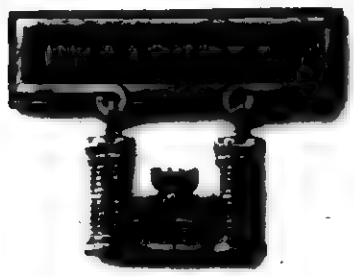

Why did the U.S. Army Corps of Engineers draft us to help solve their monumental computing problems? Simply put, we had what they needed. ■ We had the impressive track record. We had the years of integration expertise. And we had the thorough understanding of today's computing environments. ■ So it's no wonder that, with our open-systems solutions, the Army Corps of Engineers was able to move quickly and efficiently from a fragmented, data-processing system to one that is highly integrated and transforming the way they do business. ■ Perhaps you'd like to draft us to help solve your problems, too? For more information, call **1-800-257-OPEN**.

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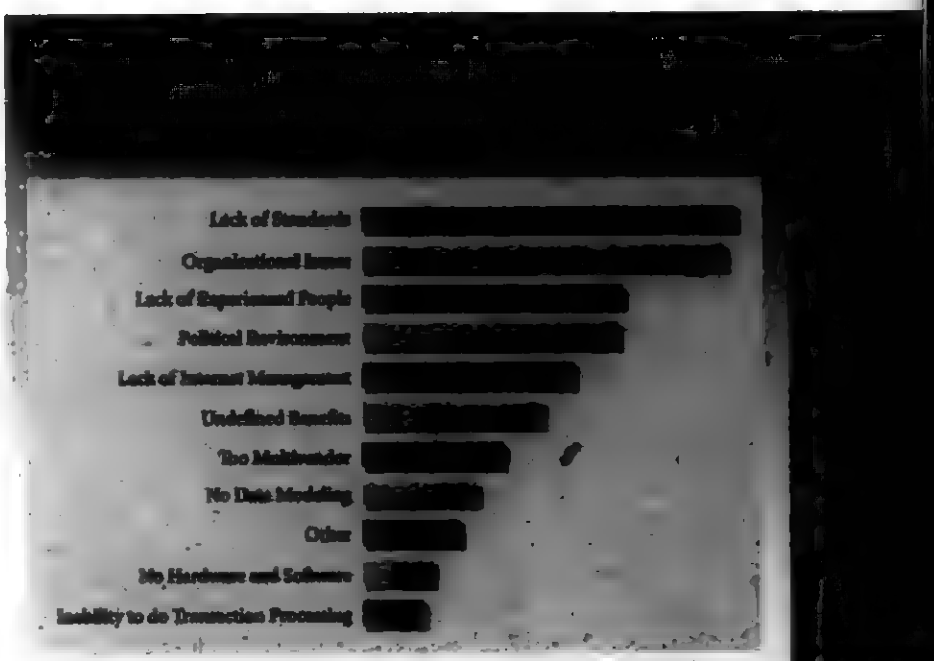
trol Protocol/Internet Protocol (TCP/IP) and Simple Network Management Protocol (SNMP) over the International Standards Organization (ISO) Transport Level 4, and Common Management Information Services/Common Management Information Protocol (CMIS/CMIP) in the U.S. market, are victories for de facto over official standards. This shows that users prefer an available, inexpensive, multivendor solution over one that may be internationally blessed but which is less accessible.



Source: The Yankee Group

DIVERGENT APPROACHES TO CREATING STANDARDS

There are now three types of standards groups:

- traditional standards bodies such as the ISO and the National Institute for Standards and Technology
- vendor consortia such as the Open Software Foundation (OSF) and Unix International Incorporated (UI)
- user groups such as SOS, Open User Recommended Solutions (OURS) and National Microcomputer Managers Association (NMMA).

The second and third groups will have the most impact on the future of open systems.

Vendor Consortia

The outstanding examples of consortia with significant effects on open systems are OSF, UI and OMG. OSF and UI, starting from the Unix area, have extended their scope to cover multiplatform solutions, particularly in the areas of distributed computing architectures (DCAs) and network management. OMG has staked out a niche in the surging object-oriented area, concentrating on network computing and interoperability using object-oriented programming.

By setting forth multivendor roadmaps and statements of direction, OSF and UI have established themselves on the leading edge of open systems. OSF/1, OSF's version of Unix, is subscribed to by IBM, Digital Equipment, Hewlett-Packard and other major OSF members.

OSF's Distributed Computing Environment (DCE), which provides basic services for cooperative processing, and the Distributed Management Environment (DME), which provides management tools for heterogeneous environments, are seen as the DCA building blocks of the future by many vendors and users. UI's distributed computing specification encompasses DCE and DME and offers further alternatives and services.

Vendors such as HP and Unix Systems Labs are increasingly building cross-graphical-user-interface tools that support both OSF's Motif and UI's OpenLook graphical user interfaces (GUIs). In terms of operability, DCE and DME are much nearer to implementation than UI's UI-ATLAS. In terms of portability, OSF may be taking the lead. It already claims several ports to non-Unix operating systems. The problem of integration with PC LANs remains, however, because these DCAs have not yet been included in popular network operating systems such as Novell's NetWare and Banyan Systems' Vines.

User Groups

User groups that attempt to define broad directions for vendors in open systems are relatively new and potentially powerful, but still not clearly effective. Prominent among these have been the User Alliance for Open Systems, SOS, OURS and the NMMA.

SOS is a group that declined to adopt a formal name, although SOS has been variously interpreted as "Standards for Open Systems," "Save Our Systems" and "Support Our Systems." Also known as "The Gang of Ten," this group of users decided to use its combined buying power — estimated at $15 billion annually — to influence vendors in support of open systems.

The next two years should see a substantial number of new standards and implementations that will have a major impact on the open systems market.

The participating companies are: American Airlines, Du Pont, General Motors, Eastman Kodak, McDonnell Douglas, Merck, Motorola, 3M, Northrop and Unilever. Many of these companies are also heavily involved in the activities of the formal standards groups. Their goal is twofold: get ven-

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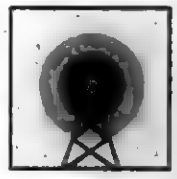
Volpe National Transportation Systems Center Driving Open Systems

The Volpe National Transportation Systems Center is a research and development arm of the U.S. Department of Transportation. It develops air traffic control software for the Federal Aviation Administration (FAA). This software is also made available to commercial airlines, the U.S. Air Force and other countries.



The Volpe Center's Enhanced Traffic Management System (ETMS) presents real-time flight and weather data to traffic controllers, alerting them to likely areas of congestion. It can show as many as 6,000 flights simultaneously.

The ETMS was originally conceived as a prototype, but is now in daily operation. It is built on several hundred networked Hewlett-Packard Apollo workstations and includes more than 750,000 lines of Pascal code. Based on distributed computing technology, this money-saving system has built-in redundancy that keeps the network up if a workstation goes down.

The Volpe Center is an active member of the Open Software Foundation (OSF). It is on the OSF End User Steering Committee, a group of international users providing OSF with input on their open systems requirements. Volpe currently has an interoperability lab, where it is testing IBM's AIX using Motif, Digital Equipment's Alpha series computers running OSF/1 — the OSF version of Unix — and Hewlett-Packard's UXF/1 connected by TCP/IP running over Ethernet. This test is part of the Volpe Center's transition to a more open system.

Volpe is committed to open systems, not only because it is part of a government agency and must therefore follow U.S. government procurement practices, but for real business reasons. It wants to be in a position where it can procure from any number of vendors and save taxpayer dollars by leveraging one vendor against another.

The Volpe Center's most critical requirement is portability. Because technology transfer is the center's business, it wants to port applications from one vendor to another as easily as possible. Robert Chew, a consultant at the Volpe Center, believes the pragmatic approach of OSF to developing worldwide standards will help the center with its plans to transfer its software and systems to international organizations.

Heterogeneous interoperability is very important to Volpe as it moves to a new generation of its distributed system. The center's current multivendor testing approach is rapidly enabling it to do that effectively. To that end it is relying heavily on OSF's Distributed Computing Environment (DCE), and Distributed Management Environment (DME).

dors to produce the products that meet their needs, and state publicly their commitment to, and plans for, support of open systems. Currently, the Gang's requirements statement consists of 25 profiles in eight different categories.

The next two years should see a substantial number of new standards and implementations that will have a major impact on the open systems market. Many standardized products are scheduled to appear in 1993.

BENEFITS AND CHALLENGES

The benefits of open systems are manifest. Among the most notable are portability, scalability and interoperability. None of these, however, is easily realized. For instance, as Unix variants proliferate, universal application portability recedes. And scalability is an increasing concern because open systems are often associated with downsizing. Downsizing to PC and Unix workstations often means moving to new platforms not seamlessly connected to the corporate mainframe. In this dynamic environment, interoperability via distributed computing has become the open systems method of choice for both vendors and users.

IS control is another benefit of open systems computing. As "rogue computing" — the unmanaged proliferation of PCs and LANs — continues, IS is shifting its emphasis from control to redesign and flexibility. Recent Yankee 100 surveys show that CIOs view business process redesign as an increasing priority. The Yankee Group asserts that management of change may be the key computing concept of the 1990s.

Open systems do, when applied intelligently, save money. Lacking a solid business reason or cost-benefit analysis, however, they may also be money losers.

THE STATE OF INTEROPERABILITY

As users increasingly focus on enterprise-wide integration, the importance of interoperability between platforms grows.

There are two steps to interoperability. The first is unlocking communication to a platform, and the second is unlocking the applications and data on the platform. By placing de facto standard communication protocols that provide wide intervendor connectivity — such as TCP/IP — on a platform, vendors instantly make that platform far more open. Because a standard like TCP/IP allows file transfer and terminal emulation, unlocking the communication instantly allows rudimentary access to a platform and data. Both Motorola and Texaco, for example, are moving to TCP/IP to achieve this first step toward interoperability.

The second and more difficult step

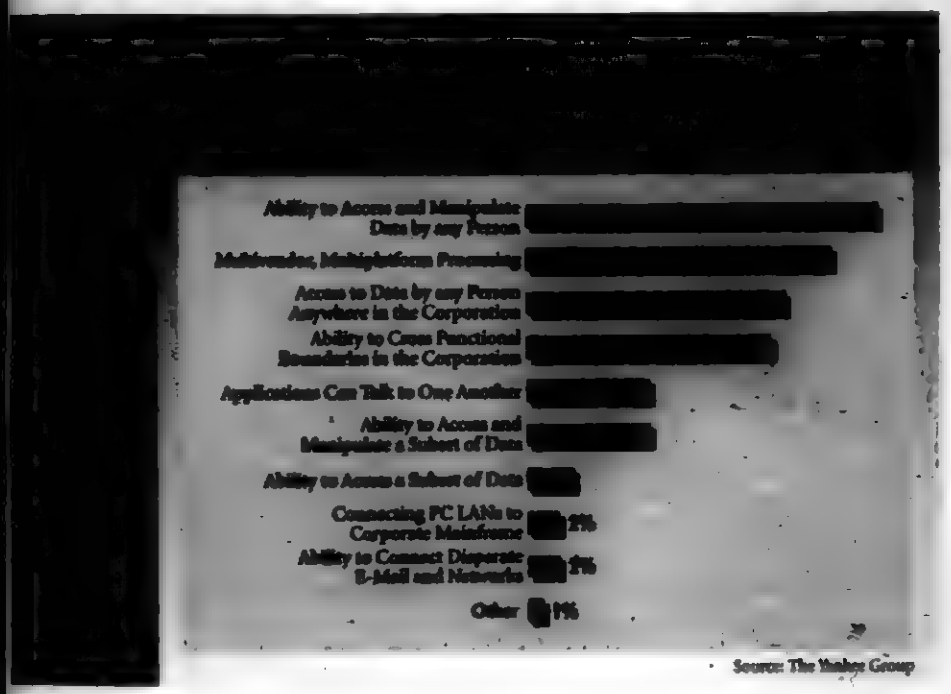
— unlocking applications and data across the enterprise — is the task of distributed computing. Standards available for distributed computing include OSF's DCE. Vendors have much to accomplish before they can provide all the tools needed to achieve this second step. Essentially, every important node in an enterprise-wide network (usually, every server) must have a common piece of distributed computing and management capability, and applications must be built or rebuilt to use those pieces as a foundation for enterprise-wide information access and manipulation.

The management pieces — supplied by distributed computing architectures such as Digital's Network Application Support (NAS), OSF's DCE and DME and UI's UI-ATLAS — are at least a year from availability, and are much further from full functionality. Clearly, systems open enough for data and application access are still in the development stage. Users also face a great deal of work in redesigning their systems to take advantage of these distributed computing architectures.

However, as Steven Jenkins from the Jet Propulsion Lab points out, in some cases there is enough technology now for users to make significant progress. He says, "I'm ready to begin prototyping and testing DCE. The lack of availability of DME is not an impediment. I need to enact change in my organization before I can proceed much further." As an early adopter of distributed systems in another part of JPL, he struggled with building distributed solutions without DCE-like tools. "I got attracted to DCE after that experience, after we had built our own. I could look at the framework and the elements underneath and say, yes, the core capability is there."

INTEGRATION WITH LEGACY SYSTEMS

Most users still see value in their legacy systems. They want to link the new open systems they are developing to their legacy systems, and find ways to migrate some portion of the old to the new. This is a crucial issue for Malik at American Express, who says, "How do we migrate from the legacy systems? How is data shared? How do we do training and change management?"



Source: The Yankee Group

Despite his doubts, Malik believes that open systems will become a reality for him in the next twelve to eighteen months.

The Yankee Group believes the key to solving the old-application dilemma involves focusing on a "one-user-interface" strategy, what Aetna calls "one and done." That is, IS managers are increasingly emphasizing open systems not as an end in themselves, but as a means of delivering multiple vendors' value to the end user.

To do this effectively, the end user needs to be able to access multiple systems through one user interface whether that is Windows, Motif or OpenLook. By specifying a look and feel, as well as the solutions to be delivered through the interface, users such as MetLife are finding all of their open systems decisions greatly simplified. They are achieving business process redesign and a clear way of deciding how and when their old applications should be modified.

THE PATH TO OPEN SYSTEMS

Vendors are providing software and hardware that can be networked and is standards- and Unix-based. IBM, Digital, HP, Siemens, Data General, Novell, Microsoft, and Sun all offer Unix hardware and/or software. They also offer adherence to OSI and X/Open standards in addition to supporting common application program interfaces. Further, these firms support DCAs based on a wide array of standards. Moreover, vendors are paying increasing attention not just to de jure standards but also to de facto standards. Currently the biggest difference among open systems vendors is the quality of their migration and multivendor integration products.

The open systems race is not a sprint, but a marathon. It requires pacing and a strategy to make it to the finish line.

Over the next five years, the milestones for users will be:

- improving interoperability
- provision of a valid migration path
- portability
- scalability.

Quaker Oats Looks for a Better Systems Mix

Quaker Oats Co. recently installed a Unix-based system at its Jacksonville, Tenn., Celeste Pizza plant. Since installing this open, hardware-independent system, the company has realized a number of money-saving, productivity-enhancing benefits.

The business decision to replace its aging system of Burroughs, Hewlett-Packard and Digital Equipment computers at the Celeste plant was tied to the need to replace its existing Statistical Process Control (SPC) software. In particular, the project sponsors wanted to streamline data collection and provide near-real-time feedback. The company believed the plant, which produces 45 million pizzas each year, could save money by more closely controlling its use of ingredients.

The need for a new system was also driven by the fact that the Food and Drug Administration and United States Drug Administration monitor separate areas in the plant. Representatives of the two agencies wanted to be able to review data without operating in each other's territory.

The old system was unable to efficiently deal with the daily reams of paper-based Quality Assurance data providing feedback on the preceding day's run. Someone back on the plant floor would view the data, and then have someone else key it into a PC or similar repository. During this process of multiple individuals shuffling through the data, some errors were inevitably made.

In addition to realizing speedier, more accurate data handling, the group wanted to make the data more widely available and easier to use. Toward this goal, a number of employees from the plant floor were involved from the beginning of the project.

Selecting the New System

In specifying a new system, the decision was made to choose the best hardware and software whether or not it was compatible with the old system. Among other things, the project team was looking for lower costs, more flexibility and quicker access.

Because the team wanted an open system, it decided to seek a Unix-based platform. It also wanted a hardware-independent system able to use packages that run on PCs from IBM and Compaq, as well as computers from HP and Digital Equipment.

Although the team was seeking something new, it also wanted to draw on proven technology. With that in mind, it wanted an Oracle database that could be accessed through SQL. While shopping for software and the expertise to run it, the team examined some 29 packages, finally settling on Production/Management Information Systems (PMIS) from Bradley Ward. The package combines the process control and management functions required for the new system.

After the hardware evaluation was finished, the team selected HP 9000 processors to complement the software. As a result, PMIS now resides on an HP 9000/832. An HP 9000/345 runs ORACLE/SAS. Connectivity is provided by an HP Vectra running TCP/IP.

PMIS allows operators on the plant floor to enter a product code and time frame, and then monitor running conditions during that time frame. The plant lab, which samples and analyzes pizza, has an HP 9000/345 workstation running X Windows to provide similar access.

Benefits

Since installing the system, Quaker Oats has realized the benefits it hoped for, including:

- cost savings due to weighing accuracy
- improved quality due to weighing accuracy
- immediate quality feedback
- appropriate data readily available to government agencies.

Once the new system was implemented, the team took an initial group of 25 employees who had helped design it, trained them in operations and gave them the responsibility for training the remaining employees.

The project team is now reviewing other software packages for future improvements. It is also building on this system by allowing the old Digital Equipment VAXes to interface with the new HP system. When this is accomplished, anyone with a terminal or PC will be able to interface with the new system.

Users will be able to rely increasingly on a common base technology, but they will need skill and vigilance to select and integrate the products and protocols that will provide optimal interoperability, portability and scalability.

Users should prepare themselves for the open systems marathon by taking the following steps:

1. Examine the payback. Although the integrated, distributed enterprise may be a few years away, there is an immediate cost benefit for many in open systems today.

At General Foods USA, technical decisions have to be tied to a specific benefit, and cost is always an issue. Project team members there estimate

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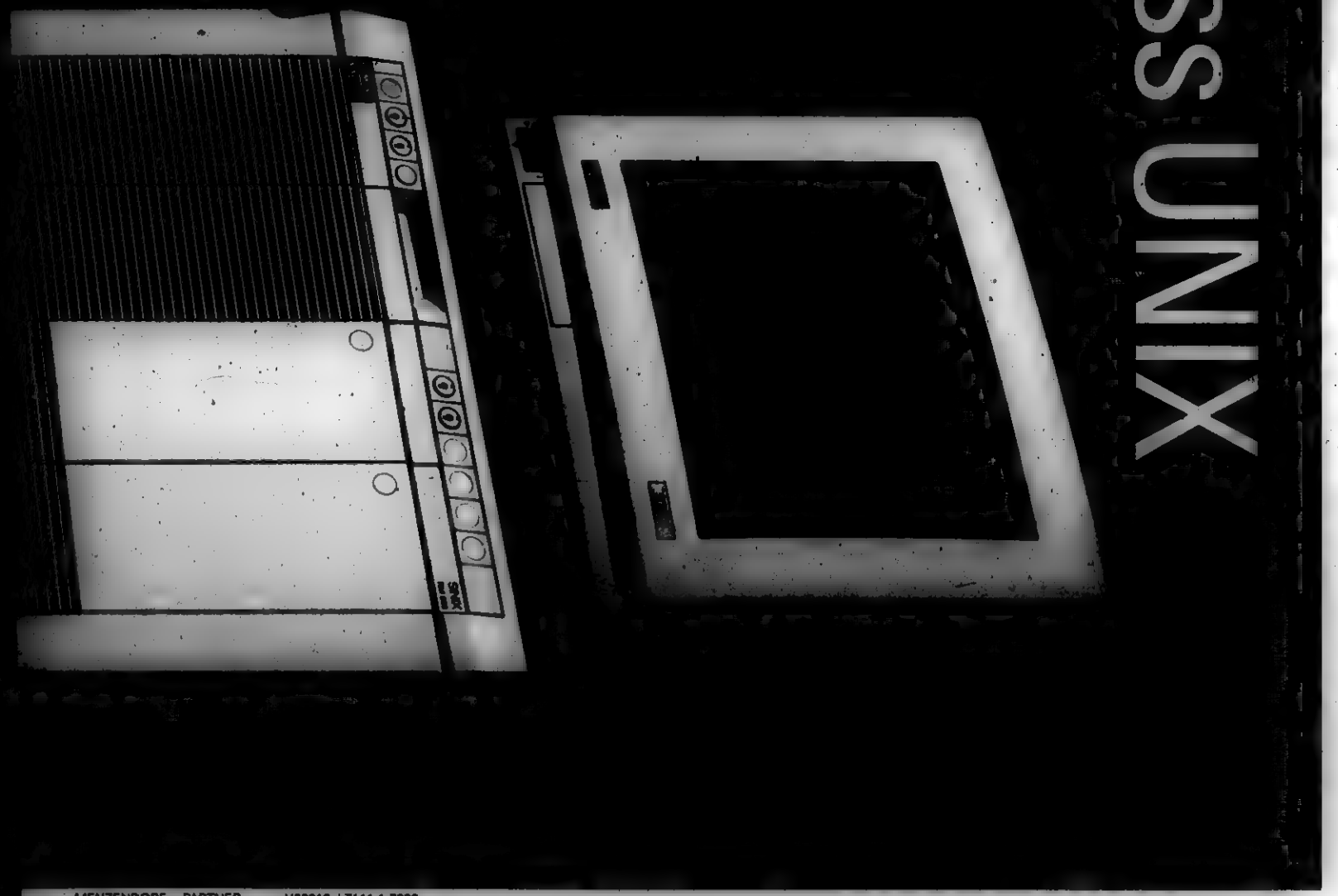

XINUS UNIX

Duke Power Co. Uses a Team Approach to Achieve an Open System

Duke Power Co., based in Charlotte, N.C., wanted to make real-time, on-line monitoring available to select groups of employees. The company, which operates a variety of nuclear, hydroelectric and fuel-fired power plants in the Carolinas, also wanted to monitor on-line data at remote sites using only a portable PC with a modem.

In order to realize its goals, Duke put together an open architecture-based system that runs DOS, OS/2, Unix, or VMS. It also uses the DECnet and NETBIOS network protocols and employs multiple relational database products, including OS/2 DBM, ORACLE, and DB2. The system was christened Total Operating Plant Process System (T.O.P.P.S.)

Duke put together a multidisciplinary team that was involved in the project from beginning to end. Team members came from different plants, and included end users (operators), design engineers, maintenance staff, IS personnel, training staff and technical support people.

Like General Foods and other astute large customers, Duke insisted that its vendors—IBM, Intellution, and Computer Products Inc. (CPI)—work together to provide the solution it desired. The vendor contacts were also considered part of the company's development team.

The team initially hoped to be able to use a system based on the seven-layer OSI Basic Reference Model. However, at the time it was designing their system, in the autumn of 1991, there simply were not enough OSI-compliant products available to run the gamut of Duke's needs.

Duke chose Intellution's process control software product, the Fix, and also its DMACS networking software. In electing to use NETBIOS, the utility incorporated extensions to NETBIOS, which allowed the Fix to be run remotely via a modem-equipped portable PC. Thus, one of the utility's primary goals was realized.

One of the attractions of Intellution's product, was that the software was already running on OS/2 and VMS. Adding OS/2 to VMS gave the team another option and made the overall system more open.

A decision was made to first implement the system at one plant, where it could be fully implemented and tested before being extended to other plants. The project took less than a year to devise, build, and test.

Each plant has multiple nodes running on Token Ring LANs. A fiber-optic WAN backbone provides communication between plants. In-plant screen updates occur within two seconds. The distributed system monitors 5,000 I/O points, and provides 3,000 additional computed variables. Since NETBIOS can run simultaneously on multiple networks, all plant data is available to the LAN and WAN users. Five plants have been interfaced to the fiber-optic WAN so far, and the system will support future additions.

they are getting up to 10:1 improvement in price performance with open systems.

They also believe that open systems make it possible to perform jobs for $100,000 that formerly weren't possible at any price. Steven Jenkins of the Jet Propulsion Laboratory has effectively argued to his management that the cost of ownership of some of the 20-year-old equipment that currently supports the Deep Space Network (DSN) is higher than the cost of acquiring open systems. In its draft of top level requirements for the DSN, his organization is recommending POSIX — the IEEE's Unix implementation — and TCP/IP.

Evaluate your vendors on their commitment to open systems.

2. Implement in one area, measure results, and then decide whether to proliferate. Both General Tire and Duke Power have espoused this strategy. Duke has rolled out its open architecture Total Operating Plant Process System to five locations thus far (See sidebar, this page). General Tire has implemented in one location and is now expanding to three.

3. Evaluate your vendors on their commitment to open systems, and that means more than determining whether they offer Unix. How big is the gap between their proprietary and open offerings? What migration tools do they offer to help you move from their proprietary to their open systems offerings? How much do they really integrate with other vendors' products? Pay particular attention to the degree to which their tools, applications and utilities are open. These are more likely to be stumbling blocks than hardware or operating systems.

4. Manage your vendors. General Foods is working with fewer vendors but demanding more from them. Management there has sent a clear message that making systems interoperate is mostly the vendors' responsibility.

5. Provide feedback on the standards that will enable distributed computing architectures. Leading-edge users may want to participate in a vendor's beta offering of DCE or DME; the more risk-averse may simply make sure they are informed about the progress of OSF, X/Open, SOS and OURS. ■

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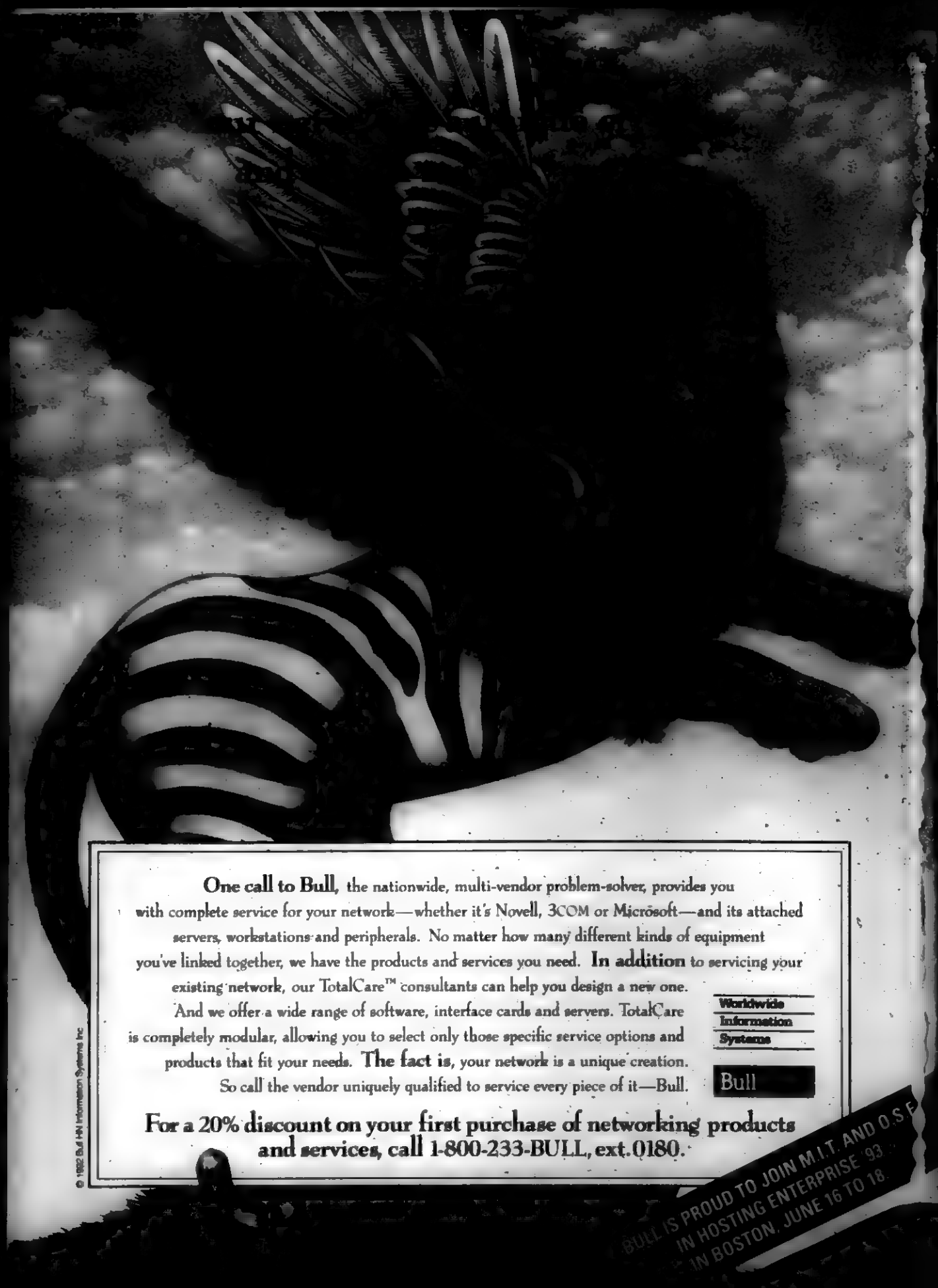

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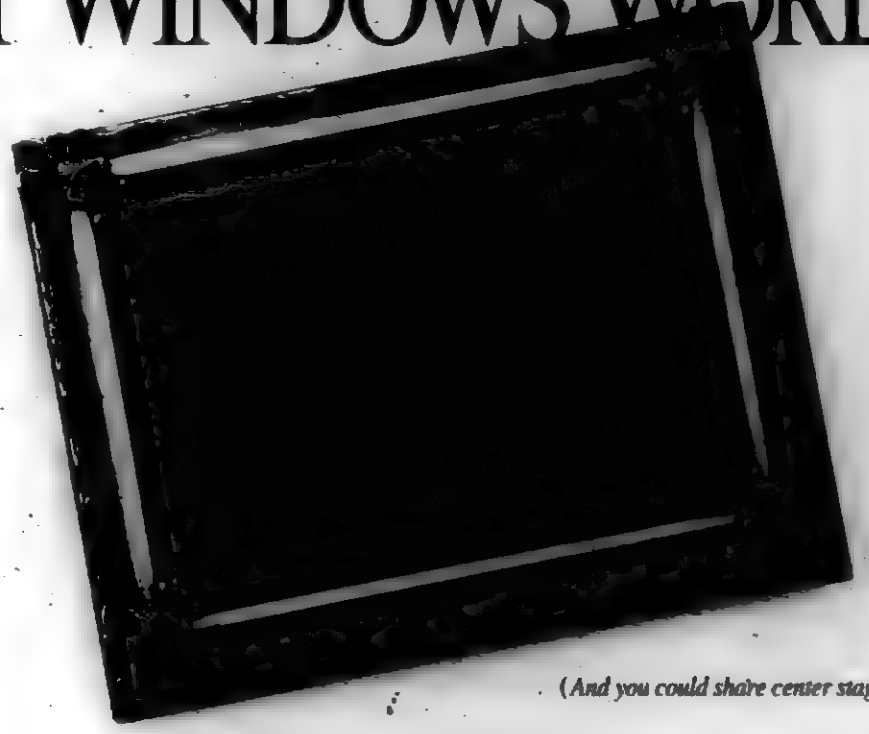

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Lotus' Notes 3.0

CONTINUED FROM PAGE 37

The only server environment Notes now supports is the 16-bit version of OS/2.

Network protocols that will be supported include Apple's AppleTalk for Macintosh clients and OS/2 servers, native Novell, Inc. IPX/SPX support for Windows and OS/2 systems, Transmission Control Protocol/Internet Protocol for OS/2 and Unix systems. Notes already supports IBM's Systems Network Architecture and Digital Equipment Corp.'s Pathworks.

Complementing the wider range of platforms supported under Notes 3.0 will be enhancements to the work-flow, versioning and routing capabilities of Notes 3.0, improvements to Notes macros, support for the Object Linking and Embedding protocol and a published Notes application programming interface for linking PC applications to the Notes database.

Also included will be support for CC:Mail transports, a database lookup function across Notes databases and SQL databases, replication services among Notes databases and the ability to create 1G-byte databases using the Notes object-oriented file system.

The initial release of Notes will provide support for a full-text retrieval server engine based on technology supplied by Verity, Inc., a Mountain View, Calif., subsidiary of Frame Technology. In addition, support for the version control feature to be added to 1-2-3 for Windows Version 2.0, due in the second quarter, will be in the initial release of 3.0.

According to Conneighton, all of the core features of Notes 3.0 will be available when the product is launched, and customers will be able to use Notes 3.0 for "large-scale, mission-critical applications."

However, users looking to build complicated work-flow applications on top of Notes 3.0 will have to wait for the arrival of support for Advanced Technologies, Inc.'s (ATI) work-flow software, which Lotus bills as an add-on component of Notes.

Notes 3.0 will have enough work-flow software built into the kernel to support straightforward applications, but customers building mission-critical applications where there are "anomalies" in the work-flow process, such as exceptions or parallel tasks, require the ATI software, Conneighton said.

"You can think of the ATI software as a CASE tool for building work-flow applications," said Conneighton, who declined to specify when the ATI software would be available beyond saying that it is due sometime this year.

The first users of Notes 3.0 will also have to wait for a tool to access data in relational databases that support SQL. The ability to link an SQL database to Notes 3.0 is tied to the inclusion of support for the Open Database Connectivity interface from Microsoft Corp. in Lotus' DataLens query tool.

In Brief

Easy as 1-800

SunExpress, the mail-order subsidiary of Sun Microsystems, Inc., recently announced two new customer services to simplify information retrieval and product ordering. One is FaxInfo, which allows customers to have product information faxed directly to them by calling (800)873-7869 (USE-SUNX). The second is SunExpress' new membership in Sun's Catalyst CDware program, which provides demo versions of a wide range of Unix software.

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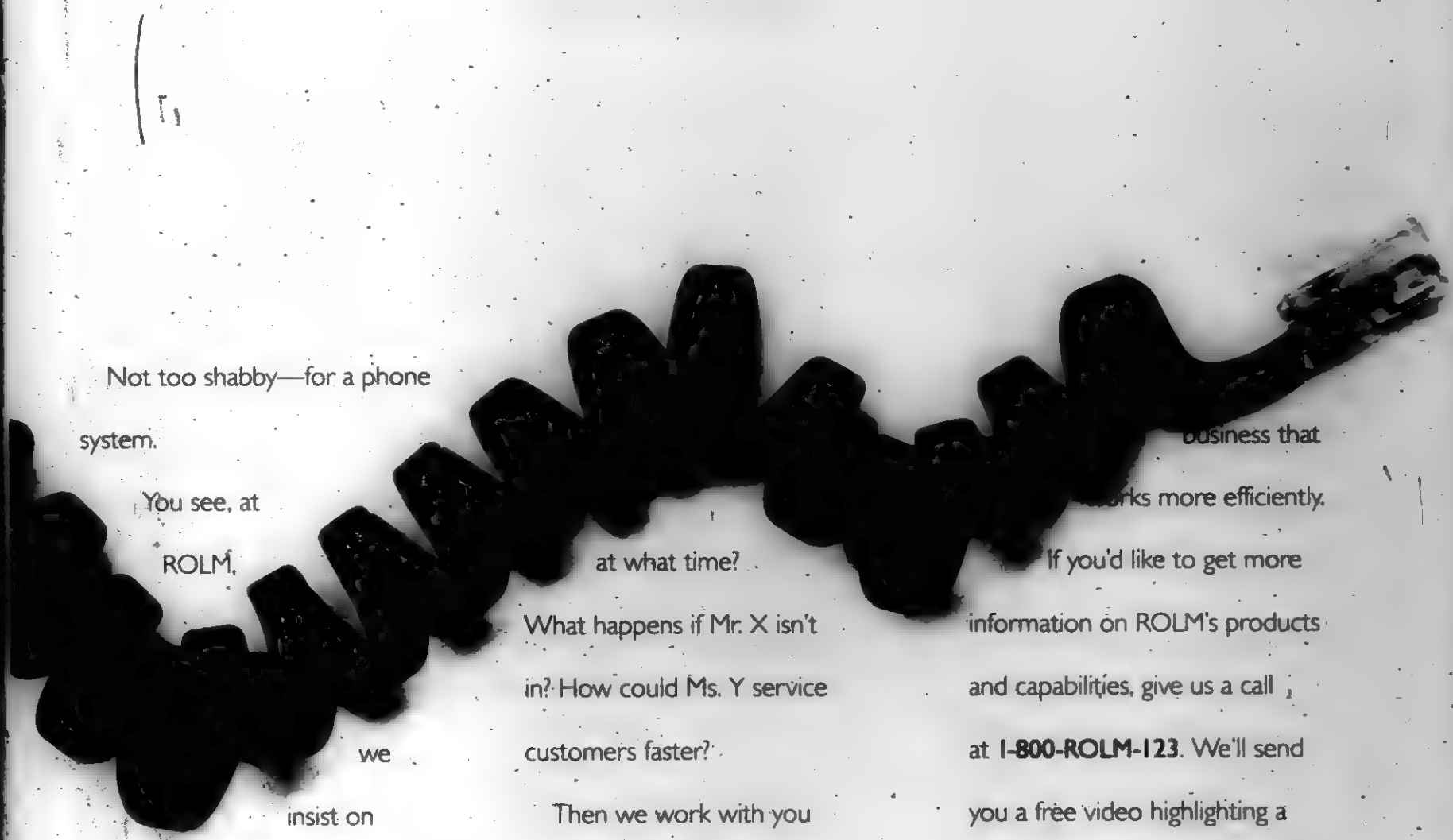

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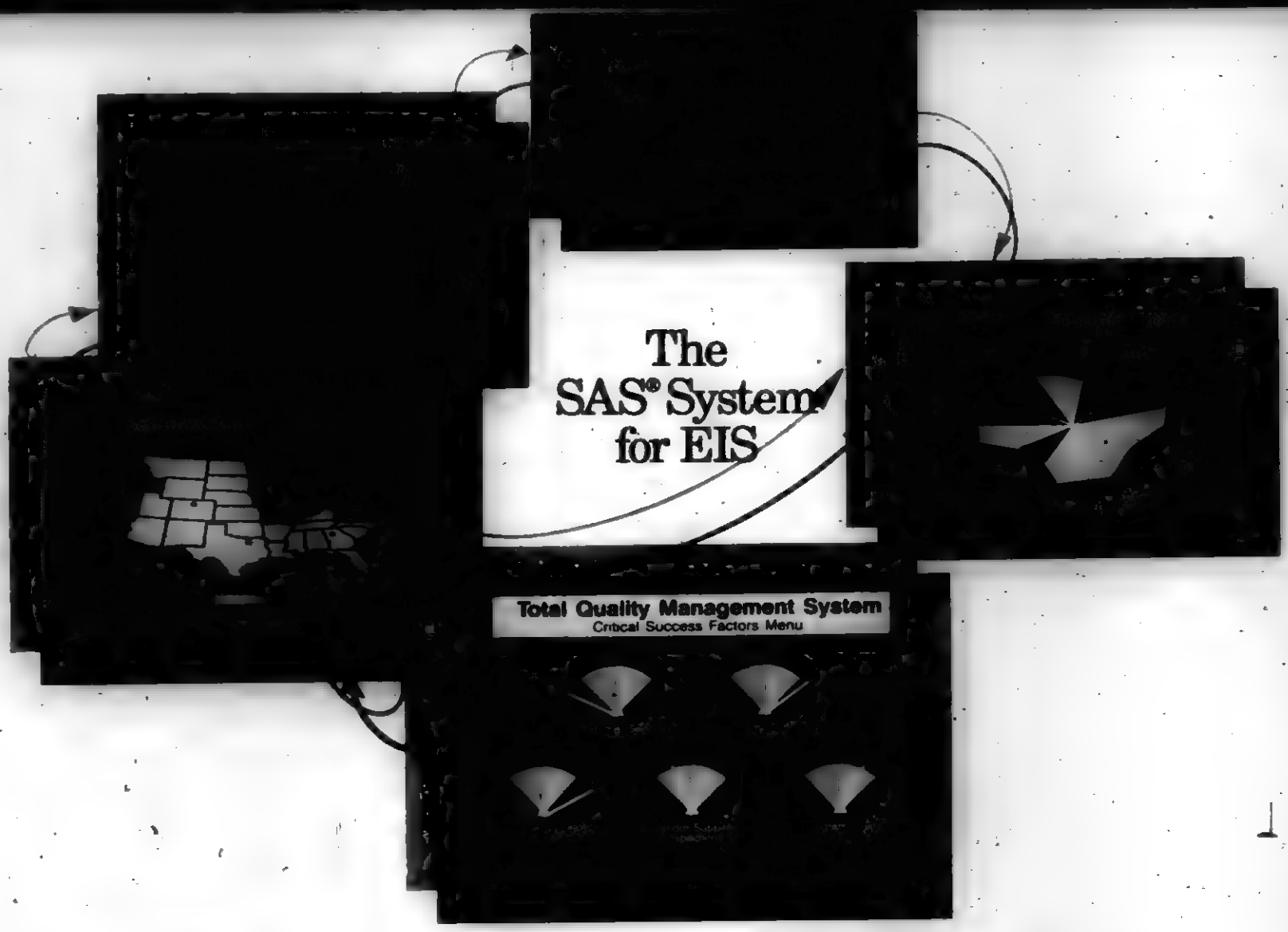

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Routers make progress in IBM connectivity

By Joanie M. Wexler
WASHINGTON, D.C.

Tweaks to the internetworking cornerstones of corporate data highways — multiprotocol routers — found their way onto the list of ComNet '93 show announcements.

The recent show marked the one-year anniversary of IBM's 6611 router announcement, and to celebrate, the vendor added support for its own Advanced Peer-to-Peer Networking (APPN) Network Node protocol. APPN is a key protocol for users migrating from hierarchical Systems Network Architecture (SNA) networks to interconnected local-area networks via IBM's networking blueprint.

IBM also added transparent bridging for linking Ethernet LANs, support of SNA and NetBIOS protocols over Ethernet and Apple Computer, Inc. AppleTalk protocols to the 6611. Company officials said Banyan Systems, Inc.'s Vines is on deck as the next protocol to make its way onto the device.

ComNet

Meanwhile, IBM-oriented router maker **CrossComm Corp.** said it also added APPN support to its router. CrossComm and IBM router capabilities rival each other, as each runs proprietary schemes for rendering SNA "routable."

Also on the IBM front, **Network Equipment Technologies, Inc.** said it has added new software to its LAN/WAN Exchange router that supports SNA Synchronous Data Link Control conversion and source-route bridging local acknowledgments.

The second capability, available on several other vendors' routers, addresses a "time-out" limitation in large Token Ring internetworks. The source — or sender — of data requires an acknowledgment by the receiving station within a few seconds or the transmission dies. This

Routers, *page 68*

Routers

IBM 6611 links Missouri sites

By Joanie M. Wexler
JEFFERSON CITY, MO.

An overhaul of Missouri's transportation infrastructure has driven the state to link local-area networks in its headquarters and 10 district offices. The goal: to allow users on far-flung Token Rings and host-based networks to share research and test data.

To that end, the Missouri Highway and Transportation Department recently installed IBM's nascent 6611 multiprotocol router as the internetworking glue.

The department is bridging IBM's Systems Network Architecture (SNA) and NetBIOS protocols and routing Internet Protocol (IP) through the 6611.

While analysts have predicted that the 6611 would find its niche primarily in IBM-heavy shops — and Dave Johnson, end-user support coordinator at the Missouri agency, acknowledged that "our network is so Blue we look like an inkwell" — Johnson said he chose the 6611 primarily for its management and configuration capabilities, his top internetworking priorities.

"You just shoot router updates directly from the RS/6000," Johnson said. "It's very understandable and straightforward. We have only been doing TCP/IP for 18 months on a limited scale, and I was worried about the learning curve. IBM stood out as a configuration tool compared to other router vendors."

Simple as 1, 2, 3

The simplicity derives from the 6611's foundation on IBM's RISC System/6000 platform. The agency is converting its geographic information systems and drafting software, now running on a 9370 midrange computer, to about 200 RS/6000s and some high-end PCs running the X Window System protocol, Johnson explained. The RS/6000, which is Unix-based, handles router configuration through X.

In addition, the router is manageable by the systems in use at the agency: LAN Network Manager, NetView/6000 and NetView.

"As this network grows, I want to keep management as centralized as possible and focus my staff on servicing users rather than having them spend a lot of time monitoring network management software," Johnson said.

A $200,000 budget for LAN integration at the department — awarded largely because of pressure from a non-information systems group of materials and research testing personnel — has so far included the purchase of eight 6611s, the upgrade of the agency's IBM front-end processor from a 3720 to a 3745 and NetView/6000 and NetView management software, Johnson said.

A $200,000 budget for LAN integration at the department awarded largely because of pressure from non-IS groups ... so far has included the purchase of eight 6611s and the upgrade of an IBM front-end processor.

In addition, Johnson said, the department is likely to purchase two RouteXpander/2s, a $795 software-based remote router compatible with any Micro Channel Architecture PC that runs the IBM OS/2 operating system. The department will use the RouteXpander/2 for routing Transmission Control Protocol/Internet Protocol (TCP/IP) traffic from smaller sites over frame-relay lines.

The RouteXpander/2 usurped IBM source-route bridges for certain links because the bridges do not handle TCP/IP traffic generated by the RS/6000, Johnson said. Bridging can often be faster and cheaper than routing in simple internetwork configurations.

The department did a three-month router evaluation that included vendors Cisco Systems, Inc., CrossComm Corp., Proteon, Inc. and Wellfleet Communications, Inc., as well as the option of routing through a front-end processor.

With the last option, "we weren't happy with performance, and there were too many points of management and lots you had to do with VTAM," Johnson said.

"In terms of performance, we found Proteon, Wellfleet and IBM all acceptable; Wellfleet and Cisco were more Ethernet-oriented, and there is no Ethernet in my house," he said. "At the time, Proteon's configuration scheme was more difficult, though prices were comparable" to IBM's, he added.

While the 6611 is seen as a strong choice for IBM shops because of its proprietary Data Link Switching feature — which lets nonstandard SNA be routed — the Missouri department is not using the capability yet.

"There are problems with 9370s with that mechanism," Johnson explained. "We were advised by IBM to look at it," but not to use it right away, he said.

CrossComm has a similar mechanism, which is called Protocol-Independent Routing, in its router, but Johnson said he was attracted to the 6611's reduced instruction set computing platform over CrossComm's Intel Corp.-based architecture.

E-mail users turn to BeyondMail for Vines

By Lynda Radosevich

In an electronic-mail world dominated by Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail, several large firms recently picked BeyondMail from Beyond, Inc. as their standard E-mail package running on Banyan Systems, Inc.'s Vines networks.

The companies already use Vines' native mail program, but they plan to move some users to BeyondMail to access its "friendlier" interface and advanced E-mail features such as spell checking. In addition, they cited BeyondMail's tight integration with the Vines operating system and its rules-based technology that lets them create personal and workgroup workflow applications.

At The Equitable Life Assurance Society in New York, a life insurance company with $245 billion worth of individual insurance in force, Vice President Bill Lewis is beginning a 500-user rollout of BeyondMail. Lewis said the firm's 1,500 E-mail users have been using Banyan mail since 1988.

"Beyond has a spell checker, which users have been asking for for years, and it's easier to attach documents to messages using Beyond. Vines does it, but it is a bit kludgy," Lewis said.

While those features, which are available in some other packages, are helpful, the deciding factor in Equitable's purchase of BeyondMail was BeyondMail's tight integration with Vines' transport technology and its ability to use the Banyan StreetTalk directory, according to Lewis.

"Because Beyond is fully integrated with StreetTalk, we don't have to build a separate [E-mail] directory," Lewis said.

Both CC:Mail and Microsoft Mail provide their own transport systems and require separate administration of user names.

NEC Technologies, Inc. in Boxboro, Mass., is starting to move 500 of its more advanced 1,800 E-mail users to BeyondMail, according to technical support manager Tim Baranowsky.

BeyondMail, *page 68*

BeyondMail has a ... market share based on ... of electronic mailboxes, the Electronic Mail and Micro Announcer said ... that that "is somewhat deceptive because their flagship product ... has only been shipping ... for about eight months or so," said Chris ... Wilson, a program director at Gartner Group, Inc.

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IBM

X servers on the rise

By Lynda Radosevich

Unit shipments of terminals with built-in X Window System server capability grew by 62%, while shipments of X-enabled PCs grew by a whopping 182% during the last year, according to two recently completed studies.

Introduced in 1989, X technology runs under Unix and other major operating systems and lets users run applications on other computers in the network and view the output on their own screen.

"Anything so new is going to grow, but this growth is considerable," said International Data Corp. (IDC) analyst Eileen O'Brien. X technology is run by a consortium of vendors and is gaining popularity rapidly, she said, because "it runs on anybody's anything."

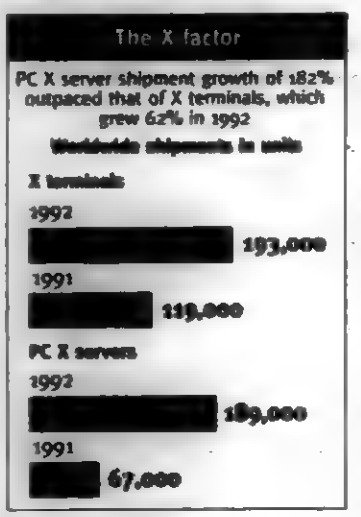
According to the separate reports from IDC and The X Business Group, Network Computing Devices led the X terminal market, with a 28.4% share of the 193,000 units shipped in 1992.

Hewlett-Packard Co. led in revenue growth with a 22.1% share of the $564 million market, according to IDC.

The PC X server market grew to 189,000, led by Canada-based Hummingbird Communications Ltd., and it has "a good chance of overtaking the terminal market by 1993," O'Brien said. This is because PC X servers can run PC applications as well as X applications, she said.

At Heidtman Steel Products, Inc. in Toledo, Ohio, an X system is helping the company deploy a quality tracking system that is too large and complex for a local-area network, according to director of information systems Jim Hill.

Using HP minicomputers and X terminal servers with touch-screen operations on the plant floors, the steel service center is replacing a cumbersome paper tracking system with X because "it's a highly integrated system," Hill said.



Source: International Data Corp.

Reporter's Notebook

AT&T "shot itself in the foot" when it indicated during its Asynchronous Transfer Mode (ATM) service announcement that it does not intend to offer SMDS, according to one analyst who attended the event. The reason: AT&T Network Systems is still saddled with the task of selling its BNS-2000, an SMDS-capable switch that AT&T carrier services elected not to use for its fast-packet services. "This has a bad effect" on AT&T Network Systems, not to mention that it could possibly stunt users' SMDS deployment when the industry discovers that the SMDS capability, largely being sold today to regional telephone companies, will not be offered in the long-distance arena by the market leader.

ComNet

A comment from Jon Fjeld, who oversees development of IBM's 6611 multiprotocol router: "We don't anticipate taking over Cisco this year, but we do expect to catch up to the other router vendors in terms of shipments."

Router giant Cisco Systems estimated that 30% of its new accounts each month are pure IBM SNA shops — an odd statistic, given that routers' strengths lie first and foremost in interconnecting LANs.

A representative from Microsoft, which supports some 28,000 workstations in-house, was overheard estimating that just 5% of its corporate desktops would be on ATM LANs by 1997. Of course, Microsoft recently became a pioneer in widescale deployment of 100M bit/sec. FDDI over copper wiring, which should stall the company's need for ATM bandwidth for a while.

Networking industry pundit John McQuillan was full of analogies at a breakfast sponsored by Netrix. "Your network is like a car; it loses about 20% of its value every year. You have to make a choice when it quits becoming cost-effective to maintain it" or replace it, he said. He also encouraged public choices for ATM networking, likening ATM to a "jet engine for your network. You can go faster and carry more stuff. But jets haven't obsoleted all propellors. And most of us don't own our own jets; we rent time on 747s."

Ninety percent of leased lines run less than 1,500 miles, and 1,500-mile distances are where frame relay becomes more economical, according to Paul Weichselbaum, MCI's vice president of data marketing.

3Com ships new family of terminal servers

By Lynda Radosevich
SANTA CLARA, Calif.

In a market that the most optimistic predictions say will be flat, 3Com Corp. is shipping a new family of terminal servers that can support four protocols and connect up to 48 terminals in one box.

Aimed at companies with large mainframe and minicomputer investments, the terminal servers can be used to link serial terminals to local-area networks, giving the terminals access to resources such as network servers and printers. Also, the servers let information systems managers connect terminals to a host computer using one network cable from the server.

"One reason the market is not growing is downsizing," said Chip Pettirossi, an analyst at International Data Corp. in Framingham, Mass. "Companies are replacing terminals with PC LANs, and applications that traditionally ran on mainframes are moving down to LAN environments."

A good investment

Despite this trend, companies with many desktop terminals are using terminal servers to help preserve their investment, he said.

In its new lines of terminal servers, the CS/3000 and CS/3100, 3Com increased the standard number of ports from 16 to 48. Accompanying software supports four protocols: Transmission Control Protocol/Internet Protocol (TCP/IP), Digital Equipment Corp.'s Local-Area Transport, International Standards Organization's Open Systems Interconnect (OSI) and IBM's TN3270 terminal emulation protocol.

For Texas Children's Hospital in Houston, the additional ports and multiprotocol support fall right into its networking plans.

The hospital uses 3Com terminal servers to allow dumb terminals on nursing station desks, for example, to communicate with the Ethernet LAN — using the network resources such as the modem pool service — and to get information from databases on the mainframe, according to David Schiller, director of network service and technical support. Schiller said he chose 3Com's terminal server because of its support for TCP/IP's Simple Mail Transport Protocol, which he uses as the transport protocol for his network management system.

"Hospitals are very concerned with space, as most of it is slated for inpatient care," Schiller said. "When we have a need to connect 3,000 users to the network backbone, it's nice to have a slim design."

The diskless CS/3000 in a 48-port configuration is priced at $6,500. The CS/3100 with internal drive is priced at $6,900. 3Com's terminal server software is priced at $600 for a site license, including TCP/IP, TN3270 and OSI support.

BeyondMail

CONTINUED FROM PAGE 65

"There will never be a total phaseout" of Banyan Mail, Baranowsky said, "but BeyondMail offers some extras."

For example, NEC plans to use Beyond's rules-based technology to build form-routing applications to guide the processing of purchase orders, facilities requests, maintenance orders and "anything that starts with a form, requires a signature and goes from one person to another," he said.

Late with Windows

While Beyond is making inroads into some corporate markets, it still has a "very small share of the LAN-based market," in part because the company didn't come out with a Microsoft Windows-based product until last June, said David Whitten, program director at Gartner Group, Inc., a market research company in Stamford, Conn. However, "as electronic-mail users become more sophisticated, some of BeyondMail's added capabilities — such as its rules-based technology — will show their value" in the market.

That fits right into the company's plans, said Chuck Digate, Beyond's president. He said the company's primary focus is large accounts such as Fortune 2,000 companies and the government. To appeal to these larger customers, Beyond is working on joint marketing agreements with Novell, Inc. and Banyan "in the workgroup arena," Digate said.

Routers make progress

CONTINUED FROM PAGE 65

is a problem when data is traversing several LANs.

The local acknowledgment scheme means that the internetworking device forwarding the data to the next LAN provides the source with the receipt.

Retailer Carter Hawley Hale will reportedly use the LWX version to consolidate its front-end processor traffic across 89 locations and 31 applications.

Market leader Cisco Systems, Inc. said it shipped the first two production units of its recently announced Cisco 7000 high-end router [CW, Jan. 18] to Unitel Communications, Inc., a carrier based in Toronto.

Cisco also said its products have passed Government Open Systems Interconnect Profile (GOSIP) Version 2 testing.

GOSIP compliance is required of federal agencies in new procurements, and Cisco estimated that government users account for 15% to 17% of its customer base.

Cubix offers auto reboot feature

Cubix Corp. has announced the PA3030 Processor Alert System, which can automatically reset Cubix's BC Series CPU cards in the event of a software crash.

Cubix's BC Series is a "computer on a card" that is typically rack-mounted and used for remote communications, application servers, gateways, batch processing and other network functions. The cards can be connected by wire to the Cubix PA3030, which monitors their status; if a card does not respond, the PA3030's watchdog timer will automatically initiate a hardware reset to that unit.

Automatic rebooting can be useful in remote communications. If a user dials in and does something that "hangs" the host, he must often wait until a local administrator can be called to reset the PC. The PA3030 will allow a user to hang up, call back and start working again.

The PA3030 is now available for $995 from authorized Cubix dealers.

➤ *Cubix*
2800 Lockheed Way
Carson City, Nev. 89706
(702) 883-7611

X Window System

Digital Equipment Corp. has enhanced its VXT 2000 multiwindow terminal family with new software productivity features for network resources access. The VXT 2000 17-in., monochrome, single-box, multiview terminal includes DECnet protocol support, Simple Network Management Protocol support and PC-style keyboard support for DEC's LK443 and LK444 PC keyboards.

Product benefits include low emissions standards compliance, resolution of 1,280 by 1,024 pixels, 100 dot/in. display and 4M-byte memory standard, expandable to 16M bytes in 2/4M-byte industry-standard single in-line memory module increments.

The product costs $2,095.

➤ *DEC*
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

Cayman Systems, Inc. has updated XGator. Release 2.0 changes an Apple Computer, Inc. Macintosh into an X Window System client for standard X server users.

Faster than Version 1.1.1 by 20%, Release 2.0 has added a number of diagnostic and functionality improvements, including color support for black-and-white and color Macintosh monitors, remote restart and the ability to launch an application when an X user establishes a connection to the Macintosh.

A single-user license costs $295; a 10-user license costs $2,495.

➤ *Cayman Systems*
26 Landsdowne St.
University Park at MIT
Cambridge, Mass. 02139
(617) 494-1999

Wide-area networking hardware

AT&T Paradyne has introduced the V.32terbo, a modem enhancement.

According to the company, the product offers 19.2K bit/sec. speed, a 25% data transmission speed increase over the present highest modem standard of 14.4K bit/sec.

The V.32terbo will be incorporated into the company's Comsphere 3800 modems as a regular feature.

A standard pack costs $795.

➤ *AT&T Paradyne*
8545 126th Ave.
Largo, Fla. 34649
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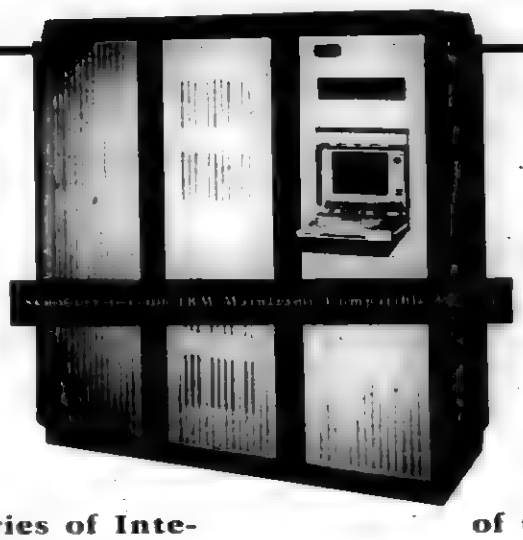

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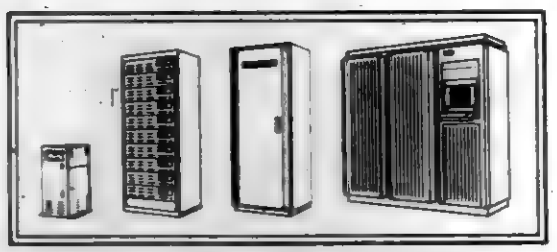

The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

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NT for the midrange: Mixed thoughts

Enthusiasm among multiuser computer vendors ranges from hot to wait-and-see

By Melinda-Carol Ballou and Mark Halper

While many PC companies have indicated their intention to support Microsoft Corp.'s Windows NT and a number of vendors of departmental and enterprise systems have also done so, others are treading with more caution, in part because of their commitment to using Unix to help users downsize.

Vocal NT supporters include Digital Equipment Corp., Sequent Computer Systems, Inc., NCR Corp. and Intergraph Corp. NT hardware boosters applaud the operating system for its multitasking and support for symmetrical multiprocessing, ease of use and relatively seamless integration qualities with Windows and DOS desktop applications.

Hewlett-Packard Co. is moving more carefully, along with Pyramid Technology Corp. in San Jose, Calif. Rich Sevcik, general manager of HP's systems and server group, noted, "NT as a viable server in comparison with Unix is going to be several years away." HP has an NT development team in Fort Collins, Colo., where activity is focused primarily on desktop use.

NT's initial impact will be as a desktop system this year, and it will catch on as a file server in the second half of 1994, Sevcik said. As a commercial business server, he said, NT will not take hold until 1996.

Even ardent NT enthusiasts agree that no new operating system, NT or otherwise, will work its way into the mainstream overnight.

Improvements necessary

To reach that level, Microsoft must hone the operating system to overcome both real and perceived shortcomings in areas including database support, terminal support, on-line backup and networking, according to HP and Pyramid officials. They said they are fighting a long-term battle to gain acceptance for their Unix wares as secure, reliable equipment and that they expect corporate users to scrutinize NT's make-up just as closely.

Industry analysts agreed. "NT is not going to capture the high-end server market quickly," said Michael Goulde, a senior analyst at Patricia Seybold's Office Computing Group, a consulting firm in Boston. "Once you get out of the interactive environment or strictly client/server, you run into a whole different set of requirements such as availability, clustering, job scheduling [and] systems management, and NT is a long way from proving itself capable in those areas."

> "NT is not going to capture the high-end server market quickly."
>
> —*Michael Goulde*
>
> *Patricia Seybold Group*

Even Microsoft said it does not expect instantaneous enterprise success. Early enterprisewide uses are likely to include decision support and financial programs, according to Dwayne Walker, director of Windows NT and networking products at Microsoft. These are the same functions, he noted, that corporate users are more likely to move from mainframes onto Unix platforms.

Sequent Chief Executive Officer Casey Powell predicted that early sales of his company's WinServer series of NT machines will go to workgroup and smaller departmental environments.

DEC will target NT as one of three operating systems running on the company's new Alpha AXP reduced instruction set computing processors, as well as on Intel Corp. microprocessor-based systems.

While DEC intends to run NT on a wide range of machines, from "the desktop to the data center," the first to ship will be an Alpha PC, perhaps as soon as this month, with a beta-test version of NT and Microsoft's Software Developer's Kit, according to DEC sources.

Microsoft has developed a Hardware Abstraction Library layer that isolates NT from hardware dependencies and makes it fairly straightforward for a range of systems vendors to support and run multiple processors on, Goulde said.

But as an enterprisewide operating system, NT has some deficiencies, such as weak backup capabilities and nonexistent support for terminals, according to Sevcik.

Walker noted that DEC and other third parties are developing their own products to tie NT into terminals. While basic backup capabilities will be offered with NT, more complex backup features will be offered by third parties.

Walker addressed another common concern expressed by hardware vendors and users — that NT is short on networking protocols. He said NT will offer Transmission Control Protocol/Internet Protocol (TCP/IP), including a range of TCP/IP such as File Transfer Protocol, Telnet, Microsoft's NetBEUI LAN Protocol and remote procedure calls.

Some sources have said that Microsoft may first issue a client-only version of NT, which would be short of networking features. Microsoft has denied those assertions [CW, Jan. 25].

NetWare client support for NT has been offered by Novell, Inc. in a prerelease version on CompuServe, and Microsoft will offer IBM's Systems Network Architecture support as a layered product for NT, according to David Solomon, president of Solomon Software Technologies, a consulting firm in Nashua, N.H.

Network File System support will be made available by SunSelect, the software division of Sun Microsystems, Inc., Solomon added.

Several hardware companies, such as Sequent and DEC, are working hand in glove with database vendors to tailor NT database offerings to their multiuser platforms.

One of the vendors least enthusiastic about NT is Pyramid. "We have plans to run NT, but I don't see it as that strategic to us at this point," said John Chen, executive vice president at Pyramid. "Any new operating system on the server side will have to establish its reliability."

Around the corner

DEC will soon ship a range of Intel-based and Alpha AXP-based NT platforms from the desktop to high-end servers and is likely to someday promote NT as the company's strategic operating system, according to industry analysts.

Sequent last month said it will offer a line of Intel-based NT servers.

Intergraph will offer NT as an alternative to Unix as an operating system for its new workstations.

NCR showcased an eight-CPU, 486-based server last spring and is shipping some of its servers with beta-test copies of NT for users who want to check out the systems, company officials said.

Jean S. Bozman

Hands are full

Who can blame Oracle for wanting to become a $2 billion firm by 1996? Oracle wants to grow its $1.18 billion database business through re-engineering partnerships with some of its largest customers — the Boeings, AT&Ts and Kelloggs of the world.

It was Oracle's largest accounts that kept on placing orders right through Oracle's financial troubles in the early 1990s. So it is natural that Oracle would once again turn to sites such as McDonald's and Nippon Telegraph and Telephone for future revenue. But user sites must hope Oracle can merge its responsibilities to provide both products and services.

That's because the vendor is in the middle of a complex rollout of products, starting with the shipment of its Oracle 7 relational database last month and continuing into June with a new graphical tool set and communications software that will make distributed client/server applications possible [CW, Feb. 1].

Raymond J. Lane, Oracle USA president and leader of Oracle's services strategy, says he believes the time is right to capitalize on IS' shift to client/server technology and open systems — two of Oracle's best calling cards. "Information technology [departments] no longer have the luxury of asking for large budgets, and they must deliver results in one year instead of three," Lane told analysts recently. "We want long-term relationships that will deliver us into project after project after project."

One-stop shopping

Oracle's new strategy extends its traditional role of product vendor. It wants to be a one-stop shopping project manager, selling its own products and consulting services and asking systems integrators such as Perot Systems to help out. The strategy was also designed to boost sales of Oracle's $49 million applications business by selling preprogrammed templates to some industries, such as the pharmaceutical and oil industries.

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Legal battles

NCR users cry foul over I series glitch

By Thomas Hoffman

A war of words over an alleged glitch in the ITX operating system used to run NCR Corp.'s proprietary I series machines continues to drag on.

Several disgruntled NCR users claim the operating system software has caused a phenomenon called "silent death" to occur where, for no apparent reason, the system comes to a halt, causing data corruption and file loss.

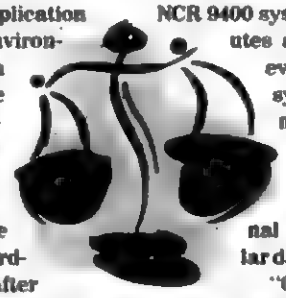
Several users who experienced problems in the late 1980s have since settled their legal cases with NCR. However, sources said at least four user companies still using the I series systems say they are experiencing problems and preparing legal action against NCR. They are Tractor Trailer Supply Co. in St. Louis, Felmor Corp. in Baltimore, Saxton, Inc. in Phoenix and Hopper Specialty Co. in Albuquerque, N.M.

Meanwhile, NCR contends that only a handful of its remaining 5,000-plus I series customers have experienced these problems, which NCR officials said are tied to an applications program originally provided by Taylor Management Systems, Inc. in Amarillo, Texas, but no longer offered to I series users.

However, some former I series users said the problems appeared even when they did not have the Taylor package on their machines. For example, Scott Petroleum Corp. in Ittabena, Miss., a fuel oil wholesaler, installed an NCR 9500 minicomputer running the ITX operating system in 1989. According to Richard Fulgham, Scott Petroleum's data processing manager, the company suffered "silent death" when the system ran Taylor's Distribution Management System.

Problem remains

Thinking the "silent death" resulted from an incompatibility between the Taylor package and the NCR hardware, Scott Petroleum removed the application software from the ITX environment in 1990. However, even after the Taylor package was removed, Scott Petroleum continued to suffer from operational glitches.



"At first, I thought it was incompatibility between the Taylor software and the hardware," Fulgham said. "But after further research, we realized that the ITX operating system was at fault."

Because of a nondisclosure agreement, Fulgham said he could not discuss the out-of-court settlement Scott Petroleum reached with NCR in October 1992. Since then, his firm has replaced the NCR system with a Digital Equipment Corp. MicroVAX 3100 Model 90 machine, which Fulgham said has "worked great so far."

Because the NCR system would crash approximately every 30 minutes, Scott Petroleum lost files and had data corrupted on those files that remained, Fulgham said.

Scott Petroleum was not alone. An auto parts distributor in San Diego had used an NCR 9400 system to handle inventory control, accounts payable and receivable and customer records. A company executive, who requested anonymity because his firm also signed a settlement with NCR, used the system for a month, in late 1989, with catastrophic results.

"The system cost us $250,000 in out-of-pocket expenses in one month and just about buried our company," he said.

The auto parts executive also said the NCR 9400 system crashed every 30 minutes and lost customer records every time it went down. That system suffered from a phenomenon called "deadly embrace," which caused the system to crash whenever two or more on-line terminal users tried to access similar data.

"Customer satisfaction with our company dropped so low that we still haven't recovered," the executive said.

NCR has contended that the problems have been incurred by a small percentage of its 5,000-plus I series customers and were caused by the Taylor management package.

"The [Taylor] software was poorly written, and NCR was able to resolve that problem for many of its customers," said Norton Cutler, NCR's general counsel.

Noting the exception of problems experienced by Fulton Provision Co. in Portland, Ore., Cutler said NCR is not aware of any system problems experienced by non-Taylor users. Fulton is currently migrating to an NCR System 3000.

In an affidavit, Jerry Hood, data processing manager at Fulton, said the firm never used the Taylor system but that almost immediately after Fulton began using the ITX system in 1989, "we experienced terminal lockups when accessing our inventory files."

Doors now closed

Taylor Management Systems went out of business in 1990, but its founders have two lawsuits pending against NCR. One is an arbitration matter between Taylor and NCR that was held in Dayton, Ohio, last month. Both sides are preparing briefs and the arbitrator will make a decision in 60 to 90 days.

Taylor claims that defects in the NCR hardware and software caused the terminal lockups, silent death and deadly embrace, and subsequently forced Taylor out of business.

Taylor's founders claim their software ran smoothly on Burroughs Corp. hardware but not on the NCR equipment. Taylor also contends that NCR was aware these problems existed but did not alert Taylor to the situation.

Taylor has a similar action pending in Dallas. Executives at Taylor could not be reached.

Bozman

CONTINUED FROM PAGE 71

That could jump-start new applications development by providing up to 40% of the base code, Oracle executives said.

It's a good plan for Oracle's next growth phase, although industry analysts who attended a recent Oracle briefing in San Francisco noted a few pitfalls.

First, large companies will get more handholding and attention from Oracle's direct sales force than medium-size Oracle sites. That is a matter of economics, says Charles Phillips, vice president of research at SoundView Financial/Gartner Group, Inc. in Stamford, Conn. High-end customers often spend millions of dollars for their Oracle databases. "The bottom line is, if you want the handholding, you've got to pay for it," Phillips says.

In boosting the use of third-party distribution for its software, Oracle is following a broader industry trend. "Relying on alternate channels at the low end of the business is the only profitable way to distribute the products," Phillips says, adding that Oracle's free consulting may also go by the wayside. "They don't want to be the application development arm of the customer; they want to pull the technology pieces together."

Second, though one-stop shopping appeals to large users, it may also blur the line between Oracle and systems integrators. "Customers want one firm to come in and fix everything, just like IBM did," explains Gary Dvorchak, an analyst at Hambrecht & Quist, a San Francisco investment firm. Even so, Oracle must be careful not to offend potential partners such as systems integrators, which manage their own global accounts.

Third, the new "service" message could overshadow Oracle's role as a products vendor. Longtime customers, whose support built Oracle's business from $55 million in the mid-1980s to more than $1 billion today, are hoping Oracle will keep timely delivery of products a top priority. Without the new graphical tools and communications software, users may delay plans to build distributed client/server applications with the Oracle 7 relational database.

To avoid these pitfalls, Oracle executives are trying to stay in sync with their user base. Lane, a former Booz Allen & Hamilton consulting executive, recently set up a Client Advisory Board with CIOs from 15 of Oracle's largest user companies. The board includes Carl Dill, McDonald's Corp. information services vice president, and Texaco's information technology department general manager, James Metzger, Lane said.

Can Oracle truly change its stripes from product vendor to product and service provider? Users at thousands of IS shops around the world hope the answer is yes. They should know how well Oracle is balancing its twin duties to deliver products and services by the time they attend the International Oracle Users Group meeting in Orlando, Fla., this fall.

Bozman is Computerworld's senior West Coast editor.

Pyramid builds partnerships with ICL units

By Mark Halper
SAN JOSE, CALIF.

Pyramid Technology Corp. recently expanded its efforts to draw in new strategic partners through deals with units of Fujitsu Ltd., giving businesses such as Fujitsu's ICL PLC in the UK rights to Pyramid's multiprocessor bus technology and calling for ICL to resell Pyramid machines.

Pyramid also signed a marketing partnership with Fujitsu/ICL Australia, under which Fujitsu/ICL will offer Pyramid servers and will provide integration services in Australia.

The agreements are the latest in a series of partnerships for Pyramid, which expects to sign other accords through the efforts of a newly formed strategic alliance unit, according to John Chen, Pyramid's executive vice president.

Last fall, Pyramid entered alliances with Comdisco, Inc. and Integris Co., tapping them for technology for Pyramid's MISserver ES series of servers.

ICL's Peter Stuart, vice president of business development for midrange systems, said London-based ICL will offer Pyramid-brand boxes until the British company — which is 80% owned by Japan's Fujitsu — implements the design sometime in 1994.

The reselling arrangement means ICL, which bases its present Unix line on Sun Microsystems, Inc. Scalable Processor Architecture (SPARC) technology, will add rival Silicon Graphics, Inc.'s Mips technology to its product mix because the Pyramid machines are built around Mips microprocessors. However, the ICL machines incorporating the Pyramid bus will use SPARC chips, Stuart said.

The interim reselling plans present ICL with the chance to immediately provide higher end Unix systems than it can offer with its SPARC line. Pyramid's machines scale up to 24 processors. Stuart said ICL "needs to get up to about eight processors" for certain customers.

Although Pyramid is focusing its marketing efforts on selling its multiprocessor machines into data centers to offload mainframes, Stuart said ICL is focusing its Unix efforts on "a new class of applications in the midrange," such as customer services and sales management.

ICL, which had roughly $4 billion in sales in 1992, garnered its revenue in equal proportions from proprietary mainframe, Unix and PC sales. Meanwhile, the deal with Fujitsu/ICL Australia adds Unix boxes to complement Fujitsu/ICL's mainframe offerings.

Utilities

FutureWare Technologies, Inc. has introduced Signoff Sentry, an Application System/400 software application.

The product was designed for unattended timeout control on a system.

Signoff Sentry offers an operating environment that can be configured, enabling users to put in their own operational values. Separate timeout times or global timeout times can be entered for either individual users or devices.

Signoff Sentry costs $1,099.

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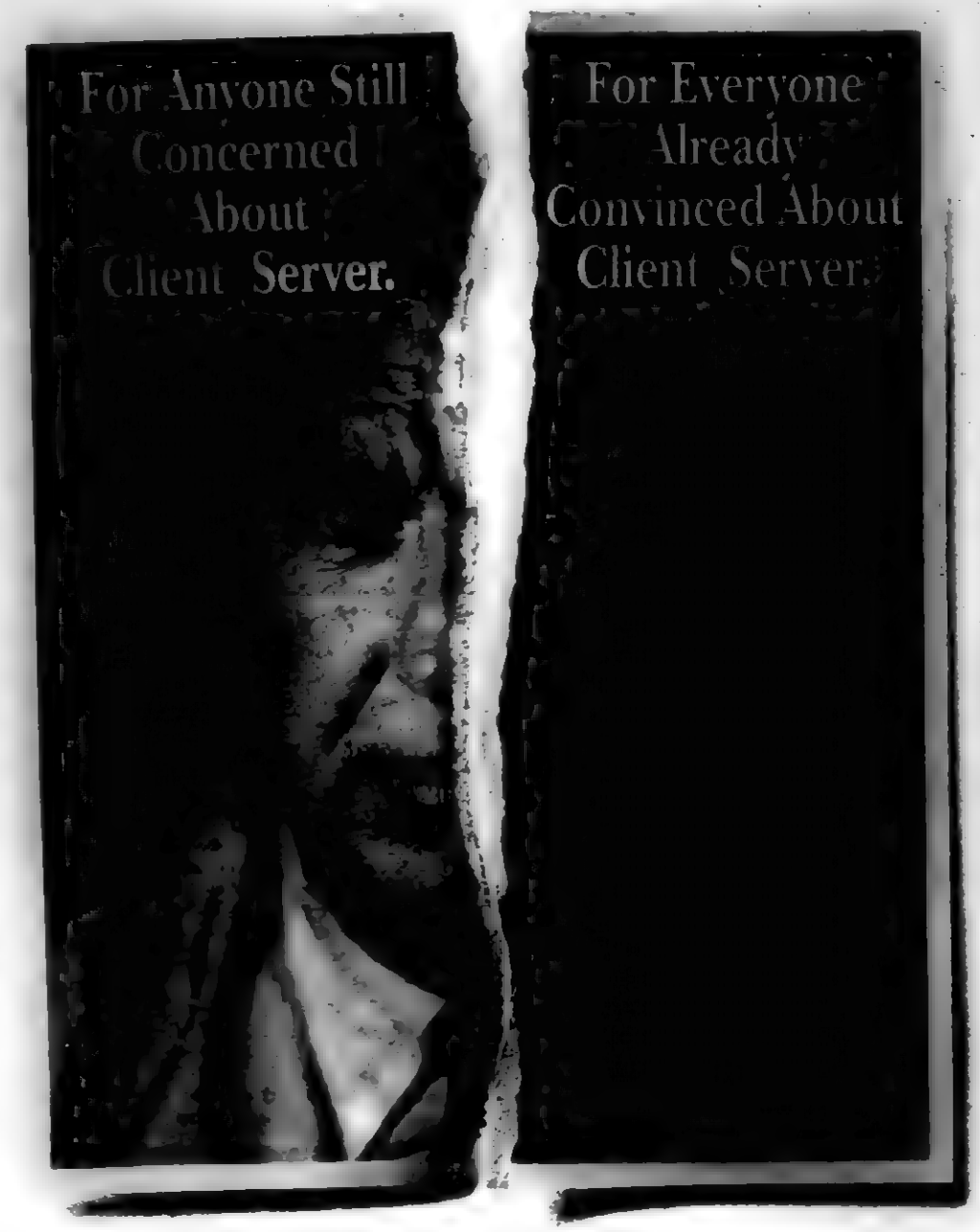

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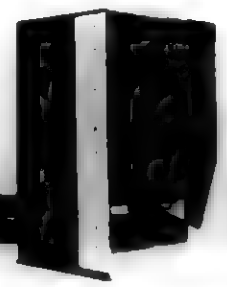

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Object-oriented programming

Borland's PAL shift proves manageable

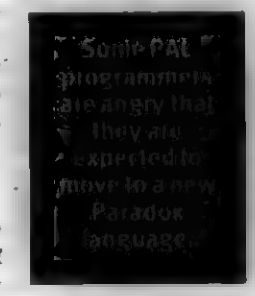
By Jean S. Bozman

■ Early users of Borland International, Inc.'s Paradox for Windows said the transition from the DOS-based Paradox procedural language to Paradox for Windows' ObjectPAL language requires a change in programming style. But the jump to object-oriented programming is a hurdle that can be overcome in a few weeks, some users said.

ObjectPAL is the object-oriented application development language in Paradox for Windows, which was formally introduced last week after a six-month delay [CW, Feb. 1]. It is a superset of the C++ object-oriented language, Borland said. Its "object inspectors," "aliases" and "clip objects" can be deployed through point-and-click methods, rather than by writing lines of sequential code.

But what some early users called the "fun" of object-oriented programming did not kick in until old programming habits were adjusted. "We programmers typically have a mind-set that we're going to write a program from beginning to end," explained Mike Peters, an MIS manager at TRW Corp.'s Space & Electronics Group in Redondo Beach, Calif.

"Now, we have a visual way to program by attaching objects to other objects," said Peters, who has been using a beta-test version of Paradox for Windows for eight months. He said some TRW programmers learned to use it in a week.



Some holdouts

Others may have more difficulty doing so, according to industry analysts.

"There is a hurdle as you shift into a new paradigm," said Donald DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass., who suggested that it could pose a fairly substantial leap for some. "In any programmer base, you'll find some people who just can't move."

However, users can decide to have both kinds of applications. Paradox 4.0 and Paradox for Windows databases can coexist on a network, along with dBase databases, Borland Chief Executive Officer Philippe Kahn said.

Users can "join" data from Paradox 4.0 and dBase databases with data stored in Paradox for Windows. Paradox 4.0 applications can also be viewed in a Paradox for Windows pop-up window, Borland said.

One style of ObjectPAL programming is designing user screens by dragging and dropping icons for colors and shapes from Paradox work palettes. "You can get into the underlying [ObjectPAL] code if you want to, or you can stay on top of it," said Ted Migliautsch, vice president at Migliautsch Marketing, Inc. in Milwaukee, a beta-test site since December. He plans to use Paradox for Windows for icon-based applications that will retrieve data from a 1G-byte Borland InterBase database server.

Users said ObjectPAL provides speedy development, ease of use and pretested objects that can be used over again.

But users also noted a few missing pieces in Paradox for Windows: Borland SQL Link programs to tie applications with remote database servers; a runtime version for use with finished Paradox applications; and support for 32-bit operating systems.

These features will be in future releases, said David Watkins, Borland's vice president of product marketing.

Teaching new tricks

Some longtime PAL programmers are mad that they are expected to move to a new Paradox programming language.

"If it's not upward-compatible, I'm a little bit angry," said one longtime Paradox developer at a West Coast aerospace firm.

"What do they expect you to do? Throw out all your work? I've got 20,000 lines of code in a Paradox PAL application, and there's no way I'm going to jump on the Paradox for Windows bandwagon for my current project."

Utility powers up with client/server

Florida Power uses Andersen Consulting tool for development project

ON SITE

Florida Power
St. Petersburg, Fla.

Challenge: To create a client/server-based customer service application for Windows NT PCs and servers.

Technology: Andersen's Foundation for Cooperative Processing Version 1.2, IBM OS/2 developer workstations.

Goals: Provide sub-second response time for client inquiries, reduce field service staff and data redundancy.

By Kim S. Nash
ST. PETERSBURG, FLA.

Florida Power Corp. is smack dab in the middle of a three-year, $48 million overhaul of a mission-critical customer service application. And you guessed it: The utility is going client/server. That is, if the development staff does not go nuts before then.

Florida Power, not to be confused with Miami-based Florida Power and Light, serves 1.2 million electricity users in the central and northern regions of the state. However, the company said it can serve Floridians better by transforming a 20-year-old, mainframe-based customer service system into a more efficient client/server application geared for Windows NT from Microsoft Corp.

The system, which handles tasks such as customer billing and troubleshooting power failures during Florida's hurricane months, "is really the cornerstone of how we do business," said Mitch Hull, manager of information systems.

The company plans to move 60% or more of its business processing off an IBM mainframe by enabling PC users to hunt down data on the mainframe and collect and work with it on the desktop.

So important is this scheme that Hull's future, to a certain extent, rides on its success. "Where I go from here depends on where this [project] goes," he said.

The linchpin of the undertaking is Andersen Consulting's recently announced Windows version of Foundation for Cooperative Processing (FCP), a computer-aided software engineering (CASE) workbench.

Building blocks

With analysis and design completed, the customer service application is now in the construction phase, with more than 680 windows painted to date by Hull and a 90-member crew. They have also constructed about 50 dialogs, which are macros that automatically provide options and solutions to the most common customer calls received by Florida Power's service desk.

But do not think the going has been glitch-free. At $48 million, the switch is not cheap. Plus, network security is an unresolved issue. FCP provides a certain level of security, as will Windows NT if Microsoft comes through on its promises. "But we don't want our users having to log on to five different nodes or four different systems levels to get their work done," Hull said. "We've still got that floating over our heads."

Andersen claimed that FCP 1.2 is better suited to client/server development than previous versions because of the following enhancements:

- Improved communication between CICS mainframes and OS/2 or Windows clients.
- Stronger security features that developers can include in FCP-built programs.
- Better application programming interfaces for moving between OS/2 and Windows.

These "powerful" additions, which are invoked automatically, shield developers from tricky communications maneuvers required by systems that share data across servers and clients, said Don Dell, managing director of Andersen's Foundation unit.

Also important to Florida Power's plans is the fact that with FCP 1.2, developers do not have to target a specific operating system for the finished application right from the beginning. That means programmers can analyze, design and create prototypes of applications without regard for platform. Then, at construction, they click a box to choose the operating system: Windows, Windows NT or OS/2.

Few full life-cycle CASE tools offer similar flexibility, but some do, such as a recently an-

Utility, page 77

Deere's faraway IS solution

By Mark Halper
MOLINE, Ill.

Deere & Co.'s approach to software development defies logic: To save time, it pushed its mainframe-linked development PCs halfway around the world to India.

For more than two years, the tractor manufacturer has contracted out a portion of its mainframe work to Satyam Computer Services Ltd. in Madras, India.

> Deere's decision to outsource software development to India was literally a case of the difference between night and day.

Using some 50 386 and 486 PCs in Madras, phone lines and a satellite link, Satyam ties into Deere's 3090 mainframes in Moline to convert programs from IMS database formats into DB2 with the aid of KnowledgeWare, Inc.'s Application Development Workbench computer-aided software engineering tools.

And according to Satyam senior technical manager Ramesh Shastri, communications between the mainframe and the Madras PCs are much faster than they are between the mainframe and Deere's Moline-based development PCs, for reasons as simple as the difference between night and day.

Because Madras is 10½ hours ahead of Moline, Satyam's daytime development crew accesses Moline's mainframes in the dead of the night, when the computers are relatively untaxed and far more accessible than they are during business hours in Moline, said Shastri, who is based in Philadelphia.

Of course, Deere had other reasons for tapping Satyam because the time savings alone would probably not have merited its choice to move software development overseas.

As Shastri noted, the switch to Madras saves Deere money chiefly because labor costs are lower in India. He declined to elaborate but said that some four Satyam conversion projects since September 1990 have cost Deere about $800,000.

Satyam's maiden voyage with Deere was actually an on-site conversion in Moline of 33 of some 250 dealer-support programs. Deere wanted first to appraise Satyam's fundamental capabilities before embarking on an unproven satellite-linked transcontinental arrangement, Shastri said.

The four-month completion of the dealer system by a four-person Satyam team led to an ongoing series of off-site assignments. Even Satyam was uncertain about the satellite link.

"At first, we had some doubts about whether it would work," Shastri said.

It did work, and Satyam is currently in the midst of converting a program that tracks goods from Deere's suppliers and has completed conversion of a parts inventory program and a communications management program. It has also converted some of Deere's Cobol into different Cobol, Shastri said.

Satyam is also discussing client/server development possibilities with Deere, he said.

One of the key ingredients in the fast hook into the Moline mainframes is the high-speed data communications links that Satyam buys from India's national telephone carrier, Videsh Sancher Nigam Ltd. (VSNL), and from AT&T stateside. Both companies use 64K-bit links, Shastri said.

The Moline-to-Madras data route also includes a 486 PC in Madras that serves as the mainframe gateway for the 50-node Token Ring network of PCs running OS/2, calling down terminal emulation software from Moline.

A 486 bridge PC in Madras ties data from the gateway into the VSNL network, which is routed by microwave transmission to an earth station in Bombay for an uplink to an Intelsat satellite. From there, information is bounced to an earth station near London and routed via AT&T phone lines to Deere's Moline data center.

Journey from Madras

Developing and delivering code from India to John Deere in Moline, Ill., entails the following:

- 50 development PCs.
- 486 gateway PC.
- 486 bridge PC.
- VSNL phone link to earth station.
- Intelsat satellite.
- London earth station.
- AT&T cable routing to Moline data center.

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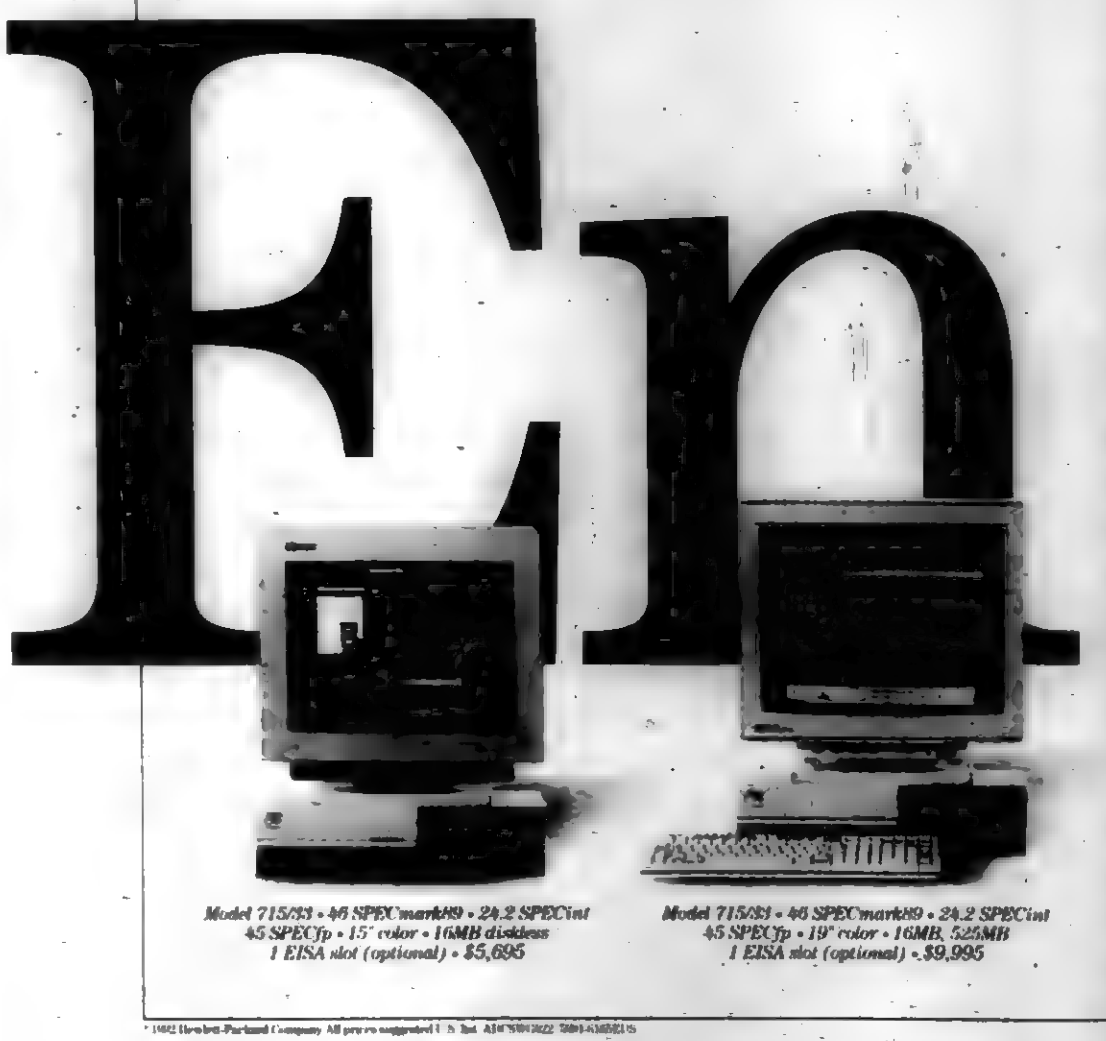

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Utility powers up with client/server

CONTINUED FROM PAGE 75

nounced version of Pacbase from CGI Systems, Inc. in Pearl River, N.Y., and System Architect from Popkin Software and Systems, Inc. in New York.

Florida Power bagged the idea of simply rewriting the existing mainframe-based application because it was too much work with too little payback, according to Hull.

For example, he originally tried to get away with tacking graphical user interfaces (GUI) on existing mainframe programs using Easel Corp.'s GUIBuilder but soon abandoned that plan when he realized that the shells were pretty but dumb. "The Easel windows had no intelligence or processing power," Hull said. Mainframe programmers had to rewrite CICS transactions to coax legacy systems to work with Easel GUIs, he added.

Client/server concerns

- Reprogramming programmers to work in teams and do more planning and analysis up front.
- Figuring out how to maintain decentralized, distributed applications.
- Formulating a plan for distributing software updates to remote servers and clients.
- Rewriting network strategies to send the least amount of data between server and client to keep network traffic down.

Past history

Florida Power's relationship with Andersen goes back to 1991, when the utility's staff did not quite believe Andersen's client/server claims. So it put the vendor's feet to the fire with a rigorous test of FCP that yielded impressive results.

"We did a prototype of a large sales application in only two months with Cobol people who had never used the tool before, never mind programmed in C," Hull explained.

The company liked what it saw in beta tests of FCP 1.2 late last year.

Noting the relative lack of development tools for building distributed applications and the mixed success of IS pioneers, Hull likened client/server to "planning in the dark. But the light will go on eventually." For Florida Power, mid-1994 is the planned dawn, when the customer service program will be fully deployed to more than 1,000 Windows NT users.

Cobol workbench aids downsizing

Migration away from the mainframe was again confirmed last week with the announcement of Intersolv, Inc.'s Intersolv Maintenance Workbench.

The set of maintenance and development tools, which run on OS/2 or local-area networks equipped with Microsoft Corp.'s Windows, allows Cobol applications running under IBM's MVS environments to be transferred to a local Maintenance database, according to company officials.

Tools in the Maintenance Workbench can then be used to search through the source-code database and make modifications. The tools also perform cross-referencing of source code and aid in program documentation.

Priced at $5,000 per seat, the Intersolv Maintenance Workbench supports Cobol 64, 74 and 85; Cobol II; IBM's VSAM, IMS DB and DB2 databases; and teleprocessing monitors such as CICS BMS and IMS MFS, company officials said.

➤ *Intersolv*
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Rockville, Md. 20852
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Utility offers access to SQL databases

Pioneer Software, Inc. announced a tool for connecting programs built with Microsoft Corp.'s Visual Basic to several SQL databases.

Q+E MultiLink/VB, due out next month, was designed to let Visual Basic programs use SQL to access data stored in 20 relational databases. Also, developers can design database tables with specific field names and data types and then link the tables to an application, according to a Pioneer spokesman.

With its database access, the $300 tool could help users create programs to run in client/server mode, the company said. Users do not have to learn interfaces for different databases because Q+E MultiLink/VB was designed to display all data in the same format.

The tool includes a feature that lets users edit, insert or delete database records from within the Visual Basic application.

Seven-year-old Pioneer makes other database access utilities, including Q+E Database Library for OS/2 and Q+E Database Editor for Windows.

➤ *Pioneer Software*
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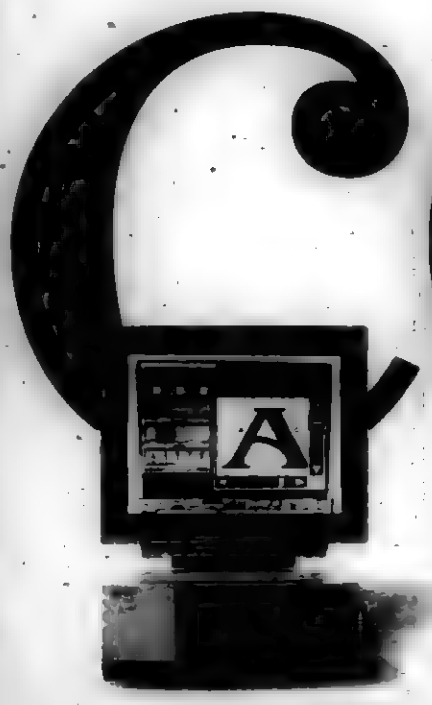

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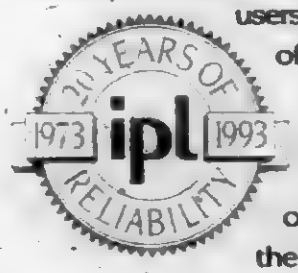

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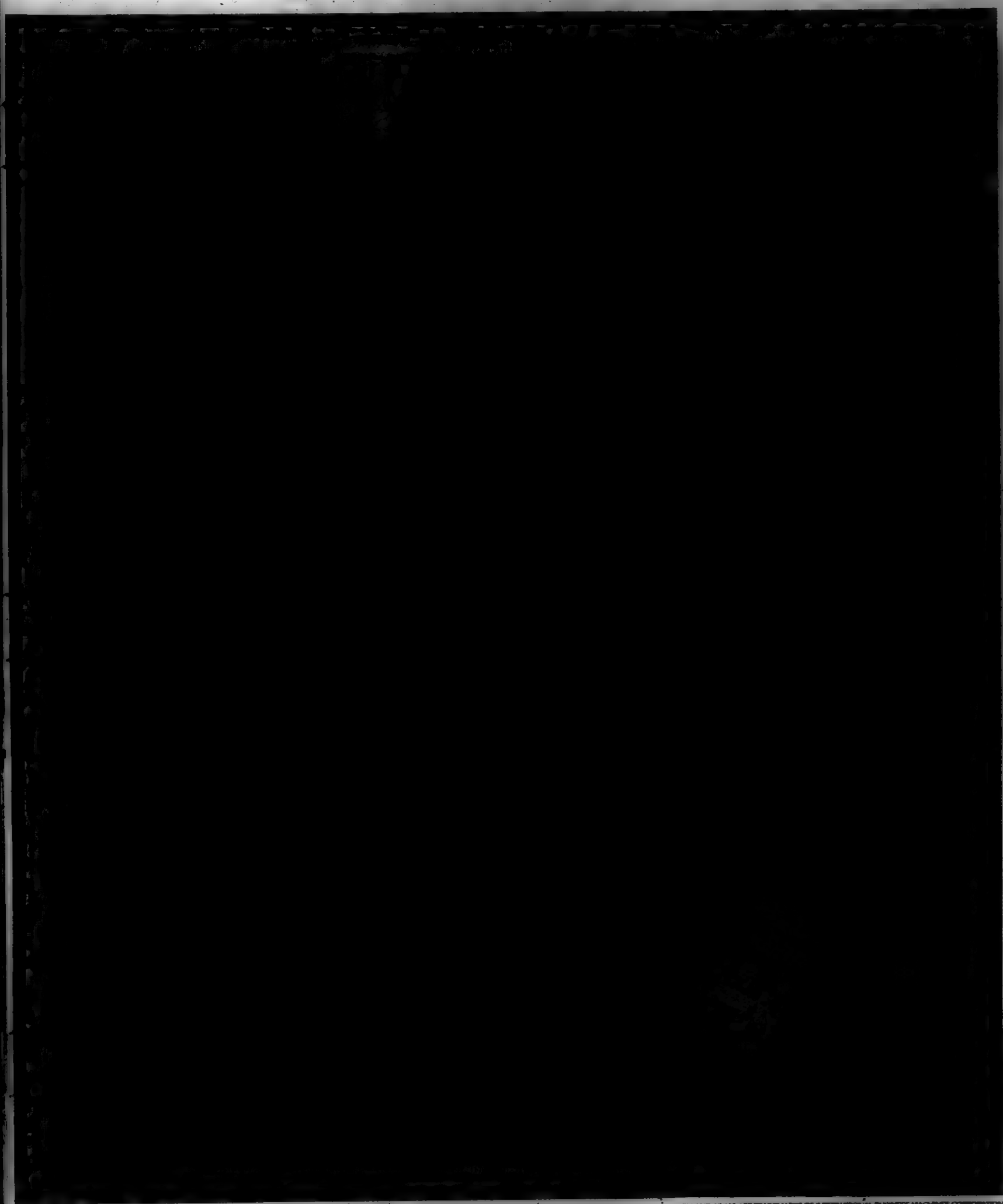

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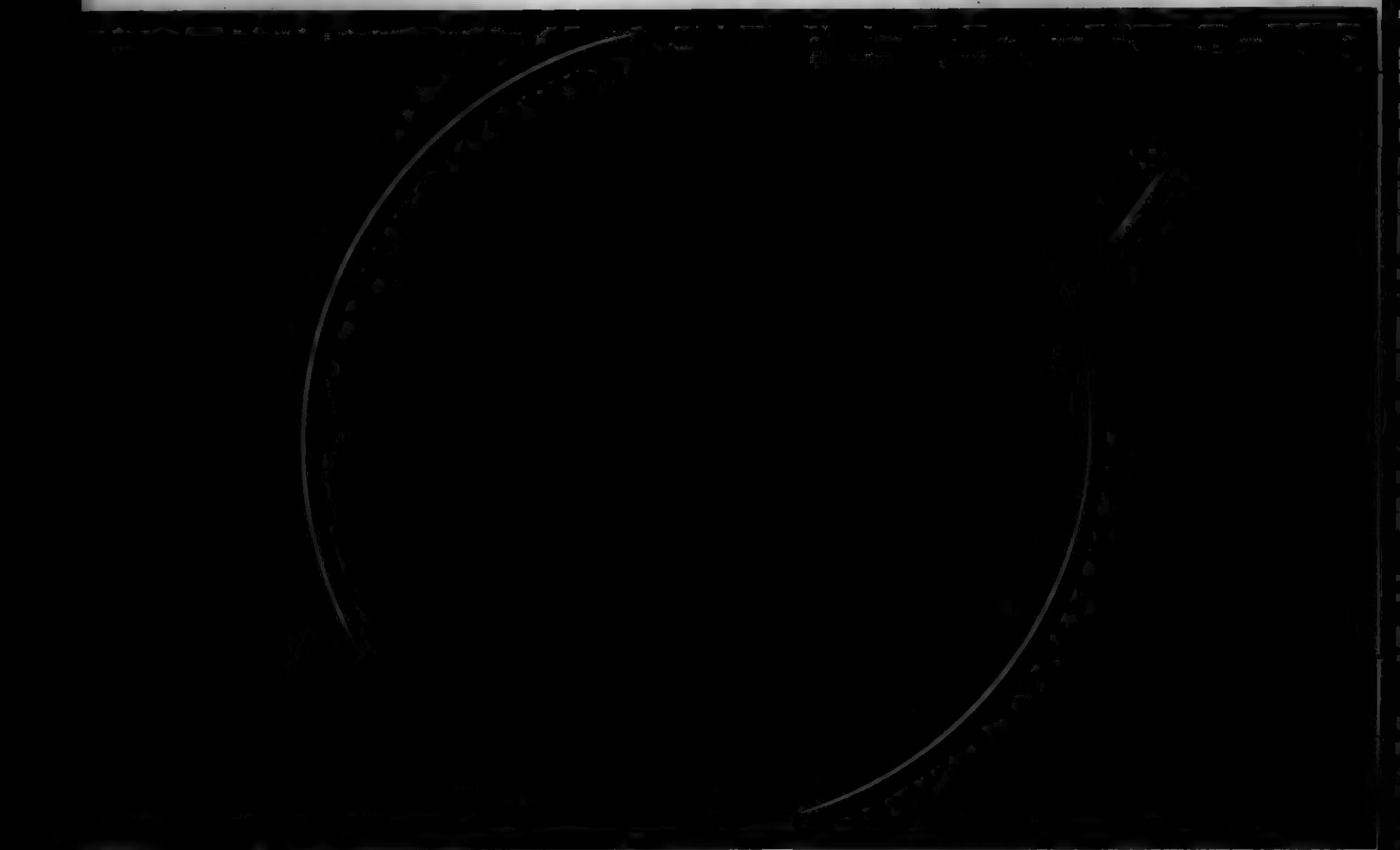

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Changing CHANNELS

No longer can big corporations simply kick back and buy everything from the local sales rep. A look at the many new ways of acquiring technology in the 1990s.

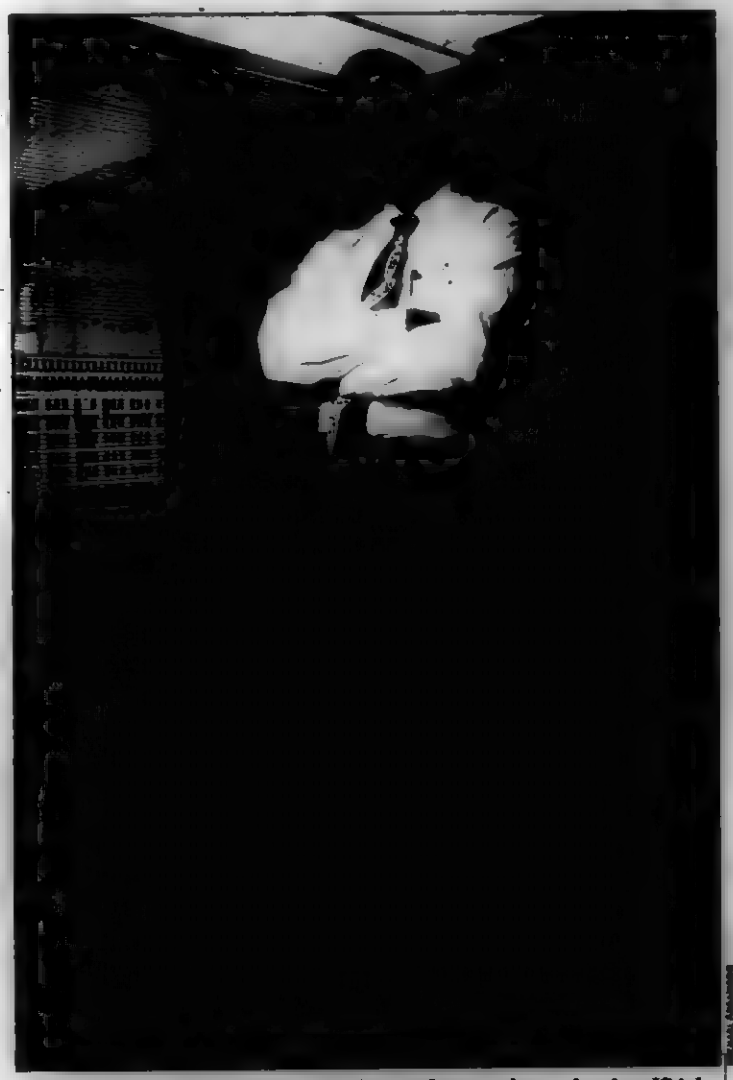
By Carol Hildebrand

For Bill Lodge, the way to stop tardy equipment purchases from crippling mission-critical applications was simple: "Eliminate the middleman."

Tired of delays in PC shipments and service, Lodge, project manager at Turner Corp., a New York-based construction company, dumped Compaq Computer Corp. in favor of direct response rival Dell Computer Corp. Compaq officials hope to win back such customers with a new direct response program to be unveiled by March 15, sources say (see story page 1).

The bottom line, says Lodge, who is responsible for maintaining Turner's client/server-based network covering 35 offices nationwide, was that the company simply could not afford downtime caused by dealer-related delays, so he switched to Dell. The Austin, Texas, firm was so eager to please, Lodge says, that they assigned him his own account representative.

"It's much more cost-effective to deal directly with the company," Lodge concludes.



Aon's Wayne Sandusky: *Solid knowledge of many channels a key IS job*

Decisions, decisions

Lodge's experience illustrates a quiet but potentially profound shift in the way large corporations acquire technology these days — especially the hottest products, including PCs, software, notebooks and local-area networks.

Information systems organizations and business units are increasingly exploring buying hardware, software and communications products from a widening range of channels in numbers that would have been unimaginable five years ago.

"Large companies are clearly expanding their channel use," says Brian Sharples, president of Intelliquest, Inc. in Austin, Texas.

Until recently, buying a truckload of PCs, for example, was relatively easy: You called your dealer and, sooner or later, your order appeared.

But today, because of rapid growth in the number and types of channels, a purchaser can buy the same product from a reseller, computer superstore, consultant or systems integrator or can buy directly from the maker, among several other options. (For a listing of channels, see page 83.)

A recent survey by Intelliquest and International Data Group (IDG), the Boston-based parent of *Computerworld*, shows that some 35% of 947 corporate technology buyers polled were dissatisfied with traditional dealer channels.

The survey found that large companies are more likely to buy desktop devices and application software from two or three sources than from one. For some buyers, the appeal is cost; for others, good deals on specific brands or top-

Changing channels, *page 83*

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Changing channels

CONTINUED FROM PAGE 81

notch service and support are big attractions.

"Software publishers are realizing the way they're going to get my attention is not to have software with one more feature but rather to make life easier for those of us that have to support the infrastructure," says Wayne Sadin, chief technology officer at a large Midwestern bank.

Sadin is moving away from buying software through a value-added reseller (VAR) and is instead negotiating agreements directly with manufacturers. He recently signed a master license agreement with Novell, Inc., for example. "We get the master disk from Novell, and we distribute from there," he says.

At Turner, Lodge has cut a similar deal with Microsoft Corp. that allows him to update his license count quarterly. Indeed, computer vendors trying to plump up margins and cultivate new markets have been eager to explore new ways of selling products.

Earlier this month, for example, Microsoft announced a new series of programs that give corporate buyers 60% to 70% discounts on enterprisewide licenses [CW, Feb. 8]. Borland International, Inc., Lotus Development Corp. and WordPerfect Corp. have similar programs in place or on the way.

PERCENT CHANGE,
BASED ON 947 TOTAL RESPONDENTS

Computer superstores	+25%
Direct response	+21%
Software specialty stores	+12%
Value-added resellers	+11%
Direct sales	+6%
Traditional retail stores	+4%
Office supply/ Warehouse clubs	-2%
Consumer electronics/ Department stores	-4%

PERCENTAGES HAVE BEEN ROUNDED

Source: Intelliquest, Inc./International Data Group

Shift will continue

"The largest corporations are making deals with vendors directly and bypassing the middleman," says David Coursey, editor of "PC Letter," an industry newsletter in San Mateo, Calif.

Analysts say mainframe and minicomputer sales are less dramatically impacted by changing channels than smaller platforms. But even so, IBM and others are drastically rethinking pricing, licensing and other sales issues.

And the shift toward new outlets seems likely to continue: The Intelliquest/IDG survey found that purchases by large, medium and small companies at computer superstores are expected to leap 25% this year. Direct response sales are expected to rise 21% (see chart above).

Observers and IS managers caution, however, that it is difficult to generalize about shifting channels. They note that early predictions about a massive shift away from direct sales, for example, have been overstated. Ultimately, which channel a corporation chooses is based on individual need, analysts say.

But no one argues that more companies are playing the field when it comes to getting the best deal on hardware, software and communications products.

Single-source fear

One inevitable result of the desire to buy technology through different channels is already evident: IS is having to expand and alter — perhaps profoundly — the role it plays in the purchasing process.

Many IS groups, fearing that clinging to the past could be disastrous, are already taking steps to modernize their purchasing process and approaches. Some organizations are educating themselves on new options, such as direct response and superstores in the hardware arena. Others are negotiating direct site licenses with software vendors, an increasingly popular choice.

"Go back 15 years ago and look at IBM," says Eric Singleton, IS director at the Orange County Appraiser's Office in Florida. "You don't want to get lazy and fall into a single point of contact because it's easy. It would be a tragedy if that situation re-evolved."

Like many of his colleagues, Singleton says he believes IS managers must be careful to avoid the trap of convenience. "It's a challenge," he says, "but that challenge is not up to the vendor; it's up to the client."

In the past, Singleton says, his group used to review products that had been preselected by a VAR. But today, he says, "we rely on ourselves to evaluate products a lot more than we used to."

To this end, the county has built a separate network entirely devoted to testing products that the staff is considering purchasing. The list of possible purchases has also been lengthened greatly, Singleton says, from about four products to as many as 50.

Wayne Sandusky, vice president and chief information officer at Aon Specialty Group, a Chicago holding company, agrees that IS can ill afford to stay myopic about a purchasing landscape.

"For an IS manager to do his job effectively, he has to focus a lot more external to the organization — on the vendors and

Changing channels, *page 84*

Channels defined

A guide to choices

Direct sales

A sales force that works directly through the manufacturer. IBM's famed Blue Suits are the best-known example. Direct sales can sometimes be disguised, as the sales rep will usually route orders through one of his traditional dealers.

Traditional dealer

This channel, while not the oldest, is possibly the most mature, having undergone a consolidation in the past couple of years. It's where corporate America first bought its PCs, encompassing dealers such as InaCom Corp., Businessland, Inc. and Computerland Corp. These firms' main goal is straight volume sales, although lately there has been a movement to "add value" through service and support.

Direct response

PCs are taken over the phone, backed by service and support (the quality of which, of course, varies from company to company). The best example is Dell Computer Corp., which has built itself into a first-tier vendor on the strength of its sales.

Value-added resellers

Value-added resellers buy products from a manufacturer or distributor, add third-party hardware and/or software, then resell the entire package as customized, turnkey systems. For example, an add-in fax board and software would turn a PC into a fax system. Real Time Consultants and Laptop Computer Centre, Inc. are representative examples.

The retail channel

This is a sometimes confusing, many-headed beast. Computer superstores, such as CompUSA, concentrate on technology products.

Office supply stores, such as Office Depot, sell computers along with the ink blotters and pencil sharpeners. Wholesale clubs, such as Price Club, offer rock-bottom prices, while mass merchandisers, such as Lechmere Sales, offer convenience along with a good price.

Quick. Think of a company with a much broader line of business UNIX computers than IBM.

Changing channels

CONTINUED FROM PAGE 83

the retailers," he says.

Sandusky concedes that need is complicated by the natural IS tendency toward conservatism and minimizing risk. But he also admits that it's no longer feasible to keep "focusing inward and thinking that IS will take care of itself."

End-user control sticky

Indeed, the proliferation of distribution channels raises a related — and much tougher — question for IS professionals: How do they manage technology acquisition by end-user departments to prevent technological chaos and further erosion of their power?

Unfortunately, according to IS managers, the growth of alternate channels seems to be further snarling this already tangled issue.

"There's always one whiz in a department who can find out that buying a Dell [PC] is cheap and a copy of LANtastic will give him a network," Lodge says.

Many companies, of course, already have corporatewide standards and lists of preferred products. But, Sandusky notes, "standards are only guidelines. We can't sit here at headquarters and tell everybody how to run their business."

PERCENT OF RESPONDENTS USING CHANNEL (BASE: 378)

Traditional retail stores	29%
Direct response	21%
Direct sales	17%
Value-added resellers	14%
Computer superstores	10%
Office supply/ Warehouse clubs	6%
Consumer electronics/ Department stores	4%

PERCENTAGES HAVE BEEN ROUNDED

IS professionals shared most of the same buying patterns as senior managers and departmental influences. The latter group was more likely to use direct sales and less likely to use computer superstores.

Large organizations prefer direct sales and are less likely to use direct response and office supply/warehouse clubs.

1. VALUE
2. SERVICE
3. QUALITY BRANDS

Source: IntelliQuest, Inc. / International Data Group

This dilemma places many IS groups in the difficult role of having neither carrot nor stick to keep users in the corporate technology mainstream.

"The only way we can get [user departments] to adhere to standards is if we give them good support and they believe us," Lodge says. "We don't have a hammer. If they don't believe us, they don't adhere. They don't *have* to do it."

At Aon, Sandusky gets users to work through his department in a similar way: by positioning IS as a service and support department rather than "keeper of the assets." He says, "If you are a control-based organization, they will work around you. But if you do your job in terms of service and support, they will work through you."

But that kind of stance, Sadin notes, makes it even more important to always be on top of new products and outlets. "We keep up with technology and channel methods so when a user has a question, we can answer them immediately," he says.

Eric Daly, vice president of information services at Royal LePage Ltd., a large residential and commercial real estate firm in Toronto, has a little more bite to his bark: His group preloads all PCs purchased with the software the company uses, both custom and shrink-wrapped. Included in the setup is a security package that prevents users from adding their own software, thereby controlling outside purchases as well as the introduction of possible viruses and pirated software.

"They complain," he reports, "but that's the way it is. I'm a bugbear about paying for software. If you're not tough about that, it's amazing how many copies get floated around."

Services Big, big, big

Attractive as better pricing and convenience can be, many corporate buyers say service and support more often drive their choice of channels. And as the price umbrella once hoisted by IBM and Compaq snaps shut, delighted IS managers are finding themselves deluged not only by price bargains but also by good service and support options.

For example, Daly puts hardware out for competitive bid but still keeps an IBM representative on-site to handle service.

At Aon, Sandusky is considering calling in a dealer to help with PC support in his department. "There's no doubt that when it comes to high-end servers and the networking technology involved," he says, "you need specialized expertise to help you — not only from your retailer but from your manufacturer."

In contrast, Greg Chetel, director of systems planning at The Gillette Co. in Boston, finds traditional dealer channels most helpful at the low end, not the high.

Quick. Think of a company with better business UNIX price/ performance than IBM.

How they sell

Dell Computer Corp. The nation's foremost direct response company sells PCs by phone and also offers a catalog of popular software. Pins, the low-end Dimension line is available in the electronic superstore circuit. For its largest accounts, Dell offers a corporate sales force, with service and support options ranging from telephone to 24-hour on-site support.

Compaq Computer Corp. Compaq has moved from its traditional dealer base into almost every distribution channel. Each of the firm's three desktop lines — high-end DeskPro/M, corporate standard DeskPro/i and low-end ProLinea — can be sold through every channel. But products tend to self-segment, company spokesman John Sweney said. So the higher end systems are seen in traditional dealers and VARs, while the ProLineas appear in the retail channels.

IBM. IBM has stratified its desktop offerings as it has given its PC company, IBM PC Co., independence. The unit carries the high-end Personal System/2 line, the mid-level ValuePoint and the PS/1. The latter is also available through channels aimed at small business and home buyers. IBM also has a direct response line. Service and support options differ according to the PC families.

Digital Equipment Corp. DEC offers its boxes through Desktop Direct, its direct response arm, as well as through the dealer channel, VARs and distributors, such as Marisel. At present, DEC does not use mass retail channels.

Microsoft Corp. The software top dog recently unveiled a licensing plan that lets companies license software in several ways, ranging from enterprisewide deals to license packs of 20 to 30 licenses. Discounts grow as the number of licenses increase (see story page 85).

Borland International, Inc. Borland also offers a volume license agreement, which it says offers better pricing as a user's cumulative purchases increase. Users can pay as they go — that is, a user can add licenses to his initial purchase as necessary.

Lotus Development Corp. License packs of less than 50 users or more than 50 users are available. Alternatively, buyers can negotiate the sales volume program, which lets them make software copies as needed in return for quarterly payments to Lotus. — *Carol Hildebrand*

"The value-add we try to get from dealers is more on the pre- and postsales hardware and software support — kind of office automation stuff," Chetel explains. "We're not really looking to them to support the networks or the real business applications." So while he might use a dealer to preconfigure and set up a PC, managing the LAN is another story.

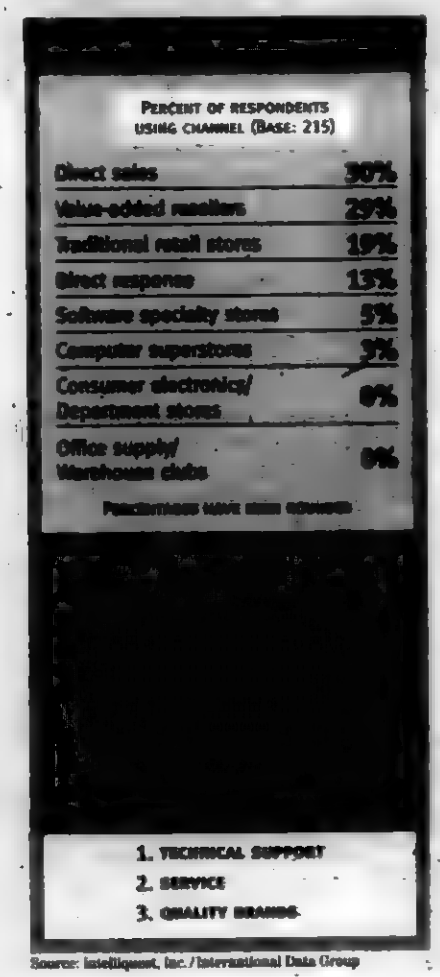
Direct response drawbacks

Chetel's not alone in his preference: Outside service and support remains an important item on corporate checklists, according to a survey by International Data Corp. (IDC) in Framingham, Mass. The firm's 1992 study of 1,600 large corporations found that $40 billion was targeted for those functions.

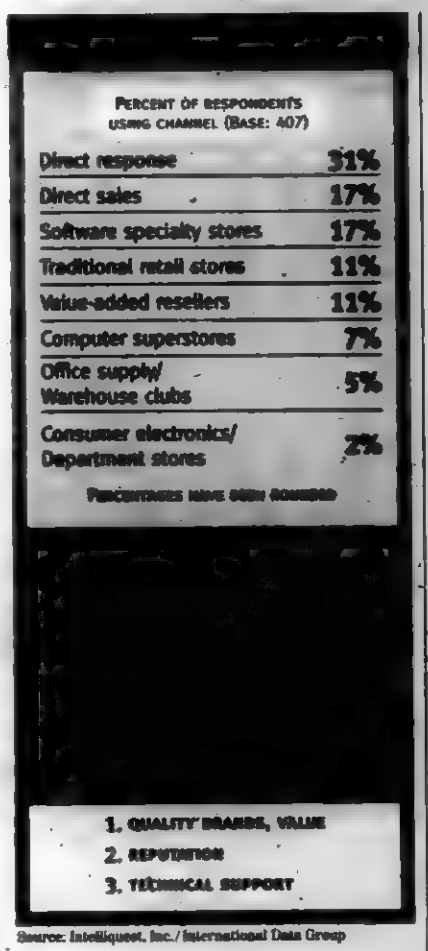
Despite the outpouring of spending, many firms are still opting to take the direct response route and bypass a third party. "If you have good in-house support and the dealers are not providing service or some sort of value-add, what do you need them for?" Coursey asks.

IS managers and analysts say that although on a good day direct response can put you in touch with your manufacturer, there can be drawbacks. Obtaining service and support via telephone is not always successful, they note, and on-site support usually costs extra.

Until recently, Jeff Newman, assistant vice president at Barclays Bank PLC in New York, says he liked direct response. His company uses PCs from Gateway 2000 Ltd. in North Sioux Falls, S.D., but Newman says he has lately been displeased with the vendor's service. "I've suggested to our purchasing department that we not use Gateway until they get their act together," he says.



Source: Intelliquest, Inc./International Data Group



Source: Intelliquest, Inc./International Data Group

What will be the long-term impact of all this channel surfing? Too early to tell, analysts say.

Some predict "channel polarization" will occur, in which resellers will gravitate toward the high and low ends. In this scenario, VARs and dealers will try to add service and support to their mix and in so doing, venture into systems integrators' traditional territory.

Superstores to grow

On the low end, superstores and mass merchandisers are expected to play an increasingly larger role in providing commodity products such as desktop PCs.

"People are not in the middle anymore," notes Natalie Silvesti, research manager for the distribution group at IDC. "If you're a reseller who is trying to be everything to everybody, you're not going to succeed."

Microsoft is beginning to push its vision of large-account resellers, or LARs, as an alternative approach (see story above). Direct sales, long thought to be on its last legs, remains "a very strong channel," Intelliquest's Sharples says. He attributes the surprise finding to the fact that many IS managers may order products from their sales rep, but the products are actually shipped from an authorized company dealer. Thus, the direct sales factor can remain hidden.

That view is supported by the Intelliquest/IDG survey in which 76% of respondents said they were satisfied using direct sales. (In contrast, only 61% were satisfied with direct response.) Direct sales, Sharples concludes, "is by no means dead." •

Joseph Maglitta, senior editor, management, contributed to this story.

Ready for LARs?

SO WHAT'S THE FUTURE of software intermediaries in the new, expanded world of purchasing? If you ask Microsoft, it's LARs.

The initials stand for large-account reseller. Some new Microsoft agreements, including the licensing pacts announced last week, call for a company to have a LAR as a key point of contact.

Under Microsoft's plan, LARs will be responsible for carrying inventory, shipping, tracking and receiving payment for products. They have to be big enough to carry the full Microsoft line, as well as have both a technical support and an outbound sales force. LARs would report shipments quarterly to Microsoft.

The model exists today in Corporate Software, a reseller based in Canton, Mass. Officials there say they see a future in license housekeeping for large corporations.

Jim Tedesco, senior vendor manager at Corporate Software, says that handling administrative and distribution chores, such as matching documentation and disks, represents a good new niche for resellers.

"We can become a secondary publisher," Tedesco says, meaning his company will act as a secondary arm of the software house in question. "The vendors only want to go so far, while the customer still needs what he needs."

But, according to one user, such an agreement would be unnecessary. "We'd have to track this stuff anyway, so it's not that much harder," says Wayne Sadin, chief technology officer at a large Midwestern bank. "We take over some of the distribution chores, but we get more flexibility in return."

At Gillette, Greg Chetel, director of systems planning, says that since his organization is decentralized and he buys from a variety of sources, he's not looking for distributors to manage administrative tasks.

He said he would, however, like some sort of software to manage the distribution and the licensing bookkeeping. "I think the real breakthrough will be when somebody big comes out with a real software management system for the networks," he says.

Several companies, such as Novell, Inc., are working on such a package, but none has yet been able to deliver. Chetel says that although he hopes it's not too far off, he's not holding his breath. — *Carol Hildebrand and Christopher Lindquist*

Quick. Think of a company with a better business UNIX environment than IBM.

Joe Auer

Take back the store

At last, some good financial news: Market forces and pressures have created an unprecedented opportunity for you to get a better deal from computer vendors. Today, suppliers are more vulnerable than ever.

It's time to take back the keys to the company store.

You can negotiate more effectively with your vendor if you are willing to follow some simple advice in the face of complex problems. A little perspective will help get you warmed up.

It's a testimony to some vendor's marketing ability that many customers will swear that the supplier is "a team member" or boast of a marketing rep who represents "their" concerns to vendor management.

The irony worsens when customers feel compelled to turn over large portions of their "secure" internal office space to a vendor, along with critical information about themselves, their executives and the very core of their proprietary operating procedures. This is a bad idea for two simple reasons:

Fact: The vendor wants to maximize its profits and minimize risks and responsibilities. Period.

Fact: Your objective is to minimize your costs and maximize performance. Period.

The most aggressive negotiators are challenging vendor's bargaining positions with tough contracts. But for many, the idea of confronting an important vendor such as IBM seems nerve-wracking or downright scary. Will they still like us? Will they still want us? Will they still want to service us? Will they still be our friend?

The mere thought of questioning IBM seems sacrilegious to many.

Don't be fooled. The sanctity of the customer-vendor relationship was choreographed (astonishingly well) by some of the best marketing organizations in history. Vendors work hard to control a customer by establishing rapport, even a long-term "personal" relationship with buyers.

But guess what? These are not real friends. The marketing representative has incentives to control you, not to negotiate with you. Insist on dealing with a much higher level of authority.

Some other common vendor gambits:

• **"Let us come closer."** The marketing rep says, "Why don't you give us some office space so we can service you better? We can work with you, get to know your people, your plans, your dreams. We'll be a team."

Hooey. Treat them like any other outsider that's trying to maximize profits on your money. Don't believe the interpersonal trust fairy tale while being insulted with contracts and documents that show they don't trust you at all.

Moreover, you should have all vendors (yes, including IBM) sign in every time and sign confidentiality and nondisclosure agreements. Take steps to cut off uncontrolled information flow. Remember: Whoever has the most information about the opponent wins!

• **"The all-Blue blues."** A special strategy encouraged by IBM. For some reason, perfectly sane executives, encouraged by their IBM rep and "friend," will still decide to become an all-IBM shop! In 1993! If this is your case, see the list at right — please!

Customer team members and IS professionals must recognize that every step in the acquisition process involves an opportunity to strengthen or weaken your position with the vendor.

Smart companies give away nothing, especially money. Vendor companies are smart. Are you?

Auer is president of International Computer Negotiations, Inc., a Winter Park, Fla., consultancy.

How to make your best deal

To ward off common vendor ploys, it is helpful to have a methodology that can guide technology acquisitions. Here are some field-tested tips:

•Conduct a risk analysis of your transactions. This can provide management and team members with an insight into hidden problems.
•Help establish and train an interdisciplinary negotiations team. Include lawyers and businesspeople, then determine roles and responsibilities.
•Assess specific negotiation requirements. This includes any products and services to be acquired.
•Identify people, products and services in the marketplace to fulfill those requirements.
•Collect acquisition objectives from each professional discipline in your organization.
•Help prioritize objectives to determine your negotiating position. Prepare a negotiations position paper.
•Conduct a bidder's conference. Input your request for proposal.
•Help evaluate vendor inducements and representations.
•Qualify two or more potential suppliers for "The Zone of Consideration."
•Negotiate with potential suppliers who fall into this zone.
•Assist in selection of vendors whose committed deliverables meet your objectives.
•Work with your attorneys to develop a contract containing the specific results in your objectives.
•Establish procedures to monitor, document, control and administer vendor performance.
•Assist in developing remedies in the event of vendor nonperformance.

—Joe Auer

Calendar

FEB. 28 - MARCH 6

CompTel '93. Washington, D.C., Feb. 28 - March 2 — Contact: Trade Associates, Inc., Rockville, Md. (301) 468-3210.

Share '93. San Francisco, Feb. 28-March 5 — Contact: Share headquarters, Chicago, Ill. (312) 822-0932.

1993 International Computer Storage Program. San Jose, Calif., March 1-3 — Contact: Joe Molina, Technology Forums Ltd., Lino Lakes, Minn. (612) 784-2279.

Key Issues in Managing Information Systems. Evanston, Ill., March 1-3 — Contact: Northwestern University, Evanston, Ill. (708) 467-1398.

Advanced Object-Oriented Analysis and Design: The State of the Art. San Diego, March 1-4 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Sensors Expo West '93. San Jose, Calif., March 2-4 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

Pen-Based Expo. Boston, March 3-4 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0526.

Mobile World. Boston, March 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0526.

MARCH 7 - MARCH 13

Geographic Information Systems (GIS) in Business '93 Conference. Boston, March 7-10 — Contact: GIS World, Fort Collins, Colo. (303) 223-4848.

First Workshop on Object-Oriented Design '93. Snowbird, Utah, March 8-10 — Contact: Object-Oriented Software Engineering, Brookfield, Wis. (414) 789-5253.

XWorld. New York, March 8-11 — Contact: XWorld, New York, N.Y. (212) 274-9135.

Internetworking with NetWare. Boston, March 9-10 — Contact: Center for Advanced Professional Development, Santa Ana, Calif. (714) 261-0240.

Technical Symposium on Computer Science Education. Phoenix, March 10-12 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Dealmaking

Want to learn ways to best your vendors? International Computer Negotiations, Inc. is running a series of seminars to help IS managers cut better deals with suppliers. Seminars range from one to three days and are offered in locations coast to coast.

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Computer Negotiations Workshop. March 3-5, Dallas; April 19-21, San Francisco; May 19-21, Stamford, Conn.

Software Issues, Contracts and Negotiations. March 24, Denver; March 25, Seattle; April 14, Chicago; April 15, Kansas City, Mo.; May 5, St. Louis. Call (407) 740-0700 for more information.

MARCH 14 - MARCH 20

National Automated Clearing House Association Conference (NACHA). San Diego, March 14-17 — Contact: NACHA, Herndon, Va. (703) 742-9190.

UniForum Technology Managers' Conference. San Francisco, March 15-16 — Contact: UniForum 1993, Registration Dept., Carol Stream, Ill. (708) 260-0396.

13th Annual Conference: "Clinical Information Systems." Park City, Utah, March 15-17 — Contact: Judy Murphy, Society for Clinical Data Management Systems, (414) 647-3244.

The Workgroup Computing Conference. Washington, D.C., March 16-19 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3670.

The 1993 Long Island Conference of Artificial Intelligence and Computer Graphics. New York, March 20 — Contact: New York Institute of Technology, Old Westbury, N.Y. (516) 686-7623.

MARCH 21 - MARCH 27

PageMaker Conference. Boston, March 22-23 — Contact: PageMaker Conference and Exhibition, Seattle, Wash. (206) 633-3431.

Apollo Users Group International Conference. Chicago, March 22-24 — Contact: Information Resources, Inc., Chicago, Ill. (312) 726-1221.

The Data Warehouse: Design and Implementation. San Francisco, March 23-24 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The Second International Conference on Software Methods. Orlando, Fla., March 22-24 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

EDI 2000. Boston, March 23-24 — Contact: EDI 2000, Dallas, Texas (214) 475-1838.

Hands-On Unix Internetworking. San Francisco, March 24-26 — Contact: American Research Group, Inc., Cary, N.C. (919) 390-0097.

Association for Corporate Growth 1993 Conference. Orlando, Fla., March 24-27 — Contact: The Association for Corporate Growth, Inc., Glenview, Ill. (708) 699-1331.

Quick. Think of a company that's sold $6 billion more in UNIX systems than IBM.

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- Industry Restructuring - The IDC Perspective
- IT Spending
- Computer Industry Wars

Track 1 - Rightsizing the Enterprise
- Rightsizing in the Data Center: Choices and Opportunities
- Evolving Network Architecture
- The Services Industry Gold Rush
- Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems
- Tomorrow's Trends in the PC Systems Market
- PC Software Confronts the Enterprise
- Messaging and Advanced Group Applications
- Channel Management in the 90s

Track 3 - Winning the Midrange Wars
- Rightsizing for Technical Computing
- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with NT Looms
- Midrange Contradictions

Track 4 - Networking
- Customer Directions: Managing Networking Investments
- Network Applications: Mobile Data Networks Add Another Dimension
- Local Area Networks: The Platform for Distributed Processing
- The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets
- The New Europe: Opportunities and Obstacles for IT
- Latin America's New IT Markets
- Opportunities in the Asia/Pacific Region
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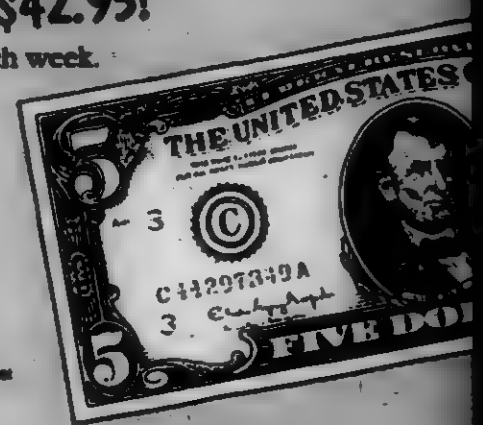

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Performance ANXIETY

When it comes to knowing what technology is doing for the business, some IS shops are in the dark. But you don't have to be.

By Dan Allen

"How good are our systems?" the business manager asks his technology officer, thinking this time he'll get a meaningful answer.

"About as good as those of our industry peers," the technology chief answers.

The manager tries again: "But are we getting what the business really needs?"

"You bet. We've implemented consistent architecture across the company and are planning...."

The manager interrupts with obvious irritation. "What about that customer information database we need to implement our basic marketing strategy? Why is that two years behind schedule?"

No response.

This information systems chief is out of touch. His business manager doesn't want to hear about pretty front ends or future plans. What he's asking for — no, *demanding* — is some accounting of how systems are meeting business needs today.

And this IS chief doesn't deliver.

But that's not to say *you* won't. There's a one-two punch that savvy IS managers use to reveal the naked truth about IS performance: an independent review plus a comprehensive review, a study that concentrates on a particular problem or question and recommends an action plan. Adding these two techniques to your performance review program will give you a complete picture of what IS is doing.

Regular, independent review of IS performance — by internal electronic data processing auditors, outside consultants or internal IS managers with no conflict of interest — acts as a check and balance to any internal performance evaluation in your company (see story page 90). An independent set of eyes has an easier time seeing the contradictions that often riddle bureaucratic thinking.

External review keeps everyone honest. When people are scrutinized, they want to look good and may bend numbers and findings so they come out favorably. Independent review gets around the problem of doctoring results.

Take a typical system uptime report that claims host systems are available 98% of the time. "Lies, lies, all lies!" is how one system operator I talked to referred to his company's uptime reports. After all, uptime can mean different things, depending on how you look at it:

- All systems available per customer request.
- All systems available per IS schedule.
- All systems available per IS schedule, with no last-minute changes to the schedule.
- All systems available with no last-minute schedule changes and all features working.
- Overnight batch jobs run without error reports reaching management.

Such a broad range of definitions leaves a lot of room for interpretation. Interpretation enables the previously mentioned shop to claim 98% uptime even while it experiences, three times a week on average, overnight batch problems requiring programmer intervention and 24-hour job delays.

Performance anxiety, *page 90*

Allen is a quality manager at a large insurance company in Hartford, Conn., where a significant part of his work entails establishing effective work practices between business and technical staffs. He is a former technology consultant at Andersen Consulting and Price Waterhouse.

IS performance

CONTINUED FROM PAGE 89

Independent reviews can help clarify this semantic confusion. That's critical because poor communication is one cause of the poor quality of IS engineering. Imagine a bunch of people who are unable to communicate on the simple concept of "uptime" trying to communicate (i.e., "program") precise and astronomically complex messages to a computer. It's no wonder so many systems are lousy; it's a wonder they work at all.

Independent review can clear up other fuzzy areas, such as completing projects within budget. A team might complete projects within budget 100% of the time but might do so by postponing development of essential functions until after the cutover to production. The team looks great on performance reports, but postponing essential functions decreases productivity in the long run.

The critical and discerning independent review unearths this type of activity. When digging, reviewers have to think in broad terms. Dubious practices often point to complex problems.

For example, postponing essential development may be part of a general lack of coordination between users and programmers. It could be that neither group understands its role. The programming team could feel that "those darn users can't explain what they want" and that the postponed requirements are outside the scope of the original work plan. For their part, the users could believe that IS provides inadequate leadership in requirements definition.

In such messy circumstances, independent reviewers do well to untangle and describe the problem and avoid the trap of pointing fingers at one side or the other.

Nowhere to hide

A regular independent review is key to supplying an organization with fresh perspectives on IS performance. It helps prevent the "go with the flow" thinking that dominates bureaucracies.

While independent reviews get a company thinking, however, they rarely offer operational or management suggestions for improvement. That's why comprehensive reviews are a powerful complement to regular independent reviews. A comprehensive review, handled by a team of insiders and outsiders, isn't finished until there is an improvement plan.

The people who make up the comprehensive review task force can include internal middle and upper business and IS managers, other key members of the organization and consultants. There should be at least one "heavy hitter" on the team, an expert with good judgment and vast technical knowledge. In addition, the team needs an influential sponsor to make sure its suggestions get carried out.

The group's first act is to determine, with the sponsor, a mission for the review. Then it gathers and analyzes information and presents a formal report at the end of its work.

Think of the comprehensive review group as the National Guard of IS performance: It comes together to tackle a specific problem and then disperses, leaving an action plan behind to improve the situation and keep it stable.

The scope of the review can include any or all parts of IS. Typical subjects the team scrutinizes are strategic planning, organizational structure, productivity and application development methods and tools. A good team is marked by its ability to take a subject and consider all the angles: technical, operational, economic and political.

For instance, a comprehensive review team might come into play after a routine performance review discovers that programmer productivity has been dismal. The team's mission is to determine how to make programmers more productive.

While on the surface it appears that the problem has to do with inadequate programming tools, upon further examination, the team learns that coders aren't using disciplined engineering techniques such as structured program design, coding and testing. After discuss-

Take a good look at yourself

How to make IS performance self-examination more thorough

By Dan Allen

The "me" decade of the '70s — in which self-analysis and self-absorption reigned — might be over for the general public. But for information systems departments, self-examination is still going strong. We are more interested than ever in finding out how well we're doing, how well we are performing.

That's because our jobs depend on whether we're giving our businesses what they want in terms of technology and staff performance.

Monitoring IS performance internally begins with a mission statement, which defines what IS does. That definition highlights the areas of utmost importance to the IS staff and the business, areas you will focus performance measurement on.

Unfortunately, good mission statements are about as rare as intellectually stimulating television sitcoms.

A mission statement should be the following:

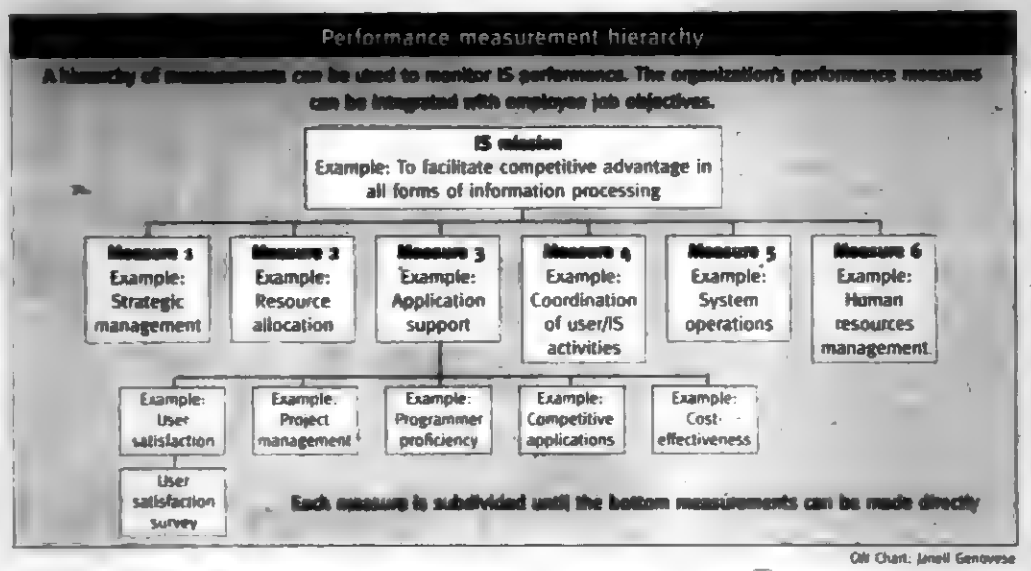
- Specific in scope.
- Consistent with senior management's view.
- Coordinated with the missions of other business units.
- Specific about what standards it expects for performance.
- Well-publicized.

Here's an example of a solid mission statement:

IS operates the organization's centralized computing resources, including certain computers, data storage devices and telecommunications resources. The precise definition of what resources are "centralized" and our specific standards for performance are given in another document entitled "Resources IS Operates," the details of which we continually review with the business. We have sole responsibility for allowing changes to hardware and software configurations so that changes do not cause unexpected results.

We strive for excellence in every aspect, with "excellence" defined by our contribution to our sponsoring organization's success.

A good mission statement will reveal the key areas to concentrate your performance measurement on. If your mission statement says something like: "To facilitate competitive advantage in all forms of information processing," you'll likely want performance information on strategic management, resource allocation and application support.



Oli Chart: Janell Genovese

These more general areas can be broken down into smaller measures until you get to items so specific it takes only one person or a small team to gather that data (see chart above). For example, one way to measure IS performance in the area of "application support" is to gauge user satisfaction. You gather data in this area by putting a staff member in charge of doing a user satisfaction survey.

It is important to have performance standards in place so you know whether performance is above or below where it should be. If your shop uses its CPUs aggressively, the standard for CPU use might be 85%. Anything below that number signifies poor performance.

Linking IS performance standards to people's job objectives is a powerful way to make sure you achieve those standards.

Everyone should be aware of how the shop is doing in terms of meeting its goals, so regular performance reports and reviews from IS managers are key. Such feedback might consist of system availability reports, development backlog status reports and staff evaluations.

Informal and continuous feedback is an effective and inexpensive way to ensure that performance is up to par. For example, if the members of a programming team and a payment processing team are all responsible for fast, accurate posting of payments, the most economical way to report on how the system is performing is in casual conversation, say, at lunch.

Such informal reporting often leads programmers to address problems even before managers know anything is amiss.

You will likely not see immediate improvement right after a performance measurement program is put in place. But just sit tight. Give your formal and informal reports and monitoring time to work. You'll notice a gradual improvement in performance as staff members find out about problem areas and try to fix them.

Measurements spur people to action because they show, in black and white, what they should be achieving.

Typically, you'll see improvement in about two or three reporting cycles. After that grace period, if you notice things aren't getting any better and staff members aren't talking to management about problems, then take action to get performance to where you want it. •

ing the situation with the programmers, the team members uncover skepticism toward structured programming.

What started as a technical problem turns out to be a cultural one. Now that they have discovered the root of the problem, the team can recommend a plan of attack for poor productivity.

In fact, more often than not "soft" factors such as culture or politics cause bad performance. For instance, in order to please potential customers, one vendor's sales group opted for some political maneuvering. It forced so many technically awkward customizations into the vendor's manufacturing resource planning system that the product was full of bugs. The system, in use at several of the largest companies in the U.S., was so unstable that certain of the user companies' top executives complained directly to the vendor's chief executive officer.

Currently, more than 100 programmers and analysts, each of whom has been pulled from his regular job for the multiyear project, are working on fixing the system.

Two-headed coin

A good comprehensive review can work wonders, but one done poorly can have serious repercussions. Bad reviews — ones that don't delve deep enough into the problem or that don't explore all the angles — can riddle the company with half-baked policies that can waste a lot of time and cost a lot of money.

One company I know of conducted a two-month comprehensive review to find the right organizational structure for its IS group. The review group included a team of consultants brought on board at a cost of more than $100,000. The company also added a part-time administrative assistant to the payroll to support the effort.

Unfortunately, the recommendation for the new structure was not based on deep review but on what the IS chief wanted, which amounted to a 1970s organizational structure. In the setup, the data center, application development, planning and IS security departments reported directly to the IS executive.

Under this reporting structure, IS' customer responsibility was vague. For example, when a production problem occurred, customers did not know whether to call the data center or applications development group.

The comprehensive review dodged all of the sensitive political issues involved in rethinking the IS setup and took the safe course.

Can't be afraid of change

Nothing is sacred when the comprehensive review staff is trying to rectify a problem. But one of the most common mistakes comprehensive review teams make is thinking the mission statement is sacrosanct. No matter how much IS management might kick and scream, the comprehensive review team can't be shy about suggesting a change in the mission statement if it is important to the business' well-being.

For example, if a company is having problems with development delays, the comprehensive review might determine that poor developer/user communication is a contributing cause. The team suspects that the miscommunication is because of the fact that the IS department is a centralized shop in what is essentially a decentralized business. Transferring IS staff into business units will likely help requirements gathering and clear up misunderstanding.

However, if the IS department's official mission states that it alone is responsible for IS personnel, it may balk at losing that control.

An ineffective comprehensive review team will accept IS' mission and dodge the politically charged issue of changing it. Thus hamstrung, the review team can only come up with weak recommendations with little benefit.

This company will be stuck in a vicious cycle, pursuing a flawed mission and pointing to the comprehensive review team's finding for justification. Most disturbing is that their development delays won't get any better.

Benchmarking

Some companies like to round out their core performance review program (internal review, independent review and comprehensive review) by including industry benchmark analysis.

This approach consists of collecting data about a group of organizations and seeing where your's ranks in comparison.

Keep in mind, however, that collecting data for benchmark analysis is a tremendous effort. Normalizing the data (i.e., adjusting it so that one compares "apples to apples") can be almost impossible.

Consulting firm Gartner Group, Inc. in Stamford, Conn., advises using industry benchmarking only for analyzing trend trends.

One part of the comprehensive review process IS shops usually underestimate is the development of a written report summarizing the team's finding and offering recommendations. The report crystalizes the team's analysis.

Reports contain the following:

- The review's mission (why it was commissioned) and who participated.
- Findings and conclusions, presented so they support the recommended plan of action. Financial analyses fit into this section.
- A plan for improvement, including concrete deliverables, due dates and responsibilities.

The report is not an addendum to the "real work" of information gathering and analysis. In fact, a lot of the thinking about the review occurs during the process of putting together a report. If the report has been done right, it becomes a working document — a reference manual — during implementation of the team's suggestions.

Timing is everything

It's easy to underestimate the time required to perform a comprehensive review because it is a discovery exercise; the team is basically treading into the unknown. A well-managed review takes between five and 40 person-months to be effective. For best results, you should put people on the review full time.

The report typically consumes about one-third to one-half of the time of the review, depending on the number of people suggesting changes and the controversy surrounding the results.

Even if an organization is entirely satisfied with its performance, all functions, including management, can benefit from a comprehensive review every three years. Such frequent review is driven by the current pace of innovation in IS methods and products.

The test of a good shop

Deciding what to measure is like deciding which features to put in a system; every organization has different needs.

However, certain areas — strategic management, resource allocation, application support, system operations and human resources management — tend to be high on many measurement hit lists. Getting answers to the following questions can help you go from mediocre to stellar IS and systems performance:

Resource allocation
Effective resource allocation amounts to design work: IS managers analyze requirements and trade-offs and come up with a solution. Just as other design work suffers from poorly structured approaches, undisciplined resource allocation yields mediocre systems and service.

To evaluate resource allocation, management can look first to see how well IS has defined a structured approach, then to see how well the approach is implemented.

- Is senior management involved in resource allocation?
- Is there centralized backlog management?
- Are there written agreements in place between IS and user departments, specifying their respective responsibilities?
- Are there guidelines for evaluating the merit of projects? Do these guidelines describe how IS projects should tie to corporate strategy?

Application software development and maintenance
Software support depends on a chain of functions: methodology, personnel management, tools, training and leadership. At a higher level, it depends on methodical resource allocation. Weakness in any of these areas diminishes overall effectiveness.

- Are users satisfied?
- Do we have a standard, rigorous and robust development/maintenance methodology? Do we use it?
- Are projects completed within schedule and budget?
- Are programmers using disciplined techniques?
- Are our computer-aided software engineering (CASE) tools integrated with our methodology?
- Is our training attuned to our methodology and CASE?

System operations
Good operations are characterized by stable environments, decreasing human involvement and a consolidated data center. Any measurement of system operations performance should indicate where a shop is in relation to these characteristics.

- How frequent are production problems?
- Are there mechanisms for software change management?
- Do operations comply with production schedules?
- Are operations cost-effective?
- Do we use automated system operations software?
- How much or how well do we utilize resources?
- Is network management in place?

Human resources management
Keeping tabs on staff helps with recruiting, training, career planning and turnover.

- Are job responsibilities integrated with the group's explicit objectives?
- Do we track productivity and performance evaluation?
- How well does our recruiting program work?
- What is the turnover level?
- Do we enable career progression/planning?
- Do we have a training strategy?

Strategic management

- Is IS integrated into corporate strategy from a customer's perspective?
- How clear is the communication between IS and the organization?
- Is IS cost-effective? Is it productive?
- Is IS structure and staffing appropriate? Why?
- How well and how quickly does the company assimilate new technology?
- Does IS performance meet standards?

Who says programmers are dull?

By Don Burleson

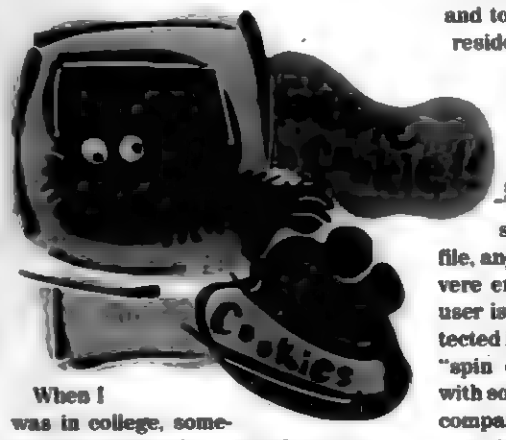
OUTSIDERS OFTEN stereotype computer professionals, particularly programmers, as cerebral whiz kids devoid of personality, who find solace and companionship in their terminals. (Remember the line in *Doonesbury* about the sunscreen that was "preferred by nine out of 10 programmers?") Only those who work with computer people on a daily basis can really appreciate their uniquely warped humor.

When I first entered computing, I assumed this was a profession dominated by humorless people wearing white socks and speaking in acronyms. As I got to know the people better, however, I came to realize that this is a field with a passion for practical jokes, especially ones that involve planting unexpected bugs in programs.

Cat and mouse

The latest one making the rounds is a bug that can be attached to Windows. Whenever a Windows pop-up or check box appears, this software instructs the icon to run away from your mouse. This extremely annoying joke makes even the most trivial Windows chore an exciting video experience.

But software practical jokes have been around for years. Remember the "Cookie Monster?" This legendary practical joke resided on a disk in an IBM 360 shop and would randomly interrupt a user's session, demanding "Gimme cookie." Startled users quickly discovered that when they typed "cookie," the routine replied "thank you" and disappeared, relocating itself to another disk to avoid detection.



When I was in college, someone placed a read-protected program in the community program pool (a shared library where programmers could share files), naming it "Runme." Of course, curious programming students ran this program, only to discover that it would send indecent electronic-mail messages to professors with their sign-on names attached.

In my first job, I was introduced to a malicious mainframer who hated end users so much that he hung a sign on his wall that declared, "User is a four-letter word." This guy developed a routine he called "Flashfinger" that displayed Mickey Mouse making an obscene gesture for 50 milliseconds, which is about the minimum threshold of human perception. At this high speed, users were never really sure if they saw something, and to my knowledge, Flashfinger still resides inside the original application.

Better call a plumber

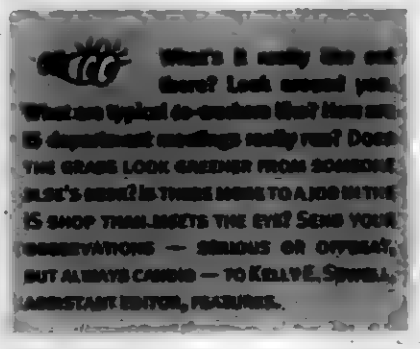
Almost all PC users are aware of "Drain," a practical joke that's been circulating for years. Programming pranksters add it to the AUTOEXEC.BAT file, and when the PC is turned on, a "severe error" message is displayed. The user is notified that water has been detected in his disk drive. The routine then "spin dries" the disk drive, complete with sound effects. Countless calls to the company help desk for water problems are attributed to this "humor," and I have witnessed programmers collapse from laughter after this prank.

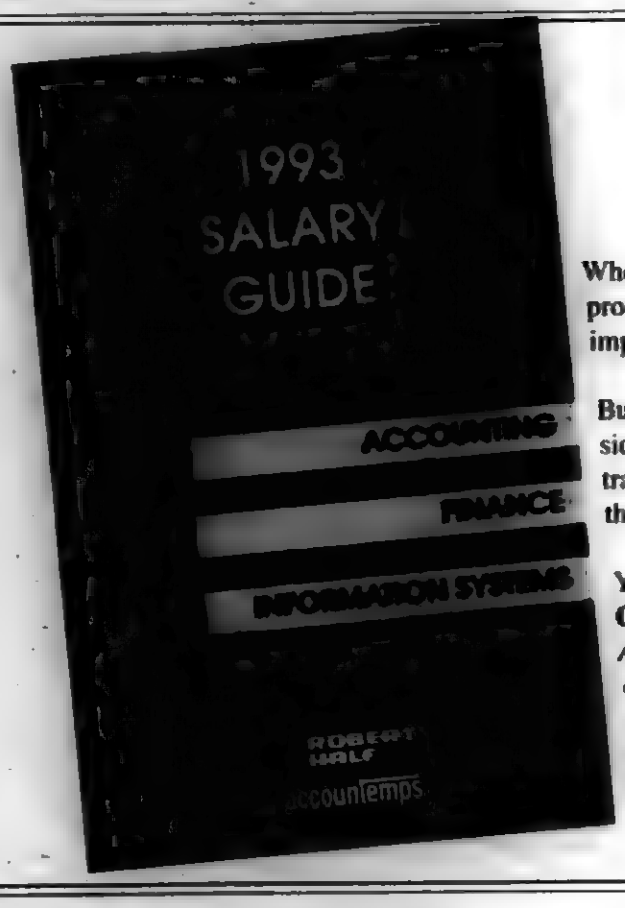
Another popular gag capitalizes on the predisposition of end users to enter profane words into the relocate field of lookup lists. For instance, we've been known, when coding relocatable lookup screens, to add an exit that displays the message, "User Jones, I am not accustomed to such filthy language," whenever an obscene character string is entered into the relocate field. This exit is only invoked when the user enters a naughty word, and you would be amazed how many end users discover this feature.

As computers become more powerful, I'm sure the humor will become even more sophisticated and that we will find many more creative practical jokes.

Personally, I still enjoy the old-fashioned kind. Have you ever taken the microchips out of those musical greeting cards? Try dropping one into the bowels of a friend's (or enemy's) display screen. It will provide them with days of round-the-clock music, playing the same song, ad nauseam. It's amazing how long the batteries last on those things.

Burleson is a database administrator at Thomson Professional Publishing Information Technology in Webster, N.Y.





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Job close-up

Unix administrators: Masters of technology and communication

By Leslie Goff

Unix systems administration is one of those information systems areas where technical skills take a backseat to analytical and communication skills.

That's not to say you don't need technical experience. Unix is a highly technical operating system. The nature of the beast — a multiuser, multitasking operating system — means it is nearly always implemented in a distributed environment.

Unix systems administrators who oversee and maintain these Unix networks need a combination of systems know-how, hands-on connectivity experience and a can-do attitude.

Because Unix networks are starting to grow in the corporate arena — particularly in financial services — Unix systems administration is a well-kept secret. People with this job often get into the limelight of high-level IS planning, and because their function is so critical to maintaining user networks, the pay is handsome.

The job's appeal is the dual challenge of mastering the technology and communicating its capabilities to users. Rob Kolstad, who has worked in a variety of Unix-related positions, including systems administration, and is currently program manager at Berkeley Software Design in Falls Church, Va., likens the job to "being the emergency room doctor — you have to keep the systems running, and you have to be prepared for anything."

"Cook and bottle washer is a good term for the job," says Wayne Schmidt, a systems administrator at Salomon Brothers, Inc. in New York. He says he has to make sure systems integration — getting different applications to work together — goes smoothly. "It's one of the most adaptable IS jobs you could have," he says.

Schmidt oversees a network of Sun Microsystems, Inc. Scalable Processor Architecture workstations at Salomon Brothers. He is responsible for distributing data, providing resources to users, installing and updating software, system security, troubleshooting and maintenance.

Schmidt, who was a fine arts major in college, was introduced to IS when he accepted a student job in the computer sciences department to help him with his artwork, which involved computer graphics.

"I felt that I didn't have enough computer skills," he says. "I was restricted to being a user, and I had the biases that anyone who hasn't worked with technology would have — some fear of what the technology can do. So I took the job at the computer science department and picked [Unix] up as best as I could."

He received his first formal training in Unix at his first job as a Unix systems administrator at Salomon Brothers, where he took a course in Solaris. His analytical skills were key to landing his position.

"You need to be familiar on some level with programming, hardware, aspects of how the network is constructed, and if you can't solve a particular problem, you have to gather enough information for someone whose specialty is to solve the problem."

This could be considered a drawback because "when everything works right, no one knows you exist," notes Sam Aruti, a systems administrator at EJV Partners LP, a financial services company in New York.

What's next?

Although Aruti says experience as a Unix systems administrator could serve as a primer for assuming more responsibility for architectural and infrastructure issues, there is no built-in career path from the post.

"The way the job is structured, there's really no place to go up from here," notes Joe Kaplenk, a senior software programmer responsible for Unix systems administration at Loyola University in Chicago. "It's harder to advance than from other positions, such as a systems analyst, probably because Unix tends to be specialized and it demands a lot of attention."

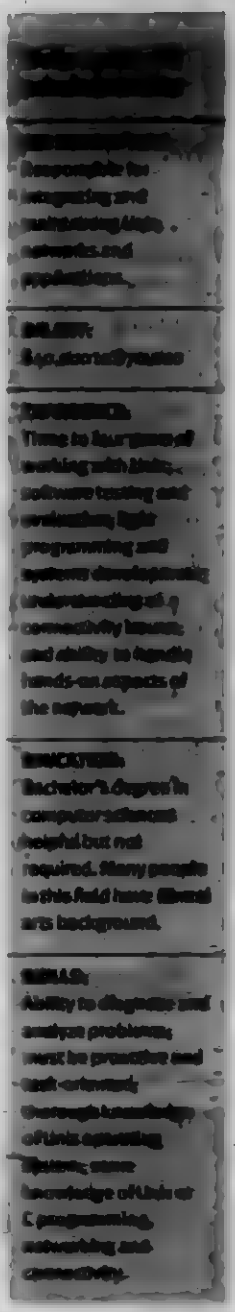
Specialist in demand

The trade-off is that the job pays well, especially in the financial services industry, where Unix specialists are in high demand. Entry-level salaries hover around $40,000 and can go up to as much as $70,000. Salaries can go even higher for those in high-leverage positions where they are responsible for making sure a computer is never down, and they wear a beeper all the time, Kolstad says. Salaries on the West Coast average about $65,000 a year.

To earn their keep, Unix systems administrators end up putting in 8- to 12-hour days as well as all-nighters and weekends when there is a major problem.

Satisfaction on the job comes with overcoming challenges, such as when Kolstad successfully wired several different buildings together under a concrete parking lot. "It isn't really a career goal that you wake up and aspire to," Kolstad says. It's still a vague post with no real curricula in colleges, no real specific job description and an unclear career path. "But if you find that you have a knack for solving problems, and management recognizes that you're the person keeping people productive," then it just might be for you.

Goff is a New York-based free-lance writer.



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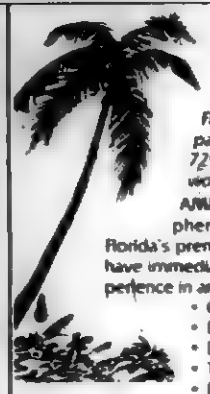

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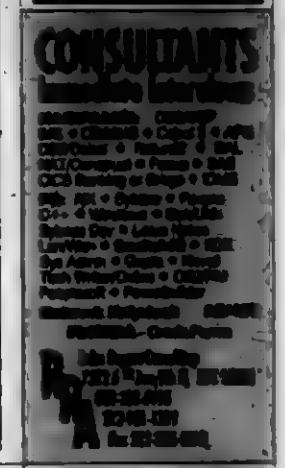

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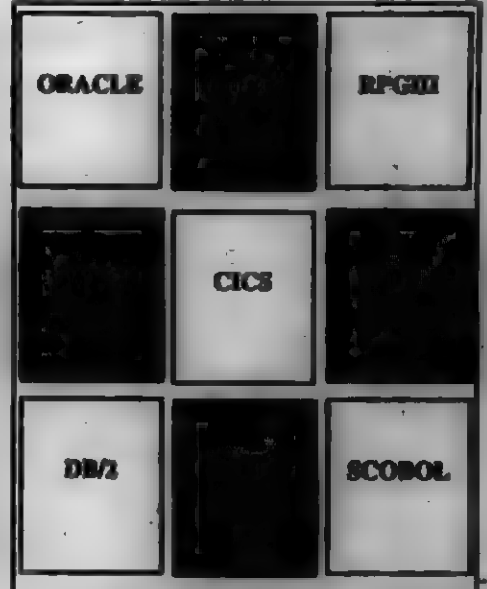

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for major global bank, Chicago: work w/traders, modelers, & others thru full SW design product lifecycle for trading & risk mgmt of derivative instruments; assist in sales & marketing support with risk mgmt advisors; $59,700/year, 40 hrs/wk; must have 3 yrs in encapsulating/deploying in range of derivatives techniques using UNIX-based applications & distributed network programming thru full prod lifecycle, as well as 1 year interacting with traders developing/designing/enhancing pricing & risk mgmt applications for currency, equities & int rate derivatives using advanced Objective C applications w/Interface Builder on NeXT computer in assisting & support of production, sales & marketing efforts. Send resume to H.R., 101 N. Wacker, Suite CM 403, Chicago, IL 60606. Equal Oppty Employer.

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Pompano Beach, FL 33064
Contact: Shirley Senecal
305/785-7308
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CPI - CHARLOTTE
129 W. Trade St., Ste 410
Charlotte, NC 28202
Contact: Ed Bales
704/334-8303
704/334-8032 Fax

CPI - RTP
2000 Regency Parkway, Ste 149
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Contact: Neil Aldridge
919/467-9088
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Contact: Sarah Draper
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Develop client/server applications in Human Resources, Financial, or Logistics. Must have 2 years of Windows programming experience. Powerbuilder, Sybase and/or relational database experience a plus.

D & B Software offers a challenging work environment, recognition for achievement, and a comprehensive salary and benefits package. Send resume in confidence to Dun & Bradstreet Software, 3445 Peachtree Road, NE, Atlanta, GA 30326, Attn: 11th Floor Recruiting. Principals please.

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Application package consists of: a letter of application with three (3) current (written within 1 year) letters of recommendation (one of which must be written by a present or former employer/supervisor), a resume, and copies of all college transcripts.

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St. Louis, MO 63141
(800) 359-6060,
FAX: (314) 275-7999

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Support all aspects of the PowerBuilder selling cycle, from pre-sales and demonstrations through account management. We require in-depth knowledge of PCs, relational databases and PC networks, along with outstanding communication skills and the ability to travel extensively. Current locations: Atlanta, Chicago, Dallas, Houston, San Francisco and Toronto. *Contact: Elizabeth Tapper.*

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In this position, you will train technical users of our PowerBuilder product and assist in course development. Extensive travel is required, along with a thorough background in teaching high-level courses to a technical audience. Knowledge of applications development, PCs, Windows and databases is essential. Current locations: Boston, Chicago, Dallas, Long Beach, New York and Washington, DC. *Contact: Elizabeth Tapper.*

CONSULTANTS
Powersoft is seeking experts to join our consulting organization. This group is dedicated to ensuring our clients' success in developing PowerBuilder applications. Extensive experience with client/server design and development, GUI design, SQL databases and PowerBuilder is required. Applicants should enjoy working with a wide variety of clients, possess excellent communication skills and a willingness to travel extensively. Current locations: Boston, Chicago, Houston, Long Beach and San Francisco. *Contact: Traci Warner.*

Positions are also available for TECHNICAL SUPPORT ENGINEERS in our Boston office.

In addition to an outstanding work environment, Powersoft provides excellent compensation and comprehensive employee benefits. Please send resumes to the appropriate individual at: Human Resources, Powersoft Corporation, 70 Blanchard Road, Burlington, MA 01803; fax (617) 221-4698. No phone calls please; all resumes will receive a written response within two weeks. Agencies please respond in writing after March 7. Powersoft is an equal opportunity employer actively seeking to diversify its workforce.

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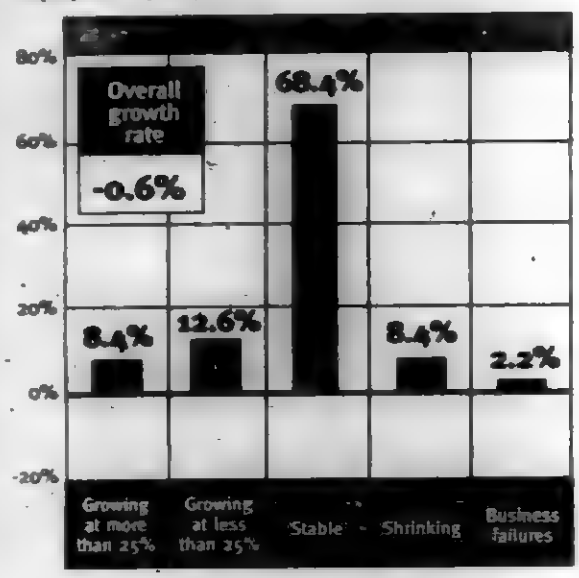
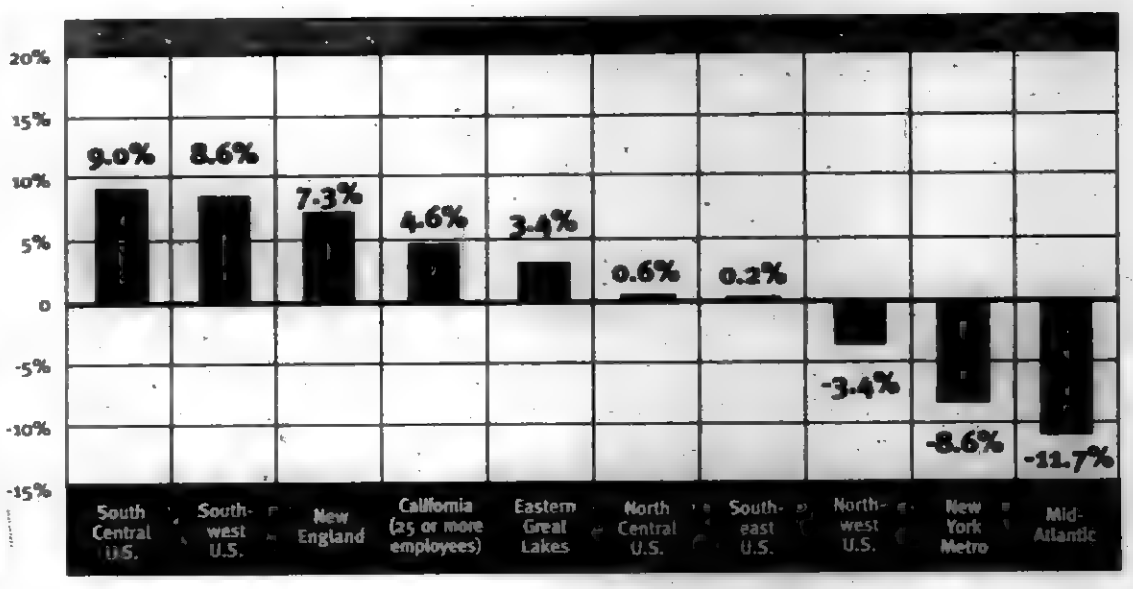
Although 21% of the 190 chemical companies surveyed by CorpTech increased their employment by 25%, collectively the firms decreased their combined total employment by 88 jobs





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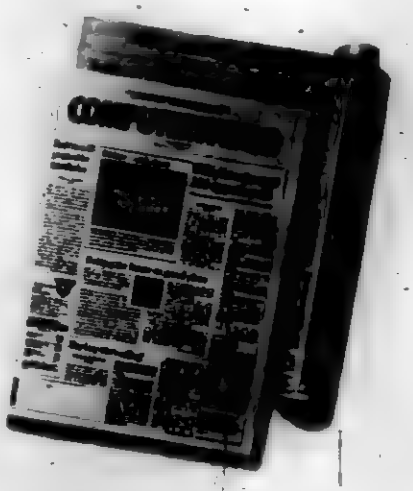

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Don't bomb out when preparing RFPs

playing it SAFE

By Murray Stein

Most information systems managers have completed a request for proposal (RFP) and know what can go wrong with the process — from poorly defined needs to broken vendor promises. As simple as some of the pitfalls are, many buyers fall prey, risking entire projects. Indeed, the simpler the problem is, the easier it is to overlook.

Following are the more common mistakes made while purchasing equipment through an open RFP process.

Failing to give vendors enough time to respond to an RFP. This is one of the most common mistakes that people make. If you don't give the vendor ample time, you run the risk of getting poorly developed responses or no responses at all.

Give vendors a minimum of one month from the time the RFP is published to submit their proposed solutions.

Not requiring standardized responses. If you don't require vendors to respond to an RFP in a consistent manner, you're asking for trouble. Without a standardized format, it becomes difficult to evaluate all solutions equally, and the best one may be overlooked.

One suggested approach is to ask the vendor to follow the outline you provide, breaking out solutions in terms of specific requirements: hardware, software and communications.

Assigning too much or not enough staff to the RFP team. Adequate staffing of the RFP team is critical. The size of the team can be based on the cost of the project. For instance, if a company plans to spend $2 million on a new system, it should involve at least four to five staff members and never less than two. For smaller projects with less complicated integration issues, it is a good rule of thumb to have at least one individual representing each of the the key areas. Of course, multiple team members mean multiple opinions.

Limiting the number of vendors who respond to the RFP. Of course, no one wants to rifle through 27 RFPs, but if you limit the number of vendors who respond, you run the risk of reducing your options. To get the best selection of vendors, request proposals from the major players supplying solutions in your market as well as vendors from related market segments.

Being adamant about one specific solution. There is more than one solution to every problem based on individual vendors, their product offerings and strategy. Therefore, it's important, particularly in complex RFPs, to keep your options open.

The best approach for getting what you need is to be as detailed as possible in the RFP. State what the company does and its current computing environment. Indicate future goals and needs. Finally, define the specific problem at hand. Also, include any solutions you have in mind so that vendors can understand your perspective.

Not thoroughly explaining your computing environment and future needs. If you're vague on details, the vendors are forced to make assumptions about how their solutions will fit into the current infrastructure.

Structure the RFP to show the requirements of the solution with consideration given to connectivity to other systems, performance, file/data storage needs, user access and so on. These requirements should be spelled out in the beginning of the RFP document.

Poorly defining system requirements. If solutions are to be limited in any way, such as physical characteristics (power, temperature, size), availability time frame, upgrade path or support for standards, make certain these requirements are stated in the RFP. If not, you could run the risk of a system that's too heavy for a particular floor, or will overheat in an un-air-conditioned room, or is too loud.

Neglecting to demand a total solution. Vendors will solve only the problem you indicate, and few provide all the necessary pieces themselves. Vendors often recommend solutions that lack critical elements that they do not provide. In requiring a total solution, the vendor commits to a systems integrator role that ensures the proposed solution works as planned.

Making vendors stick to deadlines

Vendors will almost always include their latest product in a solution, and more often than not, it's a product that has just been announced. If you need the product by a certain date, ask for a performance bond. This is a written statement, either in the RFP or purchase contract, that locks a vendor into a delivery date. If the vendor doesn't make the cutoff, it pays a fee for as long as the product delivery is outstanding.

Stein is a technology consultant at PointSource Communications in Prescott, Ariz.

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RFP No. 2363, due Wed. 3/10/93 at 3:30 p.m. for a high speed line printer for MISSISSIPPI STATE UNIVERSITY-COMPUTING CENTER. No Charge.

RFP No. 2364, due Wed. 3/10/93 at 3:30 p.m. for a UNIX-based network server and associated software for connection to an existing network for MISSISSIPPI STATE UNIVERSITY-SOCIAL SCIENCE RESEARCH CENTER. No Charge.

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Specs for RFPs with a charge may be obtained by submitting a written request with correct payment. No phone requests. Valid payments are corporate checks on a MS bank, certified check or POSTAL money order made out to -Central Data Processing Authority. No cash or out-of-state-checks. For RFPs with no charge call Kelli Brown @ 601-359-2604. If you would like to pick up RFPs at CDPA, do so between 1:00-3:00 p.m. only. CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

REQUEST FOR QUALIFICATIONS

Lewis County is requesting statements of qualifications for consulting services associated with the replacement of its current automated financial system (hardware and software).

All bids and proposals are to be submitted to the Lewis County Auditor no later than 11:00 AM, Pacific Standard Time on Thursday, February 18, 1993.

Copies of the Request for Qualifications are available from:

Ms. Debbie Lennes
Administrative Secretary
Department of Public Services
Second Floor,
Public Services Building
360 North Market Boulevard
PO Box 809
Chehalis, Washington 98532
(206) 748-9160 Ext. 370

All inquiries relative to the Request for Qualifications are to be addressed to:

Mr. Charles McCann, Director
Lewis County
Central Services Department
Post Office Box 868
Chehalis, Washington 98532
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The Board of County Commissioners reserves the right to reject any and all statements of qualifications, to negotiate with one or more of the responders, and to waive informalities. The Board of Lewis County Commissioners will have the final authority to name the successful responder and enter into a contract for consulting services associated with the replacement of the county's existing automated financial system.

NOTICE OF INTENDED SALE

Please take notice that Allent Computer Systems Corporation (the "Debtor"), debtor-in-possession in Case No. 92-15302-JNF, U.S. Bankruptcy Court for the District of Massachusetts, intends to sell to Hughes Training, Inc. free and clear of liens and encumbrances, for the purchase price of $112,200 (the "Purchase Price"), computer equipment consisting of an Allent Model 400 System Building Block, and I/O Module, and related components (the "Equipment").

Objections or counteroffers must be filed with the U.S. Bankruptcy Court, 10 Causeway Street, Boston, MA 02222-1074, no later than 4:00 p.m. on February 22, 1993. Any objections or counteroffers must be in writing, and any counteroffers must exceed the Purchase Price by $3,000. A copy of any objections or counteroffers must also be served upon counsel to the Debtor, Frank W. Getman Jr., Esq., Hale and Dorr, 60 State Street, Boston, MA 02109, (617) 526-6000.

If any timely objections or counteroffers are filed, a hearing will be held at 9:30 a.m. on February 24, 1993 before the U.S. Bankruptcy Court at the above address. In the absence of any timely objections or counteroffers, no hearing shall be held, and the sale of the Equipment shall proceed.

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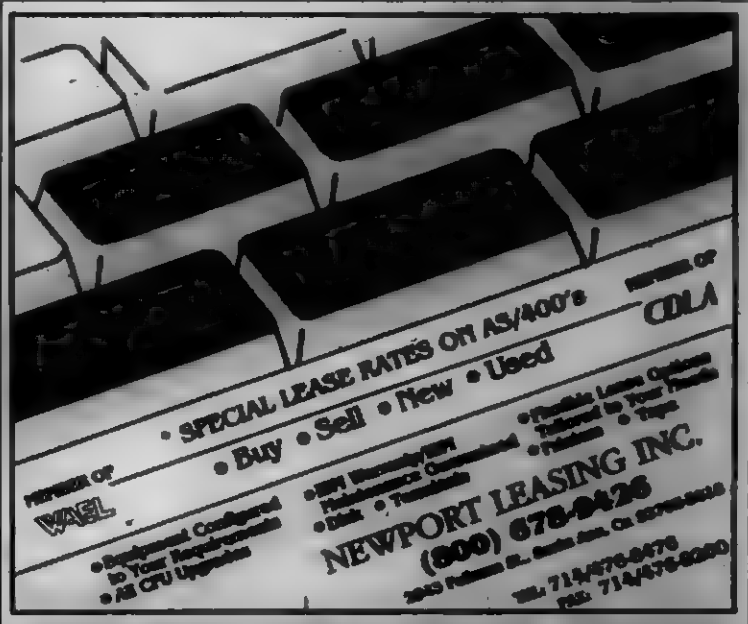

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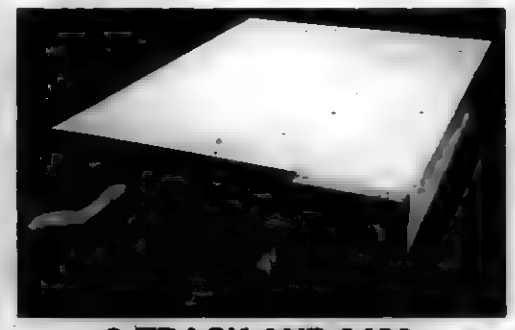

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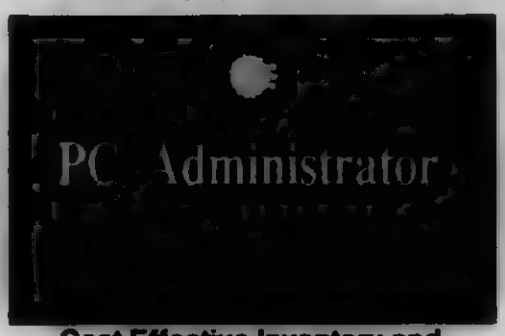

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Gainers

Percent

[illegible]	21.4	Netrix Corp.	-41.4
Compression Labs Inc.	17.4	System Software Assoc. (I)	-36.0
Bus Systems	16.7	Proteon Inc.	-21.8
Sierra Semiconductor	12.0	Datapoint Corp.	-20.2
Commodore Int'l (L)	11.4	Telebit Corp.	-20.0
State of the Art	11.1	Sapiens USA Inc.	-13.4
Spinnaker Software	10.6	Informix Corp.	-13.4
Software Toolworks Inc.	10.0	Exide Corp.	-13.0

Dollar

Intel Corp.	4.75	Netrix Corp.	-8.63
Group I Software	3.00	Cabletron Systems	-7.13
Compression Labs Inc.	3.38	Sybase Inc. (N)	-6.50
Novell Corp.	2.00	Synoptics Communications	-6.13
American Power Conversion	2.00	DSC Communications (N)	-5.25
Autodesk Inc.	2.00	Informix Corp.	-5.13
Motorola Inc.	1.75	Microsoft Corp.	-4.38
Advanced Micro Devices	1.75	Progress Software Corp.	-4.25

IPOs: Shades of 1983?

The torrent of high-tech initial public offerings (IPO) continued on the heels of wildly successful offerings by Powersoft Corp. (PWRS) and Gupta Corp. (GPTA). Superserver makers Parallan Computer, Inc. and TriCord Systems, Inc. announced IPO plans last week (see story page 109).

The frantic pace is reminiscent of the IPO boom in 1982-1984, which left some investors picking up the pieces as share prices fell in the ensuing PC market shakeout. In addition to success stories Lotus Development Corp. (LOTS) and Compaq Computer Corp. (CMPQ), that time frame featured public offerings such as Computer Memories, Inc., Trilogy, Hogan Systems, Inc., Kaypro Corp. and Fortune Systems, according to New York-based Securities Data Co.

However, market analysts said the current crop of new issues stands on safer ground, at least for the time being.

One reason is that even the jumping stocks of Powersoft (up from 20 to more than 38 on its first trading day) and Gupta (up from 18 to more than 30) have healthier price-to-growth ratios than the boom stocks of the early '80s, said Kathy Smith, an analyst at Renaissance Capital in Greenwich, Conn.

Parallan and TriCord's hardware systems sell into the same client/server market that Powersoft's PowerBuilder tool set does. The slow growth of the superserver market to date is not necessarily an indicator that the hardware companies will be less successful, Smith said. Renaissance Capital expects the superserver market to develop steadily as users gradually make the transition from legacy systems.

Meanwhile, the relative dearth of client/server stocks means that companies such as Parallan and Powersoft have more elbow room in an emerging market, said Michele Preston, first vice president at Merrill Lynch & Co.

"1984 was the emergence of the PC market, and there were way too many PC companies, spreadsheet and word processor companies," Preston said. The growth of these markets did not match up to wild growth projections. "All these companies said they just wanted their 10% of the market, and if you added up all the 10s, it came to several hundred percent," she said.

Wise investors will nonetheless look closely before leaping, analysts concurred. Charlotte Walker, chief executive at Martin & Simpson Co., said the quality of recent offerings has remained high. However, she also noted, "The market is pretty discerning right now. There are some high-growth markets, IPOs with solid fundamentals and a good dose of skepticism, which I like to see." — *Derek Slater*

Exch	52-Week High	52-Week Low		Feb. 12 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	14.63	9.63	3 COM Corp.	31.13	0.63	2.0
NYS	74.75	56.25	American Info Techs Corp.	74.13	1.38	1.9
NYS	55.25	36.63	AT&T	54.25	0.63	1.2
OTC	3.63	0.75	Aztel Communication Corp.	2.31	0.06	2.8
OTC	34.50	10.25	Banyan Systems Inc.	19.25	0.25	1.3
NYS	54.38	40.25	Bell Atlantic Corp. (N)	54.13	1.38	2.6
NYS	55.50	43.38	Bellsouth Corp.	53.88	1.25	2.4
NYS	6.75	3.63	Bolt, Beranek & Newman	5.00	0.25	5.3
OTC	28.50	10.00	Brooktrout Technology (N)	16.00	-1.25	-7.2
NYS	92.25	42.13	Cabletron Systems	80.00	-7.13	-8.2
OTC	34.50	17.75	Chipcom Corp. (N)	29.50	-2.50	-7.8
OTC	84.75	33.00	Cisco Systems Inc.	87.25	-1.13	-1.3
OTC	27.75	5.50	Compression Labs Inc.	16.00	2.38	17.4
OTC	3.66	0.88	Data Switch Corp. (N)	3.25	-0.19	-5.5
NYS	23.50	13.75	Digital Comm. Assoc.	18.75	-0.63	-3.2
OTC	14.75	7.50	Digital Systems Int'l Inc.	8.75	-0.50	-5.4
OTC	28.50	4.00	DSC Communications (N)	24.50	-1.50	-5.8
OTC	10.88	4.75	Fibronics Int'l Inc.	8.75	-0.25	-2.8
OTC	37.50	10.50	Fibex Corp.	12.00	-1.50	-11.1
OTC	4.38	1.50	Gandalf Technologies Inc.	3.75	-0.09	-2.4
OTC	7.25	0.69	Gateway Communications	1.63	0.06	4.0
NYS	10.50	2.88	General Datacomm Inds.	8.63	-0.75	-8.0
ASE	4.88	2.00	GVC Video	2.94	-0.13	-4.1
NYS	36.25	28.88	GTE Corp.	36.25	1.00	2.8
NYS	76.13	59.25	ITT Corp. (N)	75.88	0.88	1.2
OTC	63.38	29.50	MCI Communications Corp.	39.75	-0.25	-0.6
OTC	14.25	2.25	Microcom Inc.	4.88	0.00	0.0
OTC	24.25	12.00	Netrix Corp.	12.13	-8.63	-41.6
OTC	19.00	9.63	Network Computing Devices (N)	17.50	0.75	4.1
NYS	17.13	8.13	Network Equipment Tech.	10.13	-0.13	-1.2
OTC	24.25	8.00	Network General	14.50	-0.38	-2.5
OTC	16.25	8.50	Network Systems Corp.	12.13	0.75	6.6
OTC	50.00	11.88	Newbridge Networks Corp. (N)	45.75	-2.13	-4.4
NYS	48.75	30.50	Northern Telecom Ltd.	42.63	0.13	0.3
OTC	33.50	27.50	Novell Inc.	28.00	-2.25	-7.4
NYS	88.50	69.13	Nynex Corp.	87.00	2.00	2.4
OTC	37.50	16.50	Octel Communications Corp.	27.00	0.75	2.7
OTC	9.00	3.38	Penril Data Comm Networks	5.25	0.00	0.0
OTC	53.00	10.75	Picturetel Corp.	23.38	3.25	32.2
OTC	17.50	7.00	Proteon Inc.	7.63	-2.13	-21.8
NYS	30.38	10.16	Scientific Atlanta Inc.	22.13	-2.00	-8.3
NYS	75.63	56.63	Southwestern Bell Corp.	70.75	0.88	1.3
NYS	78.25	70.75	Sprint Corp. (N)	78.00	0.00	0.0
OTC	27.00	8.38	Standard Microsystems Corp.	20.75	-0.75	-3.5
OTC	18.50	6.88	Stratacom Inc.	16.25	-0.88	-5.1
OTC	95.50	18.75	Synoptics Communications	80.63	-6.13	-7.1
OTC	7.13	4.38	Telebit Corp.	4.50	-1.13	-20.0
OTC	9.38	2.13	Telematics Int'l Inc.	9.25	0.25	2.8
OTC	25.50	13.38	US Robotics	20.50	0.00	0.0
NYS	41.00	32.88	US West Inc. (N)	41.00	1.25	3.1
OTC	46.00	12.00	Wellfleet Communications	37.75	-3.75	-9.0
OTC	22.00	7.00	Xircom	8.00	0.25	3.2
PCS AND WORKSTATIONS						
OTC	8.25	3.13	Advanced Logic Research	3.88	0.09	2.4
OTC	70.00	41.50	Apple Computer Inc.	56.50	-3.13	-5.4
OTC	24.25	11.25	AST Research Inc.	18.50	1.00	5.7
NYS	16.25	5.25	Commodore Int'l (L)	6.13	0.63	11.6
NYS	58.50	22.25	Compaq Computer Corp.	47.63	-0.38	-0.8
OTC	49.88	15.00	Dell Computer Corp.	35.63	3.63	9.2
NYS	38.63	26.63	Harris Corp.	35.75	0.50	1.4
NYS	85.00	50.25	Hewlett Packard Co.	69.00	0.75	1.1
NYS	13.00	14.13	Silicon Graphics	29.50	1.00	-3.3
OTC	41.00	22.50	Sun Microsystems Inc.	35.13	0.00	0.0
NYS	32.13	22.25	Tandy Corp.	28.00	0.00	0.0
NYS	11.13	5.00	Zenith Electronics	7.38	0.00	0.0
OTC	22.75	2.75	Zeos International Ltd.	5.25	0.63	10.6
LARGE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	8.00	0.00	0.0
NYS	15.63	6.75	Convex Computer	5.75	0.00	0.0
OTC	9.50	1.88	Cray Computer	3.88	0.00	0.0
NYS	65.00	19.00	Cray Research Inc.	25.63	0.63	2.5
NYS	13.00	7.13	Data General Corp.	11.63	0.75	2.1
NYS	65.50	30.38	Digital Equipment Corp.	43.63	1.13	2.6
NYS	100.38	65.88	IBM	50.88	-1.13	-2.2
OTC	19.50	5.50	Kendall Square Research	16.50	1.50	9.3
NYS	110.00	83.00	Matsushita Electronics	88.75	0.75	0.8
OTC	17.00	6.00	Pyramid Technology	14.50	0.00	0.0
OTC	24.00	11.13	Sequent Computer Sys.	21.25	-0.13	-0.6
OTC	36.38	6.38	Sequoia Systems Inc.	2.75	-0.19	-6.4
NYS	54.25	29.50	Stratus Computer Inc.	33.25	-1.13	-3.3
NYS	16.88	9.88	Tandem Computers Inc.	13.38	-0.25	-1.8
NYS	13.25	7.75	Unisys Corp.	11.88	-0.25	-2.1
ASE	7.50	0.06	Wang Labs Inc. (B)	0.94	-0.13	-11.8
SOFTWARE						
OTC	59.25	25.25	Adobe Systems Inc.	41.00	0.50	1.2
OTC	33.00	10.25	Aldus Corp.	17.25	0.50	3.0
OTC	19.75	7.00	American Software Inc.	8.00	-0.13	-1.5
OTC	25.63	9.75	Ase Computer Systems	24.88	0.88	3.6
OTC	56.50	23.25	Autodesk Inc.	45.75	2.00	4.6
OTC	37.75	3.50	Bachman Info Systems	4.25	0.13	3.0
OTC	43.00	34.00	BGS Systems Inc.	39.75	0.50	1.2
OTC	84.13	37.25	BMC Software Inc.	68.25	-5.25	-7.1
OTC	28.25	16.75	Boole & Babbage	26.00	-0.25	-1.0
OTC	76.50	17.50	Borland Int'l Inc.	18.50	1.75	8.6
OTC	9.50	3.00	CE Software	3.50	0.38	9.7
ASE	35.00	9.38	Cheyenne Software Inc.	27.88	0.25	0.9
OTC	19.50	8.25	CompSort	16.25	1.63	9.1
OTC	11.88	5.63	Cognos Inc.	7.38	0.00	0.0
NYS	27.38	10.88	Computer Associates	24.63	0.38	1.5
NYS	12.38	4.00	Computervision Corp.	5.13	-0.13	-2.4
OTC	18.50	6.75	Cosmare Inc.	9.00	-0.25	-2.7
OTC	17.25	10.75	Cotel Corp.	11.88	0.00	0.0
OTC	46.00	6.00	Easel Corp.	11.75	1.75	13.0
OTC	25.50	11.75	Frame Technology	14.75	1.00	7.3
OTC	25.00	12.50	Group I Software	17.00	3.00	21.4
OTC	8.75	3.50	Hogan Systems Inc. (N)	8.38	-0.13	-1.5
OTC	25.75	13.75	IMRS	14.13	1.13	7.4
OTC	35.50	18.50	Information Resources	30.50	3.25	4.3
OTC	47.00	12.13	Informix Corp.	33.25	5.13	13.4
OTC	21.25	11.00	Intergraph Corp.	12.00	0.13	1.1

Exch	52-Week High	52-Week Low		Feb. 12 3 PM	Wk Net Change	Wk Pct Change
OTC	15.00	7.75	Interleaf Inc.	10.25	-0.75	-6.8
OTC	18.25	8.00	Intersolv Inc. (L)	9.25	0.00	0.0
OTC	20.00	9.50	Knowledgeware Inc.	11.00	-0.50	-4.3
OTC	54.75	28.75	Legent Corp. (N)	49.75	-2.50	-4.8
OTC	38.75	14.75	Lotus Development	24.25	-0.25	-1.0
OTC	23.25	13.00	McAfee Associates	13.50	-0.50	-3.6
OTC	8.38	1.88	Mecca Software	7.00	0.38	5.7
OTC	22.25	5.25	Mentor Graphics	9.75	-0.38	-3.7
OTC	46.00	27.25	Micro Focus	43.25	0.63	1.5
OTC	30.50	6.50	Microdoc Inc.	9.25	-1.25	-11.9
OTC	95.00	65.50	Microsoft Corp.	84.00	-4.38	-5.0
OTC	36.38	12.00	Oracle Corp.	29.75	-1.63	-5.2
OTC	63.75	35.25	Parametric Technology (N)	56.25	-1.88	-3.2
OTC	60.50	22.50	Peoplesoft (N)	53.63	-2.50	-6.9
OTC	11.00	3.50	Phoenix Technologies	5.63	0.13	2.3
OTC	25.00	11.25	Platinum Technology	19.88	0.38	1.9
OTC	61.50	39.00	Progress Software Corp.	51.00	-4.25	-7.7
OTC	24.50	3.13	Quarterdeck Office Sys.	3.38	-0.25	-6.9
OTC	32.25	11.75	Rainbow Technologies Inc.	18.50	1.50	8.8
OTC	22.75	4.00	Rasterops	7.88	-0.38	-4.5
OTC	17.25	3.63	Ross Systems	11.38	1.63	16.7
OTC	27.25	8.50	Sapiens USA Inc.	20.13	3.13	13.4
OTC	26.25	6.75	Software Publishing Corp.	12.38	0.00	0.0
OTC	8.88	2.00	Software Toolworks Inc.	8.25	0.75	10.0
OTC	5.88	0.75	Spinnaker Software	1.63	0.16	10.6
OTC	16.50	3.25	State of the Art	12.50	1.25	11.1
NYS	23.63	13.75	Sterling Software Inc.	22.50	-0.50	-2.2
OTC	25.25	8.00	Struct. Dynamics Research	13.00	-0.88	-6.3
OTC	62.25	21.00	Sybase Inc. (N)	53.50	-6.50	-10.8
OTC	48.75	5.88	Symantec Corp.	12.25	0.00	0.0
NYS	13.50	5.25	Systems Center Inc.	8.88	0.63	7.6
OTC	25.50	10.00	System Software Assoc. (L)	11.75	-4.13	26.0
OTC	13.25	2.50	Telxon Corp.	3.75	-0.38	-9.1
OTC	23.75	11.00	Walker Interactive Systems	11.00	-0.75	-6.4
OTC	6.38	1.38	Wordstar	2.50	-0.13	-4.8
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	21.38	1.75	8.9
NYS	18.75	8.63	Analog Devices Inc. (N)	17.00	-0.50	-2.9
OTC	20.13	7.63	Atmel Corp.	16.88	0.13	0.7
OTC	14.13	3.25	Chips and Technologies	3.88	0.13	3.1
NYS	16.88	7.38	Cypress Semiconductor Corp.	10.38	-0.63	-5.7
NYS	16.13	7.00	Dallas Semiconductor	14.25	-0.63	-4.2
OTC	118.00	46.50	Intel Corp.	111.50	4.75	4.4
NYS	12.25	4.88	LSI Logic Corp.	11.00	0.50	4.8
NYS	24.38	12.88	Micron Technology	24.00	0.50	2.1
NYS	63.00	36.44	Motorola Inc.	55.00	1.75	3.3
NYS	14.13	8.25	National Semiconductor	10.88	0.38	3.6
OTC	25.25	8.25	Sierra Semiconductor	16.00	1.50	12.0
OTC	38.50	22.25	SynOpsys	12.50	1.63	5.3
NYS	59.25	31.50	Texas Instruments	56.25	0.50	0.9
OTC	10.00	6.50	VLSI Technology	7.13	-0.25	-3.4
OTC	7.63	2.13	Weitek	6.00	0.25	2.1
ASE	9.63	3.50	Western Digital Corp.	9.25	0.38	4.2
OTC	33.25	16.50	Xilinx	29.88	0.13	0.4
OTC	42.75	18.75	Zilog Inc.	37.25	0.25	0.7
PERIPHERALS AND SUBSYSTEMS						
OTC	28.75	10.38	American Power Conversion	26.25	2.00	8.2
OTC	30.25	19.75	Banctec Inc.	26.38	-1.63	-5.8
OTC	23.50	9.25	Cambex Corp.	17.00	-1.00	7.7
ASE	38.38	6.00	Cognitronics Corp.	15.63	-1.75	-10.1
NYS	25.50	16.75	Conner Peripherals	20.38	-1.38	6.3
OTC	38.50	10.75	Creative Technologies Inc.	10.00	1.50	6.8
OTC	30.75	14.25	Data Race Inc.	23.38	1.88	7.4
ASE	19.88	4.75	Datapoint Corp.	8.38	2.13	20.2
NYS	38.75	7.25	EMC Corp. (N)	24.75	-0.63	2.5
OTC	10.50	5.38	Emulex Corp.	7.00	-0.25	3.4
OTC	20.13	11.25	Evans & Sutherland	17.63	-0.38	-2.1
OTC	40.63	12.00	Exabyte	13.63	-0.50	-3.5
OTC	78.00	21.00	Intelligent Mgmt. Systems	69.25	-2.75	-3.1
OTC	11.33	4.75	Komag Corp.	6.00	-0.25	-4.0
OTC	34.75	5.75	MPL Systems Inc. (L)	7.50	0.25	3.4
OTC	23.25	10.75	Komag Inc.	18.63	-2.13	-10.2
NYS	19.63	8.38	Maxtor Corp.	9.38	-0.38	-3.8
OTC	12.63	7.13	Micropolis Corp.	8.75	0.00	0.0
NYS	109.75	85.50	3M Corp. (N)	107.75	-0.25	-0.2
OTC	7.75	6.00	Printronix Inc.	6.75	0.00	0.0
NYS	17.13	6.88	QMS Inc.	14.75	-0.25	1.7
OTC	18.00	12.13	Quantum Corp.	15.75	1.63	9.4
OTC	12.75	3.75	Radius Inc.	5.50	0.13	2.3
NYS	16.25	7.50	Recognition Equipment	14.00	-0.50	-3.4
OTC	13.88	6.50	Reton Inc.	6.75	0.13	1.9
OTC	22.38	12.00	Seagate Technology	17.63	-0.88	-4.7
NYS	27.00	18.38	Storage Technology	20.13	0.75	3.9
NYS	25.25	16.50	Tektronix Inc. (N)	24.13	-0.38	-1.5
NYS	88.88	66.75	Xerox Corp. (N)	89.25	-0.75	0.9
SERVICES						
OTC	23.50	12.36	American Mgmt. Systems	20.88	-0.75	-3.5
NYS	5.38	3.00	Arbacomp Inc.	3.63	-0.25	-6.5
OTC	35.75	16.00	Analysts Int'l	32.50	0.75	2.4
NYS	55.88	38.75	Auto Data Processing (N)	54.88	-0.38	-0.7
NYS	17.25	8.97	Ceridian Corp.	14.63	-0.13	-0.8
NYS	19.16	12.50	Comdisco Inc.	14.75	-1.25	-7.8
OTC	13.25	6.75	Computer Horizons	11.75	0.50	4.7
NYS	84.00	57.00	Computer Sciences	77.38	-1.63	-2.1
NYS	10.13	7.13	Computer Task Group	7.63	-0.25	3.2
NYS	40.50	22.00	CompUSA Inc.	29.88	0.25	0.8
OTC	19.25	6.00	Corporate Software	12.00	-0.38	-3.0
OTC	30.75	7.75	Edmead Discount Software	8.88	-0.25	-2.7
NYS	35.88	25.25	General Motors E (EDS)	33.63	-3.13	-9.0
OTC	25.00	9.25	Inacom Corp. (N)	22.75	-2.75	-10.8
OTC	10.38	6.25	Intelligent Electronics	14.25	-0.50	-3.4
OTC	14.88	6.63	Medisel	11.38	1.25	9.9
OTC	15.75	5.75	Microage Inc.	12.50	0.50	4.2
OTC	40.00	31.66	Paychex	35.50	-0.25	-0.7
NYS	83.75	59.75	Policy Management Sys. (N)	80.00	-3.00	-3.6
NYS	32.75	16.81	Reynolds and Reynolds (N)	30.63	0.75	2.5
OTC	32.00	22.00	SEI Corp.	29.63	0.63	2.2
OTC	24.38	16.88	Shared Medical Systems (N)	22.88	-0.75	-3.2
OTC	14.38	5.75	SMS System House	6.88	0.38	5.2
OTC	29.25	18.25	Software Spectrum Inc.	23.00	0.25	1.1
OTC	32.25	20.75	Sungard Data Systems	31.50	0.50	1.6
NYS	3.63	1.13	Ultimate Corp.	2.00	-0.13	-5.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

EDS juggernaut

Citing expansion into commercial markets outside of parent General Motors Corp., Electronic Data Systems Corp. last week posted net profits of $635.5 million in 1992 on revenue of $8.2 billion — a 16% rise over the year-earlier period. For the year, non-GM revenue accounted for 59% of the total business. EDS earned $178 million in the fourth quarter, an increase of 14% from the year-earlier period. Revenue in the quarter was $2.1 billion, a 3% increase from 1991 levels, the Dallas firm said.

Record revenue

Systems Center, Inc. recorded fourth-quarter net earnings of $3.8 million, up 81% from the same period last year. Revenue in the period was a record $37.1 million, an 8% increase from the comparable quarter in 1991. The Reston, Va., software developer named John C. Daily as president. Daily joined the company last year as vice president of marketing. He succeeds founder Robert Cook, who remains chairman.

IPO fever rages

Initial public offering (IPO) activity remains brisk as superserver makers Tricord Systems, Inc. in Plymouth, Minn., and Parallan Computer, Inc. in Mountain View, Calif., filed registration statements last week. Tricord is looking to raise about $30 million by selling 3 million shares at an estimated price of between $10 and $12 a share, while Parallan would like to raise $20 million through the sale of 2 million shares at an estimated price of between $10 and $12 a share. Following in the shadow of successful IPOs floated by Powersoft Corp. and PeopleSoft, Inc., Gupta Corp. in Menlo Park, Calif., closed its offering by raising $39.6 million.

Microsoft left dangling by FTC

By Christopher Lindquist

The computer industry's ears perked up in anticipation last week after the Federal Trade Commission (FTC) said it would soon make an announcement concerning a "nonpublic investigation," generally regarded as the Microsoft Corp. antitrust case.

But instead of clearing the smoke, the FTC managed to fog the issue even more, after apparently deciding not to decide the case after two years of investigation. In a terse statement, the FTC indicated it would meet shortly to discuss the situation further.

Reports had circulated that the FTC's lawyers had recommended an injunction against Microsoft, possibly concerning its MS-DOS licensing practices.

The FTC could have voted to accept that recommendation, deny it or extend the investigation. Previous speculation that the FTC might seek to split Microsoft into applications and operating systems segments has generally been disregarded.

Now what?

What happens now is anyone's guess. According to George Cumming Jr., a trial lawyer at Brobeck, Phleger & Harrison in San Francisco, the lack of a decision simply indicates that the FTC feels it needs more time.

That time could be spent gathering more information, discussing the lawyer's recommendations more thoroughly or possibly working out a settlement with Microsoft attorneys.

"It's kind of difficult to read into the thing," Cumming said.

For its part, Microsoft said it is continuing to cooperate with the FTC but otherwise, business is going on as usual.

Novell, Inc., which is widely rumored to be preparing a class-action antitrust suit against Microsoft, said it will have no comment on the FTC investigation until a decision is rendered.

Wall Street watchers said it seemed strange that the FTC would be unable to render a decision after more than two years.

One possibility is that the FTC may be deadlocked. In theory, at least three of the five members would have to vote either in favor of or against any possible action.

However, one of the five members of the investigating committee reportedly removed himself because of conflict-of-interest reasons shortly before the decision was to be made public. That created a situation in which a tie was possible.

According to published reports last week, the FTC's vote ended in a 2-2 tie.

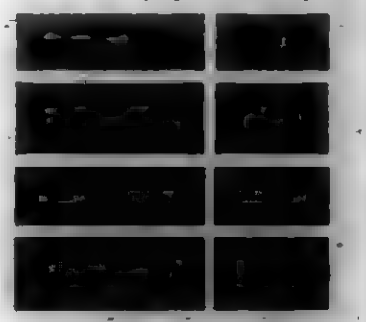
Informix diversifies Unix portfolio

By Jean S. Bozman
MENLO PARK, CALIF.

Traditionally Unix-oriented Informix Software, Inc. is broadening the reach of its database servers. Company executives said the firm is porting its Informix-OnLine database to Microsoft Corp.'s Windows NT, accelerating a push to sell a 6-month-old Novell, Inc. NetWare Loadable Module version and considering more support for Apple Computer, Inc.'s Macintosh.

FINANCIAL UPDATE
Informix Corp.

Informix more than quadrupled its '92 net income over '91



CW Chart: Stephanie Faucher

At a glance

More than 60% of Informix's sales are attributed to Unix-related products, the company said.

Informix is second to Oracle in worldwide license revenue for Unix relational database products, according to International Data Corp., but Informix said it still leads Oracle in the number of units shipped. Informix claimed it has the largest worldwide installed base of Unix relational database licenses, totaling more than 600,000 units.

The moves come as the once-struggling database vendor caps an extremely successful year. Last week, the company reported 1992 net profits of $54 million on record revenue of $283 million (see chart).

Informix Chief Executive Officer Phil White, who is credited with turning around the firm's poor financial performance in 1990 — a year in which it posted a $46.4 million loss — said client/server sales would drive annual growth rates of 20% to 30% for the next few years.

"Selling database technology is like selling hotcakes because the tide's rising," White said, referring to the downsizing trend. "I think our whole message will change from Unix to open [systems]. Given that our database will be on NetWare and NT, it'll be a much bigger marketplace."

The NT version of Informix-OnLine is expected to debut later this year, at about the same time as NT databases are available from competitors.

Open to open systems

Open systems are forcing the issue of multiplatform support, industry analysts said. "I don't think Informix is indelibly wed to Unix as a platform," said Bill Higgs, vice president of software research at Computer Intelligence/Infocorp in Santa Clara, Calif. "It is important for [the] Informix [database] to be open as a server or as a multiuser database platform."

Informix has long had support for Apple Macintosh clients via its Wingz graphical spreadsheet. A forthcoming end-user query tool called Storm will be ported to the Macintosh, White said.

Support for more platforms will be crucial, industry analysts said, as client/server systems embrace more hardware and software platforms. Informix, with its small direct sales force, must cover its bases, they noted, because it gains two-thirds of its revenue from sales through value-added resellers and independent software vendors.

"If they don't play the way the other database guys play, then they won't be in the game," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. She referred to the blanket platform support offered by competitors such as Oracle Corp.

Higgs said he believes Informix has the financial and engineering resources to extend its database products to other platforms. Its record 1992 revenue stemmed largely from providing Unix database systems in an era of downsizing, when midrange and low-end Unix packaged solutions were selling well. However, as Informix moves to other platforms, it will meet competitors such as Oracle and Sybase, Inc. on more fronts. "It's an extension of the competitive battle that's already going on," Higgs said.

Wysiwyg

GREAT NAMES

Kasey Kasemodel
Analyst, Mazda Systems Services of North America
Flat Rock, Mich.

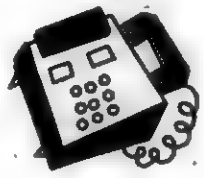
Close, but no cigar

Is 99.9% computer/network uptime good enough? If we settled for things done right 99.9% of the time, we'd have to accept:

- 20,000 incorrect drug prescriptions each year.
- 16,000 pieces of mail lost every hour.
- 500 incorrect surgical operations each week.
- 50 newborn babies dropped by doctors every hour.

Clinton out-faxed

The Bush/Quayle re-election campaign was clearly outfoxed by the Clinton/Gore campaign, but it wasn't out-faxed. The Bush team sent 550,000 items via broadcast fax technology — mostly press releases — compared with 200,000 faxes from the Clinton team.



Data security firm Datakey, Inc. is going to supply physical security firm Medeco Security Locks (maker of lock and key sets) with portable data carriers and interface components. — *Hmm. Does that mean they have safe sets?*

Sources: Successful Meetings magazine, January 1993; Infotext magazine, January 1993.

Have any stories about unusual vendor sales pitches? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

The Fifth Wave by Rich Tennant

"A CONSULTANT TOLD US THAT POLYESTER CAN CAUSE SHORTS IN THE SYSTEM, SO WE'RE TRYING AN ALL-LEATHER AND LATEX DATA ENTRY DEPARTMENT."

Inside Lines

Getting real chummy

Industry analysts were buzzing last week about the imminent merger of the OSF and Unix International (UI). The two onetime enemy camps are so friendly these days it's a wonder they don't throw joint company picnics. OSF President David Tory recently attended a big UI get-together in New Orleans, where OSF technologies such as Distributed Computing Environment (DCE) were warmly welcomed. OSF Board of Directors President Mike Saranga disavowed any concrete plans to merge the two nonprofit companies, however. "The way the industry is changing, though, anything could happen," quipped Saranga, who represents IBM on the OSF board.

Chips ahoy

Vendors will get the go-ahead, and the chips, to ship their first Pentium systems on May 20, industry sources said. Less talked about is Intel's Peripheral Control Interface (PCI) local bus architecture, which will be discussed publicly on March 22 along with the technical details of Pentium. Sources say PCI will be available in time to be designed into Pentium systems for release in late May, though it appears both PCI and existing schemes will be used in systems disclosed that day.

Battered, black and blue

IBM is expected to announce this week that it will cut even more employees than originally planned from its North American sales organization. A Merrill Lynch analyst predicted the cut — to be made initially through early-retirement options and then, if necessary, layoffs — would number around 7,000 vs. the original target of 4,000 to 6,000 this year. But that still might be a low estimate, some said. James Cassell, an analyst at Gartner Group, said IBM will probably need to cut some 40,000 employees from its total worldwide work force this year, another 30,000 in 1994 and perhaps another 30,000 in 1995.

Taking stock of the situation

Parallan's IPO filed last week (see stories pages 108 and 109) has repercussions for IBM, which owns an estimated 20% to 25% stake in the superserver maker. When and if the 2 million-share IPO breaks, IBM's ownership of Parallan, whose multiprocessing box IBM resells as part of the PS/2 line, will automatically dilute to 14.1%. But if IBM exercises stock options negotiated at the time it bought into Parallan last year, IBM could own just shy of 34% of the company and can install two members on Parallan's board. IBM watchers noted that it would be smart to keep a hand in Parallan because the market is poised for flight in 1993 and 1994.

Through the looking glass

Although DEC doesn't expect its VMS base of customers to move whole hog to Microsoft's Windows NT overnight, the company is evaluating several possibilities to make that transition easier. Those moves include a potential port of the Win-32 API to VMS or the development of a VMS subsystem for NT that is similar to the subsystems Microsoft has developed for DOS, OS/2 and Windows under NT, said Pauline Nist, group engineering manager for Alpha AXP and VAX servers at DEC. Of the two initiatives, a Win-32 port to VMS would be most welcome because it would allow developers to create applications that would run on both NT and VMS, said David Solomon, a former DEC engineer who is now president of Solomon Software Technologies.

Exxon is currently beta-testing the sports fan's ideal client/server application in Germany. Using PowerBuilder tools from Powersoft in Burlington, Mass., the oil concern is building an application that will allow German soccer fans to purchase tickets to soccer matches at Exxon gas stations. The application will link client systems at service stations with servers at individual stadiums and servers at Exxon corporate offices. Phone, fax or CompuServe News-Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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INCORRECT ISSUE NUMBER, SHOULD READ NUMBER 8.

The Newspaper of Information Systems Management
February 22, 1993, Vol. 27, No. 7, 108 Pages, $6/Copy, $48/Year

COMPUTERWORLD

IBM network group loosens host shackles

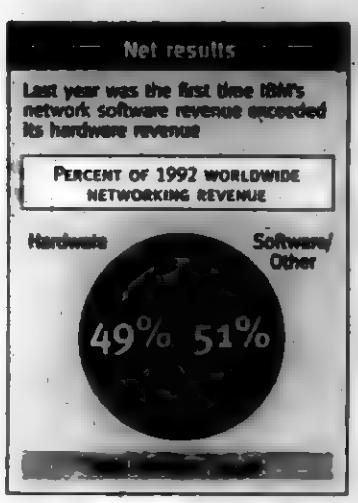
Incentives spur dedicated sales force

By Elisabeth Horwitt
ARMONK, N.Y.

■ After winning semiautonomy from its corporate parent one year ago, IBM's Network Systems Group is moving products to market faster and is attacking promising new niches.

However, general manager Ellen Hancock and her team still have a way to go before they are perceived as a viable multivendor networking player, users and consultants said.

Late in 1991, a major IBM restructuring gave Hancock's unit more freedom to pursue its own research and development and marketing objectives without having to report every move to the corporate bureaucracy. "The reorganization helped us go from host- to network-centric," she said.



Source: IBM

A year ago, Hancock took decentralization a step further by turning her line of business into a holding company in its own right, overseeing seven product-specific

IBM, *page 12*

SQL Server to get 32-bit upgrades

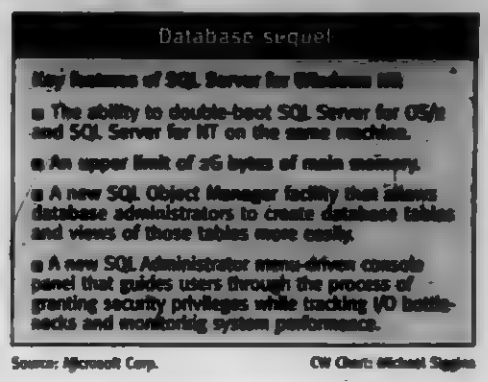
By Jean S. Bozman
REDMOND, WASH.

Just as the Microsoft Corp./Sybase, Inc. 16-bit SQL Server for OS/2 is running out of steam at user sites, up pop two 32-bit options said to at least double the database's performance. Some database applications could see as much as an eightfold boost in performance, beta-test users claimed.

Microsoft said last week that it is readying migration packages that will move users to a Windows NT-based, 32-bit SQL Server database engine in the third quarter. At the same time, Microsoft's technology partner Sybase, which developed the SQL Server database engine, said it is readying a 32-bit OS/2 product for delivery in 1994.

Shipment of Microsoft SQL Server for NT — jointly developed by Microsoft and Sybase but marketed solely by Microsoft — is expected to follow NT's shipment by 90 days, said Gary Voth, Microsoft's product manager for SQL Server. Microsoft, however, has not committed to field or sell a 32-bit OS/2 version.

It is hardly surprising that many users of SQL Server for OS/2 would welcome the new 32-bit options to the 4-year-old SQL Server product. SQL Server for OS/2 is limited to 16M bytes of main memory, and response time on heavily used PC local-area networks is often inadequate, longtime users reported.



Source: Microsoft Corp. CW Chart: Michael Siggins

"When you have a lot of people requesting data at the same time, you have a lot of thrashing about," said John Kalish, a project manager at Pepsi-Cola International in Somers, N.Y., which has 50 users on its OS/2 SQL Servers.

"I wouldn't put more than 30 to 35 active users on it at the same time," said Mohsen Moazami, president of Stanford Business Systems, Inc., a Culver City, Calif., integrator that builds SQL Servers for Fortune 500 users.

By simply moving to a 32-bit architecture, users will find that their SQL Server database engines perform much faster and will support

SQL Server, *page 20*

Client/server migration

Hotel cans mainframes

By Lynda Radosevich
PHOENIX

■ Travelers who called the 800 number for Choice Hotels International over Valentine's Day weekend were told their reservation could not be confirmed using that number because the national system was down. The customers then had to call their hotels directly and incur long-distance charges.

The inconvenience was not caused by a catastrophic system failure. It was a planned part of the hotel conglomerate's move to a client/server reservation system, said Jim Yoakum, senior vice president at the chain's reservation and information systems technology center.

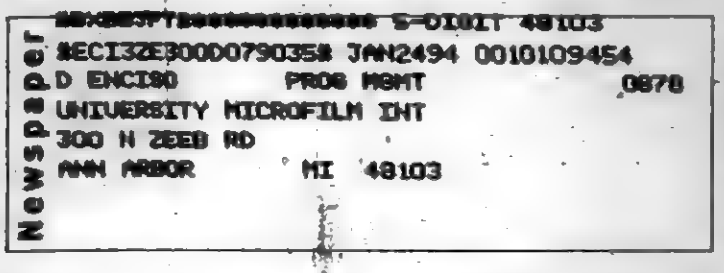
"As of this weekend, the two Amdahl mainframes will be gone," he said. Choice Hotels operates 2,889 hotels, including the Quality Inn and Econo Lodge chains.

Two years ago, the company began moving its reservation databases from mainframes to database servers. Individual hotels generally have local-area networks that use leased lines to access real-time room availability information.

"It is a major shift to client/server, and the amazing thing is, it's working," Yoakum said.

Choice Hotels' new system comprises symmetrical multi-

Hotel, *page 16*



Michelangelo virus

Security a tough sell

By James Daly

A year after the Michelangelo virus scare had the business community on the verge of hysteria, information security managers say the hype has helped raise awareness about the need for data safety. However, the job of selling security to management and end users remains difficult.

"Despite all the screaming during the Michelangelo scare, computer security is still a difficult point to get across," said Jack Skalon, a network specialist at the University Hospital Consortium in Oak Brook, Ill.

"The only good thing that came out of all the Michelangelo hype was that it got people shaken up.

The Michelangelo virus was first reported in April 1991 in Sweden and the Netherlands. It is set to go off every March 6, the birthday of the Renaissance painter and sculptor.

People need to be shaken up. They need to know security is not a joke," Skalon said.

The trouble was that in the end, Michelangelo seemed like an elaborate hoax because its impact was minimal. Michelangelo became a cause celebre for the vulnerability of our computerized society, however, when several hardware and software companies unknowingly shipped products infected with the rogue code.

The virus achieved its astonishing notoriety when heretofore reliable security experts such as John McAfee, namesake of the antivirus software maker, predicted that it could irretrievably alter data on "anywhere from 50,000 to 5 mil-

Viral threat, *page 24*

NEWS

PC software wars heat up. Microsoft has launched a training program for NT developers targeting IS, but customers are being coy. *Page 4.* On the product front, C++ compilers from both Microsoft and Borland will be shown at Software Development '93 next week. *Pages 20, 61.* And while CA gears up to make a run at Windows and OS/2 desktop applications, Lotus tries to spark interest in Inprov with an introductory price of $99. *Page 14*

IS is also struggling with desktop software issues. Balancing flexibility with consistency is among the concerns of IS managers who have to set standardization policies for PC software. *Page 39.* Chevron turns to a systems integrator to get the advantages of volume purchasing without the restrictions. *Page 14*

IBM fired the latest volley in its recent product barrage, unleashing 14 new AS/400 models. *Page 12.* IBM's networking chief, Ellen Hancock, takes time out to update *Computerworld* readers on her unit's activities. *Page 1*

RDBMS

While Microsoft and Sybase develop an NT-based 32-bit SQL Server, Sybase is building on its own a 32-bit upgrade to the OS/2-based SQL Server. *Page 1.* Early users of Oracle's new tool set, due next month, say the beta-test code is stable but needs fine-tuning. Oracle, meanwhile, is gearing up to move into the groupware arena, with plans to face off against Lotus' Notes. *Page 8*

THE CW GUIDE

Beta-test users of Microsoft's Windows NT say the desktop operating system meets their expectations, but they voice other concerns, such as performance, vague pricing and NetWare compatibility. *Page 69*

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A PUBLICATION OF IDG

AMR seeks wider horizons

Expansion of IS services to be built on Sabre's success

By Mitch Betts
FORT WORTH, TEXAS

■ AMR Corp., painfully aware of the irony that its Sabre reservation system is profitable and its core airline business is not, is forging ahead with plans to diversify into the computer services business.

While AMR is planning to dump unprofitable flights and airline operations at American Airlines, for example, it has just entered the network outsourcing business and has a contract with Canadian Airlines to provide computer and accounting services worth $2 billion over 20 years.

AMR's interest in diversification has picked up as "the airline situation has gotten worse," said Max Hopper, AMR's senior vice president of information systems. American Airlines has lost $1.22 billion since 1990.

"We are constantly looking for new niches" in the computer services business, including modest acquisitions, Hopper said. Besides trying to become an IS "supermarket" for the travel industry, AMR may someday offer transaction processing services to the health care and retail industries, he said.

Hopper said AMR considered a foray into transaction processing for the financial services industry, but he said that market "has far too many competitors, so we decided to opt out and watch."

Robert L. Crandall, AMR's chairman and chief executive officer, has long recognized the Sabre network as a money-making machine and apparently wants to exploit that strength. "If you told me I had to sell either the airline or the system, I'd probably sell the airline," Crandall told a Society for Information Management audience in 1991.

One vehicle for AMR's expansion strategy is the new network outsourcing business. Earlier this month, AMR Information Services, Inc. launched the AMRnet Network Services Division, which will sell space on the company's own data network, as well as network design and consulting services.

In addition, the IS subsidiary has developed Sabre-like reservation systems for the new French high-speed railway and more than 50 airlines worldwide. In other experiments, AMR has a joint venture with CSX Corp. to market the Encompass freight-tracking system [CW, April 20, 1992] and has its data entry clerks in Barbados taking on work for insurance companies.

AMR's image as a technology powerhouse has been tarnished, however. Its joint venture to build the Confirm reservation system for hotels and rental-car companies was a fiasco that led to lawsuits and a $165 million write-off [CW, Oct. 12, 1992].

Analysts said the transportation company's diversification into the already crowded field of computer services makes sense, but success is far from guaranteed.

"It can be done, but it will take persistence and deep pockets," said Jeff Bruckner, managing director at DMW Group, Inc., an IS consultancy in Stamford, Conn.

Flight of fancy?

AMR hopes its growing information services business will help it regain profitability

Revenue	$14.4B
Net loss	$(935M)
Estimated 1992 figures	
IS spending	$1,091M
Percent of IS spending spent on IS staff	27.6%
Total IS staff	6,096

Source: *Computerworld Premier 100*

Change in plans

DOS 6.0 upgrade cuts features

By Cara A. Cunningham
REDMOND, WASH.

Microsoft Corp. has removed networking features from its DOS 6.0 upgrade, which may be shipped without portions of its built-in data compression utility, according to a letter accompanying the latest beta-test copy.

Microsoft pulled networking and electronic-mail capabilities from DOS 6.0, which is expected to ship in April, because those features cause confusion for users who already have networks, according to Microsoft's letter.

Networking features included in earlier beta-test versions of DOS 6.0 allowed DOS machines to share resources and exchange E-mail with PCs on networks running Windows for Workgroups, LAN Manager and Windows NT. Microsoft recently released Workgroup Connection, a DOS add-on that provides similar capabilities for DOS users connected to networks running Windows for Workgroups, the letter noted.

The company also removed MaxCompress, a portion of its DoubleSpace data compression utility, from the latest DOS 6.0 beta-test release. MaxCompress is an "off-line procedure" that provides DoubleSpace with its "maximum compression," according to documentation included with previous DOS 6.0 beta-test versions. The technique uses larger data spaces for encoding compressed data.

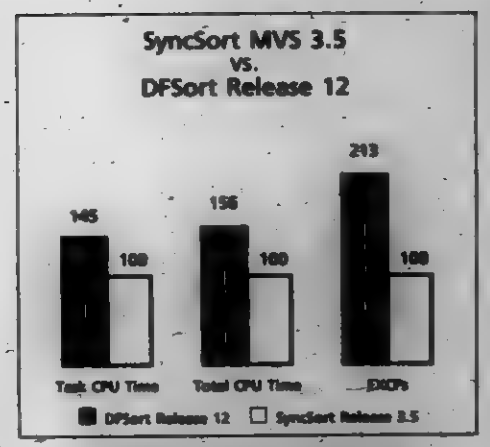
Last month, Stac Electronics, Inc. accused Microsoft of using its patented data compression technology, called Stacker, in the DoubleSpace portion of DOS 6.0 without a license.

A Microsoft spokesman said the company removed the MaxCompress portion of DoubleSpace in response to Stac's lawsuit. "Lawyers are cautious people," he said. "They advised us that we should remove it from beta" testing until they finish reviewing Stac's patents, the spokesman added.

Microsoft's letter said it was "continuing to research the MaxCompress feature" and it may not be released in the commerical product.

Cunningham is IDG News Service's U.S. correspondent.

IF IT WERE GREASED, IT WOULD BE ALMOST AS FAST AS SYNCSORT.



syncsort

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DCE on track; still hurdles

Several events planned to showcase middleware's features

By Maryfran Johnson
CAMBRIDGE, MASS.

With its next major release slated for March 17, the Open Software Foundation's Distributed Computing Environment (DCE) technology is slowly picking up momentum in user sites around the country.

Although rarely found in any serious production environments yet, the distributed computing services that make up DCE are being tested in places as diverse as a Northwest grocery store chain, a major Texas oil company and a New York bank. In all, nearly 200 user sites are now working with DCE technology, according to OSF officials.

Yet there are still substantial hurdles facing DCE. One is the paucity of independent software vendors that have publicly committed to engineering use of the DCE services in their applications. Another is DCE pricing (see story at right), considered by some to be an obstacle to the widespread adoption it needs to become a true industry standard.

"It's something of a chicken-and-egg problem," said Jeanette Horan, vice president of interoperable technologies at the OSF. "End users say there aren't enough applications, and [independent software vendors] say there are not enough users demanding it."

DCE is an integrated set of system management services and tools for providing functions such as remote procedure call, network time service, distributed file and naming services and security. This "middleware" software is intended to make multivendor networks appear as one seamless environment.

"We're just beginning to run DCE on our [IBM] RISC System/6000s," said Michael Zeitlin, team leader at Texaco, Inc.'s Integrated Visualization Technology Division in Houston. "We'll be using it to deal with additional network resources that are otherwise idle."

At Du Pont Co. in Wilmington, Del., applications are being written to DCE in the company's computer laboratory, with a focus on integrating a variety of platforms. Other firms with DCE projects under way include The Boeing Co., Mitre Corp., Citibank NA, Charles Schwab & Co., Atlantic Richfield Co. and Shell Development Co.

Industry support

For Associated Grocers, Inc. in Seattle, DCE's attraction is its aura of widespread industry backing. "There are so many definitions of open, and people are twisting the meaning of it. DCE compliance appears to be something you can hang your hat on," said Richard Lester, vice president of information services at Associated Grocers. The technology, he added, is "exciting but immature."

Planned for this spring is a series of events — culminating in Challenge '93 on May 24-25 — at which the OSF hopes to showcase the DCE software running smoothly and doing real work on a distributed multivendor network.

"I have high hopes that Challenge '93 will be significant," said Dave Eaton, a member of the OSF's End-User Steering Committee. "If it's something like 14 different versions of Motif running, it won't be interesting. But if there are applications actually using the DCE services, that will be very interesting to see."

DCE occupies the odd position of being a widely trumpeted industry standard that users have been unable to buy until very recently.

IBM began shipping DCE-based application and server capabilities on AIX Unix for the RS/6000 line just two months ago, and Hewlett-Packard Co. will ship its DCE implementation for its HP/UX version of Unix at the end of this week.

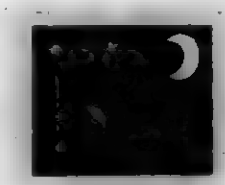
One customer waiting eagerly for HP's shipment of DCE is Doug Eltoft, director of operations for the Iowa Computer Aided Engineering Network at the University of Iowa at Ames. "DCE will allow me to administer more equipment with less staff," Eltoft said. "I don't care that there aren't any applications for it yet."

Not like NFS

Eltoft characterized DCE as basic networking software designed to deal with security and distributed systems in a way the Network File System (NFS) never was. "DCE is fundamentally different from NFS because it has low network traffic and does lots of file caching, so it keeps information local," he explained.

The scheduled March 17 release of DCE Version 1.0.2 — source code shipped to the vendor licensees, not to users — will include additional security enhancements, a debugged and improved Distributed File System and overall performance improvements.

Users and analysts agreed that DCE will not show up in full production uses until the improved version of the Distributed File System is shipped with the next round of DCE products from vendors such as IBM, HP and Digital Equipment Corp.



Reclusting revenue

Revenue for DCE has ramped up from $570,000 in 1991 to about $7 million last year — a figure that includes license fees, royalties, technical services and support.

Deciphering DCE pricing

OSF officials are reconsidering the pricing and licensing terms of its DCE technology, which many users and analysts say is too expensive and overly complex.

"We want to make it easier for our licensees to incorporate DCE into their products and ship it in volume," said Jon Goossen, the OSF's business-area manager for DCE. "Market conditions have changed, and it's time to update things."

The DCE price list has nearly two dozen prices listed, covering everything from full distribution rights and object code fees to optional services. Currently, a software vendor that wants to build applications using DCE services would pay a $15,000 license fee.

Hardware vendors incorporating DCE object code into their operating systems or layered software products would pay $150,000 for full distribution rights. But on top of those license fees are royalty fees for each product sold, and those range from $75 down to $5 per copy for high-volume products.

There are also separate prices for additional DCE "optional services" such as the directory service or security service, each of which costs $400.

—*Maryfran Johnson*

Microsoft offers training for Windows NT

By Christopher Lindquist and Jean S. Bozman
REDMOND, WASH.

Microsoft Corp. last week began drafting recruits into what it hopes will be a worldwide army of trained Windows NT support professionals ready to install and support the next-generation operating system and train others to do the same. However, users and analysts contacted remain skeptical about the effectiveness of the approach.

The training program, called Inside Track, began here with 500 attendees, including resellers, integrators and corporate users, being trained in the installation and support of Windows NT, which just entered its second beta-test phase. After successfully completing the three-day program, attendees receive a Microsoft Certified Professional rating. As part of the agreement for attending the session, each participant is also expected to train at least 50 more individuals.

Trainee turnaround

Microsoft's Inside Track program started with 500 attendees at the Redmond session, but according to Microsoft, that number will increase to more than 100,000 by the time the worldwide training program has been completed.

Some customers indicated that the program seems to be little more than a formalization of processes that have been going on for some time. "It will not change the way we do business," said Louis Kahn, network administrator at the Centers for Disease Control in Atlanta.

Kahn said the Centers' internal information systems group is currently trained to handle "front-line" support, with follow-up support requests referred directly to Microsoft. He added that the idea of going to third parties for support was unacceptable in his case. "We only allow internal MIS to mess with our network."

A bit premature

An IS manager at a large foods company said he declined Microsoft's invitation to attend the session. "We think it's a little too early," he said. "We're excited about NT, but it may be too much to digest right now."

Doubts about Microsoft's understanding of large-site information systems were echoed by others. "I still question Microsoft's capability to move into the real world of data processing," said Donald Feinberg, a program director at Gartner Group, Inc.'s Software Management Strategies service. "I don't believe they have the infrastructure for sales and support for that, and I don't think that spending a couple of hundred million dollars on it is enough."

Other analysts agreed with that assessment. Donald Depalma, senior analyst of software strategy at Forrester Research, Inc. in Cambridge, Mass., said that to truly gain the trust of large companies, Microsoft is going to have to increase its internal support and systems integration capabilities because simply training third parties will not be enough.

"I'm not sure that having a bunch of hangers-on is going to make the Fortune 500 feel warm and fuzzy toward Microsoft as a strategic vendor," he said.

For its part, Microsoft does seem willing to try, with new licensing and service policies being offered on the menu. Customers contacted said Microsoft is improving its dealings with IS. And Microsoft is working to establish the idea of third-party, vendor-assisted support as a new model.

"The days of the cradle-to-grave vendor are gone," said Dwayne Walker, director of Windows NT and networking products at Microsoft. "We won't try to be all things to all people."

DISTRIBUTED QUERY COMPARISON

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
se
wi
be
    CREATE PROCEDURE la_qty
    /* for use on WESTCOAST server */

    /* returns count for one part only */
    @partno char(6),
    @la_count int output
    AS
/*  SELECT @la_count =
    (SELECT qty FROM la_parts
    WHERE partno = @partno)

/*  DECLARE @cnt int
    DECLARE @counter int
    DECLARE @la_count int
    DECLARE @partno char(6)
    SELECT @cnt = COUNT(partno) FROM ny_parts

en  /* ny_parts is the parts master; need count
/*  for sequential comparison with la_parts
*/  to simulate a distributed join */
Dr
Dr  SELECT @counter = 0
pr
se  /* create temporary table for part numbers
wi  and quantities from ny_parts */
be  CREATE TABLE #allparts1
      (partno char(6) NULL,
      ny_qty int null)

    /* create temporary table for row numbers
    for sequential call of la stored procedure */
    CREATE TABLE #allparts2
      (seq int)

en  /* create temporary table for
/*  sequential build from first two temp tables */
Se  CREATE TABLE #allparts3
      (partno char(6) NULL,
      ny_qty int null,
      la_qty int null,
      seq int)

    /* build sequence numbers for each ny row */
    while @counter 1> @cnt
    begin
      select @counter = @counter + 1
       insert into # all parts 2 (seq) values ( @ counter )
    end

    /* populate temp table with ny parts and quantities */
    insert into #allparts1 (partno, ny_qty)
    select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

These two programs do exactly the same thing: retrieve data from multiple servers. Oracle does it with a single 3 line Industry Standard SQL query. Sybase requires 90 lines of complex code. If productivity is important to you, call 1-800-633-1071 Ext. 8185.

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News Shorts

Macintosh gains AS/400 link

Apple Computer, Inc. and **IBM** moved to close the interoperability gap between their platforms with Apple's introduction of an application that allows its Macintoshes to work on IBM-based networks. Apple said the SNA.ps 5250 emulation software package enables the Macintosh to behave like an IBM terminal and access thousands of applications available on IBM's Application System/400. The package is slated to go on sale in June and retail for $345.

Insurer outsources

The Continuum Co. in Austin, Texas, won an application development contract under which it will implement a policy administration system for two insurance companies. The agreement with **Fidelity Union Life Insurance Co.** in Dallas and **North American Life and Casualty Co.** in Minneapolis is valued at about $11 million during the first three years, with seven-year renewal options worth $25 million. The insurance firms are subsidiaries of **Allianz AG** in Munich, Germany, and are merging into a new company, **Allianz Life Insurance Company of North America.**

Wireless moves by Motorola

Motorola, Inc.'s **Interactive Data Systems Group** in Boynton Beach, Fla., said it would introduce a card-size version of its NewsStream Advanced Information Reciever by midyear. The NewsCard is aimed for use in several PCs and "personal communicators" due out later this year. Meanwhile, **AT&T** connected its EasyLink Services electronic mail to Motorola's Embare wireless delivery service allowing AT&T Mail users to send messages to portable computers in more than 200 cities.

Novell, RBOC team up

In a deal that **Novell, Inc.** said is likely to be the first of many partnerships with telecommunications carriers, the local-area network company announced last week an alliance with **Pacific Bell** aimed at ensuring interoperability between Novell internetworking equipment and the phone company's wide-area network services. The goal: to allow resellers to offer turnkey packages, including communications links for interconnecting NetWare LANs across WANs.

HP adds analysis tools

Hewlett-Packard Co. announced the first three applications that can analyze traffic samples taken by its Embedded Advanced Sampling Environment (Ease). Ease continuously monitors traffic traveling through HP Ethertwist hubs and bridges. OpenView History Analyzer compiles historical data, such as network services and protocols used. OpenView Traffic Expert can build a set of rules for a well-behaved network and generate a printed report prescribing actions to improve performance. OpenView Resource Manager provides a real-time view of all network segments across the enterprise.

SHORT TAKES **IBM** plans to expand use of **HP**'s SoftBench technology beyond the original AIX environment by implementing it on non-Unix systems, such as OS/2. . . . **Computer Associates International, Inc.** has announced plans to bundle its CA-20/20 spreadsheet into its CA-Unicenter for Unix systems management portfolio. . . . **Axil Workstations**, a division of Hyundai Electronics America, introduced two Scalable Processor Architecture-compatible Unix workstations: the $3,000 Axil 220 Professional and the $7,000 Axil 220 Workstation.

News shorts, *page 16*

Pitney Bowes cuts paper

Unix-based client/server system to provide seamless flow of info

By Elisabeth Horwitt
SHELTON, CONN.

Providing seamless, paperless information flow from sales all the way to the shop floor is still a far-off goal for most manufacturers, but not for Pitney Bowes Mailing Systems.

This spring, the Pitney Bowes, Inc. operating unit here should finish installing a Unix-based client/server system that will become the standard platform across engineering and manufacturing work areas.

The guts of the platform will be "master servers" based on Digital Equipment Corp.'s Alpha and Hewlett-Packard Co.'s HP 700s running the Open Software Foundation's OSF/1, said George Billings Jr., the unit's manager of network computing services.

Those servers will house engineering specifications and designs, as well as up-to-date production scheduling data. Manufacturing and engineering users will be able to access that information transparently, independent of where they are located and which server houses the data, he added. A fiber-optic network will link client and server systems in five sites scattered across Fairfield County, Billings added.

Time reduction

The primary use for the above platform is a concurrent engineering system that Pitney Bowes expects to have fully implemented by year's end, said Al Schmidt, director of operations development. The system will replace a traditional paper-based environment and reduce product cycle time by 50%, according to Paul Reece, the unit's vice president of corporate engineering and technology.

The guts of a concurrent engineering system is a database of engineering drawings and specifications. Such systems provide "continuous improvement in both product quality and time to market" by ensuring there is one consistent set of drawings and specifications that both engineers and manufacturing managers can view electronically, according to Ted Rybeck, director of research at Advanced Manufacturing Research, a consulting firm in Boston. Concurrent engineering is still a distant goal for most manufacturing companies, Rybeck added.

Paul Reece *says system will cut product cycle time by 50%*

Under the old paper-based system at Pitney Bowes, "it typically took weeks to collect the information, get it to the person, do the review process [and] make sure people agree on what's wanted," Reece said. "Now the designer can put the concept together [and] download it to the model shop," which then uses it to generate a prototype for manufacturing, all without paper, he added.

The result from early implementations in engineering and manufacturing tooling areas was that the design cycle of some products was down from five or six weeks to two or three days.

One example: Under the old paper-based system, manufacturing often wasted precious hours chasing down engineers with questions about a given part, according to Pat Leahy, manager of engineering information systems. Frequently, too, manufacturing would end up working from an old or incorrect version of an engineering drawing, which would result in weeks or even months of delay while a part was retooled.

Under the new system, manufacturing and engineering can call up the same drawing on their respective screens and discuss it over the telephone, Leahy said.

This kind of electronic communications will grease the re-engineering and change request processes, said Richard Mould, manager of advanced manufacturing systems at Pitney Bowes. "It's the best thing that's happened to me since I came here."

Paperless payoff

The real payoff, however, will come when Pitney Bowes implements paperless information flow down from the field sales force to the manufacturing execution systems and from marketing to engineering, Rybeck said.

Pitney Bowes expects in late 1993 to begin work on systems to provide information flow "right down the supply chain from the field to manufacturing," Schmidt said. Such links will provide tighter integration with the field so that salespeople, for example, could use their PCs to access product pricing and configuration information and send new orders to manufacturing in a "paperless, seamless fashion," Schmidt said.

Also in the works are links to marketing systems that would enable engineering and manufacturing to "respond quickly to marketing data on changing customer demands," Schmidt said. "Our ability to develop products competitively" depends on such systems, he added.

Facing integration challenge

This next phase of systems integration poses a new level of challenge in that it requires integrating the corporate IBM 3090s that house marketing, sales and accounting applications with the client/server-based concurrent engineering platforms, according to George Billings, manager of network computing services.

This, in turn, will require cooperation among corporate IS, manufacturing and engineering systems departments.

Such cooperation is crucial because the above IS projects will support a business strategy that the unit settled on about three years ago, said Al Schmidt, director of operations development. The strategy centers on dispensing with the old "serial" product cycle in which "someone up front decides what the market requirements are, then it goes to engineering, then manufacturing and then you ring up a person in sales and say 'Guess what — we have a product. Now sell it,'" Schmidt said.

Under the new regime, which Pitney Bowes will be implementing through 1994, "from Day 1, a core team with representatives from all disciplines — marketing, engineering, manufacturing, sales, IS — makes a product happen," Schmidt said.

— *Elisabeth Horwitt*

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Oracle eyes groupware battle

Sparks fly over relational vs. object orientation for cooperative computing

By Michael Vizard

As Lotus Development Corp. gears up to deliver Notes 3.0 next month, a religious war over whether relational or object-oriented database models provide the best platform for groupware applications will be heating up.

That is because database giant Oracle Corp. is in the early stages of developing a suite of groupware applications based on Version 2.0 of its Oracle Mail Server, which provides directory, scheduling and mail services on top of Version 7.0 of the Oracle relational database management system, an Oracle official said last week. That product will be aimed squarely at Notes.

So far, Microsoft Corp.'s Windows for Workgroups product is only a platform for building groupware applications, and Borland International, Inc.'s Notes assault is still in the planning stages. And because neither of these companies is positioned as a leading supplier of distributed databases, Oracle has the potential to be a very strong challenger to Notes.

Scheduled to be launched this spring, Oracle's mail server will be integrated with the Oracle RDBMS, a text retrieval engine and extensions to Oracle's SQL implementation that will allow applications to manipulate objects beyond simple rows and columns.

"We're extending the SQL language to support structured objects in the database on clients or any other file system," said Tim Negris, senior director of server product marketing at Oracle. "We'll soon be adding support for real-time video and audio, as well as complex object models, to the Oracle database."

Currently, Version 7.0 of the Oracle RDBMS is capable of supporting up to 2G bytes of binary large objects (Blobs) directly within a field in the database, Negris said. By combining support for Blobs directly in the Oracle server with mail- and text-retrieval technology, Oracle expects to support groupware applications that make use of documents, text, video and audio in direct competition with Notes.

"The database market is stabilizing, and Oracle needs a place to grow. One of those places will be in groupware applications," said Norman Weizer, president of Weizer Associates, Inc., a consulting firm in Lexington, Mass.

But Lotus officials countered that relational databases, which are built around tables and columns of data, will not be able to efficiently support documents in typical groupware applications.

"It's a lot easier to insert objects on an ad hoc basis in an object database than it is to update records in a relational database," said John Landry, senior vice president for software development at Lotus.

"Using an RDBMS to support documents is like teaching an elephant to fly," added Frank Ingari, vice president of marketing at Lotus. Ingari left Lotus for a brief period to head up Ontos, Inc., a Burlington, Mass., developer of object-oriented databases.

Oracle officials asserted that Lotus has a limited view of groupware applications based on its experience with PC client software. "A table in a database is really just a simple instance of an object," said David Knight, senior manager for server product marketing at Oracle.

Oracle is taking a servercentric approach designed to integrate large enterprises where 50G-byte databases are not uncommon, Knight said. By contrast, the object database in Notes supports databases of 1G byte.

"Lotus assumes a model where there is a lot of code on the client and marginal code on the server. We're assuming a model where you embed a lot of stored procedures on the server to limit code on the client," Negris added.

Weizer noted that information systems departments may favor a relational database approach to groupware because it will give them more control over applications. "With Notes, you have end users building applications until they are coming out of your ears. A relational database will give you better control over application development," Weizer said. But, he added, "I believe that Notes is probably a better groupware solution right now, but there is room for relational database vendors."

Lotus said it expects Notes databases to be deployed on servers alongside servers running relational databases. For example, a Notes application will use a SQL link to download data from a relational database into a Notes database, which can then be replicated across multiple Notes servers.

According to Ingari, this will allow sites to create office automation applications using Notes that can be linked to RDBMSs that track transactions.

"Notes is designed to handle a whole class of office support functions that the relational database is not designed to handle. When relational databases came on, they were deployed alongside network and hierarchical databases because they handled different types of functions. The same will be true for Notes," Ingari said.

The trade-off for IS directors, however, is that they will have to learn how to administer yet another database technology.

In contrast, Oracle envisions Notes applications as front-end clients to Oracle database servers. "We're inviting Lotus to link their applications to our work-flow server. Notes is appropriate for small application groups, but we believe that our model is better for higher levels of information integration," Negris said.

Object vs. relational

In contrast to the relational model that will be used by Oracle, Lotus uses what it calls an object database in Notes to support any data type, including text, image, voice and video. The current implementation of Notes borrows technology usually associated with object-oriented databases to create a document-oriented file system.

Lotus announced that it has garnered two major international contracts: Unilever, an Anglo-Dutch multinational, will use Notes in a conferencing system that will initially reach 10,000 users. Statoil, the largest company in Norway, will use Notes along with a variety of Lotus PC application packages to support its 14,000 employees worldwide.

Oracle's graphical tools both stable but incomplete

By Jean S. Bozman

Early users of Oracle Corp.'s new graphical tool set are expecting a developer's copy to be released next month, with a fully integrated tool set shipping by summer. Users participating in a beta-test program since November said last week that some tool features are working better than others but added that the code appears to be stable.

Users have been anticipating the tools' arrival, including the SQL Forms 4.0 application development tool, the SQL ReportWriter 2.0 report generator and the Oracle Graphics software layer, since last year. The new versions will allow users to build a generation of client/server applications for use with the Oracle 7 relational database. Without them, users have resorted to writing Oracle 7 applications using older, character-based tools [CW, Feb. 1].

One beta-test site, ITT Hartford Life Cos. in Hartford, Conn., plans to use the new graphical tools to retrofit dozens of existing character-based applications. "We can develop a form using a graphical user interface, and we can run it in on a character-mode or a block-mode terminal," said Jim Tosco, a project manager at the firm.

The insurance company uses Oracle extensively for 40 applications that run on Digital Equipment Corp. VAX machines but has few client/server programs.

Other beta-test sites have started to prototype applications that they will deploy later this year. Garrett Suhm, a systems analyst at Westinghouse Savannah River Co., a large federal contractor that runs a nuclear-fuels reprocessing plant in Aiken, S.C., is using the beta-test tool set to develop Microsoft Corp. Windows client/server applications on DEC VAXstations.

Eager to move

"We plan to be in production by the middle of the summer. We're very motivated," Suhm said, explaining that a new client/server work documentation system will replace dozens of desktop database systems scattered throughout the 1,600-PC site.

Some of the beta-test users said they want to replace independent Windows tool sets such as Gupta Corp.'s SQLWindows and Powersoft Corp.'s PowerBuilder to gain better integration with the Oracle database. "Oracle is new to Windows, but their strength is certainly the integration with the database," said Kirk Lowery, a senior manager at Price Waterhouse's Dallas office, another beta-test site. "If you've got a strong data model, you can build on what you've already done with SQL Forms 3.0."

Tool test

Worldwide, 100 sites are beta-testing Oracle's tools, 24 of them in the company's "alliance" program of early users, which started in August 1992. Oracle is changing the name of its tool kit to the Cooperative Development Environment. Tool names are also changing: from Oracle SQL*Forms to Oracle Forms; from Oracle SQL*ReportWriter to Oracle Reports; and from Oracle Data Browser to Oracle Browser.

Fine-tuning needed

Although the beta-test sites said the new Oracle tools are stable, they also said they were not yet fine-tuned for each hardware platform. For example, applications developed on Sun Microsystems, Inc. workstations sometimes made a poor transition to a Microsoft Windows PC, users said. The placement of some screen elements and the format of some forms changed when the software was recompiled for use on the Windows workstation.

But users said they fully expect many platform-specific problems to be addressed in the production copy. Oracle developers are aware of the problem and of the design requirement that the tools be portable across platforms. The beta-test copy of SQL Forms 4.0 now being used was "frozen" in December, users said. "What's there works, but it's not all there yet," one user said. "I'm waiting to see a more stable production copy."

REFERENTIAL INTEGRITY COMPARISON

SYBASE

200 LINES OF PROPRIETARY CODE

```
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @rows int
        select @rows = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
        key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @rows
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
   (DEPTNO NUMBER(2) PRIMARY KEY,
   DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
   (EMPNO NUMBER(4) PRIMARY KEY,
   MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
   DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
   (PROJNO NUMBER(4) PRIMARY KEY,
   BUDGET NUMBER(7,2),
   DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
      ON DELETE CASCADE);
```

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UB renders hub ATM stepping-stone

By Joanie M. Wexler
SANTA CLARA, CALIF.

Ungermann-Bass, Inc. last week was first out the door with capabilities aimed at making the smart hub the platform of choice for migrating to Asynchronous Transfer Mode (ATM) networking.

UB announced two "ATM-like" modules for its Access/One hub slated to ship in the second quarter. The products combine the investment-protecting benefits of dedicating the bandwidth of a full 10M bit/sec. Ethernet to a single computer — a function loosely called "local-area network switching" — with the ability to configure workgroups through software commands rather than by plugging and unplugging cords in a wiring closet.

The point-and-click "virtual LAN" is an inherent function in emerging ATM technology. It will be "key as the open corporation reaches out to customers, suppliers and others, where teams cut across traditional boundaries," said Don Tapscott, vice president of technology at DMR Group, Inc. in Toronto. "Companies that don't understand this volatile business environment will be toast."

ATM is also touted as the network hopeful for carrying multimedia traffic because of its predictable-delay characteristics and very high speeds.

However, "while we know ATM is the right technology, it's not here, not affordable and will take years to migrate to," said Ralph Ungermann, UB's president.

Interested shops

UB's $900-per-port Ethernet switching module, called DragonSwitch, will likely be of initial interest to shops with very high network traffic volumes waiting for ATM standards to gel.

For example, "we see video on the horizon at our specialist trading posts," said Bill Conkling, vice president of communications at Securities Industry Automation Corp., the technology arm of the New York and American stock exchanges. "This switch will help us provide that capability prior to 'real ATM' being available."

Integrating the LAN-per-desktop function into the hub competes with various stand-alone LAN switching approaches from vendors such as Alantec Corp., Artel, Inc., Kalpana, Inc., Lannet, Inc. and Synernetics, Inc. These firms' devices, however, do not handle the wiring concentration function and are limited in the number of LANs they can support.

UB's $900 per-port cost, while comparable to Kalpana's $700 to $900 price tag and significantly cheaper than Synernetics' $1,500 to $1,700 per-port, Fiber Distributed Data Interface-based gear, will nonetheless be a barrier to some.

"Whew, steep!" was the reaction of Mike Field, microcomputer coordinator at UB shop James River Dixie Corp. in Fort Smith, Ark. He said his company probably would not need UB's switching module for two to four years.

Mock ATM

Highlights of UB's announcement included the following:

- Ethernet-based DragonSwitch reportedly boosts network performance by 4,000%. Price: $900 per port.
- NetDirector/Virtual Network Architecture management software allows users to create and reconfigure up to 65,000 virtual workgroups around the world via point-and-click technology. Price: $3,500 to $8,500.
- UB's announcement does nothing technologically to migrate users to ATM. Rather, it aims to familiarize users with some of ATM's capabilities on their existing network infrastructures at lower speeds and costs than to transition them culturally.
- Starlight Networks, Inc., which makes video networking software, said it will port its StarWorks package to the DragonSwitch.

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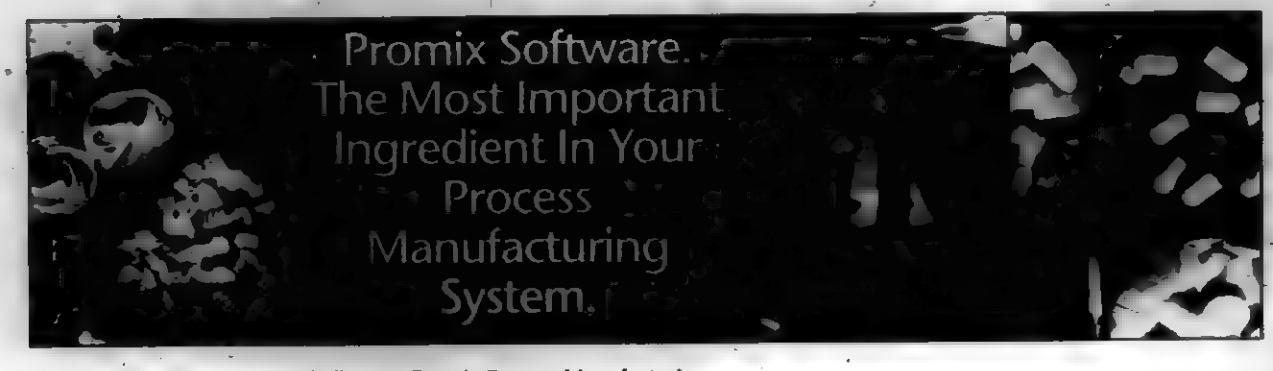

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AS/400 update

IBM refreshes minis

By Johanna Ambrosio
NEW YORK

IBM is pushing its proprietary minicomputer line into the client/server, open systems limelight, starting with its new generation of Application System/400s announced last week.

At the same time, IBM's Application Business Systems (ABS) unit is trying to turn around last quarter's blip on the revenue chart by giving customers something new to buy (see story at right).

In essence, IBM brought out something in the new P series family for both of its major AS/400 user bases: more prepackaged software for its smaller customers; and applications development and systems management packages for its larger users.

Large customers said they are particularly happy with the additional client/server capabilities, which include enhanced support for AIX, OS/2 and Microsoft Corp. Windows clients; a new file server program; and IBM's intention to provide adapters to connect the AS/400 to high-speed local-area networks running at 100M bit/sec.

Jerry Laflen, vice president of computer operations at Farm and Home Savings Association in Nevada, Mo., said his company is looking to bring up an image-based application on its AS/400 Model D60. "At that point, we would migrate to PCs in a Token Ring environment, and obviously, better PC connectivity is important."

On the open systems front, IBM has "finally realized they don't have to be Unix to win," said Teresa Elms, president of Elms Information Services Group in San Diego. "They're saying they will deliver all the tangible benefits of open systems without having to be Unix. They want ease of integration so they can plug and play in open networks."

IBM said it will incorporate the Posix and X/Open Co. standards into the AS/400, as well as allow customers to build applications using the Open Software Foundation's Distributed Computing Environment (see story page 4).

Particularly important for large users is the Integrated Language Environment, which will allow customers to mix and match languages when developing an application. It also "lays the groundwork for object-oriented languages on the AS/400," said David Andrews, president of ADM Consulting in Cheshire, Conn.

Still, there are sore spots for some AS/400 customers. Marc Cohn, senior vice president at Enterprise Rent-a-Car in St. Louis, which runs its operation with nine AS/400s and PCs, lauded the machine's ease of use. But he also said, "We do quite a few things we're not thrilled with to try to pretend it's one machine for the 11,900 employees who use this." The new systems management software will be helpful, Cohn said, "but we need an increasingly adept set of tools" to manage that complex an environment.

Also, James Matsey, corporate director at Reynolds Metals Co. in Richmond, Va., said he is in the process of installing 43 IBM RISC System/6000 Unix-based machines because of their superior price/performance. "IBM tried to bid AS/400s initially, but the RS/6000 was the clear winner," he said. "Our plan is to slow down the growth of the AS/400 by implementing more open systems over a period of years."

Analysts said it is only a matter of time before IBM will have to implement the reduced instruction set computing chip in the AS/400 to get costs down even more.

Don't look back

Forget the quarter that was not, IBM executives said last week. Instead, look for impressive gains this year from the ABS unit's expanded AS/400 minicomputer line.

Fourth-quarter 1992 was much weaker than expected, despite increased revenue in the U.S., most of Asia and Latin and South America. AS/400 revenue slipped by 2% for the year to about $4.4 billion.

However, IBM still gained a point in minicomputer market share, moving to 15%. And this year, IBM expects to grow revenue by 3% or 4% over 1992 levels, said William Stenk, an ABS assistant general manager. "Reports of our death have been greatly exaggerated," he said. "We've had 17 good quarters and only one bad one. We'll get back on track again."

—Johanna Ambrosio

Aims to please

IBM's AS/400 rollout included the following:

- The P series, 14 new processor models featuring price/performance improvements averaging 26%. Prices from $10,500 to $1.1 million. Most available March 5.
- Version 2.3 of the operating system provides license management of software with user-based pricing. It ships in December.
- Higher capacity models of disk, tape and optical devices.
- Systems management software from Candle Corp.
- The Integrated Language Environment lets customers use the most efficient language to write program modules. Available in December.
- An implementation of Sun Microsystems, Inc.'s Network File Server.

IBM network group

CONTINUED FROM PAGE 1

divisions. This ideally gives each division the maneuverability of a small, entrepreneurial company, Hancock said in an interview last week.

More importantly, the unit got its own sales force of more than 500 people last December, Hancock said. Two weeks ago, sales representatives began a training program to get an overall grounding in network technologies, she added.

Another big change is that for the first time, salespeople will now be paid on the basis of how many Network Systems products they sell, she said. "Before, they were paid on how their sales branch did overall."

No choice

Hancock's strategy is competitively necessary, said David Passmore, a vice president and service director at Gartner Group, Inc. "One might argue that even if [Network Systems] is autonomous, a $6 billion company is still too big to move quickly to respond" to changes in the market.

The effectiveness of this strategy is apparent from IBM's 1992 returns. While IBM continues to founder, the Network Systems unit pulled in $5.3 billion, meeting revenue commitments and exceeding profit and return on assets commitments, Hancock said. She declined to get more specific.

One of the most important new freedoms Network Systems enjoys is the right to make its own R&D investment decisions, Hancock said. "Before, when other lines of business wanted something from us, we had to provide it." Now her unit has the option of saying, "You want that? You pay for it," she said.

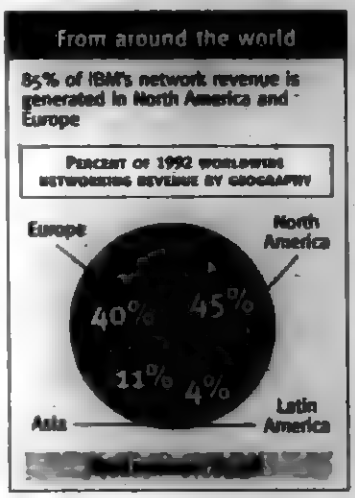
As a result, Network Systems is now putting 20% of its development money into "mature markets" and 80% into "high-growth markets," such as local-area network hubs and multimedia systems, Hancock said.

Better time to market

Some measure of R&D autonomy is key if IBM wants to be a viable seller of "hot boxes, such as the latest Asynchronous Transfer Mode [ATM] switch," Passmore said. "To do that, IBM has to radically improve time to market" for such products, he said, adding that IBM must train its sales force to be more aggressive selling non-IBM products: "They have no choice."

Network Systems has already cut average development cycles from three years to two, Hancock said. The unit has announced its intention of being one of the first major vendors of ATM switches.

Still at issue is whether Network Systems can establish credibility as a multivendor networking supplier. Even if the unit is no longer at the beck and call of other IBM businesses, some users said, non-IBM support is lackadaisical.



Source: IBM

"They have moved out of rock-hard SNA position with TCP/IP and Ethernet support available, but it isn't clear whether that's a place-holding move because they figure they can't capture all of the market by sticking to [SNA]," said Doug Underhill, an assistant vice president at CSX Corp.

The numbers support this view: IBM mainframe-based systems still accounted for more than 50% of Network Systems revenue last year, Passmore said. And Network Products, the Network Systems division responsible for VTAM, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect products, owed 80% of its 1992 revenue to VTAM product sales, Hancock said. "We are still seeing revenue growth from mainframe network systems, which means we can still spend R&D money on that, but client/server is clearly a larger growth field than mainframes," she said.

But Underhill added that he was encouraged because attaching IBM systems to non-IBM computers and network protocols no longer requires such a "Rube Goldberg wiring" arrangement of bridges, protocol converters and routers.

Still, one Fortune 500 firm rejected IBM's network management proposal last year, primarily because the solution had too many pieces, said a telecommunications manager, who requested anonymity. Also, Network Systems representatives "used too many acronyms; they were almost indecipherable," he added.

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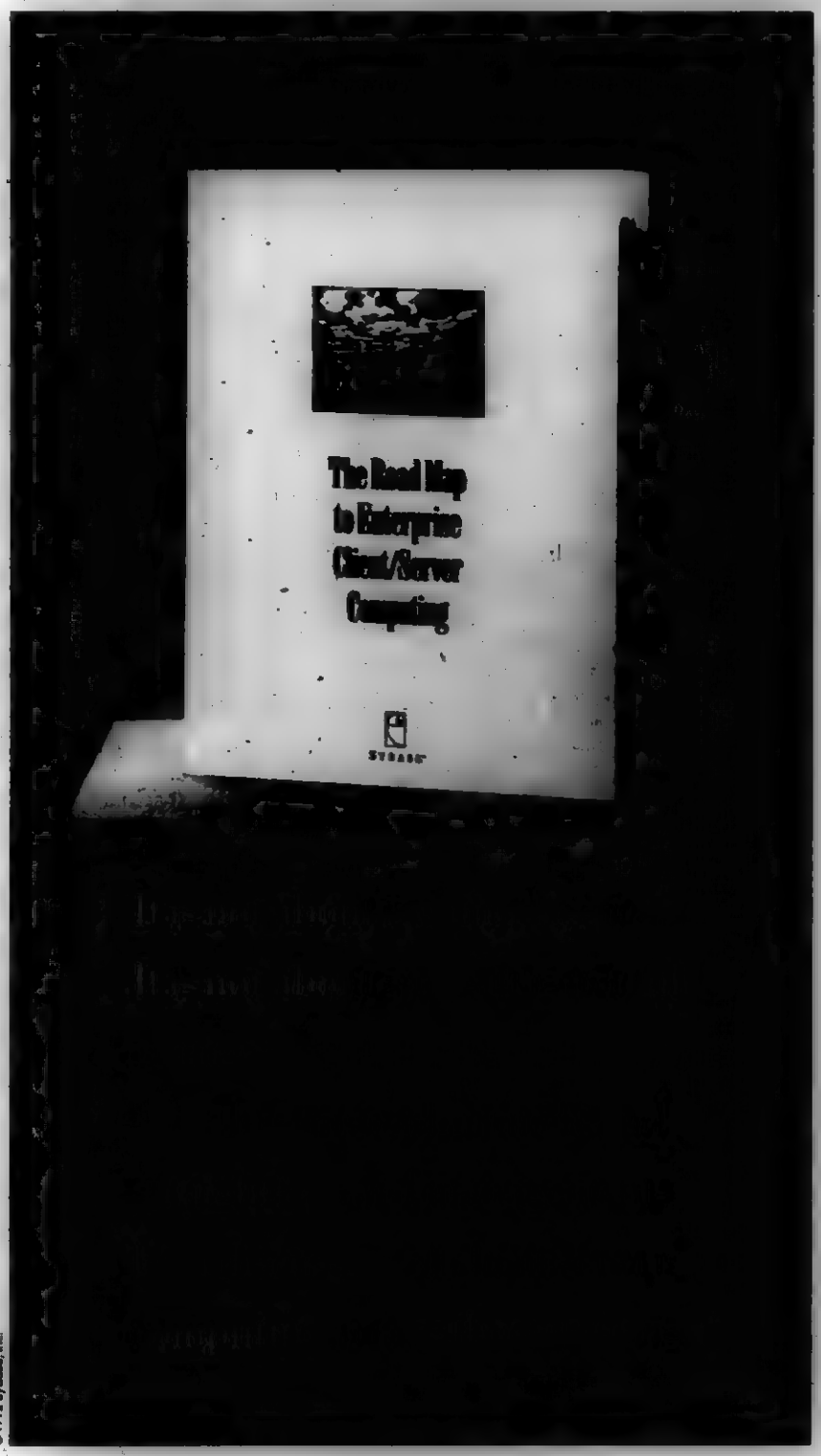

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CA gears up for micro assault

Poised to do battle with rival's Windows, OS/2 desktop applications

By Michael Vizard
ISLANDIA, N.Y.

During the next six weeks, Computer Associates International, Inc. will make good on 1992 promises by delivering three upgraded Microsoft Corp.'s Windows applications and two upgrades to existing DOS applications.

The company said it also plans to launch six IBM OS/2 2.0 applications as part of a concerted effort to boost its rising profile in the PC software market.

CA's main focus is on the integration of its disparate PC software packages, which will eventually allow them to support the same macro language.

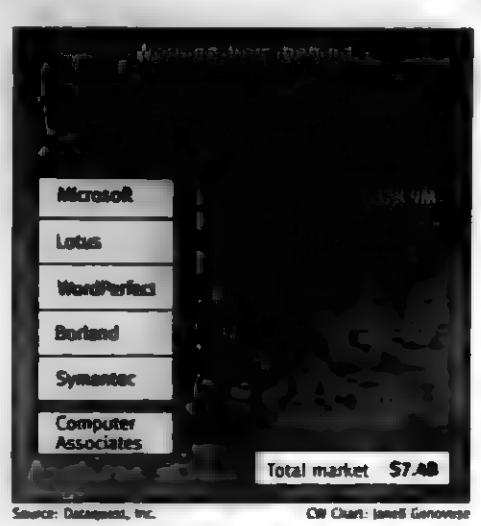
That language will be based on Version 2.0 of CA-Realizor, which is a Basic development environment for Windows and OS/2 2.0 that competes with Microsoft's Visual Basic language.

CA business applications will have a single standard macro language using Realizor, which provides an environment for building applications across multiple platforms, said Marc Sokol, director of product strategy at CA.

"Realizor will provide one consistent front end to CA applications so that you don't have to keep switching to different file formats when moving from manipulating a dBase file and a spreadsheet file," said Ron Moore, president of Marketing Technologies Group, a consulting firm in New York.

Variety is the spice of life

Most of CA's PC software revenue has been generated by accounting packages. The coming product onslaught is intended to leverage the company's installed base to sell a variety of application development tools, databases, word processors and spreadsheets that will be available on both Windows and OS/2 2.0.



Source: Datapro, Inc. CW Chart: Janell Genovese

"PCs are now a recognized option at mainframe sites, and more powerful macro tools should help users do consolidations across PC packages," said Sheldon Needle, president of Computer Training Services in Rockville, Md.

Leading the CA lineup of products for next month is Version 5.0 of Compete, a multidimensional spreadsheet available on Windows and OS/2. It was designed to counter Lotus Development Corp.'s Improv spreadsheet for Windows, which is slated for delivery next week (see story below).

Real deal

Tandem Computers, Inc. is using Realizor to develop a PC front end for a network management application that will monitor traffic across its distributed on-line transaction processing systems. "We went with Realizor because it has better graphics and charting capabilities than Visual Basic," said Mike Kolligan, a Tandem developer in Chicago.

Oncoming onslaught

Other OS/2 2.0 packages that CA will deliver during the coming weeks include versions of its CA-dBFast database, entry-level CA-Simply Accounting package, CA-Textor word processor and CA-SuperProject project management software.

These packages will support OS/2's Presentation Manager user interface, with support for IBM's Workplace Shell utility to follow later this year.

In the Windows market, CA will deliver Version 2.0 of CA-dBFast, which is an Xbase database for Windows.

And in the DOS market, it will deliver Version 5.2 of CA-Clipper for DOS, which is an application development environment; CA-Clipper Tools, which is an extended library for CA-Clipper; and a compiler that links CA-Clipper with dBase IV databases.

PC applications

Lotus launches $99 Improv into raging spreadsheet war

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. will kick off the next major battle in the spreadsheet wars next week with a $99 introductory offer for its multidimensional Improv spreadsheet for Microsoft Corp.'s Windows.

"Improv is a new and different product, so we felt we had to create some excitement about it instead of having it work its way into the market slowly," said Said Mohammadioun, vice president of word processing and spreadsheets at Lotus.

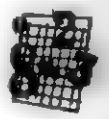
The introductory offer is in effect until May 31, after which Lotus will price Improv on par with 1-2-3 at $495 [CW, Jan. 18].

"At basically $100, you can't not afford to put it on every machine you've got," said James Alsup, assistant to the president of MIS at Hunt Oil Co. in Dallas, which served as a beta-test site for Improv.

"I think Improv will take off and replace a lot of 1-2-3 and Excel spreadsheets over the next 12 to 24 months. In addition to the gee-whiz features, you get increased accuracy and a more portable spreadsheet that can be documented by others," he added.

Improv is capable of supporting up to 12 different views of spreadsheet data in a graphical format, allowing departments to dynamically reconfigure data from a spreadsheet without having to create a new spreadsheet model.

In addition, the logic from which the spreadsheet was created is displayed in English, which makes it easy for auditors to check the validity of the assumptions used to create a spreadsheet.



Improv is targeted at structured data such as budgets where the data is symmetrical. In contrast, 1-2-3 provides more of an ad hoc environment where you can build a structure as you go along.

In direct competition with Improv will be Version 5.0 of the Compete multidimensional spreadsheet from Computer Associates International, Inc. in Islandia, N.Y. The new release of Compete is expected to go into beta-testing shortly, with the production release scheduled for the end of next month (see story above).

"Frankly, we have had trouble explaining what Compete is to the market.... So we're glad to see Lotus educate the market on the need for multidimensional spreadsheets," said Marc Sokol, director of product strategy at CA.

Compete is priced at $495.

However, users can expect to see CA respond aggressively to any pricing initiatives from its rivals, Sokol said.

Chevron gets cake, eats it too

By Michael Vizard

■ Looking to circumvent site licensing restrictions, Chevron Corp. has decided to enlist the aid of a PC software distributor in an effort to gain the benefits of volume purchasing without having to make a specific commitment to one PC software vendor.

The company announced last week that it had signed a deal with PC software distributor InfoNow Corp. in Boulder, Colo.

"We have a lot of individual business units with their own budgets, so we can't really forecast our needs to take advantage of site licensing deals," said William David Johnson, a systems analyst at Chevron.

PC software vendors have been aggressively pushing site license deals. Microsoft Corp., for example, recently unveiled its Microsoft Select program [CW, Feb. 1], while rivals such as Borland International, Inc. and Lotus Development Corp. have had similar programs in place. All of these programs offer a range of discounts that require customers to plan and commit to minimum purchases — in one case as far as two years in advance.

"PC software companies are starting to aim pricing strategies at corporate IS rather than the departmental level, and the lines between the departments and corporate IS infrastructure are starting to blur," said Tina Foraker-Blackwell, research analyst for advanced software development at New Sciences Associates, Inc., a consulting firm in Westport, Conn.

Licensing drawbacks

But for customers such as Chevron that cannot make forecasts because of the diversified nature of their operations or that do not meet volume commitments required by vendors, site licensing deals from vendors can be problematic.

Some firms also object to being locked into a specific product or fear losing control to a vendor. For example, Chevron is currently committed to PC applications from Lotus but is also evaluating software packages from Microsoft.

But Chevron's biggest issue with site licensing deals is that they typically require a company to commit to a large number of licenses, Johnson said.

To avoid this, Chevron will make use of InfoNow's CD-ROM-based software distribution service to purchase software licenses on an as-needed basis. As the number of purchased licenses increases, the discounts offered by InfoNow also increase, allowing Chevron to benefit from volume discounts without requiring an annual commitment.

This approach also frees Chevron from the costs incurred by administering the distribution of PC software and the costs associated with making PC disks.

InfoNow's CD-ROM service has been integrated with Chevron's purchase order system to simplify billing. Beyond the cost of integrating with the CD-ROM service, Chevron's only other cost is the price of the software because InfoNow tracks individual purchases. "With the InfoNow deal, we expect to save millions of dollars over a site license deal," said Monica Bellini, lead systems analyst at Chevron.

Sprint to speed transaction processing

By Joanie M. Wexler
WASHINGTON, D.C.

Sprint Corp. last week said it has built a dedicated transaction processing network that will rev up credit authorization and other transaction response times by about 20% to 50%.

Sprint's TranXact network service is slated for commercial availability in May and is targeted primarily at banks and information service providers. According to Dedham, Mass.-based consultancy Vertical Systems Group, it aims to speed transactions that can swing anywhere from one to 30 seconds to a guaranteed 10 to 12 seconds, regardless of time of day.

The goal is to allow companies to provide consistent levels of service to merchants, such as those relying on point-of-sale terminals or electronic cash registers, and ultimately to consumers, said Howard Stern, director of market analysis at Sprint.

Competing for space

Today, transactions are carried on networks that also transport electronic mail, host computer access and other applications, all of which clutter the network with unpredictable traffic patterns and characteristics. Large random file transfers, for example, can hog the network and degrade service.

However, "if you only run one kind of traffic, you could optimize your network for that traffic's characteristics. In the case of transaction processing, that means short and bursty," observed Richard Malone, a principal at Vertical Systems.

In addition to the problem of colliding applications, processing a variety of access protocols shipped to Sprint from the local telephone companies has traditionally slowed response times.

In the TranXact network, services will run across a backbone of customized Sprint TP4900 switches and Primary Access, Inc. feeder devices. The Primary Access gear will blend dissimilar protocols into one X.25 stream before shipping it across a TP4900 network linked by T1 (1.5M bit/sec.) circuits.

This should eliminate delays associated with traffic having to travel through several pieces of hardware to handle different protocols, Sprint said. The only interface necessary on the user host is X.25, Stern explained.

With TranXact, Sprint is also hoping to bring on-line businesses that traditionally rely on manual transactions, such as fast food, medical insurance and taxicab services, Stern said.

For example, patients visiting a health care provider could use the network to contact their insurance carrier, determine their benefits and electronically file a claim, he explained. And a Sprint cellular packet radio link to local phone companies opens up the credit/debit card business to mobile businesses such as taxi services, he said.

Malone predicted that most carriers' transaction networks will soon have to go "to the next level of bandwidth" because additional identification data, such as voice prints or fingerprints, will likely join these networks and increase traffic loads.

Even today, Malone said, "transaction networks are probably not as responsive as they should be at the point of sale, even though this is supposed to be the decade of service."

Correction

Because of a misunderstanding, Enrico Pasetori, vice president of Digital Equipment Corp.'s PC business unit, was incorrectly quoted in the Feb. 15 issue about DEC's history in the microcomputer business. The correct quote is: "DEC has made a number of starts and stops because top management [at that time] did not seriously believe in PCs."

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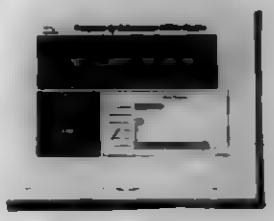

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News Shorts

High-tech programs get boost

Despite promised spending cuts elsewhere, President Bill Clinton last week recommended budget boosts for several high-technology areas. He asked for $103 million more for the U.S. Department of Commerce's Advanced Technology Program, $188 million more for research and development programs at the National Science Foundation, $148 million more for the Internal Revenue Service's tax systems modernization and $81 million more for systems modernization at the National Oceanic and Atmospheric Administration. He earmarked a total of $47 million more at various agencies for networking and computer applications and $64 million for the National Telecommunications and Information Administration to speed construction of a national data "superhighway."

Microsoft offers developer aids

Microsoft Corp. has announced a pair of programs aimed at helping both corporate and independent developers identify tools from vendors that intend to support the leading edge of Microsoft technology, including Windows NT, Object Linking and Embedding 2.0 and Cairo. The Corporate Development Partners and Development Partners programs will consist of a new logo that indicates a company's compliance with Microsoft standards as well as services aimed at helping firms identify vendors with products that meet their needs.

Deal offered on Microsoft Office

Looking to put together a major push behind its Microsoft Office suite of PC applications before the company begins upgrading the individual components in the second half of this year, **Microsoft** this week will announce an upgrade program that will allow sites that own a copy of any PC application software to upgrade to Microsoft Office between March 1 and June 30 for $569, rather than the normal $750. According to Microsoft, 40% of its Word and Excel sales are accounted for by sales of Microsoft Office. Microsoft also announced Profit, an entry-level accounting software package for Windows that is aimed at small businesses.

Chen forms new company

Acknowledging that he had failed to find enough investors to save his supercomputer company following the withdrawal of IBM's support, Steve S. Chen last week formed a new company to carry forward his work. SuperComputers International will employ some of the 320 workers from the now-defunct Supercomputer Systems, Inc. in Eau Claire, Wis. Supercomputer Systems ceased operations late last month after IBM withdrew its support.

SHORT TAKES After six years as dean at MIT's **Sloan School of Management**, Lester C. Thurow will resign July 1 and take a two-year sabbatical before rejoining the faculty in 1995.... **Powersoft Corp.** and **Novell, Inc.** teamed up to announce the PowerBuilder Library for NetWare, which is due in the third quarter and will provide a variety of high-level components to access NetWare's print, communications and file services.... **Data General Corp.** announced that **Groupe Bull** will integrate DG's Clariion storage systems with Bull's Unix systems and servers and that the two companies will also cooperate on the development of future storage products.... Deborah C. Hopkins was promoted from vice president of corporate business analysis to corporate vice president and controller at Unisys.

Users bring downsizing demands to Exposition

By Michele Dostert
CHICAGO

Showgoers at last week's Downsizing Exposition here testified that downsizing is still gathering steam, but practitioners have become more realistic about the time, trouble and expense involved.

"There's not a lot of flashy applications being demonstrated here. Instead, people are focusing on data transfer and the underlying plumbing of downsized platforms," said Johnny Swann, a senior analyst at United Airlines in Elk Grove, Ill., which is engaged in a number of downsizing projects.

He echoed the widely held opinion that workable data transfer, though unglamorous, takes more planning and study than was previously expected by eager downsizers.

Plans for the future

Some attendees whose companies are still mainframe-based came to attend strategy sessions. Wally Yee, an analyst at Ameritech, a regional Bell operating company in Chicago, said, "We are interested in gradual mainframe-to-PC transition, so we came to see what strategies people had used to run the two platforms together successfully."

Other attendees who have decided to downsize but have not yet picked a platform came to examine the alternatives.

"I know I need a faster, more responsive platform for my manufacturing operations, but I haven't picked one yet," said James Skinner, director of MIS at Piper Aircraft in Vero Beach, Fla.

Many information systems managers who have already chosen and implemented their downsizing platform said they were looking for tools to help them build client/server applications. The most crowded demonstrations were the graphical application-building languages offered by Powersoft Corp. in Burlington, Mass., and Magic Software Enterprises in Irvine, Calif.

"We are looking to build communications-enabled applications for our OS/2 LANs, so we came to the show to look for an API to build them on," said Armando Ortiz, a systems unit manager at Discover Card Services, Inc. in Riverwoods, Ill.

Attendees at the conference, while committed in principle to downsizing, have evidently heard enough horror stories to be more cautious than early adopters.

"There are a lot of issues in architecture design and implementation of downsized platforms that can bite you hard if you're not prepared for them, and I think people are planning carefully these days," Ortiz said.

Testing demand

IBM representatives quietly demonstrated a downsizing tool that had many of its mainframe users excited — even though IBM currently sells the product only to OEMs. The Personal/370 Adapter A is a single card that contains a full System/370 processor. When plugged into a Micro Channel Architecture Personal System/2 running OS/2, it allows the user to execute System/370 programs and versions of IBM's VM and VSE operating systems.

Hotel cans mainframes

CONTINUED FROM PAGE 1

processor machines from Pyramid Technology Corp. and central reservation system software developed by Anasazi, Inc. and built using relational database software from Informix Software, Inc. running on a Unix operating system. Now the company is updating the Pyramid machines' complex instruction set computing processors with reduced instruction set computing (RISC) processors to take advantage of RISC's faster processing.

Part of that move included updating the software: Last week, Choice Hotels took the system down to recompile nearly one million records in its reservation database to the new database format, a process that took about 17 hours, Yoakum said.

Choice Hotels International

1992 sales: $2 billion.

Hotel properties: 2,500.

Seven chains: Clarion Hotels, Quality Inns, Comfort Inns, Econo Lodge, Rodeway Inns, Friendship Inns and Sleep Inns.

Subsidiary of Manor Care, Inc., which had revenue of $950 million in 1992.

"It was a planned decision to go through with the process," Yoakum said. "If there was some way of converting safely without bringing the system down, we would do it."

The advantages of the new system far outweigh the limited downtime, Yoakum said. For one, the new system includes marketing information that allows the hotel business to gain immediate access to information booking trends and individual customer preferences.

"As hotels compete for more business, they have to figure how to provide value," said Victor Januliatis, chief executive officer at Positive Support Review, Inc., a management consultant and information technology firm in Santa Monica, Calif. Knowing customer preferences is one way of providing that value, he said.

When the 800 number is down, agents are not able to confirm reservations or get information from the reservation database.

"It's awfully awkward when you depend on an 800 number and that becomes inoperative," said H. Wayne Berens, vice president of industry affairs and corporate travel at American Express Travel Related Services Co. in New York and a member of the American Society of Travel Agents.

The shift to client/server within the hotel industry is a major trend that includes hotel chains such as Hyatt Corp., said Paul LeFort, senior partner of management consulting at Deloitte & Touche's travel and leisure industry and hotel office in Chicago. But, he said, client/server technology still poses systems performance concerns for the hotel industry because of its heavy reliance on computers.

"The client/server-type architectures have relatively embryonic backup-and-recovery capabilities," LeFort said.

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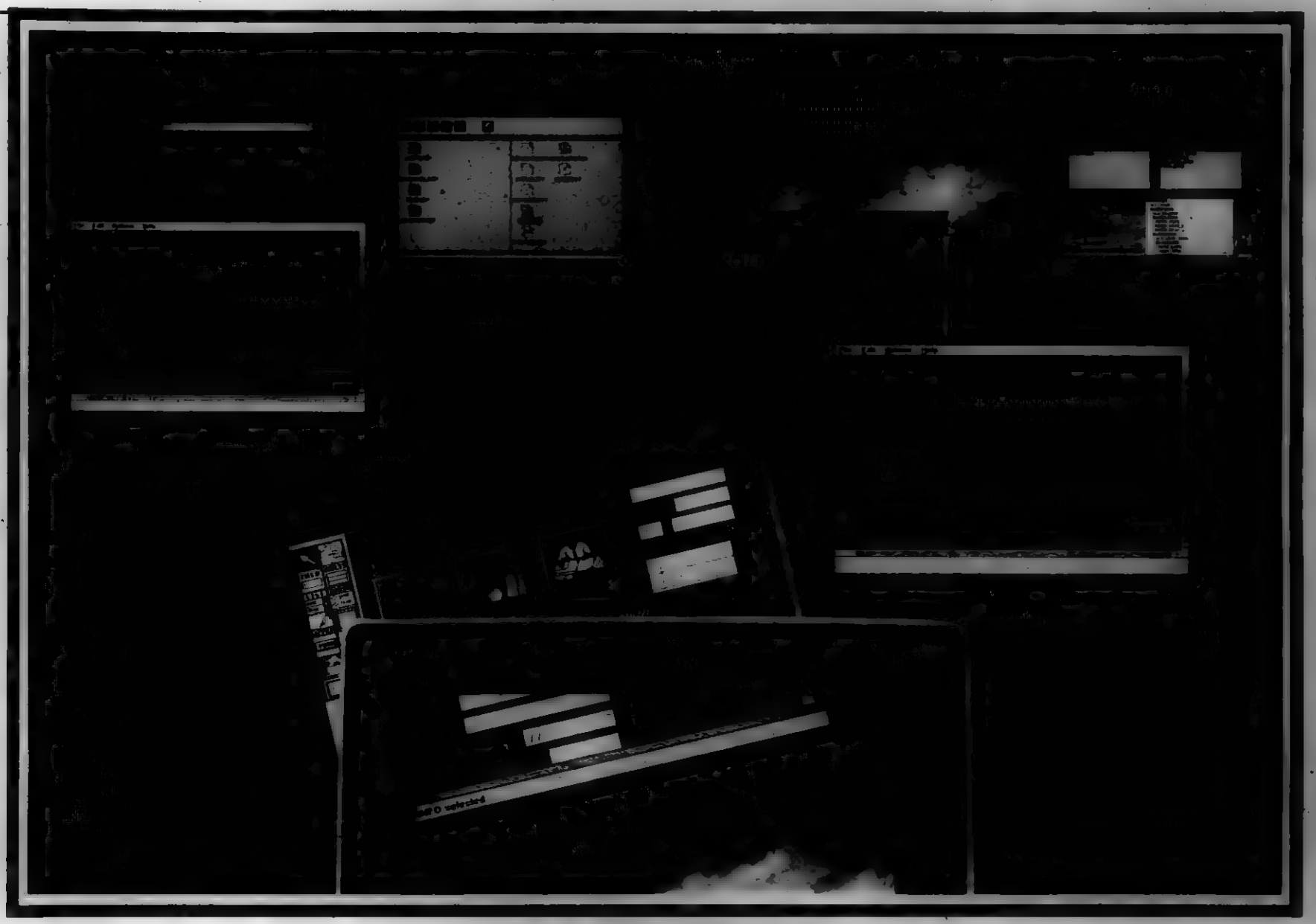

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E-mail extended to X.500 services

By Lynda Radosevich
PALO ALTO, CALIF.

The Wollongong Group will start shipping an electronic-mail package on March 1 said to include a Unix-based backbone mail server, integrated X.400 message handling, X.500 directory services and an end-user messaging application.

The company is targeting organizations that use Transmission Control Protocol/Internet Protocol (TCP/IP) for network transport and are moving toward systems based on the Open Systems Interconnect (OSI) architecture.

Called PathWay Messaging, the product will allow users to expand their E-mail systems without continually having to add complicated gateways that are required to link proprietary mail systems, said Doug Ambort, product marketing manager for Wollongong's OSI messaging and directory services.

Analysts said Wollongong's move introduces the company to a growing X.400 market.

"By 1996, we see X.400 passing the proprietary/de facto products like Message Handling Service, Simple Mail Transport Protocol and Systems Network Architecture Distribution Services," said Judith Rosall, program manager for electronic messaging at International Data Corp. in Framingham, Mass.

A step ahead

What distinguishes PathWay Messaging from X.400 competitor Retix's messaging software is PathWay's full implementation of the X.500 directory standard, said Eric Williams, senior systems engineer at Integrated Systems and Communications, Inc., a government systems integrator in Washington, D.C. Retix said it will provide a migration path to X.500 in the future.

In addition, PathWay provides end-user software, whereas competitors Soft-Switch, Inc. and Retix do not, said David Whitten, program director of the office information system service at Gartner Group, Inc. in Stamford, Conn.

Whitten said large organizations are pretty committed to X.400, which he described as the only well-defined, mature E-mail standard. But, he added, "Wollongong will have a tough market to crack because of entrenched LAN E-mail such as CC:Mail."

Need for openness

Virtually all major E-mail vendors provide gateways to X.400 and promise more complete migration paths in the future, Whitten said.

But for organizations such as the U.S. Navy, the need for open standards is here today.

"X.400 is important from a communications point of view because we envision the ship as a node in a global network," said Luther Blackwell, network systems engineer for the Navy's Integrated Interior Communications and Control project. "In order for messaging to take place between ships and shore installations with different E-mail, X.400 is going to be the common protocol to allow those groups to communicate with each other and the outside world."

The PathWay Messaging server will cost $9,495, and the stand-alone E-mail client will cost $195 for one node, with discounts for quantity purchases.

Dueling compilers arrive

By Christopher Lindquist
SAN FRANCISCO

tools

Borland holds a commanding lead in the C tools market. In 1992, Borland's C++ posted revenue of $431 million, compared with $58 million for Microsoft's C/C++ 7.0, according to Computer Intelligence/Infocorp, a Santa Clara, Calif., market research firm.

Borland International, Inc. and Microsoft Corp. will announce major additions to their C++ compiler lines this week. While Microsoft's offering may help it compete with Borland in the DOS and Windows arena, Borland's entry is intended to help IBM take on Microsoft in the operating system wars.

Microsoft will unveil Visual C++, the successor to its C/C++ 7.0 and QuickC product lines, at Software Development '93 (see story page 61). Visual C++ is something of a departure for Microsoft in that it integrates some of the development features of Visual Basic with the power of Microsoft's optimizing compiler, effectively allowing prototype and primary development in the same language.

Such code-generation tools have been available from third parties, but Microsoft is taking a lead in integrating such tools into the compiler, users said.

A variety of tools are available in Visual C++, including the AppWizard, which automates construction of a program's framework; AppStudio, a graphical screen painter; and the ClassWizard, which automatically connects the screen elements to C++ code. These tools will enable a developer to flesh out an application quickly and then go back and modify it.

For example, Jim Bohannon, a consultant in San Francisco, developed a skeleton of an application in about six hours using Visual C++. The same process had taken him three weeks using Microsoft's C/C++ 7.0, he said.

Visual C++ may help Microsoft compete with Borland in the DOS and Windows arena.

One limitation of Visual C++ is that it still does not include templates, something users reported they were expecting in this release. Templates can make it easier to provide an enterprisewide standard for applications developed in C++.

"The template-like thing they've included in the [Microsoft Foundation Classes] is not really templates," said Steve Emmons, lead software engineer at Micrografx, Inc., referring to Microsoft's set of C++ classes for things such as tool bars and dialog boxes. However, he added, that is not going to keep Micrografx from using the compiler. "It has made some significant improvements [over] C/C++ 7.0," he said.

Borland's C++ for OS/2 2.0 — which will also debut at Development '93 — does include templates.

"As a developer, I like it a whole lot," said Patrick Little, Comm++ product manager at Greenleaf Software, Inc., a maker of class libraries for several compilers. "It's a big step foward." Little said he plans to do most of his development with Borland C++ for IBM's OS/2 and then port that code back to other platforms.

CompuServe users in the IBM support forum have been asking about the release of Borland C++ for OS/2 for several months, and the advent of new tools can only help the OS/2 market. Borland is also reportedly working on the development of object technology for future versions of OS/2.

Both Visual C++ and Borland's C++ for OS/2 are slated for release March 1. The price for Visual C++ Standard Edition, which lacks some features as an optimizing compiler and a source profiler, will be $199.

Visual C++ Professional Edition will list for $499. Borland C++ for OS/2 will be available for a 90-day promotional period at $149.95. The retail price for the product will be $495.

SQL Server to get 32-bit upgrades

CONTINUED FROM PAGE 1

heavier work loads, longtime users said.

Both the NT and OS/2 32-bit SQL Server systems will have faster performance for several reasons: more memory, a multithreaded architecture that separates database tasks and the ability to store temporary database extracts in main memory. By pulling frequently used data into main memory, users can eliminate the paging and swapping to disk that slows overall response time. The OS/2 and NT 32-bit database systems can directly address 2G bytes of main memory, far outpacing the 16M-byte memory maximum for the 16-bit database systems.

The OS/2 and NT 32-bit database servers can directly address 2G bytes of main memory — far more than 16-bit systems.

Despite the advantages of moving to a 32-bit operating system, some SQL Server for OS/2 users have no immediate plans to migrate. "We are in production on mission-critical systems," said Bill Soper, manager of information services at Chevron Canada Ltd. in Vancouver, British Columbia. The Chevron Canada headquarters has been developing a suite of new administrative applications on SQL Server for OS/2 since 1989 and has found it takes six months to move from SQL Server Version 1.1 to Version 4.2. "We're not going to move too quickly until we're sure we've got a solid [32-bit] operating system," Soper said.

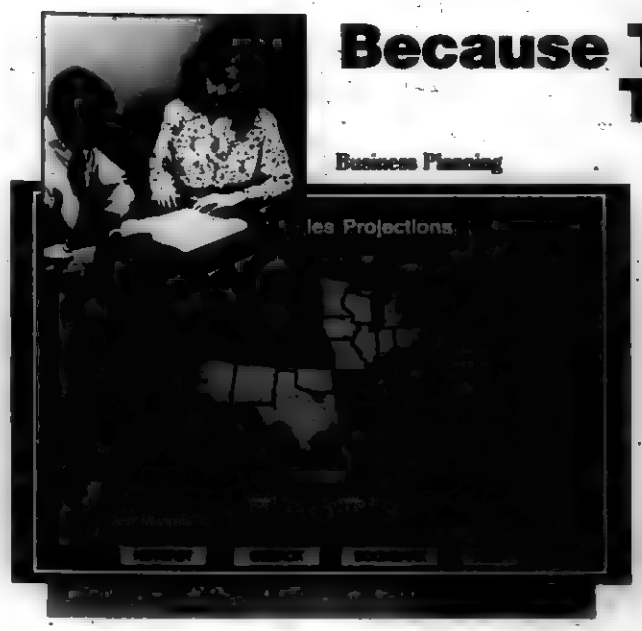
A year ago, Soper bought two Parallan Computer, Inc. servers for his SQL Server for OS/2 databases, allowing him to use 128M bytes of main memory. One database runs transaction applications for 40 users; the other has 40 users for decision-support applications.

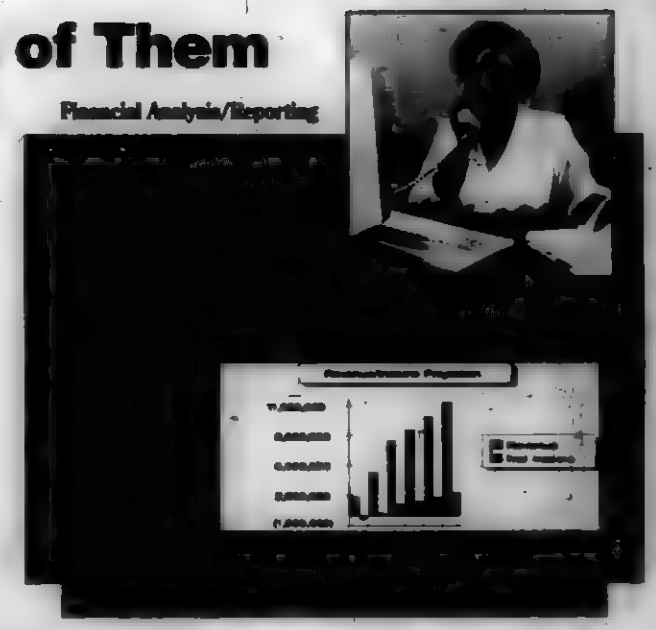
Boeing Computer Services' SQL Server for NT beta-test software is running appreciably faster than the OS/2 version, said Michael Smith, a software engineer at Boeing in Richland, Wash. The speed-up is because of the fact that users store frequently used database tables in main memory, thus avoiding inefficient paging and swapping to disk, he said.

"We've been beating up on the Compaq Computer Corp. SystemPro pretty heavily, and we're seeing differences in response times that are six to eight times better on queries that require data sorting," Smith said. The SystemPro, outfitted with two Intel Corp. 1486 33-MHz processors and 80M bytes of main memory, has been running the SQL Server for NT beta-test copy since last fall.

The firm plans to offer a "low-cost platform exchange option" to keep upgrade costs low for users who decide to migrate to SQL Server for NT, Voth said. However, he did not give any details about the NT version's pricing, including upgrade prices.

Work to develop a 32-bit version of SQL Server for OS/2 is in progress, said Sybase vice president of marketing Stewart Schneider. "The plan is to be able to ship it by the end of the year," he said.





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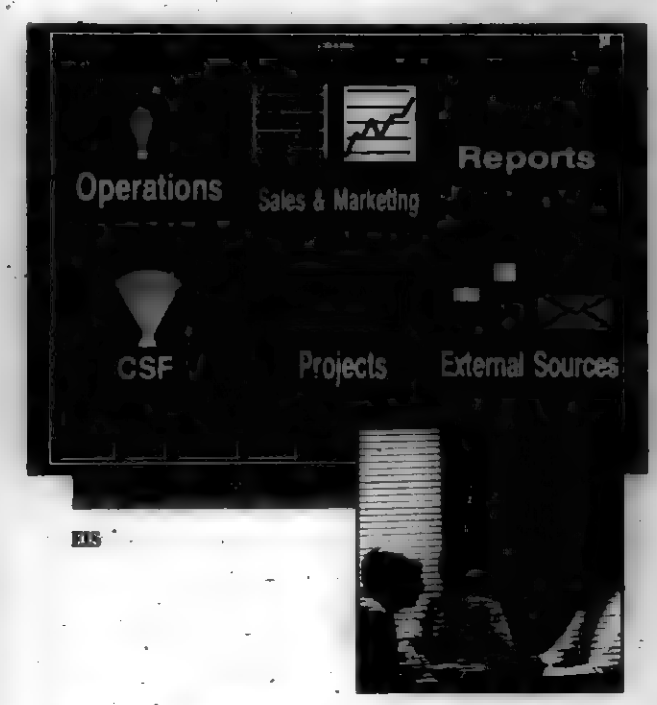

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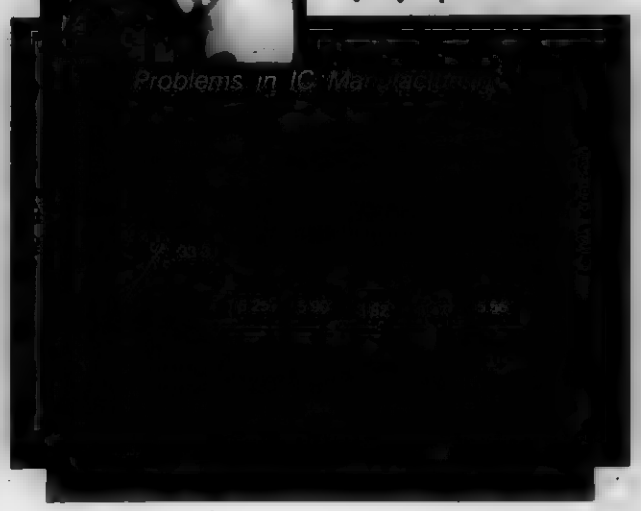

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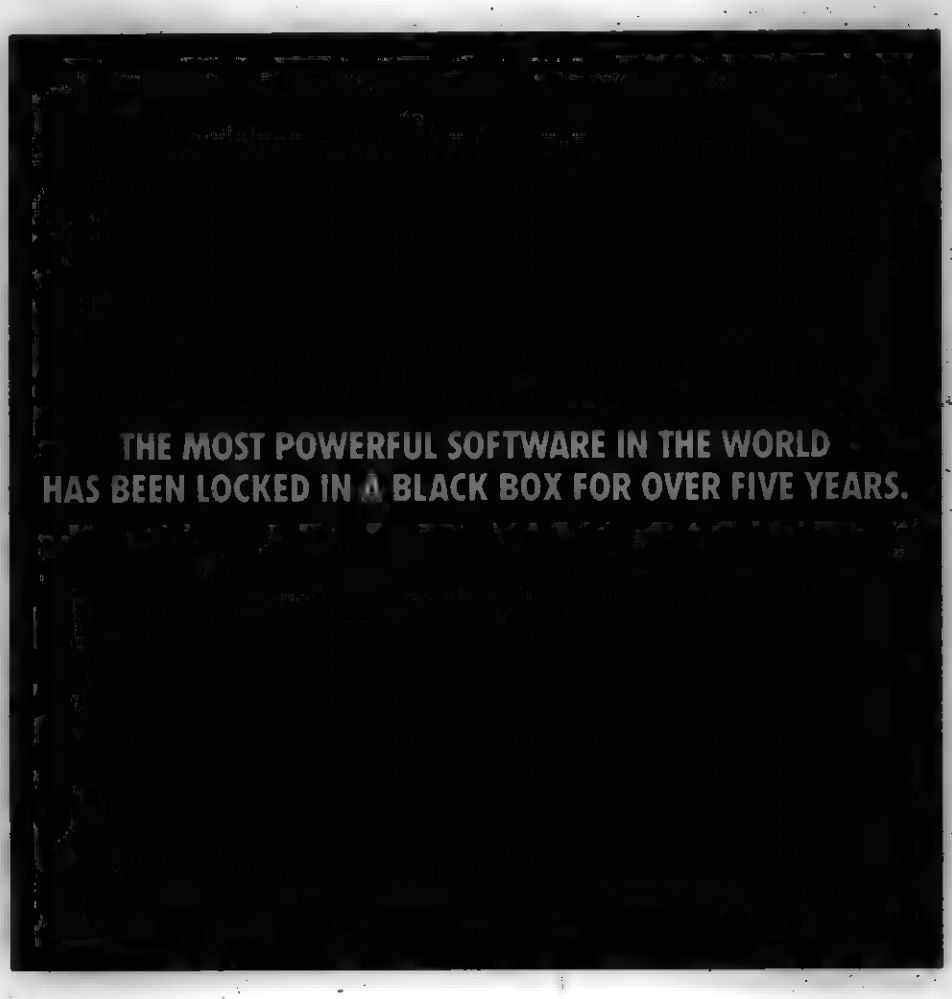

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THE OBJECT IS THE ADVANTAGE.™

Viral threat lingers

CONTINUED FROM PAGE 1

fion" DOS-based PCs worldwide.

The actual damage turned out to be much less, afflicting an estimated 20,000 to 40,000 PCs worldwide, according to Robert Bales, executive director of the National Computer Security Association in Carlisle, Pa. A spokesman for AT&T, for instance, reported that Michelangelo erased data on only two of the company's 250,000 IBM PCs.

And Charles Atterbury, coordinator of microcomputer security at Eastman Kodak Co. in Rochester, N.Y., said scanners found Michelangelo on only about two dozen of "several thousand" PCs.

In the aftermath, some observers said they feared the technohoed would cause managers to view their security personnel as latter-day snake oil salesmen. "We thought, 'Uh-oh, they're going to think we're crying wolf,'" said Kevin Hemsley, a specialist in the unclassified computer security program at the Idaho National Engineering Laboratory in Idaho Falls.

Yet the virus is actually set to detonate on March 6 of every year, so there could be future disasters if precautions are not taken.

Not to be taken lightly

The possibility of not taking viruses seriously frightens security experts. Computer viruses are real, they emphasized, just like grizzly bears — but they are not lurking behind every tree. "The hype was very exaggerated, but computer viruses are still a very genuine threat," said Bob Brown, a sergeant at the Los Angeles County sheriff's office and a co-founder of the High-Technology Crime Investigation Association, a 400-member organization of law enforcement and security personnel.

Instead, the Michelangelo episode only seems to have reinforced remedial security rules. "There was nothing particularly amazing about Michelangelo," Hemsley added. "Nothing that we couldn't stop doing what we are always supposed to be doing, which is scanning every disk before it enters a PC."

Ultimately, the Michelangelo scare gave end users a much-needed reality check, raising awareness about viruses and general precautionary measures. "Michelangelo finally drove the point down to the end user that security is a critical part of our business and not an add-on," said Catherine Englishman, acting supervisor in the computer security group at AT&T Bell Laboratories in Murray Hill, N.J. "Computer security can't work as an add-on."

The longest lasting result of Michelangelo, then, may be that users are less likely to slip an unscanned floppy disk into their computers. At AT&T, several workgroups have set up a schedule to scan for viruses, where none existed before, Englishman said.

Security awareness

Michelangelo also served to give credence to security warnings. "We kept telling the users to avoid public domain software; Michelangelo allowed us to point to a reason why," one security manager said.

Security managers said they will actively play off the awareness of the need for daily vigilance. At Du Pont Co. in Wilmington, Del., managers have begun an ambitious corporatewide security program that includes guest speakers and regular security bulletins sent via electronic mail.

"We were always security-conscious, but Michelangelo allowed us to be a lot more aggressive," said Dave Penaak, Du Pont's corporate adviser for computer technology.

Continuing education is a must. Dennis Evans, a systems analyst for data security at the Illinois Department of Revenue in Springfield, said Michelangelo helped propel the launch of a bimonthly security newsletter that he distributes to his company's 2,000 employees. "More than anything, I think that Michelangelo made people realize the necessity for protection," Evans said. "I'm not going to let people forget that."

Evans also noted that as a result of the scare, management has begun to approach computer security in a preventive, rather than a reactive, way. After getting quick approval from management, Evans updated security on his organization's Novell, Inc. network. "It went very smoothly, and I think Michelangelo may have had something to do with that," Evans said.

Added Bales: "If the Michelangelo scare served as a lever to sensitize upper management to day-to-day security concerns, then I think that all the hype was very useful."

Security experts said there could be dark consequences if Michelangelo's ultimate message of vulnerability is lost. This is particularly true among large bureaucratic organizations, such as the federal government.

"We may just need a disaster to happen before some organizations realize how important computer security is," said Angie King, author of the "Federal Computer Security Market 1992-1997" report prepared by Input, a research and consulting firm in Vienna, Va. "With the end of the Cold War, a lot of people are underestimating our security needs, and that's dangerous. They remain constant."

Precautions not taken

Two-thirds of the 600 firms surveyed by Dataquest, Inc. having fewer than 300 PCs received at least one virus strike this year. Only 15% of the companies said they had any type of antiviral software installed.

Wake-up call

VIRUS PROTECTION IS NO LONGER AN AFTERTHOUGHT

Did you run antivirus software specifically for Michelangelo before March 6?

Yes, as routine	19%
No	3%
Yes, in response to publicity	47%
Yes, before the hype but not as routine	30%
No response	1%

How much will your organization spend on computer and information security this year?

$0 - $10,000	28%
$10,000 - $25,000	11%
$25,000 - $50,000	9%
$50,000 - $125,000	15%
Over $125,000	29%
No response	8%

Source: Computer Security Institute

Michelangelo paints scary picture for unwary users

Can the Michelangelo virus strike again? It can and will.

Although it is unlikely that the virus will ever achieve the fiendish notoriety it did last year, Michelangelo was designed to activate *every* March 6, regardless of whether it is featured on the *MacNeil/Lehrer Newshour*.

Michelangelo is a memory-resident infector of disk boot sectors and hard disk partition tables. It is roughly based on the Stoned virus.

The virus works by going into memory the first time a user attempts to start the computer with an infected disk. Once it is memory-resident, it will infect disk boot sectors as disks are accessed. It will also infect the hard disk partition table as the user attempts to access a file on the hard disk.

On March 6, the virus will format the hard disks of infected systems by overwriting them with random characters from system memory.

While the treatment may seem to be as simple as setting the computer's date past March 6, some users who have tried this have lost everything on their hard disks.

Security experts agree the only effective treatment for Michelangelo is to use good antivirus software to find and remove it.

Finally, remember the three rules of data security: backup, backup, backup.

—James Daly

Vendors agree on Mips ABI

By Maryfran Johnson

SAN JOSE, CALIF.

A group of Unix system vendors, hoping to attract more software to the Mips Technologies, Inc. chip set, today announced specifications for the Mips Application Binary Interface (ABI).

An extended and enhanced version of Unix System Laboratories, Inc.'s Unix System V Release 4 ABI, the Mips ABI aims to provide independent software vendors with a single, binary-compatible port spanning several hardware platforms, including those from Tandem Computers, Inc., Silicon Graphics, Inc. and Pyramid Technology Corp.

Software written to the Mips ABI will run unmodified — without recompiling or relinking — on any member company's hardware.

Other members in the Mips ABI group are AT&T Federal Systems Computer Division, Concurrent Computer Corp., Control Data Systems, Inc., NEC Corp., Olivetti USA, Pellucid, Inc., Siemens/Nixdorf Information Systems, Inc. and Sony Microsystems Co.

Honorary members

Oracle Corp. and SAS Institute, Inc. are also working with the Mips ABI group, whose member companies claim collective 1992 revenue of $3 billion in the Unix market and more than 140,000 users worldwide. The group, which first came together as part of the failed ACE consortium, is concentrating its efforts solely on the Mips reduced instruction set computing processor and Unix System V.4 operating system.

Although each member company runs a Unix-based operating system, none of them are identical, and few software developers could afford to port applications to all of them, said David Lee, manager of application software marketing at Pyramid.

Alongside Oracle and SAS Institute, 13 software vendors this week announced their commitment to support the Mips ABI in their products. The products include Empress Software, Inc.'s relational database management system, Frame Technology Corp.'s FrameMaker and FrameViewer, Information Builders, Inc.'s Focus fourth-generation language, Interleaf, Inc.'s document creation software, IXI Corp.'s X.desktop manager and Mentor Graphics Corp.'s electronic design software.

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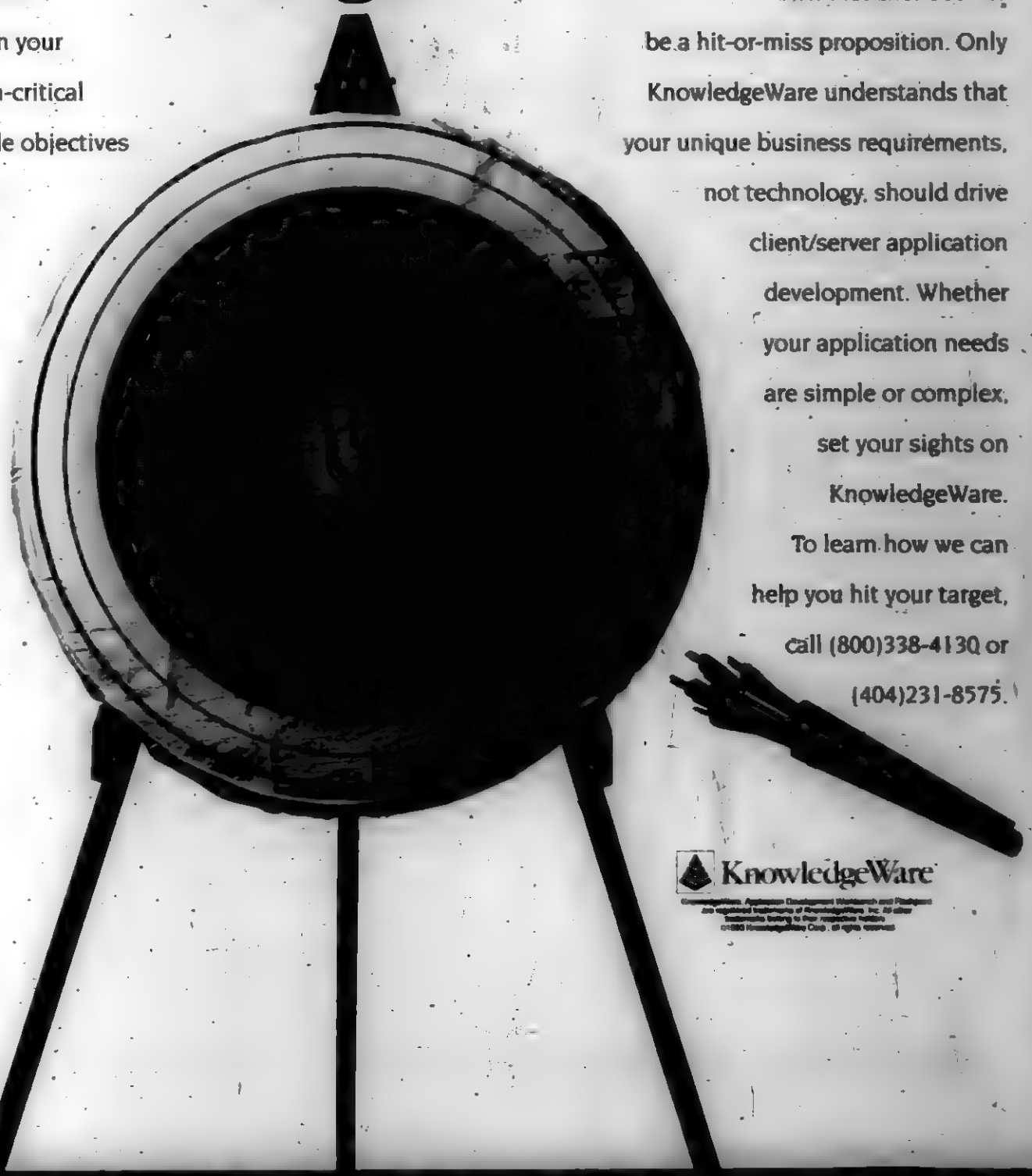

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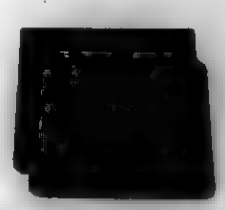

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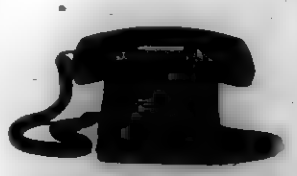

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Robert Palmer

Face to Face

DEC's chief executive officer talks about Alpha and the transition to open systems

Q. What have been the most satisfying accomplishments of your first 4½ months?
A. Getting costs somewhat under control and doing so ahead of expectations. Although our second quarter was a loss, it was less than had been anticipated. It's been satisfying getting as far as we have in defining our new business structure. I'm quite pleased with the progress we're making with Alpha. We're somewhat ahead of schedule on software programs, with more than 2,000 applications committed to Alpha AXP. The momentum seems to be building.

Q. What have been the biggest surprises?
A. I have been struck by how many customers want Digital to be successful and are pulling for us. We need to get organized in customer-focused business units so we can establish contact with those customers and show that we are a different Digital than we had been.

Q. You said you hoped to change the culture at DEC. How have you progressed against that goal?
A. We have been criticized in the past for having such a highly matrix organization that accountability was lacking. Some of that criticism was justified. We've tried to make sure that accountabilities are clear, but this is a large enterprise, and it's going to take a long time to get all these messages across. As we shift over to a business unit model in fiscal 1994, each business unit will be measuring itself against the markets they're playing in. The PC business, for example, is quite different than the model for health care.

Q. How do you prevent these different ways of operating from confusing the customer?
A. The goal is to have the account manager as the interface. But that manager has to have the ability to draw on the resources of the organization. We're trying to eliminate layers between the customer and the chief executive: My goal is to get that down to four or five layers.

Q. You have committed to supporting three industrial-grade operating systems — Unix, Microsoft Corp.'s Windows NT and Open VMS. How do you plan to keep those choices straight with customers?
A. Customers are not saying they want to buy an operating system; they say they have a problem to solve. We have the capability to support [multiple] operating systems. In the past, we were reluctant to get behind Unix, and that hurt us. We now intend to be a leader in open systems and in Unified Unix.

Q. How important to you is it to have a second source for Alpha?
A. It's important but not critical. Our objective is to establish this architecture as the standard, and that means you have to have availability. The semiconductor people will be hesitant to go into a major architecture unless they see broad market acceptance, and I think we're beginning to see that now. In the meantime, we're on plan.

Q. Are you in discussion with Intel Corp.?
A. Not at this time. We talked to Intel, but that was more than a year ago. We're in discussions now [with a major chip maker], and I'm pretty confident we'll have a major announcement in the next few months.

DEC's Robert Palmer seeks to eliminate layers between the chief executive officer and the customer.

Q. Why are you undertaking such an aggressive PC push when the margins are clearly shrinking in that business?
A. Most of our businesses these days are extremely competitive, so there's nothing different there. Our customers buy a lot of PCs, and if Digital's going to make any money in that sale, we have to design and manufacture those products ourselves. I would not want to become just a distributor of PCs because there are no margins in that. We want to become a manufacturer and distributor both. We also have the advantage of a worldwide service structure, which most of our competitors don't have. So, if you want a vendor that will sell and service the product worldwide, Digital is among the two or three companies that can do that

Q. Does it concern you that Hewlett-Packard Co. is about to pass you as the second-largest computer company?
A. What concerns me is that we provide customers with solutions and return to profitability. HP got ahead of the industry in open systems a few years ago, and you might remember that there was concern at that time about the transition they were making. They came through it, and now they're enjoying the results. I think as we get this [current trouble] behind us we're going to reap the benefits of being a leader.

Q. HP has 20,000 fewer employees than DEC. Do you look to emulate their model?
A. We don't emulate another company's model because our business models are somewhat different. HP is very strong in instruments and printers. We're much stronger in professional services and consulting, and that's a people-intensive thing.

Q. The cuts you made in your software portfolio were less than many people expected. Will there be more?
A. I think more cuts are necessary. [I don't know what they'll be], but we will make sure whatever we do doesn't create undue difficulty for customers.

Q. You are targeting specific vertical markets. How do you reassure customers in markets you haven't identified as strategic?
A. All customers with a purchase order are important to me. But in internal investments, in some industries we will not have the same level of support as others. We have to get focused. In those we choose to participate in, we are in a leadership position.

Interview by Paul Gillin, *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

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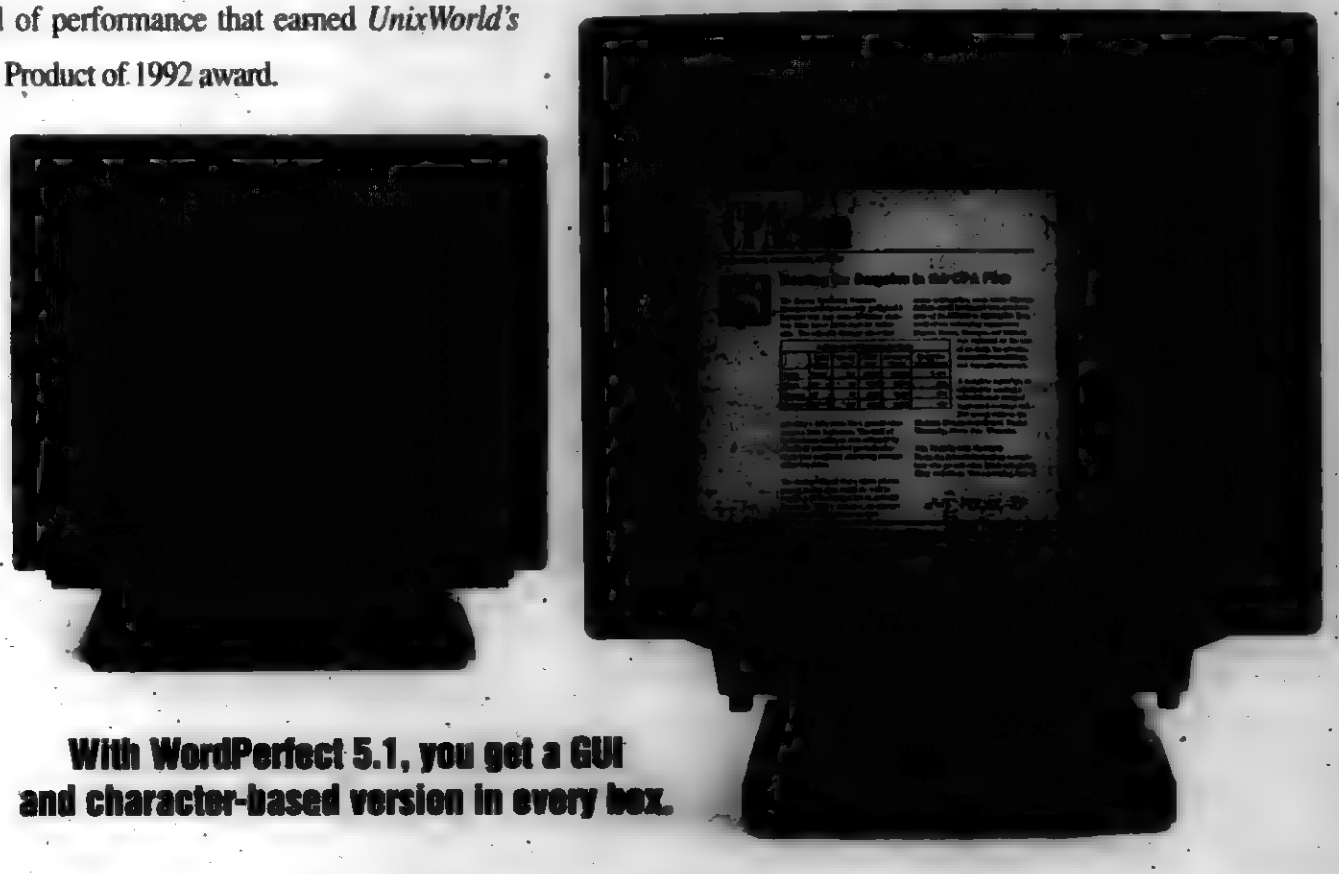

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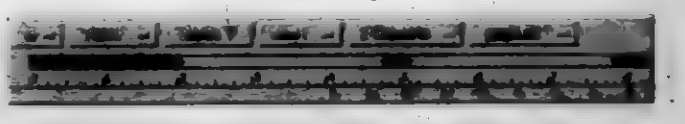

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No pain, no gain

There will be lots of grumbling in corporate boardrooms this week about the Clinton administration's plan to sock it to the wealthiest wage earners in the form of higher taxes and fewer deductions. But all things considered, I'd say the computer industry came through the president's tax package proposal in pretty good shape last week.

Although the Clinton plan will hit large corporations across the board, several provisions play to the strengths of the technology industry. Chief among them is the 7% investment tax credit. This on-again, off-again incentive, which was eliminated eight years ago, had been a major stimulus to corporate investments in computers and technology.

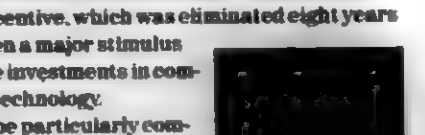
It should be particularly compelling this time around as the real estate crash and surplus plant capacity has muted some of the enthusiasm to invest in plants and equipment. This administration clearly believes that dollars spent on computers and communications is money well spent. Let's hope other incentives lay ahead.

The other bit of good news for start-up firms, in particular, is the provision for capital gains relief for investors who put money into small businesses for at least a five-year period. Entrepreneurism is the heart of high tech. Witness the fact that 15 of the Top 25 companies on *Inc.* magazine's 500 list are in the computer and communications fields. With the old line corporate giants reeling under the weight of their own bureaucracies, the time is right for investors and customers to look to smaller concerns. The Clinton package contains incentives to do exactly that.

The surtax on energy consumption won't win any popularity contests but should be a boon to sales of computerized products that can cut energy costs by 25% or more (not to mention energy-efficient "green PCs"). The package also preserves corporate R&D tax breaks and actually proposes modest increases in government spending on basic science research.

I may be reaching a bit in trying to find a silver lining here. In the short term, the incentives for high-tech investment won't offset the whack that major industry players will take from defense spending cuts or that the PC business will feel as higher personal taxes put the squeeze on home computer sales. But I have a hard time finding fault with a tax plan that penalizes multimillion-dollar executive bonuses in order to preserve the viability of small businesses.

We will all pay plenty to climb out of the deficit hole previous administrations and Congress have dug for us. But we should not do so at the expense of the technology innovation that still makes the U.S. the envy of the world. The Clinton tax plan is at least a start in investing in the future.



Paul Gillin, *Executive editor*

What's Next?

Jim Daly's article "Next to cool black box, push OS" [CW, Jan. 25] gives an excellent synopsis of the history and plans for Next. Unfortunately, it devotes only one paragraph to Cubbage's concise analysis of the Achilles' heel that continues to prevent Next from enjoying the success it might otherwise: Jobs' utter disregard of open systems standards.

As your editorial noted in the same issue: "Arrogance and smugness have no place in today's market." Jobs' approach to operating systems is nothing if not arrogant and smug.

This has been the main cause of the limited success of Next the hardware company and will guarantee that Next the software company is at best a niche player of little consequence. Actually, a more likely scenario is another palace coup in which those funding Next force Jobs to add X/Open compliance to his darling operating system.

I predict that Jobs at Apple developed the last successful proprietary operating system and that Jobs at Next will prove it (to have been the last).

George Pajari
West Vancouver, British Columbia

Warning helped

I have read many letters to the editor in different publications, all with the same conclusion as Rob Rosenberger's [CW, Feb. 1], and each time I wonder at the failure [of experts] to grasp this fact: The reason so few computers succumbed to the Michelangelo virus last March 6 was because of all the publicity and resulting protective measures taken.

I am an MIS manager, and we found Michelangelo on disks distributed by one of our software vendors, and it never made it to our local-area network. If we had not been prompted to scan disks and hard drives for viruses as a result of the "scare" of Michelangelo, it would surely have made it onto the network hard drives, and from there who knows where.

Not once have I seen any publication give credit to the scanning software available or to the warnings in trade journals, etc., as reasons why the impact of Michelangelo was so slight.

The 5 million [estimated] figure may have been potential targets of the virus. Without checking and scanning, it probably would have been an "actual" number.

Thank you and other publications for raising the warning flag for us; it saved us substantial grief.

Gary L. Allen
Bountiful, Utah

C++ is poor business choice

I disagree with Scott Koehler's commentary "The scoop on OOP" [CW, Feb. 8] because his analysis focuses on narrow technical concerns, not business issues. Modern businesses and organizations depend on software in every aspect of their operation.

This dependency defines the objectives of application development groups: creating more reliable applications, doing so more quickly and rapidly modifying those applications in the face of evolving user needs.

C++ — Koehler's recommended object-oriented programming language — was designed around the question: How much object-oriented capability can I provide without any runtime performance cost?"

While C++ is an excellent response to this question, its fundamental orientation on performance is irrelevant for a typical application developer. C++ applications are easily two to three times as hard to build as applications based on Smalltalk, Choreographer and other high-level object development tools. Except in systems programming tasks, the actual performance benefits of C++ are minor compared with its enormous development costs.

Corporate IS management needs to look at the business concerns, not the technology. The issue is how to make your organization more responsive to customer needs. C++ is a poor choice based on this criteria. I would urge members evaluating object technology to look beyond low-level performance issues and focus on real organizational needs.

Jeffrey Bonar
Pittsburgh

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Windows: Calling it awkward would be kind

Bruce J. Muckian

The large and increasing market share garnered by Microsoft's Windows is proof positive that P. T. Barnum knew what he was talking about when he said, "There's a sucker born every minute." An addendum to Barnum's statement might be "and many of them purchase computers and software for large corporations."

When is corporate computer management finally going to realize that forcing Windows on computer users is like making a secretary take dictation while holding a pencil with a pair of pliers and a notepad in a catcher's mitt?

Despite the programmed responses of cultists who sing the praises of Windows, I have never seen any evidence that it made my work with applications software any easier. Windows delays initial startup of application programs and then lies dormant, hogging precious memory until I have to get out of it for some reason or until it trashes my work because of some unexplainable Unidentified Application Error (UAE).

When I first heard about Windows, I was told it would contain the common I/O routines that most applications were duplicating. By reducing the number of I/O routines, printer fonts and other duplications of effort, Windows would supposedly reduce application program size and hardware requirements. Instead, what we find today is that Windows hogs up to

10M bytes of hard disk storage and has caused applications programs to grow by a factor of two to four times their original DOS-based size.

Personally, I'd like to turn back the clock and go back to the more efficient days of DOS.

I'd rather have a stand-alone version of Microsoft's Excel running from my DOS prompt than have to wait for Windows to go through all of its memory-grabbing gyrations before I can even get near the Excel applications programs. That way, I'd also be able to make a nice clean exit back to the DOS prompt or my MENU system instead of being stalled by the Windows window, which I am required to close in no less than three steps.

Adding new applications to the Windows environment is also a trial. Third-party software installation routines are almost never user-intuitive and require more than a rudimentary knowledge of computers.

Sometimes things just don't work the way they are supposed to. The user is then faced with the ubiquitous UAE, which seems to be Windows' response for 80% of all problems. By the way, there is no on-screen Help for a UAE. How could there be? Windows doesn't even know what the hell is going on.

I attribute the fact that Windows is still at the top of the charts in software sales to the same kind of dronelike thinking that used to cause corporate computing managers to recommend and purchase only IBM hardware, defending their choice by saying, "No one ever got fired for buying IBM."

They should have been fired! There were and are other systems on the market that are just as good, if not better, and a whole lot less expensive than IBM.

The same holds true for software — and especially for Windows.

Muckian is a systems analyst at The Boeing Co. in Seattle. He works with Windows 3.0.

If nothing on E-mail is private, just say so

OPEN MIND *by* Esther Dyson

Should you read your employees' mail? Your mother would say you shouldn't; it's not polite. The corporate controller might say you should so workers don't waste company resources. After all, they're at work; what do they expect?

That's the key question: "What do they expect?"

There has been a lot of discussion lately over electronic-mail privacy. Some of it involves important constitutional questions and interpretations of old laws in new media. But as far as workplace rights are concerned, the new technologies don't really change the old verities: Make the rules. Make them clear. And enforce them fairly.

Almost any policy is OK as long as it's clearly expressed, not just "understood." The vital thing is to make sure workers know the rules about E-mail, just as they know how long they can take for lunch and whether it is OK to use the phone for personal calls.

Most employees can live with a policy as long as it doesn't hit them as a surprise. On the other hand, it is embarrassing, degrading and unfair to have something you thought was private waved in front of you as evidence of malingering, insubordination or dishonesty. If someone knows her mail is open to inspection, she probably won't exchange embarrassing poetry, call the vice president of sales a pedantic idiot or send little notes for her kids to the family PC.

The fairest thing to do is to make sure that the limitations of E-mail privacy are spelled out from the start.

Some limitations are inherent. No company can guarantee complete E-mail privacy even if it wanted to. Personal E-mail could be read in error by a systems administrator, by someone legitimately borrowing a machine or by someone filling in when the user is sick. Other people may need to read an employee's mail for business reasons (and not just after you've left the company, as in the Borland/Symantec case). And sometimes mail is misaddressed.

People with truly private or embarrassing mail of any kind are better off sending it from home — or perhaps not at all.

Then there is the need to safeguard other employees' rights. An individual who receives offensive or time-wasting mail from a persistent source has every right to forward it to management and ask for help in stopping the offender. That's not an invasion of the sender's privacy; the sender's behavior is an invasion of the receiver's privacy.

Even if you, as a manager, promise to keep E-mail private (or as private as possible) you can still impose and enforce rules governing the use of company time and money. In principle, employees are free citizens and have the right to send mail to anyone they want. On the other hand, workers who waste people's time (after being warned) don't necessarily have a right to keep their jobs.

Again, it's more a question of judgment than of rights.

What if employees don't like the rules? What if you, as the person who has to enforce policies, don't agree with them? You have a choice: Compromise or leave. Jobs that involve principles sometimes require sacrifices.

In our private lives, where we are not (realistically) free to choose, we should be able to be free from surveillance — either by our company or by the government. On the job, however, all an employer really owes an employee is a clear statement of what's private and what's not.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.

Charles Babcock

A barrier crumbles

Proven, useful Unix concepts seldom make it across the barriers of chemistry and culture into the world of PC software developers. Like oil and water, these two communities tend not to mix.

This tradition of standoffishness makes it all the more surprising to find a key concept of Unix — the flexible network "socket" — being adopted on behalf of PC Windows applications.

The Windows Socket Application Programming Interface, or WinSoc API, will make it easier for Windows applications to connect to other PCs, Unix workstations and servers. It will give Windows users access to many variations of TCP/IP networks, the fastest growing way for interconnecting different computers.

The making of sockets for Windows was a case of quiet collaboration. The concept was first proposed by JSB Corp.'s Martin Hall at the Interop '91 show in San Jose, Calif.

JSB is a supplier of windowing interfaces to Unix machines, and Hall pointed out that without a common specification for networking Windows applications, a variety of TCP/IP products would flood the field.

Four or five varied approaches already characterize the TCP/IP implementations for Unix workstations and DEC's VAX, but the problem is being compounded by sheer numbers in an expanding PC market. An estimated two dozen implementations already exist for PCs. That number could easily double as TCP/IP, which has earned its stripes on the Internet, becomes the protocol of choice for linking PCs to dissimilar machines or to networks beyond the PC LAN.

By 1997, 23% of PCs will be attached to a TCP/IP network, according to International Data Corp.

In this context, the significance of the WinSoc API is hard to overestimate.

When a Unix application needs to access the network, it calls on the operating system to create a socket. The socket is generated using variables that match the needs of the application to the network protocol stack. This approach gives the user independence from a brand-specific network. But to gain this flexibility, the operating system relies on calls to underlying libraries that invoke vendor-specific procedures.

Under Windows, the Dynamic Link Library (DLL), called from a file on disk, contains the procedures, and without a WinSoc API, vendors would have to compose DLL-tapped procedures as each saw fit.

Group result

The working group for the WinSoc API produced a 140-page specification, available to all, that outlines what each DLL procedure should be.

In addition to JSB, the group was drawn from FTP Software, which supplies TCP/IP products for PCs; SunSelect, which supplies Sun Microsystems' Network File System for PCs; and Microsoft. Communicating over the Internet, members hammered out Version 1.0 of the specification, which was subjected to a stress test last October.

Now, after some additional changes, Version 1.1 has been published and may be used as the basis for commercial TCP/IP implementations.

Instead of struggling to stay abreast of TCP/IP variations, Windows developers can compete on function and features, adding value to their applications. Users can plug into their TCP/IP networks without worrying about whether a particular application happens to work with their TCP/IP network.

It makes you wonder why the PC and Unix development communities don't get together more often. Maybe they could even start to heed each other's best ideas.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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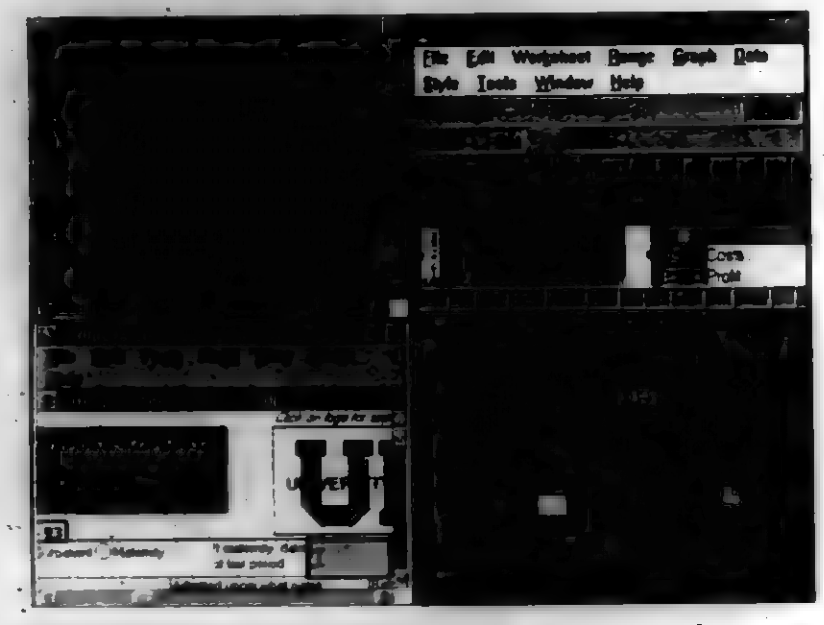

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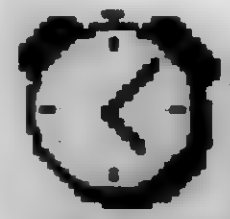

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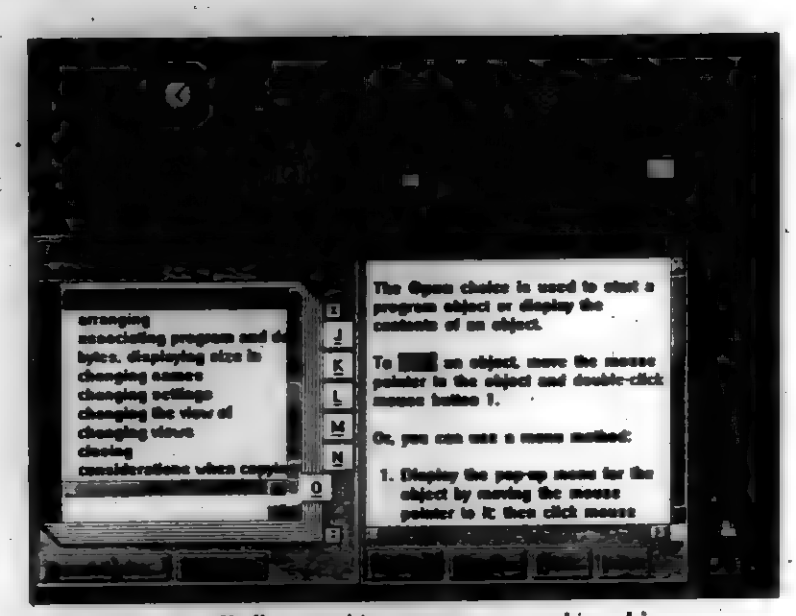

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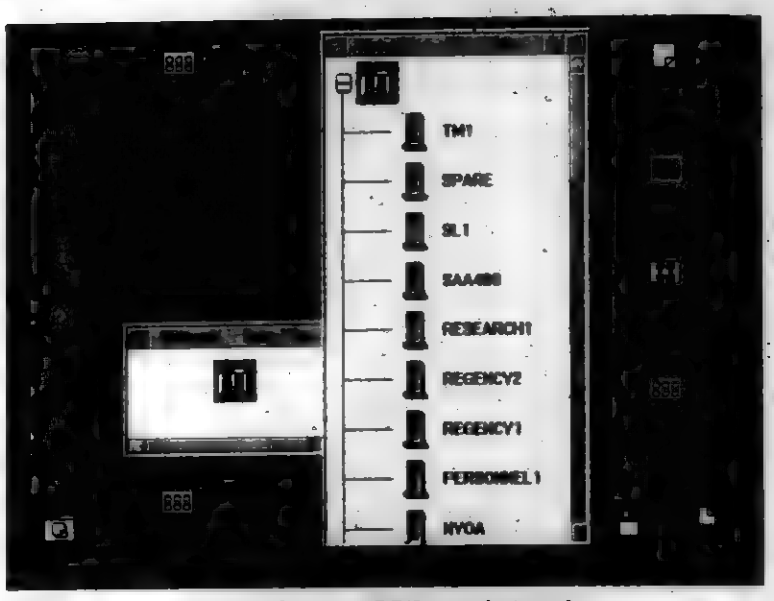

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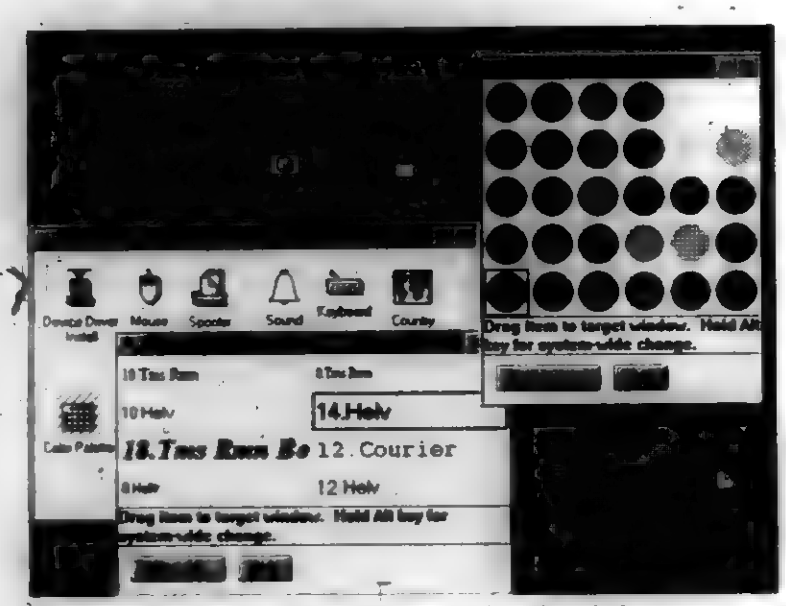

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User Voices

Managing the mishmash

Question: What is your strategy for managing/supporting multiple personal productivity applications throughout your company?

➤JOHN TRAENDLY, *a group director of Ryder technology at Ryder System, Inc. in Miami.*
The approach we are taking is to try to establish standards that still leave users with some options.

We need to provide broad support, and you really can't do that unless you at least have some defined set of software. In addition, those standard applications have to exist with the applications we are developing and work together successfully.

One way we address that is that we hook internally developed software into WordPerfect to produce customer proposals.

In addition, we are strongly encouraging everyone to move to Windows. We just purchased a suite of integrated applications — Microsoft Office — and we will encourage its use because of the price advantage and its high level of integration.

(Editor's note: Microsoft Corp.'s Microsoft Office integrates the Excel spreadsheet, Microsoft Word word processing, the Microsoft graphics package and a one-node license for Microsoft Mail.)

We are trying to decentralize the process so users can get what they need quickly, but we give users buying/integration guidelines, such as through the PC guide we have published. Long term, some uniformity will reduce the training costs. If you don't have some standardization, training would become unmanageable.

➤ROBERT HECHT, *vice president of investment systems at Prudential Investment Corp. in Newark, N.J.*
Our focus is determining the cost of doing something in a standardized way vs. giving people a great deal of flexibility. You could take a path with a certain spreadsheet and find that the cost of changing the user's software — even if it's better — may not really be cost-beneficial in terms of training costs.

We make a recommendation that we find has worked for the majority of our customers. We have about 25 to 30 applications on Windows, and as the business drivers warrant, we migrate people to a Windows environment.

We cannot dictate which application a user will run, but they do have to present a business-driven case. We have to support the package, we have to put it on the LAN, and we have to make sure it works properly.

So, we charge back everything that we do. If somebody wants something that we don't have out there, we will give them a cost and they will be charged.

➤JOHN CHAMBERLIN, *PC coordinator at British Petroleum Oil Co. in Ferndale, Wash.*
We originally had separate groups of applications for advanced users and for novice users. Then Windows came in and, at the time, people brought in various Windows applications.

So, things went from pretty good to kind of bad to awful.

About six months ago, we came out with a strong standards statement, and approximately 50% of our people responded to it.

And in the last six months, the other 50% have started coming around because they've realized they can't share their work without the standard software.

For me, this is much easier to support, and for users, the gates are open for teamwork.

➤JUDE GARTLAND, *senior vice president at Lehman Brothers in New York.*
We have set up numerous committees to look at ideas for standardizing applications. We are differentiating strongly between developers and users.

We feel that we should take a much harder stance with developers, whereas with end users, it's much harder to set standards.

"Enforcement" is a word we will use with developers; some things we choose will become mandatory for them.

If we choose the Borland compiler, for example, we will enforce that pretty strictly.

End users will have less defined standards.

For the people going forward and making a shift to Windows, that's a marvelous time to try to help them switch. But you can't force someone to give up an application they've been using.

The least we want to do is put a burden of proof on users — to require that they make a strong business case if they want something nonstandard.

Standardization would help users in workgroups because they would be working with the same packages.

Then there are the economics. You can get a better deal with one spreadsheet vendor for many licenses instead of four different vendors.

I think there are going to be a lot of voices in this process. It's more the committees who will make the decisions. It won't be IS.

➤JOHN [illegible], *vice president of computer services at Unum Corp. in Portland, Maine.*
We are trying to focus on a desktop environment that's consistent, so we've rolled out Microsoft Office.

We are upgrading managers in the application development area all over the corporation. What we are finding is that while you may use one application, you are familiar with about 80% of the others. This is really proving to be a good investment.

My experience is that moving from character-based to graphical-based applications is about all the incentive you need.

We approved Windows 3.1 and then a tool set for it. Windows 3.1 is the supported graphical standard. We don't push people, but it is the only one supported. That is how you help people move.

We are not just moving everybody en masse.

Responses compiled by senior editor Rosemary Cafasso. Comments have been edited slightly for clarity.

USER voices

In the "User Voices" column rotating throughout our technical sections, Computerworld shares user opinions solicited at random on computer-related issues. This week, users speak out on their efforts to integrate and support disparate personal productivity applications companywide.

High-tech firms form customer support initiative

By James Daly

Overloaded technical support lines have become a sore point for a high-tech industry that once prided itself on the image of being simple and foolproof. Confusing manuals, endless busy signals and callbacks that sometimes take days are common and frustrating to users, as well as vendors.

What's being done? In recent weeks, 19 high-tech companies have formed the Customer Support Consortium to compare notes and come up with some way to untangle the problem-solving business. The development project is ultimately expected to produce a set of software tools and applications that it vows to pass on to the user community.

Support vendors
Many vendors are beginning to look to customer support as a way to differentiate their product and stay ahead of the competition. Companies such as Apple Computer, Inc., Microsoft and Intel Corp. are among the firms that offer customer support contracts.

The consortium grew from a simple strength-in-numbers idea. "All of the vendor community is facing the same support problems, and we can't resolve them on our own," said Craig Chelius, consortium director and vice president at member company Symbologic Corp. "We've got to help each other out."

The job of providing adequate support to the growing number of users facing the daunting challenge of moving to client/server environments has pushed many vendors to the breaking point. "Every organization is faced with the paradox of supplying better quality and improved timeliness of customer support while at the same time, demand grows," said Robert Haubner, customer support manager at member company Intel Corp.

Support problems affect everyone from the small to the tall. In a highly publicized internal memo that was leaked to the press more than a year ago, Microsoft Corp. Chairman Bill Gates complained: "It is really embarrassing that people have to wait so long on the phone to talk with us about problems in our products.... The number of customers who get a bad impression because of this must number in the millions worldwide," Gates said.

The consortium's plans call for the development of an open client/server application known as a "product knowledge management system." It will be designed to supply instant information about what went wrong, why and how to fix it. The

Customer support, *page 40*

Spotlight on multimedia, comm at Demo '93

Products include tools to update PCs, scanning software for Windows

By Christopher Lindquist
INDIAN WELLS, CALIF.

This year's Demo show once again highlighted products that have the potential to open up new segments of the computer industry.

The emphasis this year was on multimedia and products — both available and not yet available — intended to enhance business communications via the PC.

Featured products included technology from Burlington, Mass.-based Watermark Software Corp. that allows scanned images to be appended to a Microsoft Corp. Windows application that supports Object Linking and Embedding, including databases. The software also allows the images to be appended with a variety of highlighting tools.

The introductory version, Watermark Discovery Edition, is slated for availability in April, and the Pro Edition is due in the third quarter. The Discovery Edition is aimed at small groups of up to 100 people who want to try image-enabled applications. The Pro Edition will contain optical character recognition of scanned documents.

Also featured were a variety of tools designed to help get information into a PC and keep it updated. Among the participants was Smartsync for Windows, a product planned by Nomadic Systems, Inc. in Mountain View, Calif. Using Smartsync, users would reportedly be able to keep files on multiple machines continuously updated to maintain data integrity on, for example, an office PC and a laptop.

Kiva conferencing

A more real-time use for connected PCs was demonstrated by Tucson, Ariz.-based Artisoft, Inc. Called Kiva and due for release in the first quarter of 1994, the product allows for conferencing over a network. According to the company, the network acts as an electronic conference room in which participants take part in rules-based meetings.

The advantages over a traditional meeting, according to the firm, include the ability to keep extremely accurate notes and provide anonymity to the participants. Long-range plans for the product include the ability to teleconference.

On a more personal level, San Diego-based Octus, Inc. demonstrated Octus1, a system that allows information from phone calls, including caller identification, fax sending and retrieval and digital signals such as voice to be stored in a personal information manager.

The Key to Business

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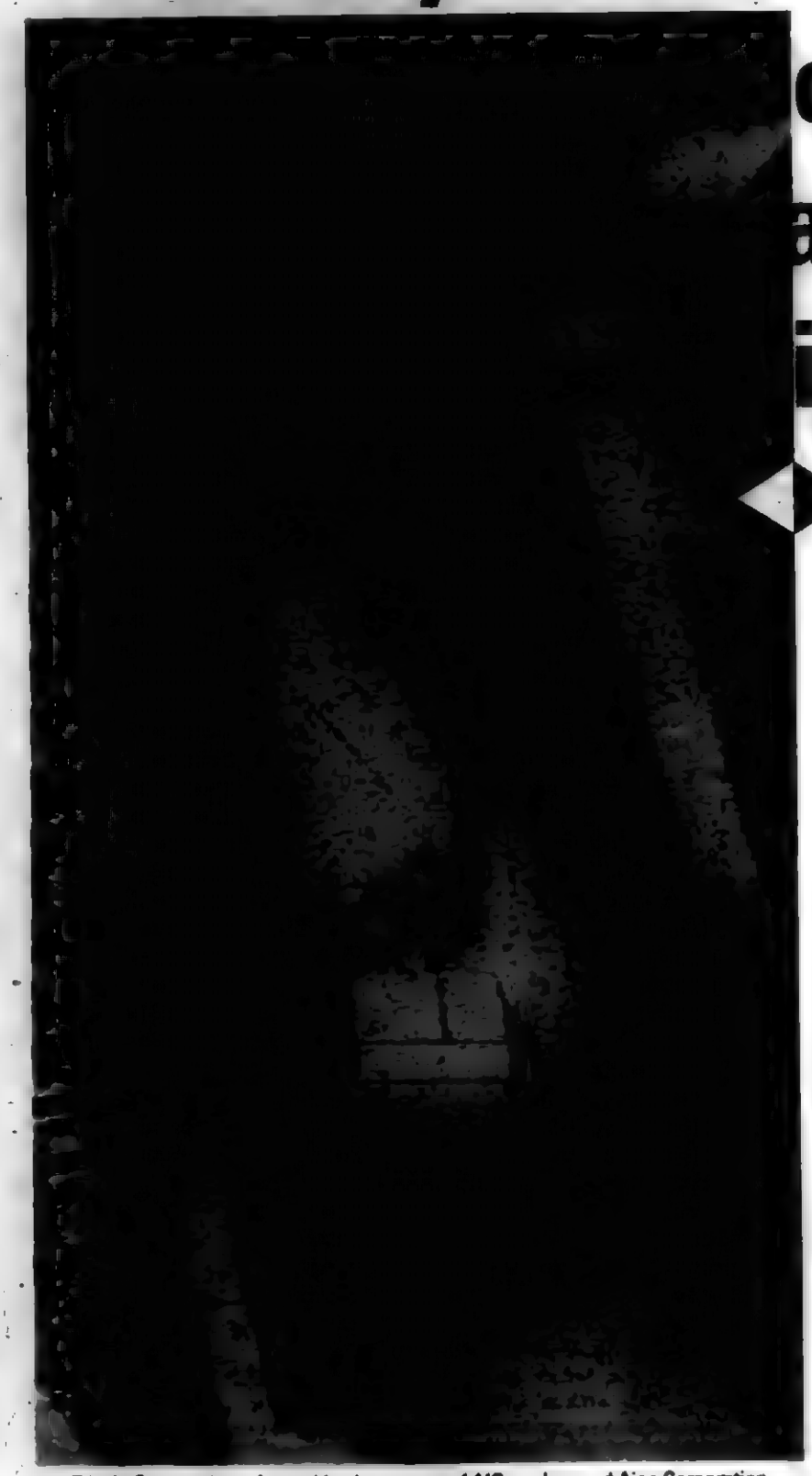

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Customer support initiative formed

CONTINUED FROM PAGE 39

system now under development includes software tools and applications that will automate the acquisition, management and use of large and complex bodies of product knowledge.

The package will then be distributed to corporate help desks, systems integrators, value-added resellers and strategic business partners, Chelius said. He acknowledged that "a lot of work still needs to go into it," and he predicted that the consortium's first package will be available by next year.

The system will also be designed to use intelligent retrieval technologies to increase the speed, ease and accuracy of answering customer support calls, Chelius added.

Member companies said they are anxious to address support problems immediately and effectively and will not hesitate to offer tips and tricks that have worked for them. "We're committed to exchanging ideas, techniques and tools," said Bert Forniciari, vice president of Silicon Graphics, Inc.'s Customer Support Division.

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IBM Japan's outlook on the future of PCs

Nobuo Mii, general manager of IBM's Entry Systems Technology business unit, was tapped in 1991 from the company's Japanese subsidiary to head development of PC technologies three to five years into the future.

Cambridge, Mass.-based writer Lori Valigra recently interviewed Mii on the future of PC development.

Q: You've worked on both sides of the Pacific. Is there any difference in research and development investment strategy in the U.S. vs. in Japan?

A: Some people say the Japanese are long-range and the U.S. is short-range, but it's not true. IBM is spending a lot of money for the long term in the U.S. The key difference is that the decision process is much shorter and easier in a Japanese company. Japanese companies are not that loyal to stockholders; they don't worry so much about what the dividend should be. In the U.S., we need a lot of studies for long-range strategic investment. Sometimes, technically, something is needed, but it's not affordable because IBM is responsible to stockholders.

IBM's Nobuo Mii: *'In the very early stages ... maybe a closed system works more effectively'*

Q: IBM has been focusing on joint ventures. Are strategic alliances becoming necessary to advance PC technology?

A: New technology itself needs a much more huge investment now, beyond the one-company size. IBM's total $6 billion R&D budget (net spending) is bigger than the national budget of some countries.

The U.S., Japan and Europe are now getting smarter. Why do it by yourself? Why not build a strategic alliance? That type of collaboration will become more frequent.

We need a lot of high technology even for LCDs, new disk drives, new silicon and fiber optics to make a small laptop.

Q: What are some of your alliances for future IBM PCs?

A: We are now in an alliance with Toshiba for small, flash memories as well as flat displays. And with Siemens and Toshiba, we formed an alliance for next-generation dynamic random-access memory chips.

Q: Keeping technology proprietary seems to be almost a natural reflex for corporations. How can that work in an international setting?

A: My philosophy is that in the very early stages of new engineering and technology, maybe a closed system works more effectively. I don't think it's wrong because the technology is not mature yet. We can concentrate and do not have to listen to public opinion.

But you need some level of saturation when new technology becomes a commodity business. At that time, it should become open so everyone can use it. That's the only way to reduce costs.

We need to be very strategically smart about when we close, open and then once again close the technology. Even five years ago we still believed the PC was the IBM crown jewel, but now everyone wants this kind of function.

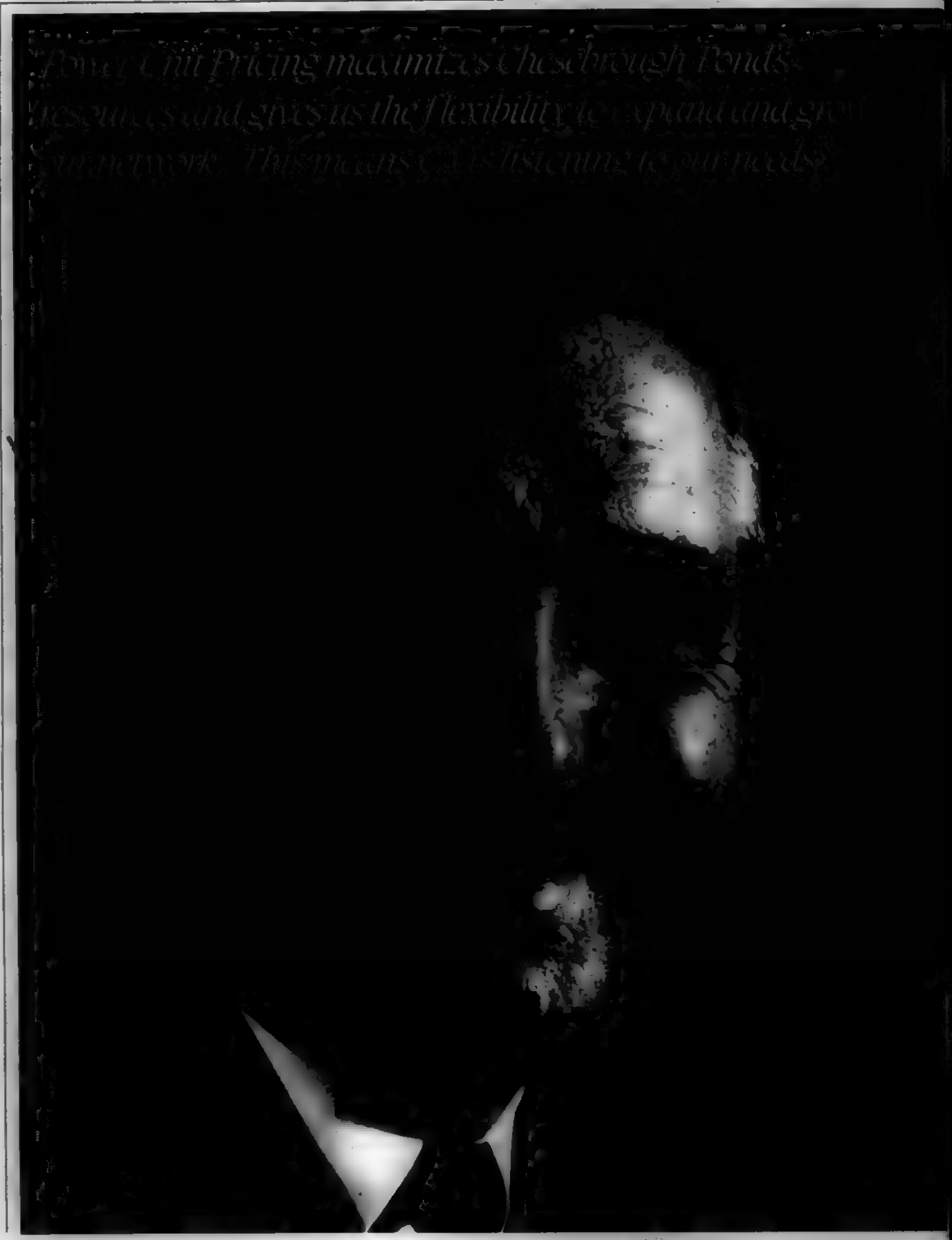
We are a business; we spend a lot of money on investment. At some time, if we don't open up, that market is not expanded.

Q: Isn't it still important for a company to be the originator of technology?

A: License income is very important to us. Technical origin is important. I don't care who built it — made in China, made in Taiwan, made in Hong Kong. I only care that if you build this, how much percentage do I get because I am the origin agent.

IBM is enjoying good sales of technology — my license fee for IBM technology to the outside in 1992 is over $100 million worldwide for PCs only. We license the basic I/O system to Matsushita, for example.

Technology has a global market. We can sell products, but my license business is IBM.



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Peripherals

Maxtor Corp. has started shipping the Maxtor 7245.

According to the company, the product is a 240M-class, 1-in.-high, 3½-in. disk drive that has 245M bytes of formatted capacity.

Designed for PCs, file servers and workstations, the Maxtor 7245 has an average seek time of 15 msec. Its track-to-track seek time is 3 msec.

Available with either an IBM Personal Computer AT or Small Computer Systems Interface (SCSI) controller interface, the Maxtor 7245 has buffer transfer rates of 9M byte/sec. for the AT interface and 10M byte/sec. for the SCSI fast interface.

Evaluation unit pricing for either interface is $395.

➤ *Maxtor*
211 River Oaks Pkwy.
San Jose, Calif. 95134
(408) 432-1700

Lexmark International, Inc., a former division of IBM, has introduced the IBM 4029 Print Accelerator/600.

According to the company, the product is a Microsoft Corp. Windows-based print accelerator that speeds up 600-dot/in. printing, making it up to eight times faster, while using two-thirds less printing memory than its competition.

Graphics-intensive printing with 3M bytes of printer memory is available for the Windows accelerator and the recently announced IBM 4029 OS/2 driver by using advanced memory management techniques and the processing power of host PCs for formatting jobs, the company said.

The enhancements are provided at no additional charge on Models 6, 6P, 10L and 10P on the IBM 4029 line and on the IBM LaserPrinter 10, according to the company.

An upgrade kit of the current IBM 4029 LaserPrinter costs $59.

➤ *Lexmark International*
740 New Circle Road
Lexington, Ky. 40511
(606) 232-2000

DynaPoint, Inc. has released DynaTrak, a trackball for laptop, notebook and subnotebook computers.

DynaTrak has a "breakaway" design that averts damage to the trackball or computer if it is suddenly jumped, the company reported.

Left- and right-handed users can work with the product because it offers a swiveling two-button control.

DynaTrack is 100% Microsoft Corp. Windows-compatible and is available in both a serial port version for all IBM compatibles that have serial ports and a Personal System/2 version, the company said.

DynaTrak costs $69.95.

➤ *DynaPoint*
1016-B Lawson St.
City of Industry, Calif. 91748
(818) 854-8440

Sigma Designs, Inc. has introduced ColorMax 20T, a high-quality, 20-in. Trinitron monitor.

The ColorMax 20T has a dual-pitch display with unlimited colors and a viewing resolution of 1,024 pixels by 768 pixels with a 75Hz vertical refresh rate.

The product can operate with Apple Computer, Inc. Macintosh graphics display adapters, and it can be used in multimedia applications, graphics design and desktop publishing environments. ColorMax20T is part of Sigma Designs' ErgoView family of displays, providing a low-emission technology design.

ColorMax 20T costs $2,499.

➤ *Sigma Designs*
47900 Bayside Pkwy.
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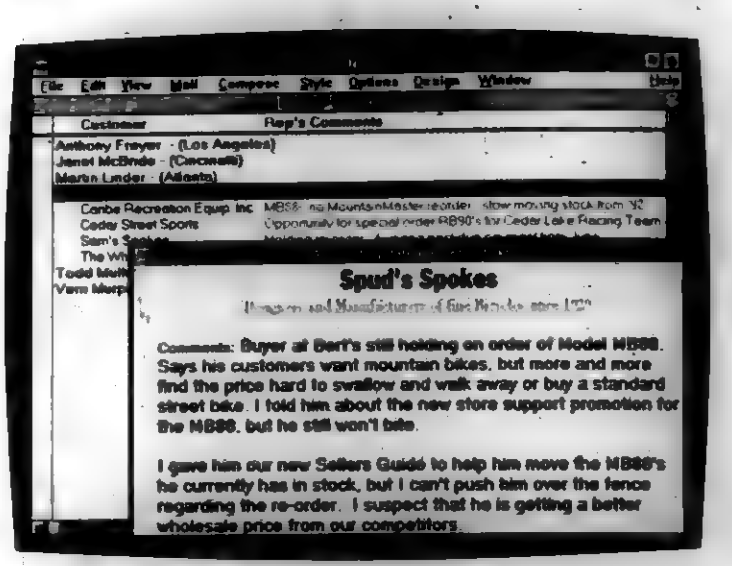
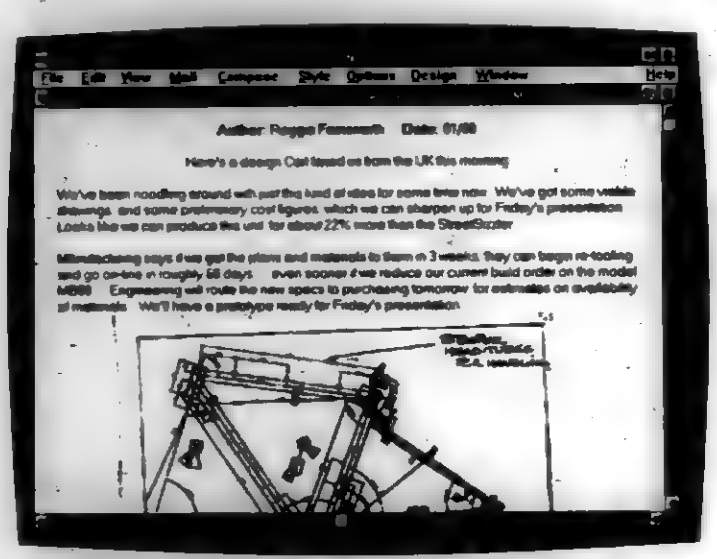
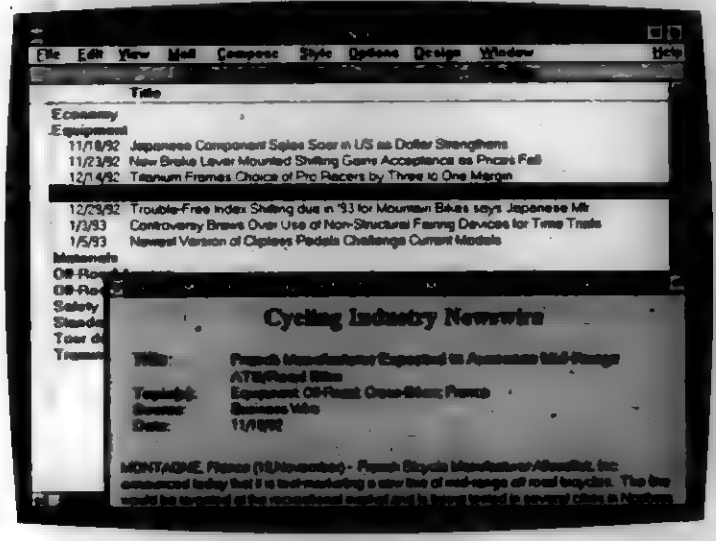
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing - a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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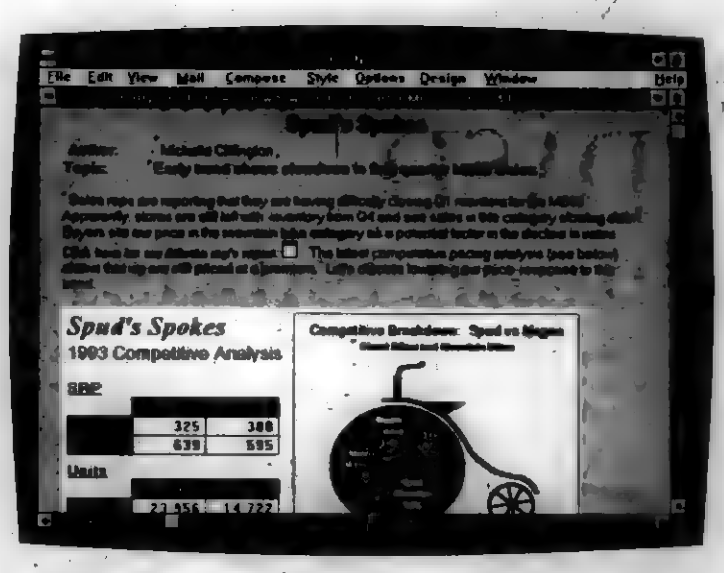
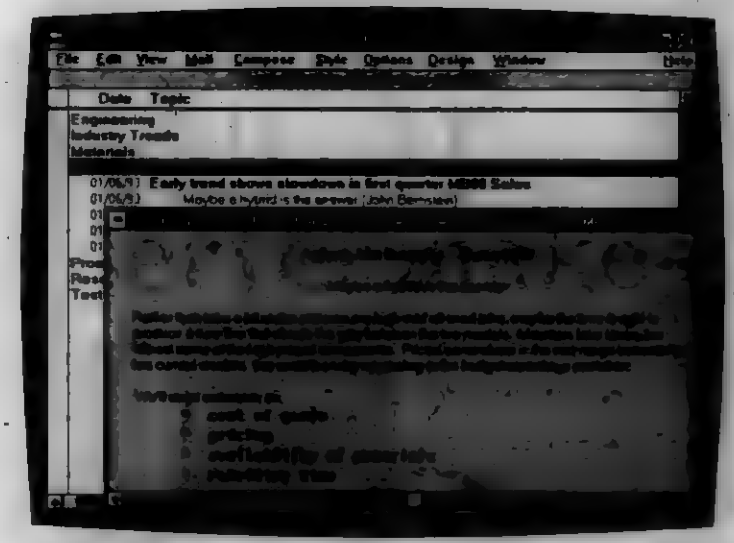
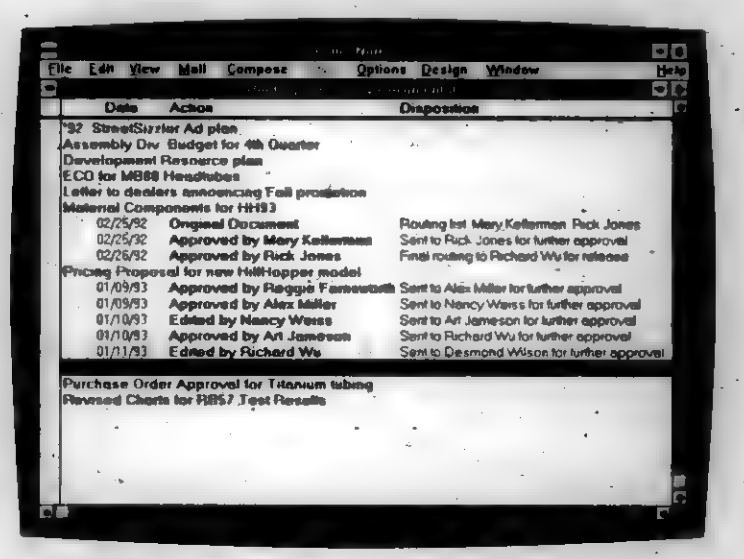


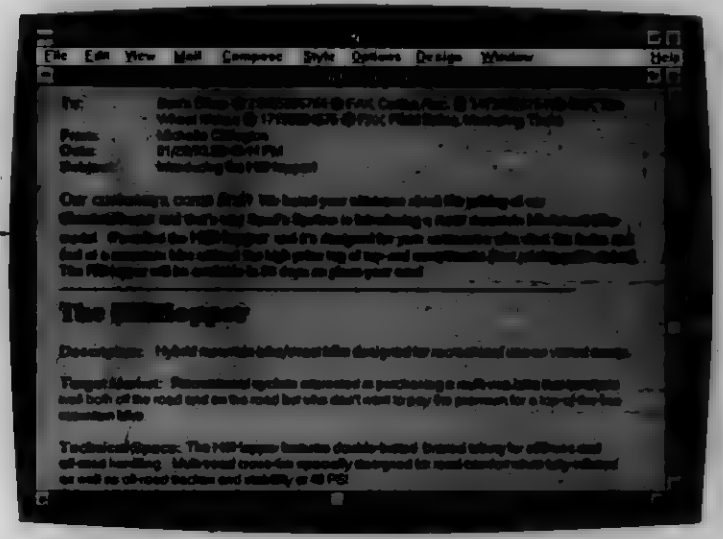
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

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Retailer has client/server make-over

By Jean S. Bozman
DALLAS

■ Retailer Neiman Marcus is outfitting its 27 stores and two warehouses nationwide with a brand-new set of client/server systems that will record crucial point-of-sale (POS) data on a server within each store and on a host.

The 20-month make-over is expected to boost sales-force productivity because it will capture vital customer data at the time of purchase. That reduces paperwork and helps generate more sales through directed marketing.

The client/server systems replace thousands of decade-old POS terminals with Intel Corp. 386-based IBM PCs that double as cash registers and data-entry points for a centralized relational database system. The firm is running the The ASK Group, Inc.'s Ingres 6.3 database on IBM RISC System/6000s at each store and at a central site at its headquarters here.

Change for users

By the time the chainwide conversion is completed later this year, it will have changed the daily work routines of 15,000 salespeople. Most sales associates used to record all commission sales with ink in their own "clientele books." The new sales system automates the record-keeping and updates a personal database for each sales associate that is stored in the RS/6000 store server.

Because the sales information is also stored centrally, Neiman Marcus will gain new insights into customer spending patterns, said Keiffer Buggs, the firm's manager of credit, finance and administrative systems. "Each time a sale is made, one update is made in the sales associate's database and another is made in the repository, which is uploaded to the [IBM mainframe] host," Buggs said. The mainframe runs a centrally managed commission system and sales audit system, he added.

Productivity gains are expected because sales personnel will have less paperwork, and they will be able to alert customers when favored brands of merchandise arrive at the store.

"I used to get bogged down in recording all of my customers' purchases in my clientele book," said Greg Lim, a senior sales associate at the North Park store in Dallas. "Now, we build our customer list daily, and we always have that information available." Lim accesses his sales database from his sales department's PC cash register.

There was some resistance, however, to the changeover from the old cash registers and paper records.

"Some thought nothing was as good as their tried-and-true client book," Lim said. "But the software makes it easier for us to carry out the transactions, and it prompts us to do things that used to be written in manuals." For example, Lim said, the new system supports on-line credit authorization and lists out-of-state sales taxes.

Training for any given sales department takes one day, but several days are needed to train 500 sales personnel in a large store, Buggs said. The conversion to the new store systems takes a week, during which time up to 130 POS terminals are replaced and technicians install an RS/6000 server linked to multiple IBM Token Ring local-area networks.

Hardware maintenance costs have dropped since moving to the new systems because the aging POS terminals required frequent repairs. The PC-based cash registers use IBM's PC-DOS operating system to conserve on-board memory that would be used up by graphical user interfaces, Buggs said. Ingres 6.3 was chosen for its fourth-generation language, performance and backup-and-recovery utilities, he said.

Buggs said the client/server systems were developed by a project team of 15 people during a period of two years. The team included programmers, database experts, telecommunications specialists and support personnel.

So far, seven Neiman Marcus stores have made the transition to client/server operations, including two Dallas stores and stores in Atlanta; Beverly Hills, Calif.; Denver; Scottsdale, Ariz.; and Troy, Mich. The remaining 20 are scheduled for conversion by year's end.

ON SITE

Neiman Marcus
Irving, Texas

Mission: To replace all of its systems with intelligent PCs and sales databases and move to client/server architecture.

Users: 15,000.

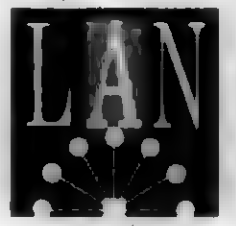
Hardware: RS/6000 servers; PC/cash registers.

Software: IBM AIX on servers; ASK's Ingres relational database on each server; IBM PC-DOS running on Intel 386-based IBM PC/cash registers.

Token Ring faces barrage of tests

By Lynda Radosevich

Forces are gathering in the 16M bit/sec. Token Ring world to ensure that vendors' hubs and adapters interoperate well over unshielded twisted-pair cabling.



A consortium of vendors including Proteon, Inc. began testing last week at the University of New Hampshire Interoperability Lab in Durham, N.H. A similar group led by Synoptics Communications, Inc. began testing in December. Meanwhile, the Institute of Electrical and Electronics Engineers, Inc. 802.5 committee, which sets Token Ring standards, will continue work next month on developing standards for 16M bit/sec. Token Ring over unshielded twisted pair.

The goal is to allow users to mix and match Token Ring products from multiple vendors on inexpensive unshielded twisted pair, a move that could help drive Token Ring prices down more.

"It will only have a positive effect if different vendors can assure that their products work together," said Chip Pettirossi, local-area network research analyst at International Data Corp. in Framingham, Mass. "That will stimulate price competition. Vendors won't be able to differentiate themselves as much, and that lowers the price curve."

Now, mixing vendors' 16M bit/sec. Token Ring products can cause problems because the standard for 16M bit/sec. Token Ring over unshielded twisted pair is not yet in place.

"Essentially, the issue in Token Ring is the problem of jitter," especially in 16M bit/sec. over unshielded twisted pair, according to Barry Reinhold, director of the Interoperability Lab. Jitter is distortion that happens when the signal gets out of synch, he explained. "It exists in all environments to some extent, but clearly there is more potential in heterogeneous environments."

The result of high levels of jitter is that the user sees more and more errors, and in some cases, the ring can stop functioning. It can be caused by slight variation in how vendors handle the addressing protocols and is especially pronounced in Token Ring networks because data packets travel from station to station, causing a cumulative effect. Once the problems are identified, however, they are easy to fix, Reinhold said.

De facto standard

At the Synoptics Token Ring Interoperability Lab in Santa Clara, Calif., IBM equipment is being set up as the de facto standard, and members' equipment is introduced into the IBM environment. The lab is looking at frame error rate testing in a variety of configurations, said Carol Weinreich, manager of the lab.

Guaranteed Token Ring compatibility would allow organizations such as the American Cancer Society to rethink their purchasing strategy.

To avoid problems, the Cancer Society has standardized on 16M bit/sec. products from IBM, which owns between 70% and 80% of the Token Ring market, according to analysts.

"We found that standardization reduces support costs," said Kyle Cooper, senior technical analyst at the society's national information systems headquarters in Austin, Texas. "We don't want to run into support issues because of some bogus Token Ring board we bought from a yahoo vendor."

However, "If they guaranteed perfect interoperability with [IBM's] Communication Manager, in our case, and had significantly reduced the cost, we'd have to look at it," Cooper said.

The Inland Steel Co. in East Chicago, Ill., uses IBM 16M bit/sec. Token Ring bridges and adapters in its 35 LANs, but "that might change because of price," said LAN manager George Bosnich. "Personally, I would jump on a vendor like Proteon that guarantees that if there is a [compatibility] problem, it's their problem."

Falling prices

[redacted]

PC package may tighten network security

By James Daly
SANTA CLARA, CALIF.

Connecting two or more PCs has two basic implications for security: You have more to lose and more ways to lose it. Systems administrators know, however, that the number of networked PCs is projected to rise rapidly during the next few years, and they are scrambling for ways to get their arms around the security risks inherent in intercomputer communications.

One recently introduced assistant from Semaphore Communications Corp. is the Network Security System (NSS), a hardware and software package that controls network access and encrypts data as it travels from source to destination over both local- and wide-area networks.

NSS is a platform- and protocol-independent tool wherein sensitive data is encrypted at the source and remains protected until it reaches its destination, according to Semaphore President Charles J. Hart.

The package consists of two primary components: the Network Security Center (NSC) and the Network Encryption Unit (NEU).

Administrator's focal point

The NSC is an application that serves as the network administrator's focal point, providing him with a variety of security controls that are accessible through a graphical user interface, pull-down menus and mouse control.

The administrator can also create customized security sequences that are tailored to an organization's specific data protection needs, Hart said.

Individual estimates vary, but experts generally predict a 40% annual growth rate for PC networking during the next several years.

The NEU is a reduced instruction set computing-based hardware component that resides between one or more network nodes and the network itself.

Its duties are many, including encryption, authentication to detect masquerade threats, access control to prevent unauthorized resource use and data integrity to detect data modification attempts. It uses both the Data Encryption Standard, a government-approved algorithm for encrypting digital information, as well as RSA Data Security, Inc.'s public-key encryption algorithm.

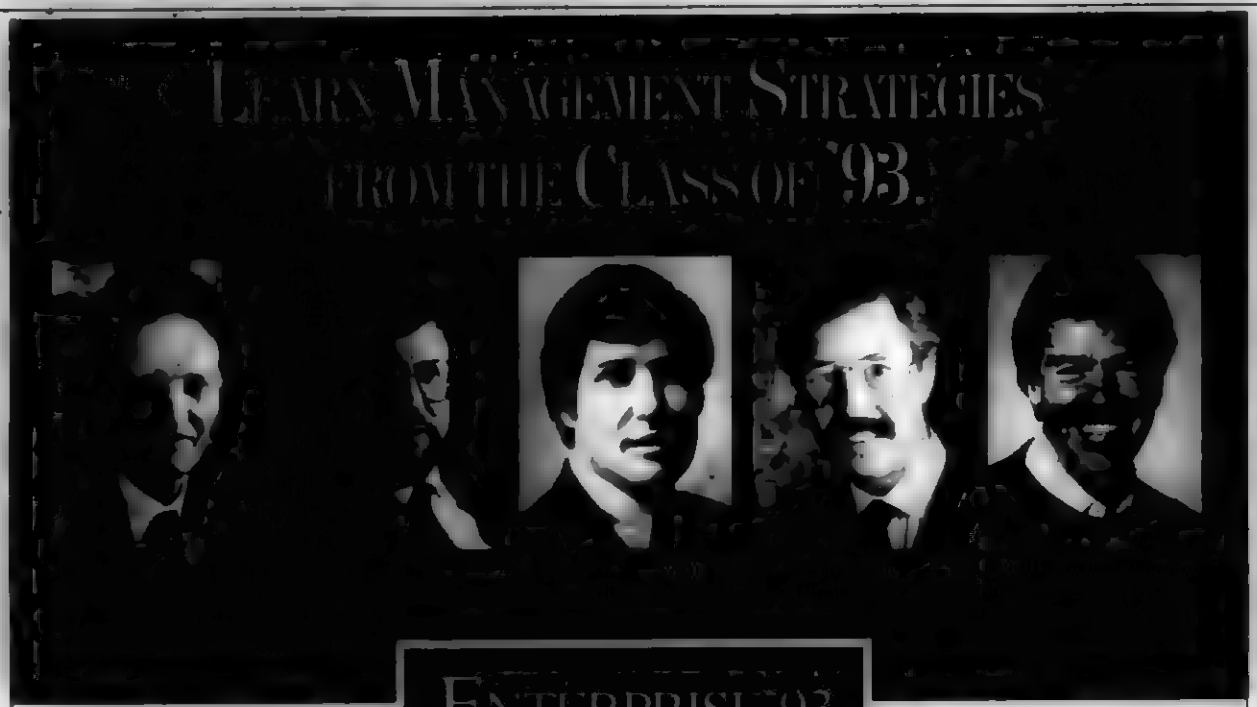
Numerous entry points

Network security presents a particularly dodgy problem for security administrators. Information that is transmitted across a network is available to all nodes in the transmission path, such as PCs, workstations, printers, mainframes, file servers or other devices, and not just the intended recipient. Each node can thus access any resource on the network.

These operating characteristics make the network vulnerable to unauthorized use, data modification or disclosure. While physical security measures may be adequate for small, local workgroups, this limited form of security is no longer effective when data is transmitted across enterprisewide networks.

Semaphore hopes that NSS, which starts at $3,500 for a 16-node setup, will remedy those problems by rendering the data unreadable. The system was designed with current and future WAN technologies, including X.25, frame relay, Asynchronous Transfer Mode and Switched Multimegabit Data Service, Hart said. Products currently available were designed for use on IEEE 802.3 and Ethernet networks.

Semaphore is a Xerox Technology Ventures company and was formerly known as Advanced Encryption Systems.



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FileNet unveils two IBM RISC-based servers

FileNet Corp., an imaging company, has announced Model 6220 and Model 6580, two servers based on the IBM RISC System/6000 reduced instruction set computer. As part of the company's Series 6000 family, the models consist of an entry-level desktop server (6220) and a high-performance, multitasking tower server (6580).

The Model 6220 houses a 3½-in., 1G-byte magnetic disk drive, a 3½-in., 2.88M-byte disk drive, a ¼-in., 525M-byte tape drive, 32M bytes of system memory, a 33-MHz RISC processor and an Ethernet or Token Ring adapter. Peripheral Device Cabinets enable the 6220 to support up to 5G bytes of external disk capacity, the company said.

The Model 6580 comprises a 1.44M-byte disk drive; two 3½-in., 1G-byte magnetic disk drives, which are expandable to 6G bytes; 64M bytes of system memory; and a 62.5-MHz RISC processor. Support is provided for a high-capacity 5G-byte, 8mm tape drive and a CD-ROM drive. When using Peripheral Device Cabinets, up to 30G bytes of external disk capacity is also supported.

Under AIX/6000 Version 3.2, the Series 6000 servers support departmental, workgroup and enterprisewide applications with workstations that run WorkFlo software and imaging applications on Ethernet and Token Ring local-area networks, according to the company.

Shipment is scheduled to commence next month, with prices starting at $14,400 for the Model 6220 and $85,000 for the Model 6580.

➤*FileNet*
3565 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 966-3400

Unix

Accelr8 Technology Corp. has released Open RMS, a file system implemented on Unix.

According to the company, the product was patterned after the RMS file system on Digital Equipment Corp.'s VAX/VMS computers. VAX RMS facilities, including Open, Create, Put, Get, Update and Close, are implemented, functioning with relative, indexed and sequential files. RMS structures such as FAB, NAM, RAB, XAB-KEY and XABPRO are supported for manipulation and file access.

The product is currently available for DEC's reduced instruction set computing (RISC) systems as well as Sun Microsystems, Inc., Hewlett-Packard Co., IBM RISC System/6000 and Silicon Graphics, Inc. systems.

Prices start at $3,988.

➤*Accelr8 Technology*
Suite 106303
East 17th Ave
Denver, Colo. 80203
(303) 863-8088

Woodside Technologies, Inc. has announced Fortress, a graphical user interface-based security program with antivirus protection for Unix.

Working with an intuitive point-and-click interface, users can explore and monitor system security risks, including viruses, worms, weak passwords and Trojan horses. The Trojan Horse Detector, the Worm-Proofer, the File Inoculator and The Password Cracker are Fortress' four modules.

The product is available for Sun Microsystems, Inc. Sun4 and SPARCstation hardware, the SunOS 4.1+ operating system and Versions 2.0 and 3.0 of Open Windows. Fortress costs $495.

➤*Woodside Technologies*
474 Potrero Ave.
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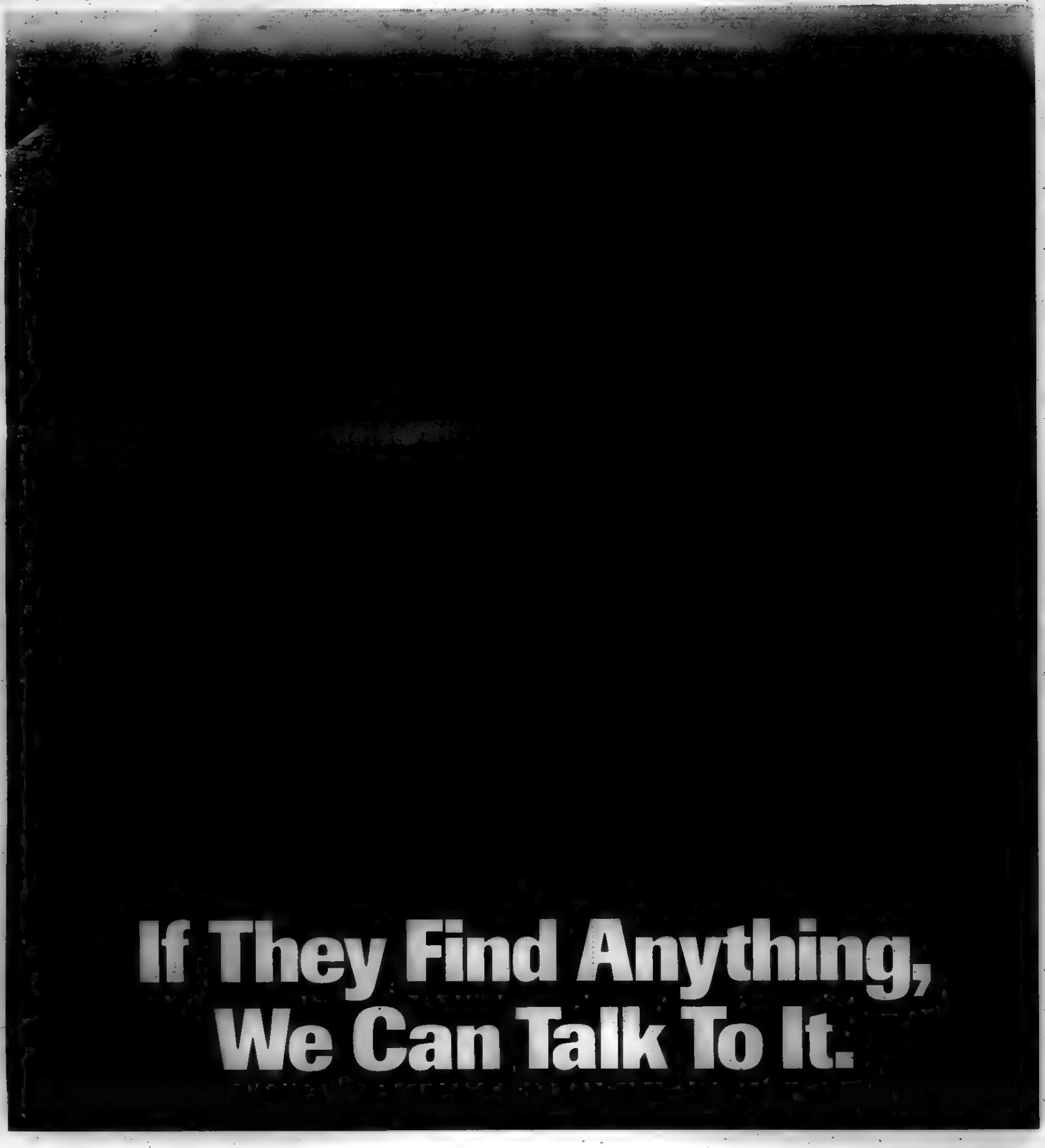

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Network niche players take stand at ComNet

By Elisabeth Horwitt
WASHINGTON, D.C.

Several small but feisty network management vendors popped up at the recent Communication Networks Conference and Exposition show to say they are alive and well and enhancing their products' appeal to potential customers.

Companies such as Objective Systems Integrators (NetExpert), Maxm Systems Corp. (Maxm), Boole & Babbage, Inc. (Net/Command) and Nynex Corp. (Allink) specialize in tools for managing a mixed batch of legacy networking systems that often do not support standards such as Simple Network Management Protocol (SNMP), according to Jeremy Frank, vice president of Gartner Group, Inc.'s Networked Systems Management Service. This makes such products a potentially great fit with the leading integrated network management packages such as IBM's NetView and Hewlett-Packard Co.'s OpenView, Frank added.

Unfortunately, such systems have failed to attract huge user bases, at least partly because of their large price tags — typically around $200,000.

In addition, such systems tend to be a set of tools, rather than a plug-and-play system. Because most leading multivendor network management systems share this limitation, a vendor's ability to provide full support and integration services becomes crucial to success in the market, Frank pointed out.

Indeed, one of the main reasons United Parcel Service, Inc. recently picked Novell, Inc.'s NetWare Management System from about 50 competitors was Novell's willingness to work side by side with the information systems department to put the system together, according to UPS telecommunications manager Marc Dodge [CW, Feb. 15].

Name of the game: Usability

Price cuts, greater ease of use and expanded support were the focus of recent announcements from the niche network management players. They included the following:

• Nynex said it has introduced a tiered pricing structure for its Allink Operations Coordinator to make it affordable to customers that have smaller networks with fewer types of devices, a company spokesman said. Allink interfaces with local-area networks, T1 multiplexers and modem network managers to collect alerts. It is said to use artificial intelligence to correlate alerts and figure out the most likely source of a problem.

The new pricing ranges from $33,000 for a package managing up to 2,500 objects, to $88,000 for a package managing 150,001 or more objects, Nynex said. Nynex will also offer free operator and administrator training for new customers.

• In the same vein, Objective Systems Integrators has just launched a new version of its NetExpert, which packages selected modules of

Network, *page 56*

Mobile users just a beep away

Start-up's WinBeep to extend reach of Motorola's Alert Central

By Joanie M. Wexler

■ Users hungry for advances in liberating wireless networking technology should soon see the fruits of a joint project from wireless granddaddy Motorola, Inc. and the company that recently created a stir by "beep-enabling" Microsoft Corp. Windows applications.

The goal: To use start-up Fourth Wave Technology, Inc.'s WinBeep software, which enables users at Windows desktops to send messages and files to roaming users carrying alphanumeric pagers, to extend Motorola's Alert Central plant floor monitoring system throughout the business side of companies.

Motorola's Alert Central wireless hardware/software monitoring system automatically sends messages to appropriate personnel when devices such as smoke detectors, robots and security systems go awry. However, "our customers tell us, 'too bad you can't integrate some of our other systems, like E-mail,' " said Steve Spiro, director of Motorola's Customer Owned Paging Group in Boynton Beach, Fla.

Always in touch

Most users agree and continue to express enthusiasm for being able to access nomadic employees on the fly.

"I could definitely see how the 'PC in a pocket' concept could be used in a lot of ways," said Randal Roch, director of MIS at the U.S. branch of Oxford University Press in Cary, N.C. in particular, it could be useful "when you're doing picking of books from large warehouses," he said. Though Roch's warehouse is currently small enough that "we can still shout" to get messages to floor workers, "as we extend the size of our warehouse, we need to expand ways for instantaneous communications for people who are mobile," he said.

At clothing maker Byer California in San Francisco, "a vast majority of our people are not at their desks a good part of the time," said Michael Higgins, technical support manager. "Sometimes I have someone on the phone and I need an answer right now."

Higgins added the caveat, however, that "I would not consider deployment of any wireless technology before the [Data Encryption Standard] is a part of it. Then I would see that specific application and many others rolling out in this company."

Fourth Wave will be reconstructing the current MS-DOS-based Alert Central for Motorola under the Fourth Wave architecture, which includes building it to the Fourth Wave wireless application programming interface and writing 32-bit Alert Central code under Windows and Windows NT, which will ship this summer, said Tim Hudson, president of Fourth Wave in Troy, Mich.

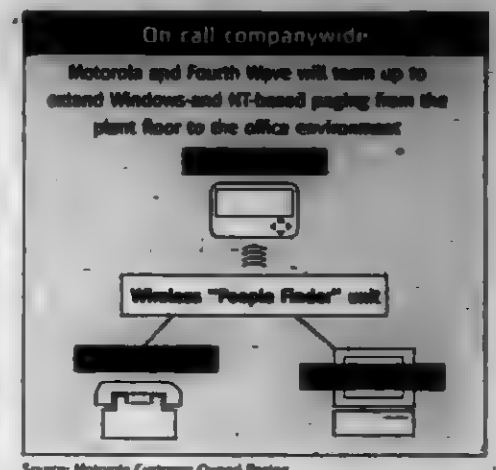
Hudson said there are "384,000 manufacturing plants" in the U.S., and "they will be our target customers."

Among the users of Motorola's Alert Central today are Ford Motor Co., General Motors Co. and the San Francisco News Agency.

NT is the platform of choice, explained Steve Sparks, senior product planner for the Customer Owned Paging Group at Motorola, because of its multitasking and inherent networking capabilities. Today, the system can do facilities maintenance, security or dispatch "in a serial fashion — one at a time," he explained. "With NT, you'll never miss a piece of that data."

This type of development "broadens the bandwidth of a person," said David Courcey, editor of "P.C. Letter," an industry newsletter published in San Mateo, Calif.

"When a pager gets addressable off E-mail, it becomes fairly powerful because anyone on the network can reach this person," he said.



Source: Motorola Customer Owned Paging

Beeper power

Fourth Wave's WinBeep software currently works across one-way paging systems, such as the MobileComm network. The software will link with one-way data networks, such as Ericsson and Skytel soon, within 90 days. Two-way packet data nets, such as RAM Mobile Data and Ardis, are due this summer, Fourth Wave President Tim Hudson said.

Bank taps Advantis

By Elisabeth Horwitt
SAN FRANCISCO

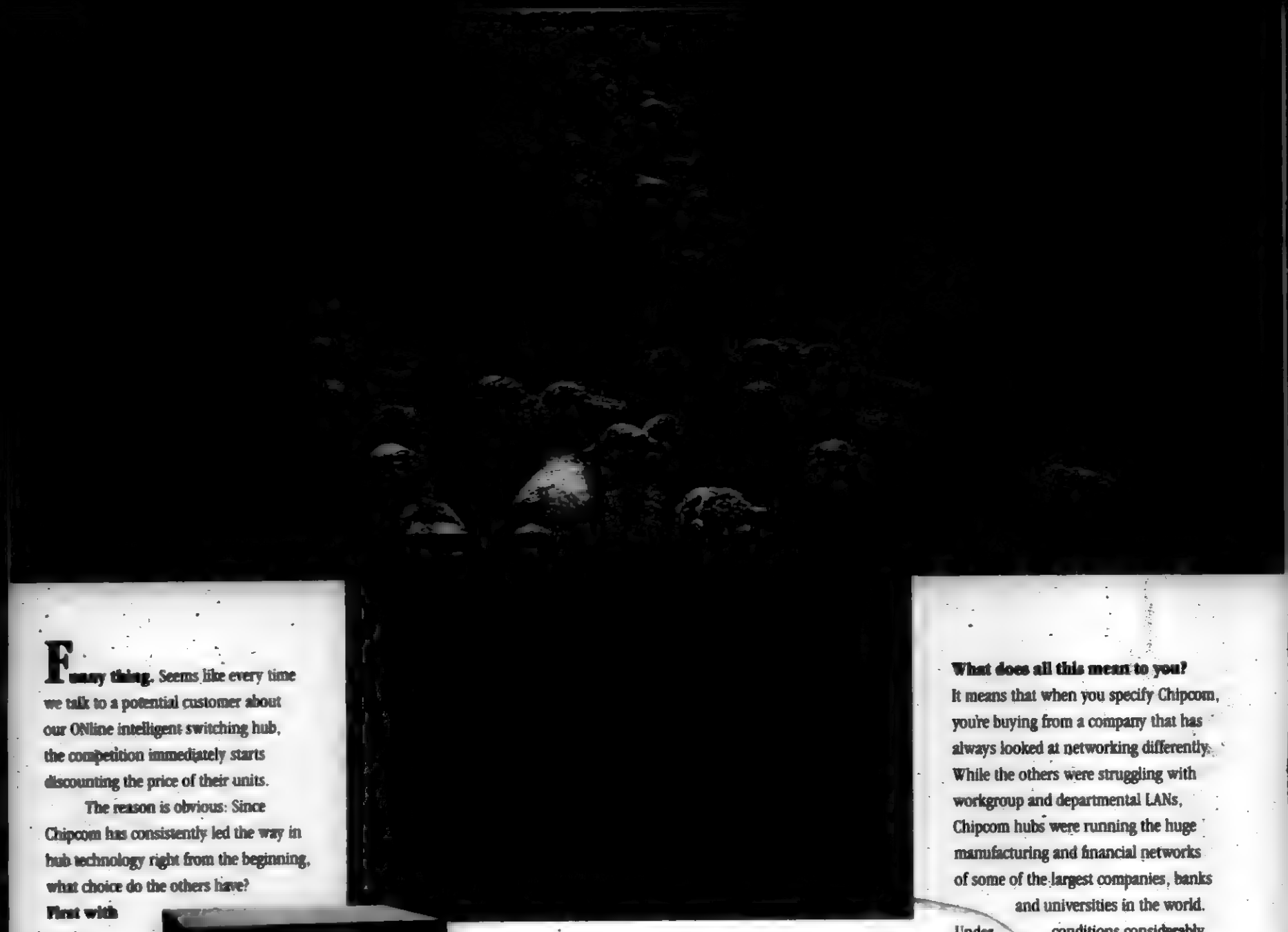
First National Bank, Inc. has recruited Advantis, the IBM/Sears Communications Co. network outsourcing vendor, to manage and operate the financial service company's wide-area network for the next three years.

The idea is for First National's information systems and telecommunications departments to offload the responsibility for managing wide-area links, T1 multiplexers and circuits so they can concentrate on developing technologies and applications that are critical to First National's business, according to Webb Edwards, the bank's executive vice president and general manager of IS. "Right now, we are focusing on how to provide better service to end users, to our affiliate banks and employees."

A major project now under way involves integrating disparate databases into a common resource that will be accessed by a common set of standardized applications, Webb said. The project, which is scheduled for completion by the end of next year, will provide users with faster, more complete access to customer account information that is often scattered across different databases and hosts, Webb said. This in turn will enable them to service customers more effectively, he added.

While First National may renew its contract after three years, there is a strong likelihood that the company will bring its WAN management back in-house at the end of the contract period, Webb said.

Advantis, *page 56*



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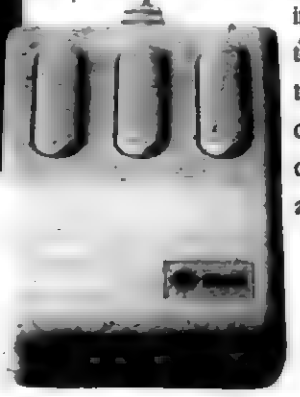

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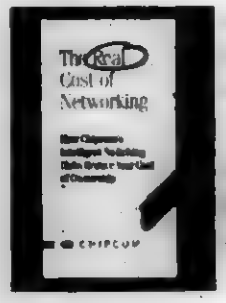

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X terminals gain sound support

By Joanie M. Wexler
MOUNTAIN VIEW, CALIF.

The X terminal fought to keep pace as a competitor to PCs and workstations this month when market leader Network Computing Devices, Inc. (NCD) introduced terminals that support sound.

The $3,295 to $4,295 line of color terminals is based on application-specific integrated circuit technology that NCD said allows the company to provide audio capabilities at no extra cost.

"Until now, if anyone wanted to use sound, they had to buy a PC or workstation," said Judy Estrin, NCD executive vice president, who said her firm is scurrying to give users reasons not to use those platforms.

X terminals — diskless, lower cost alternatives to PCs and workstations — run the X Window System (X) graphics-oriented protocol. X serves as the "glue" that lets users tap into a network of multiplatform hosts that also run the protocol.

However, the requirement for sound on X terminals — and other desktop platforms — is debatable.

"We're not looking for sound," said Bill Holt, manager of production open systems administration at US West NewVector Group, Inc., a large X terminal shop in Bellevue, Wash. "I'm not yet too sure of the actual value of multimedia."

"Desktop conferencing will be no significant driver to audio in the 20th century," asserted Tom Nolle, president of CIMI Corp. in Voorhees, N.J. "And to date, users have emphatically rejected voice-annotated messaging."

Application ally

NCD has formed a partnership with Z-Code, Inc., a San Rafael, Calif., developer of Unix-based electronic-mail systems, to develop just such an application. NCD is also working with Applix, Inc. in Boston to bring sound to that developer's Asterisk office automation software.

For example, Estrin explained, "you could click on a speaker symbol in a document to record or listen to sound." Estrin also suggested audible factory-floor alarms as a potential application.

Ronald R. Cooke, senior analyst at Dataquest, Inc. in San Jose, Calif., said a key point of the NCD announcement is that the digital encoding used allows the audio application to reside on a server anywhere in the network, which could be beneficial in help desk applications.

When a user has a problem, "sometimes it's nicer if you could have options explained orally in nontechnical terms," he said.

In Brief

Retail connection

BP Oil Retail Marketing is implementing a system based on XcelleNet, Inc.'s RemoteWare software to gather daily sales receipts and exchange pricing and personnel data with its 1,100-plus company-operated retail service stations in the U.S.

Holiday Inns linked

Under a three-year, $5 million contract, **Holiday Inn Worldwide** will use BT's Global Network Services to link Holiday Inn hotels in Asia and the Pacific Rim with the chain's data center in Atlanta. It will also connect reservation offices and agents on the Holidex reservation system.

Multivendor launched

Rolm, a Siemens AG company, has launched a network systems and services group that will design and engineer multivendor voice, data and multimedia networks for customers. The installations will include broadband, video and local-area networks, which Rolm can internetwork, the company said.

EDI for Ungermann Bass

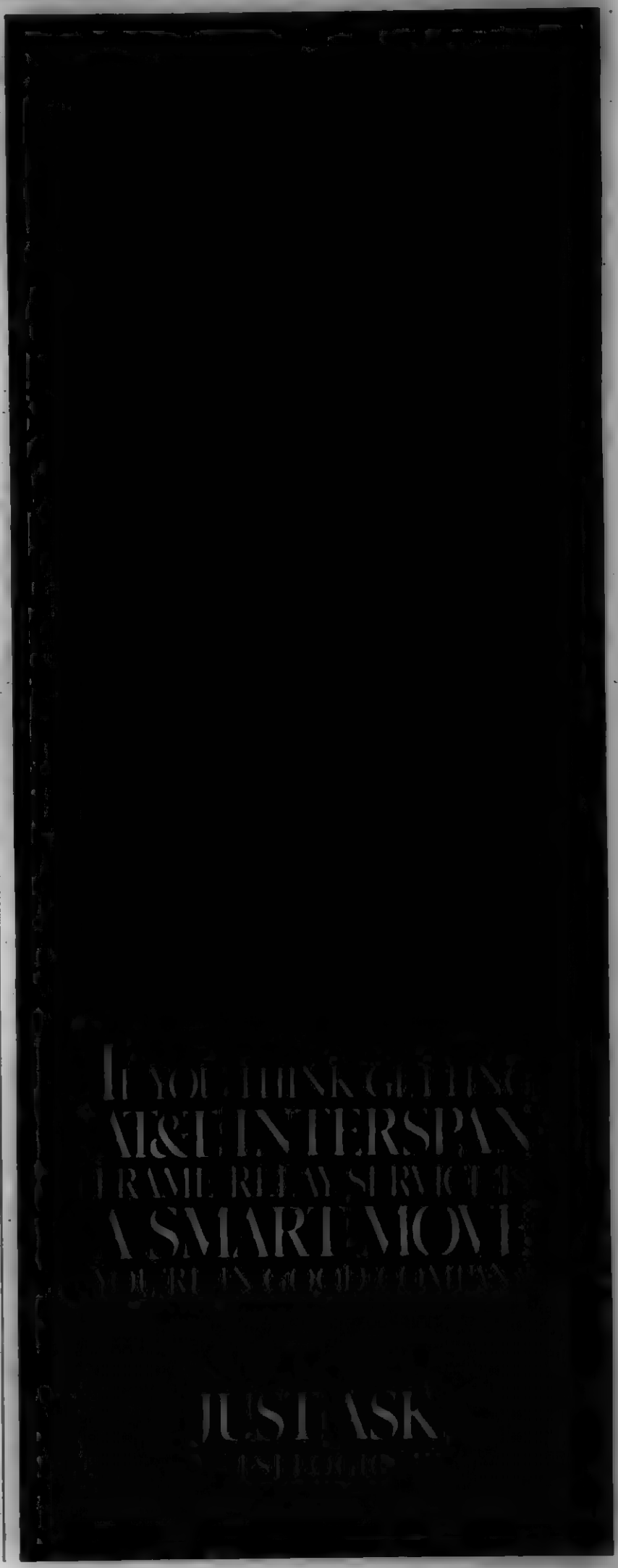
Ungermann-Bass, Inc. will enable customers to expedite the product delivery process by communicating with the hub vendor via electronic data interchange (EDI). EDI standardizes formats by which business partners can electronically exchange documents such as shipment notification. The EDI links can expedite product delivery by two weeks, the firm said.

Railroad chooses Sprint

Sprint Corp. will provide a nationwide packet-switched data network and a Telemail brand electronic-mail system to **PKP**, the Polish state railways. The contract is valued at more than $9 million over the next two years. The Polish railways will implement a nationwide ticketing and passenger reservation system as the first application on the network, Sprint said. Sprint will also supply managed data network services to the stock exchanges of Norway, Denmark, Sweden and Finland.

Alliance in the works

Network Systems Corp. and **Storage Technology Corp.** have signed a memorandum of understanding to form a strategic alliance under which they will jointly develop and market products to link mainframe storage devices to networked computing environments. The idea is to enable other systems besides IBM, Unisys Corp. and Bull HN Information Systems, Inc. hosts to attach directly to Storage Tek silos. The first systems to be linked will be Sun Microsystems, Inc. workstations, according to the partnership.



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Advantis

CONTINUED FROM PAGE 51

Nor does the company plan to outsource management of other parts of its network, such as local-area networks or IBM Systems Network Architecture, Webb said. "We're open to everything, but it just doesn't fit our strategy right now. I don't think of outsourcing as all or nothing."

Savings estimates

First National, which spends between $30 million and $40 million per year on communications, "certainly expects to save some money" from outsourcing WAN management, Webb said. However, he would not go into cost or savings projections on the contract.

The financial service company chose Advantis after a request for procurement that involved another network outsourcing company and two carriers, Webb said. Advantis won on the basis of cost and service and because it "already had the network control center facilities in place" to manage First National's network, he added.

First National is the first customer to sign up with Advantis since Ford Holland, Advantis' first official customer, signed its original contract with IBM Information Network.

Network players

CONTINUED FROM PAGE 51

the multivendor wide-area network fault management system at a new low price of $60,000, a company spokesman said. The new package will include a graphical user interface, Microsoft Corp.'s Windows text presentation, alarm filtering and a gateway to SNMP-based management systems, the spokesman said.

Objective has developed links that enable its system to manage a variety of proprietary telecommunications devices and also provides tools for developing links to devices it does not yet support, he added.

Corporate target

Unlike the existing NetExpert, which is more of a build-it-yourself tool set, the new product will be a plug-and-play system aimed at corporate IS departments. Most of the Folsom, Calif., vendor's current customers are carriers such as Pacific Telesis and Infonet.

These announcements may make the above products more attractive to end users who are looking for "functional products to manage their legacy systems," Frank said.

These vendors may lose their viability a few years hence, when heavy hitters such as IBM and Digital Equipment Corp. are slated to come out with "real answers" to customers' multivendor network management needs, he added.

• Meanwhile, Maxm has announced that users can develop automated applications and routines for its Maxm system via IBM's Rexx scripting language. Maxm is said to provide automated management of LANs, WANs and data center components. Jobs or commands can be automatically initiated by an event, a schedule or a host application such as IBM's NetView. Rexx is now available for Maxm's OS/2-based Operator Workstation.

BMC introduces dynamic tuning tool for SNA

BMC Software, Inc. recently introduced Opertune for NCP. According to BMC, the product is the first dynamic tuning tool for Systems Network Architecture networks.

IBM's Network Control Program (NCP) is an operating system designed for IBM front-end processors.

When network traffic changes occur, Opertune for NCP can sustain optimum network throughput and response times on an ongoing basis.

Network statistics are gathered and examined by the product, which then selectively determines tuning parameters based on equipment capabilities and local configuration information. Necessary modifications are made automatically.

Service interruption or program regeneration is not needed, and the parameters automatically and simultaneously alter as network conditions change.

Opertune for NCP targets problems such as bottlenecks, query times for transactions and imbalances.

Pricing is based on NCP tier level, starting at $10,000 for a perpetual license.

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Gateways, bridges, routers

Network Systems Corp. and its subsidiary, Vitalink Communications, have announced enhancements to their 6400 and 6800 series modular bridge/routers.

An Ethernet trunk interface and an Internet Protocol coprocessor are among the new enhancements. The PDIP3 coprocessor offers improved routing capabilities for a variety of protocols, including Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s DECnet and Apple Computer, Inc.'s AppleTalk.

The Ethernet board houses four Ethernet interfaces and a Direct Memory Access engine that improves off-board performance by as much as 25% to 30% over its predecessor, according to Network Systems.

The coprocessor costs $5,000, and the Ethernet board costs $8,000.

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- Industry Restructuring - The IDC Perspective
- IT Spending
- Computer Industry Wars

Track 1 - Rightsizing the Enterprise
- Rightsizing in the Data Center: Choices and Opportunities
- Evolving Network Architecture
- The Services Industry Gold Rush
- Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems
- Tomorrow's Trends in the PC Systems Market
- PC Software Confronts the Enterprise
- Messaging and Advanced Group Applications
- Channel Management in the 90s

Track 3 - Winning the Midrange Wars
- Rightsizing for Technical Computing
- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with NT Looms
- Midrange Contradictions

Track 4 - Networking
- Customer Directions: Managing Networking Investments
- Network Applications: Mobile Data Networks Add Another Dimension
- Local Area Networks: The Platform for Distributed Processing
- The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets
- The New Europe: Opportunities and Obstacles for IT
- Latin America's New IT Markets
- Opportunities in the Asia/Pacific Region
- Worldwide Market Evolution - A Perspective on Japan

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CA's Unicenter outlines plans to go distributed

By Thomas Hoffman

As user companies steadily move mission-critical applications off their legacy systems and onto cheaper and faster client/server distributed environments, one glaring weakness industry observers have noted is the lack of robust systems management tools for environments such as Unix.

Computer Associates International, Inc. hopes it has effectively killed two birds with one stone by recognizing those shortcomings and reacting quickly.

During the past year, CA has outlined plans to port its IBM MVS-based CA-Unicenter systems management package to several different Unix environments, as well as to IBM's OS/2 2.0 and Novell, Inc.'s NetWare operating environments (see story page 60). Analysts and users said that by doing so, CA has addressed several industrywide distributed management issues while strategically placing Unicenter as a lever to increase CA's installed base of customers outside the mainframe arena.

"Our research shows that enterprise buyers who are looking at distributed systems view Unix as a difficult and expensive operating system. They want the same quality of tools they're used to using in the corporate data center," noted Peter Kastner, vice president at the Aberdeen Group, a market research firm in Boston.

Unix users agreed. "It's hard to find a good systems management package on Unix. People who come from MVS find it to be a bit of a culture shock," said Gary Graham, coordinator of data management at Home Oil Co. in Calgary, Alberta.

Several beta-test users and other potential customers said they like what they have seen in the Unicenter plan.

CA kicked off its CA-Unicenter announcements last year by making known its intention to move the nine-module systems management package onto Hewlett-Packard Co.'s HP/UX.

Sam Palm, data center manager at Cheeseborough-Ponds USA in Trumbull, Conn., has been testing CA-Unicenter on an HP 9000 Model

CA's Unicenter, *page 60*

Unicenter bundles up

A vital link in CA's Unicenter strategy is the company's agreement to bundle Unicenter ports with its partners' hardware. Alan Paller, CA's director of open systems, said Unicenter will be bundled with every HP/UX box after April 1. CA has reached similar agreements with Sun Microsystems, Inc., Data General Corp., Sequent Computer Systems, Inc. and Pyramid Technology Corp. CA has not yet announced plans to bundle Unicenter with IBM's RISC System/6000, though Paller did not rule out the possibility.

Supercomputing in the '90s

IBM, Silicon Graphics servers edge into world of supercomputers

By Maryfran Johnson

■ Supercomputers are sprouting up in some surprising places lately. Both IBM and Silicon Graphics, Inc. recently introduced supercomputer-class systems at the top end of their Unix-based workstation/server lines — a move analysts and users view as a harbinger of more widely accessible and affordable supercomputing.

"The scientific, engineering and technical community is sending a very loud and clear message to vendors," said Gary Smaby, president of Smaby Group, Inc., a Minneapolis-based research and consulting firm. "They want price/performance characteristics that grow up from the workstation world and not down from the mainframe."

IBM's entry into Unix-based supercomputing is with the Scalable Power Parallel System 1 (SP1), an eight- to 64-processor system slated to make its debut in October 1993 at an entry price of $312,000. Silicon Graphics' move into this market is planned for early 1994 with delivery of the Power Challenge XL line of shared-memory symmetric multiprocessors, scalable from two to 36 processors and priced from $120,000.

Innovative workstation technologies such as reduced instruction set computing (RISC) processors, CMOS technology, symmetrical multiprocessing and shared memory architectures have now climbed the technical wall into the low end of the supercomputer business. Perhaps even more significantly, IBM and Silicon Graphics are producing binary-compatible supercomputers that run the same operating system and software as their workstation lines.

"This is the leading edge of what supercomputers will be doing for the next 10 years," said Ken Anderson, co-publisher of "The Anderson Report" newsletter on technical computing.

Still up in the air

Still a large question for both vendors, however, is the quality and availability of parallelizing compilers and special software development tools needed to create applications that take maximum advantage of such systems. And these low-end supercomputers are by no means an across-the-board replacement for vector supercomputers, which will still be needed for tasks such as quantum physics calculations.

Even though the IBM and Silicon Graphics systems are not generally available, the race will soon be joined by other contestants. Hewlett-Packard Co. is expected to join in with systems built from its partnership with Convex Computer Corp., and Cray Research, Inc. is working on systems based on Sun Microsystems, Inc.'s Scalable Processor Architecture RISC chips.

Analysts agreed that Silicon Graphics' Power Challenge machines will overlap the same scientific and engineering markets where IBM's SP1 is expected to appeal, despite the fundamental differences in their underlying architectures.

The Silicon Graphics supercomputer pushes its symmetrical multiprocessing and shared memory architecture to the max with a 36-processor configuration, which is accomplished by linking two 18-processor systems. Unlike the IBM system, which runs a complete version of the AIX Unix operating system on each node, the Silicon Graphics machine uses a single multithreaded operating system based on its own Unix variant, Irix.

How they stack up

IBM's Scalable Power Parallel (SP1) System:
- **Scales:** From eight to 64 processors.
- **Processing power:** From 1 to 8 GFLOPS.
- **Special feature:** High-performance, switch-enabling, high-speed communications between processor nodes.
- **Entry price:** $312,000 (eight-processor system).
- **Availability:** October 1993.

Silicon Graphics' Power Challenge System:
- **Scales:** From two to 36 processors.
- **Processing power:** 1 to 5.4 GFLOPS.
- **Special feature:** 64-bit Mips Technologies, Inc. RISC processors providing Cray Y-MP-class performance in a single chip set.
- **Entry price:** $120,000 (two-processor system).
- **Availability:** First- to second-quarter 1994.

IBM's SP1 leverages the power of eight to 64 RISC System/6000 processors by integrating the communication between the processors with an innovative new switch technology. IBM officials are confidently predicting systems with more than 500 processors within two to three years.

The IBM switch technology allows SP1 users several choices: to run a single parallel job using multiple processor nodes, to execute serial tasks on individual nodes or to perform a combination of these tasks simultaneously.

"The advantage of the IBM switch is that it makes all the processors adjacent to each other," said Ted Krum, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "That means it's not as hard to keep track of where your data is, and it's not as difficult to route data from one processor to another."

> "This is the leading edge of what supercomputers will be doing for the next 10 years."
>
> *Ken Anderson, "The Anderson Report"*

A number of supercomputer software developers have already signed on with the IBM system, targeting fields such as computational chemistry, engineering and electronics analysis, petroleum exploration and production.

One of the early users of the SP1 is Halliburton Geophysical Services in Houston, which is developing scalable parallel applications with the machine.

"We see this as a major turning point in our industry," said Walt Ritchie, vice president of data processing at Halliburton. "We now have the computing capability to solve complex seismic problems in a cost- and time-effective manner."

From the users' point of view, the interconnectability of such systems with their smaller workstation brethren is far more important than vendor boasts about mega-FLOPS (floating-point operations per second), GFLOPS or other "macho-FLOPS" — a humorous term coined by supercomputer analysts.

"All of them will be using RISC microprocessors that leapfrog each other every six months," Smaby pointed out. "What people will really focus on is the communication fabric underlying the network."

HP user study confirms gender pay gap

By Mark Halper
SUNNYVALE, CALIF.

Reflecting a national gender bender, a Hewlett-Packard Co. user group reported that in 1992, male HP computer users earned more money than their female counterparts in comparable jobs.

According to a survey of HP users by user group Interex, the largest disparity in pay fell in the vice president/chief financial officer/chief information officer category, where men earned an average of $91,590 per year compared with an average of $72,860 for women.

Male information systems directors earned an average of $61,490, while women earned an average of $55,170 in the same category, according to Interex.

A male/female differential persisted throughout all computer ranks, including programmers and systems administrators.

"The survey revealed that 55.3% of the women surveyed earned $49,999 or less, while 62.5% of the men earned $50,000 or more, even though there were virtually equal percentages of men and women in each job category," Interex stated in a press release.

Interex said it sent the survey to 4,100 U.S. members and received 1,512 responses.

More pay, more work

According to the user group, most respondents said that when they received a significant pay raise, their work load simultaneously increased, even though their department head counts did not drop.

Seventy-nine percent of the respondents received raises; of that group, 21.2% received raises of 7% or more, and 70% received raises of between 3% and 6%. About 2% endured pay cuts.

Of the respondents, 79% were IS managers, 11.1% were programmers/systems analysts/computer operators, 5.2% were corporate managers. The remainder held other types of positions.

Thirty-eight percent were at companies with annual IS budgets between $250,000 and $1 million, while 23.3% were from companies with budgets of more than $1 million.

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[redacted]

System software

Janus Software, Inc. has released ICU MVS for Computer Associates International, Inc.'s Top Secret MVS environment.

According to the company, ICU MVS is a Vulnerability Identification Tool that associates vulnerabilities that hackers or users may locate while attempting to break into an MVS system.

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CA's Unicenter

CONTINUED FROM PAGE 57

827 since October. Palm said his staff has received comprehensive training from CA on all aspects of the Unicenter modules, which include console management, security, storage management and work-load management.

Palm said Cheeseborough-Ponds, which also runs an IBM 3090-200 mainframe and two IBM Application System/400 machines, is impressed with the product's ability to manage information as effectively as legacy-based systems' management offerings. "When you're a lights-out shop like we are, you really need an overall tool. It looks like CA-Unicenter is the direction we want to take," Palm added.

Beta-test user Ed Wolff, group director of MIS at Break Parts, Inc. in McHenry, Ill., said his firm was forced to downsize from its large IBM and Digital Equipment Corp. centralized environments to better respond to customer needs with a more flexible client/server information systems environment. Wolff said that while the HP Unix boxes had the horsepower to deliver information more cheaply and efficiently, he was troubled to find that Unix is not secure and is incapable of controlling message switching systems.

The CA-Unicenter port, he said, has fulfilled that need. "By getting Unicenter in the Unix environment, we were able to gain the same kinds of control necessary in MIS on a mainframe platform," Wolff added.

Good timing

Analysts said network managers are facing similar obstacles. "We still don't have a comprehensive LAN management solution that's comparable to what's on the mainframe level. It could be that CA is very fortunate in its timing," noted Stan Schaff, senior analyst at Computer Intelligence/Infocorp, a Santa Clara, Calif., market research firm. Schaff said there are "dozens" of products on the market that address portions of the network management puzzle but no comprehensive solutions for enterprise networks.

He praised CA and Novell for developing the forthcoming CA-Unicenter for NetWare port but warned that the two vendors must develop a graphical user interface (GUI) with which local-area network managers are used to working.

CA executives said the company is addressing this concern. According to CA, the Unicenter-to-NetWare port includes both database and GUI servers. The first release of the product, slated for the second quarter of 1994, will have the IBM OS/2 2.0 workplace shell, though future releases may also include a Microsoft Corp. Windows-based shell.

One Novell user said he welcomes the Unicenter-to-NetWare port. "It's a plus for us. We'll be able to administer our LANs through different points in the organization," said M. Nicholas Lovelace, IS review officer at Connecticut Mutual Alliance in Hartford, Conn.

CA executives would not comment on other Unicenter ports but hinted that announcements are imminent. "Our belief is that customers shouldn't have to bet their careers on who's going to win the operating system war. We plan on making Unicenter available on all surviving platforms," said Alan Paller, director of open systems at CA.

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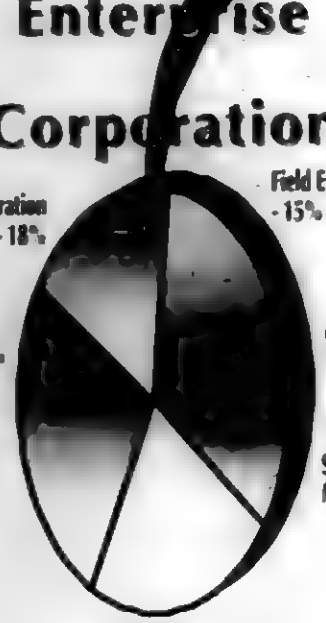

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Moving in '93

CA has announced this timetable for porting its CA-Unicenter package to various environments:

- HP's HP/UX Unix operating environment: In early release now, with general availability planned by the end of this quarter.
- IBM's OS/2 2.0: Beta-testing begins this quarter.
- Novell's NetWare network operating system: Beta-testing slated for the third quarter of this year.
- Sun, Tandem and Pyramid's Unix operating environments: Beta-testing scheduled to begin in the fourth quarter of 1993.
- IBM's RISC System/6000 AIX and DG's Avion DG-UX Unix operating environments: Beta-testing planned for the first quarter of next year.

Show preview

New tools alter development strategy

By Kim S. Nash
SANTA CLARA, CALIF.

■ Both Microsoft Corp. and Borland International, Inc. plan to unveil C and C++ development products this week at Software Development '93.

The powerhouses join some 40 other software firms expected to announce tools at the show, which has been gaining stature during its seven-year history as a venue for the development community to preview upcoming products.

But fancy new products may provide limited help with software development if information systems departments fail to address management and personnel issues. Assessing risks is critical to erecting a strong foundation for a given project, according to William Roetzheim, a senior associate at the San Diego office of consulting firm Booz Allen & Hamilton, Inc.

Building software with nontraditional technologies such as object-oriented or visual programming tools means changing the way projects are conceived and how developers work, said Roetzheim, who is scheduled to lead a seminar at the conference on managing risk.

Failure rates are higher in projects anchored by technologies that are new to an organization because developers have little experience with the tools and techniques. Also, the tools may be immature, so tracking product history is a good idea, he said.

Study impact

Before starting a development project, study and rate the organizational impact of the project and the tools, Roetzheim advised, adding that both programmers and project managers should spend one to three days weighing a proposed project against a checklist of factors. Determine both the likelihood and the consequences of failure in the following areas:

- **Technical risk.** Developers should assess the experience of the staff with the technique and the tool. Also, schedule the more difficult tasks early in the development cycle, if possible. That way, more recovery time is available.
- **Cost.** Managers should realistically look at the price of tools and training. Do not skimp, or you will stack the odds against yourself from the beginning. If a proposed venture calls for too much money, scale the project back.
- **Schedule.** Add more time than is needed for each major task.
- **Dependency.** Managers and developers must determine how the success or failure of a project might affect other projects under way. Conversely, you should look at how the failure of other events and projects could impact your mission.

Roetzheim cautioned that a high-risk proposal should be put into motion if the return on investment is equally high. "If you're not going to get a lot out of a risky project, it's probably not worth the effort," he said.

Software Development '93

Borland announced C++ at the show in 1991, and Microsoft unveiled C7 at last year's show.

More than 60 new PC development products are scheduled to be announced this week from some 40 software companies.

Other management issues are at the fore this year, including seminars on how to approach analytically the human aspect of introducing new technologies. Resistance, poor communications, turf-guarding and low commitment can doom a project, according to Judah Mogilensky, president of Process Enhancement Partners, a consulting firm in Silver Spring, Md.

Several Unix vendors plan to demonstrate tools for building small- and large-scale Unix applications, including Next, Inc., Centerline Software, Inc. and Unix International.

Coming soon

In addition to Microsoft's Visual C/C++ and Borland's C++ for OS/2 compiler environments, other new products on the agenda include the following:

- Wilson WindowWare, Inc. in Seattle plans to demonstrate WinEdit Version 2.0, a text editor for Microsoft's Windows. WinEdit comes in three types: Light, priced at $29.95, which resides in Windows' Notepad section and provides up to 16M bytes of memory for storing and manipulating data such as CD-ROM manuals; Standard, priced at $59.95, which includes a compiler and error-checker; and Pro, priced at $89.95, which includes a 199-function macro language for use in applications running under Windows.
- Zinc Software, Inc. in Pleasant Grove, Utah, will introduce Application Framework 3.5, an object-oriented tool set that supports DOS, Windows, Windows NT, IBM's OS/2 and the Open Software Foundation's Motif. A C++ library of objects, the product was designed to automate the matching of application events or processes with their appropriate objects. Along with a $499 base engine, operating system-specific modules are required and range in cost from $99 to $1,499.
- The WNDX Corp. in Calgary, Alberta, intends to introduce graphical user interface building tools for both Windows NT and OS/2.
- Lead Technologies, Inc. in Charlotte, N.C., will unveil Leadtools 32 DLL, a graphical image compression tool kit, and Leadtools Data, which compresses any type of data file.
- ImageSoft, Inc. in Port Washington, N.Y., will show Object/Designer, a C++, C and Pascal application generator for Windows, and VZ Programmer, which lets programmers visually build applications for Windows and OS/2 Presentation Manager.

Middleware aids migration to client/server

By Lynda Radosevich

A new "middleware" architecture from Digital Communication Associates, Inc. (DCA) is so far being met with approval from users.

Middleware is client/server software that helps developers connect front-end applications running on PCs and workstations to back-end database servers on mainframes or local-area networks.

"What makes [middleware] unusual is not that it combines mainframe information into other applications; it's that it does it so easily. What would normally take several months can be done in a matter of days or hours," said Enrique Crespo Jr., manager of corporate sales systems at The Torrington Co. in Torrington, Conn.

Target market

Aimed at companies that are moving their computing operations from mainframes to client/server networks, DCA's Universal Communications Architecture (UCA) is a communications framework for integrating host environments, network transports, communications application programming interfaces (API) and desktop operating systems (see chart).

The first component of UCA is QuickApp, application development software that currently works with Microsoft Corp.'s Visual Basic to access APIs such as IBM's High Level Language Applications Programming Interface (HLLAPI) and Advanced Peer-to-Peer Communications. QuickApp must be used with DCA's terminal emulation products or compatible products.

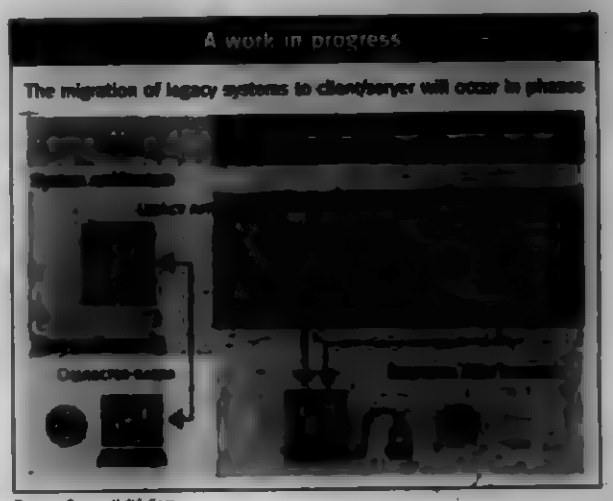
"I would be in favor of anything that lowers the mainframe intimidation factor," said Bruce Laycook, network systems consultant at Montgomery Ryland, Inc., a facility management firm that operates data processing for the Loma Linda University Medical Center in Loma Linda, Calif. "Even for an experienced programmer, porting [applications] to the PC and getting used to graphical user interface and mainframe API calls can be intimidating."

"This type of philosophy does help," said Larry Diecianco, a technology consultant at Travelers Insurance Co. in Hartford, Conn. "But for us, DCA is too late" because Travelers developed its own middleware.

Beginner assistance

For those who are not so advanced, DCA's software can be useful. A developer using Visual Basic for Windows can create, for example, a PC front end to a mainframe-based application by logging onto the host and using QuickApp with DCA's Irma terminal emulation hardware and software to

Middleware, *page 63*



Source: Connection Corp.

3-D applications can be created in Windows

By Michael Vizard
BOULDER, COLO.

A major step toward integrating three-dimensional applications within Microsoft Corp.'s Windows has come to pass with the arrival of a 3-D application development kit for Windows from Spatial Technology, Inc.

Personal ACIS is a development tool aimed at programmers working with Microsoft's Visual Basic to create Windows applications. Using Visual Basic as a front end to a derivative of the LISP programming language, which manipulates the core ACIS 3-D engine, programmers can integrate 3-D applications within the Windows environment. The core ACIS engine is written in C++, while the link from 16-bit Visual Basic to 32-bit LISP is accomplished using the Dynamic Data Exchange protocol.

No exiting Windows

Using a Dynamic Link Library, Spatial Technology then connects the 3-D application created using ACIS with other Windows applications so users can manipulate those images without having to exit a Windows program.

"This is a personal 3-D modeler for engineers that can also be used as a photo-rendering tool for Windows," said Richard Sowar, senior vice president for advanced technologies at Spatial Technology.

"This is a very interesting, enabling technology for advancing 3-D on Windows and NT platforms," said Brent Williams, director of PC software research at International Data Corp. in Framingham, Mass.

Because ACIS is a widely supported 3-D graphics standard in the workstation market, Williams said the 3-D application development environment will be a key element in Microsoft's drive to position its Windows NT against Unix in the high end of the workstation market.

"As an engineer, if you know how to use the 3-D modeling techniques of, say, Autodesk, you should be able to use Personal ACIS at home on your PC," Williams said.

ACIS is currently licensed by more than 160 vendors and research organizations. Versions of ACIS are available on a variety of Unix platforms, Digital Equipment Corp.'s VMS and the NextStep operating system from Next, Inc.

"ACIS has tremendous potential because it essentially gives you a core model for 25 man-years of 3-D application development that is widely supported in 3-D application software already," said Scott Bordin, president of Woodbourne, Inc., an application development house in West Linn, Ore., that is currently developing a stand-alone 3-D application for Windows using Personal ACIS.

"Spatial told us that they hope ACIS will become a geometric data bus standard that will play a similar role to the one Postscript plays in the publishing world," Bordin added.

Personal ACIS costs $995, with an introductory price of $495 until March 31. Professional ACIS, which includes all Personal ACIS subsystems, enhanced models and application redistribution rights, costs $5,000 for three developer seats.

Each additional seat is $2,500, and commercial applications created for resale using ACIS require a $250-per-unit royalty fee.

In Brief

Better CASE tool

CGI Systems, Inc. in Pearl River, N.Y., announced PacBase for Client/Server. The improved computer-aided software engineering tool includes a local-area network repository and the ability to build client/server programs for Microsoft Corp.'s Windows, IBM's OS/2 and various Unix-based platforms, the company said. The product is scheduled to ship by the third quarter.

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Visix ports Galaxy to VMS, desktop worlds

Visix Software, Inc. has announced the general release of its Galaxy Application Environment, a cross-platform tool set for the development of portable and distributed applications.

The tools — which are currently available for Unix — will be ported to Microsoft Corp.'s Windows and IBM's OS/2 by next month, and to Microsoft's Windows NT, Apple Computer, Inc.'s Macintosh and Digital Equipment Corp.'s VMS during the second quarter, according to company officials.

Pricing ranges from $7,500 to $9,600 per developer seat. There are no runtime charges.

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Ernst & Young adds to methodology tools

Consulting firm Ernst & Young has updated its Navigator Systems Series development methodology with a new set of tools and enhancements. Navigator Release 2.0 now includes support for client/server and object-oriented applications and integrates with KnowledgeWare, Inc.'s Application Development Workbench and Powersoft Corp.'s PowerBuilder.

The Navigator 2.0 Automated Methods Environment comprises project planning, enterprise standards and on-line access to methodology information.

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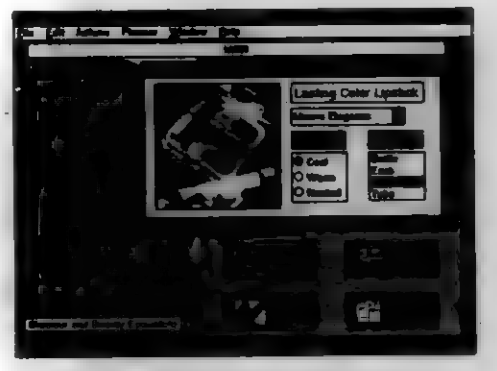

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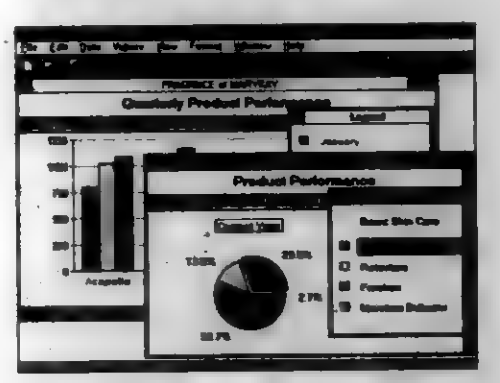

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Middleware

CONTINUED FROM PAGE 61

automatically capture keystrokes and generate the necessary connectivity code.

"DCA is playing to two trends: downsizing and rapid application development," said Tom Wood, senior industry analyst at the Business Research Group in Newton, Mass.

Traditionally, applications built using development software such as Visual Basic were limited to departmental use because developers cannot access mission-critical applications. This architecture and the resulting middleware will help software vendors and users integrate LAN and host applications, Wood said.

Offering their support

Several middleware vendors, including Connectivite Corp. and Flexus International Corp., have announced support for QuickApp and are considering plans to incorporate the software into their own development tools. Microsoft and Novell, Inc. are also backing QuickApp.

What this will mean for businesses such as Torrington is access to more host environments from a "one-size-fits-all" interface, said Connectivite President Omar M. Azmy. Torrington, part of Ingersoll-Rand Co., is a manufacturer of precision components such as ball bearings. The company uses software from Connectivite to connect PC applications to information residing on IBM 3090 mainframes and an Application System/400 minicomputer.

DCA will ship QuickApp with support for HLLAPI and Microsoft Visual Basic this spring for $295.

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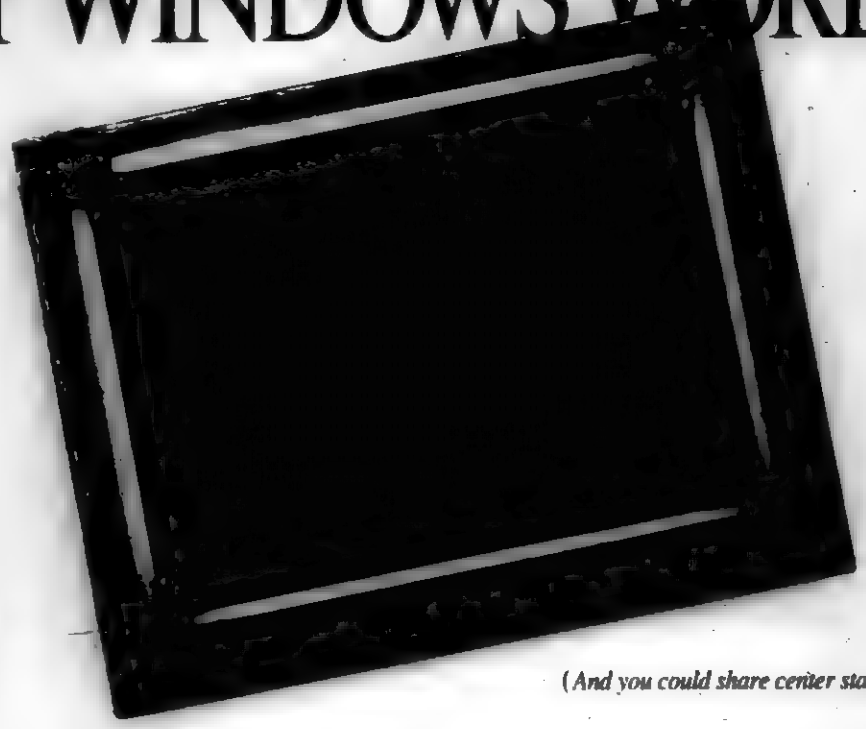

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Ahoy technology!

Skipper Ron Compton holds tight to faith in computers as Aetna struggles to right itself

Sailing relaxes Aetna Life & Casualty Co. Chairman and President Ron Compton. Knowing that his laptop-based executive information station is stowed safely aboard his 42-foot sailboat relaxes him even more.

"We're not talking about a lot of space or a lot of time here," Compton notes. When at sea, "The first thing I do is start up the coffee. Then, I just plug this baby in, and there I am: I can get into CompuServe, check for important messages, answer anything pressing and even get the marine weather information I need, all in the time it takes for the coffee to brew." By the time he drains his cup, he's also eased his mind, he says.

Extending E-mail to sea-mail is typical of Compton, 60, whose 38 years as an Aetna executive are studded with examples of information technology that he has pragmatically and effectively enlisted in the aid of the $92 billion insurance giant's business goals.

Not even a knock from one of business management's reigning gurus dampens his enthusiasm. "How about the case of Aetna Life & Casualty Chairman Ron Compton?" asks Tom Peters in a 1991 book review examining how much executives should be involved with technology issues. "He confesses to an active E-mail hookup on his sailboat. Ye gads!"

"Tom Peters just doesn't get it," Compton counters. "I don't use technology to meddle; I use it to keep informed so that I don't ever have to get unhealthily involved in any of the company's activities."

Compton's philosophy of tech-enabled awareness without interference has inspired him to design and implement an overall management methodology widely credited as a change agent at Aetna (see related story page 66).

Among the key pieces are a knowledge-based expert system available to 44,000 or so

Ahoy technology, *page 62*

Aetna Tower Street Entrance

The CEO: Ronald E. Compton, 60, chairman and chief executive officer, Aetna Life and Casualty Co.

The career: 1991: Chairman and chief executive officer, Aetna; 1988: President, director; 1987: Senior vice president, executive vice president, office of the chairman; 1980-83: President, executive vice president, senior vice president, American Re-Insurance Co.; 1975-79: General manager, Pittsburgh office, Philadelphia office, Aetna; 1972: Assistant vice president, commercial casualty division; 1968: Assistant secretary and countrywide underwriting officer; 1954: Underwriter.

The education: Northwestern University, 1954, B.A., philosophy.

Inside

Intelligence Files
• *Ideas for action.*
Executive Track
• *Comings and goings.*
Calendar
• *Hot events.*
Page 67.

Aetna is one of the world's largest providers of insurance and financial services to corporations, public and private institutions and individuals. It is based in Hartford, Conn.

Aetna's assets total $92 billion, making it the nation's largest stockholder-owned insurance and financial services organization and the 15th-largest U.S. company.

The company's 1992 IS budget was a hefty $538 million. Technology operations employed roughly 4,900 at the beginning of 1992, although the company has laid off approximately 700 IS workers in the past year. Aetna's downsizing has brought them $200 million in projected paybacks. The IS staff is responsible for about 43,500 PCs companywide.

Aetna Chairman and CEO Ron Compton may be a major PC booster, but his point-and-click proclivities are not limited to his laptop: The chairman also spends some quality time behind a camera. "If you ask him about his photography, he'll probably downplay it and tell you he isn't all that great," says one of his close associates at Aetna. "But don't believe it: His work has been shown at galleries."

Ahoy technology!

CONTINUED FROM PAGE 65

users across the company and a repository-based executive information system (EIS) that keeps the CEO apprised of its progress.

These days, there's lots to keep track of. Two weeks ago Aetna reported huge drops in both year-end and fourth-quarter results. The insurer said it lost $192 million during the last part of 1992. Worse, year-end income shrank from $505 million in 1991 to just $56 million.

Compton blamed the dismal showing chiefly on various environmental charges, losses from Hurricane Andrew and winter storm Beth, and nearly $100 million in buyout packages for departing workers.

Despite the setbacks, Compton remains optimistic that technology will continue to play a crucial role at Aetna. He spoke recently with *Computerworld* Senior Editor Neil Margolis.

CEO's role in choosing a CIO

I think the CEO should *do* it.

There are four resources anyone needs to really run a company: capital, people, technology and time, which is the only one that's absolutely limited. So, at least for me, it's axiomatic that the CEO had better play an active role in the selection and [deployment] of all of these critical resources.

Of the four, technology is by far the one least understood by most CEOs. That's all the more reason why they ought to get close to it through the CIO.

Raising Aetna from IS mediocrity

When I returned to Aetna about six years ago, the company wasn't known as an exemplary deployer of IS. I had never been satisfied with Aetna's technological performance — I rated us as fairly mediocre.

So the first thing I did was an audit of our resources to find out what we were offering, what the various businesses of the company needed from us and where the differential lay. From there, we could start to plan how we would fill in the gaps.

We ended up with a baseline all right: On a scale of 1 to 10, we were safely in the three to four range on almost everything. The best score I remember any function or service ranking was a six.

This didn't go down real well with the staff. Nobody wanted to hear it — nobody here at corporate headquarters, that is. The people out in the field already knew — heck, they were the ones who told *me* about it. But here there was a lot of resistance, a lot of denial: This is how we've always done it, yadadadadada — and probably that was true. But the way we were doing it didn't yield quick, flexible and right.

Picking a top-notch CIO

What I needed was not a good chief information officer, but the best CIO. So I went to Naomi Seligman at The Research Board and asked her to make me a list of the 10 best users of technology in the country. Then I asked her to broker me meetings with the CIOs at each of those companies.

These folks weren't candidates for the Aetna CIO job. What I needed to do was establish a set of benchmarks in my own mind to measure the eventual job candidates against: These 10 were my benchmarkers. We had had an absolutely top CIO at American Re — Judy DeMuth. I used her as a benchmark, too.

I traveled to each of the 10 companies and studied what they were doing with IS and how they were doing it — what it was that made them so good. I picked the brains of every CIO. It took anywhere from a half-day to a day at each; you can learn a lot in that amount of time if you're not bashful about asking questions. I ran into a lot of interesting folks along the way, and their examples have continued to inspire me.

For the actual hiring of the CIO, we used a search firm. As it turned out, we hired someone [CIO John D. Loewenberg] Naomi found, who *was* available.

Twin roles of the CIO

One critical thing a CEO realizes from becoming involved in the selection of a CIO is that you're really not looking for one person, you're looking for two: A strategist and a manager. The big mistake you can make is assuming they're going to come in the same package. If they do, you're in a very lucky minority. Don't think you can get around the conundrum by hiring a strategist and backing him up with a good manager, or vice versa. What you'll likely end up with is a CIO who is isolated from a critical part of his job and is handicapped as a consequence. It doesn't work.

Creating a technology arm

Once we had the CIO we wanted, I created a kind of company within the company — Aetna Information Technology (AIT) — and equipped it with a board of directors, made up of the five group executives. I'm the sole shareholder. We took the customers and had them run the business.

How fuzziness blocks IS alignment

The proposition that IS be well-aligned with the needs of the business — that's getting a lot of attention these days and it ought to — is critical.

But one of the flaws that CEOs have to come to grips with is that frequently, not just occasionally, the businessperson doesn't know what he wants. He thinks he does. He'll tell you he does, and he'll tell you what it is — but he won't be right.

Importance of user involvement

Several years ago, we had a technically very good claims system that didn't go anywhere because the field claims managers hadn't been involved in creating it. It did some neat things. [But] it failed to address some needs that could have been taken care of if the users had been forced to very precisely articulate their needs.

New model: Team and plan

The old design-build-run model for IS implementation is really useless today. There's no way that works other than taking the users and the techies, locking them up together until they solve the issues of who needs what and why, and then build exactly that — with no changes in direction once construction is under way.

Until the businessperson can commit his needs to paper, complete with charts and specifications, the techies can't get started. Once they do start, the door should be barred. If it isn't, the changes'll kill you.

Why changes are fatal

At American Re, I've seen 10% of the customers build systems in one quarter of the time it took anybody else: That's because in their cases, IS went about it pretty autocratically. They got lots of customer input in the planning stages, but when it came to implementation, they took one last look and BAM! Meanwhile, there were 5,000 changes the customers would've asked for, if anyone had been listening.

There is plenty of documentation to back this up: Any changes after Day 2 are *fatal*. That means that you have to take excruciating care at the outset to make sure you get it right.

On the mounting importance of PCs

We used to be a big mainframe shop — and when I say big, I mean *big*. It took three separate computer sites to house our big iron. It wasn't all that long ago that it looked like that was the future of computing: A wall of mainframes as far as the eye could see.

I'm working on my fifth laptop right now; I've run through four, and one self-destructed. My mind isn't closed — I'm always open to a good argument. But anyone who thinks they're going to satisfy *my* needs with a mainframe is going to have one heck of a lot of convincing to do. •

Turning up the AMPs

Teasing out exactly what users really need (not what they think or say they need) is a key but frequently overlooked part of a successful IS/business pairing, says Aetna Chairman and President Ron Compton.

So Compton designed an executive information system to discover *real* user needs and to help IS tailor the technology to satisfy them. He then extrapolated the EIS' underlying methodology into an overall management approach.

Today, the Aetna Management Process (AMP) has become an active part of daily life at the $92 billion insurance giant, says Compton.

"We AMP just about everything," Compton says.

AMP relies on the following seven pillars:

1. **Identify your mission; be extremely specific.**
2. **Keep the emphasis on specifics; identify the success factors critical to your mission.**
3. **Identify and describe the factors that impact critical success factors, both within and outside of your environment.**
4. **Pinpoint a) where you are and b) where you want to be.**
5. **In each instance, set a measurable objective for closing the gap between a) and b) above.**
6. **Work out an action blueprint and a specific timetable for each projected gap-closing step.**
7. **Set up a system — automated or otherwise, whatever works best — to monitor the performance of each blueprinted plan.**

—Neil Margolis

Intelligence Files

The fleeting edge

More evidence that the competitive advantage of innovative systems does not last forever: Merrill Lynch & Co.'s technology-supported Cash Management Account (CMA), so revolutionary 15 years ago that it was patented, is now a commodity product because most securities firms offer something similar.

The CMA used information systems to give customers a combined account for money market funds, checks, credit cards, stocks and bond trading. It became Merrill Lynch's No. 1 source of new customers and accounts for $255 billion of the company's $475 billion in assets.

Recently, however, CMA account growth has slowed to a crawl due to competition from discount brokers and newer financial products.

Source: "Merrill's Once-revolutionary CMA Is Losing Its Edge," *The Wall Street Journal*, Jan. 7, 1993, Randall Smith, author.

Colleges try outsourcing

Many colleges have privatized their bookstores and dining halls, but now budget pressures and rapid changes in technology are causing some colleges to consider outsourcing for IS. A recent survey found 30% of colleges use contractors for at least one IS activity, and 6% have hired contractors to run their computer centers.

The University of Richmond decided to outsource because officials felt overwhelmed by demands from administrators, professors and students for computing power. At Norwich University in Vermont, outsourcing IS has solved the problem of attracting qualified IS personnel to the institution's rural location.

Source: "More Colleges Eye Outside Companies to Run Their Computer Operations," by Thomas J. DeLoughry, *The Chronicle of Higher Education*, Jan. 13, 1993.

Banks get the message

Bankers are beginning to learn what retailers have known for some time — investing in customer service pays off in higher customer-retention rates and higher revenue. This newfound interest in customer service is driving many bank technology investment decisions.

Capital investments in retail delivery systems are projected to increase 18% by 1996. Investments include modernizing branch automation systems and experimenting with self-service technologies.

Source: "Operating Budgets & Capital Expenditures for Banking Technology," a market research report by Mercis Corp., Salisbury, Md., Jan. 22, 1993.

EDI in Japan, Inc.

During the past 20 years, electronic data interchange (EDI) in the U.S. has migrated from proprietary protocols to industry-specific standards to the cross-industry ANSI X.12 standard. But in Japan, open EDI standards have been slow to develop.

Japan's close-knit groups of trading partners already enjoy many of EDI's advantages through closed, proprietary systems for the exchange of business data. However, last April the Japan Information Processing Development Center released a cross-industry EDI standard called the CII Syntax Rules.

Several industry associations in Japan have agreed to conduct a trial of the rules, which may be the foundation for a Japanese EDI standard and spur development of EDI translation software.

Source: "EDI Development and Trends in the United States and Japan," a paper by Donald J. McCubbrey, University of Denver.

Court imaging rules

Court administrators are beginning to consider imaging technology for applications such as processing traffic citations. Here are five "ground rules" to consider:

- Imaging systems are only as good as the database serving them. Accurate indexing is critical.
- Optical character recognition (OCR) systems are not accurate enough for legal work. OCR can enhance the document indexing process, however.
- Image computer files are large. An image of the average traffic ticket in Los Angeles takes up 50K bytes, with data compression.
- Fast networks are needed to link desktop computers to the imaging server.
- Because imaging is expensive, it should be used for active case processing rather than archives.

Source: "Imaging Can Ease Courts' Record-Keeping Tasks," by Jim McMillan and Tom Dibble, *The National Law Journal*, Feb. 1, 1993.

Compiled by the CW staff.

Calendar

MARCH 7 - MARCH 13

Geographic Information Systems (GIS) in Business '93 Conference. Boston, March 7-10 — Contact: GIS World, Fort Collins, Colo. (303) 223-4848.

First Workshop on Object-Oriented Design '93. Snowbird, Utah, March 8-10 — Contact: Object-Oriented Software Engineering, Brookfield, Wis. (414) 789-5253.

XWorld. New York, March 8-11 — Contact: XWorld, New York, N.Y. (212) 274-9135.

Internetworking with NetWare. Boston, March 9-10 — Contact: Center for Advanced Professional Development, Santa Ana, Calif. (714) 261-0240.

Technical Symposium on Computer Science Education. Phoenix, March 10-12 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

MARCH 14 - MARCH 20

National Automated Clearing House Association Conference (NACHA). San Diego, March 14-17 — Contact: NACHA, Herndon, Va. (703) 742-9190.

UniForum Technology Managers' Conference. San Francisco, March 15-16 — Contact: UniForum 1993, Registration Dept., Carol Stream, Ill. (708) 290-0396.

13th Annual Conference: "Clinical Information Systems," March 16-17 — Contact: Laura Lee, Society for Clinical Data Management Systems, Los Angeles, Calif. (213) 224-6259.

The Workgroup Computing Conference. Washington, D.C., March 18-19 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The 1993 Long Island Conference of Artificial Intelligence and Computer Graphics. New York, March 20 — Contact: New York Institute of Technology, Old Westbury, N.Y. (516) 686-7628.

Executive Track

McKesson Corp. reportedly has reassigned its first chief information officer, Russell J. Harrison. The $10.3 billion pharmaceuticals and health firm hired Harrison, a 29-year IBM veteran, as its first CIO in October 1991. Now, however, the San Francisco-based company says Harrison can serve better as a vice president focusing on order processing and other tasks affecting hospitals, buying groups and suppliers.

Avis, Inc. has appointed Nicholas O'Connor director of systems development. The 21-year company veteran will be responsible for developing Avis' computer-driven sales and marketing systems.

BSG Consulting, Inc. in Houston continued its expansion with the announcement of two new positions. Director Peter Ryder will focus on business re-engineering; while Eric Reed will serve as director of BSG's Technical Knowledge Organization.

Both will be stationed in the firm's Houston headquarters. The 250-person consultancy specializes in client/server technology and systems integration.

CompuServe, Inc. has named John Thompson general manager of the Mid-Atlantic Region of its systems integration group, based in McLean, Va. Thompson, most recently director of operations at Evernet Systems, Inc., will direct a staff offering local-area network design, implementation and consulting.

Awards

Electronic Data Systems Corp. and **Anderson Consulting** were named top firms in the second annual excellence contest held by "The Integrator," a Barnegat, N.J., newsletter. Dallas-based EDS took honors as "integrator of the year," while Andersen Consulting in Chicago was named "best commercial systems integrator."

SHL Systemshouse, Inc. won "best rising star" and "best client/server" integrator awards. Winners in the $50 billion worldwide industry were selected by a panel of industry observers, journalists and analysts.

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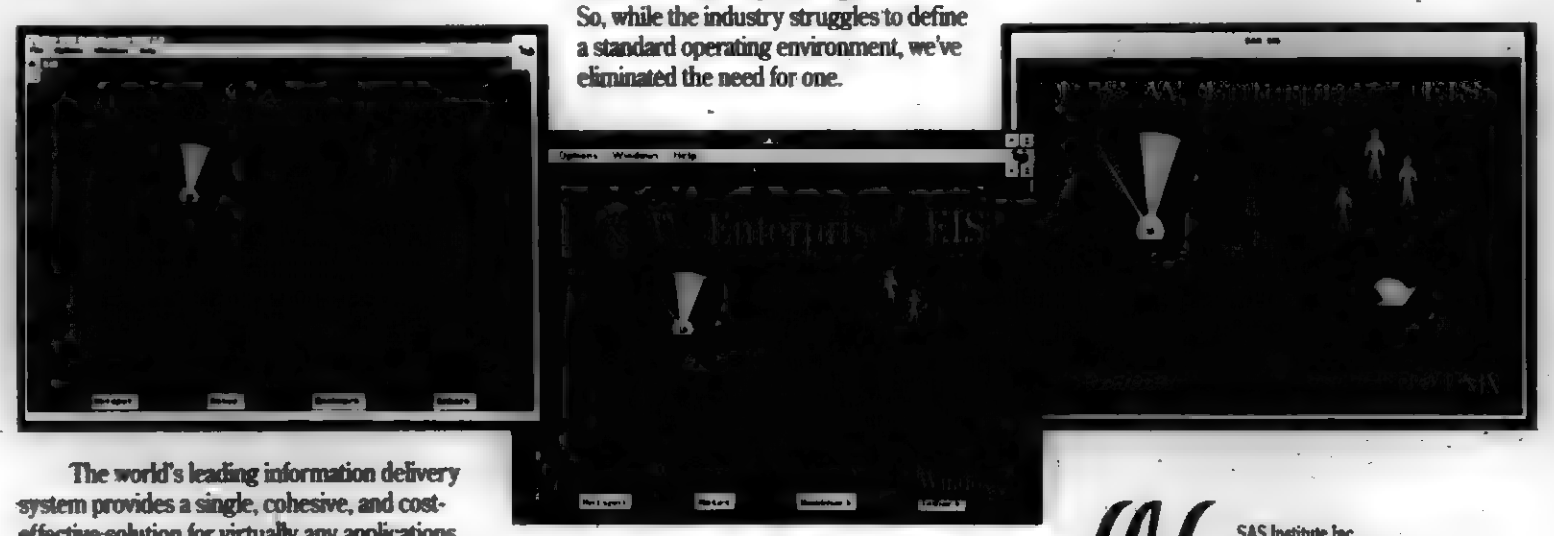

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The CW Guide: Desktop Operating Systems

The BEST for the desk

Sorting out vendor schemes and product features can be difficult. Ultimately, the best choice depends on how you plan to use your operating system.

WINDOWS (MICROSOFT)

STRENGTHS: Windows NT combines the power of multitasking and memory management with the intuitive interface of Windows 3.1. The DOS/Windows/NT trio is highly scalable, supporting the smallest laptop up to DEC's Alpha systems.

WEAKNESSES: NT won't be available until midyear at the earliest, and the first release may lack the maturity and stability of its competitors. Beta-test versions require substantial memory and disk space.

UNIX (SUN, SANTA CRUZ OPERATION, NOVELL)

STRENGTHS: User-friendly interfaces are now available, which puts a familiar face on Unix's powerful but difficult to use features, such as multitasking and multiuser support.

WEAKNESSES: You can pay a significant price for Unix, compared with other operating systems, in terms of hardware and training. It can also be complicated to install and administer.

OS/2 (IBM)

STRENGTHS: Users like the fact that it runs several processing tasks simultaneously and doesn't crash when an application crash occurs. OS/2 serves as a highly stable and reliable platform.

WEAKNESSES: OS/2 requires substantial memory and disk space, and it operates only on Intel-based microprocessors. There's also a dearth of native OS/2 applications.

SYSTEM 7 (APPLE)

STRENGTHS: Users report high stability and ease of use. They say applications are easier to master because of the consistent interface. System 7 also exhibits the best handling of graphics applications, compared with other operating systems.

WEAKNESSES: System 7 requires state-of-the-art Macintosh hardware, and users say it is still difficult to integrate into the PC-oriented business world.

INSIDE

So, you want a new desktop operating system? Probably the most valuable information you can receive is straight from the users. According to our Buyers' Scorecard survey, each user group finds different strengths and weaknesses in their operating systems. **Page 71.** Beta-test users say NT is meeting expectations so far. **Page 75.** Specific users also relate their desktop tales. **Page 74.**

The big-picture view is also important; a leading member of the Microcomputer Manager's Association talks 'vendor strategy' for the top products in the 32-bit world. **Page 70.**

And, of course, there's always the issue of cost — one of the biggest concerns for any major platform move. We explore the price of migrating to a GUI. **Page 73.** In fact, some contrarians are posing other options to GUIs. **Page 74.**

Desktop Operating Systems

One isn't always enough

Picking the right mix of systems requires studying how they relate to your business

You may be heartened to know that whatever desktop operating system you choose, it won't sound the death knell for your company, nor will the decision make or break you financially. However, the wrong decision will ripple throughout your organization in the form of future technology directions and how flexible your operations are.

For instance, you might have difficulty with application interoperability, configuration management and processor administration if the wrong operating system is applied. In addition, the personal tools with which you outfit your staff directly correlates with the staff's efficiency, productivity and competitiveness. In this way, too, your operating system will impact your business.

From IBM to Microsoft Corp. to Apple Computer, Inc. to the many Unix providers (including The Santa Cruz Operation, Novell, Inc. and Sun Microsystems, Inc.), there are operating systems galore, providing vastly different capabilities. It's already been established that no one operating system will prevail as "winner take all." Rather, each system's relevance is based on the makeup of your business, the systems you intend to deploy and the goals you hope to achieve.

In fact, many companies will likely install a variety of operating systems, depending on where they fit best, such as OS/2 for development, Windows for administration tasks and Unix on the server.

To help you find your way through the operating system world, we have taken a variety of perspectives: what users think, what vendors intend and what studies show.

The enterprise view

Top players' schemes differ

By Mark Roy

Features and functions are certainly important when choosing your company's future desktop operating systems. However, it is also mandatory that you view each system in light of the current computing platforms you have in place.

Bridging the gap between legacy systems and future desktop technologies is the difficult challenge faced by information systems managers — as is choosing the operating systems.

Three major players in the 32-bit world — IBM, Microsoft Corp. and Sun Microsystems, Inc. — have set out vastly different offerings for their next generation of desktop operating systems.

Following is how each vendor's offering fits into a working enterprise, complete with a review of strengths and weaknesses for each system.

Roy is the vice president of the National Microcomputer Managers Association (MMA) and a founding member of the MMA-New England. He can be reached at (508) 369-4840, Ext. 297 or via CompuServe 73257,633. He is currently a senior network consultant at Bytex Corp.

User profile: A company choosing OS/2 would likely value reliability above flexibility and prefer the security of a single-vendor approach, from the server to the network to the client. An example is a financial services firm, where transactions depend on system commonality and conformity.

Strategy (mostly) matches needs

"On a scale of 1 to 5, where 5 is extremely well and 1 is poor, how well does your current vendor's operating system strategy meet your needs?"

Response base: 180 Buyers' Scorecard survey respondents

Microsoft Windows	4.1
IBM OS/2	3.9
Apple System 7	3.8
SCO Unix	3.7

Overview: OS/2 is a portion of the revised IBM Systems Application Architecture (SAA). The desktop system is an integral component in a network of high-powered servers, which can run the gamut of mainframes, minicomputers and PCs. Services can include terminal sessions and file and peripheral sharing, as well as real-time data such as live news feeds and peer-to-peer communications.

In an OS/2 scenario, the knowledge worker is presumed to be predominantly office-bound and the focus of these networked services.

In this communications structure, OS/2 accepts data types arriving at asynchronous times and rates and in a variety of data types. Who among us has not had trouble doing simple things such as downloading from CompuServe at 9.6K bit/sec. while maintaining a 3270 session and running a couple of other applications under Windows 3.0/3.1?

Hallmarks of the "IBM Office" are Personal System/2s with 386 processors or better. The communications needs are a combination of mainframe or minicomputer applications, which combine traditional Systems Network Architecture (SNA) terminal sessions and advanced peer-to-peer and client/server applications. The latter would include access to large-system databases using the OS/2 graphical user interface as a robust front end, replacing older CICS or terminal-based environments.

IBM's offering was designed to leverage and extend the SNA investment while providing robust network services to the enterprise.

Smaller applications could be distributed across workstations, building on the ability to use the combined platform strength and recoverability of a distributed strategy.

Using Advanced Peer-to-Peer Networking (APPN), each workstation is also a server with responsibility for a portion of the system support, thereby increasing performance and utility.

OS/2 runs on PCs by vendors other than IBM. However, it was uniquely designed to take advantage of the capabilities of the IBM Micro Channel Architecture (MCA).

Biggest strengths: As much as IBM may be bashed for its complexity and narrow view of knowledge worker needs, when OS/2 is placed in context with the broad SAA strategy, OS/2 and MCA PCs make perfect sense. For those environments where IBM is the strategic direction, OS/2 is a clear winner.

In an OS/2 and SAA environ-

Top players, *page 72*

OS/2:
Access to OS/2 engineers and developers is available on CompuServe. At a CIS prompt, enter "FIND IBMF" for a listing of forums. Especially recommended is the APPC Forum (GO APPC). Check out The APPN Story in Library Four.

NT:
Access to Microsoft engineers and developers is also available on CompuServe. At a CIS prompt, enter "FIND MICROSOFT" for a listing of forums. Try the Windows NT Forum ("GO WINNT") for the latest progress on NT developments.

Information, *page 72*

Desktop Operating Systems

Buyers' Scorecard: Apple System 7 leads the way in desktop satisfaction

By Derek Slater

The Buyers' Scorecard asked users to rate the market leading desktop operating systems based on their individual features and functions. While Apple Computer, Inc.'s System 7 garnered the highest satisfaction score, each operating system proved to have distinctive strengths and weaknesses in key areas.

The 32-bit Macintosh operating system lived up to its reputation of providing exceptional ease of use, respondents said. System 7 earned the highest overall score of 78, including top scores in stability and overall ease of use.

Its lack of compatibility with the IBM-compatible world was a drawback. Users were also dissatisfied with the hardware and software costs involved in running System 7.

Microsoft Corp.'s Windows 3.x, running with DOS, placed second to System 7 in ease of use and second overall with a score of 74. In general, Windows' strengths were the opposite of the other systems in the survey.

Windows earned high satisfaction grades in value for the dollar and kudos for its compatibility with installed hardware and DOS applications. Its weaknesses, users said, were in speed and stability. Users rated the product lower in networking capabilities as well. While 65% of the other respondents surveyed reported using their operating systems on networked systems, only 42% of the Windows users were networked.

The Santa Cruz Operation's Open Desktop, which runs atop Unix, is notable for its multiuser support, respondents said. Nearly all its users said their PCs are networked.

The product also scored highest in the area of multitasking, ahead of IBM's OS/2. It placed behind its competitors in ease of use and ease of installation.

IBM's OS/2 2.x users gave the product its highest marks in multitasking, value for the dollar and networking capabilities, singling out multitasking as the product's key benefit. OS/2 rated lower than the other products in key areas, including availability of third-party applications and vendor service and support.

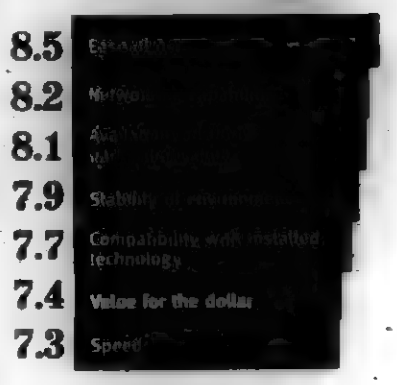
According to International Data Corp., DOS still dominates the desktop, with a 53% share for 1992; Windows is second with a 28% share; Macintosh is third with 10%; and OS/2 is fourth with about 7%. Unix was less than 2% of the PC operating system sales.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their desktop operating system in 15 specific categories. All categories were factored into the final scores. (For a complete list of categories, see chart on page 69.)

The majority of the 180 Scorecard respondents were information systems professionals: directors and higher (9%), managers (24%), end-user computing managers (10%), local-area network administrators (3%) and system analysts (11%). •

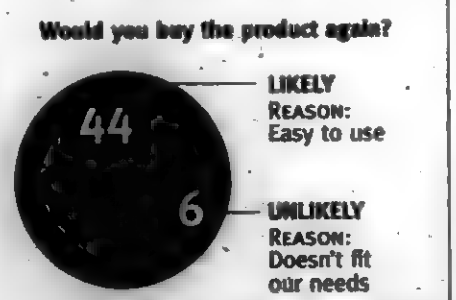
Apple's System 7.x

OVERALL SCORE: 78



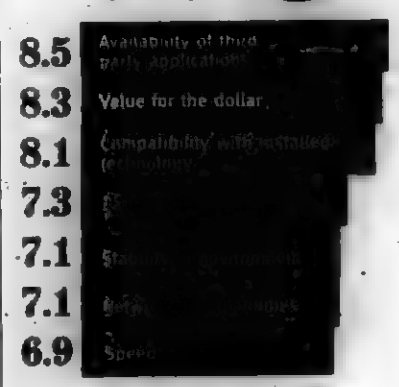
RESPONSE BASE: 50 USERS

Would you buy the product again?



Microsoft's Windows 3.x

OVERALL SCORE: 74



RESPONSE BASE: 50 USERS

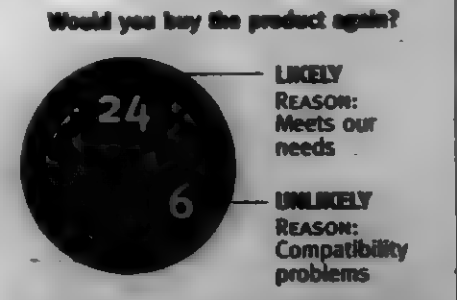
Would you buy the product again?

SCO's Open Desktop

OVERALL SCORE: 73

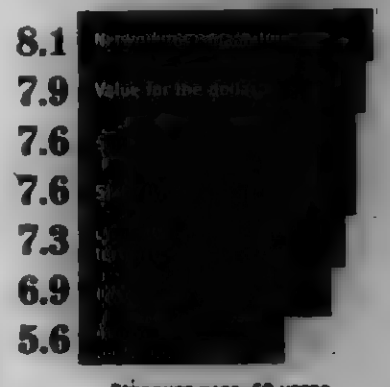
RESPONSE BASE: 30 USERS

Would you buy the product again?



IBM's OS/2 2.x

OVERALL SCORE: 72



RESPONSE BASE: 50 USERS

Would you buy the product again?

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 30 users of The Santa Cruz Operation's Open Desktop and 50 users each for the other products.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the survey.

To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in each category by the importance rating for that area. 2) Average the resulting figures and convert to base 100. Numbers are rounded off where necessary.

Desktop Operating Systems

How Univel fits into the picture

It's easy to make the mistake of comparing what Unix System Laboratories, Inc. and Novell, Inc. are doing with their operating systems to the offerings from IBM, Microsoft and the various other Unix suppliers, such as Sun. The differences are quite significant.

First and foremost, Univel was not intended to be a desktop operating system. Rather, it is supposed to be an application engine that provides seamless local-area network integration. The applications to be run will be specifically geared toward LAN operation.

For example, the security components of the MIT Kerberos system can run as a process on the server, independent of the file- and peripheral-sharing functions but linked to an accounting process to track on-line time and application use. Based on various triggers from the server, management applications can be run to track and log, for instance, disk utilization and capacity.

Watch for Univel to unveil advanced client applications for the major desktop operating systems to take maximum advantage of the new server-based capabilities. This facility — combined with advanced peer-to-peer communications on powerful APIs able to run on various platforms — will catapult user access and workgroup computing into action.

These benefits, however, will apply only to Novell users. The Univel solution was designed to address only the shortcomings in the Novell environment. Issues of workstation-level peer and enterprise communication are still outstanding.

A better scheme may be to continue to use existing file servers in their current capacity and add more power with a desktop-empowered strategy.

—Mark Roy

Top players' schemes

CONTINUED FROM PAGE 70

ment, older terminal-based applications running on large embedded systems can continue to provide valuable service to the enterprise. By using additional tools, the large systems application front end can be separated from the data and can allow new applications to be developed in a client/server model.

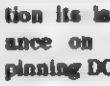
Through APPN, even greater communications can be initiated for robust workgroup connectivity. The advanced nature and full-system control provided under OS/2 (not to mention its lack of reliance on an underpinning DOS) make it a highly stable and reliable platform for application operations.

Applications that do leverage OS/2's capabilities provide significant access to current and future IBM systems.

Advanced network management, database front-end analysis and executive information systems all currently benefit from OS/2's outstanding features.

Biggest weaknesses: OS/2 is hindered by substantial hardware requirements and the limitation to operate only on Intel Corp.-based microprocessors.

Although a few thousand applications currently run in the OS/2 environment, most are not mainstream applications, nor do many take maximum advantage of the OS/2 environment, having been "ported" from the earlier DOS or Windows versions to become OS/2 also-rans.



User profile: If your shop is comprised not of heterogeneous knowledge worker tools but of cross-platform applications, data sharing and workgroup computing, the Microsoft strategy is for you.

A Windows NT company values flexibility and needs a variety of platforms, portables and networks with a wide array of applications and an interface that is familiar to users. It's also capable of supporting a system that does not have proven reliability, security and stability.

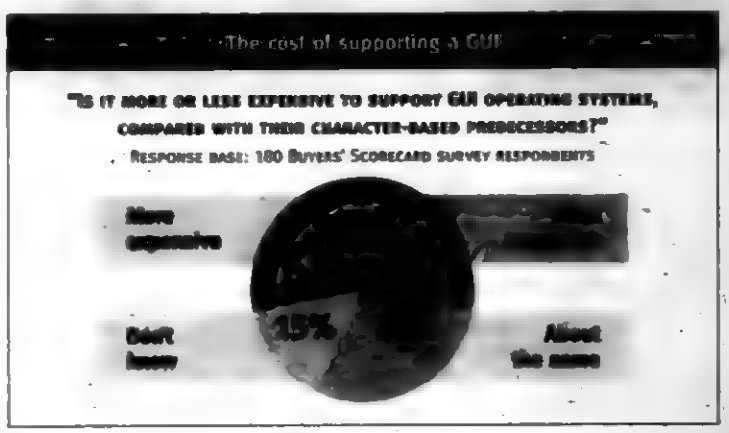
An example is a consumer products company, where there are varied types of users, including salespeople on the road, financial workers with spreadsheets, manufacturers and marketers.

Overview: In Microsoft's view, work forces are nomadic, armed with palmtops, laptops and portables. Route drivers, salespeople and mobile managers need timely information that can be received, examined, manipulated and stored.

Back in the office, this rich text and graphic data must be seamlessly retrieved by other users to complete the business cycle. Powerful processors and high-end workstations crunch and manage the data.

To provide continuity, Microsoft developed application programming interfaces (API) designed to leverage backward compatibility with DOS systems and bolster new advanced applications. Dynamic Data Exchange and Object Linking and Embedding support cross-application communications and manage complex data types incorporating images, video and sound.

The Windows Open Services Architecture (WOSA) is an open-ended API allowing integration of Windows and Windows-based applications with larger enterprise systems. WOSA incorporates Open Database Connectivity and Messaging Application Programming Interfaces (MAPI) — a database API based on the work of the SQL Access Group — as components. MAPI allows communications with messaging systems.



Biggest strengths: Adhering to the promise of backward compatibility, Microsoft's scalable operating platform trio (DOS, Windows, NT) supports the smallest laptops to systems running Mips Technology, Inc.'s R4000 chip up to the substantial new line of Digital Equipment Corp. Alpha-based systems. NT's support for symmetric multiprocessing (SMP) at the thread level was recently demonstrated on a Sequent Computer Systems, Inc. Symmetry/750 with 16 Intel 60-MHz I486 processors.

The information systems manager is thus provided with both the logical and the financial ability to spend scarce resources where necessary while still providing full function to the knowledge worker.

Because applications across platforms are heterogeneous, issues of training, network software licensing and application management are reduced.

Biggest weaknesses: Caution should be observed if you contemplate a Microsoft-based strategy. With all its promise, NT is not available. Claims of reliability and performance must be proven in the marketplace crucible. The Windows NT beta-test version that shipped in October 1992 did not yet include scheduling and electronic-mail features. Tuning for the NT File System and memory size are still under way.

Windows 3.1, while more stable than Windows 3.0, remains tied to single-threaded DOS. With device drivers groaning to support the API activity churning above them, unidentified application errors have yet to be eliminated.

User profile: A company choosing Sun's Solaris would typically have a disparate variety of processors, each selected for unique applications (such as security authentication) and purposes (such as an SMP database server) but still part of the

Continued from page 70

Also available is the Microsoft Developers Network, through which compact discs packed with information and sample code for all Microsoft languages and systems are distributed on a regular basis. Call (800) 227-4679 or send a message via E-mail to devnetwk@microsoft.com for information or to enroll. It includes the "Microsoft Developer Network News," published bi-monthly.

NT, in depth:
Computer Technology Research Corp. has published "Windows NT — Microsoft's New Operating System Strategy." Having used a beta-test copy of Windows NT since mid-1992, the authors provide a critique of NT's performance, look and feel, security options and memory requirements and compare it with OS/2 and Unix. The report also examines how NT will affect other parts of the industry such as the Advanced Computing Environment consortium, application development, networking and more. The price is $190 per copy. Contact: Brian Lindgren, editor, at (803) 853-6460.

Forecasts from Europe
According to London-based market research firm Ovum, which takes a look at the desktop market in Europe in its recent "Software Product Markets Europe" report, each desktop operating system will have a place in corporations. Unix will remain the platform of choice for technical applications, while OS/2 will be used mainly for corporate applications where PC-to-host communications are important. The Apple Macintosh is expected to hold its market share of about 10% in Europe, and Windows NT installations will overtake OS/2 and Unix during 1995 as increasing stability encourages existing Windows users to migrate to that platform. Annual subscription is $2,315. Contact: Julian Hewett, Heather Stark or Brigitte Engelen at (011-44) 71-255-2670.

GUI migration tools
For more information on the cost of graphical user interface migration, see the Management section in the Jan. 18 issue of *Computerworld*.

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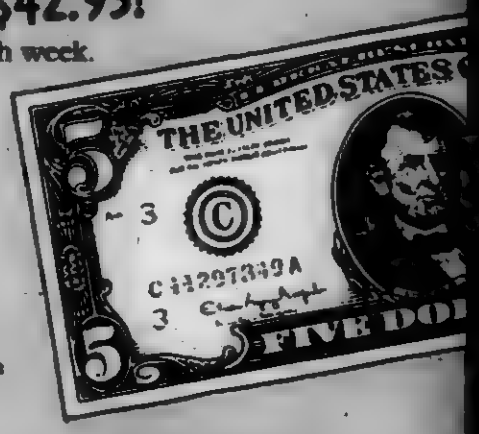

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Desktop Operating Systems

corporate whole. Data must be shared, but not at the expense of popular and easy-to-use applications. An example is an aerospace company where there's heavy research and development — engineers who love Sun workstations running Unix, as well as other users more familiar with PC platforms.

Overview: Raw Unix is an uninviting world. Knowledge workers need power, yes, but the objective is productive work, not wasted time navigating an obfuscated operating system.

This is where Solaris comes in. The Solaris environment provides compatibility with popular applications while maintaining the power, flexibility and utility of Unix. Although the advanced features of Solaris are best used on Sun Scalable Processor Architecture (SPARC) systems, Solaris also runs on Intel systems. Built from a common source-code base, Solaris can support many applications on either platform. Consider the fact that Sun has built workstations based on Intel processors since 1985.

> There comes a point where obsolescence requires us to abandon the old for the new.

Solaris also scales from midrange Intel systems (80386 and up) and Sun SPARC systems to supercomputers from Cray Computer Corp. In this way, Solaris integrates current PC applications with powerful systems while maintaining control of management and administration.

Biggest strengths: The IS manager choosing Solaris is positioned to support the current generation of workstations and knowledge worker needs, but Solaris is also driving toward the advanced capabilities of distributed computing. Specialized servers will manage data and applications based on clearly specified needs using single or multiprocessor systems. Administration, security and configuration management can be managed in an organized manner using integrated tools.

Solaris offers the power of an industry-leading, multitasking, multiprocessing operating system with fully integrated, open networking to provide the most powerful graphical environment ever developed.

Biggest weaknesses: Be prepared to pay a significant price for this power in relation to OS/2 and Windows NT. Solaris averages some $795 per workstation. There are also additional costs you need to consider for education in the world of Unix administration. Though there is much correlation to the DOS world, Solaris poses sufficient complexities that require diligent care to maintain such an advanced environment.

As many would argue that OS/2 and Windows NT are overkill for the desktop, the same argument could be levied toward Solaris.

.....

As each IS manager knows, there comes a point in the technology life cycle when obsolescence requires us to abandon the old for the new. That fact in itself gives us pause: Although OS/2 and NT are multitasking, they are not multiuser.

Though multithreaded, there's no support for parallelism. Of the three, only Solaris supports all this, provides backward compatibility for popular applications and fully supports open standards. If the decision we are making is to be truly strategic, we must realize the shortcomings of popular technology directions.

The IS manager has greater flexibility than ever before in customizing the enterprise environment. Major players have developed systems to manage data and applications for maximum performance, on or across platforms. No limits are placed on the network construction or data types that can be supported. However, problems can arise from improper application of an operating system to the task at hand.

Maybe in the 24th century, there'll be only one operating system. All systems will interoperate and will understand our implication by context. For now, though, we must make good design choices. •

The price of migration

A recent study says it can cost an average of $4,000 per PC to move from a traditional desktop operating system to a GUI-based one

414 members of the Microcomputer Managers Association (MMA) were asked how much it cost to move to one of today's leading GUI-based platforms. The mean migration cost for each operating system is at the top of the table. The rest of the table provides a more detailed look at how much, on average, the respondents paid for specific elements of the migration. The numbers reflect the percentage of respondents who reported spending within each given range. Response base: Unix (78), OS/2 (107), Windows (163) and Macintosh (129).

WHAT IT COSTS TO MOVE TO EACH PLATFORM

UNIX: $4,261	OS/2: $4,219	WINDOWS: $3,917	MACINTOSH: $4,163

THE TABLES

Price points	Less than $500	$500 – $999	$1,000 – $1,499	$1,500 – $1,999	$2,000 or more

HARDWARE

Hardware upgrade costs are slightly higher for Unix than for other operating systems and lower for Windows 3.x.

PC Unix	17%	25%	28%	7%	24%
OS/2	35%	29%	21%	8%	27%
Windows 3.x	21%	29%	21%	9%	20%
Macintosh System 7.x	22%	26%	19%	8%	24%

SOFTWARE

70% of the Windows respondents paid less than $1,000 for software upgrades per PC.

PC Unix	28%	39%	20%	5%	7%
OS/2	26%	37%	26%	8%	4%
Windows 3.x	27%	43%	20%	7%	3%
Macintosh System 7.x	23%	43%	20%	10%	3%

NETWORKING HARDWARE AND SOFTWARE

The trend continues with 80% of the Windows users upgrading networking gear for under $1,000 per PC.

PC Unix	52%	23%	9%	6%	10%
OS/2	51%	28%	7%	8%	5%
Windows 3.x	55%	25%	7%	5%	8%
Macintosh System 7.x	55%	25%	9%	7%	5%

TRAINING

Training costs are highest for OS/2, with 26% of the respondents paying more than $1,000 per PC.

PC Unix	48%	32%	15%	3%	2%
OS/2	45%	30%	14%	8%	4%
Windows 3.x	50%	28%	13%	5%	4%
Macintosh System 7.x	50%	27%	15%	7%	2%

SERVICE AND SUPPORT

System 7 and OS/2 have the highest service and support costs, with 28% of respondents spending more than $1,000 per PC.

PC Unix	45%	32%	9%	7%	8%
OS/2	47%	26%	13%	7%	8%
Windows 3.x	53%	25%	11%	5%	6%
Macintosh System 7.x	48%	25%	12%	9%	7%

Source: Microcomputer Managers Association/IDG Research study (Numbers rounded off)

Desktop Operating Systems

From the trenches

What users want on their desks

➤*Jo Haraf, director of office technology, Booz Allen & Hamilton, Inc., McClean, Va.*
Current operating systems: Macintosh, Unix, DOS.
Comment: "I suppose I want stability and the ability to move easily between different levels of an operating system. [We've had] problems with Apple and earlier versions of operating systems not allowing us to print from the old operating system and the new version. Vendors should let us know which functions will be upwardly compatible and which won't.

"I'd also like my operating system to do its job and run in the background.

"As for [my] next operating system, in Unix I can't say what we will standardize on, but in Apple it will be System 7 or 6.8. For DOS, we will run the most current Microsoft operating systems."

➤*Bruce Linker, assistant vice president, group information technology, Dean Witter Reynolds, Inc., New York.*
Current operating system: DOS/Windows.
Comment: "I'd like to get past the 640K limit. We have 6M and 8M, and the operating systems aren't keeping up. We're looking at NT or OS/2 because we want multitasking and multithreading. IBM is there; it just needs to be cleaned up. Otherwise, we'll stay with Windows."

➤*Carol Meadows, manager, Great Western Bank, Chatsworth, Calif.*
Current operating system: DOS/Windows.
Comment: "I'd like faster print spooling and disconnected printing capabilities so that I can work on other things while something is printing. As it stands now, I have to wait for it to happen.

"We work in DOS 5.0 and Windows and will go forward with Windows. I'm generally in about five or six applications at a time, and Windows makes it easy to switch between applications, check E-mail and cross around."

➤*Wayne Dunn, manager, end-user support, Massachusetts Bay Transit Authority, Boston.*
Current operating system: Migrating to OS/2 2.0.
Comment: "People here are transforming the way they do business, and I'm getting demand for high-end graphics and sharing information across platforms. I needed a 32-bit operating system that was fully graphical object-oriented and truly multitasking.

"OS/2 2.0 gives me the flexibility to migrate to new applications when I want to and continue to use the ones I own already.

"Because of all those factors, OS/2 was the only one. Unix is powerful, but it wasn't a fit, given that users in this particular department were doing a lot on PCs. Unix didn't have a graphical environment at the same cost."

➤*Bill Wostenberg, systems supervisor, technical support, health care department, Southern California Edison, Rosemead, Calif.*
Current operating systems: Macintosh, DOS/Windows, OS/2 1.3.
Comment: "I would like to see a graphical user interface and user-friendly comprehensive help facilities. Some of the common utilities that people use day in and day out — such as file compressions, backup to file and tape — should be built in.

"Ideally, the operating system should make it easy to locate data that resides anywhere on your disk. In this day and age, there should be some built-in peer-to-peer networking. We see it in the Mac but don't see it in DOS, Windows and OS/2.

"I see our direction going more toward OS/2 because we are downsizing applications to a client/server architecture in a LAN environment, and OS/2 is a better operating system to support client/server relationships.

"A lot of people are talking about Windows NT, but we feel that NT doesn't exist and won't exist until Microsoft officially releases it to the market and it is bug-free."

➤*Sally Atkins, consultant, large financial company in Boston.*
Current operating system: DOS/Windows.
Comment: "We're using DOS and Windows, which will lead us in an NT direction because Microsoft has positioned NT as a growth path for Windows. We need scalability, which means I can use it on my portable up to my supercomputer and be able to port programs. If we start with a new line of business and write code for five customers, that code can be scaled up if a product of ours takes off. We also need distributed services, such as a naming, timing and remote procedure calling." •

Interviews compiled by Alice Bredin, a free-lance writer based in New York.

Opinion

Go GUI? Well, maybe not

At least once a week, somebody asks me, "Should I switch to a GUI-based operating system?"

As I write this article with Lotus' Ami Pro 3.0, a Windows word processor, using a $10,000 behemoth 486 50-MHz machine I built that runs Microsoft's Windows 3.1 with only acceptable speed, the answer I give surprises even me.

Maybe. Maybe not. It depends on what you do.

The gang around the GUI campfire is growing, and I'm one of the guys tossing on logs. I use Windows 3.1 daily, and I wouldn't give it up.

DOS is a clunky, ugly dinosaur. Its limitations are legendary. Yet I suspect we're rushing into Windows and other GUIs for silly reasons. They're cute, with smiley faces and consistent menus, and if you're a novice, they might be easier to learn from scratch. And sure, you can share data seamlessly among most GUIs, even across different platforms.

It's true — DOS applications are loners. Most GUI packages are built from the ground up to talk to each other. Windows NT, still fantasyware, promises tight integration between applications and the operating system. Exciting, yes.

What's important?

The question is, do you need to do any of that? If your job really calls for either Object Linking and Embedding, IBM OS/2's object-oriented document management or Next, Inc.'s Display Postscript, buying the exotic, high-horsepower hardware you must install to run a GUI could justify the stiff price tag.

But many tasks don't require seamless data sharing or flawless typesetting. Passing a Lotus 1-2-3 spreadsheet around the network suffices. You may just need to do business — not publish *USA Today*.

To get back to the question, sometimes I reply, "No. You could probably get by with a non-GUI operating system." My own personal preference is Quarterdeck Office Systems' DesqView 386.

But for DOS users, DesqView can still be a better deal. It's true that Windows, the Apple Macintosh, the Next system and OS/2 are prettier, and in many ways they're all more technically advanced. Not to mention, almost every application vendor is aiming the big guns in development at programming for Windows and, to a lesser degree, the other GUIs.

For about half the random-access memory demanded by the GUIs, DesqView provides crash protection, multitasking and serial communications. It protects DOS applications from one another with user-assigned degrees of protection, preemptively multitasks them and handles serial communications well enough that I've been able to format floppy disks while Qmodem Pro was getting my E-mail.

Like the GUIs, DesqView will force your DOS applications to talk to one another. You can paste data from a 1-2-3 spreadsheet into WordPerfect with a few keystrokes.

There's even a "clipboard" to which you can append. It doesn't provide you with "active links," like most of the GUIs do; it's a simple cut and paste of what's on the screen at the moment.

DesqView handles protected-mode applications and software that wants expanded memory with equal aplomb. In the two years I've used it, no ill-behaved application except Windows 3.0, running in a window, has crashed DesqView. There's a cruel irony there, I think.

It's also a good environment for software development. DesqView will run a compiler in the background, and if you want to stop the program to get full use of the system, you can "freeze" it from the DesqView menu and later restart it when you're ready — with no loss of data.

Simplicity a key

Best of all, DesqView is not resource-hungry. You can run it on a 386SX 16-MHz machine with 4M bytes of RAM. And with simple hardware like that, you can load at least three or four applications.

A Windows machine needs at least 8M bytes to be useful. OS/2 2.X and Windows NT do (and will) realistically need even more RAM. A Unix machine starts with 16M bytes and goes up from there.

So, before you haul your company's DOS power users into the GUI world, take a look at DesqView 386. Your employees get to keep the DOS tools they know and love and get all the benefits of Quarterdeck's memory management, true multitasking and solid crash protection — from a package that takes a meager 500K bytes of disk space. That's roughly 11M bytes less than Windows and about 40M bytes less than OS/2 2.0. •

Written by Todd Henschell, a free-lance writer in Burbank, Calif.

Desktop Operating Systems

Windows NT: Meets user expectations, but lacks performance, application and networking features

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

Windows NT

■ **The current beta-test version of Microsoft Corp.'s Windows NT, shipped in October, meets user expectations. But key pieces have yet to ship, and performance and compatibility can't be judged until the final release of NT, scheduled for later this year.**

■ **Users said they are concerned about compatibility with Novell, Inc.'s NetWare, device driver support and performance relative to Windows 3.1. They also said they are mystified by vague pricing statements made by Microsoft.**

With more than 10,000 beta-test copies in the field, Windows NT is widely anticipated to be the inheritor of the DOS desktop. Because of this prerelease hoopla, *Computerworld* went outside of its usual practice of evaluating production versions of products and instead reviewed the current beta-test release, which became available in October 1992.

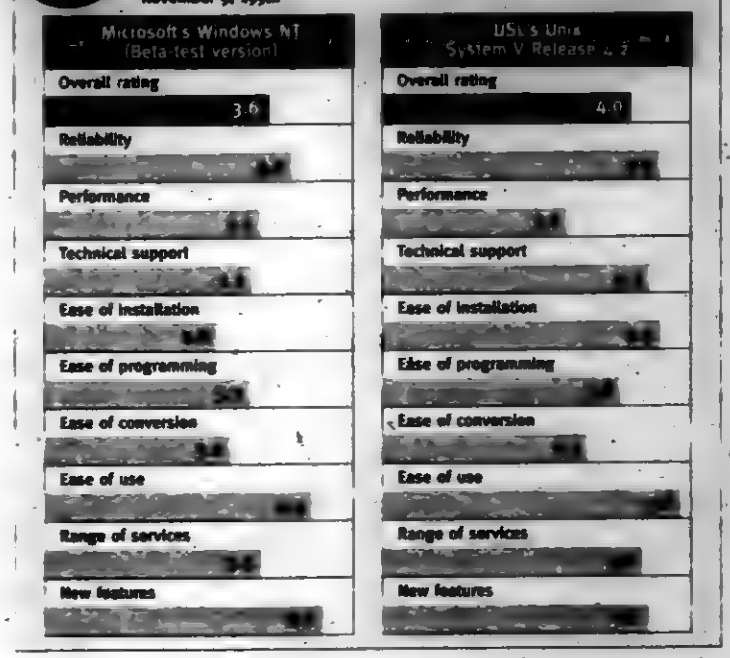
With four months' experience evaluating this version of Windows NT — and after working with previous versions — the four users in our evaluation participated in a teleconference with *Computerworld* editors and Bill Bluestein at Forrester Research, Inc. in Cambridge, Mass. They also documented their findings in a questionnaire designed with assistance from Howard Rubin Associates, Inc. and Technology Investment Strategies Corp.

All of the users were running Windows NT on 486-based PCs with a minimum of 16M bytes of random-access memory.

Facts about Microsoft's Windows NT (beta-test version)

- First DOS/Windows-compatible 32-bit operating system.
- Multitasking, multithreading, multiprocessing.
- Scalable architecture supports Intel Corp., Digital Equipment Corp. and Mips Technologies, Inc.
- Approximately 10,000 beta-test sites; midyear rollout expected.

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users. Unix System Laboratories, Inc.'s System V Release 4.2 ratings are based on a separate user evaluation conducted November 9, 1992.



Reliability

The evaluators reported a relatively low failure rate considering they were dealing with a beta-test product.

Manufacturer 1 (Windows user): "It has not failed in and of itself. It's hard to determine whether the failures that have occurred are more faults of the application or of NT."

Manufacturer 2 (mainframe user): "We've had a number of problems with network hangs, but the rate has only been every two to three weeks, which is not severe."

Telecommunications company (OS/2 user): "Even for the beta versions, it has performed pretty well in a development environment."

Performance

Because they were using a beta-test version, the evaluators did not stress-test the operating system to determine production performance.

But in general, the users said NT was running as fast as Windows 3.1 in development work and as fast as they expected for a beta-test product.

Manufacturer 1: "It's running neck and neck with Windows 3.1."

Manufacturer 2: "We did have some problems with the July beta release, but they've apparently fixed that. This version is as quick as we need it to be. I don't think people should migrate to this platform just for performance. It's the multitasking that's important."

Technical support

The evaluators reported little need for technical support largely because the software came with extensive documentation. The documentation could have been better organized, they said, but overall, the users found the answers they needed on their own.

Manufacturer 1: "We've had no need to call Microsoft. I browse CompuServe, but mostly it's a case of information overload. I sometimes feel like I'm going where no man has gone before when I search for the answers."

Manufacturer 2: "We had to call on one problem caused by an old network card. The support people were prompt and helpful. The information supplied with the product is overwhelming."

Telecommunications company: "They have given us a lot of personalized support, even to the point of taking a couple of our folks up to the porting lab they have in Redmond, Wash. There has been some technical arrogance in the past on their part. There was some technical elitism, and we had to have a heart-to-heart talk about where we were going."

Ease of installation

Installing the software for NT was not difficult. Users reported taking anywhere from an hour to a day to get the system running, depending on the complexity of their configuration.

Manufacturer 1: "I had to use the old DOS installation procedure because the CD-ROM installation doesn't work with my Sony drive.

Windows NT, *page 76*

Desktop Operating Systems

Windows NT users say they are concerned about vague pricing and compatibility with NetWare

CONTINUED FROM PAGE 75

But it was simple."

Manufacturer 2: "Whenever we deal with an Intel Corp. product, we expect to invest some time in getting it set up. When we get deeper into the LAN area, it will be more difficult."

Telecommunications company: "I expected to be able to take the CD installation they gave us and load it and have it up and running in a day or two. We achieved that. Our experience with OS/2 was very different. We always seemed to need additional tools to get it going."

Installation descriptions for users who evaluated Microsoft's Windows NT (beta-test version)

	Telecommunications firm	Manufacturer 1	Manufacturer 2	Petroleum firm
Version	OCTOBER BETA	OCTOBER BETA	OCTOBER BETA	OCTOBER BETA
Hardware platform	486 PC	486 PC	486 PC	486 PC
RAM	16M BYTES	16M BYTES	16M BYTES	16M BYTES
Time in use	4 MONTHS	2 MONTHS	4 MONTHS	2 MONTHS
Application	CUSTOMER SERVICE	SOFTWARE DEVELOPMENT	MAINFRAME CONVERSION	NO COMMENT
Comparison system	OS/2	WINDOWS 3.1	TANDEM'S GUARDIAN	NO COMMENT

Ease of programming

There is a learning curve, the users warned. Programming with NT is more complex than previous versions of Window's because of the number of application calls and options.

Manufacturer 1: "There is so much to learn before you can become productive. The concepts are straightforward, but there's a wider scope of what's available."

Manufacturer 2: "My view is based on working with a mainframe operating system, and it's as easy, if not easier, to use than that. I had a small annoyance with waiting for multiple events to be completed. If you aren't careful, you can get stuck in memory."

Telecommunications company: "So far so good, but we are very early in the conversion. There are a lot of development tools coming out that look promising."

Ease of conversion

Users reported that Windows NT's ability to emulate their current environments and run previous applications was hampered by the lack of device drivers.

Manufacturer 1: "Microsoft has a difficult task obtaining third-party support for drivers for all the DOS-based applications. I had trouble with Aldus Corp.'s Photostyler."

Telecommunications company: "The typical Microsoft office applications run without any problem. Our experience in porting the current code for our custom applications has been pretty good so far. We have been able to port a good part of the code using Microsoft's porting tools with very little manual intervention."

Ease of use

Users said Windows NT was as easy to use as previous versions of Windows from an end-user standpoint.

They also said it will be easier for those familiar with character-based environments after they become used to dealing with a graphical system.

Telecommunications company: "NT looks like Windows 3.1, so everyone is familiar with the environment."

Range of services

For the most part, they were satisfied with the number and kinds of utilities provided, but the evaluators noted that some monitoring and diagnostic tools were lacking.

Manufacturer 2: "I have some problems tracking activity on different threads and determining the state of the threads. The package needs more display and diagnostic tools."

New features

Perhaps the most important new feature of Windows NT compared with previous versions of Windows is more robust multiprocessing and memory management.

Manufacturer 2: "Multithreading is a godsend. We use it for asynchronous communication with the mainframe. Once in a while, the tasks behave choppily."

Memory management was also improved in NT compared with Windows 3.1.

Manufacturer 1: "I spent so much time in Windows 3.1 wrestling with memory management. It has much more difficult memory allocation limitations. Windows NT is almost painless in comparison."

Manufacturer 2: "NT is somewhat more efficient. It still has some relics of the 16-bit address space."

Price

Based on reports of prices ranging from $300 to $500 for a new operating system and $200 for an upgrade, Windows NT might not be as widely distributed as the users would like.

Those who were upgrading from Windows 3.1 or OS/2 thought the price should be much lower — under $200 new and $100 for an upgrade.

Networking

All of the evaluators thought support for Novell NetWare would make or break Windows NT. They considered Microsoft's waffling on the issue to be "political" and uniformly said they believe NetWare will eventually be supported in Windows NT.

Manufacturer 2: "They have to add in NetWare support. If NetWare support did not show up, we would have to think real hard about the viability of the product."

Forrester's Bluestein: "If there is no NetWare support, there will be no acceptance of NT."

Written and compiled by Michael Sullivan-Trainor, CW research manager.

Microsoft responds

The following answers were provided by Microsoft officials in response to issues raised in this evaluation.

• Deployment and upgrade costs: Our customers tell us they will deploy Windows NT widely through their corporations on high-end desktops and servers, but neither they nor we expect Windows NT to become the high-volume version of Windows. For those high-end desktops that are going to be upgraded from Windows 3.1 to Windows NT, we will offer special upgrade pricing.

• NetWare support: Windows NT was designed to work in multiple networking systems and to provide uniform user interfaces and programming interfaces over those different networks. Since the October beta test, Novell has demonstrated their NetWare requester for Windows NT at Interop and Networld and has made the beta version available on CompuServe.

• Device driver support: The first beta supported more than 300 PC systems, 200 printers, display adapters for VGA, SuperVGA, XGA, local bus and similar numbers of other peripherals. The next beta test will more than double the number of devices supported.

• Developer learning curve: The feedback we have gotten from developers is that going from developing today's Windows applications to new, 32-bit Windows applications is not hard. The programming model for 32-bit Windows applications is the same, and all the basic services are the same.

COMPUTERWORLD PRODUCT EVALUATION FORUM

- Alamo Rent-A-Car, Inc.
- Alliant Techsystems, Inc.
- Amerada Hess Corp.
- America West Airlines
- American Greetings Corp.
- American Industries, Inc.
- American President Cos.
- AT&T
- Avon Products, Inc.
- Barnett Banks, Inc.
- C. R. Bard, Inc.
- Bell Atlantic Corp.
- Borden Brunswig Corp.
- Boise Wamby Corp.
- Bradley University
- Carolina Freight Carriers Corp.
- Carolina Power & Light Co.
- The Chase Manhattan Bank NA
- Cigna Corp.
- Clark Equipment Co.
- Colonial Williamsburg
- Commonwealth Edison Co.
- Consolidated Freightways, Inc.
- Corestates Financial Corp.
- Dresser Industries, Inc.
- Dr Pepper Co./ The Seven-Up Co.
- Electronic Data Systems Corp.
- Federal Express Corp.
- First National Bank of Chicago
- FMC Corp.
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- Freeport McMoRan, Inc.
- Fuller Co.
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- Guilford Mills, Inc.
- Hanka Corp.
- International Paper Co.
- Kmart Corp.
- Lever Brothers Co.
- Long Island Lighting Co.
- Mars, Inc.
- Massachusetts Mutual Life Insurance Co.
- MCI Communications Corp.
- Mellon Bank Corp.
- Metropolitan Life Insurance Co.
- New Mexico State University
- Northeast Utilities
- People's Bank
- PNC Financial Corp.
- Preston Corp.
- Primerica Corp.
- Prodata, Inc.
- Public Service Electric & Gas Co.
- Ryder System, Inc.
- SCM Office Supplies Group
- Sprint Corp.
- Tribune Broadcasting
- Unum Life Insurance Co.
- Wilson Industries
- Worldcorp

Take an INSIDE LOOK

Digital's ability to offer a high-performance PC that's also affordable is the result of taking a hard look at all aspects of the process — from design through to delivery and support. This attention to detail allows us to offer the highest-quality product at the lowest-possible price.

It's enough to make your head spin. You can easily become bewildered when confronted with the deluge of PC models and product lines offered on the market today. The main question you may be asking yourself is: Which PC do I buy to satisfy all my business needs?

Your requirements include compatibility, reliability, and service. In addition, you want assurances that your PC investment will increase business productivity — without a lot of hidden costs attached. You ask one more question: Is there a company out there that can do all this and more?

The answer is yes. The company is Digital.

A Complete Package

Service, support, and security. You get all three when you purchase a PC from Digital. We provide you with the networking expertise, the service capabilities, and the complete backing of a global organization that does business in many countries around the world. We've cornered the market on consistency and quality. According to a study published by Computer Intelligence, a market research firm in La Jolla, CA, Digital was the fastest growing PC vendor in 1992.

How do we do it? It's simple. Digital sets and maintains high standards of quality by starting small — at the component level. For example, Digital offers outstanding PC video performance by using the latest video chips from S3 Incorporated, one of the leaders in the field. These chips interface directly from the motherboard to the local bus, freeing up the powerful CPU for other tasks.

Other details that emphasize the quality of Digital PCs include a vacancy socket into which you can plug an Intel Corporation clock doubler chip to double the CPU frequency. And there's a variable-speed fan to make your working environment quieter.

Digital has also implemented a production process that helps to ensure customer satisfaction. Bringing the final assembly point closer to the customer makes it easier to respond quickly to your needs. That's why we ship all the components — skins, CPU, motherboard, disk, and floppies — to local integration centers for final assembly and testing.

We Work Hard to Deliver Competitive Prices

Digital continues to look at the costs involved in every aspect of our PC business in order to provide you with the very best competitive prices.

Because the PC business is such a low margin business, it's extremely important to keep inventory, pipeline, and technology obsolescence costs under control. We've accomplished this in a number of ways, such as implementing a modular design approach. Simply put, we can redesign a PC by replacing only a tiny portion of the CPU card. The box, the power supplies, the floppies, the hard drives, etc., remain the same. Total redesign becomes unnecessary. And, product quality and consistency is maintained.

Changes in traditional business practices have also helped Digital become a primary player in the PC market. For instance, we continuously negotiate the price of individual PC components and the PC itself in order to maintain competitive pricing.

Attention to Detail Is the Secret of Digital's PC Success

Plus, Digital has implemented a production cycle to better answer customer needs. Specifically, our engineering group is divided into two teams, so that we're prepared to deliver new products every six months.

In Store for the Future

Consistently delivering quality products and services — that's Digital's philosophy for today and for tomorrow. This quality is offered through a number of computing choices to suit all your desktop requirements. We will continue to expand our line of industry-standard products, plus introduce products based on our new Alpha AXP technology. These options provide power and performance today and a cost-effective pathway to future computing.

In addition, Digital will continue to offer a product "cost of ownership" plan to help companies lower costs while increasing productivity.

The bottom line? Digital is the first full-line, full-service company to sell PC hardware, software, and service. We deliver a quality product at a competitive price — plus technical service and support that is unrivaled in the industry. In other words, our competitors may offer a "box," but we offer the complete PC solutions package to answer all your current and future business requirements.

Need Information on Digital PCs? Access Is Right at Your Desktop

Digital makes it easy for you to do business by offering a variety of PC information and ordering channels — at your fingertips.

- By calling Digital's DESKTOP DIRECT line, you can get all your questions answered by trained personal computer experts. Ordering can be completed over the phone, too. Simply dial 800-PC-BY-DEC (800-722-9332) for assistance.
- For online information and ordering, access Digital's Electronic Connection by dialing 800-234-1998 at 1200 to 9600 baud, from any Digital-compatible terminal or PC.
- If you are a member of CompuServe, you have access to a host of PC information. The Digital Equipment Corporation PC and PC Integration (DECPCI) forum on CompuServe covers a wealth of valuable information on DECpc systems, PATHWORKS PC networking software, EtherWORKS network interface cards, applications, and services from Digital.

Digital Gives You License to *Move* Your Applications — and SAVE MONEY

The way Digital does business is as important as the products and services we provide. That's why we're offering licensing flexibility. It allows you to make the most effective use of technology, while protecting your IT investments.

Digital's licensing flexibility — a business practice that is the first of its kind in the industry — provides you with the option to move your software applications between hardware platforms without paying additional licensing fees. This flexibility helps you make more strategic use of computing assets and at the same time simplifies your migration to other hardware platforms, including Alpha AXP.

Digital's user licenses provide cross-platform mobility by allowing the use of a layered product across all platforms running the same operating system. For instance, a Personal Use license for DEC Fortran for OpenVMS can be used on either a VAX or an Alpha AXP platform. You benefit by being able to move the user licenses between systems you already own and those you acquire in the future. No additional paperwork or license fees are required.

By implementing Digital's user licenses, you can break the traditional link between the power of the computing system and the price of software for that system. How? Companies that utilize powerful systems but employ a small staff can take advantage of the first-come first-served nature of concurrent licensing. You save money by buying these licenses according to the number of users rather than the total number of employees.

In addition, companies that wish to evaluate a software product before purchasing can do so simply by acquiring a few user licenses.

All in all, the mobility provided by this flexible business practice not only cuts costs, but also lets companies make an application investment today on an available platform — with complete confidence of full investment protection for the platforms of tomorrow.

For information on Digital's award-winning licensing practices, call Allen Belancik, Marketing Executive, Corporate Business Practices Group, at 603-884-2372.

Digital's CSR Solutions Give You the Competitive Advantage

Paper costs are up. Productivity is down. Time is money — and both are wasted if your office is still utilizing manual procedures to retrieve information.

Content-Based Retrieval (CSR) solutions from Digital save you both time and money by making your information accessible online. With its ability to search and retrieve documentation, reference materials, customer files, and other information, CSR technology can reduce the time it takes to recall only the information essential for making operational and strategic decisions.

Moreover, CSR solutions often make it unnecessary to maintain expensive multiple copies of information, whether hard copy or replicated on multiple LANs.

Ramboyte Consulting Company, a Digital Authorized Reseller, can help you select the most appropriate CSR tool. To maximize your investment, services such as technical and end-user training, systems integration, and ongoing support are often included in the purchase price of software.

For information on how to jump-start your office productivity via Digital's CSR solutions, call Ramboyte Consulting Company at [illegible] ([illegible]).

Digital Program Boosts Multivendor Integration through NAS

Digital has announced an expanded program for software developers to help ensure that applications from different companies will work together better. The NAS Advantage Application Program creates a new level of recognition for third-party and Digital applications that display maximum conformance to the industry standards embodied in our NAS family of software products.

Who benefits from such a program? Both developers and end users. Developers of qualifying applications can participate in added promotional activities that highlight their more complete open systems applications. End users are assured that software carrying the NAS Advantage Application designation will work more smoothly and easily with a host of other applications.

For information on the NAS Advantage Application Program or how to qualify, call [illegible].

Access UNIX News Online with DECnews for UNIX

Digital offers you all the facts on UNIX right at your desktop. *DECnews for UNIX*, published electronically for Internet distribution every three weeks, contains product and service information of interest to the Digital UNIX community.

The news is timely and to the point. And best of all, it's UNIX specific. Every issue spans the range of our UNIX offerings — from DEC OSF/1 to ULTRIX to SCO UNIX. In addition to base operating system information, articles will cover related areas, such as:

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Lower Cost-per-Seat with VXT 2000/Alpha AXP Companion Program

Digital has coupled its Alpha AXP systems with its VXT 2000 X Window terminals — enabling desktops to access our powerful 64-bit Alpha AXP technology at the lowest-possible cost-per-seat for a multiwindow device.

Now you can get the same presentation and windowing capabilities provided by more expensive workstations. The VXT 2000 X Window terminal gives you high-resolution graphics, data security, and ease of use, while eliminating desktop management — all this at about half the cost of similar standalone workstations.

Engineers porting applications running on UNIX and OpenVMS can enhance the power of a single Alpha AXP processor by accessing it through VXT 2000 X Window terminals — combining fast, robust computing power with lower cost-per-seat.

For information on Digital's VXT 2000/Alpha AXP Companion Program, call David [illegible], VXT 2000 Marketing Manager, at [illegible].

Digital's GIS Solutions Put a *World of Data* at Your Fingertips

A world replete with business facts, figures, research, and documentation based on geography demands an information system that effectively collects, manages, and analyzes data more efficiently. In fact, more than 80 percent of the information used every day by most organizations is geographically based — making the demand for Geographic Information Systems (GIS) solutions even more critical.

Digital's GIS solutions have already succeeded in helping a range of customers — from government agencies and utility companies to commercial industry — maximize the productivity of the information and systems they have.

Who Benefits from GIS Solutions?

Benefits garnered from GIS solutions cross a range of industries, including:

- Governmental agencies, using GIS for environmental impact evaluation, emergency response systems, resource and facilities planning, among other services.
- Utilities (electric, gas, and water), implementing GIS solutions to help manage data related to the physical network (pipelines, wires, etc.) used to deliver services.
- Telecommunications, utilizing GIS to manage information associated with land-based telephone lines or wireless cellular towers.
- Commercial sector, using GIS to manage inventory and distribution and for demographic analysis.

"Taking the integrator approach, Digital has diligently built a solid GIS business, and the company's market strength is a reflection of that commitment."

KATHRYN HALE
SENIOR INDUSTRY ANALYST
DATAQUEST INC.

Dataquest Inc., a leading market research firm, ranked Digital as the number one host-based hardware vendor in Geographic Information Systems (GIS) revenue worldwide.

Digital Makes GIS Work for You

We do so through a combination of systems integration expertise, leading-edge technology, and an extensive portfolio of third-party software solutions. As a matter of fact, more than 50 of the leading GIS applications run on Digital computers — from PC to mainframe.

Our networked, integrated GIS solutions make geographically defined data accessible not only to specialized mapping functions but to management, financial, project planning, scientific, and engineering functions throughout an organization. As your single point of systems integration expertise, we provide the complete solution — from integration to training, from third-party software solutions to service and support after the sale.

More than a dozen of our strategic GIS software partners have committed to and are porting critical applications to the Alpha AXP platform. In addition, for a limited time, many of these vendors are offering significant discounts with purchase of Alpha AXP systems as part of our Alpha AXP GIS campaign.

Alpha AXP Systems Meet GIS Demands

From terrain modeling to mapping to image scanning — GIS is graphics intensive. Many agencies deal with terabytes of data on a daily basis. That's why it's imperative that a truly high-performance system be implemented for GIS solutions. Digital's Alpha AXP systems deliver the high performance needed at an affordable price.

Based on a 64-bit RISC architecture, Alpha AXP systems provide both the speed and the addressability required for simple to complex GIS applications. What's more, the Alpha AXP platform is available on multiple operating systems. This leading-edge technology provides a strong base in which to incorporate GIS solutions with new technology such as multimedia and animation.

The Alpha AXP architecture is also important to the GIS market in terms of investment protection. Not only can Alpha AXP provide high performance today, but it also provides a 25-year growth path to future computing.

For information on Digital's GIS solutions or to receive a FREE GIS brochure, call 800-DEC-INFO (800-332-4636), press 1, and reference ext. 650.

Digital Offers You Choices

THE BUSINESS ENVIRONMENT OF THE '90s challenges organizations to work faster, better, and at a lower cost than ever before. Styles of computing that suit large, monolith, routine batch jobs cannot sustain the free flow of information and resources required by businesses today.

Companies need the freedom to provide their employees with access to information when, how, and where they require it. Fortunately, this need coincides with a dramatic increase in performance and a downward turn in the price of computers. Digital helps you take advantage of this price/performance — enabling you to put powerful information tools into the hands of your business professionals.

Our strategy is to provide you with a more flexible and open future. We'll help you plan, design, implement, and manage information environments that are cost-effective — from initial purchase through ongoing management and change.

Enabling Your Company to Work As It Wants to Work

Providing your professionals with the freedom to access information when, where, and how they need it requires the foundation of a disciplined, standards-compliant environment. Whatever your current starting point, Digital can help you quickly and efficiently achieve a standards-compliant environment that is open to the best components now and in the future.

Your professionals use desktop units and applications of choice, benefiting from behind-the-scenes disciplines that enable transparent data flow across multiple vendors' clients, servers, and applications. Digital delivers open computing environments that provide mainframe levels of performance, functionality, reliability, security, and integrity — but with far more flexibility and at much less cost.

Digital offers you the freedom not only to choose the best information tools and products, but also to orchestrate and adapt these into a whole that best suits the way your company wants to work. Take advantage of our unrivaled depth and breadth of connectivity and integration tools, products, and services. We provide:

- **Worldwide Consulting, Training, and Systems Integration Professionals**
  Our experts work with you to manage and balance the people, business, and technology dimensions of distributing information throughout your business.
- **Multivendor Integration**
  You choose the best components to serve your business — from desktop to data center. We can integrate and support almost any client or server your company is likely to own now or in the future. Plus, we have packaged these capabilities into products that deliver integration and interoperability right out of the box. For example, Digital's Network Application Support (NAS) capabilities, such as PATHWORKS, enable you to interconnect multivendor systems and achieve a free flow of information across platforms, sites, and groups.
- **Unbounded Capacity at Far Less Cost**
  Utilizing the world's fastest 64-bit RISC microprocessor, our Alpha AXP family of open server and desktop systems give you unbounded capacity — at a fraction of mainframe cost.

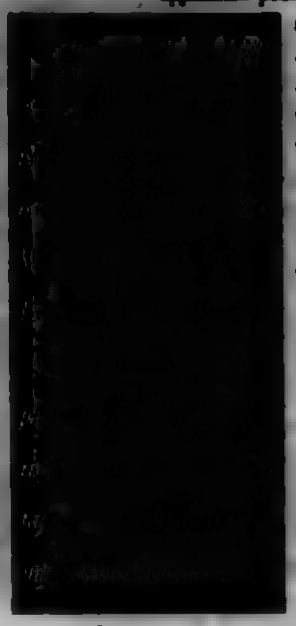
Take Advantage of Our Experience

Digital pioneered moving information out from the data center to work groups — whether they're in the same office or around the world. We'll help you achieve the most flexible and cost-effective approaches to your information requirements — today and tomorrow.

For more information on Digital's computer downsizing solutions, call 800-332-8228.

What drives companies to move to more cost-effective computing environments? Two reasons. Not only do you want to increase the payback of your information technology dollar, but you're also looking to increase the productivity of your front-line professionals. Digital helps you do both.

Libbey-Owens-Ford Profits from Digital's Downsizing Solutions



Libbey-Owens-Ford Company's Auto Glass Replacement (AGR) Business Unit has added 69 service centers since 1988, and plans to establish 100 by the end of 1993. This customer-wide service network — including AGR's three giant depots — supplies local auto glass replacement shops that serve consumers throughout the U.S. and Canada.

Building market share with this fast-growing service challenges AGR to meet market demand for quick response and competitive pricing by dramatically cutting distribution time-to-market and cost.

These goals drive AGR's move from an in-house application on an IBM mainframe to a Digital client/server environment — an environment that provides nationwide, distributed, real-time inventory management.

Connecting the service centers, depots, and headquarters, the Digital environment integrates and distributes AGR's preferred application packages: Distribution Management from McHugh Freeman Associates, for real-time inventory control throughout the supply chain; and DAI from Distributed Architects Incorporated, for integrated resource planning and order processing in all service centers.

VAX 4000 systems, the field office servers, will link to an Alpha-ready VAX 6620 system at AGR headquarters.

Digital Helps The Brookings Institution Save Over $1 Million

With the help of Digital's computer downsizing solutions, The Brookings Institution's Social Science Computation Center (SSCC) has saved a total of $1.7 million over a six-year period. It spends less annually in areas such as computer maintenance, software, and peripherals.

Digital has been providing Brookings with computing power since 1970. Eventually, the SSCC adopted VAXcluster system technology. But, as PCs assumed an increasingly important role at Brookings, the organization was faced with a dilemma. PC and VAX users needed to collaborate and communicate. Brookings needed to maintain both systems and cut costs at the same time.

The solution? Lower-cost and higher-performance Digital computers are servers to the growing base of PCs and Macintosh systems at The Brookings Institution. These desktop units are integrated with each other and the Digital server via Digital's PATHWORKS networking.

The SSCC has upgraded the VAXcluster system that functions as the server several times, moving smoothly from the VAX 8650 computers down to VAX 4000 systems. Now, with the lower maintenance and electricity costs, Brookings will recoup its equipment costs in two years.

Senior SSCC Director Jane Fishkin, "The SSCC accomplished this computer downsizing without endangering or impairing the flow of Brookings' most important asset: information."

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To: ismanager@bigco.com From: jsq@tic.com Subject: What can businesses get out of the Internet?

SPEEDY GLOBAL MESSAGING AND ACCESS TO SOFTWARE AND UNIQUE DATABASES ARE ENTICING COMPANIES TO EXPLORE THE INTERNET

By John S. Quarterman

What is made up of more than 8,000 connected networks, has more than 1.3 million connected computers and has users numbering about 8 million? Answer: the Internet.

The Internet, which is the world's largest computer network, has been doubling in size (number of hosts and networks) every year since 1988. Once the exclusive domain of research and education groups, whose interest, among other things, was access to supercomputer power, the Internet is gaining stature among business users.

Companies such as General Electric Co. and Addison-Wesley Publishing Co. are being enticed by the Internet's speedy, low-cost global communications, its appropriateness for collaborative work, its on-line software and its unique databases (see story page 82). Organizations see the meganetwork as a complement to their existing networks.

"More and more [commercial] organizations are viewing the Internet not in its former context as an R&E 'supercomputer' network but rather as a shared information utility," says Joel Maloff, vice president of client services at Advanced Network and Services, an Internet connectivity provider in Ann Arbor, Mich.

With the low connection cost — often a flat monthly fee for leased line or dial-up access — users can access commercial and noncommercial services in the U.S. and 40 other countries.

Electronic mail is by far the most popular application on the network. While on some networks an E-mail message may take hours or days to reach its destination, on the Internet it usually takes seconds to minutes. Internet mail protocols handle queue congestion and flow control automatically. Images aren't an obstacle because of the Internet's Multipurpose Internet Mail Extensions (MIME). MIME enables an Internet message to encapsulate fax, sound, video and Adobe Systems, Inc. PostScript files as well as character sets for foreign languages.

Through Internet's E-mail, companies can exchange information with other organizations, salespeople, customers and so on with the immediacy needed to conduct day-to-day business. And they can do so on a global basis — oftentimes at a cheaper cost than most other E-mail offerings.

Tom Mandel, senior management consultant at SRI International, a research and

The Internet, page 82

FYI **This article's aim is to give business users an idea of what they can get out of the Internet. It is not meant to be about the ins and outs of connection and maneuvering on the network. The following publications can help with the more technical aspects of Internet use:**

- *Crossing the Internet Threshold: An Instructional Handbook*. By Roy Tennant et al. (Library Solutions Institute and Press, 1992)
- *The Internet Companion: A Beginner's Guide to Global Networking*. By Tracy LaQuey with Jeanne C. Ryer. (Addison-Wesley, 1993)
- *The Whole Internet User's Guide and Catalog*. By Ed Krol. O'Reilly & Associates, Inc., 1992)
- *Zen and the Art of the Internet: A Beginner's Guide*. By Brendan P. Kehoe. (Prentice Hall, 1993)

The Internet

CONTINUED FROM PAGE 81

consulting firm in Menlo Park, Calif., says the Internet's mail function enables more efficient, frequent and inexpensive message exchange than was possible before between SRI's California and London offices.

Previously, Mandel's department exchanged mail with its foreign office by having a machine in Menlo Park call a modem on a local-area network in London. Because of the cost of a transatlantic phone call, messaging British staffers occurred sporadically. But Mandel and his group switched to a public access Internet system in London, resulting in more regular communications.

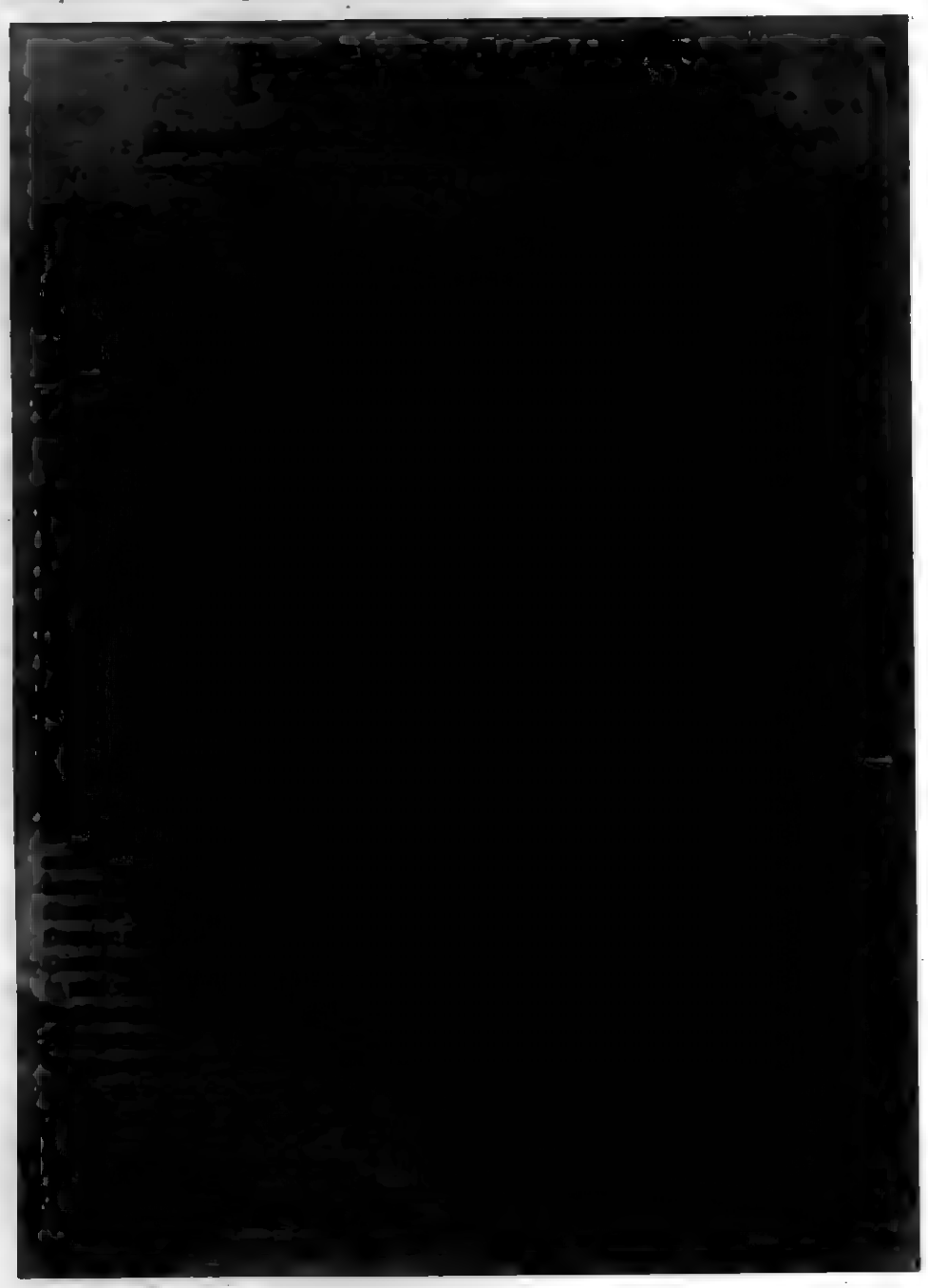
Costs came down because Internet services are carried over the Transmission Control Protocol/Internet Protocol (TCP/IP), which multiplexes mail messages (and other services) across common links. This maximizes bandwidth use, which minimizes cost and permits continuous connection.

Notebook vendor Tadpole Technology, Inc., with headquarters in Cambridge, England, and offices in Austin, Texas, San Jose, Calif., Dallas, New York, Washington, D.C., and France, keeps everyone together through the Internet. "Even when the salespeople are traveling, they carry a notebook and [connect to us through the Internet] from the customer premises, their hotel room or even from the airport lounge," says Jim Thompson, portability scientist.

Tom Stone, senior editor at Addison-Wesley Computer Science Division in Reading, Mass., says with E-mail over the Internet, correspondence with authors that used to take a week can be finished in one day.

Also, with a heavy travel schedule, use of the Internet allows him to keep up with correspondence while away from the office.

"You've got it!
How do you know whether your machine is on the Internet? If you can use the Internet FTP to retrieve files from machines such as *nic.ddn.mil*, *ftp.uu.net*, or *ftp.psi.com*, you are on it.



"I call E-mail over the Internet 'productivity software,'" says Raj Manandhar, research assistant at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass. Manandhar has used the system to correspond with software technical support staffs. He routinely sends bug reports and receives fixes and explanations from software developers.

Mailing lists, newsgroups

Business users are not confined to one-to-one communications, however; group information exchange happens through the Internet's slew of mailing lists and newsgroups. Mailing lists enable a user to send a single mail message to a mail alias. Software then automatically sends the message to everyone on the list. Organizations have used mailing lists, for instance, to announce new products to their on-line customers.

The Internet is the biggest carrier of Usenet newsgroups. Members of newsgroups receive messages and news articles according to their specific group profile.

With mailing lists and newsgroups, not only do customers have the option of getting information such as problem or benefit reports directly from individual customers, but firms can also sponsor customer mailing lists or newsgroups. In this way, they can keep abreast of what their customers need and want by posting questions and collecting responses.

For example, certain major newspapers, such as the *Houston Chronicle*, *The Village Voice*, the *New York Times* and *The Economist*, query readers on their interests or ask them specific questions that might help with a story. "I can post a question on various lists or groups and in 24 hours have several excellent answers," says Dan Gillmor, regional affairs writer at the *Detroit Free Press*.

Companies can also receive information from experts on a variety of topics. Gillmor says he prefers the Internet to other services such as CompuServe because it "contains the narrower specialties." For instance, there is a geographic information systems mailing list as well as others that are "populated with real experts," he says. "It's a tip sheet, and it's full of sources. Not a bad resource."

Businesses may find it useful to join mailing lists to stay on top of general issues affecting their industries. For instance, there are lists associated with topics such as technology transfer, Japanese business studies and the oil and gas industry, which includes a daily posting of oil prices financial companies may need to make investment decisions.

The newsgroup setup tends to be more efficient than mailing lists and can support more participants. The reason is that while a copy of a mail message is sent to each list subscriber, newsgroup messages are sent to each machine that subscribes. A large number of people in a newsgroup can read the same copy of the message or news article. For instance, the Usenet network has more than 2,000 newsgroups and more than 2 million users.

There are newsgroups specific to computer operating systems, other groups that distribute software and still others that discuss specific products. Help wanted and position open newsgroups are among the most popular. For a fee, services such as ClariNet enable users to pick and choose among traditional wire service news, sports, features, syndicated columns, business news, newsletters and other packages.

Because the Internet is attached to a global matrix of networks that includes CompuServe, MCI Mail and Bitnet, among others, businesses sending mail have the potential to reach 20 million people.

Collaborative work

Internet mail, combined with fast interactive protocols such as Telnet and File Transfer Protocol (FTP), encourage collaborative work over the Internet. FTP and Telnet permit resource sharing by making resources on one machine available across the Internet to

Play it safe

Because the Internet had its roots in the open and information sharing world of academia, security has typically taken a backseat. But this is an area of concern for many business users sending mail over the network.

Password protection is the common security measure on the network today. You can also set up other defenses, including prohibiting incoming network connections, limiting incoming connections or prohibiting incoming connections for certain hosts or networks for each service.

In the works is a security feature known as Privacy Enhanced Mail (PEM) that should protect users even further. PEM uses public key encryption to ensure that users know who sent a mail message. The mail message itself can be encrypted to keep anyone else from reading it.

—John S. Quarterman

users of other machines.

FTP enables users to connect to other computers and perform certain actions, such as listing the files in a directory and copying files back and forth. The Telnet protocol connects users to a remote machine and lets them log on as if they were on a directly connected terminal line.

Because it is suitable for collaborative work, the Internet has been a boon to far-flung businesspeople, writers and authors who need to pass draft documents and comments back and forth by E-mail and FTP. The Internet enables "joint writing of papers, sharing of data, coordinating—you name it," says Dick St. Peters, physicist at General Electric Co.'s corporate research and development group in Schenectady, N.Y.

Easy editing

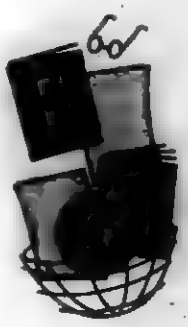
Paul Betz, copy chief at the Oxford University Press in Cary, N.C., coordinates text from 7,000 contributors in collaboration with advisory editors and the general editor, according to Naomi Courter, network services specialist at the Concert network, a North Carolina statewide data network connected to the Internet.

Addison-Wesley's Stone says potential authors submit proposals on-line, which he reviews on-line. By using mail and FTP, Addison-Wesley can now handle copy editing without any paper passing between author and editor.

"We used the Internet extensively to exchange drafts and iterations of our book, writing and producing it in two months' time, from contract through delivery to the publisher," says Laura Fillmore, president of Editorial, Inc. in Rockport, Mass., which produced *The Internet Companion: A Beginner's Guide to Global Networking*.

Hodgepodge of info

Some of the commercial Internet connectivity providers support large anonymous FTP servers that collect information from many sources. Information available from these servers includes software, Supreme Court decisions, book publisher catalogs, network maps, technical reports on protocol specifications and several TCP/IP implementations. These servers include *ftp.psi.com*, which is run by Performance Systems International and *ftp.uu.net*, which is run by Uunet Technologies.



The use of the Internet to collaborate on producing a book, business document or any other related report saves time, eliminates express mail expense, does away with error-prone manual transcription steps and reduces the need to exchange floppy disks.

> The number of Internet hosts worldwide has grown from 213 in 1982 to 1.3 million today.

Free software

Beyond mail-based capabilities, companies can use the Internet as a source for state-of-the art software that is often available at no charge.

Using the anonymous FTP convention, companies can retrieve software from publicly available files. Anonymous FTP enables users to retrieve files with FTP without having a logon account on the Internet server.

Energy company Unocal Corp., for instance, uses the Internet to get state-of-the-art software from Caltech for modeling seismic data, according to Peter Ho, network systems engineer at Unocal in Brea, Calif.

One Houston company says a free software package it got off the Internet was worth more than the cost of its 56K bit/sec. Internet connection. Such a connection usually costs about $12,000 a year.

GNU Emacs, a popular text editor and formatter, is available without cost on the Internet from the Free Software Foundation. Companies can get it from a machine called *prep.ai.mit.edu* as well as from *ftp.uu.net*.

GE's St. Peters says his group has used and retrieved "hundreds or thousands" of software offerings from the Internet. Hundreds of people in GE's R&D and medical departments use GNU Emacs alone.

That's not to say GE doesn't give anything back: St. Peters and his group wrote and maintain a software package for research medical imaging that is distributed to medical R&D sites on the Internet. "We use the Internet to remotely log in and help them when they have problems," St. Peters says.

There are approximately 2,000 anonymous FTP servers worldwide on the Internet, including the following:

- For general MS-DOS PC software, look on *wsmr-simtel20.army.mil*.
- For NCSA Telnet, a TCP/IP package for PCs, try *ftp.ncsa.uiuc.edu*.
- For general Apple Computer, Inc. Macintosh software, try *sumex-aim.stanford.edu*.
- For Columbia University's AppleTalk Package, try *rutgers.edu*.

Vendors are also getting in on the act, cutting down on distribution costs by placing software on the Internet. Apple has made its System 7 operating system as well as early versions of its MacOS available for free by anonymous FTP from *apple.com*. (But System 7.1 is not available this way.)

Digital Equipment Corp. maintains a large collection of non-DEC-developed software on its *gatekeeper.dec.com* machine.

. . . . . .

In the end, the Internet is not about free software or mail functions or supercomputers or any individual service it offers. The bottom line is that the Internet supports the largest and most directly connected community in the world. It might be to your business' advantage to become a part of that community. •

Quarterman is a partner at Austin-based Texas Internet Consulting, which consults on networks and open systems. He is author of the book *The Matrix: Computer Networks and Conferencing Systems Worldwide* (Digital Press, 1990). Quarterman gathered most of the examples in this article through a single query to business users on an Internet mailing list. Follow-up was also done on-line. He can be reached through the Internet at *jsq@tic.com*.

Internet misconceptions

The Internet is owned by the government.
The Internet is owned by approximately 15,000 organizations worldwide, from large corporations to military services and government agencies. The U.S. government was very influential in the development of the Internet but currently owns or funds only a small fraction of it.

Commercial use is prohibited.
Most of the Internet is privately owned and consists of local-area networks inside companies. In fact, commercial connections are growing faster than educational ones. Most wide-area Internet connectivity providers are privately owned and operated and will carry any traffic that users pay for. Some parts of the Internet (including the fastest parts) restrict use to research or education.

The Internet is just U.S.-based.
The Internet extends to more than 40 countries currently, and expectations are that 100 more will come on board. After the U.S., the countries with the most Internet hosts are Australia, Canada and Germany. The countries with the most hosts per person are Norway, Sweden, Denmark, Finland and Iceland.

The Internet is the same as the Arpanet.
The Arpanet was merely one network within the Internet. Started in 1969, Arpanet was the first distributed packet-switched computer network. In 1977, the Arpanet became one of the Internet's backbone networks, and the protocol research done on the Arpanet was very influential in the development of the TCP/IP currently used on the Internet. Arpanet's technology became obsolete, however, and it was retired in 1990.

The Internet is the same as the National Research and Education Network (NREN).
First, the NREN, which is expected to be the fastest wide-area network on the Internet, does not yet exist. However, interest in creating the NREN has reached fever pitch because one of its proponents is Vice President Al Gore. When (and if) it finally gets here, the NREN will be but one of the thousands of networks on the Internet. The NREN will likely be limited to the U.S.

—*John S. Quarterman*

Finders, keepers

So many resources are available on the Internet that a slew of index and search services have cropped up to help users. They include the following:

- **Archie:** A service that indexes more than 1,000 anonymous FTP servers worldwide—about 150G bytes of information. Basically, you ask Archie to locate a program or other package by name, and it responds with a list of all the hosts that have it, which directory and file it is in on each host and when it was last updated.

  Public Archie servers in the U.S. are in Maryland (*archie.sura.net*), Nebraska (*archie.unl.edu*), New York (*archie.ans.net*) and New Jersey (*archie.rutgers.edu*).

- **Wide-Area Information Servers (WAIS):** WAIS can index any piece of text and report to you passages that match key words. It lets you search for information in databases located on servers. Users have access to *The Bible*, current weather forecasts, documents about the Internet and so on.

  Users can try a WAIS terminal interface by remotely logging on to *quake.think.com*. Use the username "WAIS."

- **Gopher:** Gopher helps you find the right menu and keep track of the various servers and information sources. Gopher ties all these items together in a worldwide distributed menu system. Archie, certain libraries and many WAIS servers are available through Gopher, as are text files and software packages.

  You can get an idea of how Gopher works by logging on to one of the public Gopher sites. Try *gopher.micro.umn.edu*.

Hytelnet: Hytelnet helps you find the right library catalog. This program, which can run on the PC, Macintosh, Unix or other operating system, helps users find the appropriate hosts and logon names for library databases. Information is built into menus.

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Job discrimination

Age no barrier, perception is

By Sheryl Kay

Who says you can't teach an old dog new tricks? John Parsons, 57, a systems programmer at the Housing Authority of Baltimore, refutes that theory. With absolutely no computer background, he went back to school at age 47 and got a job as an entry-level systems programmer.

"Age has nothing to do with survivability," he observes.

The perception that older information systems professionals may be less likely to adapt to and absorb new systems is a form of age discrimination. But apart from some isolated cases, age discrimination is not a big problem in most IS shops.

"It's the great theoretical argument," says Paul LeFort, a senior partner of information technology at Deloitte & Touche in Chicago. LeFort says he has never observed age discrimination, yet he concedes that because developers spend a lot of time with users, some companies hire younger employees as developers because they're perceived as being more lively and aggressive than older employees.

When to watch out

As with most professions, age discrimination in IS can take place during hiring, promotions, reviews, training and terminations.

Most instances of age bias in IS occur during training and terminations when a company assumes older employees can't learn new technologies. Some firms either don't give them the option to learn or fire them for not knowing.

Where IS age bias occurs:

Hiring: Younger candidate with equal skill sets, education and salary requirements hired over an older one. Rarely happens in IS.

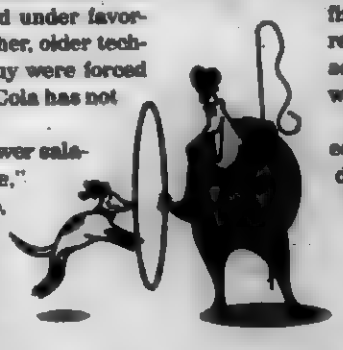
Promotions: Younger employees, perceived to have more energy and a better handle on current management styles, are more likely to be promoted.

Training: Most common form of IS age bias. Perception is that only younger employees can keep technically current.

Terminations: Perception in IS is that an older employee is less able to assimilate new technical concepts and is less willing to do so. When layoffs are necessary, he is first to go.

Jake Waller, 57, retired almost four years ago from the Coca-Cola Co. in Atlanta where he served as vice president of administration and technology. Although he retired under favorable circumstances, he says other, older technical employees at the company were forced out against their wishes. Coca-Cola has not responded to this accusation.

A younger manager with a lower salary came in and "cleaned house," Waller recalls, and in doing so, forced the resignation of a number of individuals in their late 40s who had been with the company more than 20 years. But "the whole thing fell in on him," Waller notes. "He only lasted 18 months, and it took almost four years to shore the organization back up again."



Skills matter, not age

Having recruited IS professionals for more than a decade, Hal Sullivant, president of Linn-Truett, Inc. in San Antonio, has not seen age discrimination in IS: "If there's bias out there, then the companies are hiding it." Sullivant maintains that he has placed many individuals in their 50s.

"If they're good in the boardroom but not technically proficient, yes, there may be [fewer] jobs for them, not because of their age, but because there is only one CIO at any company," Sullivant says.

LeFort notes that some industries actually prefer hiring seasoned IS professionals. "Financial services or airline reservation systems, for example, require specialized knowledge, which is usually only found in more experienced employees," he says.

"And in some instances, gray hair just lends some credibility," Thomas adds.

Nevertheless, to suggest that age discrimination does not exist in IS is "utter nonsense," says Debra L. Raskin, partner at Vladeck, Waldman, Elias & Engelhart, a New York law firm that specializes in labor-related issues. "Why do we see scores of qualified 50-year-olds who can't get work?" she asks.

"Management is strongly educated on sexual and racial discrimination," Raskin says, "but age bias is the last vestige of the stupid." Comments regarding age and adaptability in IS are fairly common and generally tolerated.

For example, IS managers might not send an older employee to a training class if they feel that they "can't teach an old dog new tricks." They don't even think they are being discriminatory, Raskin says.

Indeed, some computer employees may be subjects of age discrimination, says Frank Cronin, a managing partner at the Los Angeles law firm of Jackson, Lewis, Schnitzler, Krupman, who has litigated more than 20 age bias cases in the computer industry. Still, he contends, most age discrimination suits are unsubstantiated and are filed because an employee doesn't understand why he was terminated.

It's easier for some employees to blame the company for age bias than to take blame for their unwillingness to learn new technologies, Cronin says.

Kay is a Tampa, Fla.-based business consultant and a free-lance writer specializing in emerging technology.

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Career advice for the '90s

Always check organizational chart

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Paul Andersen, a principal at Andersen, Jones & Muller Associates in Southfield, Mich., a recruiting firm specializing in the placement of information systems professionals.

Q: I have been presented with two opportunities at companies that have similar technical environments. I am a programmer/analyst and want to develop systems analysis skills.

Both companies claim to have career paths for me. How do I evaluate or compare these opportunities?

A: In an interview, you need to ask the right questions. In your case, the right question is: "How does this position for which I am interviewing fit into this department?"

A verbal or visual (organizational chart) description of a department screams volumes about the career prospects. If the programmer/analyst reports to a systems analyst who reports to a project leader who reports to a project manager, then the career path and training are probably available.

If the programmer/analyst reports to the manager of the department, then the career path is less certain.

Q: I recently received a bachelor's degree in computer science. I want to get into computer programming but don't have the experience most companies require. There is a position available to me as a computer operator. My thoughts are that this will get me in the door, and then I can learn programming. Do you agree?

A: No. Computer operations offers an excellent but different career path than computer programming. Unless you're looking at a small environment where you might perform multiple functions, an operator's career path is not easily transferable to a programmer's career path. It has always been tough to get that initial experience, but if you have specific career goals, stick with your search. Your patience will eventually pay off.

Q: My department manager is offering me a promotion to project manager. While I'm excited about being promoted, the technology is very old and not where our industry is headed. What do you recommend?

A: Keeping current in IS is essential. However, if the position offers you the career steps you need, other considerations become important. Let your immediate supervisors know your concern. See if you can take on additional responsibilities that would allow you to work with state-of-the-art technology. Talk to them about starting an initial analysis toward converting the project to technology that the rest of the industry uses. Turning down a promotion is not in your best interest.

Q: I am due for a salary review soon. My performance reviews have always been very solid, but I know that my salary is slightly less than that of my associates of equal experience and performance. How would you suggest I get myself in line with my peers in terms of compensation?

A: Start by determining who the salary decision-maker is. Talk with the person directly, avoiding negative commentary (such as "Why does so-and-so make more than me?"). Tell this person that you hope your next increase will bring you in line with others. Never mention a specific number or percentage.

Sure that you're being undervalued? Stressed out? Feeling discriminated against? We want to hear about these and other issues that affect your career. Call your questions in using the Fast Track line at (508) 820-8522, MCI Mail them to CWCAREERS or send them by fax to Kelly Sewell at (508) 875-8931. If we use your question, we'll send you a gift.

What skills do ideal IS applicants possess?

■ **The common denominator of successful IS professionals is that they're visionary, pragmatic, and they focus intensely on realistic business needs. If they get enamored with CASE tools, they forget they're trying to build something that will benefit the business.**

James M. Spitze, senior vice president and CIO
Tri Valley Growers, San Francisco

TIPS from the TIMES

■ **I'd look for someone who could look at a project and be able to lay out the entire process in a logical way. Also, people need to learn techniques that aren't language-specific, such as software engineering and data structures. Good writing skills are also important for writing program documentation.**

Gary Berkemeyer,
director, application development
TCBY Enterprises, Inc., Little Rock, Ark.

■ **Generally, the industry is headed to PC client/server-type applications, so we look for skills in application development languages and networking.**

Dave Devore, manager, systems and programming
Florida Rock Industries, Jacksonville, Fla.

■ **I deal primarily with analysts, and when they get to this level, they need to have business experience. I recommend that they get an MBA. The further you go in IS, the more your general business skills and communication skills are required over technical skills.**

Nicholas Speranzo, director,
Continuums Life Office Administration System
Berkshire Life Insurance Co., Pittsfield, Mass.

What kind of tips would you like to read about? Call your ideas in to Kelly Sewell, assistant editor, features at (508) 879-0700.

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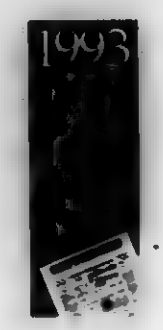

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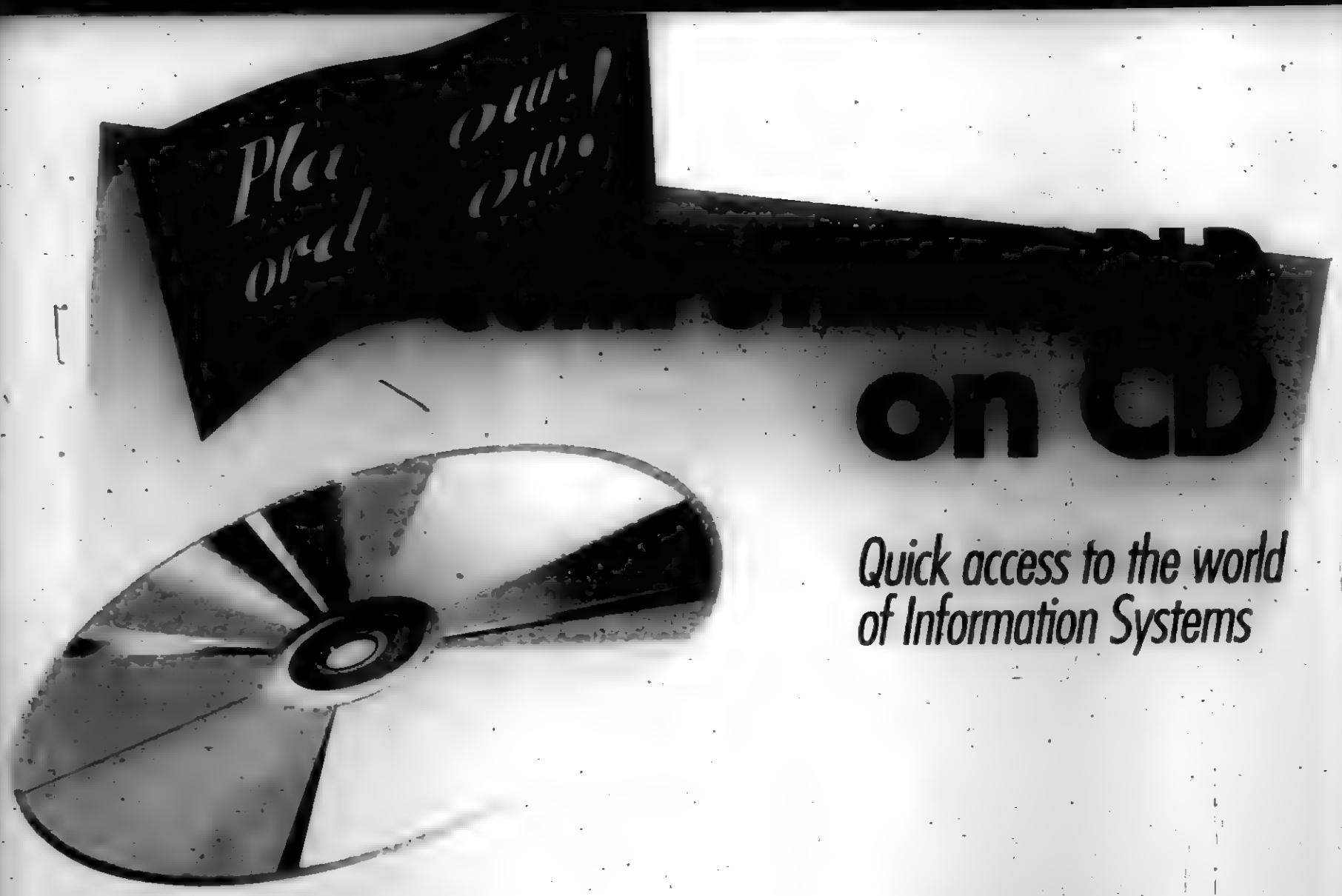

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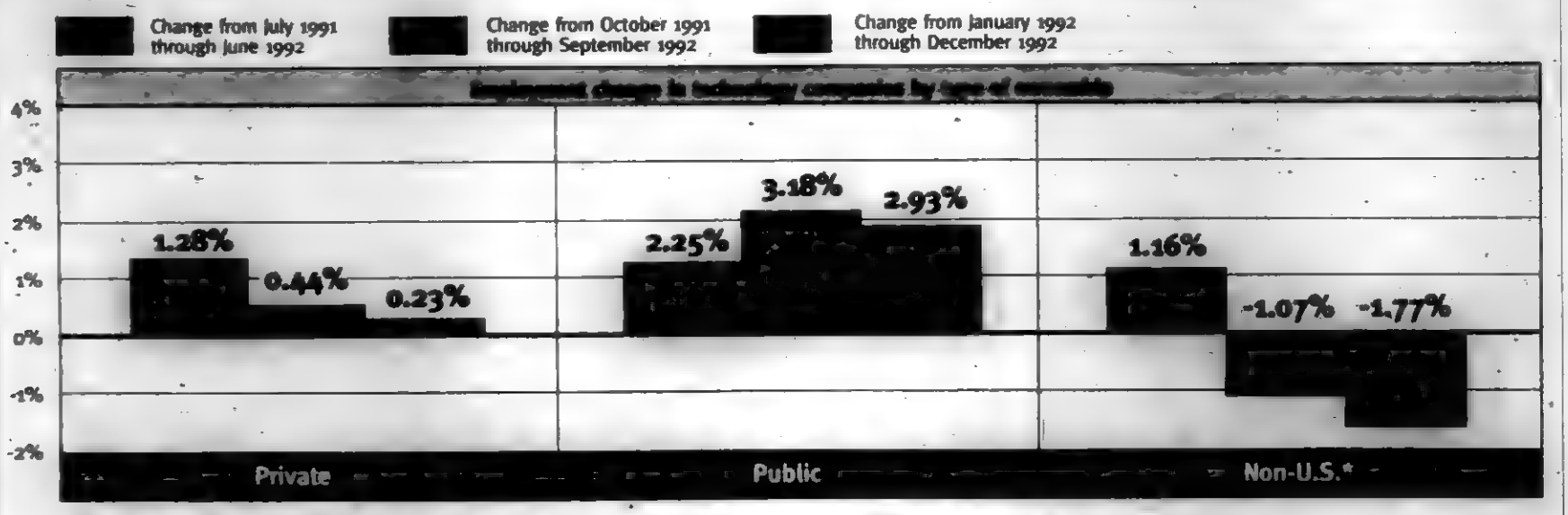

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The ABCs of mail-order returns

By Alice Bredin

Anyone who has purchased a computer through the mail knows that returns are part of the experience. If you buy often enough, a broken system or an incompatible peripheral is inevitable.

As the mail-order industry matures, return policies are becoming more sophisticated. Almost all vendors offer full money-back guarantees, but even the most progressive policies carry restrictions. Buyers planning on taking full advantage of a return need to know a variety of things.

Vendor policies

Following is a sample of mail-order policies from well-known and less well-known firms. Offerings are similar in most cases but may differ in terms of shipping costs and refunds.

Computer Discount Warehouse, Chicago, Ill.	15-day money-back; ships on ship date.	Vendor pays.	$95 to $105 for standard; call regarding other options.	2 weeks.	Customer pays return shipment.
Dell Computer Corp., Austin, Texas	30-day money-back; ships when customer requests them.	Customer pays.	None.	3 to 4 days.	Vendor pays return shipment; must call to obtain return okay.
Gateway 2000, Inc., North Sioux City, S.D.	30-day money-back; must call to obtain return okay.	Customer pays.	None.	5 to 10 days.	Vendor pays return shipment.
Zeos International Ltd., Minneapolis	30-day money-back; ships on ship date.	Customer pays.	None.	Less than 1 week.	Customer pays return shipment.

Steps for returning products:

■ Immediately contact the mail-order company you purchased from.

■ Write a summary of your conversations with the vendor and any promises made. Ask the person you speak with to send you the same on company stationery. Mail a copy of your summary to the vendor by registered mail.

"The letter is a promise of what the company will do for you," says Stephanie Brown, director of consumer affairs at the Washington, D.C.-based Electronic Industries Association.

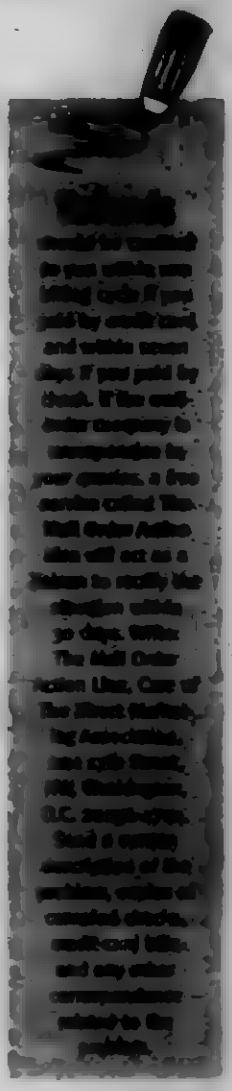
■ Wrap up the products securely in their original packaging if possible, and send them back insured for their full purchase amount.

■ Heed return deadlines. Some vendors make allowances for late returns, but they are under no legal obligations to do so. To avoid losing money on a product, make sure that when you order items, you have time to test them. Vendors may extend the deadline if you notify them at the time of purchase that you won't be around to test the product when it arrives.

■ Return of damaged goods should be paid for by the vendor, and the vendor should also ship replacement equipment at no charge, say experts at The Direct Marketing Association in New York. However, many vendors may expect the customer to pay for shipping costs.

■ Before you buy, check with the Better Business Bureau in the vendor's state or town to see if there have been complaints against it.

Bredin is a free-lance writer based in New York.



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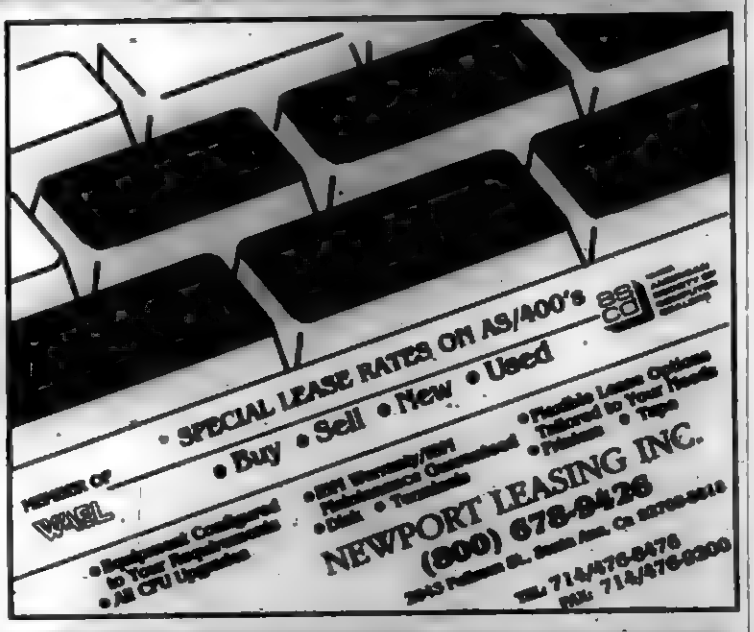

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Portable III	$500	$425
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The New York City FINANCIAL INFORMATION SERVICES AGENCY has issued a formal Request for Information (RFI) as to the general availability of mainframe software which could be acquired to replace products in its current software inventory (information packages due March 18, 1993, 5:00 p.m.).

Requests for information may be obtained by calling Dorothy Duncan at (212) 206-3229.

Further details may be found within the RFI.

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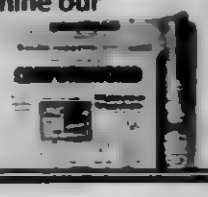

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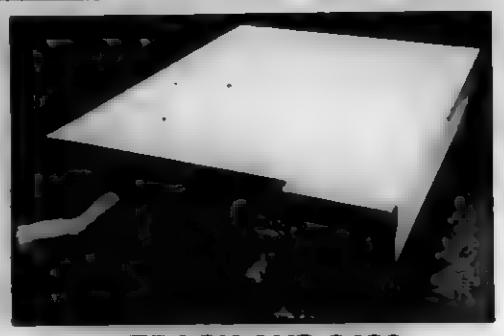

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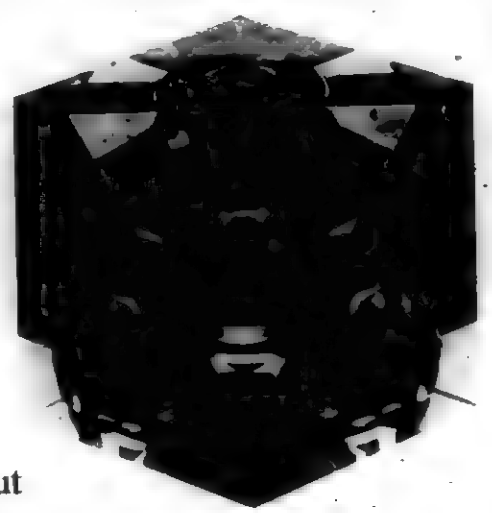

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Policy Management Sys.	-4.75
Lexcel Corp.	-4.25
3M Corp.	-4.00
Progress Software Corp.	-4.00
Microsoft Corp.	-3.75

Concerns yield Sell ratings

The "Sell" rating is a rare bird among brokerage firm reports. When it does appear, however, a Sell rating does not always indicate that the stock is due for a quick drop. Instead, it may mean that a company's flagship product is not catching on or that analysts think a company is strategically off the mark in a highly competitive market.

Quarterdeck Office Systems (QDEK)
Quarterdeck was among three software companies carrying the Sell rating in a report by Montgomery Securities analysts Betty Lyter and Doug Gordon earlier this month. The other two Sell ratings went to **Borland International, Inc.** (BORL) and **Lotus Development Corp.** (LOTS).

In Quarterdeck's case, declining sequential sales of the new DesqView/X software (from $1.7 million to $1.3 million in the December quarter) contributed to the negative forecast. Future prospects for Quarterdeck's QEMM software are also uncertain because DOS 6.0 is expected to feature improved memory management, and DOS 7.0's anticipated 32-bit architecture could render memory management add-ins superfluous.

Montgomery Securities noted there is little evidence that Quarterdeck is developing new products to contribute to revenue growth. Quarterdeck hit a 52-week low of 3¼ in the middle of the week.

Commodore International Ltd. (CBU)
Commodore received a "Source of Funds" rating from Alex. Brown & Sons, Inc. in a Feb. 8 report, indicating that people who have funds invested in Commodore stock could find more constructive ways to use that money. (Alex. Brown does not issue a "Sell" rating.)

The company reported an operating loss of 82 cents per share for the December quarter, on revenue of $238 million. In addition, Commodore took a $50 million charge to cover inventory write-downs and the shutdown of manufacturing facilities overseas. According to analysts Steven Eskenazi and Janet Regalia, the key concern was faltering Amiga multimedia system sales, which dropped more than 25% from the same quarter a year ago. New Amiga A1200 and A4000 systems reached the market behind schedule and in insufficient quantities.

The Alex. Brown report recommended that investors avoid the stock until the company shows tangible evidence of reversing declining sales momentum.

Commodore issues have held at about 8 since the Alex. Brown report was released.

—Derek Slater

Exch	52-Week High	52-Week Low		Feb. 19 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	34.63	9.63	3Com Corp.	29.63	1.50	4.8
NYS	75.13	56.25	American Info Techs Corp. (H)	73.00	-1.13	-1.5
NYS	59.25	36.63	AT&T	53.50	-0.75	-1.4
OTC	3.63	0.75	Aztel Communication Corp.	2.13	-0.19	-8.1
OTC	24.50	10.25	Banyan Systems Inc.	18.75	-0.50	-2.6
NYS	54.38	40.25	Bell Atlantic Corp.	54.25	0.13	0.2
NYS	55.50	43.38	Bellsouth Corp.	53.75	0.13	-0.3
NYS	6.75	3.63	Bolt, Beranek & Newman	4.63	-0.38	-7.5
OTC	18.50	10.00	Broadtrout Technology	15.50	-0.50	-3.1
NYS	92.25	62.13	Cabletron Systems	77.75	-2.25	-2.8
OTC	34.50	17.75	Chipcom Corp.	28.38	-1.13	-3.8
OTC	94.75	33.00	Cisco Systems Inc.	84.50	-2.75	-3.2
OTC	27.75	5.50	Compression Labs Inc.	14.88	1.13	7.0
OTC	3.44	0.88	Data Switch Corp.	3.19	0.06	-1.9
NYS	22.75	13.75	Digital Comm. Assoc.	18.00	-0.75	-4.0
OTC	14.75	7.50	Digital Systems Int'l Inc.	7.88	-0.88	-10.0
OTC	28.50	4.00	DSC Communications	24.63	0.13	0.5
OTC	10.88	4.75	Fibronix Int'l Inc.	8.25	-0.50	-5.7
OTC	37.50	10.50	Frenet Corp.	12.00	0.00	0.0
OTC	4.38	1.50	Gandalf Technologies Inc.	3.75	0.00	0.0
OTC	2.25	0.69	Gateway Communications	1.50	-0.13	-7.7
NYS	10.50	7.88	General Datacomm Inds	8.00	-0.63	7.2
ASE	4.88	2.00	Go Video	2.75	-0.19	-6.4
NYS	36.00	28.88	GTE Corp.	36.00	-0.25	-0.7
NYS	76.25	59.38	ITT Corp. (H)	74.38	1.50	2.0
OTC	63.38	29.50	MCI Communications Corp.	38.88	0.88	2.2
OTC	13.50	2.25	Microcom Inc.	4.75	-0.13	-2.6
OTC	24.25	10.13	Netrix Corp. (L)	10.13	-2.00	-16.5
OTC	19.00	9.63	Network Computing Devices	16.25	-1.25	-7.1
NYS	16.63	8.13	Network Equipment Tech.	9.25	-0.88	-8.6
OTC	23.50	8.00	Network General	14.88	0.38	2.6
OTC	15.75	8.50	Network Systems Corp.	11.13	1.00	8.2
OTC	50.00	13.00	Newbridge Networks Corp.	48.38	2.63	5.7
NYS	68.75	38.50	Northern Telecom Ltd.	42.88	0.25	0.6
OTC	33.50	22.50	Novell Inc.	27.50	-0.50	-1.8
NYS	88.50	69.13	Nynex Corp.	87.88	0.88	1.0
OTC	37.50	14.50	Octel Communications Corp.	25.25	1.75	6.5
OTC	9.00	3.38	Penril Data Comm Networks	5.00	-0.25	-4.8
OTC	50.50	10.25	Picturetel Corp.	24.63	1.25	5.3
OTC	17.50	7.00	Proteon Inc.	8.13	0.50	6.6
NYS	30.38	10.16	Scientific Atlanta Inc.	19.38	-2.75	-12.4
NYS	75.63	56.63	Southwestern Bell Corp.	72.25	1.50	2.1
NYS	38.25	20.75	Sprint Corp.	27.13	-0.88	3.1
OTC	27.00	8.38	Standard Microsystems Corp.	20.13	-0.63	-3.0
OTC	18.50	6.88	Stratacom Inc.	16.25	0.00	0.0
OTC	95.50	18.75	Synoptics Communications	77.50	3.13	3.9
OTC	7.13	4.38	Telebit Corp.	5.63	1.13	25.0
OTC	9.38	2.13	Telematics Int'l Inc.	8.00	-1.25	-13.5
OTC	25.50	13.38	US Robotics	19.75	-0.75	-3.7
NYS	41.88	32.88	US West Inc. (H)	41.88	0.88	2.1
OTC	46.00	12.00	Wellfleet Communications	35.00	-2.75	-7.3
OTC	22.00	7.00	Xircom	7.75	-0.25	-3.1
PCS AND WORKSTATIONS						
OTC	8.25	3.13	Advanced Logic Research	3.63	0.25	6.5
OTC	70.00	41.50	Apple Computer Inc.	55.00	0.50	0.9
OTC	24.25	11.25	AST Research Inc.	10.25	0.25	-1.4
NYS	16.25	5.25	Commodore Int'l.	5.75	-0.38	-6.1
NYS	58.50	22.25	Compaq Computer Corp.	48.63	1.00	2.1
OTC	49.88	15.00	Dell Computer Corp.	36.88	1.25	3.5
NYS	38.63	26.63	Harris Corp.	35.75	0.00	0.0
NYS	85.00	50.25	Hewlett-Packard Co.	74.13	5.13	7.4
NYS	33.00	16.13	Silicon Graphics	28.38	1.13	3.8
OTC	41.00	22.50	Sun Microsystems Inc.	34.25	0.88	2.5
NYS	32.13	22.25	Tandy Corp.	25.25	2.75	9.8
NYS	11.13	5.00	Zenith Electronics	7.13	-0.25	3.6
OTC	22.75	2.75	Zeos International Ltd.	5.38	0.13	2.4
MINICOMPUTER SYSTEMS						
ASE	20.63	6.63	Ardent Corp.	7.75	0.25	3.3
NYS	15.63	6.75	Convex Computer	5.38	-0.38	6.5
OTC	7.13	1.88	Cray Computer	5.63	-0.25	-6.5
NYS	45.00	19.00	Cray Research Inc.	25.25	-0.38	1.5
NYS	13.00	7.13	Data General Corp.	12.50	0.88	7.5
NYS	65.50	30.38	Digital Equipment Corp.	44.88	1.25	2.9
NYS	100.38	45.88	IBM	50.25	-0.63	1.2
OTC	19.50	5.50	Kendall Square Research	15.75	-0.75	4.5
NYS	110.00	83.00	Matsushita Electronics	90.25	1.50	1.7
OTC	17.00	6.00	Pyramid Technology	14.00	0.50	3.4
OTC	24.00	11.13	Sequent Computer Sys.	20.75	-0.50	2.4
OTC	16.38	3.38	Sequoia Systems Inc.	2.50	-0.25	-9.1
NYS	54.00	29.50	Stratus Computer Inc.	32.50	-0.75	-2.3
NYS	16.88	9.88	Tandem Computers Inc.	12.38	1.00	7.5
NYS	13.25	7.75	Unisys Corp.	11.75	0.13	1.1
ASE	7.50	0.06	Wang Labs Inc. (B)	0.88	0.06	-6.7
SOFTWARE						
OTC	59.25	25.25	Adobe Systems Inc.	43.00	2.00	4.9
OTC	32.50	10.25	Aldus Corp.	17.50	0.25	1.4
OTC	19.75	7.00	American Software Inc.	7.50	-0.50	-6.3
OTC	25.63	9.75	Ask Computer Systems	22.88	2.00	8.0
OTC	56.50	24.88	Autodesk Inc.	46.50	0.75	1.6
OTC	32.75	3.50	Bachman Info. Systems	4.25	0.00	0.0
OTC	43.00	14.00	BGS Systems Inc.	41.00	1.25	3.1
OTC	84.13	37.25	BMC Software Inc.	60.00	-8.25	-12.1
OTC	28.25	17.00	Boole & Babbage	26.50	0.50	1.9
OTC	75.25	17.50	Borland Int'l Inc.	21.50	3.00	16.2
OTC	9.50	3.00	CE Software	6.00	0.50	14.3
ASE	35.00	9.38	Cheyenne Software Inc.	26.38	1.50	5.6
OTC	19.50	8.25	ChipSoft	15.50	0.75	4.6
OTC	11.88	5.63	Cognos Inc.	6.88	-0.50	6.8
NYS	27.38	10.88	Computer Associates	20.50	0.13	0.5
NYS	12.38	4.00	Computervision Corp.	6.75	-0.38	7.3
OTC	18.50	6.75	Comshare Inc.	8.88	-0.13	1.4
OTC	17.25	10.75	Corel Corp.	11.63	-0.25	2.1
OTC	44.00	6.00	Easel Corp.	9.50	-2.25	-19.1
OTC	25.50	11.75	Frame Technology	13.00	-1.75	11.9
OTC	22.25	12.50	Group 1 Software	15.00	-2.00	11.8
OTC	8.75	3.50	Hogan Systems Inc.	7.38	-1.00	-11.9
OTC	25.75	12.25	HMPS (L)	12.25	1.88	13.3
OTC	34.75	18.50	Information Resources	31.13	0.63	2.0
OTC	42.00	12.13	Informix Corp.	31.00	2.25	-6.8
OTC	21.75	11.00	Intergraph Corp.	12.50	0.50	4.2
OTC	14.75	7.75	Interleaf Inc.	10.25	0.00	0.0
OTC	18.25	8.00	Intersolv Inc.	8.75	-0.50	-5.4
OTC	19.50	9.50	Knowledgeware Inc.	10.50	-0.50	-4.5
OTC	54.75	28.75	Legent Corp.	65.50	-6.25	-8.5
OTC	38.75	14.75	Lotus Development	23.88	-0.38	-1.5
OTC	23.25	11.00	McAfee Associates (L)	11.00	-2.50	-18.5
OTC	8.38	1.88	Mega Software	6.38	-0.63	-8.9
OTC	21.50	5.25	Mentor Graphics	9.63	-0.13	-1.3
OTC	46.00	27.25	Micro Focus	42.25	-1.00	-2.3
OTC	20.50	6.50	Micrografx Inc.	8.25	-1.00	-10.8
OTC	95.00	65.50	Microsoft Corp.	80.25	-3.75	-4.5
OTC	36.38	12.00	Oracle Corp.	29.75	0.00	0.0
OTC	63.75	25.25	Parametric Technology	55.25	-1.00	-1.8
OTC	40.50	22.50	Peoplesoft	26.50	-7.13	-21.2
OTC	11.00	3.50	Phoenix Technologies	9.13	-0.50	-8.9
OTC	25.00	11.25	Platinum Technology	17.25	-2.63	-13.2
OTC	61.50	29.00	Progress Software Corp.	47.00	-4.00	-7.8
OTC	24.25	3.13	Quarterdeck Office Sys.	3.25	-0.13	-3.7
OTC	30.00	11.75	Rainbow Technologies Inc.	17.50	1.00	-5.4
OTC	22.75	6.00	Rasterops	6.63	-1.25	-15.9
OTC	17.25	3.63	Ross Systems	10.63	-0.75	-6.6
OTC	27.25	8.50	Sapiens USA Inc.	21.75	1.63	8.1
OTC	26.25	8.75	Software Publishing Corp.	11.88	-0.50	-4.0
OTC	8.88	2.00	Software Toolworks Inc.	7.63	-0.63	-7.6
OTC	5.75	0.75	Spinnaker Software	1.50	0.13	-7.7
OTC	16.50	3.25	State of the Art	13.25	-1.25	-10.0
NYS	23.63	13.75	Sterling Software Inc.	22.00	-0.50	-2.2
OTC	25.25	8.00	Structural Dynamics Research	12.38	-0.63	-4.8
OTC	62.25	21.00	Sybase Inc.	52.88	0.63	-1.2
OTC	68.75	5.88	Symantec Corp.	11.75	-0.50	-4.1
NYS	13.50	5.25	Systems Center Inc.	8.38	-0.50	-5.6
OTC	25.50	10.00	System Software Assoc.	11.25	-0.50	-4.3
OTC	10.38	2.50	Tymlox Corp.	4.00	0.25	6.7
OTC	23.75	8.63	Walker Interactive Systems (L)	8.63	-2.38	-21.6
OTC	4.38	1.38	Wordstar	2.31	-0.19	-7.5
SEMICONDUCTORS						
NYS	21.88	7.38	Advanced Micro Devices (H)	21.88	0.50	2.3
NYS	18.75	8.63	Analog Devices Inc.	16.63	0.38	2.2
OTC	20.13	7.63	Atmel Corp.	16.63	0.25	1.5
OTC	14.13	3.25	Chips and Technologies	3.50	-0.38	-9.7
NYS	16.88	7.38	Cypress Semiconductor Corp.	10.25	-0.13	-1.2
NYS	16.13	7.00	Dallas Semiconductor	11.88	0.38	2.6
OTC	210.00	46.50	Intel Corp.	112.00	0.50	0.4
OTC	12.25	6.88	LSI Logic Corp.	11.13	0.13	1.1
NYS	24.88	12.88	Micron Technology (H)	24.88	0.38	1.6
NYS	63.00	36.44	Motorola Inc.	57.38	2.38	4.3
NYS	14.13	8.25	National Semiconductor	10.38	-0.50	-4.6
OTC	25.25	8.25	Sierra Semiconductor	14.00	0.00	0.0
OTC	38.50	22.25	Synoptics	31.25	-1.25	3.8
NYS	59.25	11.50	Texas Instruments	55.00	0.75	1.4
OTC	10.00	6.00	VLSI Technology	7.13	0.00	0.0
OTC	7.63	2.13	Weitek	6.25	0.25	4.2
ASE	9.63	3.50	Western Digital Corp.	9.13	0.13	1.4
OTC	33.25	16.50	Xilinx	29.00	-0.88	-2.9
OTC	27.88	12.50	Zilog Inc.	21.63	-1.21	4.9
PERIPHERALS AND SUBSYSTEMS						
OTC	28.75	10.38	American Power Conversion	23.63	2.63	10.0
OTC	30.25	20.00	Qbitec Inc.	26.50	0.13	0.5
OTC	32.00	9.25	Cabletron Corp.	11.25	-0.75	6.3
ASE	18.38	6.09	Cognitronics Corp.	14.38	-1.25	-8.0
NYS	25.50	16.75	Comdisco Peripherals	20.38	0.00	0.0
OTC	38.50	10.25	Creative Technologies Inc.	20.25	1.75	5.8
OTC	30.75	14.25	Data Race Inc.	21.75	-1.63	7.0
ASE	19.66	6.75	Databarn Corp.	8.00	-0.38	-4.5
NYS	28.75	7.25	EMC Corp.	23.63	-1.13	-4.5
OTC	10.50	5.38	Emulex Corp.	7.25	0.25	1.6
OTC	19.25	13.25	Evans & Sutherland	15.00	2.63	-14.9
OTC	39.75	12.00	Exabyte	13.63	0.00	0.0
OTC	28.00	21.25	Intelligent Info. Systems	24.00	-5.25	7.6
OTC	11.13	4.75	Iomega Corp.	5.38	-0.63	-10.4
OTC	34.75	5.75	IPL Systems Inc.	8.00	0.50	6.7
OTC	23.25	10.75	Komag Inc.	23.75	3.13	16.8
OTC	19.63	8.38	Maxtor Corp.	9.00	-0.38	-4.0
OTC	12.63	2.13	Micropolis Corp.	9.13	0.38	4.3
NYS	109.75	85.50	3M Corp.	103.75	-4.00	-3.7
OTC	7.75	4.00	Pyramid Inc.	6.75	0.00	0.0
NYS	17.13	6.88	Qms Inc.	14.63	-0.13	-0.8
OTC	18.00	13.13	Quantum Corp.	15.88	0.13	0.8
OTC	12.75	3.75	Radius Inc.	5.38	-0.13	2.3
NYS	16.25	7.50	Recognition Equipment	13.88	0.13	0.9
OTC	13.88	6.50	Reflex Inc.	6.50	0.25	-3.7
OTC	22.38	12.00	Seagate Technology	17.75	0.13	0.7
NYS	75.00	18.38	Storage Technology	19.63	0.50	-2.5
NYS	25.25	16.50	Tektronix Inc.	23.75	-0.38	1.6
NYS	88.88	66.75	Xerox Corp.	81.88	3.38	4.0
SERVICES						
OTC	23.50	12.16	American Mgmt Systems	18.38	-2.50	-12.0
NYS	5.38	3.00	Analogic Inc.	3.50	0.13	3.4
OTC	35.75	16.00	Analysts Int'l.	31.50	1.00	3.1
NYS	55.88	38.75	Auto Data Processing	55.25	0.38	0.7
NYS	17.25	8.97	Ceridian Corp.	19.00	0.38	2.0
NYS	19.16	12.50	Comdisco Inc.	15.13	0.38	2.5
OTC	13.00	6.75	Computer Horizons	10.00	-1.35	-11.1
NYS	84.00	57.00	Computer Sciences	74.75	-2.63	3.4
NYS	10.13	7.13	Computer Task Group	7.50	-0.13	1.6
NYS	40.50	22.00	CompuSA Inc.	28.00	-1.88	-6.3
OTC	19.25	6.00	Corporate Software	11.50	-0.50	-4.2
OTC	30.75	7.75	Egghead Discount Software	8.63	-0.25	2.8
NYS	35.88	25.25	General Motors E (EDS)	29.75	-1.88	-5.9
OTC	25.50	9.25	Inacom Corp. (H)	20.75	-2.00	-8.8
OTC	90.38	6.25	Intelligent Electronics	13.88	-0.38	-2.6
OTC	14.88	6.63	Merisel	11.00	-0.38	3.3
OTC	15.75	5.75	Micrografx Inc.	12.00	-0.50	-4.0
OTC	40.00	21.00	Paychex	36.00	0.50	1.4
NYS	83.75	59.75	Policy Management Sys.	75.25	-4.75	-5.9
NYS	32.75	16.81	Reynolds and Reynolds	29.50	-1.13	-3.7
OTC	32.00	22.00	SEI Corp.	28.50	-1.13	-3.8
OTC	24.38	16.88	Shared Medical Systems	22.75	-0.13	-0.5
OTC	14.38	5.75	SML Systemhouse	8.38	1.50	21.8
OTC	29.25	18.25	Software Spectrum Inc.	23.50	0.50	2.2
OTC	32.50	20.75	Sungard Data Systems (H)	30.13	-1.38	-4.4
NYS	3.63	1.13	Ultimate Corp.	1.88	-0.13	-6.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

HP Q1 revenue up

Fueled by strong growth in nonimpact printers, Unix systems and telecommunications test equipment, **Hewlett-Packard Co.** last week reported fiscal first-quarter revenue of $4.6 billion, up 18% from the same period last year. Net earnings for the period ended Jan. 31 were $261 million, compared with a loss of $30,000 a year earlier. The red ink followed accounting changes that caused a one-time writedown of $332 million.

EMC profits take off

Hopkinton, Mass., storage systems vendor **EMC Corp.** posted fourth-quarter profits of $10.1 million, up 52% from the comparable period last year. Revenue was $109.1 million, up 42% from the year-earlier quarter. For the year, EMC earned $28.7 million on sales of $349.1 million, up 120% and 50%, respectively.

SHL gets equity lift

New York investment house **E. M. Warburg, Pincus & Co.** has agreed to buy 4.5 million shares of **SHL Systemhouse, Inc.** The deal, valued at $32 million, comes weeks after minority investor, **BCE, Inc.**, found a buyer for its 22% stake in the Ottawa-based systems integrator [CW, Jan. 25].

SHORT TAKES **Novell, Inc.** has signed a definitive agreement to acquire **Unix System Laboratories, Inc.** from **AT&T** in a stock deal valued at $323 million. The deal still needs shareholder and regulatory approval.... **Informix Corp.** has reached an agreement in principle to settle securities class-action suits filed against it and some of its officers and directors in 1988. The Menlo Park, Calif., software developer will provide $8.4 million, and its liability insurance carrier will give $2 million to a settlement fund.

S. Korea, Spain cited as software pirates

By Gary H. Anthes
WASHINGTON, D.C.

A coalition of trade groups representing U.S. producers of software and other copyrightable items last week asked U.S. Trade Representative Mickey Kantor to take trade actions against South Korea and Spain for flagrant violation of copyright laws.

The International Intellectual Property Alliance (IIPA) — which includes the Information Technology Association of America, the Business Software Alliance, the Computer and Business Equipment Manufacturers Association and five other groups — asked Kantor to put South Korea on the government's list of "Priority Foreign Countries." Countries on that list are subject to the most intense pressure to end widespread piracy of software, films, books and sound recordings.

Roughly 88% of all software used in South Korea is pirated, according to Robert Holleyman, president of the Business Software Alliance, which represents firms such as Apple Computer, Inc., Lotus Development Corp., Novell, Inc. and Microsoft Corp. "Korea has grossly deficient software protection law and inadequate enforcement," he said.

For example, Holleyman said, Korean law does not provide for raids on organizations suspected of using pirated software. South Korea's response to U.S. complaints so far has been mostly "window dressing" aimed at getting the U.S. to back off, he added.

Unchecked piracy represents the single largest trade barrier for U.S. software publishers, which hold roughly 75% of worldwide market share, Holleyman explained.

The IIPA asked that Spain be added to the lower priority "Watch List," which means the government will increase scrutiny of the country's copyright protection regimen. The organization cited 26 other countries for inadequate copyright protection under the Special 301 provisions of the U.S. Trade Act of 1974.

The IIPA estimated U.S. software firms lost out on $2.18 billion worth of trade last year, up from $1.95 billion in 1991 (see chart). The IIPA also said it will file a petition seeking removal of Cyprus, Egypt, El Salvador, the Philippines, Poland, Thailand and Venezuela as beneficiaries of duty-free trading privileges with the U.S. unless they beef up copyright protections.

Kantor has until April 30 to identify countries as Priority Foreign Countries — those deemed the worst offenders — under Special 301. After a six-month period of negotiations, if the practices have not ended, the U.S. may take retaliatory trade action against those countries.

Walking the plank

The flagrant violation of copyright laws cost the industry an estimated $2.18 billion in 1992

Taiwan	$585
S. Korea	$510
Italy	$326
Poland	$300
Thailand	$244
Philippines	$225
Turkey	NA
People's Republic of China	$225
India	$170
Brazil	$90
Venezuela	$90
Saudi Arabia	$70
Egypt	$54
Australia, Greece, Cyprus, El Salvador	NA*
Spain	$300
Russia	$250
Bulgaria	$150
Paraguay, United Arab Emirates, Indonesia, Malaysia, Pakistan, Hungary, Israel, Guatemala	NA*

*Not available

Source: International Intellectual Property Alliance

Wavetracer forced to close doors

Slow supercomputer sales, lack of funding sealed company's fate

By Maryfran Johnson
ACTON, MASS.

Beset by inadequate financial backing and inexorable market trends, supercomputing vendor Wavetracer, Inc. recently joined the industry's casualty list of failed companies.

"We made attempts to market our hardware and software technology but were not successful in finding buyers within a reasonable time period," said Thomas Pickett, company president and last remaining employee. Wavetracer closed on Jan. 31, four months after its investors declined to supply further funding.

Wavetracer sold only 20 of its deskside Zephyr supercomputer systems in the past two years to companies such as United Technologies Corp.'s Sikorsky Aircraft Division and Du Pont Co. But the difficulties of programming and developing software for parallel computers limited Zephyr's appeal, Pickett said. The hardware itself was highly regarded, however, as one of the first supercomputer-class systems to be affordably priced (see box) while delivering speeds of more than 700 million instructions per second.

Big boys move in

Another fatal blow was the rise of standards-based technologies for building supercomputers, as companies such as IBM, Hewlett-Packard Co., Thinking Machines, Inc. and Silicon Graphics, Inc. began targeting the low end of the supercomputer market with systems based on reduced instruction set computing (RISC) processors (see story page 57).

"The parallel computing world is moving away from systems built on proprietary processors and moving to those built on RISC," said Robert Utzschneider, former vice president of marketing at Wavetracer. "It's pretty difficult for a small start-up to compete effectively if you have to develop your own processor and compiler technology."

Utzschneider and other Wavetracer employees have now established a spin-off software and systems integration company called Applied Parallel Technologies, Inc. in Cambridge, Mass. "There is a significant need for software to take advantage of parallel processors," said Utzschneider, president of the new firm.

Wavetracer's remaining users have not been abandoned completely, however. Customer service and support will be provided on a contract basis for the next 12 months, Pickett said.

"We still love the machine," said David Pensak, corporate adviser for computer technology at Du Pont in Wilmington, Del., which uses a Zephyr system for molecular modeling. "We found them to be extremely professional and very innovative in what they tried to do. We'll keep using it until it dies."

Wavetracer, Inc.
Acton, Mass.

Founded July 1988.
Closed: January 1993.

Funding: $24 million in venture capital.

Employees: 45.

Product: Wavetracer Zephyr, a desktop massively parallel computer for two models, priced at $85,000 and $150,000. Shipping since February.

Customers: Analysts and simulators using large-scale, three-dimensional problems.

Key competitors: Government research agencies; government defense contractors; chemical companies.

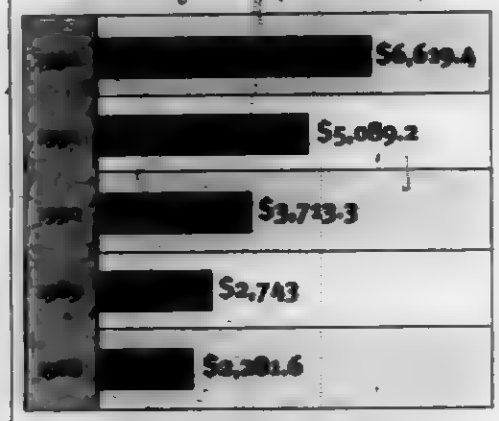
The final word: "We still love the machine."

Industry Pulse

Top 5 worldwide software application vendors (revenue in millions)

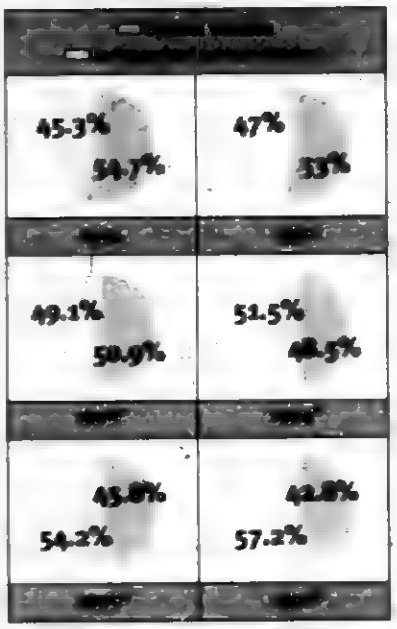
Source: Dataquest, Inc.

Industry sales (in millions)



Source: Gartner Group, Inc. Yardstick

Percent of market



Source: Forrester Research, Inc.

Legislation watch

Congress passed S.893, which elevates software piracy from a misdemeanor to a felony. Prison terms of up to five years and fines of up to $250,000 can now be imposed on people convicted of making at least 10 copies of a copyrighted program for financial gain.

*Projected

The Fifth Wave by Rich Tennant

"THE SHORT ANSWER TO YOUR REQUEST FOR A RAISE IS 'NO.' THE LONG ANSWER IS 'NO, AND GET OUT OF MY OFFICE.'"

Inside Lines

All along the watchtower

Dell Computer could soon find itself on Gartner Group's "Problem Watch," a report that lists vendors experiencing significant difficulties, according to sources close to the Stamford, Conn., consultancy. Dell is being cited for BIOS problems with its new P and L systems series and quality problems with its notebook line. Gartner Group is currently reviewing Dell's responses to its initial report. A final draft is due by month's end. If added, Dell won't be alone on this list: The IBM PC Co. is already there because of its parent's financial difficulties.

What's good for the goose....

A WordPerfect spokeswoman said last week that Novell is actively courting PC software vendors to combat Microsoft's dominance of the desktop by drumming up interest in bundling software packages with DR DOS and NetWare Lite. She declined to discuss the details of "informal discussions," and a spokesman at Lotus would neither confirm nor deny that the company was having similar discussions with Novell.

Going au naturel

In its continued bid to boost "natural" data types such as full-motion video and audio, Intel last week said it will offer 20 products in 1993 devoted to compression, acceleration and image capture. It will also introduce products that will advance wireless communications for mobile computers and push ISDN for the PC. "We think we're on the verge of an evolution in PCs as significant as the PC was to the replacement of the typewriter and the calculator," said Pat Geisinger, an Intel vice president.

Big Blue ripple

IBM's massive downsizing efforts are beginning to have a ripple effect on businesses that ride Big Blue's coattails. K/W Control Systems in Slate Hill, N.Y., which sells backup power supplies to IBM and its mainframe customers, announced plans last week to lay off roughly 25% of its work force. K/W executives cited IBM's 12% drop in mainframe sales last year and anticipated double-digit mainframe sales declines this year as the primary reason for the layoffs. K/W, which employs 230 people, is planning to eliminate up to 55 positions.

Clouded picture

Clearpoint Peripheral Resources, a memory and disk drive manufacturer in Hopkinton, Mass., has laid off 105 people in the past month, a spokesman confirmed last week. Total employment is now about 80 vs. a peak of about 300 employees worldwide a few years back. The vendor is continuing to sell its major product lines, the spokesman added, although it will outsource the manufacturing of some of its memory modules.

Windows For Wargroups?

"Windows everywhere," says Microsoft Chairman Bill Gates — but we had no idea that his vision included the U.S. Army's ultrasophisticated M1 tank. Windows was the platform used by Symbologic Corp. for the Turbine Engine Diagnostics (TED) program it developed for the M1 using its expert systems tool, Symbologic Adept for Windows. Granted, TED will be used behind the lines like an intelligent repair manual, but the day seems to be drawing near when Windows could act as an interface to the tank's onboard computer.

Did you see who was seated next to Hillary Rodham Clinton during President Bill Clinton's State of the Union address last week? None other than Apple CEO John Sculley. Seems that Sculley, a lifelong Republican who endorsed the former Arkansas governor during the campaign, has come to personify Clinton's interest in high tech. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 620-8555.*

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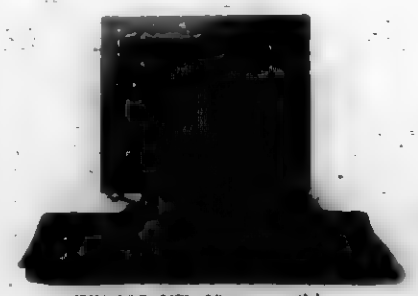

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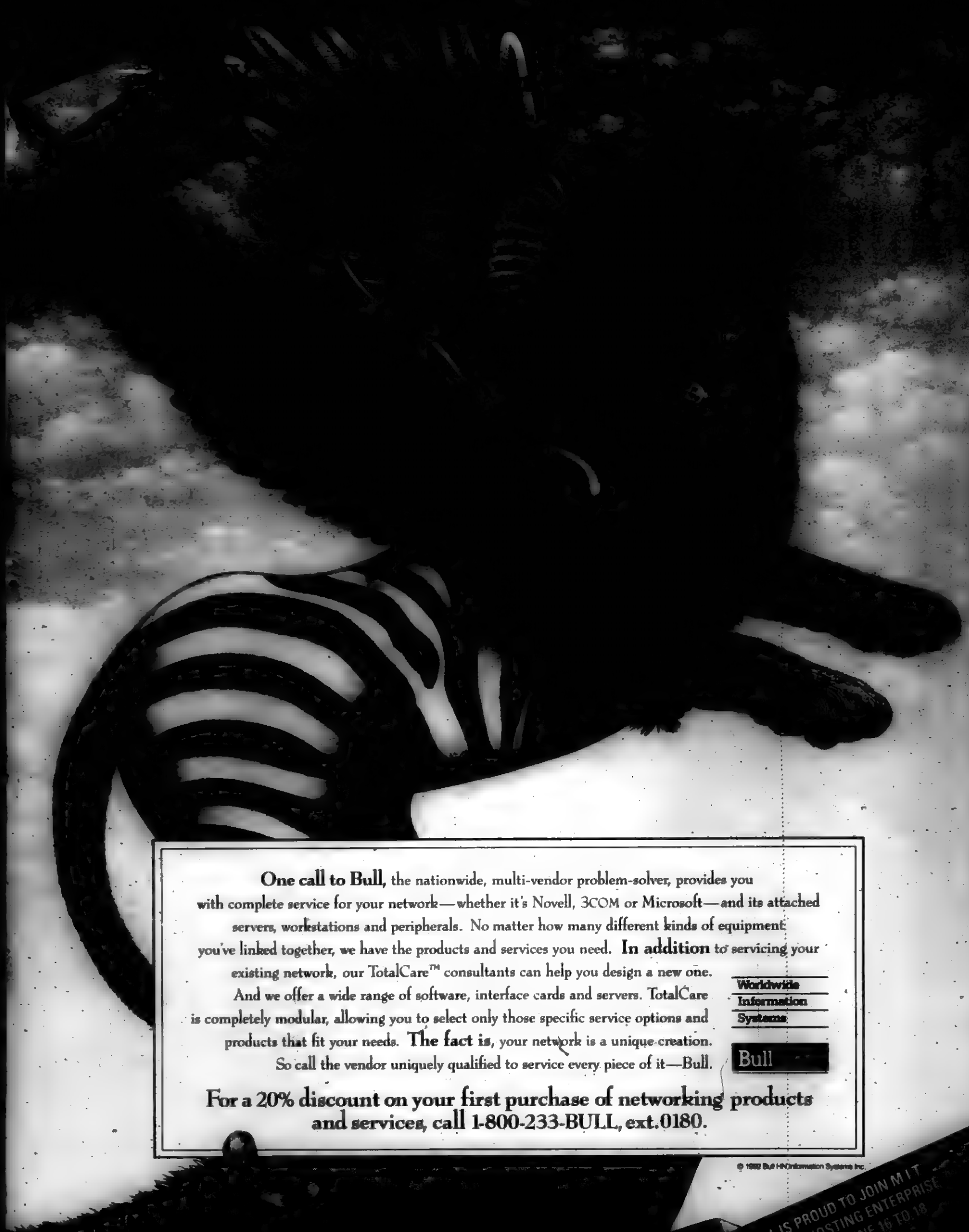
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COMPUTERWORLD

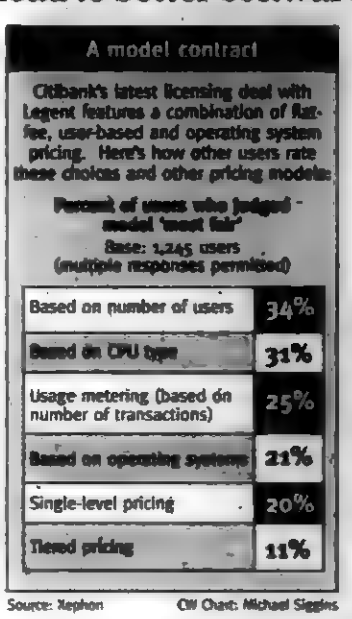
Citicorp protects its 'assets'

Consolidation efforts lead to better software license tracking

By Thomas Hoffman
NEW YORK

When Citicorp struck a flat-fee, enterprisewide software agreement with Computer Associates International, Inc. last October, the deal was merely one aspect of a worldwide software asset management program.

Citicorp Vice President Salvatore Giordano III, who spoke here at last week's Information Management Conference — co-sponsored by The Conference Board and Gartner Group, Inc. — detailed some of the $219.3 billion bank holding company's other approaches to improved software asset management. These include reducing the number of vendors it works with, developing a new flat-fee, enterprisewide software agreement with Legent Corp. and negotiating with IBM and other vendors for license changes.



Giordano said the moves are part of Citicorp's ongoing data center consolidation [CW, Nov. 18, 1991]. Although Giordano would not divulge how far Citicorp has come in its worldwide data center consolidation efforts, analysts said they believe the firm has reduced its global data centers from 150 to approximately 50. Analysts placed Citicorp's annual worldwide information systems budget at $1.5 billion.

Cost not only concern

Software asset management is not just a cost-cutting plan, Giordano explained, but rather an attempt by the bank to protect itself from long-term exposure to software upgrade and transfer fees. However, Giordano, who was wooed away from Coopers & Lybrand by Citicorp 15 months ago, does expect the program to yield substantial short- and long-term cost savings.

"I think we're going to reduce our cost base by a couple of percentage points," he predicted, declining to elaborate.

Citicorp, *page 16*

Travel firm seeks lift from X.25 net

By Joanie M. Wexler
ATLANTA

■ Worldspan Travel Information Services last week made a technology shift that could signal a trend in the ailing travel industry: It began to migrate from a leased-line data communications infrastructure to a more economical and far-reaching switched network.

The company signed a multiyear, $100 million deal with AT&T for an X.25 network that will initially serve its 10,000 U.S. travel agency members. A key reason for moving to the switched scenario is cost: It is less expensive to pay for local access into a switched data highway than to foot the bill for myriad dedicated lines running extremely long distances, explained George Balog, senior vice president of operations and technology.

In addition, the switched network allows dispersed travel agents and others to tap into more distributed hosts and services as the business expands, Balog said.

The move is seen as a trend in the airline and travel industry, kicked off three weeks ago by AMR Corp., American Airlines' parent. Such companies are likely to move to switched networks to leverage today's most competitive segment of the travel business — information and reservation services — to offset long-sagging airline financials, analysts said.

In fact, Worldspan — the world's fourth-largest computerized reservation system — plans eventually to link with

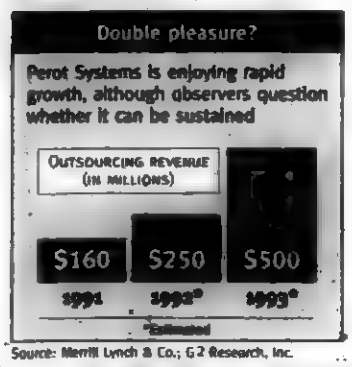
Travel firm, *page 12*

Perot growing pains strain relationships

Staffing issues and delays hurt projects

By Mark Halper
RESTON, VA.

After a fast start from illustrious roots, Perot Systems Corp. has spent much of the last year catching its breath and juggling resources to fulfill an abundance of user promises.



A can-do, breakneck pace enabled the firm inspired by billionaire co-founder H. Ross Perot to grow into a $250 million company in five years. Growing pains, however, set in early last year, soon after the firm landed its last two major contracts, sources close to the company said.

One of those jobs, the European International downsizing plum [CW, May 18, 1992], has suffered enough bruises to cause Perot to redeploy star staff members from large clients such as the $118 billion NationsBank, upsetting those customers and in some cases disrupting their service, according to several former Perot employees and current customers who asked not to be identified.

Perot has had to switch software

Perot, *page 14*

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Kash n' Karry shops in new technology aisles

By Maryfran Johnson
TAMPA, FLA.

James Sfiligoi
heads development

Kash n' Karry Food Stores, Inc. is parlaying its unique, leading-edge object development technology into a multimillion-dollar bargaining chip as the $1.2 billion grocery store chain enters the final weeks of negotiations with a trio of major systems vendors.

By the end of this month, Kash n' Karry intends to disclose plans to roll out point-of-sale systems and in-store Unix-based processors to its 115 stores starting later this year. Moreover, the supplier of Kash n' Karry's Store 2000 system will be part of an unusual joint marketing agreement based on the grocer's own object-based tool sets (see story page 24).

Initial vendor bids for the Store 2000 contract ranged from $150,000 to $300,000 per store — an $18 million to $35 million bill that Kash n' Karry executives found a bit too steep. Once vendor interest in the company's object technology was piqued, however, Kash n' Karry found itself in a much stronger position for deal-making.

Company officials declined to name the three vendors involved because only one

Kash n' Karry, *page 24*

ASSET MANAGEMENT

Users and vendors are getting serious about software tracking. Citicorp, for example, has embarked on a worldwide software asset management initiative that is designed to reduce long-term exposure to accelerated software budgets because of upgrade fees and relicensing issues tied to its worldwide data center consolidations. *Page 1.* Gradient Technologies is working on separate projects with both DEC and Novell designed to help administrators track software purchasing and manage licensing and use across LANs and enterprise networks, respectively. *Pages 8 and 16*

NETWORKING

Vendors will start rolling out local- to wide-area ATM switches along with messaging products based on the X.400 messaging standard at Interop '93 Spring next week. *Pages 8 and 12.* Meanwhile, a trio of vendors — IBM, Sun and HP — offered an alternative to FDDI technology that they hope will define a standard for fiber-optic workstation connections. *Page 14.* Other access improvements in the works come from Novell, which is putting its IPX-revving software on Wellfleet routers to further ingrain itself in the enterprise networking market. *Page 8.* And BT North America has embarked on a three-year initiative to broaden user choices for accessing its data network faster, more cheaply and more ubiquitously. *Page 12*

HIGH-TECH POLICY

Government officials mixed it up with the technology sector in several venues last week. After meeting with President Bill Clinton and Vice President Albert Gore, industry executives generally praised their plans for high tech but said the proposed spending cuts do not go far enough. *Page 85.* Separately, Clinton's State of the Union address reportedly gives Section 1706 proponents more ammunition with which to repeal the section. *Page 71*

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Managed health care

EDS, Blue Cross eyeing EDI

By Nell Margolis
DALLAS

Electronic Data Systems Corp. and Blue Cross/Blue Shield of Maryland last week inked a pact aimed at positioning the partners as pioneers in the burgeoning managed health care arena.

Under the 10-year contract, EDS will take over management of Maryland Blue's LifeCard division in Owings Mills, Md., putting its largely manual claims processing operation — currently about 30% of the insurer's total volume — on-line via an electronic document interchange (EDI) system.

For Maryland Blue, which holds an estimated 50% share of Maryland's regional health insurance market, upgrading to EDI through EDS means multiplying many times over the 5.8 million claims annually that it currently can handle, said Senior Vice President Thomas Higgins. The upgrade, Higgins said, is slated to be accomplished within a matter of months.

All 28 LifeCard employees will be offered jobs at EDS, he added; the division will remain in Owings Mills. What is more, Higgins said, using EDS' vaunted processing power will enable Maryland Blue to do more for less.

In a report issued last spring, the U.S. Department of Health and Human Services pegged the savings inherent in electronic claims filing at $5 per claim.

Nifty numbers, but the "real significance of the deal," Higgins said, "is that it lays the technological groundwork for a planned private-sector, statewide 'all-player' network" linking health care providers, payers and patients of every ilk. Plans to leverage the Maryland Blue system into the Maryland Health Information Network will go into effect well within the current year, Higgins said. That will rank Maryland among "only a handful of states" with an all-player network up and running, he added.

The Maryland all-player network scenario is the very model of a modern major general health care information exchange and a cornerstone of the managed health care concept that quickly gained currency in the Clinton White House, said Alice Lusk, EDS corporate vice president and group executive.

EDS savings

The health care industry's Workgroup for Electronic Data Interchange estimates that multiplayer EDI could top $4 billion to $10 billion from a health care administration bill pegged in a *Consumer Reports* study at a whopping $163 billion; Arthur D. Little, Inc. in Cambridge, Mass., placed the potential savings at $30 billion.

For EDS, it is also "a critical piece of a broader strategy," Lusk said. The $8.2 billion outsourcing player has an intercompany task force at work targeting ways to "take immediate and effective advantage of any [federal] legislation that is forthcoming," Lusk said.

EDS has forged alliances with Tulsa, Okla.-based reimbursement management services provider CIS Technologies, Inc. and Health Information Technologies, Inc. The latter is a Princeton, N.J., firm that runs an electronic communications network linking doctors and insurers. Both partners will play pivotal roles in the creation of the Maryland all-player network, according to EDS.

A "key piece of our strategy is to make a significant local impact very quickly," Lusk said. Maryland Blue, with its dominant market share, offered an exciting prospect but not an exclusive one: "We're having a lot of discussions with a lot of players," she added.

So did Maryland Blue, Higgins noted: Some 27 services providers queued up to bid for the contract that EDS won on the basis of its fiscal stability and health care depth.

Late Breaking News Briefs

Manhattan blast preempts trading

An explosion under the World Trade Center in New York Friday afternoon knocked out Over The Counter Market computers at downtown brokerages, closing two commodity exchanges, according to a published report. The resulting fire disrupted 149 NASDAQ terminals at various brokerages throughout lower Manhattan. About 86 of the terminals were restored through temporary telephone hookups, while 51 never resumed operation. NASDAQ also halted trading on its Small Order Execution System, which processes trades of 1,000 shares or less.

IBM sends pink slips

IBM's no-layoffs policy officially bit the dust last week when the company announced it will eliminate more than 500 corporate staff and service operations positions in its Armonk, N.Y., headquarters group. A voluntary retirement program will be used, but "layoffs will be required to accomplish the total reduction," IBM said in a statement. Included in the cuts were roughly 150 corporate staff jobs and approximately 350 service operations jobs. Service operations staff members provide billable services to IBM's business units, the company said.

Layoffs temper Novell profits

Novell, Inc. announced both record quarterly profits and a 4%, or 160-person, layoff last week. Novell posted fiscal first-quarter earnings of $70.9 million, a 36% increase over the same period in 1992. Quarterly sales rose 27% to $260 million, with sales of NetWare v3.11 growing 60%.

Microsoft Windows claim overturned

Microsoft Corp. lost a round in its bid to register Windows with the U.S. Patent and Trademark Office. The office made a nonfinal action denying Microsoft the trademark on the grounds that it found Windows to be a generic term. A Microsoft attorney said the firm is planning to present counterarguments in hopes that the trademark office will reverse its decision.

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BUSINE

INTERN COMPET INTENSI

One by one, world trac falling, leading to the r truly global marketplace.

Aided by the substan throughs in telecommunic computer technology, many are finding it easier than ever enter markets around the wo were previously unreachable.

Even the smallest firms are to compete on a global basis, an are finding that overseas mark greater growth potential than d markets,which may be flat or satu

However, this advent of inc global competition has had a brut on price margins.

Local firms which had previous protected by tariffs or governm port are now finding themselv pressed to compete with the ne of global competitors, who economies of scale are offerin quality at lower prices.

This new global marketplace created the demand for multi multicurrency financial softwa can consolidate a firm's global picture into one integrated bala or P&L in seconds.

Due to very confusing, com and ever-changing tax structur foreign currency exchange ru vary country-by-country—this new challenge to the new breed c CFOs. ■

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New spreadsheet technology such as CA-Compete!, which allows the creation of a multi-dimensional cube of data as

werful and are wooing om traditional vironments. NIX, AS/400, 2 offer incredible breakthroughs and (graphical user interfaces).

c hardware platforms are ecra await proven, mission- are to run on these exciting ns.

WN-SIZING REND CELERATES

ill be needed is a way to integrate nnovative, new, cost-effective plat- and technology with clients' exist- stems and investments.

one can afford to walk away from past investment and start over. ouring hundreds of millions of dol- IS systems for several decades, America is starting to demand ty from its MIS departments. Return On Investment) of IS difficult to measure and sible to project. But still, ngful way to assess it must be found.

ne aspect of it that is easy to nd that is the amount of n existing IS systems.

g back and adding up the ment in systems, training, evelopment, etc., it's easy to how much a corporation will ndoning its current systems.

corporations who have under- s exercise, it can be quite a experience. It also puts in a w light proposals to scrap exist- ms. ■

INVESTMENT PROTECTION #1 PRIORITY

many hardware and software ven- e proponents of "starting over" for us self-serving reasons, it is rarely a -efficient or rational move for clients. nstead, prudent clients focus on evolu- onary technological advances, as pposed to revolutionary ones. There's o reason to throw away existing sys- tems when there's always technology that integrate the old with the new.

Informix tools to debut

GUI tool sets will target client/server DBMS applications

By Jean S. Bozman
MENLO PARK, CALIF.

Building on the graphical tools embedded in its Wingz spreadsheet, Informix Software, Inc. this week will announce a suite of tools for client/server applications.

Informix-ViewPoint will be marketed as a way to build point-and-click screens for users viewing data stored in Informix-OnLine and Informix-SE relational databases. Companion tools for corporate developers, such as the new Informix-DBA, will allow programmers to fine-tune their client/server database design. That will prevent runaway PC queries that can halt a database engine and will allow users to find data without wading through many database tables.

> Oracle and Informix are replacing their character-based tool sets with graphical user interface client/server tools.

The need for client/server capabilities is clear, longtime Informix users said. "Our users rely on standard reports or on ad hoc queries that are done by MIS," said Hal Lindstrom, a systems analyst at the Seattle Municipal Courts in Seattle who said he did not know about the new tools. "But if it's feasible to give them the ability to do their own queries, we could save time and money."

The Seattle court system has a large Informix-OnLine 4.1 database with more than 7G bytes of data — too large for users to peruse from their character-based terminals, he said. Without the means to present selected "views" of the large database, users launch broad-based queries that bring too much data to their desktop terminals.

Informix is making its tool announcements just a few weeks before its largest database competitor, Oracle Corp., is expected to unveil its graphical tool set for client/server applications on March 15. Both vendors are replacing character-based tool sets with graphical user interface client/server tools. Oracle plans to begin shipping its tools between now and June, while Informix expects to deliver its products beginning sometime in the second quarter, with the balance expected later in the year.

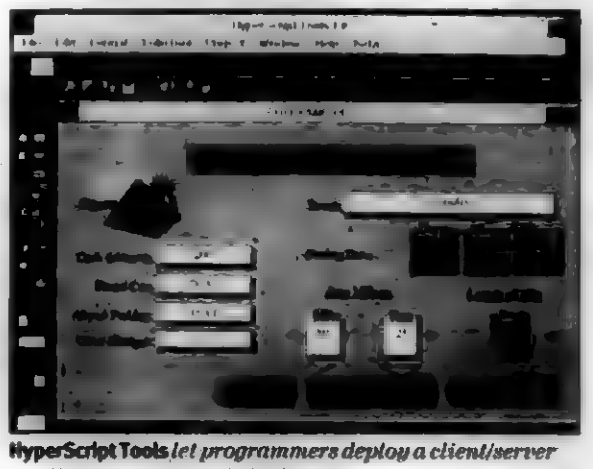
"The database [engine] war is over now that vendors can't differentiate their products much more," explained John Morrell, a software analyst at International Data Corp. in Framingham, Mass. "Now we'll have a tools war."

Into enemy territory

That war could turn hot: Both Informix and Oracle have said they are developing tools to access other vendors' databases. Informix gets 55% of its license revenue from tools sales.

Also debuting this week are Informix-HyperScript Tools, which are based on the object-oriented technology embedded in Wingz. In theory, corporate programmers can create a client/server application once and then deploy it on several platforms: Informix plans to support Microsoft Corp.'s Windows, the Open Software Foundation's OSF/Motif and Apple Computer, Inc.'s Macintosh. A Windows version will be shipped by June, but Informix did not say when the Motif and Macintosh versions would be available.

One beta-test site, Citicorp Mortgage, Inc. in St. Louis, is using several new Informix tools to build a decision-support system for in-house network management. "We're laying the foundation of how you would really enact a distributed network," said Stephen Skinner, a senior applications analyst at the Citicorp banking subsidiary. "Our applications understand what software and hardware are available so we can find the network resources we need."



HyperScript Tools *let programmers deploy a client/server application on several platforms*

Taking off

Informix's Windows-compatible HyperScript software will be available in the second quarter for $2,500; runtime versions will be priced at $400. Informix-DBA will be priced at $2,500 for the Windows version; Windows-compatible ViewPoint will cost at $795. Informix-Wingz 2.0 will be available in the second quarter for $499 per single copy.

Microsoft casts lure for dBase users

By Michael Vizard and Christopher Lindquist
REDMOND, WASH.

Microsoft Corp. last week launched another missive in its campaign to undermine Borland International, Inc.'s installed base of dBase database sites by extending an upgrade program designed to entice dBase users to switch to FoxPro.

Aimed primarily at the retail sales channel, the latest Microsoft program will give dBase users the ability to purchase Version 2.5 of FoxBase for Windows for $149 between now and June 30. The program extends an existing program that allows users of any other PC-based database management system to upgrade to FoxPro for $199.

The Microsoft initiative comes amid reports that Borland's dBase for Windows will not be ready by midyear, as was expected, and will not ship until year's end, a charge that Scotts Valley, Calif.-based Borland refused to confirm or deny. Borland claims it never provided a ship date for the product, though analysts said the company informally promised customers it would be ready by June.

At least one dBase user contacted via CompuServe was disappointed with the news that dBase for Windows was going to be pushed back even further. "Having grown accustomed to numerous Windows 3.1 applications and their WYSIWYG display/print, dropping back to dBase's report writer is genuinely painful," said Matt Nations, a dBase developer.

Nations indicated that his company is still attracted to dBase for several reasons, including familiarity with the environment, the portability of the dBase file and index format and the fact that his company is slated to receive the dBase for Windows compiler free as a dBase IV Version 1.1 customer.

However, new Windows databases are not out of the question as they can read dBase files formats while storing new data in their native formats.

"As matters now stand, we will almost certainly migrate to some other Windows-based relational database before Borland releases dBase for Windows," he said. Microsoft's latest pitch includes a 20-unit license pack offer, a FoxPro evaluation kit and a set of migration utilities.

Borland executives dismissed the latest Microsoft salvo as yet another unsuccessful effort to gain market share.

Borland maintains that in the DOS market, its dBase offering is a stronger product than FoxPro because of its installed base, and the Windows version of FoxPro is only a port of Microsoft's DOS product.

"If you want a state-of-the-art, graphical, event-driven application, you have to program all that stuff in using extensions to the Xbase language that Microsoft has added to FoxPro for Windows," said David Kaplow, director of product marketing at Borland.

Tod Nielsen, Microsoft's group product manager, countered Borland's claims by stating that FoxPro 2.5 for DOS and Windows was hardly a port of the DOS product. He added that users could run their dBase III+ applications under FoxPro "better and faster" than they could under dBase. In addition, Nielsen said FoxPro users could run their old FoxPro code under the new version, something Paradox for Windows users cannot do with their old Paradox applications.

"We don't think it's a bad thing to allow users to run their existing code," Nielsen said.

Nielsen denied that FoxPro users were in any way restricted from using Windows features, noting that FoxPro's screen painter allows developers to create interfaces "visually," while other tools allow access to advanced Windows features such as Object Linking and Embedding.

Timing is crucial

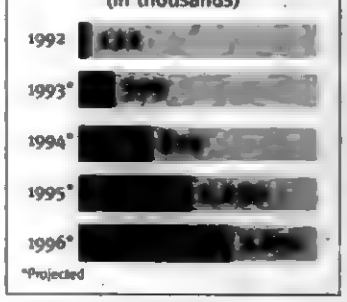
Perhaps the biggest advantage for Microsoft, Nielsen said, is timing. "FoxPro has a Windows product that is at least 12 months ahead of what [Borland is] doing," he said. That should cause some users who need to move applications to Windows to migrate to FoxPro, he said.

Microsoft counters that FoxPro 2.5 is more than 30 times faster than dBase IV 1.5. It said Macmillan Publishing, Inc. and the Bank of Boston have sites that have converted from dBase to FoxPro.

In contrast to the Microsoft approach, Borland is completely rewriting dBase for the Windows environment by customer request, rather than porting dBase IV to Windows.

Open window

The potential growth in the Windows DBMS market will keep vendors vying for a share



Source: Computer Intelligence/Infocorp

dBase add-on

Some dBase users are suggesting using Paradox for Windows graphical tools as a way to access DOS-based dBase data. And if reports from a CompuServe user who claimed to be an insider are true, Borland may be promoting the idea: Its developer's conference may include a session called "Using Paradox for Windows as a dBase Add-On."

REFERENTIAL INTEGRITY COMPARISON

SYBASE

200 LINES OF PROPRIETARY CODE

```
/* Make sure deleted manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted

CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
        key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

<u>These two programs do exactly the same thing</u>: direct the server to enforce business rules to ensure data integrity. Oracle does it in 12 lines of Industry Standard SQL. Sybase requires 200 lines of their vendor proprietary language, Transact-SQL™. If productivity is important to you, call 1-800-633-1071 Ext. 8186.

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News Shorts

What's in a name?

On one level, **Ameritech Corp.**'s restructuring last week was a cosmetic name change. Its five "Bell" telephone companies in Illinois, Indiana, Michigan, Wisconsin and Ohio will now be known as "Ameritech" in marketing literature and on customers' phone bills. But Ameritech executives said the changes go far deeper and are in preparation for the day when the $11 billion regional holding company is permitted to break out of its regulated shackles and offer currently prohibited services such as long distance and cable television.

Early next month, Ameritech will deliver its regulatory reform plan to the Federal Communications Commission and various state regulatory commissions and will propose separating transport services from switching services.

In other news, Ameritech issued a bid for gear it can use to construct an Asynchronous Transfer Mode (ATM) network throughout its region. Ameritech said it plans to begin ATM testing at year's end, and commercial services are slated for early 1994.

ParcPlace adds environments

ParcPlace Systems, Inc. has added support for IBM's OS/2 2.0 and SunSoft, Inc.'s Solaris 2.x to its VisualWorks application development environment. The Smalltalk-based environment, which also supports Microsoft Corp.'s Windows 3.1, Apple Computer, Inc.'s Macintosh and a variety of Unix implementations, can be used to create programs that are portable across supported platforms, according to the Sunnyvale, Calif., company. Available now, the OS/2 and Solaris versions are priced at $2,995 and $4,995, respectively.

Da Vinci, Novell strike deal

Da Vinci Systems Corp., the Raleigh, N.C.-based electronic-mail vendor, and **Novell, Inc.** have announced a strategic development agreement focused on more tightly integrating Da Vinci Email with Novell's upcoming NetWare 4.0 local-area network operating system. Da Vinci will write a version of Email that will use NetWare 4.0's directory services and messaging transport standards. Da Vinci will also rewrite the Da Vinci Assistant, its mail-handling product, as a NetWare Loadable Module, eliminating the need for an external gateway and workstation.

Papows heads Notes group

The ex-presidents' club at **Lotus Development Corp.** gained a new member last week. Jeffrey Papows, former president of Cognos, Inc., signed on as vice president of Lotus' new Notes product division. Papows, who is now the sixth former corporate president at Lotus, will report to June Rokoff and John Landry, who head Lotus' development organization. Other former company presidents now at Lotus are Frank Ingari of Ontos, Inc., Robert Weiler of Interleaf, Inc., Said Mohammadioun of Samna Corp., Ke Branscombe of Inference Corp. and David Connor of Vista Consulting. In addition, Landry, Weiler, Papows and Ingari are alumni of Cullinet Software, Inc.

SCO buys IXI

The Santa Cruz Operation (SCO) in Santa Cruz, Calif., last week announced its acquisition of Cambridge, England-based **IXI Ltd.**, a supplier of desktop windowing software for Unix. The $160 million SCO holds an estimated 70% share of the market for Intel Corp.-based PCs running Unix. IXI's X.desktop interface, based on the Open Software Foundation's Motif, is available on more than a dozen Unix platforms.

News shorts, *page 16*

Michelangelo virus

McAfee antivirus code has bug

By James Daly
SANTA CLARA, CALIF.

Preparing for the March 6 arrival of the Michelangelo virus could be trickier than you think.

Users of a McAfee Associates, Inc. antivirus application designed to ferret out the nefarious Michelangelo virus have discovered that the cure can sometimes be worse than the problem.

A software bug in Version 9.12V100 of McAfee's Clean utility may actually render the hard disk of a user's PC inaccessible, according to both McAfee officials and users who have encountered the problem.

"When a procedure is run to remove the Michelangelo virus on some computer systems, the original master boot record of the hard disk is restored to the wrong location, resulting in a nonaccessible hard drive until repaired," said Aryeh Goretsky, manager of technical support at McAfee. "This problem does not occur consistently, and we are now investigating it."

Michelangelo is a memory-resident infector of disk boot sectors and hard disk partition tables that is scheduled to go off every March 6, the birthday of the Renaissance sculptor, architect and painter. On that date, the virus is supposed to format the hard disks of infected systems by overwriting them with random characters from system memory.

The McAfee bug has some users hopping mad. "The product is worse than the virus itself," said Ray Glath, president of RG Software Systems, Inc. in Scottsdale, Ariz. Glath lost complete access to one hard drive during a McAfee cleanup.

To the rescue

Goretsky said the problem can be corrected in several ways, including grafting a boot sector onto the hard disk from another PC or running a disk repair program.

In the meantime, Goretsky suggested that anyone wishing to remove the Michelangelo virus from a hard disk should use the [GENP] I.D. code with Clean instead. For example, CLEAN C: [GENP] will remove the Michelangelo virus by replacing the infected portion of the master boot record with a clean piece of code from the CLEAN.EXE file.

Bumpy road

The new bug marks the latest bump in an already rocky year for McAfee, which recently went public amid much fanfare. Several weeks ago, a federal judge in Richmond, Va., ordered McAfee to stop distributing its Pro-Scan Version 2.31 and Virucide Version 2.33 applications because they were incorrectly identifying some commercially available software packages as infected with viruses.

The ruling came after software maker Imageline sued McAfee for libel and fraud when the Pro-Scan and Virucide products began coming up with "false positive" readings on Imageline's PicturePak and ValuePak products. Imageline executives said the false readings scared away customers.

Hackers switch sides, offer security package

By James Daly
GLADWYNE, PA.

A pair of computer hackers who cut their teeth breaking into computer systems have changed their ways, saying they have designed a new encryption package that improves data security.

VinCrypt is a $159 application that was developed by some of the nation's top underground systems programmers, said co-developer and distributor Ian Murphy, a security consultant who serves as president of Secure Data Systems, Inc.

The DOS-based package has not been approved by any government agency, nor does Murphy want it to be. He said the government-approved Data Encryption Standard and RSA Data Security, Inc.'s data encryption package are inherently insecure because their basic algorithm has been submitted to the National Security Agency.

a la mode

VinCrypt, which can reportedly encrypt a 60K file in six seconds, employs two encryption methods. The primary mode can be used on any type of file and can handle non-ASCII characters. The second mode, called Vinlynx, is used exclusively for text files and ASCII files.

"We're not going to pass this source code around because we feel that will compromise the security of the data," Murphy said.

Some experts contend, however, that it is impossible to determine VinCrypt's effectiveness if they are not allowed to examine the algorithm.

"How are we going to know how good this package is if we can't test it?" asked Martin Hellman, a cryptographics expert and mathematics professor at Stanford University in Palo Alto, Calif. "It's critically important that an algorithm be made available so we can test it." Murphy noted that he would submit the algorithm for testing.

Murphy said large companies should not be wary of the fact that VinCrypt is a product of hackers. "Security that is truly state of the art often comes from the computer underground," he claimed.

Unfortunately, it is an argument that some users cannot stomach. "It's like letting the hawks guard the hen house," said one microcomputer security manager. "They won't let the government have the algorithm, but maybe there's a back door built in for the hacker community. The risk factor would be too uncomfortable."

Tough sell

Brian Redler, manager of information security at The Equitable in New York, agreed. "As an individual user I might take a look at it, but from a corporatewide standpoint, there's no way I could sell management on a product developed by hackers." He noted, however, that the Apple Computer, Inc. Macintosh was originally developed by two hackers: Steve Jobs and Steve Wozniak.

Others were more curious. "I could see taking a look. There would be no harm in that," said John Murphy, chief of the information and communications management branch of the U.S. Department of Energy in Richland, Wash.

But some users said long-term issues such as service and support would be more of a deciding factor. "I would feel uncomfortable dealing with any new company offering a totally proprietary technology, hacker or not," Redler said. "I want to know that they are going to support the product in six months or a year."

DEC to resell object-oriented 4GL

By Michael Vizard
PHOENIX

Digital Equipment Corp. plans to resell an object-oriented, fourth-generation language (4GL) created by a California start-up that has the potential to significantly advance the development of distributed client/server applications across heterogeneous environments, according to analysts.

Developed by Forte Software, Inc. in Oakland, Calif., the Forte object-oriented application development environment will allow developers to write applications in logical components that can be deployed independently of the physical environment they were intended to run in, Forte President Martin Sprinzen said.

As a result, any process can be partitioned to run on a peer-to-peer basis in any client or server system based on the requirements of the applications, Sprinzen said. And because the application is developed using an object-oriented language independent of the environment, developers can dynamically reconfigure their applications as the physical environment changes, Sprinzen added.

DEC officials refused to comment on the matter.

In addition to the planned deal with DEC, Forte has sales referral agreements with Sequent Computer Systems, Inc. and Apple Computer, Inc., Sprinzen said.

Sprinzen told attendees at the PC Forum here that Forte will go into beta testing this summer on DEC's VMS, the Open Software Foundation's OSF/1 and Microsoft Corp.'s Windows NT servers, with production release of the software scheduled for the end of this year. Forte also supports Windows clients. The entry-level price for Forte will be $75,000.

"It's too early to say if the Forte software works, but they are definitely saying all the right things for developing the next generation of mission-critical client/server applications," said Aaron Zornes, an industry analyst at Meta Group, Inc.

Forte hopes the ability of its 4GL to generate C++ code in a native file format for multiple types of systems will give it a leg up on Cognos, Inc., The ASK Group, Inc.'s Ingres Products Division, Information Builders, Inc. and SmartStar Corp.

Mips boosts NT support

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

With Acer America Corp. signing on as its first customer and Microsoft Corp. giving its blessing, Mips Technologies, Inc. will announce today a special research and development facility to help PC makers build RISC boxes based on Mips' processor technology and capable of running Microsoft's Windows NT.

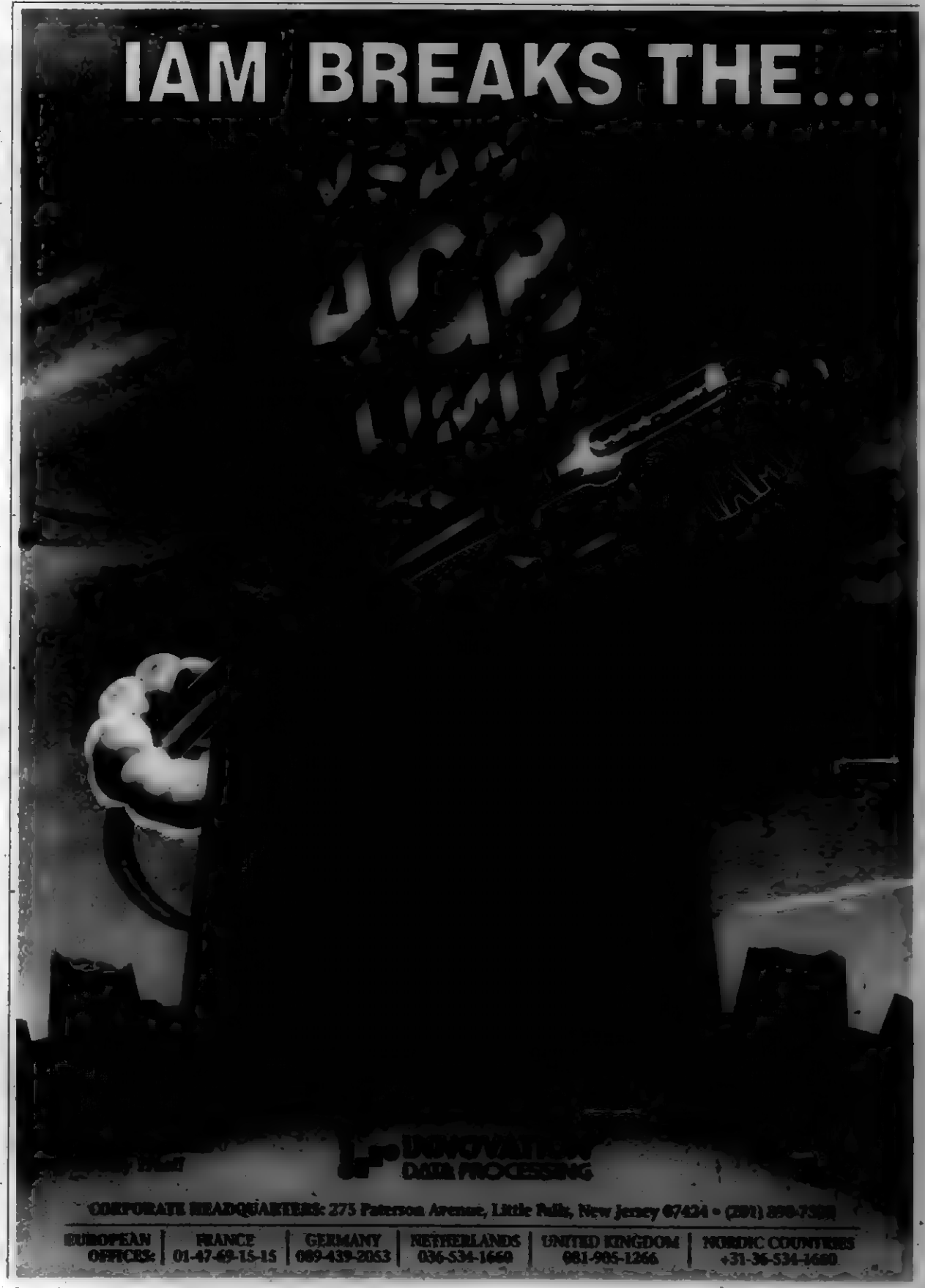
Mips' Open Design Center will provide PC systems designers with prepackaged design kits to integrate Mips' reduced instruction set computing (RISC) processors into their products.

Performance boost

The kits were intended to accelerate product time to market and reduce the costs of developing next-generation PC systems to run Windows NT. Priced from $2,500 to $5,000, the design kits use either the Mips R4000 or R4400 RISC processors, which reportedly deliver roughly twice the price/performance of Intel Corp.'s 66-MHz 1486 and as-yet-undelivered Pentium chips.

Priced under $5,000, the RISC Workstation/EISA design kit includes integrated graphics, networking and multimedia support for the Extended Industry Standard Architecture, or EISA, bus. Other kits will be available later this spring and summer.

The center will also provide support to independent software vendors wishing to port to Windows NT on Mips' RISC platforms. So far, there are only 40 applications committed to NT on Mips.



Vendors switch on ATM links

Cascade, other vendors tighten their LAN-to-WAN connectivity

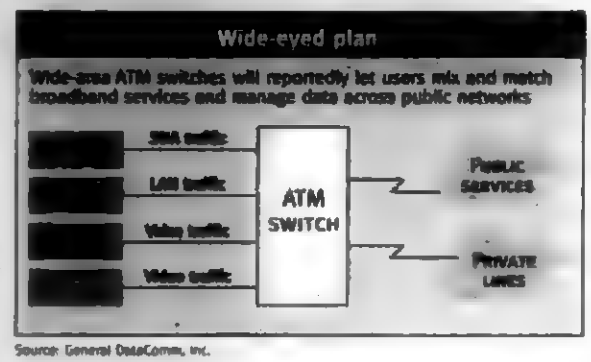
By Lynda Radosevich
WESTFORD, MASS.

Low-end frame-relay switch vendor Cascade Communications Corp. plans to announce today and demonstrate next week at Interop '93 Spring an Asynchronous Transfer Mode (ATM) switch for connecting local-area networks to wide-area networks.

Slated to ship in October, the switch is one of the first ATM local- to wide-area switches to debut, analysts said. StrataCom, Inc. in San Jose, Calif., announced an ATM wide-area switch in January for shipment in the fourth quarter.

Aimed at companies and service providers that want to begin migrating from frame relay to ATM, the switch will let users combine private leased-line and public-packet services and let companies manage data on the public networks, Cascade said.

For example, Internet access provider Performance Systems International, Inc. in Sterling, Va., uses Cascade's frame-relay switches in its internetworking service and plans to deploy the ATM switch when it ships. The switch will give customers speedier and more reliable transmissions without requiring them to install their own ATM equipment, said Marty Schoffstall, vice president and chief technical officer.



Source: General DataComm, Inc.

But "ATM has enormous problems from its addressing to standards, and the Cascade switch is an ATM solution for today" rather than a long-term solution, he said.

While analysts said the move to ATM may make sense for companies that have invested in frame relay, they predicted that initial user demand will be for LAN interconnection rather than local- to wide-area connections.

For example, Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif., forecast that large companies' first major applications of ATM will be in 1994 for LAN interconnection, similar to the interconnection role of Fiber Distributed Data Interface today.

Meanwhile, in an attempt to enter the LAN market, modem and multiplexer vendor General DataComm, Inc. in Middlebury, Conn., said it also will announce an ATM local- to wide-area switch today and demonstrate it at Interop. General DataComm said the ATM switch, developed with British company Netcomm Ltd., will ship in August.

Other companies working on ATM wide-area switches include BBN Communications in Cambridge, Mass., and Ascom Timeplex, Inc. in Woodcliff Lake, N.J.

Network administration

Novell, Gradient ease license management

By Michele Dostert
PROVO, UTAH

Network administrators struggling to track application licenses and use on large NetWare networks will soon get help from software jointly developed by Novell, Inc. and Gradient Technologies in Hudson, Mass.

Called Electronic Software Licensing (ELS) for NetWare, the software will use Gradient's NetLS license server technology to build a NetWare Loadable Module (NLM) that will run on Novell servers. In addition, Novell and Gradient will deliver developer tools that will facilitate the building of license-enabled NetWare applications. For example, developers would be able to build in mechanisms for tracking which and how many users are using applications.

"Users are demanding a simple way to ensure that they are legal in their application licensing," said Jan Newman, vice president of Novell's NetWare Systems Group. He said the upcoming licensing product, as well as Novell's forthcoming Navigator software distribution product, will greatly reduce the time administrators spend managing application software.

The Network Navigator provides configuration and inventory reports, as well as simplified, automatic, scheduled distribution of software and upgrades.

At least one user agreed. "At last! We've desperately needed a product like this for years," said Craig Anderson, information systems manager at Lutheran Brotherhood insurance company in Minneapolis. "When I took over here, I found that we had no inventory of applications or licensing. I have one person working full-time now just on application and license inventory. Any server-based tools that will help us do that we'll jump on. In fact, Novell is pretty late getting around to it," he said.

"Managing applications takes up a fair amount of our time now; depending on price, we would be very interested in a product that could eliminate that burden," agreed Richard Alexander, system operations officer at the Bank of Kuwait in New York.

The Novell/Gradient product works as follows. If a company has a "concurrent use" license, the product can create a waiting list, allowing users to launch the software when a license becomes available. Other uses include node-locked licensing, in which applications can only be accessed from certain desktops; personal licensing; and time-specific licensing. A Secure Multitiered utility lets administrators dispense licenses from an "inventory" in a secure and accountable manner.

"Besides licensing information, ELS will provide currently unavailable information on actual usage of applications," Newman said. "Administrators may discover that they are paying for 100 licenses, but only 10 users access the application." Newman added that by writing custom-built applications to the ELS application programming interfaces, use of internally developed applications can also be tracked.

The ELS NLM is slated to be available from Novell by year's end, with Software Development Kits for application developers slated to ship in the third quarter of 1993. Pricing has not been set.

Enterprise networking

Novell IPX gains backbone clout

Teams up with Wellfleet routers

By Joanie M. Wexler
PROVO, UTAH

Novell, Inc. took a key step last week toward honing its network software for enterprise-wide communications when it tapped Wellfleet Communications, Inc. routers as the first to support protocols that accelerate NetWare performance over wide-area links.

The result is interoperability that will blend Novell's low-end, server-based internetworking software with the high-end Wellfleet routers that many firms use to build their network infrastructures. The efforts signal a partnership in which "Novell provides departmental services and Wellfleet is the backbone supplier," said Kanwal Rekhi, executive vice president of Novell's interoperability systems group.

While Novell would not discuss any other such partnerships, the firm said the Wellfleet deal is not exclusive.

The firms will team up to put two pieces of Novell software on Wellfleet routers by the third quarter to let Novell's IPX protocol use wide-area bandwidth more efficiently, said Paul Severino, Wellfleet's president.

Comparable to any other

The upshot is that Novell/Wellfleet shops can start expecting the same backbone performance with Novell's IPX that they get with other backbone protocols, analysts said. This means IPX could become a contender in the backbone wars raging among Transmission Control Protocol/Internet Protocol (TCP/IP), Systems Network Architecture, Advanced Peer-to-Peer Networking and Open Systems Interconnect.

"IPX to date lacks the standardization and support that IP and other protocols have," said the corporate internetwork manager of a New York brokerage firm running both Wellfleet routers and NetWare. Novell software on Wellfleet routers "will allow us to gain the same capabilities that OSPF" — a routing protocol — "offers in the IP environment," he said.

Wellfleet routers will support Novell's NetWare Link Services Protocol (NLSP) and IPXWAN protocol. NLSP is the "smart" routing protocol for Novell IPX backbones — the counterpart to Open Shortest Path First (OSPF) in the TCP/IP world.

IPXWAN is a set of IPX tweaks Novell has introduced to make its IPX protocol faster across telecommunications lines. These enhancements have included honing IPX so that it requires less frequent acknowledgments and can send larger chunks of data simultaneously.

Wellfleet/Novell shop Northern States Power Co. in Minneapolis is looking for a revved-up IPX because "we're always adding more [NetWare] servers, most of which are at remote locations," said Steve Magnuson, senior communications engineer.

This situation is increasing the need for more efficient IPX bandwidth use in the wide area, he explained.

"The sooner these protocols are on the Wellfleet box, the better," Magnuson said.

Across the board, "router interoperability is still a pipe dream," said Janet Hyland, a Forrester Research, Inc. analyst. She said there are other functions and router vendors in the interoperability equation to consider: "What if Novell and Wellfleet team on SNA encapsulation, but Cisco does it differently? I doubt they'll interoperate."

Similarly, sources close to Wellfleet said Novell is supplying NLSP and IPXWAN source code to the firm — but does not intend to do the same for other router vendors.

Wellfleet estimated that upward of 80% of its customer base includes IPX in their networks.

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IBM

Oil firm powers up Fujitsu super CPU

Schlumberger subsidiary becomes first U.S. group to move over to VPX 220 vector architecture

By Jean S. Bozman
HOUSTON

A petroleum industry service bureau has become the first U.S. user of a Fujitsu Ltd. VPX 220 vector supercomputer, Fujitsu America, Inc. said last week.

Geco-Prakla, a division of Schlumberger Ltd.'s Oilfield Services Group, is leasing the Japanese machine for five years at a cost of $6 million for hardware, software and services. The firm, which will use the VPX 220 for seismic exploration data analysis, is a service bureau for major U.S. and international oil companies.

The San Jose, Calif.-based American Fujitsu subsidiary won the bid against competitors Cray Research, Inc., Convex Computer Corp. and IBM, said Tom Miller, sales vice president at Fujitsu America's supercomputer group. The VPX 220 series list prices range from $2 million to $18 million.

Industry analysts said they believe there are only a few Japanese supercomputers in the U.S., including one NEC Corp. supercomputer at another Houston oil industry consortium.

Jeffry Canin, a technology analyst at Salomon Brothers, Inc. in San Francisco, said the lease is also a vote of confidence for traditional supercomputers at a time when many users are considering alternative architectures, such as massively parallel processors (MPP).

"In the 1980s, the Japanese were perceived to be a threat to Cray," Canin said. "Now the question is how the vendors will fill the hole left by decreasing defense sales and by the challenge of MPP machines and networked workstations."

> Industry analysts said they believe there are only a few Japanese supercomputers in the U.S.

The 1.25 billion floating-point operations per second VPX 220 supercomputer will add 50% more capacity to the Houston site, said Colin Hulme, a Geco-Prakla marketing manager who helped acquire the machine.

The data center here is replacing two older Fujitsu VP 100 supercomputers and one VP 200 machine, which were sold by Amdahl Corp., in which Fujitsu is the largest shareholder, Fujitsu America said. The new computer will run UXP/M, Fujitsu's version of Unix System V Release 4, Hulme said. He said he is not concerned about being the first U.S. user of the VPX 220; Fujitsu said another one is installed in Alberta, Canada. "We had experience with the older Fujitsu machines, and we also have a Fujitsu VP 2000 in Europe," Hulme said.

The fact that the computer was manufactured in Japan was not a factor in the leasing decision, Hulme said, because his own company is transnational.

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BT offers more data access options

By Joanie M. Wexler
SAN JOSE, CALIF.

Reflecting fundamental changes occurring in the way people work and the nature of their computer applications, BT North America, Inc. last week outlined a plan to give its 2 million customers a wider array of choices for accessing its data network.

The initiative, due to begin this year, includes higher access speeds, cheaper local calls that the carrier said could cut on-line network use costs by 30% and wireless links into the network.

In addition, BT has added countrywide uniform 950 calling — the local counterpart to long-distance 800 service — so users will not have to look up a separate 950 access number each time they go to a new location.

The reason for these moves is the growing mobility of users and the response-time-sensitive nature of their applications, explained Jefferey D. Zanardi, manager of network product management at BT.

For example, "the BT network is our only distribution channel, and the sales and service applications we are developing are dependent on higher data-transfer speeds," said Tony Lucente, manager of dealer services at Nissan Motor Corp. U.S.A. in Carson, Calif.

"Most of our access speeds today are below 9.6K bit/sec., so we've been evaluating high-speed alternatives, such as frame relay and satellite" from alternative vendors, he said.

Specifically, BT — which analysts said is catching up to its competitors with some efforts and leaving them in the dust with others (see chart) — plans to offer the following capabilities during the next two to three years:

- An eventual mix of 14.4K bit/sec. and below local dial services in all 520 BT central offices. The effort is scheduled to begin in September.
- Switched 56K bit/sec. access due in July.
- Radio-based wireless access through the RAM Mobile Data radio network in December; users will get one combined RAM/BT bill.
- Wireless cellular connections via CellulPlan II and Cellular Data, Inc. when those services are available. Cellular Data is targeting availability for the second quarter of this year. Service from CellulPlan II, a consortium of McCaw Cellular Communications, Inc., the regional Bell holding companies and IBM, is currently on hold because of dissension from the Bells about AT&T's involvement since its equity purchase in McCaw several months ago.
- Switched T1 (1.5M bit/sec.) and fractional T1 access due in first-quarter 1994.
- Deployment of V.fast (28.8K bit/sec.) modem access speeds planned for six months after a standard is final in early 1994.

"Fundamental changes in demographics and the way employees work is forcing [value-added network] service providers to broaden their spectrum of capabilities," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Montclair, N.J.

Because of this, carriers need "universality, total standards support and various transmission options to solve customers problems today," Briere said.

Variable speed

Value-added network service providers offer dial-up or switched local access to their networks at the following speeds and below:

- **Advantis:** 9.6K, 19.2K, 56K.
- **AT&T:** 9.6K.
- **BT:** 9.6K; 14.4K, 28.8K, 56K (announced).
- **Cable & Wireless:** 9.6K.
- **CompuServe:** 9.6K.
- **GE Information Services:** 9.6K.
- **Graphnet:** 9.6K.
- **Harbinger EDI:** 9.6K, 14.4K.
- **Infonet:** 9.6K
- **MCI:** 9.6K.
- **Sprint:** 9.6K; 14.4K (announced).

Interop '93 focuses on X.400 messaging

By Lynda Radosevich
WASHINGTON, D.C.

Enterprise Solutions Ltd. will announce and demonstrate next week several work-flow additions to its Enterprise Mail X.400 messaging line. The company will be just one of many messaging vendors making X.400 announcements at Interop '93 Spring.

Included in the Enterprise announcement will be DOS and Microsoft Corp. Windows-based calendaring and scheduling add-ons for Enterprise Mail, a module that adds security encryption and an add-on that integrates Enterprise Mail with public bulletin-board systems. The add-ons will cost between $20 and $50 per user, Enterprise said.

The add-ons are attractive to Enterprise Mail user Wal-Mart Stores, Inc. because "we are looking to complement the X.400 and X.500 direction we have already taken with capabilities other than E-mail," said Al Marney, senior systems engineer at Wal-Mart's information systems division in Bentonville, Ark.

Enterprise Mail uses the 1988 Open Systems Interconnect (OSI) X.400 messaging and X.500 directory standards at the desktop. While "X.400 has definitely reached critical mass already as a backbone protocol, it has not yet reached critical mass at the desktop," said Daniel Blum, principal at Rapport Communication in Takoma Park, Md.

Other announcements at Interop include the following:

- **Alisa Systems, Inc.** in Pasadena, Calif., will announce software that connects its Digital Equipment Corp. VAX-to-Macintosh electronic-mail integration and directory service product to X.400 and Simple Mail Transfer Protocol-based messaging. The company will also announce that its directory service will work with Lotus Development Corp.'s CC:Mail, Microsoft's Mail and Novell, Inc.'s Message Handling Service.
- **Retix** in Santa Clara, Calif., will demonstrate an X.400 directory exchange server and other components of its Open Messaging Solution, announced in January and now in beta testing.
- **The Wollongong Group, Inc.** will demonstrate its Pathway line of X.400 messaging and X.500 directory services that were announced last week [CW, Feb. 22].

Separately, **Uniplex Integration Systems, Inc.** in Irving, Texas, announced last week a native X.400 mail system for Unix that works with Windows, X Window System and character terminals. Called OnGo Office, the system includes E-mail, calendaring and scheduling and directory and management services based on OSI standards. The office suite is scheduled to ship March 31 and will cost $70 per user for 100 users.

Travel firm seeks lift

CONTINUED FROM PAGE 1

other airline, car rental and hotel systems, Balog said. However, while Worldspan's goal to build an integrated hospitality reservation system makes sense, an AMR-led consortium failed at such an endeavor last year [CW, Aug. 3, 1992].

Worldspan's shift to a hybrid, partially outsourced communications highway will consolidate currently separate private leased lines running from the company's Atlanta and Kansas City data centers to the nationwide travel agencies. Balog said he anticipates the move will save 10% per site on communications costs.

> "It takes resources to manage sophisticated networks and data processing systems."
> *Robert Braudy*
> *DMW Group*

The two data centers currently serve separate computer reservation systems inherited when the PARS system, previously owned by Trans World Airlines and Northwest Airlines, merged with Delta Airlines's Datas II system two years ago to form Worldspan. However, the company is also in the process of consolidating the centers, a Worldspan spokesman said.

Local leased-line, specialized subnetworks managed by Worldspan will feed into a switched X.25 service owned and operated by AT&T. Aside from the economics and reach, Worldspan also aims to gain initial capabilities such as automated software distribution, remote troubleshooting and expanded electronic mail, Balog said.

AT&T will convert multiple protocols, such as the airline industry-specific 19.2K bit/sec. Airline Link Control protocol and IBM's Synchronous Data Link Control, into X.25.

X.25 is appealing because it is a well-proven, worldwide standard that allows connected nodes to tap into many other information resources running the protocol, such as public database services, said Robert Braudy, a principal at consultancy DMW Group, Inc. in Stamford, Conn.

With its decision to outsource the operation of the switched portion of its new network, Worldspan's plan diverges from AMR's. However, AMR has the resources to run its own X.25 network, called AMRnet, while "Worldspan's financials are not as robust," Braudy said.

While privately held Worldspan would not discuss its financials, its three parent companies collectively lost billions of dollars last year; Delta alone posted a half-billion dollar net loss for fiscal 1993, and TWA is currently in Chapter 11.

"It takes resources to manage sophisticated networks and data processing systems," Braudy observed. "You lose a transaction, you lose money."

AMR, for example, will attempt to beef up revenue by selling bandwidth on its network to other companies and acting as an outsourcer to some of those firms, said Braudy, who is a consultant to AMR. Balog said some outside revenue generation from the Worldspan network is also in the plan. "We intend to offer network services to other companies," he said.

Previously, the Worldspan architecture "tied individual terminals to host systems" — Enterprise System/9000-class mainframes in the data centers — and did not accommodate local-area networking, Balog said. Using X.25, "we're any-to-any, and inter-LAN traffic can be supported."

LANs and client/server computing are pervading the travel information business at American's Sabre operations and United Airlines' Covia, which "a year ago ran private lines," said Jeff Bruckner, managing director at DMW.

He said the distributed scheme is economically more sound because "instead of being on-line with the host, you do your stuff on the LAN, then ship the whole thing to the host."

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Rival vendors tout alternative fiber

By Mark Halper
SAN FRANCISCO

A trio of fierce workstation rivals banded together last week in an effort to persuade IS shops to put more fiber into their computing diets.

Conceding that Fiber Distributed Data Interface (FDDI) technology has been less than pleasing to the information systems palate, executives from Hewlett-Packard Co., IBM and Sun Microsystems, Inc. launched the Fibre Channel Systems Initiative to define a standard for fiber-optic workstation connections.

The executives said early use of the technology will be for CPU-to-mass storage — rather than CPU-to-CPU — communications.

A source inside Sun who asked not to be identified said Sun will offer workstations that use a Fibre Channel interface by year's end. HP said it plans to offer product by the end of this year or early next year and that it will announce an availability date in the first half of this year. IBM demonstrated a product in November and said it typically delivers products 12 to 18 months after showing them.

Quick and easy

Fiber channel backers said fiber channel offers several advantages over FDDI. It will perform 10 times faster than FDDI, in part because of its point-to-point deployment. By comparison, FDDI and other networking technologies work on a "party line" basis in which bandwidth is shared, the backers said. The point-to-point deployment requires simpler communications protocols than do shared-bandwidth networks. Another reducing step in the communications pathway.

Point-to-point reliance

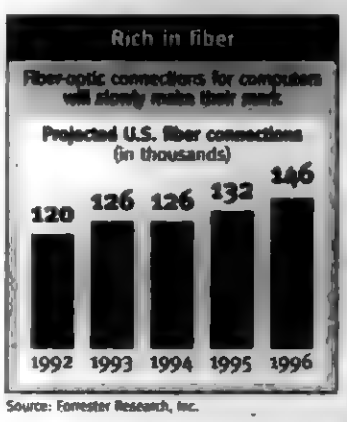
Channel technologies such as Fibre Channel, copper-based High Performance Parallel Interface (Hippi) and others rely on point-to-point connections for their lightning-fast speeds. This is in contrast to the slower, "party-line" nature of today's shared-medium local-area networks.

Guaranteeing uninterrupted bandwidth between two end points renders channel speeds much faster than FDDI, Ethernet, Token Ring or others.

For example, Fibre Channel speeds are specified at up to 1,000M bit/sec. — about 10 times faster than FDDI's 100M bit/sec. maximum rates. Hippi runs at 800M bit/sec. Such speeds become necessary to prevent the network from becoming a bottleneck when linking high-performance computers that have I/O capabilities exceeding the rate at which a LAN, for example, accepts data.

But fiber channel technology's point-to-point trafficking renders it less suitable for distributed networking, compared with multidirectional or shared-bandwidth technologies, said Dataquest, Inc. analyst Marty Palka. He said tools should emerge to improve Fibre Channel's network capabilities.

Fibre Channel will support single link distances of up to 10 km, Fibre Channel executives said. Early versions of the point-to-point fiber channel technology will support up to 64 connections, noted Phil Hester, vice president of systems and technology at IBM's advanced workstations and systems business. Fibre Channel will evolve to support 256 and then more than 1,000 nodes, he added.



Source: Forrester Research, Inc.

The Fibre Channel group broadens efforts already in place between HP and IBM to share Fibre Channel technology [CW, March 16, 1992]. IBM already uses a slower fiber channel technology, called Escon, in its mainframes.

Executives from IBM's workstation group could not say whether the mainframe group plans to adopt products using Fibre Channel technology. The group said it plans to select specific options from a broader list that the American National Standards Institute X3T9.3 committee is drawing up.

HP, IBM and Sun executives said that by joining forces to hammer out a standard, they hope to avoid the disparity that has hampered FDDI.

"We learned from FDDI that just having a specification and putting it out on the market doesn't necessarily work," noted Wim Roelandts, vice president of HP's computer systems organization.

Advances in Ethernet technology have also hurt FDDI, they said, as "fast Ethernet" is expected to soon approach the 100M bit/sec. speeds characteristic of FDDI.

Fibre Channel executives said FDDI's failure to gain momentum prevented prices for interfaces from falling to affordable levels. "You can buy a PC for less than you pay for an FDDI adapter," noted Andreas Bechtolsheim, Sun Microsystems Computer Corp.'s vice president of technology.

Perot pains

CONTINUED FROM PAGE 1

conversion tools midstream and add support for Europcar affiliates not included in the original business plan, which has caused delivery of system parts to slide by two months, said Robert Verasdonck, Europcar's corporate director of information systems. Europcar is Europe's largest car rental agency.

But Perot President Pat Horner said that while Europcar required Perot to redeploy talent, the move did not harm other customers. "I don't know another company around that isn't changing around resources. We're no different."

Europcar's importance to Perot is clear and not just because a banner performance would showcase its distributed computing capabilities and help Perot shed the image of hierarchical computing that users still attach to outsourcers.

The job carries enormous weight for Europcar's future and could demonstrate that Perot can play an integral role in a company's well-being, if not survival.

"If they don't deliver this year, there may not be a Europcar next year," Verasdonck said. The privately held company is believed to have posted a small profit in 1992 after losing $478 million in 1991.

But if Perot focuses exclusively on Europcar, it risks rankling clients such as NationsBank, for which it handles data processing.

Series of problems

Ex-employees and current Perot customers who asked to remain anonymous said the loss of resources to Europcar was the latest development in a series of troubling events that culminated in a Perot computer crash last December. That crash caused the bank to lose track of account balances for four days [CW, Feb. 8].

Earlier, a Perot project to move data from a mainframe to an NCR Corp. Teradata massively parallel system also flared into discord at NationsBank, sources said.

After the December debacle, NationsBank sent Perot a termination notice, which contractually granted a grace period that Perot Chairman Morton Meyerson has used to return staff members from Europcar and salvage the relationship, the sources said.

A NationsBank spokesman said only that the two companies are not parting ways. Horner declined comment on the NationsBank situation.

Amid the disruptions, Perot has managed to sign what appear to be small contracts with Volkswagen of America, Inc. in Auburn Hills, Mich.; Chrysler Corp.'s Pentastar Services, Inc. rental car operations, which own Snappy Car Rental, Dollar Rent A Car, Inc. and Thrifty Rent-A-Car System, Inc.; and Cadillac Plastic and Chemical Co. in Troy, Mich., a Detroit-based plastics company.

But industry watchers said the NationsBank episode has served as a wake-up call cautioning Perot to get its house in order.

Horner said the schedule at Robert Plan Insurance "was stretched out a little bit" because the insurer experienced significant change during the course of the contract.

ICH, which was one of Perot's earliest customers, is now about half the $12 billion asset company it was when the two parties first agreed on terms, Horner said. Perot has been working hard to help ICH adapt to changes, he added.

Another contract, with scandal-ridden First American Bankshares in Washington, D.C., has had other problems. Sources said the contract has generated marginal revenue at best because the federal government is selling off the bank, which was once secretly controlled by Bank of Credit and Commerce International (BCCI). Perot is retaining only some processing assignments from buyers.

Horner acknowledged that First American had not generated the amount of revenue that Perot had hoped for. The BCCI issue aside, Perot knew it was taking chances on a troubled financial institution.

On the prowl for talent

The departure last fall of former Frito-Lay, Inc. Chief Information Officer Charles Feld may have temporarily stung Perot Systems, but it has not prevented the company from attracting other high-profile talent.

Recent Perot executive appointments include the following:

•Gordon Stevenson, former head of the now-defunct Intrico travel industry consortium. He will oversee the company's push into one of outsourcing's most coveted markets: the travel and leisure industry.

•Change management experts Marc Gerstein and Richard Pascale, who are expected to help clients adjust to shifts in technology as well as to changes within their own corporate fabric, such as company shrinkage and business refocusing.

Likewise, the company has formed an advisory board consisting of Gerstein and Pascale, industry analyst Esther Dyson, Dataquest, Inc. President Judith Hamilton, MIT information technology professor Thomas Malone and investor Steven Brooks.

Perot has also added board members from outside Perot circles, including GTE Corp. Vice Chairman John Segall; former Defense Advanced Research Projects Agency Chief Craig Fields, who now heads Microelectronics and Computer Technology Corp. in Austin, Texas; and Ray Golden, a partner in New York investment firm James D. Wolfensohn, Inc.

Feld left Perot last September, less than two months after he was hired to win an outsourcing deal with troubled transportation force Burlington Northern, Inc. After leaving Perot, Feld landed his own consulting contract to oversee a technology overhaul at Burlington Northern [CW, Sept. 28].

— Mark Halper

NCR developing video-based ATMs

By Thomas Hoffman
NEW YORK

NCR Corp. is developing automated teller machines (ATM) equipped with two-way audio/video capabilities designed to allow bank customers at remote terminals to videoconference with bank employees.

While industry analysts applaud the systems for their technical merit and user-friendliness, reaction is decidedly mixed on how the interactive ATMs will be received by bank information systems executives and external customers.

"I think there will be some applications for these machines, particularly specialized services [such as discount brokerage services]," said James Moore, president of Mentis Corp., an Eden, Md., market research firm that specializes in banking technology.

Two-way, audio/video-equipped ATMs will let bank customers at remote terminals videoconference with bank employees.

The video-equipped ATMs may eventually help encourage consumers to use ATMs for more than only cash transactions, said Diogo Teixeira, a partner at Ernst & Young in Boston.

The next-generation ATMs and self-service terminals within branches would provide customers with expanded services such as mortgage loan information. Customers using the ATMs solely for cash withdrawals would not videoconference with bank employees unless requested using a Touch-Tone keypad.

Huntington Banks in Columbus, Ohio, has expressed a strong interest in the technology. The bank is currently piloting videoconferencing on NCR self-service terminals at its branches, and executives there see a future for their use.

"It's not always possible to have the right bank expert at the location and at the time a customer needs them. Videoconferencing can bridge the distance and bring the banker and customer together, at the customer's convenience," said Bill Randle, director of marketing and strategic planning at Huntington Bancshares, Inc., the parent company of Huntington Banks.

However, Moore voiced concern that the engines used to run interactive video in ATMs — not to mention communications costs and bandwidth problems associated with them — are more expensive than typical ATMs, which are priced at about $15,000 per unit.

An NCR executive who requested anonymity said the vendor is working on alleviating those concerns. At present, he said, the cost of the systems is $5,000 to $6,000 more than standard ATMs, but NCR is hoping to reduce that differential to $1,000 by year's end, when the company plans to begin shipping the new ATMs.

That effort will be aided by new compression/decompression technology being developed by NCR, AT&T and Bell Laboratories. In addition, a new AT&T-based computer chip called Codec will enable ATMs and self-service stations to transmit audio and video.

Phillip Johnston, a senior marketing consultant at NCR, said the proliferation of Integrated Services Digital Networks and fiber-optic networks throughout the U.S. will eventually enable banks to exploit the use of these ATMs by developing "centers of expertise." Johnston said banks would be able to deploy product services experts at central locations to interact with customers using the ATMs at different sites.

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News Shorts

New Clipper sets sail

Computer Associates International, Inc. has begun shipping CA-Clipper 5.2, an upgrade to its Xbase application development system. The new version features general performance improvements and new links with other Xbase products. Discounts are also available for users of other Xbase systems such as **Microsoft Corp.**'s FoxPro and **Borland International, Inc.**'s dBase. A new version of CA-Clipper Tools, featuring a new **Novell, Inc.** CA-Clipper 5.2, costs $795, and the new CA-Clipper Tools costs $695, although promotional prices are available.

IDAPI completes draft

The vendor consortium that is championing the Integrated Database Application Programming Interface (IDAPI) for client/server connectivity said it has completed a working draft of the specification. The draft was delivered in Austin, Texas, last week to the more than 30 software vendors that have signed up to support IDAPI. IDAPI founder **Borland** plans to deliver a preliminary developer's kit to IDAPI consortium members this summer.

Notebooks to get cellular modem

What its vendors said is the first Personal Computer Memory Card International Association-compliant cellular modem emerged last week for notebook computer/cellular phone users from **AT&T Paradyne** and **Nokia Mobile Phones**. A $699 package with a software interface for Nokia phones and AT&T Paradyne's credit-card-size modem is slated to go on the market in May.

Next-day PCs

PC Connection, Inc. in Marlow, N.H., is about to take the PC mail-order business to its next level of abstraction. The company has started an overnight delivery service for custom-configured PCs, including both peripheral and application software installation. The company said orders received by 10 p.m. will be delivered by noon the next day.

SHORT TAKES **NCR Corp.** in Dayton, Ohio, has created two new units, the Professional Services Division and the Systems Support Division, to expand and consolidate the various consulting and systems integration services within its U.S. group.... In related news, NCR expanded its StarSentry network and systems management package to include centralized management of Unix-based systems from **Hewlett-Packard Co.**, **IBM** and **Unisys Corp.** StarSentry already manages NCR, **AT&T** and **Sun Microsystems, Inc.** systems.... **NCR Microelectronics Products Division** in Colorado Springs announced last week an $81 million expansion that will more than double its production capacity at its Colorado Springs semiconductor plant by the third quarter of 1994.... **Intersolv, Inc.** announced a new version of its PVCS configuration management software, PVCS 5.1, featuring a new graphical user interface, project management to standardize development efforts and logical mapping file directories.... **Digital Equipment Corp.** said it will close its hardware manufacturing facility in Galway, Ireland, sometime in the next year, eliminating 780 jobs, although the company's European software development and distribution headquarters will remain in Galway.... **Willard H. Scherrer Jr.**, senior vice president of purchasing at **Consolidated Freightways, Inc.**, has been named senior vice president for transportation systems at **Emery Worldwide**, the Palo Alto, Calif., air freight unit of Consolidated.... **Unisys** declared a dividend of $1.40 per share on Unisys Series A cumulative preferred stock.

Software assets

DEC to help users track licenses

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. is expected this week to announce a plan to work with other vendors of software access control technology to ease software management across multivendor systems, according to DEC officials.

Managing software licenses and assets across the enterprise is an enormous headache for users, particularly at large sites (see story page 1).

"It's a problem on any platform — on PCs, on servers, on hosts — so it would be nice to have a single solution," said Stanley Rose, vice president of technical architecture at Bankers Trust Co. in New York.

"The issue for virtually every major corporation in the U.S. and globally is to know what you have, what version [and] be able to [access], track and report on it by product and by vendor, and that is a tall order," said Gene Friedman, vice president of applied technology at Chase Manhattan Bank NA.

DEC is working with other vendors, including Gradient Technologies, Inc. in Hudson, Mass., and Highland Software, to develop products that will let users capture license information in disparate databases and enable managers to manage software across the enterprise, according to Mary Welch, DEC marketing manager for corporate business practices.

Gradient and Highland will seek to extend a License Service Application Programming interface, established last year by a group of 21 vendors.

DEC has been ahead of the curve in adopting new software licensing alternatives.

A joint proposal from Hewlett-Packard Co. and Gradient, which included Gradient's NetLS, was chosen last year by the Open Software Foundation (OSF) as the software licensing portion for the Distributed Management Environment (DME). NetLS is becoming a de facto standard, analysts said. Vendors who have adopted NetLS include HP, The Santa Cruz Operation and Novell, Inc. (see story page 8).

DEC is expected to release its own software access control product, code-named Omni, probably by summer, according to DEC sources. It will be compatible with the OSF's DME scheme.

But the market focus, according to DEC, has so far been primarily on developers, enabling them to protect their intellectual property rights and offer more flexible licensing options.

Users need their tools to have consistent access to the products they purchase.

DEC's Omni license management technology will provide a license management call in the applications, a license key that contains information about the license and a license manager that manages the information. Developers will be able to use the same key for an application across different platforms. Users will be able to establish parameters for their license database, letting them access the software across local- or wide-area networks.

DEC will also offer a set of applications and reporting tools to be used with the license management software, giving users the ability to understand what they have, where it is and how it is being used for release later this year.

Len Halio, president of Gradient, said his company will also offer end-user applications for software asset management by year end.

Citicorp

CONTINUED FROM PAGE 1

The initiative is expected to help Citicorp reduce by up to 25% the number of redundant mainframe software packages that it uses throughout its operations, according to Giordano.

As a result, he said, the bank expects to reduce its annual mainframe software maintenance fees by 25%.

"What we've found in the Citicorp environment is that we've paid the same bill many times. As we go through this [data center] consolidation, we are being asked to reduce the number of vendors we work with," Giordano said.

While Citicorp has reduced its data center population by two-thirds, that does not necessarily mean it has reduced software use by that amount.

By moving from a large population of older mainframes to newer, more powerful mainframes with single, powerful CPUs, Citicorp might actually be using fewer software packages.

Under the program, Citicorp is identifying every software package that its various locations use. Furthermore, the bank has gathered all its software vendors' contracts to identify where redundant use of software can be eliminated and/or renegotiate vendor contracts wherever cost benefits can be attained.

For example, Giordano said, in one Citicorp location, the bank was able to identify 1,450 software contracts with 275 vendors. Locating and consolidating all of these contracts "was the hardest task to do. It took me six months in one location to gather all this information," he said.

Agreements afoot

Last October, Citicorp and CA announced a flat-fee, enterprisewide software agreement encompassing the bank's worldwide IS operations [CW, Oct. 19].

Last week, Giordano disclosed that effective Jan. 1, Citicorp began a similar flat-fee contract for all the domestic IBM MVS, VSE and VM-based software packages it uses from Legent Corp. Earlier this month, Legent formally introduced a set of flexible licensing options for its customers.

In addition, Citicorp is renegotiating existing licensing agreements with other mainframe software vendors, including IBM, Giordano said. While he declined to name the other vendors or identify the status of these negotiations, Giordano hinted that IBM may finally loosen its grip on the tiered pricing model it established as a de facto industry practice in the early 1980s.

"What we'd like to do with IBM is have them work with us on our pricing model," Giordano said. IBM has publicly stated that it has no corporate plan to break the tiered pricing model.

However, an industry observer close to IBM who requested anonymity said Big Blue has already worked with a few of its largest customers on new enterprisewide licensing schemes. Sources close to IBM said they expect it to introduce a comprehensive alternative licensing program sometime early next year.

Terrence Quinn, managing director at Furman-Selz, Inc., a New York brokerage house, said he believes CA's introduction of alternative pricing options last April has influenced mainframe customers to demand flexible licensing terms.

"When the word gets out, customers will push for these alternative pricing agreements," Quinn said.

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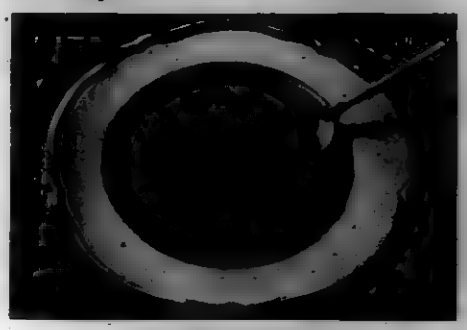

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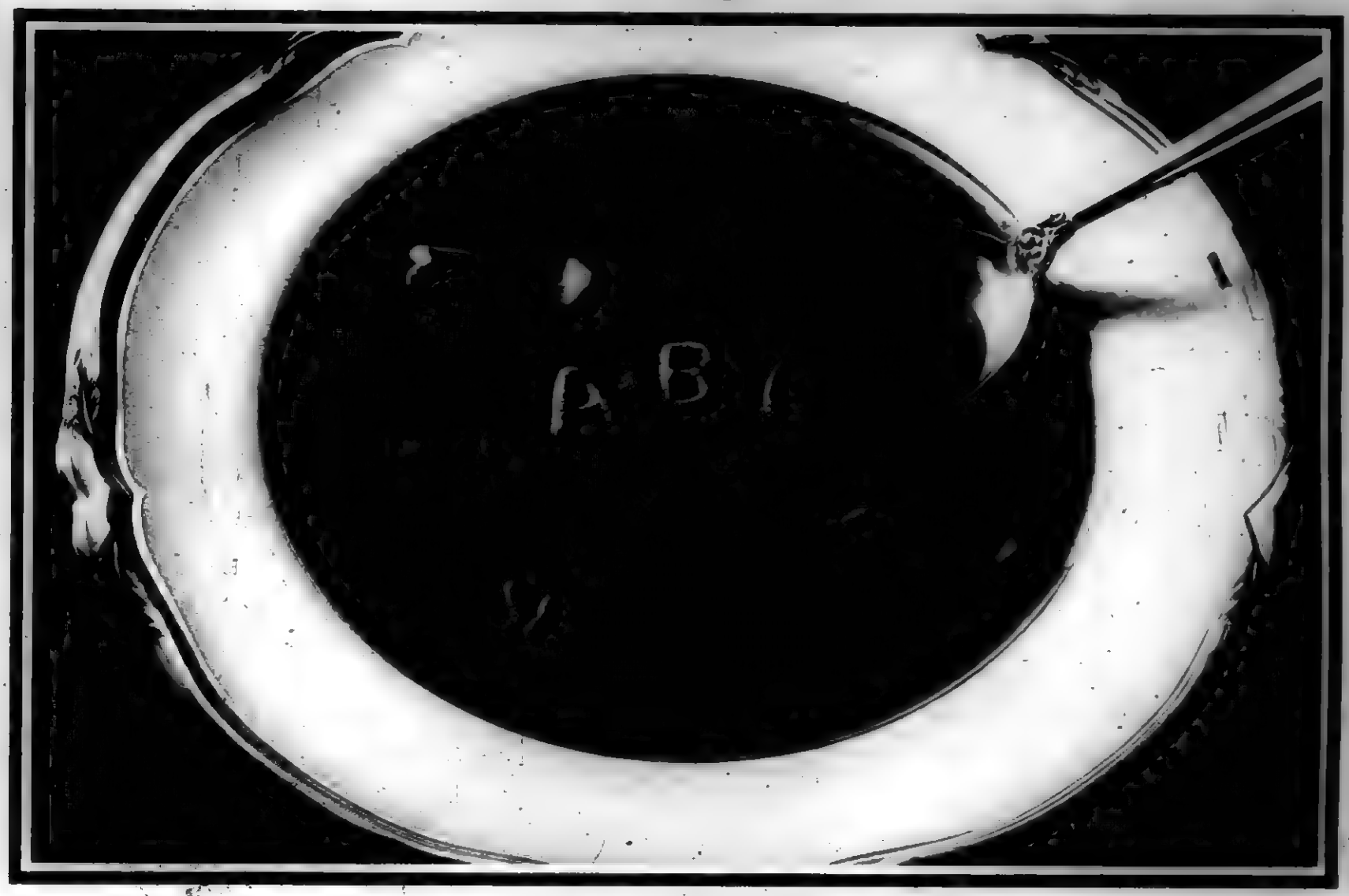

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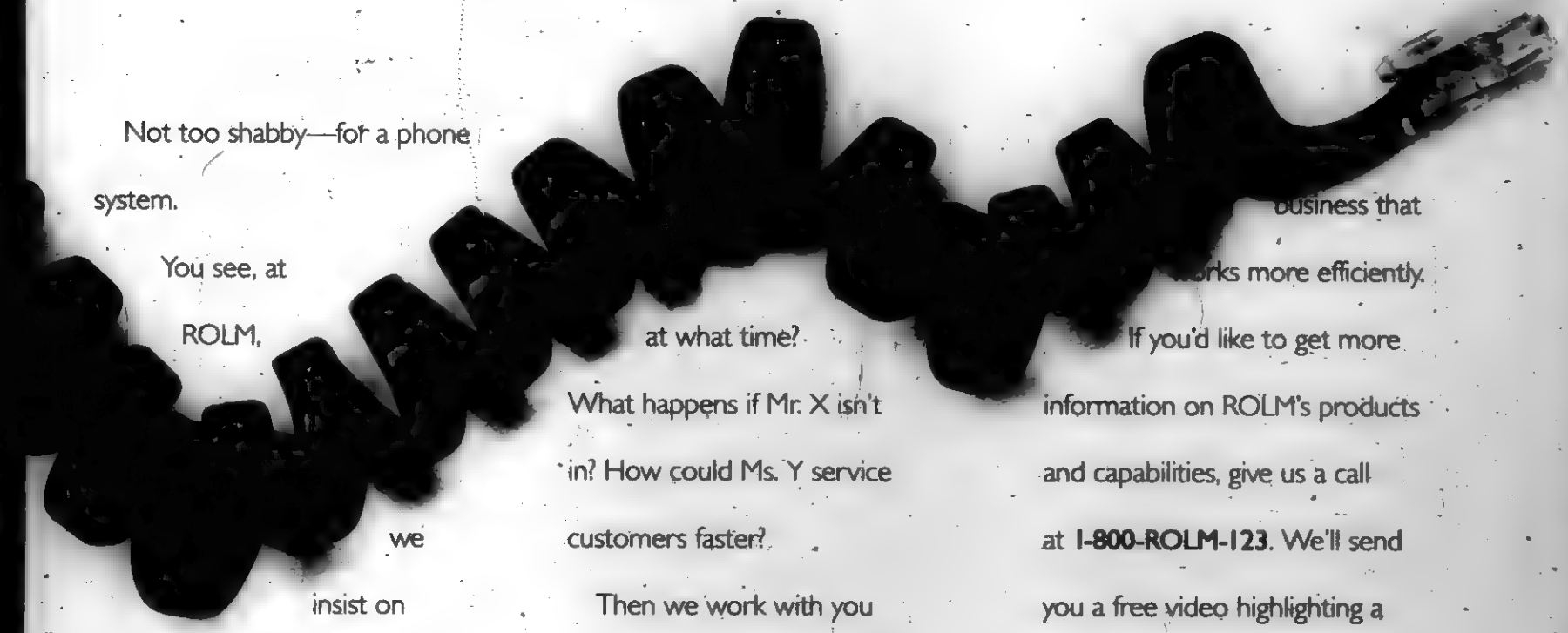

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Dell withdraws $200M stock offering

Decline in share price, soft PC maker market precipitate decision

By Alan Alper
AUSTIN, TEXAS

Dell Computer Corp. last week canceled a long-awaited 4 million-share stock offering, citing unfavorable market conditions.

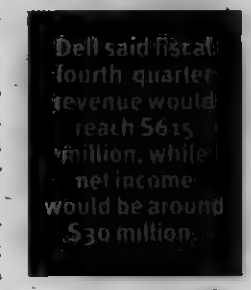
Late last year, Dell had said it was planning to proceed with the potential $200 million offering, despite the brouhaha following allegations that the PC maker had masked losses on foreign currency trades [CW, Dec. 7, 1992].

A company spokeswoman said an ongoing Securities and Exchange Commission audit of Dell's currency trading had no bearing on the decision to withdraw the offering. The decline in the company's share price — from a high of $50 last December to $36 before the offering was tabled — was a major factor in the decision, she said. The stock tumbled 17%, to $30, after Dell withdrew the offering.

"Since we have cash available, we did not feel we'd have to complete the offering at a lower price," she said, noting that declining interest rates make other financing avenues more attractive at this time and that the company has, if needed, a $200 million credit line.

Dell may need access to additional capital if it is to reach its revenue growth target of 70% in the current fiscal year. If it is met, Dell would be a $3.5 billion company this time next year, financial analysts said.

"Dell has a good balance sheet, so they could go out and get more financing if need be," noted Antoine Tristani, an analyst at Southcoast Capital Corp. in Austin. "If they grow 70%, that would eat up $100 million in cash."



Tristani said Dell was wise to pull the stock offering, given concerns over the ongoing PC price wars — which have cut deeply into profit margins — and the recent battering taken by high-technology stocks.

If Dell hits its growth objectives, the stock should rebound accordingly, Tristani pointed out. "They would then have the ability to revisit a common stock offering in six or nine months," he explained.

While a 70% revenue increase appears ambitious, Dell's growth has exceeded that figure every quarter during the last year, the Dell spokeswoman said. And Dell sees no signs of its growth abating.

The company intends to fuel growth through geographic diversification in Asia and Latin America and continued expansion into the home office and consumer segments. Dell also expects to expand its notebook offerings later this year and begin offering "Dellware" services — bundles of preinstalled software and peripherals — in Europe.

Dell's return to its high-flying stock status may take more than revenue growth. "The PC market continues to be difficult and unpredictable, and people aren't interested in paying very high premiums for PC stocks given the current environment," said Eric Zimits, an analyst at Volpe, Welty & Co. in San Francisco.

Product research coordinator Derek Slater contributed to this story.

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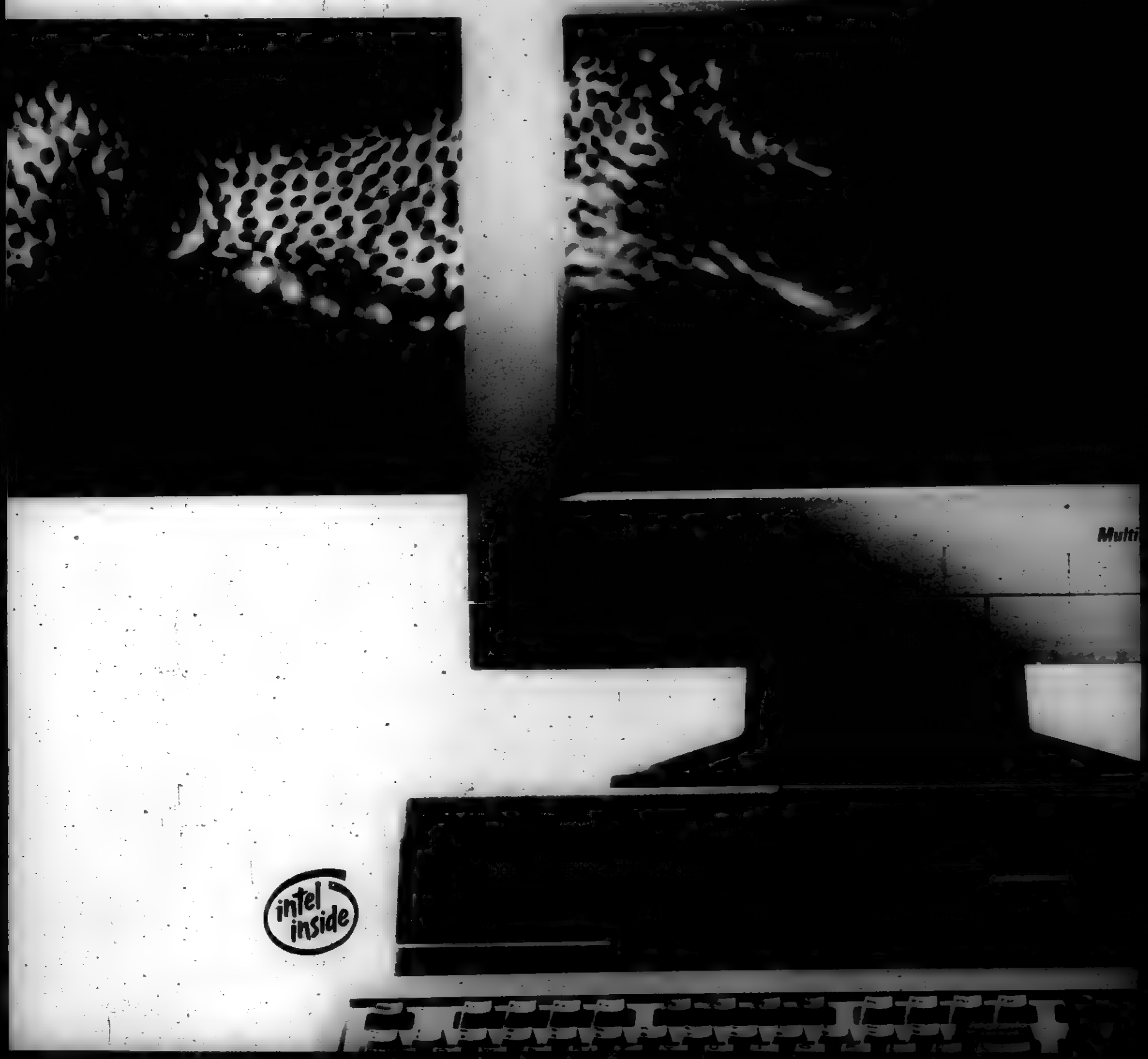

Kash n' Karry shops in new tech

CONTINUED FROM PAGE 1

will emerge the winner. The goal of Store 2000 is to extend Kash n' Karry's new information architecture out to the stores, providing a seamless information flow from the cashier level to the chief executive officer.

"We're more than just your typical grocery store," said Jim Stikeleather, director of systems development at Kash n' Karry. "We got as far as we did (with object technology) because we basically jumped off the bridge and started doing it."

Object of desire

A user survey of 1,000 companies ranked the benefits of object-oriented technology and indicated a threefold gain in productivity

(Listed in order of importance)

1. Improved productivity
2. Flexibility
3. Reuse of software
4. Reduced maintenance costs
5. Good for interfaces
6. Modeling capability

Source: Ovum Ltd.

Even more unusual is that Kash n' Karry used public domain or freely distributed software, available on the Internet, to build its new object-oriented language, database and tools. The company turned to academic institutions instead of vendors for advice and help along the way, in part because there was so little commercially available software to choose from two years ago.

"Commercial software lags behind public domain software in capability and adaptability, and that's still true today," Stikeleather said. "We had the money to buy CASE tools, but they tend to dictate their view of an object and [were] not what we wanted. Also, a lot of object-oriented tools are not multivendor-oriented."

In fact, the more his development team explored available products, the more convinced they became that creating their own tool sets would best serve the company's plans.

"Most people really don't understand what we're doing because it's so far [out] in left field from data processing," Stikeleather said. "But they recognize the results."

Among those results is an object-oriented warehousing system in production today at Kash n' Karry's Returns Processing Center (RPC), which Stikeleather's 17-person staff built in four months. The new software system, which processes up to 50,000 transactions a day through a Sun Microsystems, Inc. SPARCstation 2 workstation, led to a 35% productivity savings and eliminated the $90,000 annual bill for the third-party vendor system it replaced.

Another result is a promotional pricing system, called PromoMan, that 60 store buyers are now using. It was built in six weeks using Kash n' Karry's object technology, after two mainframe programmers abandoned a two-year effort to create the same sort of application.

"PromoMan has allowed me to do things like pull information from disparate databases throughout the organization," said Elnar Seadler, director of marketing at Kash n' Karry. "Instead of my people being scared to have a computer on their desk, they're demanding to have one."

Closer look

Dawn Boocham, a former mainframe programmer who made the jump to Stikeleather's development team, said the group is in a constant "research mode" as it explores available tools and software technologies. "If something looks good on the PC or on the mainframe, we should look at it," she said. "We have to be able to pick up any language or operating system and pull out things we could use."

When Stikeleather describes the reaction vendors and visitors have once they see his object technology in action, he paraphrases science fiction author Arthur C. Clarke's observation: "Any sufficiently advanced technology appears to be magic."

"MIS executives see the results we've gotten, and they want their people to learn the magic," he said. Some of his colleagues will hear Kash n' Karry's story firsthand next week in Tucson, Ariz., when Stikeleather addresses a chief information officer conference.

One issue he will address is the organizational upheaval that often accompanies dramatic shifts in the way a company develops new systems. When Stikeleather began Kash n' Karry's object quest two years ago, there was a 70% staff turnover in the first six months as programmers decided whether to be part of this new "information architecture."

Programmers are rewarded for "wiring together" objects, not for writing code. One of their new credos is: "If you write a piece of code more than once, put it in a tool."

"What they're doing is really bleeding-edge. They've done their own language, built their own tools and database and written their own messaging and distribution system," said Chris Stone, president of the Framingham, Mass.-based Object Management Group (OMG), an industry standards consortium.

Last year, Kash n' Karry's RPC won an OMG award for the best implementation of a distributed application using object-oriented tools.

Stone stressed that object technology has matured greatly in the past year or so and that getting "locked into somebody else's data model" is less of a concern today.

"Jim took a risk on using new, unproven technologies, and he won," Stone said. "MIS executives should always investigate options [in public domain software], but they have to be prepared for the support and a lot of development work."

To answer the usual vendor response about free software — "you get what you pay for" — Stikeleather insisted that support problems are often exaggerated. Calling a software vendor's help desk, he noted, may take several hours to a few days to get the right answer. But broadcasting a message for help on the Internet — directed to the special interest group closest to the software — often delivers a highly specific, detailed answer.

Kash n' Karry Food Stores
Tampa, Fla.

Retail grocery chain with 115 stores throughout Florida; carries 60,000 items.

Employs 12,000 and generates annual sales of $1.2 billion.

'New Information Architecture' staff of 17, with $1.2 million annual budget. All new development adhering to industry standards, including X/Open Co.'s X/Open Portability Guide (XPG3 & 4), MIT's X11R4 windowing standard and ANSI C++.

Development systems: 30 Sun Microsystems, Inc. SPARCstations and servers.

Current hardware platforms: IBM Enterprise System/9000 mainframe, with 200 X Window System terminals. Apple Computer, Inc. Macintoshes in advertising.

Innovation n' adaptability

Kash n' Karry's Unix-based Information Architecture is a five-year effort that will culminate in 1996 with a re-engineered company running on object-oriented, standards-based information systems.

"People still think of an information system in terms of a database, but this is much bigger and overarching," said Jim Stikeleather, director of systems development at Kash n' Karry. "The new architecture will include every piece and type of information, and all the facilities any employee would need to view and manipulate the information."

One key goal is to eliminate the IS department from the "business-critical paths" because users will be able to assemble their own applications like Lego blocks, selecting objects from the company's home-built ObjectManager repository database and establishing their own rules of behavior for the objects.

Critical business functions such as payroll and accounting will remain on an IBM Enterprise System/9000 mainframe for the next few years, but mainframe-based applications will no longer drive the company, he added.

During the past 18 months, the programmers — now renamed "information engineers" — created their own object-oriented language, tools and database with freely available software, including NASA Clips, a database inference engine; Stanford University's Interviews, a presentation engine; and Carnegie Mellon University's Garnet, a LISP-based programming language for prototyping.

The core of the ObjectManager repository is an Informix Corp. relational database management system. An additional 3,500 lines of C++ and SQL code, added by Kash n' Karry developers, isolates object-oriented programming from specifics of the Informix database.

—Maryfran Johnson

Microsoft to link Windows, PBXs

By Elizabeth Heichler
LONDON

Microsoft Corp. has announced that it plans to extend Windows to office telephone systems with the release of a new application programming interface (API) to Windows. The interface will eventually let users integrate the functions of their private branch exchange (PBX) systems and telephones into Windows-based local-area networks.

A prototype application that uses the new API to let a Windows-based PC control an office PBX has already been developed in Germany and could be demonstrated at CeBIT '93 in Hannover, Germany, next month, according to Christoph Marloh, senior consultant at Microsoft Consulting Services in Germany.

The application was developed by German firm CSB-System Software Entwicklung & Unternehmensberatung GmbH with input from one of Germany's largest retailers, Kaufhof Holding AG. CSB is helping Kaufhof replace its telephone system with desktop PCs and Windows, Marloh said.

Just as calculator icons in Windows have replaced the electronic devices that used to sit on many desks, so a telephone icon on the Windows desktop will replace the familiar handset for Kaufhof's users, said Ralf-Rainer West, chief information officer at Kaufhof.

The company is providing users with audio-equipped Windows-based PCs from which users can simply select a telephone icon to bring up an application that dials and manages phone calls for them. The PCs are connected by a Novell, Inc. LAN gateway to its PBX.

Heichler is the IDG News Service's correspondent in London.

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Tech Talk

PC telepathy?

Could a computer be controlled one day by thought alone? Fujitsu Ltd. is looking into this question with research that seeks to detect so-called "silent speech," a mental state that occurs just before speaking. Test subjects wearing a specialized array of electrodes on their heads were seated before two light-emitting diodes, one red and one green. While keeping still, they were instructed to "think" only when one of the two colors blinked. According to initial test results released last October, brain waves were detected at the back of the head 0.3 seconds after the subject had seen the designated light and at .42 seconds in the front of the brain, where the cognitive and action centers are located. Future tests will do away with electrodes.

On display

R2-D2, the diminutive *Star Wars* robot, was inducted into the newest gallery at The Computer Museum in Boston last month. Stocked with 25 robots and almost 30 interactive computer stations, "Robots & Other Smart Machines" features such famous computer programs as Eliza, the "nondirective" psychotherapist, and SimLife, the artificial ecosystem. The permanent gallery is supported by the American Association for Artificial Intelligence and Digital Equipment Corp., among others.

Leading role

A role for Integrated Services Digital Network (ISDN) in multimedia? Last month at Communication Networks Conference and Exposition '93 in Washington, D.C., Bellcore demonstrated MediaCom, an icon-based software package that uses an ISDN telephone line to carry voice, fax and electronic mail, as well as to set up conference calls with up to six people. Eventually, MediaCom will be able to handle full-motion video, predicted Bellcore, which is licensing the system.

Light shines on optical

University shows first system using light to process, store data

By Ellis Booker

OPTICAL COMPUTING TOOK a historic step forward last month when researchers at the University of Colorado announced the completion of a "proof-of-principle" machine that both processes information and stores data using light instead of electricity.

The university's Optoelectronic Computing Systems Center (OCSC) heralded its system — a desk-size device crammed with fiber-optic lines and optical switches — as the first general-purpose optical computer.

Two years ago, AT&T Bell Laboratories demonstrated a simple optical processor, but that system used an external electronic computer for program control. The breakthrough in the OCSC device is that data is never stored physically but is always "on the fly" in the form of light pulses (see story below).

Harry Jordan, a professor of electrical and computer engineering at the University of Colorado at Boulder, who along with Vincent P. Heuring heads up development at the OCSC, said the advantages of fully optical computers are twofold.

Why it's better

First, unlike light photons, which travel at the unvarying speed of 186,000 mile/sec., the speed of an electron is compromised by capacitance and inductance, which vary according to the material at hand. The practical speed of an electronic signal on a chip is roughly one-fifth the speed of light, Jordan noted, adding, "And when you go off the chip into a wire, things slow down even more."

A second advantage is that this kind of computer, in theory, can interconnect a virtually limitless number of optical switches in "free space."

The OCSC's optical computer *uses only a single channel*

Such an architecture maps to the current interest in massive parallelism for some kinds of computations.

AT&T's system used "free space" interconnection between optical switches and had between 16 and 32 parallel channels. The current OCSC device has only a single channel because it connects processors physically with fiber optics.

"We're already interconnecting cabinets with fibers. Soon we'll be connecting boards with optics and then chips," said Jordan, who is bullish on the application of optics in general-purpose computing.

Thomas Cathey, director at the OCSC, goes so far as to predict that optical computers will become a commercial reality in the next several decades. Like Jordan, Cathey said he feels that the shift to optical will occur gradually.

Formed in 1987, the OCSC is funded by the National Science Foundation (NSF), the Colorado Advanced Technology Institute and industrial affiliates. It is the only one of the 18 NSF Engineering Research Centers devoted to optoelectronic computing.

Quantum leap

Paralleling advances in optical computing are developments in quantum particle physics that could lead to radically faster electronic circuits.

Yale University electrical engineer Mark Reed has proposed gating devices that could force the electrons in an electrical circuit to march single file through a wire. These devices would contain a "quantum dot" — an infinitesimally small box that can capture and hold a single electron.

Reed, who invented the first quantum dot and whose lab has already succeeded in building semiconductors just three atoms wide, speculates that with the addition of gates, quantum dots could be made to start and stop a flow of electrons. Millions or even billions of these boxes might then be linked — using technologies not yet explored — and made into a calculating engine: a computer.

What do optical computers do?

Five years in the making, the University of Colorado at Boulder's bit-serial optical computer is about the size of a large desk and contains lasers, electronic switches and optical fibers arranged in layers.

Data is encoded as light into hundreds of thousands of light pulses, stored in some three miles of spooled glass fiber.

Each "bit" of information is carried in a 12-ft long light pulse, which traverses the memory spool every 20 millionths of a second, giving the system a 50-MHz clock speed. As in electronic computers, information is represented by 1s and 0s. In the optical computer, 1s are pulses of light and 0s are the absence of light pulses. The current system works with 16-bit words, the same as an Intel Corp. 8086 processor.

Simple calculations are performed by the machine's 66 AT&T optical switches, which can be turned on and off millions of times per second. The pulses are synchronized by the unvarying speed of light.

Flushed with excitement over the success of their project, the university's OCSC predicted a number of real-world applications for devices of this type "on the immediate horizon":

- A telecommunications processor comprised of the bit-serial optical computer on a cylindrical wafer 3 in. in diameter that would operate at 20 billion clock pulses per second.
- A high-speed graphics processor that uses millions of optical switches interconnected in free space using mirrors rather than through glass fiber.

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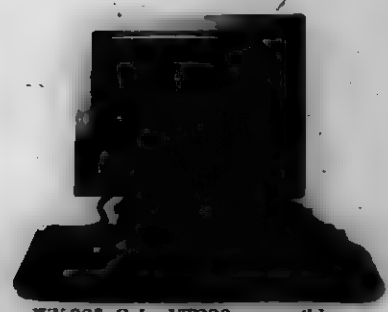

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3.3-volt chip technology decreases power drain by as much as 25%, while adding up to 27% more battery life.

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Buyer's delight?

Last month I met with some software executives who were touting their company's telemarketing sales efforts. The firm has been pretty successful in using the direct-marketing approach, as have scores of companies hawking PC hardware and software.

Only this was not a PC company but one selling mainframe database management system products. One recent phone sale netted an $800,000 order. Can you imagine buying that kind of product over the phone? Apparently a growing number of users do so, and by all indications, they are very happy with the outcome, as evidenced by the growth in virtually all distribution channels for an increasing variety of products.

As we've noted ["Changing Channels," CW, Feb. 15], corporate buyers are cozying up to alternative channels in unprecedented numbers. The image of a corporate buyer prowling the cavernous halls of a warehouse buying club to strike a deal on 100 printers would have been utterly out of context just a short time ago. But not anymore.

Channel mainstays, such as vendor direct sales and traditional computer stores, are still the buying venues of choice for corporate IS. But the growing use of the array of alternatives is gaining favor and, with this change, is developing challenges that have caught some IS buyers off guard.

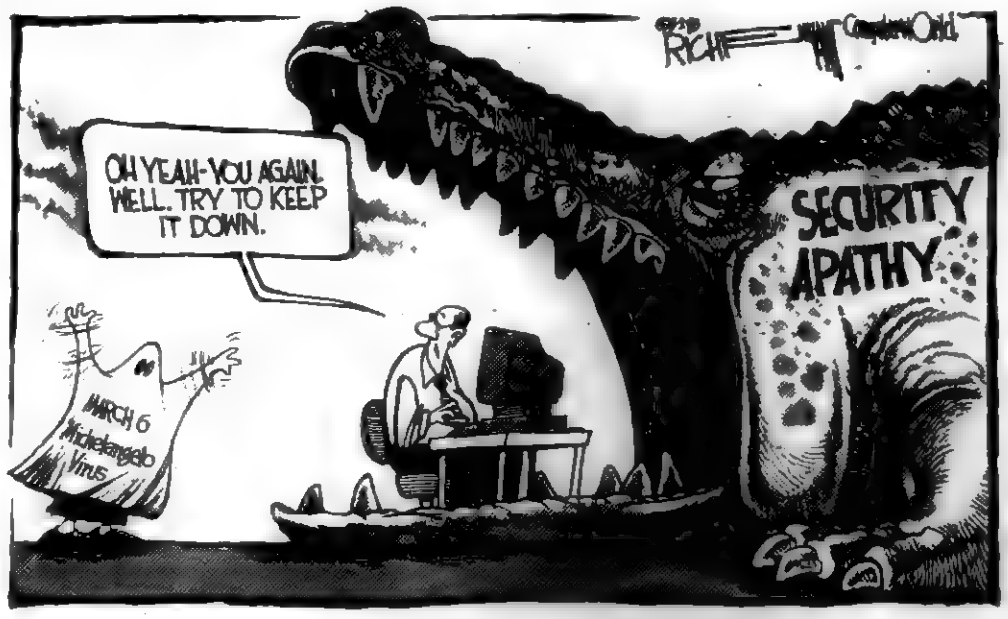
For example, the most preferred channel remains vendor direct sales, even though it isn't the most frequently used. Why? Because it is the most expeditious, and IS has traditionally purchased most of its equipment that way. As a result, it's probably correct to assume the channel is used more than it ought to be, and some of the channel data bears this out.

In addition, the expanding channel choices have encumbered an already heavily encumbered IS community with the burden of honing negotiating skills. This might seem trivial at first. But negotiating in alternative channels is far different than dealing directly with your vendor rep. The difference is akin to the experience of refinancing your home. The most direct and easiest route is through the bank. The mortgage companies can offer better deals but going that route requires you to become a much more astute shopper.

Finally, while the widening of distribution channels has generally meant more efficient pricing for the user, the levels of technical support from channel to channel vary from blanket coverage to "we sell the screwdrivers in aisle nine," meaning nonexistent. With internal IS support staffs either flat or shrinking today in most organizations, the allure of the lowest priced channel can be nothing more than a tender trap — which someone needs to explain to the CFO.

Bill Laberis

Bill Laberis, *Editor in chief*



Metrics misuse

Michael Schrage is certainly correct in his assertions that metrics can be and frequently are overplayed ["Metrics: The art of the well-supported lie," CW, Feb. 8]. However, he is missing the point when he states: "We should seek software metrics — and distrust them." In truth, we should seek software metrics — and *understand* them!

The risk in measuring development (or support) productivity is in using the results as blind measurements to place the "good" or "bad" label on the work being performed.

Software development is as much a process as a tool, and the resulting product is never identical to any other resulting product. We can get some measurement of the process involved, but we surely should not hang our hats on the results. The key is to evaluate the entire process, compare the outcome with as many other similar organizations as possible and look for those places where the normalized information (data made comparable by carefully mapping to equivalent bases) indicates *significant* deviations from an average or set of norms.

Too much emphasis is put on those 10% deviations. Let's look for the places that we are 40%, 50% or more away from what might be expected. Then we should be able to identify the key issues and see what is causing such deviations.

Drawing conclusions from one statistic is like forecasting the weather based on the wind speed. It is the understanding of the complex interaction of *many* metrics that begins to provide useful information to the systems manager.

So let's not blame metrics as the villain — place the blame on the people who misuse them!

Richard W. Taylor
Darien, Conn.

Better luck Next time?

In your Feb. 15 issue, I found two amusing contradictions in your coverage of the recent "changes" at Next, Inc.

First, on the same page that covers these changes in the article "Next KOs workstation line," a glimpse of the upcoming Buyers' Scorecard is offered that compares four desktop operating systems: Apple System 7, Microsoft Windows 3.1, SCO Unix Open Desktop and IBM OS/2 2.0.

I find it ironic that on the same page that NextStep is praised by "users" and your interviewee, it was left out of your survey.

Second, your editorial "Bridge too far" refers to an SAS Institute programmer whose you believe would be saddened by the news that Next is terminating its hardware business. I highly doubt that he was referring to Next's hardware but rather was actually praising NextStep.

If you could put DOS on a Macintosh or a Next machine, I highly doubt that any Macintosh or Next user would still praise his machine.

Franklin Ibimaloukis
Durham, N.C.

OS/2 sensitive?

I just read "Easy as 1-OS/2-3" [CW, Jan. 11] after reading the angry letters from the OS/2 crowd in subsequent issues of *Computerworld*. Just to add a voice to the fray, I thought the article (prominently marked "Humor") was a scream! As anyone who has installed OS/2 many times, I can relate to the story.

Trying to write humor about OS/2 is like trying to poke fun at a particular religion. For people who have staked their sustenance and careers on whether OS/2 works and whether they can sell their OS/2 applications when they finish them, OS/2 is not a laughing matter.

In order to keep management interested in their project, many have turned into nothing short of evangelists. The trouble with evangelists is that they tend to reject dissimilar beliefs and opinions as invalid or, worse, heresy.

It's strange, though, that although Unix proponents can be just as evangelical regarding the holy mystery of Unix, they seem to have a much better sense of humor about it. I guess after OS/2 has been around for 20 years, we'll see the situation ease up a bit.

Greg Stricker
St. Louis

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Abandon the end user at your own peril

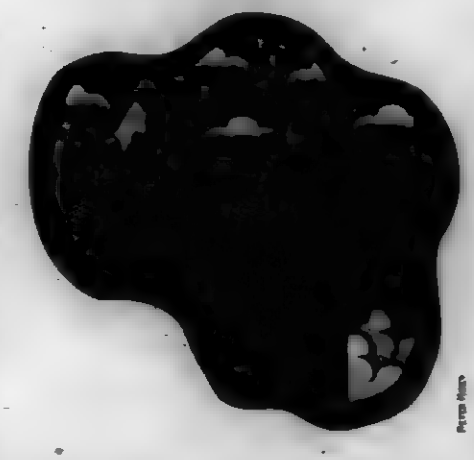
Joanne Kelleher

There's a very big difference between cutting corners and cutting your own throat, but it is beginning to seem like some IS executives are missing the distinction.

Faced with what feels like an either/or choice between all-out production of revenue-generating systems and ongoing support of end users, more than a few IS chiefs are choosing to leave the end users to their own devices. Something has to give, they say. Budgets aren't going up by much — if at all — while ideas for strategic projects keep pouring through the pipeline. Handholding just isn't a strategic priority.

All of this is true, of course . . . well, all except the last part. These are hard times. Resources are stretched. There aren't enough trained bodies to go around. And it is never easy to tell a top corporate executive that the system he's convinced will fatten the bottom line or shake the teeth of the competition won't be ready for several months. But even so, cutting users loose to handle most of their own support is not smart. It may even be suicidal.

Picture this: We're looking at a business department recently "empowered" by IS. It has been three weeks since IS cut the cord, and things have been going along swimmingly. Suddenly a persistent error message begins to rear its head each time a user tries to perform a certain routine function. Work grinds to a



Peter Hoey

halt. Co-workers gather. A call is put out to the department's power user, the regional sales director, who happens at the moment to be preparing an urgent report on competitive incursions in his territory.

As the de facto Answer Man for computer problems in his department, the sales director can't easily say *no*. So four hours later, he's still bent over a PC trying to figure out what's triggering that rogue message. His report lies half-finished and forgotten on his own desk.

Is this sensible? Is this productive? Don't you think there's going to be a backlash?

Let's face it. When people don't get service, they shop someplace else. The only exceptions are monopolies, and IS departments don't have that power anymore.

User departments have the machines, and in many cases, they are working with software that comes in a plastic wrapper. They have the means and the will if pushed to look elsewhere for development or support services. Hell, they may even hire their own system wizard to keep on the premises, given enough provocation.

It is important to watch the budget and important to keep the big bosses strategically satisfied. But if you turn your back on your real customer base, you are asking for trouble.

Being reviled or replaced aren't the only negatives. Probably the most insidious consequence is the loss of connection with the actual process experts. Most of the really interesting new system concepts aren't found in the executive offices. The best schemes for shaking up processes, cutting time and building value from information are bubbling around in the rank and file.

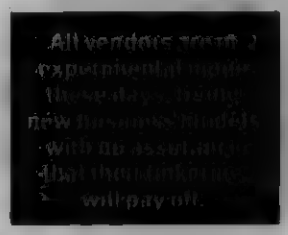
Every request for application development assistance, every call for system support is an opportunity to tap into process change at the source. Do you really want to send your regrets?

Kelleher is *Computerworld*'s features editor.

Not sure what you're doing? Join the crowd

FIRE WATCH *by* John Gantz

Let's face it: All our role models are gone. We're adrift. Computer vendors are trying to figure out how to manage their businesses with the gross margin structure of a Dell Computer. User organizations are all trying to organize the chaos of distributed computing. Everyone has a theory or a plan, but no one has proof of success.



This reality first hit home while I was sitting on a panel at ComNet '93, listening to Mike McKenna, a vice president and technology planner at Citibank, discuss that company's massive IS reorganization.

A little over a year ago, Citibank came to the conclusion that its decentralized computer operations had to go. Autonomy was costing more than it was worth.

The company decided to put all of its IS professionals in one department, locking departmental IS budgets and consolidating data centers. Having made that decision, it took less than a year for the company to get rid of about 100 IBM mainframes — half its complement.

So now Citibank, once a role model for decentralized IS, is now a role model for consolidated IS. But which Citibank should you emulate? The one that set the standard for decentralization or the one cleaning up a decentralized mess?

Figuring out who or what to emulate is no easier for vendors. I sat on another panel recently and listened to Duane Walker, Windows NT marketing manager at Microsoft, and Mark Benioff, vice president of advanced technology at Oracle, argue about what it will take for software companies to be successful.

Walker's take was that because of falling prices, the only worthwhile way to go will be selling low-priced software to high-volume markets. Software companies that try to be all things to all customers will fail.

Benioff had a different answer. For a software company to succeed, he said, it will have to sell value-added services and "solutions" to customers facing increasingly complex computing environments.

Which model is right? A single-function company relying on the distribution channel and partners to turn its products into solutions or the "one-stop shopping" company with close ties to customers?

Who knows? Who knows anything? All vendors, including IBM and DEC, are in experimental mode these days, trying new business models with no assurance that their tinkering will pay off. Microsoft sure looks like it's got the inside track to success today, but a catastrophic bug in NT or a car accident in Redmond could change things tomorrow.

I'm not sure I'd want to bet my company on any of the role models out there.

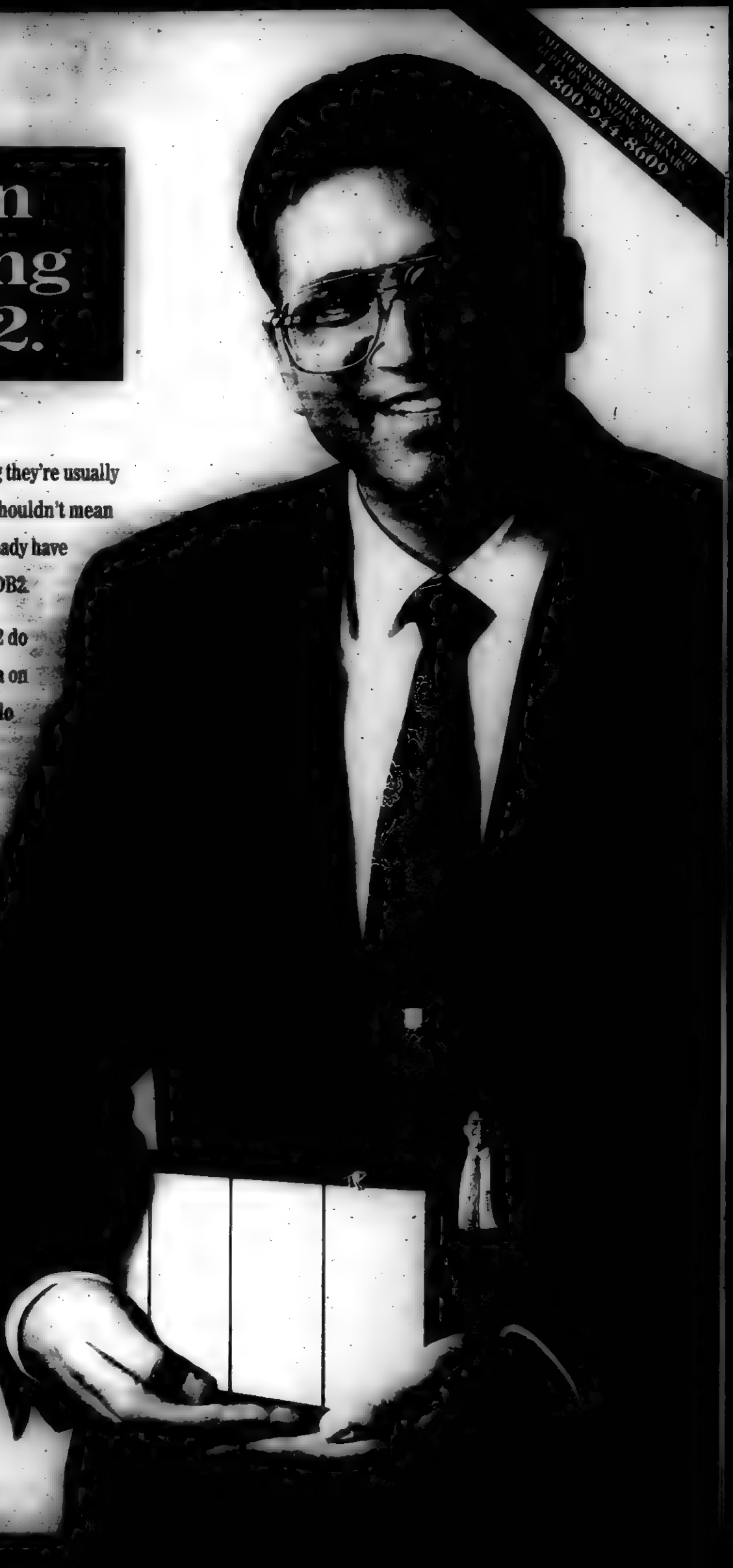
For IS professionals, the message is this: You'll need the skills of advocacy to get through this period. There's opportunity as well as danger in chaos. But pursuing that opportunity in a time without role models is more a matter of being convincing than being right.

When McKenna got higher-ups at Citibank to buy into IS consolidation, he didn't do it by talking about terabytes or gigabytes. He did it by talking about impact on earnings. Walker and Benioff may both be wrong, but they each make a convincing case for their point of view.

Keep it in mind. Until things settle down — if indeed they ever do — to be successful, you'll have to package and market your ideas like any other businessperson trying to deal with change.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Gupta on downsizing with DB2.



These days when people talk about downsizing they're usually talking about client-server and PCs. But that shouldn't mean throwing out mainframes. Particularly if you already have a powerful transaction processing system like DB2.

What downsizing really means is letting DB2 do what it does best: manage central corporate data on the mainframe. And letting PCs do what they do best: off-load applications from the mainframe.

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Charles Babcock

NT: Design dilemma

The current widespread anticipation of Microsoft's Windows NT underestimates the multiple — and at times contradictory — goals of its design.

Both early implementers and authors who have examined the strategy behind the product say Windows NT is likely to emerge as a very different operating system than what many users expect. Its adoption may be slower than we've seen with previous Microsoft launches, and there may be more room than predicted for competition from OS/2, Solaris and UnixWare.

PC users tend to perceive Windows NT as just a feature-rich addition to the Microsoft family of operating systems. First there was MS-DOS; then Windows layered the GUI atop MS-DOS. Windows NT, in this view, is just a full-fledged, backward-compatible, power user's version of Windows. Underneath the interface, however, Windows NT is something "radically different," according to Helen Custer, who wrote the book *Inside Windows NT*, published by Microsoft Press.

Top of the class?

Windows NT may look like plain vanilla Windows, but it is larger and more complex, a kind of Stanford Ph.D. in a family of Parsons College graduates.

While definitely meant for the PC power user, Windows NT also embodies grander ambitions and addresses layers of computing and networking above the stand-alone desktop. It was designed to run on powerful hosts such as Silicon Graphics' MIPS R4000 or DEC's Alpha, as well as PCs and workstations. And for that reason, Windows NT has been endowed with some mainframelike capabilities, such as C2-level security and symmetrical multiprocessing.

These capabilities, important as they may be, do carry a cost for the average user. For example, virtual memory, an alien concept to MS-DOS, is required. Also, Windows NT can achieve its goal of C2-level security only at the expense of losing some backward compatibility with MS-DOS and Windows. Many DOS and Windows applications or device drivers seek to control the underlying hardware, and a C2 security prohibits release of control over the hardware.

Finally, many PCs will simply be too underpowered to run Windows NT. At minimum, Windows NT is likely to require a 486 CPU with 16M bytes of RAM and a 100M-byte hard disk. That's already more power than many PC managers plan to purchase in the near future, and it may not even be enough. According to Computer Technology Research Corp.'s report "Windows NT: Microsoft's New Operating System Strategy," Microsoft advises that "an additional 50M bytes should be set aside as swap space."

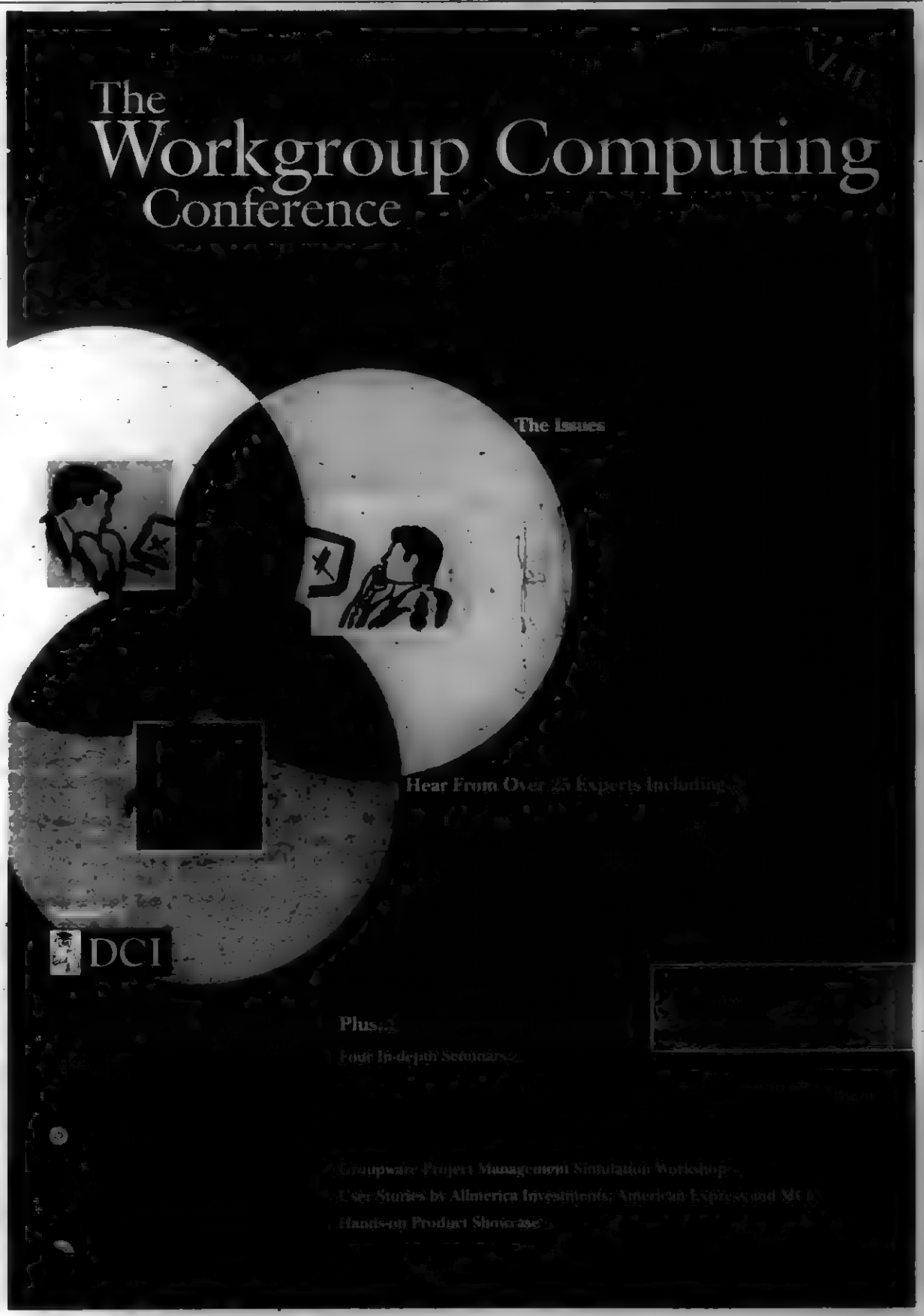
IBM's OS/2, which offers many Windows NT-like capabilities, runs on 6M bytes of RAM and 30M bytes of hard disk. OS/2, of course, was regarded as a resource hog when it first came out.

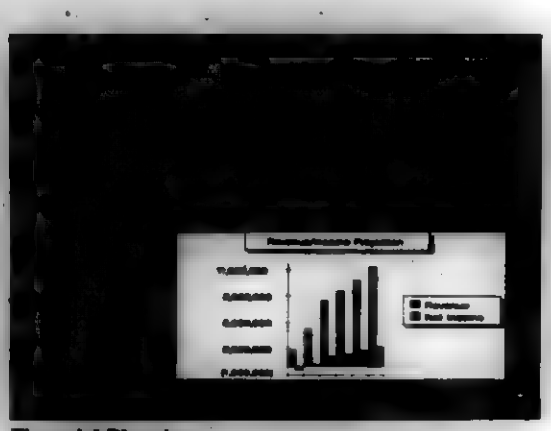
There are many long-term advantages to the Windows NT design, particularly as the outlook for client/server systems takes shape.

Someday, it will matter greatly that Windows NT can run MS-DOS, OS/2, Windows and Windows NT applications, along with Posix-compliant Unix applications. But right now, many PC managers, gazing at the sheer scale of Windows NT, are going to ask whether they really need all this and whether Microsoft couldn't have invested more in Win/32, Windows for Workgroups and Windows itself before urging users to upgrade.

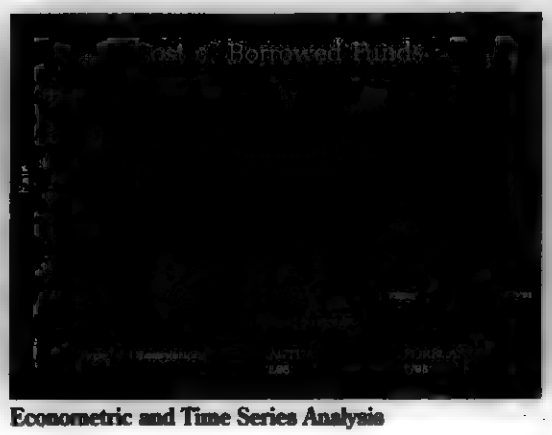
In the end, Windows NT may vie with Windows OT for desktop predominance. (That's OT as in Windows Old Technology.) An enhanced Windows environment running 32-bit applications might enjoy as long and full a life as MS-DOS.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

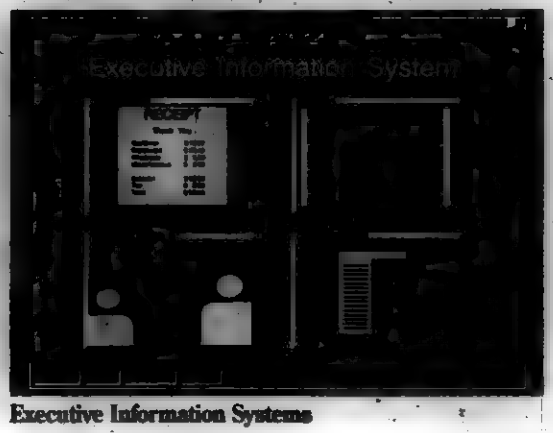




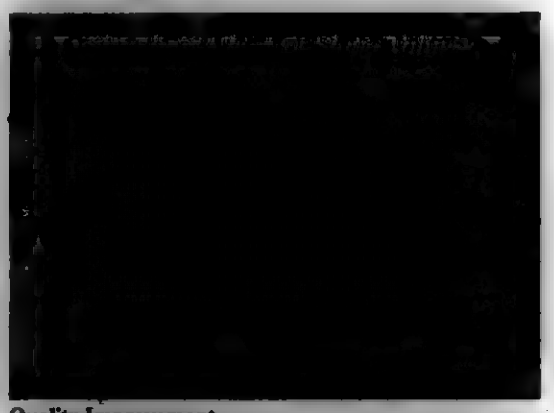
Financial Planning



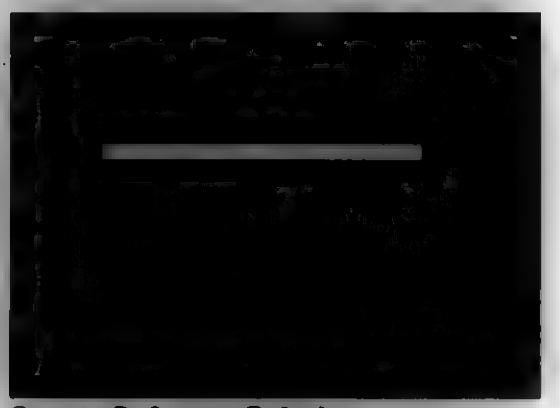
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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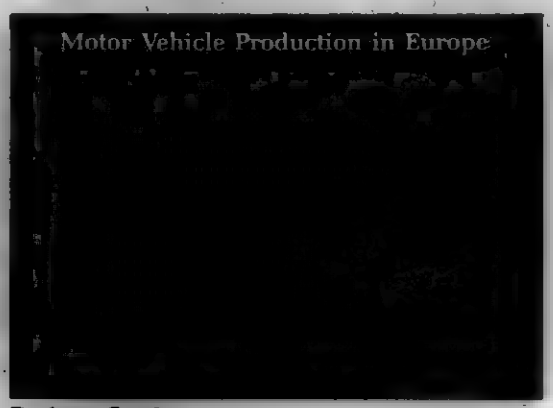
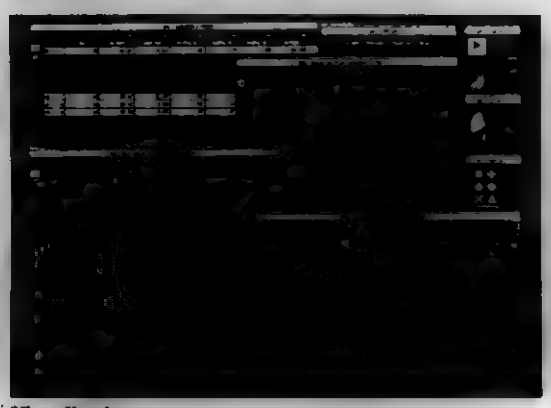
Reporting

Market Research

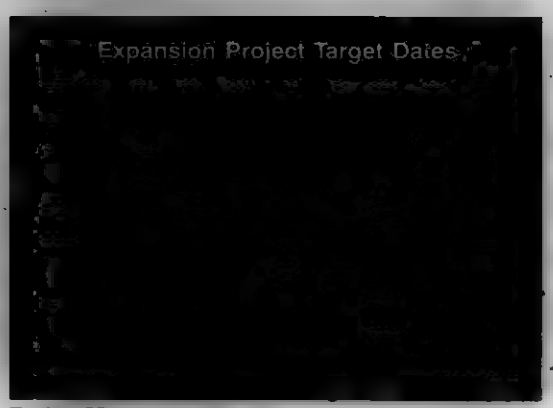


Business Graphs



Visualization

Data Analysis



Project Management

Paul Gillin

Bytes to burn

If you're as fanatical a PC user as I am, you can't resist installing every piece of software you can get your hands on.

You've probably also discovered that Windows and OS/2 software packages aren't exactly sparing of disk space.

The 120M-byte disk drive on my machine — which looked so spacious 18 months ago — became downright puny last fall. That's when Iomega Corp.'s products entered my life. The Roy, Utah-based pioneer of removable storage products has come up with the Multidisk, a 150M-byte removable hard disk that attaches via a SCSI port to your PC or Apple Macintosh. The cartridges weigh only 5 ounces.

This product is a screamer. Performance is almost indistinguishable from that of a Winchester disk drive, largely because of a nice caching program Iomega includes with the driver software. With compression software, you can squeeze 300M bytes onto a single pancake-size cartridge.

Power users and IS departments will find a lot to like in the Multidisk for some applications. If you don't want to tie up your network transmitting giant graphics files, the Multidisk lets you store them on a disk for transporting via "Sneakernet." Users who do a lot of on-site work at client locations will find it handy to be able to carry programs and data in their briefcases between home office and customer site. And users like me who run more than one operating system can store their applications on different disks and pop in the appropriate files at boot time.

Iomega is also targeting network administrators with the Multidisk because the device can be configured as a boot drive. Basic network files such as the E-mail structure and print drivers can be stored on the removable cartridge so the network can be rebooted

Gillin, *page 38*

486s take over notebook market

386 prices expected to drop to $1,000 as vendors clear out low-end stockpiles

By Michael Fitzgerald

■ Recent trends show a dramatic shift to Intel Corp. i486 technology in notebook development, and prices are inching down toward $1,000 for a low-end notebook.

The pricing plunge is most evident as vendors such as Compaq Computer Corp., Zenith Data Systems and others have cut prices on their existing models, particularly 386SX-based models.

Vendors grudgingly acknowledged a spiral in pricing that will probably see widespread sub-$1,000 pricing of a 386SX notebook with a 60M-byte hard drive and 2M bytes of random-access memory by year's end.

The trend is widespread. Even a big-name player such as Toshiba America Information Systems, Inc. now sells a 386 notebook for $999, using a rebate program.

"By July, there'll be a huge shift going on," predicted Steve Lair, vice president of marketing at Irvine, Calif.-based Toshiba. "The 386 products in the color version will still be viable, but monochrome versions will be priced to liquidate from most vendors, I expect," he said.

Fast drops

Even notebooks based on the pricey 386SL will drop in price rapidly.

"You'll definitely see SLs down at a thousand bucks by year end," said Daniel D. Sheppard, director of notebook product marketing at AST Research, Inc. in Irvine, Calif.

Sheppard said $1,000 is becoming a magic price point for notebook buyers.

Lair and Sheppard predicted massive volumes for notebook computers this year. Analysts agreed with them.

"We are seeing a shift to the 486 in notebooks. It's been coming on pretty fast starting near the end of last year," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. Zwetchkenbaum said the shift to the 486 on the desktop was accelerating the move to the 486 in the notebook market as well, particularly at corporations that use Microsoft Corp.'s Windows.

At the same time, Zwetchkenbaum said, price cutting was not the early salvos of a notebook price war. Rather, he said, most companies were cutting prices as they ready new notebooks based on the 486SL or 486SX processors.

"I expect midsummer will bring a massive shift to the 486, and that will be the volume leader in notebooks by the end of the year," Lair said.

Happy users

Users reacted favorably to the thought of lower priced machines, and several said price competition might allow them to buy full-fledged 486 systems in place of 386SX notebooks.

"It's a good thing for us," said the PC coordinator at a large multinational company who asked not to be named. "About a year ago, notebooks didn't have enough speed," he said. According to the user, because his company buys only one machine per person, faster processors will help justify the purchase of notebooks in place of desktop machines.

"We've pretty much shifted all our users to the 486 on the desktop, and that carries over to our notebook purchases as well," said Dawn Kroll, technical buyer at Chemical Bank, Inc.'s Geoserve division. If employees "are in a Windows environment on their desktop and they're used to that, it's easier to justify the additional cost," she said.

Kroll added that 486 notebook pricing was falling, along with prices on 386 notebooks.

Not all users are pleased with faster cycle time from the 386 to the 486. "Every time we find a nice machine and get our users used to it, it gets discontinued," said Bret Everett, deputy systems editor at the Los Angeles Times. Everett said that for his users, most of whom are reporters, faster processors are not an issue.

InTouch graphically manages work flow

By Christopher Lindquist

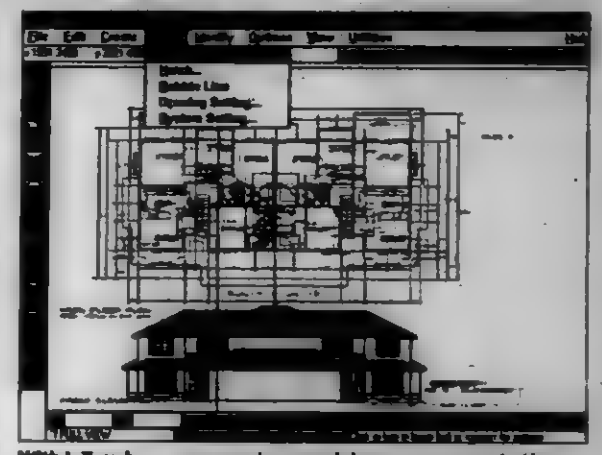
InTouch may not be for everybody. While the world is moving to Windows, InTouch is still based on DOS (though it will run under Windows).

Rooms, desks, reports, calendars, forms, letter trays, Rolodexes: These are the common building blocks of any office. But what if the reports could automatically summarize the information held in the trays? And what if those trays were smart enough to automatically attract information needed by the tray's creator?

Such a situation is the goal of InTouch, a work-flow application development environment produced by InTouch Software in San Rafael, Calif. InTouch was designed to allow users to graphically create an electronic model of an office environment using common representations of keys, doors, desks, trays and forms. These "objects" can be placed inside floor plans that can be made to look just like the actual office layout. In this way, the jump in logic from the real world to the world on the screen is shortened over traditional graphical applications.

Users said that despite its power, InTouch is easy to use. Bruce Kohen, a senior partner at Anesi, Ozmon & Rodin in Chicago, said he has done a great deal of development with InTouch since his company purchased it several years ago. "And I'm still a lawyer, not a computer expert," he said.

Kohen said his office uses InTouch to integrate accounting, docketing and word processing into one system. "It has been very successful," he said.



With InTouch, *a user can drag and drop a memo onto the president's 'desk' without getting up from the computer*

InTouch uses customer-defined rules to control the behavior of objects. For example, a sales manager's "in" tray could have a rule attached to it that says, "If a sales order's grand total is more than $5,000, attract it here."

Such actions can also be taken manually: A secretary could drag and drop a memo onto the president's "desk" for approval.

Security in InTouch is accomplished by applying "locks"

InTouch, *page 39*

Beware of Michelangelo in March

Later in the month, be on the lookout for Maltese Amoeba

By James Daly

Guess who is back? Our good friend the Michelangelo virus.

One year after it became a notorious celebrity, Michelangelo again rears its ugly head on March 6 — the birthday of the Renaissance painter and sculptor. This year, however, Michelangelo will strike on a Saturday, thus becoming more of a threat to home, rather than business, users.

Michelangelo leads a trio of virulent strains in a month peppered with mostly nondestructive nuisance varieties, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software. Michelangelo is a memory-resident infector of disk boot sectors and hard disk partition tables. It is roughly based on the Stoned virus, although it is very different in its behavior.

The virus goes into memory the first time the user attempts to start the computer with an infected disk. Once it is memory-resident, it will infect disk boot sectors as disks are accessed. It will also infect the hard disk partition table as the user attempts to access a file on the hard disk. On March 6, Michelangelo will format the entire system hard disk by overwriting it with random characters from system memory.

On March 15, keep an eye out for Maltese Amoeba, a rare destructive virus that also activates on Nov. 1. On activation, Maltese Amoeba overwrites the first four sectors of cylinders 0 through 29 on the system hard drive as well as any disk drives.

Another virus that can crop up on any day in March is the Micropox virus. When a program infected with Micropox is executed, the virus overwrites the system hard disk.

WATCH

Viruses expected to activate this month

March 1, 8, 15, 22, 29
Garfield, Exterminator, Bad Guy, Bad Guy 2

March 2
Ah, Kamasya, Demon, Demon B, Flip, Nuke

March 3, 10, 17, 24, 31
Victor

March 5
Frere Jacques, Smack, Payday, Frog's Alley

March 6
Michelangelo, Finger, Phenome, Migram

March 7, 14, 21, 28
Sunday, Sunday-2

March 8
Taiwan

March 9, 16, 23, 30
Ah, Kamasya, Demon, Demon B

March 10, 20, 30
Day 10

March 12, 19, 26
Frere Jacques, Smack, Payday

March 13
Finger, Phenome, Migram, Monxla

March 15
Maltese Amoeba

March 18
Form 18

March 19, 26
Skism, Skism-1

March 20, 27
Finger, Phenome, Migram

March 24
Form

March 26
Sub-Zero B

Source: FGS Virus Watch — CW Chart: Michael Siggins

Electronic tax filing heats up

By Gary H. Anthes

WASHINGTON, D.C.

The Internal Revenue Service reported a sharp increase in automated tax return filing this year and promises fewer processing errors and speedier refunds as a result.

As of Feb. 5, about 5 million returns — more than one-third of all those filed — were filed with electronic assistance (see chart). The 1040PC alternative posted the biggest percentage gain over last year.

The 1040PC is a condensed paper format printed from one of several commercially available PC software packages certified by the IRS. The software computes tax due and prints only those lines from the 1040 and supporting schedules that contain taxpayer data. Most returns fit on one page.

The IRS said 1040PCs are filed by taxpayers and processed by the IRS faster and with fewer errors than traditional forms. The form also provides for direct deposit of a refund to the taxpayer's bank account.

A spokesman for the IRS said the IRS is expecting some 6.7 million 1040PCs this year, compared with 1.5 million last year.

In another filing option, called TeleFile, taxpayers can call a toll-free number and enter tax return information through a Touch-Tone telephone during a computerized "interview." The IRS will compute the tax and any refund or tax due while the filer is on the phone. The option is being tested in Ohio for the second year.

In last year's test of TeleFile, taxpayers still had to mail in a special form containing W-2s as well as the taxpayer's signature. In Southern Ohio this year, taxpayers will enter all W-2 data via telephone and will send in a "voice signature" — the taxpayer's name and social security number — attesting to the accuracy of the return. The signature will be stored on laser disk.

IRS on-line

The biggest growth in electronic tax filing is through 1040PC

Returns through first week in February

	1992	1993	% change
[redacted]	80,000	200,000	150%
	4,205,000	4,814,000	14.5%
	72,000	75,000	4.2%

Source: Internal Revenue Service

Electronic filing of federal returns by tax preparers for individuals so far this year is up to 4.8 million. In addition, some 300,000 returns were combined federal and state returns from 12 states that offer that option. The IRS expects 14 million electronic returns this year, compared with 10.9 million last year.

Individuals may not file electronic returns directly but must go through tax preparers or other organizations that the IRS has approved for electronic filing.

PC DOCS for Windows debuts

By Michael Vizard

TALLAHASSEE, FLA.

PC DOCS, Inc. is now delivering a Microsoft Corp. Windows-compatible version of its document management software, which is widely used in legal offices.

Called PC DOCS Open, the system provides an infrastructure for tracking documents created in Windows applications such as WordPerfect Corp.'s WordPerfect, Microsoft's Word and Excel and Lotus Development Corp.'s Ami Pro 1-2-3.

"We decided to go with PC DOCS because it's been a standard in the legal field for a long time, and we needed something that could manage all the different document types we have," said Andi Esposito, office automation systems coordinator for the legal offices of Mobil Oil Corp. in Fairfax, Va.

Esposito added that Mobil was looking for a document management system that could be linked with industry-standard SQL databases. PC DOCS currently supports SQL links to the Sybase, Inc./Microsoft SQL Server, Novell, Inc.'s NetWare SQL and databases from Oracle Corp. and Gupta Corp.

PC DOCS employs a dual database architecture to support text retrieval; A SQL database provides document profile information and a text engine module developed by PC DOCS for indexing and searching.

Network operating systems supported by PC DOCS include NetWare, Banyan Systems, Inc.'s Vines, Microsoft's LAN Manager and Digital Equipment Corp.'s Pathworks. The company plans to add support for Microsoft's Windows for Workgroups and Windows NT, Apple Computer, Inc.'s Macintosh, IBM's OS/2 and Sun Microsystems, Inc. and Next, Inc. platforms later this year.

In addition, PC DOCS intends to integrate work-flow software with its document management system as part of a bid to expand its customer base beyond the legal community, said Michael Safar, PC DOCS product manager.

PC DOCS Open is priced at $299 per client and $495 per server. SQL database software is priced separately.

Gillin

CONTINUED FROM PAGE 37

from a backup server and kept running if the main server crashes.

On the downside, the Multidisk is not for the budget-conscious. The street price for the unit is about $800. Cartridges are $100 each, though that's cheap on a per-megabyte basis. You may also find yourself swapping disks in and out more than you like if you keep a lot of program groups active on your Windows desktop. And many IS managers may blanch at the idea of having so much mission-critical data stored on a format that a user can drop in a briefcase and take home. Still, the Multidisk is a relief for the storage-constrained user.

The more intriguing new Iomega arrival is the 21M-byte Floptical drive. The Floptical combines optical and conventional magnetic read/write approaches to give the user vastly increased capacity on a 3½-in. disk. Floptical drives can read and write standard 720K-byte and 1.44M-byte disks but also give you 15 times the storage and three times the performance when used with the Floptical media.

I've had an external Iomega Floptical drive connected to my PC for two months now, and it delivers on its promises. Performance is good enough that you could conceivably run programs off the drive. And I can back up an entire 120M-byte hard disk on six floppies. The payoff comes for users with large image or multimedia files that can't be squeezed onto a conventional floppy.

But there are drawbacks. At $350, the drive costs at least five times more than a conventional floppy unit. Disks cost about $20. The bigger problem is what I call the Picturephone syndrome: The technology is only useful if a lot of other people have it. And Floptical is just a blip on the chart today.

Iomega seems prepared to lose money on its Floptical drives for some time in hopes that growth — when it comes — will be explosive. The company this week will introduce versions of the drive that plug into SCSI and parallel ports, making it easier to install and move around. And Iomega wants to push the prices of the drives and the media down as far as possible.

But that will come with volume, and there isn't much of that in the Floptical market today.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

HELP LINE

IBM OS/2

This is another installment in a series of articles containing questions commonly asked by users and responses from vendors' support lines. This week's focus is on IBM's OS/2.

Q: I've gotten to the point where I run so many programs my swap file fills up, but I don't want to add memory. What can I do to solve this?
A: If you have another partition or drive, you can change the SWAPPATH statement in the CONFIG.SYS file to move the swap file to another drive. Then reboot your system to make the change active. The only limitations are that you cannot put the swap file on a disk or tape drive, nor can it reside on a local-area network drive.

Q: I have an IBM Thinkpad and get an Internal Processing Error when I try to install OS/2.
A: OS/2 was released before the Thinkpad line. There is a file on the reference disk for each IBM machine with a Micro Channel Architecture bus that is specific to each machine. To run OS/2 on machines released between releases of OS/2, perform the following steps:

1) Look on the reference disk or partition on the machine for the BIO file for that specific machine. It will be named something like F8E500.BIO. Each system has its own specific file, so do not copy files from machine to machine.

2) Copy this file to both the install disk and disk 1 of your OS/2 2.0 disks.

3) Use a text editor and edit the file called ABIOS.SYS on the install disk. Add a line at the top and make it the name of the file you just copied. Now save the new ABIOS.SYS.

4) Copy this new ABIOS.SYS to disk 1 as well.

5) Now your system will be all ready to install.

Q: I have programs in my start-up folder as well as ones that are running when I shut down my system. How do I prevent these from starting automatically when I reboot my computer?
A: When you shut down your system with programs running or have placed programs in the start-up folder, they are automatically started when your system reboots. There may be reasons why you want to inhibit this action.

To inhibit this action, you can reboot your system. When you see the desktop animation (looks like an exploding box), press and hold the Ctrl+Shift+F1 keys. Hold the keys for approximately 15 seconds or until the desktop icons appear.

Q: I added in a card to my computer, and now I cannot print.
A: You need to check the IRQ settings of the card added to ensure it is not set to IRQ7 or 5, which are used by LPT1 and 2, respectively.

Q: I received my copy of OS/2 in the 3-in. disk version, but my computer's A drive is 5 inches. What can I do?
A: You have several options. First, you can reconfigure your computer so that the A drive is the 3-in. disk. You may need to switch cables or contact your computer manufacturer to do this. You can also contact the IBM support bulletin board or CompuServe to obtain the special installation program that allows OS/2 to be installed from the B drive.

Q: I've heard there is an OS/2 ServicePak. Should I install it?
A: The basic question is whether you have problems with your system that are important to your use of OS/2 and whether they are fixed by the ServicePak. If so, then you should install the ServicePak. Or if you need the function of the 32-bit graphics engine, you should then install the ServicePak.

Q: I print from my DOS application, but then no other application can print. What can I do?
A: It is likely that your DOS application is accessing the printer port directly and not releasing it. OS/2 will not allow two programs to access a physical port simultaneously. You must close the DOS application to allow other applications to print.

InTouch

CONTINUED FROM PAGE 37

to objects that can only be opened by users who carry the proper "keys."

InTouch consists of a Navigator with which users move through the artificial office environment; an Information Processor that allows users to view and track objects and all the other objects they are linked to; and an Object Base that contains all the objects in the environment.

Baldwin Forrester & Co., a consultancy in Atherton, Calif., has used InTouch to develop work-flow applications for a variety of firms. Ease of use, both at development time and day to day, is one of the biggest advantages of the InTouch system.

Indeed, the entire user documentation for a large project built for the National Association of Realtors in Chicago comprised only 18 pages, and the complete developer documentation is less than 200 pages.

Fast and easy

According to Lloyd Dubroff, senior consultant at Baldwin Forrester, InTouch gives customers a chance to create a work-flow application quickly and efficiently.

However, InTouch may not be for everybody. It requires the customer to buy at least one full copy of Revelation Technologies, Inc.'s Revelation database ($850) as well as runtime copies (about $200) for each workstation because InTouch is built on the Revelation Technologies system.

InTouch costs $5,000 per server and $500 per seat. It runs on 286 and higher processors, though 386 or higher with 4M bytes of memory is recommended, the company said.

HP gets serious about PCs, wins some industry respect

By Michael Fitzgerald

PC used to be an unfamiliar acronym way back when at Hewlett-Packard Co., but HP has changed its perspective since then.

"We're still not a Compaq or an IBM, but we're much better off than we were," said Boris Ellisman, PC product market manager at HP.

The numbers seem to bear him out. HP had 150% unit growth and 88% revenue growth in the torrid second half of last year. Analysts said this put HP at close to $800 million in sales — not enough to make the Top 10 but still close. According to International Data Corp., HP was one of only three vendors ranked between No. 10 and No. 25 to grow last year.

Driving this growth was a new image — one users applauded.

"In the past, they didn't seem to take the PC end of the business seriously," said Dawn Kroll, a technical buyer at Chemical Bank, Inc. "With their new outlook on the PC market, we were able to take them seriously." Kroll said Chemical Bank added HP to its buy list in the fall. HP joined Compaq Computer Corp., Dell Computer Corp. and AST Research, Inc.

Analysts said HP is well-positioned to continue solid growth.

"I guarantee you that HP is going to become a much more important player in the PC industry," said David R. Korus, an analyst at Kidder Peabody & Co.

Korus and others cited HP's aggressive attitude toward pricing, a high-quality product line and an ability to deliver its products in a market wrenched by shortages. HP recently made broad price cuts on its Vectra line of PCs at a time when many vendors were holding prices steady.

In part to increase its image in the market, HP plans to expand its dealer base this year, and recently signed on with CompuCom. Ellisman said HP has no plans to move beyond the dealer channel, adding that the vendor plans to aggressively introduce new products this year, with launches planned for each quarter. These will include new lines of PCs to complement its flagship Vectra line.

Source: IDC Strategic Decisions CW Chart: Ismail Genaveese

Sources said HP will also fill a gap in its product line by introducing a notebook product this year, though Ellisman would only comment that "it makes strategic sense for us."

Ellisman said HP's goal is to be a Top 5 vendor in the PC market by the end of 1994.

[redacted]

Software application packages

Autodesk, Inc. has announced AutoCAD Release 12 for Windows, a fully functional version of AutoCAD for Windows 3.1.

The product offers a variety of features such as the Autodesk Device Interface, the AutoCAD Development System, the AutoCAD Visualization Extension and the AutoCAD SQL Extension.

Microsoft Corp. Windows-based specific features include multiple sessions, performance enhancements, Dynamic Data Exchange, Object Linking and Embedding Server Implementation and Visual Basic 2.0 support, among others.

The product costs $75.

➤*Autodesk*
2320 Marinship Way
Sausalito, Calif. 94965
(415) 332-2344

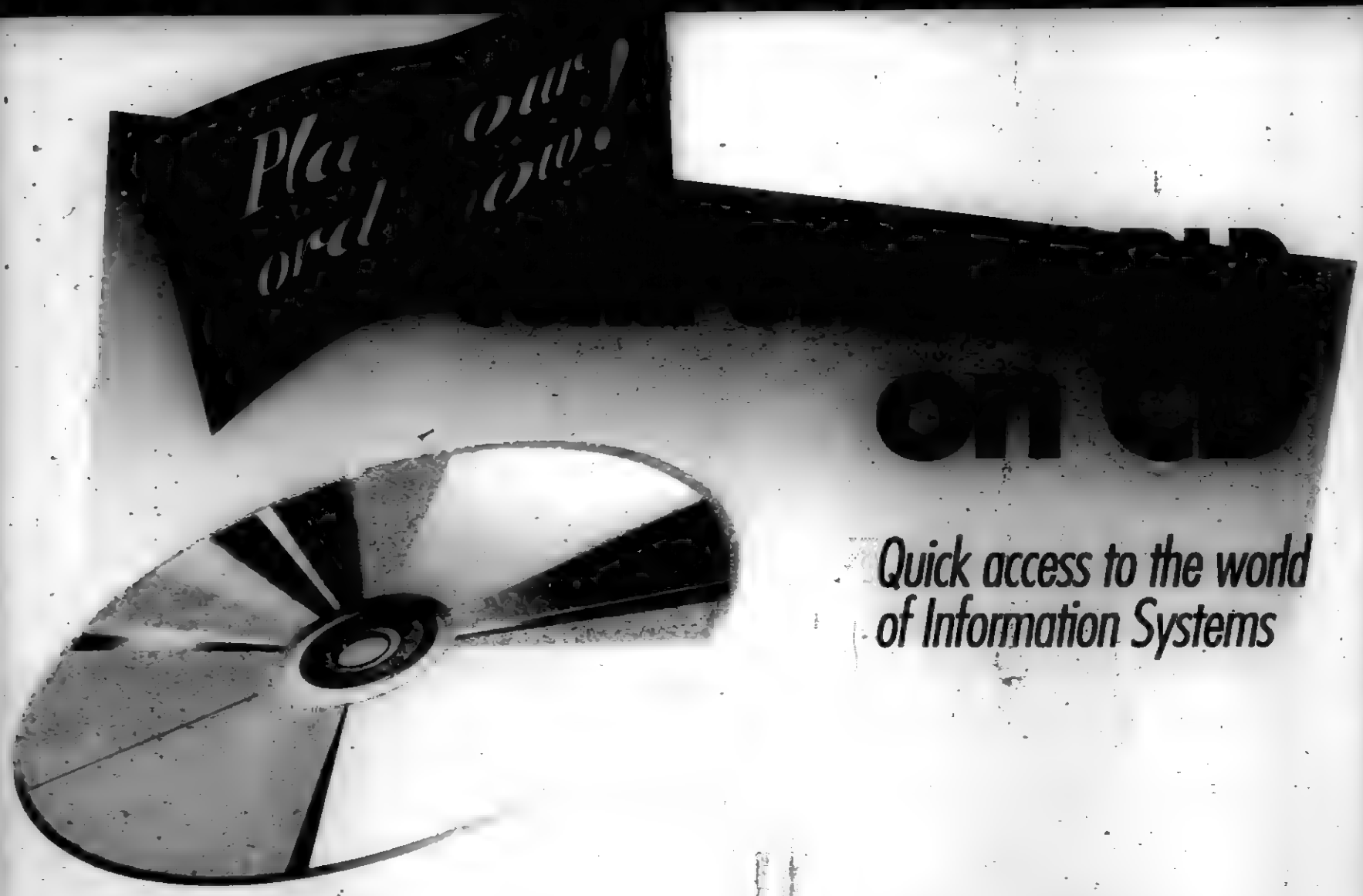
Dydacomp Development Corp. has introduced Version 5.0 of its Mail Order Manager (MOM) automation program.

According to the company, MOM is a modular, MS-DOS-based system that can be expanded and customized and is compatible with a multiple-user local-area network. Support for well-known network software is provided.

The product uses the dBase Plus file format and has pull-down menus and function keys such as those from Microsoft Corp.'s Windows. MOM's capabilities include prospect management, inventory control, profit analysis, accounting and order processing.

A single station costs $1,195.

➤*Dydacomp Development*
Suite N1
150 River Road
Montville, N.J. 07045
(201) 335-1040



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Workgroup processes

Work flow next rising star?

New activity

Recently, there has been a steady pace of work-flow software introductions, and more are expected. FileNet Corp., one of the granddaddies of work-flow technology, started off the year by launching FolderView, a Microsoft Windows-based program that allows users to create less-structured work-flow applications. Last week, Beyond, Inc. said it would begin shipping a tool that helps users create custom forms for the BeyondMail E-mail environment. And this week, Xsoft, a division of Xerox Corp., will roll out InConcert, a Unix-based document work-flow management package.

By Rosemary Cafasso

■ With many pilot projects under way and a host of new product offerings recently released, work-flow software has rolled in as the next big wave in workgroup computing.

But while users and analysts said they believe it will deliver productivity boosts, they do not expect work-flow implementation to be quick.

Work-flow software promises to streamline and automate work processes, but it will not be worth much unless the processes are sound. Users and observers said it is key to first study the process to discover how much room for improvement exists. In some cases, it will call for minor fixes, while in others it will require a major overhaul. As a result, the big benefits of work-flow software will often come after a lot of hard work.

"When people think of work flow, they might think there's a pull-down menu for it in [Lotus Development Corp.'s] Notes, but that does not exist," said Kevin Brown, president of the Worldwide Notes Users Group.

Actually, workgroups did not discover work flow. For years, companies such as FileNet Corp. have been selling image management and work-flow management systems. In fact, a 1992 survey by the Delphi Consulting Group, Inc. shows that imaging is still the most commonly used work-flow application. "This technology is mature in some sectors and now it is trying to give birth all over again on a new platform, the PC local-area network platform," said Amy Wohl, president of Wohl Associates.

closer look: Work-flow software

But Wohl and other analysts expect work-flow technology to flourish in PC LAN and workgroup environments because it is particularly suited for these platforms. A workgroup's success often comes down to the exchange of information among workers.

Currently, there are several work-flow approaches for workgroups, including tool sets to develop in-house applications, such as Work-flow Tools software from Action Technologies, Inc. that will be offered as a companion product to Notes; complete packages with a database or document-management foundation, such as Xsoft's InConcert; and enhanced electronic-mail packages, such as Microsoft Corp.'s Mail, which has basic forms-routing capabilities, or Beyond, Inc.'s BeyondMail, which has more sophisticated routing techniques and customization capabilities.

Look out for No. 1

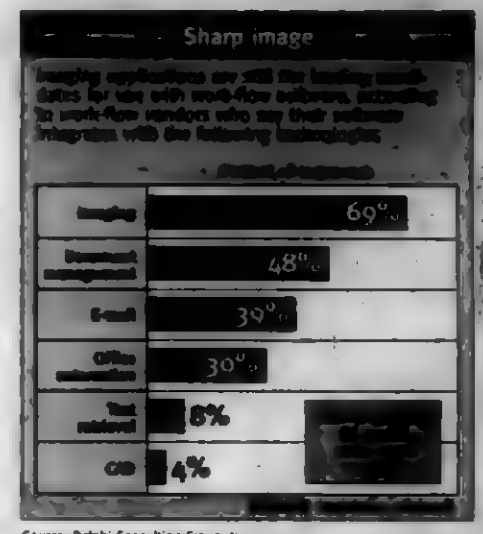
Many vendors will claim their offerings and work-flow approaches can handle a whole spectrum of work-flow needs, from the mundane, administrative operations to the more knowledge-intensive processes. But users seem to be proceeding with their own concerns.

EMC Corp., a disk drive maker, selected Reach Software Corp.'s Workman to beta test, in part because it was the only work-flow package it could find that would work with its Banyan Systems, Inc. Vines platform.

Peter Markell, MIS director at EMC, said the company has high hopes for Workman, although he has not given it a green light just yet. The software fits into the company's overall plans to reduce costs and make operations more efficient. As an example, the software will automatically move documents from one station to the next, so "you know if someone is sitting on something," he added.

The City of Edmonton in Alberta does not have a work-flow strategy per se, but it recently solved a work-flow problem anyway. Using Notes, it built an application that is a "bit of both work flow and workgroup," said Gord Stang, project leader of office automation.

In this case, Stang's group studied the process by which a citizen's request for information traveled from the mayor's office throughout various city departments and then back again. Using Notes, the mayor's office now maintains a requests database, which can be viewed and contributed to by the various departments on-line. The process has eliminated the manual process of moving from department to department.



Source: Delphi Consulting Group, Inc.

Resistance factors

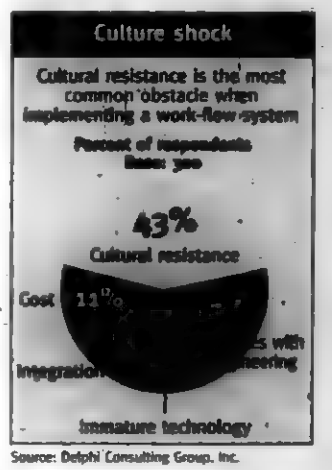
While users piloting work-flow projects have not detected much conflict in the ranks, at least one consultant said managers should be prepared for some resistance.

"There are obstacles with any new introduction to an organization," said Susan Chapdelaine, a consultant at Delphi Consulting Group, which recently completed a survey on work-flow technology. "Our findings have shown that overwhelmingly, they are based on cultural resistance to change."

Chuck Riley, a group director and executive vice president at Young & Rubicam, Inc., said his staff has been very positive about a current work-flow pilot project. "They are all very excited to be part of it, and they've really endorsed it," Riley said.

However, Chapdelaine suggested that such a reaction is not always guaranteed. Unlike other automation efforts, work flow can dramatically change the steps and pace of a work process with which a person has grown familiar.

"It effects people on a very basic level — their way of working," Chapdelaine said. "The ability to control your work environment is very important. People need ... some control over their environment or some flexibility."



Source: Delphi Consulting Group, Inc.

User experience

A different flow

Nicholas Rudd, chief information officer at Young & Rubicam, Inc., a billion-dollar advertising and communications firm in New York, went on the road last year to promote his plans for workgroup technology within the company.

Rudd said he knew the folks at Action Technologies and then he became aware of Lotus' Notes workgroup platform. "It occurred to me that a marriage of the two [products] could prove of interest to us," Rudd said.

In San Francisco, he crossed paths with Chuck Riley, a group director and executive vice president at Young & Rubicam. Rudd found a very receptive audience for his pitch.

Riley said, "There has been no highly structured or formalized work-flow process" in the San Francisco office he manages.

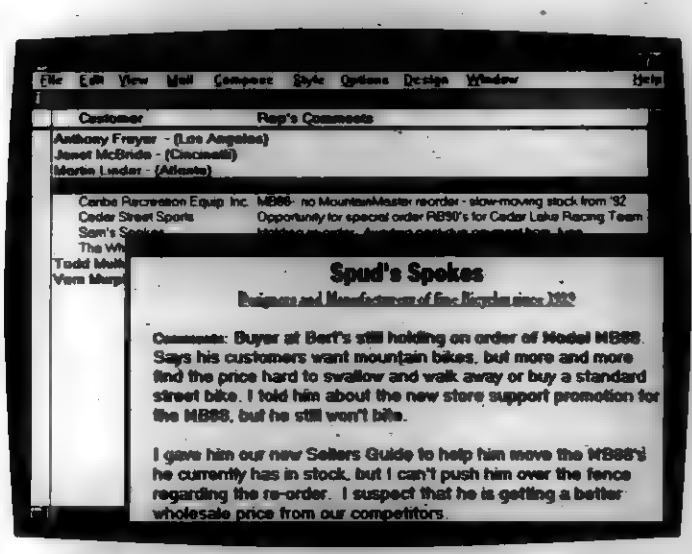
His staff went to work with Action Technologies staff members to figure out what the processes were and what could be done to make them better. "They did a great deal of interviewing ... and we did a very thorough reanalysis of our work flow and how we go about getting things done," Riley said. "We've already made significant changes."

For example, the agency needs to fill out work orders to launch a new job, and that requires inputting information beforehand. "We learned that there was a lot of information that was often missing when we started work on something," Riley said. That, in turn, would result in more work; once the project was under way, a person would have to go back and find the missing pieces.

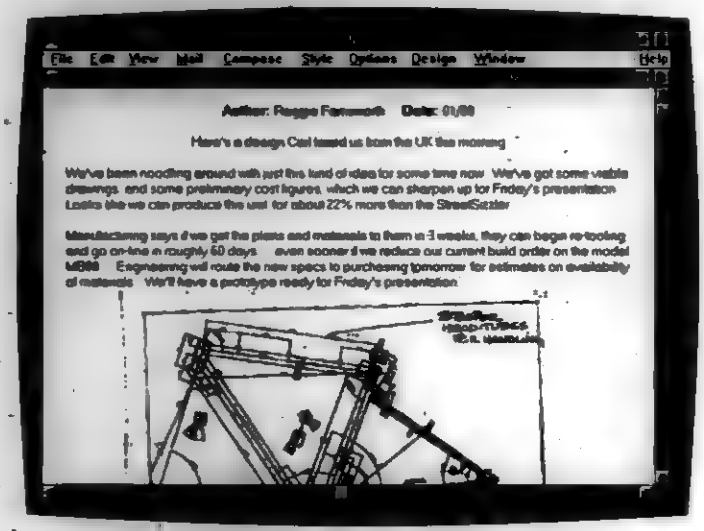
With the work-flow software, a process is being set up to ensure that all the up-front information be loaded into the work order before the process is allowed to move to the creative department.

—Rosemary Cafasso

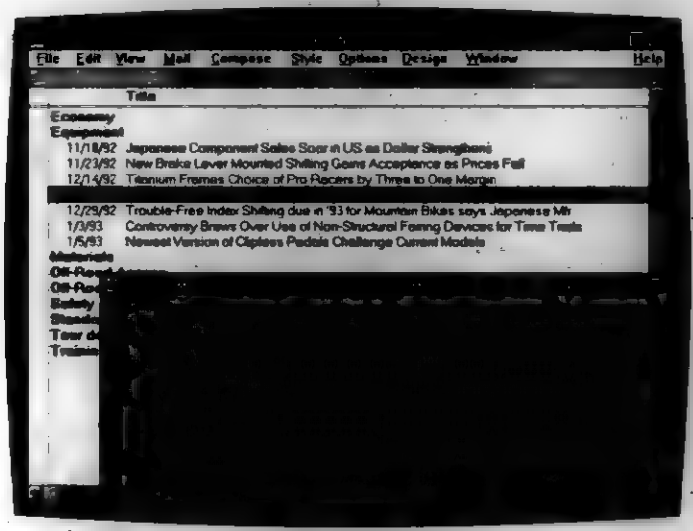
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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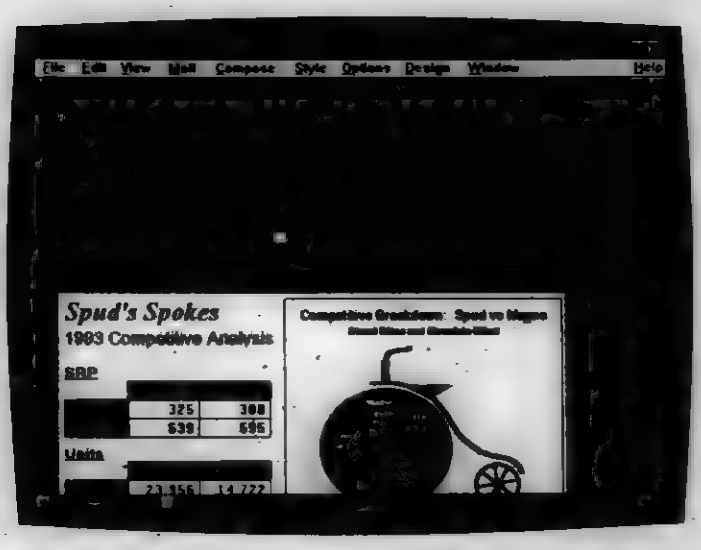
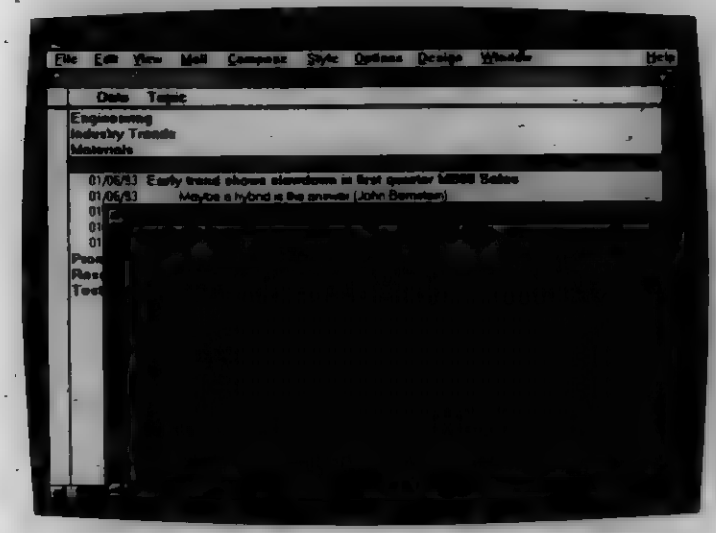
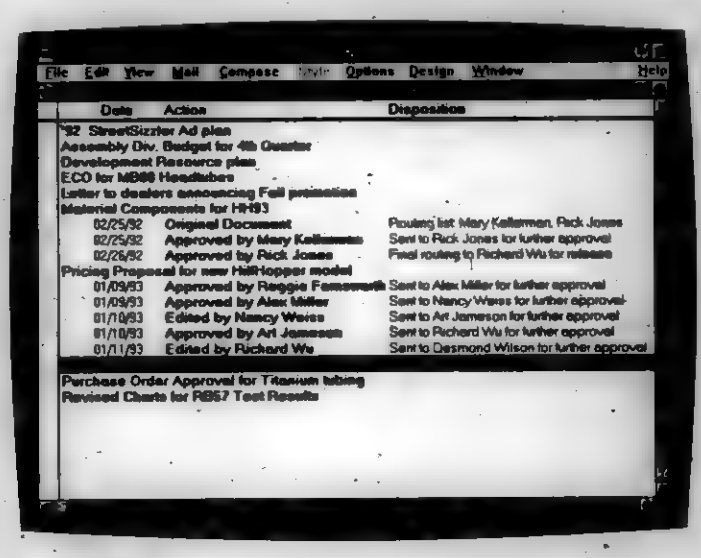


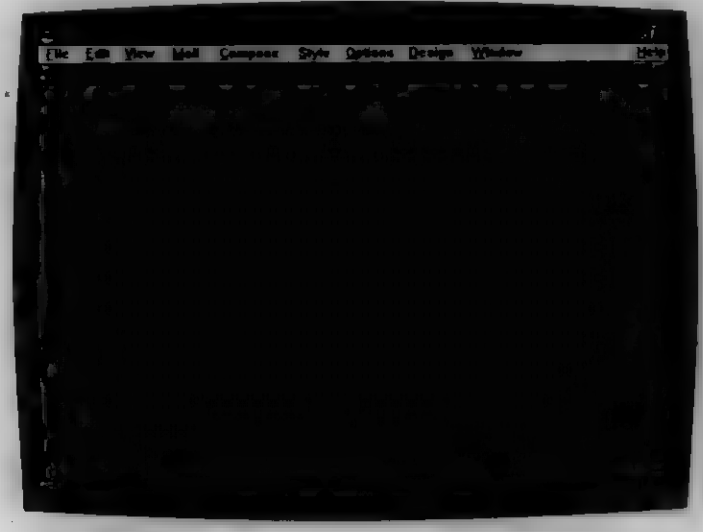
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

effortlessly people use Notes to respond and move the project forward.

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Lotus Notes

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Client/server challenge

Networking issues remain for daily newspaper

By Thomas Hoffman
SAN DIEGO

During the past year, *The San Diego Union-Tribune* completed an overhaul of its editorial systems environment. Although the new client/server platform offers substantial productivity gains over the predecessor system, the daily newspaper is still facing some thorny networking issues.

Union-Tribune executives said they are hoping to resolve bandwidth problems resulting from the use of Microsoft Corp.'s LAN Manager 2.1 over the NetBIOS protocol.

The *Union-Tribune*, which reaches 387,000 readers in the greater San Diego area, replaced seven aging Digital Equipment Corp. PDP-11 minicomputers with a network of more than 300 Intel Corp. 1486-based NEC Corp. PCs. The editorial PCs — equipped with co-adapter cards — run a proprietary software package from Sacramento, Calif.-based integrator System Integrators, Inc. as well as Microsoft's MS-DOS 5.0 and Windows 3.1 applications. Editors and reporters are then able to toggle between operating systems.

The PCs are linked to a Tandem Computers, Inc. R/4000 reduced instruction set computing-based fault-tolerant machine. Although the newspaper successfully linked its users over a Fiber Distributed Data Interface (FDDI) Ethernet backbone, the group is still working to settle some pressing network bandwidth issues, according to David Knight, the *Union-Tribune*'s computer systems director.

ON SITE

The San Diego Union-Tribune
San Diego

Challenge: To solve network bandwidth issues in order to add new applications to its recently installed editorial system.

Technology: Microsoft's LAN Manager, MS-DOS 5.0, Windows 3.1, System Integrators' software, Ethernet LANs, Tandem hardware and NEC PCs.

Results: The newspaper is hoping to resolve bandwidth issues so text and photographic images can be distributed more easily across the network.

The newspaper is using Microsoft's LAN Manager 2.1 to manage the editorial network. However, Knight said the supported NetBIOS protocol gobbles up "inordinate amounts of bandwidth, which is our biggest network issue."

Because NetBIOS is not an internetworking protocol, nodes attached to networks using the protocol do not have internetwork addresses. As a result, network administrators are forced to broadcast messages to everyone on the network when they are contacting another NetBIOS address for the first time.

Knight said he has discussed the problem with Microsoft officials to determine whether the newspaper is managing the network inefficiently or whether it is an internal problem with NetBIOS.

Knight said he has considered replacing the NetBIOS protocol with Transmission Control Protocol/Internet Protocol (TCP/IP), but this, too, poses a problem. "TCP/IP over Microsoft's LAN Manager doesn't run as well as NetBIOS," Knight said.

He added that Microsoft has confirmed that its upcoming LAN Manager 2.2 network administrator will offer improved bandwidth capabilities over its predecessor.

Last year, the *Union-Tribune* worked with System Integrators to replace the slow and problematic DEC PDP-11 cluster with the client/server configuration. "The PDP-11s were getting hard to maintain, and reliability was a major problem," Knight said.

Up to speed

The paper went to full production with the system last October, and Knight said the new configuration offers five to 50 times faster response in gathering news information than the former DEC PDP-11 word processing environment. As a result, the newspaper's editors and reporters are better equipped to meet their deadlines.

While the four-processor Tandem system runs the newspaper's editorial production, a DEC VAX powers the paper's library system in nearby La Jolla, Calif.

Reporters working on the editorial system are able to access text from past articles stored on the VAX using Intel 80386-based multiple local-area network attachment devices and Ascom Timeplex bridge routers. Client PCs are locally connected onto an FDDI ring. Terminal emulation is conducted via TCP/IP. Dual T-1 links were added to the La Jolla site for redundancy purposes.

David Knight: *'The PDP-11s were getting hard to maintain'*

If the newspaper is able to solve its bandwidth problems, Knight said, he would like to add a distributed database to the network. Such a system would eventually house thousands of pictures taken by staff photographers. More importantly, the on-line database would allow the paper's caption writers to access photos instantly on their PCs, a feature that is currently unavailable.

The *Union-Tribune* currently receives digitized photographs over a proprietary Associated Press file server. Images are routed to Apple Computer, Inc. Macintosh PCs using a DEC VAX server. However, that network cannot feed photographic images to the newspaper's caption writers.

Knight said he expects to identify prospective vendors for the photographic database system this year and receive approved funding for the project in 1994.

In Brief

Building blocks

FileNet Corp. will port its document imaging and WorkFlo software to **Hewlett-Packard Co.**'s Precision Architecture-RISC-based HP 3000 and HP 9000 Unix systems and servers by year's end.

Novell giveaway

Novell, Inc. has launched a promotion intended to boost sales of its Network Navigator electronic software distribution product. Under the promotion, resellers who attend Novell seminars on Network Navigator will receive a free 10-user copy of Network Navigato and coupons for free five-user versions that can be used by customers to upgrade their Novell NetWare local-area network operating systems to NetWare v3.11.

Self-help networking

Coactive Computing Corp. in Belmont, Calif., has announced a new family of do-it-yourself networking products designed for small offices. The products, called Coactive Connectors for **Microsoft Corp.**'s Windows, MS-DOS and **Apple Computer Inc.**'s Macintosh, consist of hardware, software and cables required to connect PCs through the parallel port. Coactive Connectors will be priced at $129 for DOS and Windows versions and $29 for the Macintosh version. The products will begin shipping in April and will be available from distributors, large computer stores and mail-order catalogs.

Added security

Secure Computing Corp. in St. Paul, Minn., won a $22.3 million contract to develop computer security products for the U.S. Department of Defense Secure Network Server program.

Symphony of choices

Crescendo Communications is shipping Fiber Distributed Data Interface (FDDI)-over-copper adapter cards for three new environments: **Sun Microsystems, Inc.**'s Solaris, HP's Apollo 700 series and Novell's NetWare. The cards allow users to run the high-bandwidth FDDI protocol over unshielded twisted-pair copper wiring. Prices are $2,395, $1,995 and $995, respectively.

LANalyzer rights

Novell has announced a licensing and technology agreement with Bloomington, Minn.-based **Network Communications Corp.** (NCC) whereby NCC will acquire exclusive rights to develop, market and support the hardware-based version of Novell's LANalyzer network analyzer. The agreement includes the hardware-based LANalyzer only; Novell will continue to develop and market its software-only LANalyzer for Windows product.

XDB-Server for OS/2 2.0 debuts

By Jean S. Bozman
LAUREL, MD.

XDB Systems, Inc. has shipped a 32-bit desktop version of IBM's DB2 relational database management system for IBM's OS/2 2.0 operating system.

The new XDB-Server for OS/2 2.0 will be sold to two audiences: corporate developers that are downsizing DB2 mainframe applications to PC local-area networks and users who perform mainframe programming on the desktop.

"We provide all the functions of mainframe DB2," said XDB Chief Executive Officer and President Bing Yao. "The application will see the same behavior on our system. Our job is to downsize the platform, then make it run every bit like a mainframe."

The 32-bit OS/2 server supports more main memory than the previous 16-bit version, which lets users hold many temporary database files in main memory, XDB executives said. Users can extract database tables from a mainframe DB2 system and download them to the XDB-Server, Yao said.

The XDB-Server for OS/2 2.0 supports all the functions in XDB Version 3.0. It uses the same naming conventions, security features and storage structure as mainframe-based DB2. But XDB's client/server development tool also supports multiuser access and connectivity with workstations running IBM's PC-DOS and OS/2, Microsoft Corp.'s Windows and Unix. Client workstations can connect with more than one XDB server, if needed, XDB said.

Pricing for the OS/2 system ranges from $2,000 to $30,000, depending on the number of users accessing it, Yao said. Users will need a PC with an Intel Corp. 80386 to 1486 microprocessor, a minimum of 6M bytes of main memory and a copy of IBM OS/2 2.0. Earlier versions of XDB-Server for 16-bit OS/2 were priced at $1,500 for a single-user copy. Yao said some 30,000 copies of the company's flagship XDB Workbench product are installed worldwide.

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While other mainframe disk companies have been slow to deliver high data availability, the new Symmetrix 5500 ICDA™ from EMC was designed for IBM and compatible mainframe sites that need continuous operation – 24 hours a day, seven days a week. With redundant hardware

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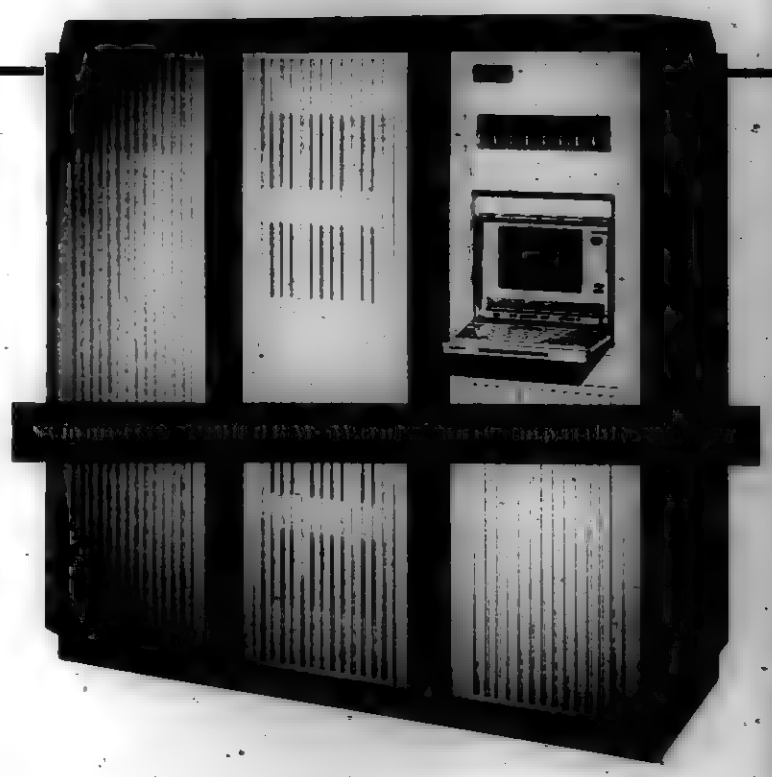
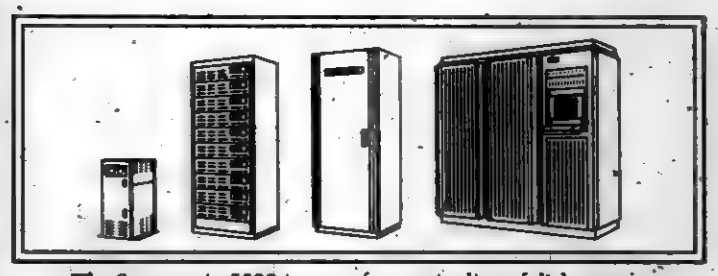


now brings the unbeatable combination of superior performance and continuous operation to high-end mainframe computing. What's more, EMC is shipping this product today.

The Symmetrix 5500 is the latest evolution of the high performance Symmetrix Series of Integrated Cached Disk Arrays (ICDA™), and



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

footprint and low cost of ownership that has become the hallmark of the Symmetrix Series. Over 1,000 Symmetrix installations world-

fore has e system this o available.

components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime, the Symmetrix 5500 offers the highest level of data availability you can find in the market today.

And, the Symmetrix 5500 incorporates the high performance, small

wide are proof of the widespread acceptance of Symmetrix ICDA™ technology.

To inquire about Symmetrix 5500 availability, please call 1-800-424-EMC2, extension LM64C.

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[redacted]

Electronic mail

CE Software Holdings, Inc. has announced that it will ship Version 2.6 of QuickMail by March 26.

QuickMail 2.6 is an Apple Computer, Inc. Macintosh server-based electronic-mail software product.

Version 2.6 provides client/server software, forms creation, remote access and enhanced administration tools. Gateways, mail filing and real-time, on-screen conferencing are also included in the system.

Enhancements have been made to QuickMail's Network Status Display, and the product works with AppleShare 3.0 and 3.0.1 and System 7 file sharing, the company reported.

A 10-user pack for QuickMail 2.6 costs $649.

➤ *CE Software Holdings*
1801 Industrial Circle
West Des Moines, Iowa 50265
(515) 224-1995

Casady & Greene, Inc. has released Snap Mail, an electronic-mail and messaging system.

Snap Mail was designed for the Apple Computer, Inc. Macintosh and offers automatic installation with supported features, including file enclosures, encryption, mail reply and forwarding, dated return receipts and forms.

Icons can be created and designed by users, and temporary alerts are available. System 6.02 can communicate with System 7.1 users. Snap Mail's only requirement is an AppleTalk network.

Five-packs costs $125, 10-packs are $200, and 50-packs are available for $900.

➤ *Casady & Greene*
22734 Portola Drive
Salinas, Calif. 93908
(408) 484-9228

Frontier Technologies Corp. has announced Super-TCP for Windows, an electronic-mail application.

The product offers full Multipurpose Internet Mail Extension that enables users to send and receive multimedia/multipart messages across Transmission Control Protocol/Internet Protocol networks, the company reported.

Adobe Systems, Inc. PostScript images, database files, graphic files, word processor files, spreadsheets and audio and digital video messages can now be sent and received by Microsoft Corp. Windows users.

Super-TCP for Windows costs $495.

➤ *Frontier Technologies*
10201 N. Port Washington Road
Mequon, Wis. 53092
(414) 241-4555

Applications

Microdyne Corp. has announced 3270 Workstation for Windows emulation software.

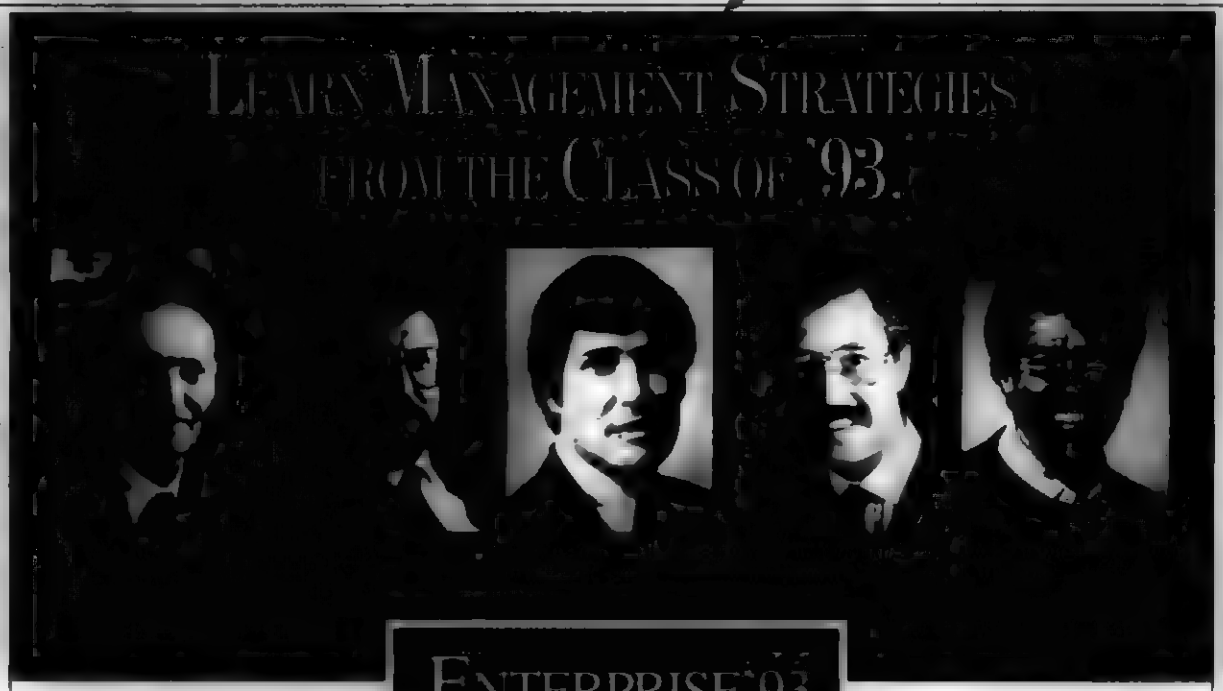
The packages include full-featured, icon-based 3270 emulators created for the Microsoft Corp. Windows operating environment. They offer icons, extensive graphics and point-and-click functions and were designed to simplify the most complex 3270 operations, the company reported.

The 3270 Workstation for Windows is available in two versions: 3270 Cut Workstation for Windows and 3270 Multi Workstation for Windows.

According to the company, the 3270 Cut permits a single mainframe session access across coaxial attachments, while the 3270 Multi provides for up to 26 mainframe sessions across industry-standard Token Ring and Synchronous Data Link Control attachments.

Pricing begins at $350.

➤ *Microdyne*
207 South Peyton St.
Alexandria, Va. 22314
(703) 739-0500



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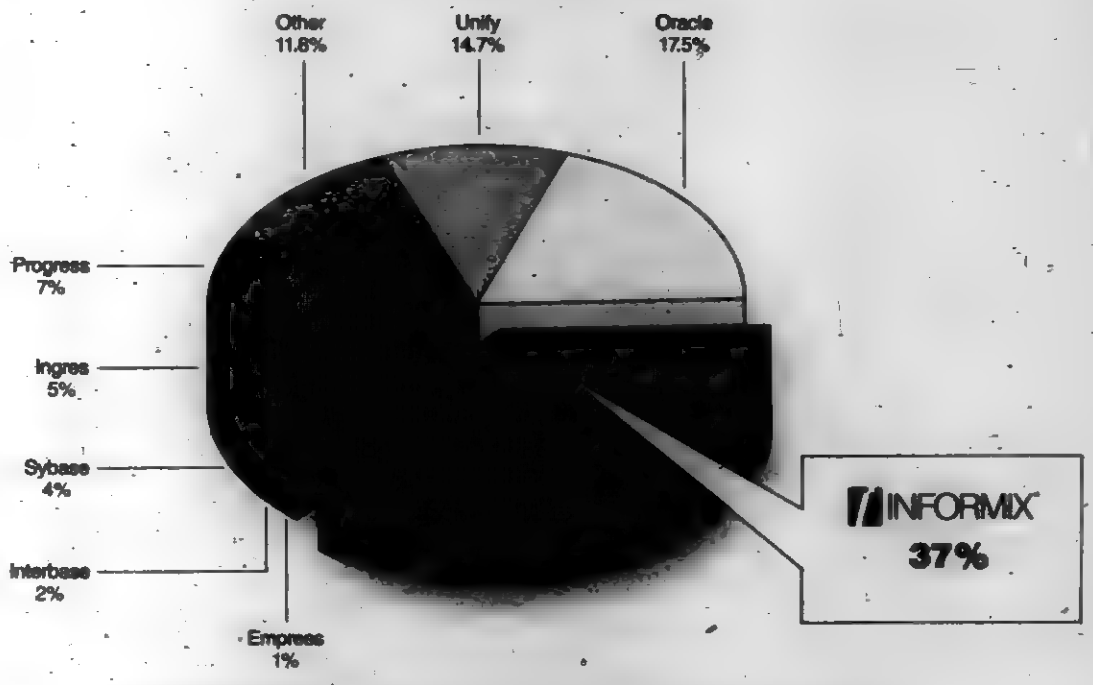

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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Smart hub vendors flock to switching

By Joanie M. Wexler

■ While Ungermann-Bass, Inc. recently became the first hub vendor to slap a ship date on its "ATM-like" LAN-per-port switching module [CW, Feb. 22], several of the company's competitors have indicated they also will blend such capabilities into their gear.

"LAN switching," which is becoming the rage among hub suppliers, gives individual computer users their own private local-area network. This increases and guarantees bandwidth to each node. Because bandwidth is guaranteed, users can run delay-sensitive traffic, such as voice and video, on today's LANs.

"We will see similar announcements from all the hub vendors within the next 12 months," said Dave Passmore, vice president and service director of local-area communications at Gartner Group, Inc., a Stamford, Conn.-based research and consulting firm.

Bytex Corp., for example, plans to offer an Ethernet switching module in 1994 prior to supporting Asynchronous Transfer Mode (ATM) in the 1995 time frame, according to William S. Starper, corporate vice president of product marketing.

ATM is a higher speed version of the LAN switching concept that brings several other capabilities, such as mixing and matching node speeds, to the table.

Similar murmurings about LAN switching and ATM migration have come from such companies as hub market leader Cabletron Systems, Inc., Synoptics Communications, Inc. — through an alliance with Ethernet switching company Kalpana, Inc. — and Chipcom Corp.

On the bandwagon

In addition, according to analysts, Synoptics plans to roll out a stand-alone ATM switch at the Interop trade show in Washington, D.C., early next month. If the switch materializes, Synoptics would join Adaptive Corp. and Fore Systems, Inc. in that market.

Bytex also announced earlier this month that its network management software is available on Hewlett-Packard Co.'s OpenView platform. Bytex and Chipcom, until the UB development, had a technology advantage in network management, in that their "per-port switching" capabilities allow a limited set of virtual LAN configuration capabilities. These capabilities were part of the UB announcement and are inherent in ATM technology.

These management features allow network administrators sitting at a workstation to move users and devices such as printers from one workgroup to another through point-and-click technology, rather than physically rewiring at the cabling closet.

Bytex's management software already runs on Sun Microsystems, Inc. SunNet Manager, IBM's NetView 6000 and other Unix-based platforms.

The OpenView compatibility "is a very smart move because that's a very accepted platform," said Charlie Robbins, director of communications research at Aberdeen Group, a consulting firm in Boston. Not supporting that OpenView "might have locked them out of some accounts."

By year's end

Bytex said it plans to ship new automated network management applications before year's end for its hub to lower customers' LAN operations costs. The applications include programming the network to automatically reconfigure at certain times of the day or when it hits specified traffic levels and an automatic departmental billback system.

Future directions include incorporating expert system technology into the platform, Starner said.

Simultaneously with its OpenView announcement, Bytex said it will ship a $4,995 low-end hub for lightly populated branch offices (12 to 24 ports) next month with a limited degree of modularity, and that a 16-port nonmodular version would likely emerge by the end of the year.

Off list

Forty percent of the companies listed in the Fortune 500 15 years ago are no longer listed today, according to consulting firm DMR Group, Inc. To stay on the list, companies must employ technologies such as LAN switching and virtual-LAN reconfiguration coming to smart hubs to break down traditional hierarchical walls and dynamically set up teams to work together across the enterprise, DMR Group said.

Manufacturing

Ford, Mazda put car quality on-line

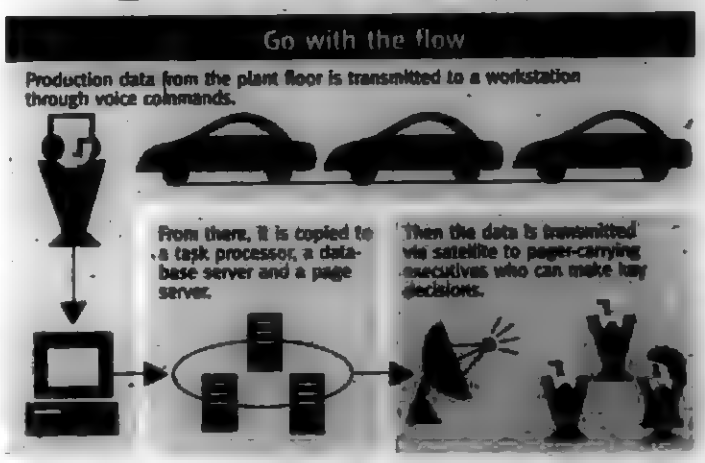
By Lynda Radosevich
FLAT ROCK, MICH.

The word "kaizen" is Japanese for a business philosophy of constant improvement. You can find the word written on bulletin boards and the concept depicted in murals on the manufacturing floor at Auto Alliance International, Inc. (AAI), the venture between Mazda Motor Corp. and Ford Motor Co. that produces the Ford Probe, Mazda 626 and Mazda MX-6.

To help implement kaizen, the alliance has launched a quality information management system (QIMS). The system instantly delivers information collected by inspectors on the plant floor about problems that prevent cars from shipping.

The information is compiled every six minutes and made available to managers, engineers, analysts and executives via nodes on a local-area network.

Although this was a big improvement over previous paper and pencil systems, the company has gone one step further and found a way to get the data into the hands of 70 managers and executives wherever they are, using pagers.



"There are some people that say, 'You aren't going to change manufacturing or make an improvement with just the data.' That is correct," said Kasey Kasemodel, an analyst at Mazda Systems Service of North America, the group in charge of developing QIMS. "But you also aren't going to make any changes unless you have the information, so this is just one step in being able to improve the quality of the vehicles."

Immediate info

Before QIMS, it took roughly 80 hours for data collected on the production line to reach decision-makers who could address problems, Kasemodel said. In addition, it was difficult or impossible to study the history of problems because the reports were rigidly formatted and distributed on paper. Now, information is available almost immediately, and custom reports can be generated in minutes.

While the impact of getting data faster is hard to measure precisely, response time to problems "has definitely improved," according to Joe Silvestri, senior staff engineer at AAI.

In addition, the company saves administrative and personnel costs because fewer people are needed to collect and distribute the data.

The half-million-dollar investment in hardware, software and programming hours will pay back in less than eight months, Silvestri estimated.

Inspectors check every vehicle and record problems on a ticket that accompanies the vehicles to the end of the production line. There, final inspectors speak into headsets equipped with Task Man-

Ford, Mazda, *page 52*

ON SITE

Auto Alliance International, Inc.
Flat Rock, Mich.

Challenge: To collect data on problems with cars at the end of the manufacturing line and make it available as soon as possible.

Objective: To increase number of cars that go straight through manufacturing line without any problems.

Technology: Voice recognition software, radio transmitters, Token Ring networks, client/server databases, pagers.

IBM, Raylan offspring puts Token Ring users on fiber

By Joanie M. Wexler

IBM and Raylan Corp. recently served up a device that allows Token Ring nodes cabled through IBM's 8230 smart hub to communicate across optical fiber.

The 8230 Fiber Optic Lobe Access Module will likely appeal initially to niche Token Ring shops, such as interference-prone manufacturing floors, that are cabling large buildings and campuses, users and analysts said. The reason is that running Token Ring over fiber via the module alleviates the distance limitations of copper wiring.

This allows users to conserve real estate by consolidating wiring closets and to eliminate investments in copper-to-fiber conversion gear previously needed to achieve longer hub-to-desktop distances. Token Rings of 16M bit/sec. speeds can run across fiber up to 1,000 meters, while copper wiring supports them for just 100 or 145 meters, depending on wire grade.

IBM co-developed the module, which lists for about $1,500 and is scheduled to ship next month, with fiber networking company Raylan in Menlo Park, Calif. Because fiber cable costs have dropped to about even with copper, Token Ring sites interested in the security and upgrade potential of fiber can install the medium pervasively, explained Bob Love, senior engineer of IBM's Networking Systems group in Research Triangle Park, N.C.

For example, the Mid-Hudson Regional Computer Center for the Alstair County Board of Cooperative Educational Services in New York, an 8230 shop, said the fiber module would allow them to consolidate wiring closets and save space and money on additional hubs and wiring in the schools it supports.

"Plus, [having all the intelligence centralized into fewer closets] makes it easier to manage the whole thing," said Kevin Conero, computer coordinator.

Good reason

The four school districts supported by the center are motivated to move to a fiber infrastructure because "the big thing in education is multimedia and interactive voice and data," Conero said. "Fiber [bandwidth] will hold us over for many years to come," while copper will be outdated more quickly, he said.

Previously, Conero was limited to running Token Ring over fiber in a backbone configuration — not to the desktop — because he could not afford the $1,500 price tag of each IBM 8220 copper-to-fiber converter needed to wire every node, he said.

Most hub vendors do not offer fiber modules for their gear, according to Aberdeen Group, a consultancy in Boston.

Part of the reason could be that the standard for running Token Ring local-area networks over fiber is not yet complete. However, it is in final stages of approval, said D'Arcy Roche, president of Raylan.

All in one

In other Token Ring hub news, Racal-Datacom, Inc. said last week it has crammed all the functions for connecting and managing a 16-user Token Ring network onto one $2,995 module that snaps into its Interlevel smart wiring hub.

The goal of consolidating Simple Network Management Protocol management and Token Ring connectivity onto a single module, company executives said, is to accommodate IBM-centric customers looking to move to Token Ring local-area networking in branches without breaking the corporate budget.

Blending functions onto one module, explained Scott Wieder, Racal's director of product marketing, means users make fewer card investments and have more slots free to expand the network.

Racal also rolled out a second $1,995 card that connects up to 16 additional nodes that can be managed under the chassis umbrella. The design reportedly allows the hub to support more than 200 Token Ring users in an 11-inch-high space. — *Joanie M. Wexler*

IBM unveils entry-level NetView

IBM recently announced an entry-level version of NetView/6000, which is said to be a third of the price of the original RISC System/6000-based system for managing Unix and Transmission Control Protocol/Internet Protocol networks [CW, Feb. 1].

The company also announced Trouble Ticket/6000, a set of integrated applications for tracking and coordinating responses to network problems from the first alert through resolution.

The package will be able to exchange trouble tickets with IBM's Info Man, a host-based program for keeping track of problems. This will enable NetView/6000 users managing local networks to coordinate problem resolution with network control center operators on IBM's NetView "without a lot of phone calls," IBM spokesman Bill Warner said.

Priced at $12,500, Trouble Ticket/6000 is available now for NetView/6000 Version 1. It includes an Ingres database access feature.

IBM also announced that it now has 35 members in its NetView/6000 Association of vendors who have committed to delivering applications for its network management system.

➤ *IBM Networking Systems*
P.O. Box 12195
Dept. 83-A, Building 002
Research Triangle Park, N.C. 27709
(800) 426-2255

Micro-to-host

Wall Data, Inc. has released Rumba for VAX software.

Rumba for the VAX is part of the company's PC-to-host connectivity product line and offers Microsoft Corp. Windows users the ability to fully and transparently connect to Digital Equipment Corp.'s midrange and mainframe computers, Wall Data said.

Features include a history buffer, split-screen file transfers, Wall Data TrueType VT terminal fonts and an on-screen VT terminal keyboard. Intelligent macros plus an Emulation High Level Language Application Programming Interface are also provided. Hot links, color remapping, context-sensitive Help, keyboard remapping and Dynamic Data Exchange are standard Rumba features.

Rumba for the VAX costs $295 for a single-user license.

➤ *Wall Data*
17769 Northeast 78th Place
Redmond, Wash. 98052
(206) 883-4777

Systems Network Architecture

Teubner & Associates, Inc. has announced A-Net and the A-Net Login Server for IBM's AIX.

According to the company, the products provide IBM block-mode 3270 terminal users access to applications on the RISC System/6000. A variety of full-screen AIX applications can be accessed by 3270 users via A-Net's industry standard ASCII terminal emulations including Digital Equipment Corp.'s DEC VT200. A Systems Network Architecture (SNA) connection between the Enterprise System host and the RS/6000 is a requirement; it eliminates the need for terminals, protocols or non-SNA networks.

A-Net prices range from $10,000 to $33,000. Prices for A-Net Login Server for AIX range from $1,500 to $12,000.

➤ *Teubner & Associates*
623 S. Main St.
Stillwater, Okla. 74074
(406) 624-2254

Ford, Mazda

CONTINUED FROM PAGE 51

ages voice recognition software from Vocollect, Inc.

The inspectors have a 600-word vocabulary to describe what is wrong with the vehicle. Every time a car is completed, the information is transmitted by radio frequency to a workstation 70 feet away. The station is connected to a Token Ring network via fiber cabling that runs to the ceiling of the production area and continues on to a task processor in a computer room.

Mazda Systems Service installed fiber throughout the production building when it moved there in December 1991 because "in addition to fiber's impervious nature to disturbances, we now have capacity from now until ... there is no future that fiber could not accommodate," Kasemodel said.

At intervals of one minute, an Intel Corp. 1486-based task processor on the network establishes a peer-to-peer connection with the workstation on the plant floor, uploads the data, generates reports and creates database files.

"The reason we didn't send the data directly to the file server is that if we had a problem with the file server," it would disrupt data collection on the plant floor. By sending data to the workstation, "if the network dies, the inspectors can still collect data," Kasemodel said.

What's the connection?

A database server lifts the data from the task processor, and users throughout the network query the database and generate reports using a Microsoft Corp. Excel spreadsheet program. The users are connected to three 16M bit/sec. Token Ring networks with adapter cards from Madge Networks, Inc. The three rings are connected using Synoptics Communications, Inc. hubs.

Mazda Systems Service used Excel to develop the client/server report system because Excel is the AAI standard spreadsheet and users are comfortable with the software. Using the Excel program, users can click on a certain field, such as Top 20 concerns, and generate a custom report in a matter of minutes.

Writing the complex Excel macro was the project's biggest challenge, Kasemodel said.

Meanwhile, condensed data, such as the number of cars that come through the system, is sent every two hours via modem from a page server to a host computer and then is broadcast to roughly 70 unit leaders, managers and executives carrying pagers from PacTel Corp.

"The way we are disseminating information is changing how people look at data," Kasemodel said. "They don't have to seek out a PC; the data comes to them, and that keeps people focused on quality."

Plant facts

AAI is a 50/50 joint venture between Mazda and Ford.

It produces 240,000 vehicles per year.

Each car travels 13 miles in the course of production.

After the metal pieces of the car are cut out, it takes about 32 hours to produce one car.

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IBM Business Partner

InterBase: Serving two worlds

Borland positions DBMS to please two distinct groups

By Jean S. Bozman

As Borland International, Inc. positions its InterBase database management system, it must deal with an InterBase user community divided into two camps: longtime users who turned to the InterBase relational database engine in the late 1980s to downsize their minicomputer applications and a new group of PC local-area network users who want to upsize from desktop databases to an industrial-strength database server.

The needs of the two groups are quite different, users at 10 InterBase sites said during recent interviews. Many of those who chose InterBase for its ability to store images and geometric data types bought the product from InterBase Software Corp. and rely on their own resources for database maintenance. Often found at aerospace companies such as Lockheed Corp. and The Boeing Co., they tend to run InterBase on networked Unix workstations or traditional minicomputers.

A newer group of users tends to purchase InterBase as a robust database for client/server applications. They are buying it directly from Borland, which acquired InterBase when it bought Ashton-Tate Corp. in 1991. Many of them accept Borland's stated strategy for InterBase as a hub for Borland's Paradox and dBase desktop databases and Integrated Database Application Programming Interface middleware. The combination package appeals to small information systems shops moving into relational databases for the first time, users said.

InterBase, *page 57*

Don't bet the farm on it

InterBase users are often proud of their self-reliance. Many learned to troubleshoot their own problems and invented workarounds during the last six years when their product passed from start-up InterBase Software to Ashton-Tate to Borland.

But longtime users seem content to do their own maintenance. "The only time you really hear from an InterBase customer is when you first sell the thing to him," said Donald De Palma, co-founder of InterBase and now a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "They have a package of tools that lets them build whatever they want." These tools include precompilers for C, Fortran, Cobol, Ada, Pascal and PL/1.

Aficionados like the long list of InterBase bells and whistles, but newcomers may not like the degree of technical expertise required to build new applications. InterBase users still do not have many client/server tools, and they have few Microsoft Corp. Windows development tools.

But that is about to change. In six months, Borland will provide a SQL Link product to tie InterBase to its new Paradox for Windows object-oriented desktop database tool set. Industry analysts said Uniface, Inc. in Alameda, Calif., is also working on an InterBase driver for its database tool kit. Borland promises that its IDAPI middleware will connect most PC front-end tools to InterBase.

Still, InterBase is likely to be low on the porting list for many third-party tool kit makers. That is just a matter of market share: Industry analysts estimated there are roughly 10,000 InterBase licenses worldwide, although Borland claimed the installed base is 20,000.

"InterBase was a fine little company," said Chris LeTocq, a senior research analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. "But some will question whether the InterBase product is big enough to bet their future on it."

Big iron bills drive Armco to outsource

By Mark Halper
MIDDLETOWN, OHIO

To an information systems director considering outsourcing a data center, a prospective outsourcer's pitch can sound like the old line, "Heads I win, tails you lose."

Such may have been the case at Armco Steel Co. as it began weighing outsourcing options last July, a process that culminated last month in a 10-year contract with IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary.

George Homand *says outsourcing will let Armco focus on manufacturing steel*

Armco and ISSC are now enjoying the honeymoon, following a marriage that George Homand, director of information resources management at Armco, said "will allow us to concentrate on our core business of making steel." Armco anticipates the arrangement will save $100 million in IS costs. Unlike other outsourcing contracts, the Armco/ISSC deal does not provide Armco with an up-front cash infusion, according to Mark Essig, vice president of employee relations at Armco.

Driven by upgrade costs

There is a touch of irony in the company's turning to IBM's outsourcing unit because the compelling economic factors in Armco's decision, Homand said, include upgrade fees that Armco had been paying to IBM.

"If you have a computer that's 60 MIPS and you need to go to 65, but the next computer up is 100, you have to go for it," Homand observed.

Such was the case last June, when Armco upgraded from an IBM 3090 mainframe to an IBM Enterprise System/9000 Model 740, a move that entailed buying a lot of excess capacity, Homand said.

In choosing to outsource, Armco simply opted for a lower cost computing solution from its supplier — one that took a lot of IS worries off its industrial mind, full of core material such as ingots, furnaces, rolling machines and tariffs.

In headier days, Armco may have made do with what some erstwhile outsourcers have tried: using its data center to bring in revenue by selling excess capacity. However, some of those companies found that approach was easier said than done.

Furthermore, Armco's financial condition — the company lost $250 million in 1991 on sales of $1.5 billion and anticipates a loss for the year ended Dec. 31 — has it looking for ways to save money and does not create an environment for business diversification.

But the power of excess computing was not lost on ISSC, which, having outsourcing as its raison d'etre, plans to use the excess capacity in Middletown to process for other ISSC customers.

Armco, *page 57*

ES/9000s gathering speed at high end

IBM's Enterprise System/9000 mainframe family has been slow to take hold, according to a new survey by Computer Intelligence in La Jolla, Calif. By mid-1992, almost two years after its introduction, there were only about 3,600 ES/9000s installed.

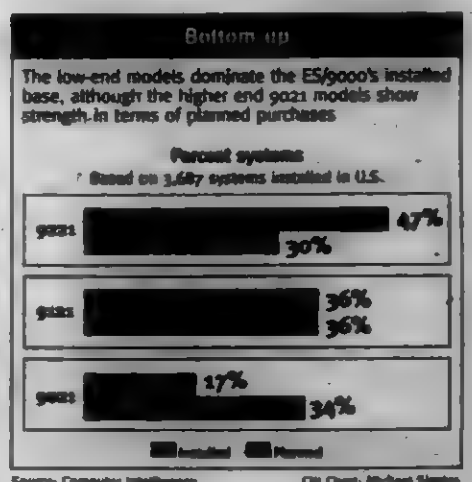
Many of the new mainframes in place — 47% of the installed base — are low-end, rack-mounted models. The air-frame models account for 36% of the ES/9000s installed, with the water-cooled high end making up about 17% of the base.

In 1992, about 55% of the 9221 models — the rack-mounted and air-cooled machines — went in to replace older Model 4300 mainframes. An additional 23% of those systems replaced by 9221s were 9370s. However, of all the 4300s and 9370s replaced in 1992, only 11% and 50% of the users, respectively, migrated to an ES/9000, with the rest going to other platforms, Computer Intelligence said.

Of the water-cooled ES/9000 models installed in 1992, Computer Intelligence said, 45% replaced Model 4300 mainframes. And 29% of the systems replaced by the ES/9000 models were water-cooled 30XX systems. Still, only 19% of the 4381s replaced in 1992 were succeeded by a 9121.

On the other hand, according to Computer Intelligence, future purchase plans are pretty well divided among the three ES/9000 processor groups, with large-horsepower boxes the primary beneficiaries. "IBM's business will be at the high end," said Karen Landis, an analyst at Computer Intelligence. "It is where the most interesting announcements are, and it is what IBM is really concentrating on."

—*Johanna Ambrosio*



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Armco

CONTINUED FROM PAGE 55

The caveat, Homand noted, is that the steel company "has the right to agree to who they bring in."

If ISSC were to win a contract with competitor LTV Corp. across the state in Cleveland, for instance, Armco might block ISSC from bringing LTV into the Armco center.

Meanwhile, Homand is looking forward to gaining benefits above and beyond cost savings and core business concentration from the ISSC contract.

"This gives us bench strength," Homand said, noting that ISSC can draw on greater numbers of experts in any technological field than Armco could.

"In today's environment, if we need additional support in, say, EDI, we only have a few people knowledgeable in it, and we wouldn't be able to hire a specialist," he said.

Homand is looking forward to gaining benefits above and beyond cost savings from the ISSC contract.

As for the cost savings, a portion will come out of computer leases that ISSC absorbs. The outsourcing company is taking over leases for IBM equipment used for payroll, finance and inventory, as well as for a Prime Computer, Inc. machine.

A separate operation within Armco will continue to operate computers that support manufacturing.

Holding onto its VAX

Armco will continue to operate its own Digital Equipment Corp. VAX 6610, a machine it purchased a year ago that it uses to support its steel rolling scheduling.

Armco had no payments left on the DEC machine and therefore had less incentive to hand it over to ISSC than it had with the leased equipment, Homand said.

ISSC is offering jobs to all 90 IS staff members who survived a round of layoffs last summer. A minority of the 90 will be asked to relocate, Homand said.

The employees are scheduled to transfer by April 1. Homand and Essig will remain at Armco, as will Dick Sunderman, manager of application development, and John Beck, senior staff planner. Sunderman and Beck will continue to report to Homand, and all three will act as liaisons to ISSC, which will run application development and data processing.

DEC's Polycenter easing integration

By Melinda-Carol Ballou

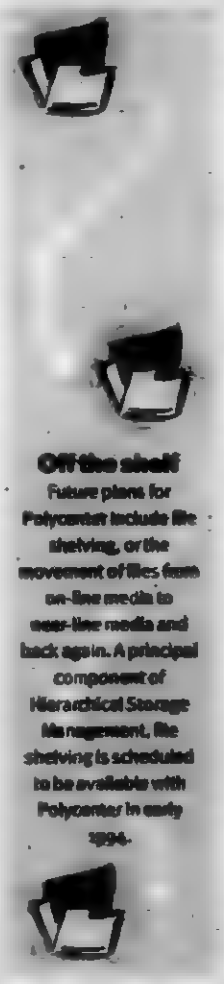
Digital Equipment Corp. improved its new Polycenter network and systems management offerings with the introduction of Polycenter Console Manager Version 1.0 and enhancements to nine other products last month.

The goal of Polycenter is to allow users to integrate applications for all management functions within the Polycenter framework, which now supports the Motif graphical user interface, better execution of scripts and collection of events, DEC officials said.

"We recognize the need to manage the new distributed computing environment, where you have the mainframe end of the business downsizing and the PC LANs upsizing," said Dennis Biedrzycki, Polycenter marketing manager.

Accompanying this release of Polycenter is a console for systems and network management that lets users handle up to 200 systems — from Hewlett-Packard Co. and Sun Microsystems, Inc. platforms to DEC VAXs, print servers and LAN bridges — over both wide- and local-area networks using Telnet and DEC's Local Area Transport protocol.

The Console Manager runs on Ultrix and increases the availability of data center resources by providing customizable event monitoring, detection, filtering, notification and corrective action using a Motif interface, DEC said.



Off the shelf
Future plans for Polycenter include file shelving, or the movement of files from on-line media to near-line media and back again. A principal component of Hierarchical Storage Management, file shelving is scheduled to be available with Polycenter in early 1994.

Positive reception

Industry analysts were favorable in their assessment of the product.

"Users don't want to have to look at half a dozen screens to manage systems and networks; they want all their information in one place and in one format," said Chris Christiansen, an analyst at International Data Corp., a market research firm in Framingham, Mass. "This addresses legacy systems and integrates them with standards such as DME compliance."

Some users agreed.

"If it works as an access module [to network and systems management], that would be good," said Sandra Wallace, a member of the technical staff at Mitre Corp. in Bedford, Mass. "They also offer components which allow you to do remote management of Ultrix and VMS through Unix systems, and I like the Motif interface."

Christiansen said DEC is on the right track with Polycenter but must do a better job of getting the message across.

In addition, DEC has improved Simple Network Management Protocol capabilities for the Polycenter Network Manager. The company is offering support for 8mb backup with the Storage Library System and also for seven-cartridge, high-end unattended backups. The Security Intrusion Detector will offer support for Ultrix and Sun's SunOS operating systems. The Security Compliance Manager will support the IBM AIX and HP/UX operating systems. Software Distribution for Polycenter will now install operating system and layered software for Alpha AXP servers on Open VMS, as well as automatic file backup and restore, distribution and installation of network addresses and software licenses.

DECtrace now offers a monitor component as a complement to the DECtrace Collector and Reporter, which collects event-level performance data for any application and is used to characterize the application's performance for tuning and planning resource requirements.

Polycenter Framework Version 1.3 will ship this month and is priced at $1,000, regardless of the processor. The Console Manager, which is slated to ship next month, is priced at $750 per device or $80,000 for 200 devices.

Borland's InterBase

CONTINUED FROM PAGE 55

"The high-end users of InterBase usually understand computers at a relatively intimate level," explained Ted Migliautsch, who designs InterBase servers for marketing applications based on database queries. "The PC person plugs it in, and it had better work," said Migliautsch, vice president at Migliautsch Marketing, Inc. in Milwaukee.

Differences will show

The natural division of the installed base will show itself at the InterBase user meeting in San Diego in May. "It's the downsizers vs. the upsizers," said Kim Everingham, a senior systems analyst at SRI International, Inc., a Menlo Park, Calif., research institute. "The downsizers know all about tuning the database, and the upsizers think it's all very simple to administrate." But new InterBase sites may not have the expertise to troubleshoot their own database problems, he noted.

Sites such as SRI, which runs one InterBase database on a Sun Microsystems, Inc. workstation and another on a Hewlett-Packard Co. HP 3000 MPE/IX, supply much of their own technical support. But SRI also gets hot line support and maintenance from Cognos, Inc., a major InterBase value-added reseller in Ottawa. Cognos also sells its own front-end development tools, including PowerHouse for InterBase.

Praxair, Inc., a Tonawanda, N.Y., firm that designs gas-processing plants, uses InterBase's multigenerational architecture to allow five or six designers to view the same data simultaneously. But Praxair's programmers also do their own database tuning and support. "We don't have a lot of interaction with Borland because we acquired the product before it came to Borland," said Don Dupree, manager of computer-aided design and engineering at the firm.

The California State Assembly in Sacramento receives training and support from Cognos, which installed InterBase, rather than from Borland. The assembly just finished a two-year conversion from scores of Digital Equipment Corp. MicroVAXes to nearly 100 Sun Unix workstations. All of the Sun machines run copies of InterBase, and all are peers in a statewide network that can be accessed by hundreds of users in assembly representatives' offices, from San Diego to San Francisco.

As more InterBase sites move to client/server applications, Borland may yet reap the benefits of owning the rights to the InterBase database engine. Borland plans to sell its Paradox database and PC spreadsheets to existing InterBase users and sell InterBase to new users.

For example, the California assembly's IS agency plans to convert from character terminal interfaces to graphical user interfaces. "Most of our users are using ASCII terminals to the InterBase workstation servers," said John Hutchinson, a systems analyst at the assembly. "We're just now defining what our PC environment will look like." Current applications are developed with Cognos' PowerHouse for Windows tool kit, he said, but Borland's front-end client/server tools, such as Paradox for Windows, will also be considered.

[redacted] Brief

Oracle DBMS for Unix

Oracle Corp. has begun general shipments of Unix versions of the Oracle 7 database and of its Trusted Oracle 7 secure database. Announced in June, Oracle 7 was shipped to Digital Equipment Corp. VAX customers first, on Dec. 31. Oracle also said it has reached a $24 million settlement of a class-action lawsuit brought by shareholders who lost equity during Oracle stock's rapid decline in 1990. The plaintiffs alleged Oracle had "violated federal securities laws and state common law by artificially inflating" the price of Oracle stock, according to a report Oracle filed with the Securities and Exchange Commission. Oracle said it has settled the suit to resolve the litigation but maintained the allegations are untrue.

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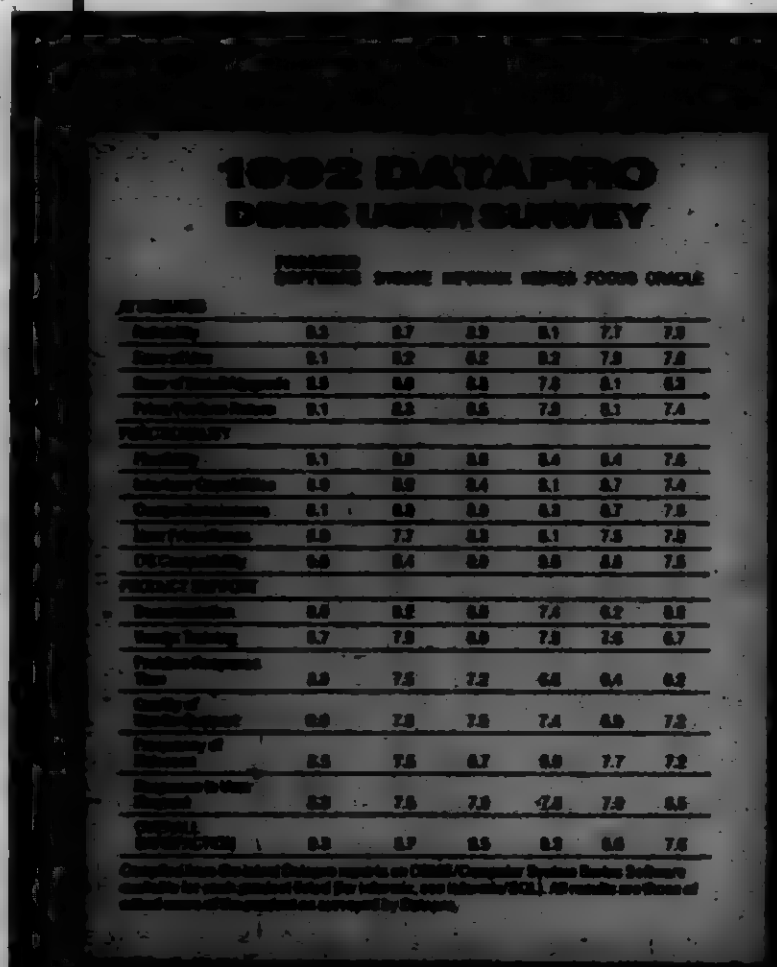

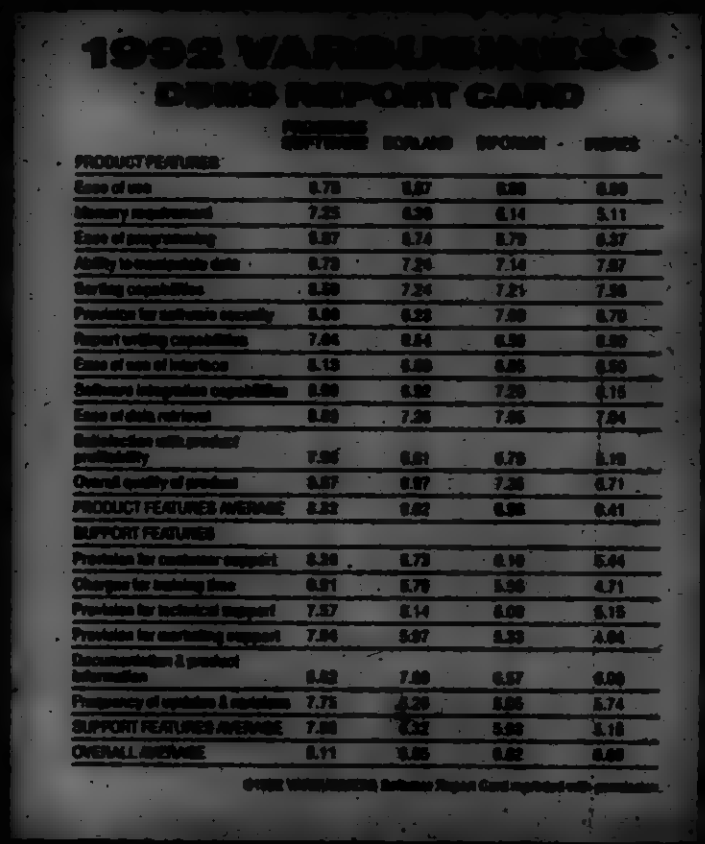

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Visualization making inroads

By Maryfran Johnson
WALTHAM, MASS.

With the newest release of its visualization software development environment now shipping, Advanced Visual Systems, Inc. (AVS) has expanded a bit beyond its technical and scientific roots into a few commercial shes on Wall Street.

The privately held software company, spun off from Stardent Computer, Inc. in 1991, said it hopes to broaden the niche for visual computing, which refers to the use of graphics-based applications for complex data visualization and analysis.

AVS software is a development environment used to build customized applications in medical imaging, engineering analysis, financial modeling, environmental studies and oil and gas exploration and production.

With the introduction last month of AVS5, the vendor expanded the spectrum of tools used to develop applications for processing and displaying complex data and images. AVS5 also incorporates new imaging and volume rendering features culled from the AVS acquisition of Sun Microsystems, Inc.'s SunVision technology.

"By taking the SunVision tools and making them into AVS modules, we now have access to a number of the most common image processing techniques," said Marc Kessler, an assistant professor in the radiation oncology department at the University of Michigan in Ann Arbor. "We were in the habit of having to write these things ourselves."

At Harvard Medical School, AVS software has been used both for joint commercial development in neurosurgical treatment and radiation therapy and for prototyping applications, said Dr. Hanne Kooy, an assistant professor at

Visualization, *page 60*

Gangbusters

"Visual computing, as a concept, is still fairly unknown, but it's going to become much more important as multiprocessor [systems] start coming on like gangbusters with all that additional power," said Marcia Brooks, editor of the "Anderson Report," a technical computing newsletter in Santa Ana, Calif.

Garry Ray

Internet wires users to the world

As a developer, you know the heat is on. The business press and politicians sing arias to downsizing, innovation and education. But the accounting department is questioning the $35 book that you need to sharpen your technical skills. Employee education, always great for lip service, is usually the first benefit to suffer in a budget crunch.

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Ray, *page 60*

4GL for OpenVMS increases customization

By Melinda-Carol Ballou

Users responded favorably to Information Builders, Inc.'s new release of Focus, the firm's fourth-generation language (4GL) for OpenVMS Release 6.5, which offers features that increase performance and the ability to customize reports.

Shared image applications increase the performance of Focus applications by letting users compile applications into object files that are then linked into sharable images using standard VMS services. When these images are installed, users will have the same benefits and performance enhancements experienced using 3GL-based shared images, company officials said.

"We've extended our 4GL into a new arena for large, multiuser applications so that organizations can get the productivity of a 4GL without paying the 4GL performance hit," said Melissa Webster, vice president of the digital division at Information Builders.

Information Builders added a compiler to Focus that lets users prototype and develop in the 4GL. The compiler will then generate the required machine code when the application is ready for production, she said.

"The advantage of having a sharable image is that it saves orders of magnitude on systems resources," Webster said.

Also new with this version of Focus are style sheets that let users create customized, operational reports that take full advantage of PostScript using multiple fonts, sizes and styles, for instance.

Positive reception

Users were enthusiastic about the new features.

"Before the shared image applications were available, it took a long time to move from screen to screen, but this has solved that problem pretty well," said Joe McCafferey, programmer/analyst at the Directorate Information Systems Delivery in Ottawa.

"One of the features we like is the style sheets, which let us use PostScript capabilities for our reports so that we can make them look better for our managers," said Bob Romocer, systems analyst at the Public Utilities Commission of Ohio in Columbus. "And the shared memory reduces the load on our machines and lets us use fewer resources."

Focus for OpenVMS 6.5 is available now. Prices range from $3,200 to $194,000.

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Visualization

CONTINUED FROM PAGE 59

Harvard's Joint Center for Radiation Therapy.

The appeal AVS software holds for financial and brokerage businesses lies in its ability to support the acquisition of real-time data, access large databases on multiple hardware platforms and work with complex analytical models.

"We're not replacing numbers with pictures, but the pictures can help identify which numbers to examine further," said Ian Reid, vice president of marketing at AVS.

The company, with revenue heading toward $5 million, officially opened its doors in January 1992 and has since built its user base to 4,000 customers.

The AVS product includes a large suite of data visualization and analysis capabilities that incorporate both traditional visualization tools such as two-dimensional graphs and image processing, as well as advanced tools for three-dimensional interactive rendering and volume visualization.

AVS software runs on more than 20 Unix workstation and supercomputer platforms, and the firm recently added Cray Research, Inc.'s supercomputers, Digital Equipment Corp.'s Alpha AXP platforms and Data General Corp.'s Aviion systems to its roster.

Among the new features of AVS5 are the following:

- **Enhanced development tools:** A new release of Developers AVS and AVS Runtime Creation Kit includes support for ANSI-C and C++ modules and direct user interface control for application developers.
- **Expanded image processing:** With the addition of SunVision technology, AVS5 added more than 50 modules specifically developed for image processing.
- **Volume rendering:** SunVision tools also added direct 8-bit volume rendering for very large data sets such as 3-D seismic surveys.
- **Presentation modules:** Through a combination of new labeling, annotation and output modules, AVS5 allows users to combine presentation features for printed reports, videos and slide presentations.

The new version is shipping now, with the Developers AVS starter pack priced at $25,000. An AVS runtime license starts at $3,000, but decreases to $1,000 for high-volume developers. End-user AVS licensing starts at $6,500.

Client/server serves up data

By Gary H. Anthes
DES MOINES, IOWA

■ The Principal Financial Group has moved summary sales data from an IBM mainframe — where users previously could retrieve only canned output — to a client/server environment, where they can now get their hands on the underlying data.

The firm said the move has saved expensive mainframe cycles and disk storage while offering users greater flexibility for sales analysis.

The company, a $10.4 billion family of financial services concerns, used to devote 24 hours of IBM 4381 processing at month's end to produce 2,100 sales graphs for managers in the group and pension sales department. The graphs, generated by software from SAS Institute, Inc., were then reported out of IBM's Executive Decisions data presentation tool.

Because the system gave users the ability to view only predefined output, every combination of sales representative, office and region had to be plotted in advance in case someone might want to view that slice of the data. "The majority of them were not looked at in any given month," said Nancy Carley, compensation and research analyst. "How could you look at that many graphs?"

Now, monthly sales data is summarized in minutes on the mainframe and passed to a Novell, Inc. local-area network where it is preprocessed by the SAS software and stored on an AST Research, Inc. server. Sales managers with OS/2-based AST PCs then use SAS/AF, SAS's tool for interactive applications development, generating only the needed sales graphs.

Users, who are not technically trained, use a mouse to select a series of icons defining the graph to be generated, which then "pops up in a couple of seconds," Carley said. Sales histories going back five years and data such as current period sales goals are available, she said.

Life is simplified for systems administrators as well. Previously, when a representative was added, for example, someone had to update a number of screens to build indexes for any graphs affected by the hire. Now, simple table updates are automatically propagated through the system.

Tailormade graphs ahead

Although the new system is far more efficient and moves the data closer to the user, the data sets available for generating graphs are still predefined. The firm will soon receive a beta-test copy of SAS/EIS for OS/2, an object-oriented development environment for building executive information systems. That will allow users to tailor their own graphs and produce ad hoc reports and queries, Carley said.

"We're kind of in the middle now," she said. "We started out just being able to look at pictures. Now we're moving toward being able to work interactively with the data."

Carley said it took her roughly three months to program and set up software for the system.

Database app development takes a faster ride with Arcade

Applix, Inc. in Westboro, Mass., today is scheduled to announce Arcade, an object-based application development environment for rapid construction of client/server database applications on Unix platforms.

Scheduled for delivery in April, Arcade will reportedly enable programmers with no prior experience in SQL or C++ development — but with knowledge of Basic — to build complete graphical database applications, according to the company.

With support for both static SQL and dynamic SQL, Arcade can access information from any Unix-based database, according to the company. The initial release will support applications developed for use with Oracle Corp. and Sybase, Inc. databases. A release scheduled for later this year will be expanded to include databases from Informix Software, Inc. and the Ingres Products Division of The ASK Group, Inc.

Arcade will be released first on Sun Microsystems, Inc. SPARCstations and SPARCservers and will be priced between $1,000 and $2,000 per developer license. Company officials said Arcade is essentially an expanded but standalone version of Applix's ELF (Extended Language Facility) development environment, which is part of its Asterx office automation software.

The primary target market, company officials said, will be mainframe programmers involved in downsizing projects.

➤ *Applix*
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

Ray

CONTINUED FROM PAGE 59

the cost of a single college course, you can join discussions on software engineering, programming technique, tool selection and object-oriented development methodologies. The forum we're talking about is the worldwide Internet.

The Internet is a global network of thousands of host computers and probably a million or more users. Once the private domain of college students and research engineers, it now hosts hundreds of companies in varied industries. Universities and military contractors are still at the core of Internet activity (and support most of the hardware that makes the network possible), but commercial users now account for the bulk of the network's expansion.

Internet users share E-mail, software, computer time, technical treatises and plain old gossip. For example, you can obtain thousands of public-domain documents and tools using a program called File Transfer Protocol. For E-mail, there are gateways to all of the major services, including CompuServe and MCI Mail. Many companies have installed Internet gateways to their internal E-mail systems.

For most users, the hundreds of Internet conferences are the biggest draw. Collectively known as "network news," these cover everything from the absurdly trivial to the profound. For the inquisitive developer, there are dozens of conferences on computer technology, including at least 10 self-help groups dealing with a variety of programming languages, state-of-the-art discussions on object-oriented development, forums where developers can share experiences in CASE and the latest bot-headed arguments about "the best" operating system.

Gaining access

To participate in these conferences, you'll need an Internet account. Not too long ago, that was a problem: Accounts were available only to those at Internet sites such as universities and government organizations. Today, commercial use of the Internet makes it much easier to gain access.

If you're in a larger company, someone may have already installed an Internet node. Check with your Unix coders or a systems administrator to see if you already have a means to get on the network. Or you can become an advocate for installing a dedicated Internet gateway, but this can be a costly endeavor requiring hardware, a dial-up or dedicated network link, monthly fees and a systems administrator. Firms such as Sprint Corp. in Herndon, Va., and Advanced Networks and Services in Ann Arbor, Mich., can give you the details.

For most individual users, the simplest and quickest route may be a public-access provider. There are dozens of these throughout the U.S., including The Well in Sausalito, Calif., and The World in Brookline, Mass. Both offer the full range of Internet services for monthly fees of $10 to $20. You can also find local Internet providers with a smaller set of offerings (sometimes limited to E-mail) and correspondingly lower fees. However, it is best to go with a full service provider; you are unlikely to find network news conferences through a no-fee provider. Services such as CompuServe offer gateways to the Internet, but not network news.

Finally, you can get detailed information on the universe of Internet services from a book published by O'Reilly & Associates, Inc. in Sebastopol, Calif. Called "The Whole Internet User's Guide & Catalog," this 375-page directory by Internet authority Ed Krol will get you up and running pretty quickly.

Using the Internet may present a short learning curve, but once you get started, you'll find much that will stimulate and entertain you and keep you abreast of top development technology.

Ray is a Computerworld senior editor, application development.

To support gung ho company expansion, Publix Super Markets needed to create an agile **new IS** department. Reinventing old-guard IS, though, was like **battling**

Publix enemy no. 1

Publix's Daniel Risener *says strategy, not cost, drives key IS revamp*

inside

IS and corporate row: creating strategies. page 64.

Intelligence files: quick hits on hot topics. page 65.

By Mark Mehler

For Publix Super Markets, Inc., a proposed $9 billion expansion had the potential to add up to a lot of cabbage — but only if the information systems department could produce.

In 1989, the Lakeland, Fla., food retailer embarked on "Vision 2000," a huge, long-term effort to boost company sales to $25 billion by the year 2000.

To help keep ahead of rivals such as Winn-Dixie Stores, Inc. and A&P, Inc., the $16 billion privately held firm is planning a major expansion through the Southeast. It is an ambitious plan that requires huge support from IS.

But according to Daniel Risener, vice president of IS at the 400-store chain, until a three-year departmental re-engineering effort kicked in, his department did not have the resources to support the vision. "The systems getting built," Risener says, "were often things that team leaders dreamed up to keep their people busy."

Today, "make-work" projects are as out of place at Publix as rotten produce or stale bread. The company has overhauled its IS department, integrating two departments into a single group with a flat reporting structure. Structured job titles are gone, replaced by positions defined by "role functions."

Communication between user departments and IS has been streamlined by the centralization, too. As a result, projects can be implemented based on business impact, not how hot the technology is.

Analysts applaud the moves.

Joseph Ronning, a food retail analyst at Brown Brothers Harriman & Co. in New York, says today any supermarket chain must leverage technology to expand in the face of tiny margins and relentless competition.

But by moving into a new geographical area, Ronning notes, "you're talking about big logistical problems and high advertising costs." Such a giant rollout, he says, would be impossible without a strong technology infrastructure.

"This is a very low-margin business," adds Michael Sansolo, editor of *Progressive Grocer*, a trade magazine based in Stamford, Conn. "The leaders will be companies that can use technology either to increase sales and market shares or lower costs. Publix is one of the most respected supermarket chains, a class organization."

Hammers and wrecking balls

Company officials concede that Publix's technology use wasn't always so smart.

Publix enemy No. 1, *page 62*

Mehler is a free-lance writer in Jackson Heights, N.Y.

Publix enemy No. 1

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Three years ago, when Vision 2000 was drafted, the 225-member IS staff was deployed along traditional business lines, divided into two subdepartments: technical support and IS development.

The latter in particular, Risener says, was hierarchical, inflexible, narrowly focused, slow-moving and bureaucratic. Each development team was devoted to certain business systems, he says, that "had little communication with each other." Worse, there was no way to share or move resources to address business priorities.

Realizing they had a serious problem, IS called in Michael Hammer, a Cambridge, Mass.-based celebrity re-engineering consultant. IS also sought help from a "best practices" study done by the Prism group at CSC Index, Inc., also in Cambridge. These influences led to a three-year effort to better align IS development with the goals of Vision 2000.

The Hammer-inspired team set about smashing existing functional boundaries, including combining the two subdepartments, creating project managers and instituting peer reviews (see story below).

According to Risener, these key decisions and others were driven by strategy, not cost. In fact, Risener claims Publix didn't even analyze project costs and instead from the start saw Vision 2000 as an ongoing process.

To help employees understand the changes, Publix IS management went to great lengths to broadcast goals. The team kicked off with a special theme dinner for IS staff members at a local country club. It also published monthly newsletters to keep staff abreast of changes and held regular "town meeting-style" open discussions to get staff feedback.

Early signs are positive

Even though it's early, employees seem sold on the new approach. Chris Brabbs, a senior systems analyst and previously a project manager, says she believes these planning sessions have already resulted in improved business focus.

For example, Brabbs says, "We're working now on a keypunch scanning and validation project. We're having some success in getting all the retail divisions to agree on how it should work, its functionality, so everybody ends up being pleased. This could never have happened under the old organization."

Ken Deal, user coordinator for warehousing and distribution, lauds the plan's flexibility and the vision it has helped foster. "Had Hurricane Andrew hit us and knocked our [south Florida] warehouse out of commission," he says, "we could not have shifted distribution to another location. IS is coming out of its tunnel vision, no longer looking only at what's good for one distribution center."

Consultants also see a lot to like in the effort. In fact, Ouellette & Associates Consulting, Inc., a Bedford, N.H., consultancy, liked the efforts so much that it awarded Publix its fifth annual "Developing The Human Side of Technology Award."

Another consultant familiar with the project, Sarah Kaull at CSC Index, says she likes the practice of giving workers a major say in their career paths and not penalizing those who choose a nonmanagerial track.

"Publix recognizes that if it wants to develop skills, [the company] has to have a salary structure that provides equal compensation," says Kaull, director of Prism. "What you have in most IS organizations is a structure that encourages the Peter Principle: Good systems analysts wind up being poor managers."

Despite such praise, it's clear that much work remains.

Moving from management

Campbell says several new project managers, feeling like fish out of water, have given up in frustration and moved back to technical posts.

To fix such problems, he says, he believes that roles must be further refined. For example, while project managers are clearly seen as the glue that ensures proper resources are assigned to each project, the kinds of skills needed to handle the role are less clear.

Some things have become a bit more complex, Deal adds. "Occasionally, small needs arise that in the past I could have filled by simply calling a programmer and getting a few minutes of time," he says. "Now, of course, there's more bureaucracy [in funneling reports to business analysts]. I have to admit that sometime I do a little end run around bureaucracy to get something done more quickly."

Publix enemy No.1, *page 64*

Created in a team image

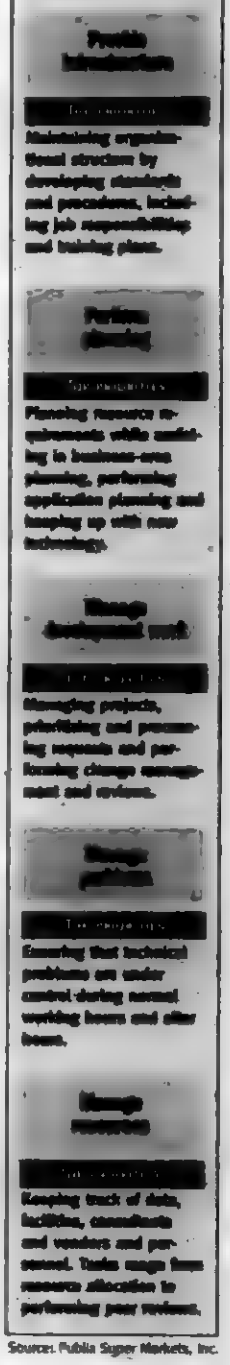
Publix converted two IS departments into one flat reporting structure with emphasis on integration of IS and user needs

1989	1992
• Two departments, 100 associates	• One department, 100 associates
• Hierarchical organization chart	• Flat, matrix reporting structure
• Teams/team leaders	• Projects/project managers
• Red tape, high supervision	• Boundaries, empowered associates
• Poor communication	• More communication (internal and external)
• Single-input performance evaluations	• Peer/customer performance evaluations
• Team priorities and team assignments	• Publix priorities and master schedule
• EOY deadline planning	• Integrated technology & application planning
• IS focus	• Customer focus
• Sys Development vs. Tech Support	• Business analysts, planners, project managers
• Team leaders as user contacts	• User coordinators, request analysts
• Technical/product training	• Overall business orientation and more
	• Technical, leading-edge education

Source: Publix Super Markets, Inc. CW Chart: Janell Genovese

IS role model

Publix's IS department is broken down into functions rather than job titles



Source: Publix Super Markets, Inc.

Publix's shopping list for successful re-engineering

Here are some of the main steps Publix Super Markets took to realign and reinvent its IS department:

- Two subdepartments, IS development and technical support, were combined into a single entity for improved technology planning.
- Teams and team leaders were abolished and replaced by a flat, matrix organization. Individual project teams draw from resource pools of similarly skilled developers.
- Project managers, systems analysts and programmers were moved away from performing multiple jobs in one small area of the business. Efforts were made to more closely match people and skill sets while deploying staff members throughout the company.
- To keep the process going, a centralized management system was established for work assignments, project management, technology planning and human resource management.

Under the plan, "business analysts" and "planners" assign priorities on incoming and continuing projects based on business needs. "User coordinators" or liaisons and "request analysts" from the user community assist in the process. Analysts meet once a week and hash out logistics, scheduling and project importance across a bargaining table.

Each project request ultimately channeled into the IS development group comes with its own business unit sponsor, who shares the risk with IS. The divisions also get back summary information, telling them where the IS resources are being deployed within their units.

- IS peer reviews were introduced. In the past, team leaders did annual performance evaluations. While traditional reviews tend to focus on previous months' work, explains Daniel Risener, vice president of IS, peer reviews are ongoing. "Every time someone does something, it's recorded and logged," he explains.

Here's how it works: At year's end, a worker selects the peers he wants to evaluate him. An administrator then compiles the responses and puts together a report. "Peers tend to be more honest, and the employee gets a truer picture of how well he's performing and what areas he needs to improve upon," Risener says.

—Mark Hall

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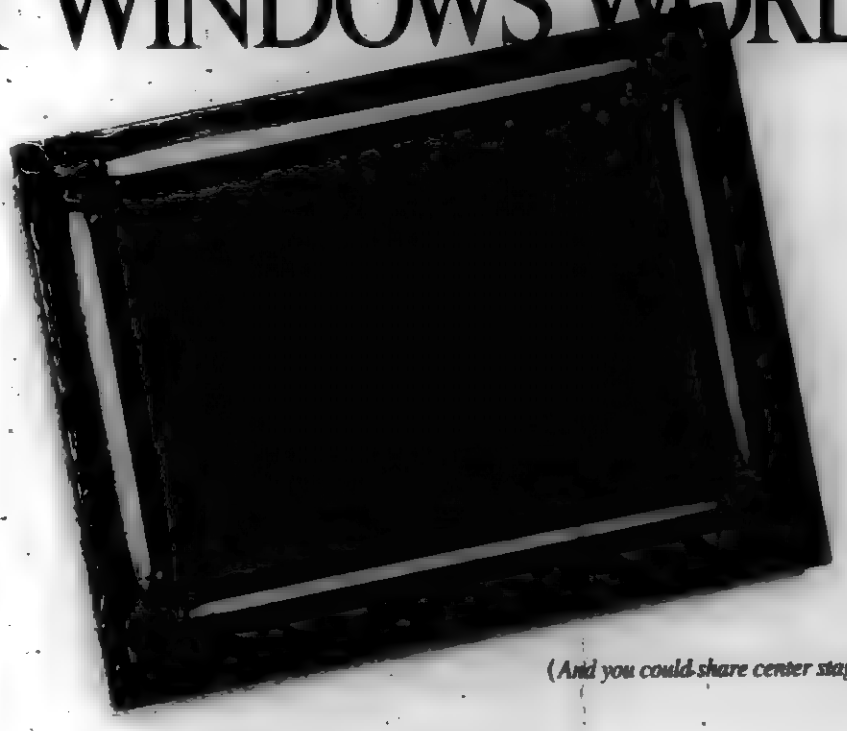

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Publix enemy No. 1

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CSC Index's Kaull recommends that IS organize along natural process lines — business systems development, technology innovation, architecture and planning, for example. "They haven't gone the full nine yards," she notes.

> Vision 2000 is a long-term effort to boost Publix's sales to $25 billion by the year 2000.

And so far, Publix is nowhere near the huge sales leaps it desires. Last year's revenue rose a modest 6% to 7%, from $6.2 billion to $6.6 billion. Still, argues a company spokesman, "any increase in supermarket business in this recession represents good performance."

Publix's IS group is hardly waiting for the hefty hikes to accomplish themselves, however. Several key IS projects are under way, including a total warehousing system that will serve three independent groups and 20 distribution centers and computer-aided software engineering-generated systems that will eventually let divisions access and share mission-critical applications.

Plus, Risener says, plans are afoot to form a corporate steering committee to even more closely base IS goals on Publix priorities, as well as create a more formal career training plan based on those core competencies. He says he is sure that IS can bring home the groceries.

"Right now I feel confident that every project we undertake addresses a real business goal and not a supervisor's request for an X/Y screen change," Risener says.•

Executive Track

Craig Burlingame, credited as being the architect of the Hyannis, Mass.-based **town of Barnstable**'s information systems organization, is on his way to a new post as director of teleprocessing for **Massachusetts' Criminal History Systems Board**. The move puts Burlingame in charge of all technical aspects of the agency that oversees the statewide Criminal Justice Information System and Network, which links 500 agencies and interfaces with the FBI's National Crime Information Center.

Wayne, N.J.-based **Valley National Bancorp** recently promoted its top-ranked information technology officer. Former senior vice president **Peter Crocitto**, a 15-year Valley veteran, is now first senior vice president. In addition to information technology, Crocitto is in charge of bank operations.

Dan Raleigh, 39, has been named vice president of the MIS department at **Designatronics, Inc.**, a New Hyde Park, N.Y., manufacturer. Prior to his promotion, he was manager of the division.

At the New York-based accounting firm of **Goldstein Golub Kessler & Co.**, former independent consultant **Joel D. Levy** was named the new director of MIS. Levy, 48, was additionally named principal in the firm's business solutions and services group.

John R. Garvin, 45, is the new chief information officer at **GFT USA Corp.**, a New York retailing subsidiary of Turin, Italy-based **Uppo GFT**. Garvin was formerly president of his own consulting company, the Garvin Group.

Alan J. Lokensgard has been appointed director of administrative computer services at Chestnut Hill, Mass.-based **Pine Manor College**. A longtime IS veteran with experience on the vendor and consultancy fronts as well as in management, Lokensgard most recently served as manager of administrative systems and procedures at the Woods Hole Oceanographic Institute in Massachusetts' Cape Cod.

Minneapolis-based medical device manufacturer **Medtronic, Inc.** has elected **Edith W. Martin** to its board of directors. Martin, 47, is vice president and CIO of the **International Telecommunications Satellite Organization** — a position she took last year after having served as vice president of The Boeing Co.'s High Technology Center since 1984.

George Harris, vice president of Customer Satisfactionat Cosa Mesa, Calif.-based **Symbol Technologies, Inc.**, has been elected chairman and president of the Fort Myers, Fla.-based **Association for Services Management International**. He succeeds ICL Europe Vice President of Services Franck Armaingaud as chief executive of the 6,000-member organization of technology services professionals.

Norman L. Haylett has been promoted to vice president of data services at **The Dollar Savings and Trust Co.** Overseeing the day-to-day operations of the data services department, Haylett was most recently senior data processing officer. He has been an employee at the company since 1972. Kevin J. Brogley was also promoted, from data processing officer to senior data processing officer.

John Reid, vice president of information technology at **Amoco Corp.**, has been elected to **The Conference Board's Council of Information Management Executives**. Based in New York, the board is one of the world's leading business membership organizations. Its council meets three times a year to allow top IS executives to network in the non-electronic sense.

Louis Fried

Let the IS execs play!

Surveys during the past few years have consistently shown that IS directors and CIOs have identified "aligning information technology and MIS goals with corporate business strategy" as their primary concern, and it's a good thing. The failure to create such alignment can lead to disappointment with IS responsiveness or major business problems.

Some years ago, as vice president of MIS at a West Coast insurance company, I was informed one day by the president of the company that he had just completed the acquisition of another company and that he would like to have the information systems of the other company merged with those of our company. I immediately made arrangements to visit the acquisition and examine its systems with a small group of my senior analysts.

> IS managers must be allowed to *influence* corporate business strategy.

After a week of examining those systems, which were based on a different operating system from ours, we put together a project plan and a tight schedule to accomplish the integration within six months. Satisfied with our work, I returned to the president with a presentation of our approach.

The president's response was jarring: "I want their systems merged with ours by the end of the month so that we can consolidate our books," he said.

No explanation that I could provide seemed to make sense to him. After all, the acquisition had computerized systems, and so did we. What was the big deal?

We ultimately satisfied the problem of consolidating the books by writing a few programs that unloaded their month-end files, reformatted them, translated the chart of accounts, and input their figures to our month-end closing system. However, the integration of their systems really did take about six months, and our president never did understand it.

Preparation, education key

If I had known in advance that we were considering growth by acquisition as a corporate strategy (several other acquisitions followed this one), I would have been able to prepare my staff. More importantly, I would have had time to educate management about the implications of acquisitions for IS.

About two years ago, a friend who is CIO of a major corporation ordered substantial upgrades to his company's mainframe equipment only to find out through the newspaper that his company planned to divest itself of several business units and return to a focus on its core business.

A large Eastern firm's IS director had gained a reputation with management by tightly controlling IS costs, taking pride that IS costs for his firm were well below average for the industry.

Last year, the firm undertook a Total Quality Management program. Surveys from that program found that the greatest volume of complaints in the company were about the antiquated computer applications and the lack of responsiveness of IS to business needs.

Suddenly, the IS director found top management doing an about-face and questioning the judgment that had permitted the company's systems to fall behind the competition.

These examples show the need for corporate/IS alignment, but they show something else as well.

Learning about corporate strategy and sitting in on boardroom meetings is not enough. To really be successful, IS managers must do more than align IS with business strategy — they must *influence* corporate business strategy.

Getting involved

Corporations move through modes of acquisition, divestiture, alliances, just-in-time manufacturing, cooperative product design with suppliers and customers, new and faster delivery systems and other business directions.

Increasingly, these changes are dependent on fast and flexible responses from IS. It is evident that many future business strategies cannot be implemented without the support of IS. The failure to consider the advantages or limitations of information technology can result in the failure of business strategies or the inability to meet competitive pressures or market opportunities.

This transition has been made by some firms, notably Wal-Mart Stores, Inc., Hewlett-Packard Co. and Merck & Co., but it is not an easy one to make. One IS director I know likened the difficulty to the old analog of trying to stuff an angry wildcat with wet poodles.

Another told me that she did not expect to make much progress until a new generation of computer-familiar executives replaced the current generation of top management.

Until IS managers become participants in the strategic planning process instead of recipients of the process results, alignment of IS with business strategy will continue to remain a major issue.

Fried is vice president of information technology consulting at SRI International, a consultancy in Menlo Park, Calif.

Intelligence Files

Whither pen-based?

Although conventional wisdom pushes pen-based computing as a haven for nontypists, a new study suggests that nonusers instead do not need computers or are not convinced of the value of the applications.

The authors predict that pen-based computing needs to offer functionality not currently available in traditional mouse and keyboard systems, rather than adapt applications already established on keyboard-based machines.

Source: "Whither the Pen-based Interface?" *Journal of Management Information Systems*, Winter 1992-93, Vol. 9, No. 3. Robert O. Briggs, Alan R. Dennis, Brenda S. Beck and Jay F. Nunamaker Jr., authors.

EDI: Growin' around town

The just-released "1993 Census Report of 'EDI Town' " shows electronic data interchange (EDI) growing at a healthy rate, although varying by geographical region and industry. For example, the report shows 60% of EDI use is in the manufacturing sector, with 14% in wholesale trade, 8% in transport/utilities, 8% in retail and 10% miscellaneous.

Source: "'1993 Census Report of 'EDI Town,'" EDI Spread the Word Publications, Dallas.

Twist on IS investments

An increasing number of businesses are using a variety of new approaches to evaluate their next-generation information systems investments. Traditional financial approaches cannot capture the true business value of today's emerging technologies. The shift in IS decision-making to executive row, along with the increasing complexity of investments associated with enterprisewide computing and the need to better link business goals with IS, are some of the big factors behind today's changing technological investment perceptions.

While traditional analyses are needed to assess IS, they must be used in conjunction with nontraditional concepts, such as establishing a research and development budget to evaluate new technologies with no return on investment involved.

Source: "New Approaches to Assessing the Value of Information Technology," NCR Corp. Strategic Consulting Group, Dayton, Ohio.

Warehouses add tech value

Public warehouses, which lease distribution space and services, are using technology to move from being short-term storage solutions to becoming third-party service providers. Technologies such as EDI and bar-code scanning let these warehousers add value to their service, providing systems implementation and training to clients in some cases.

Source: "Public Warehousing: The Original Third Party," *Distribution Magazine*, Lisa H. Harrington, author.

Quality air by computers

Weyerhauser Co. is using technology to keep on the safe side of the pollution law. Michigan Integrator Island Automation worked with the firm to develop a computer-based system to track and control the vast amounts of data required to keep its emissions below the levels contained in the company's air quality permit. The system calculates emission and production levels with six-minute rolling averages and hourly, month-to-date and year-to-date averages.

Source: *Pollution Engineering*, Feb. 1, 1993.

Award

UPS head lauded for IS use

Kent C. "Oz" Nelson, chairman and chief executive officer at Atlanta-based United Parcel Service, Inc., last week became the 11th winner of the Excellence in Technology Award, presented annually by Gartner Group, Inc. and The Conference Board.

The wizardry of Oz "played a key role in . . . transforming an operations-oriented company into a master of modern technology," said Gartner Group President and CEO Manny Fernandez. "Almost overnight, UPS built a world-class information system for international package deliveries."

Prior to 1986, UPS — a worldwide company with revenue of approximately $16 billion and a package/document traffic volume recently estimated at 2.9 billion a year — did not rely on information technology to drive its distribution business, reportedly the largest in the world. Nelson, then a senior vice president, was charged with changing all that.

At the head of the newly assembled Technology Task Force, he set out to forge a strategy aimed at "fundamentally overhauling technology at UPS," a company spokesman said.

The group started out with a $1.5 billion budget and a five-year plan, the spokesman said. "But the fact is, we ended up spending that much well before the five years was up," he added. "The effort ended up costing multibillions."

The plan came in on time. By 1991, UPS was able to boast a network that linked six mainframes, approximately 250 minicomputers, some 40,000 PCs and an estimated 75,000 handheld units, connecting some 1,300 distribution worldwide distribution sites.

Today, enabled by a cellular-based nationwide mobile service and supported by a $100 million data center in Mahwah, N.J., the company relies on an electronic data storage and retrieval system to track an estimated 11 million packages a day delivered to destinations around the globe. The company is prepared to invest an additional $3 billion toward an expansion of the system that will make real-time package tracking a reality by 1997. — *Nell Margolis*

Calendar

MARCH 14 - MARCH 20

National Automated Clearing House Association (NACHA) Conference. San Diego, March 14-17 — Contact: NACHA, Herndon, Va. (703) 742-9190.

InterChange Technical Writing Conference. Lowell, Mass., March 15-16 — Contact: Dirk Messelaar, University of Massachusetts, Lowell, Mass. (508) 934-2405.

Lap and Palmtop '93 Exposition. New York, March 15-16 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7988.

UniForum Technology Managers' Conference. San Francisco, March 15-16 — Contact: UniForum 1993, Registration Dept., Carol Stream, Ill. (708) 260-0396.

15th Annual Conference: "Clinical Information Systems." March 15-17 — Contact: Laura Lee, Society for Clinical Data Management Systems, Los Angeles, Calif. (213) 224-6259.

The Mobile Professional in the Enterprise Corporation. New York, March 16-17 — Contact: Betsy Gray, The Yankee Group, Boston, Mass. (617) 367-1000.

The Workgroup Computing Conference. Washington, D.C., March 18-19 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The 1993 Long Island Conference of Artificial Intelligence and Computer Graphics. New York, March 20 — Contact: New York Institute of Technology, Old Westbury, N.Y. (516) 686-7823.

MARCH 21 - MARCH 27

PageMaker Conference. Boston, March 22-23 — Contact: PageMaker Conference and Exhibition, Seattle, Wash. (206) 633-3431.

Apollo Users Group International Conference. Chicago, March 22-24 — Contact: Information Resources, Inc., Chicago, Ill. (312) 559-2360.

The Data Warehouse: Design and Implementation. San Francisco, March 22-24 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The International DataBase Users Conference and Exposition. Orlando, Fla., March 22-24 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The Second International Conference on Software Methods. Orlando, Fla., March 22-24 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

EDI 2000. Boston, March 23-24 — Contact: EDI 2000, Dallas, Texas (214) 475-1698.

Business Solutions Conference and Expo. Boston, March 24 — Contact: Microsoft Corp., Seattle, Wash. (800) 677-4697.

Hands-On Unix Internetworking. San Francisco, March 24-26 — Contact: American Research Group, Inc., Cary, N.C. (919) 380-0007.

The Ninth International Conference on Engineering Information Systems. Fort Lauderdale, Fla., March 24-26 — Contact: Supriya Pande, Management Roundtable, Boston, Mass. (617) 232-9090.

Association for Corporate Growth 1993 Conference. Orlando, Fla., March 24-27 — Contact: The Association for Corporate Growth, Inc., Glenview, Ill. (708) 699-1331.

CeBIT '93. Hannover, Germany, March 24-31 — Contact: Hannover Fairs USA, Inc., Princeton, N.J. (609) 987-1202.

MARCH 28-APRIL 3

14th Annual IS Performance/Capacity Management Conference. Scottsdale, Ariz., March 30-April 2 — Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

Voice '93 Spring Conference and Exposition. San Diego, March 30-April 1 — Contact: Linda Wilson, *Voice Processing Magazine*, Houston, Texas (713) 974-6637.

JAD/CASE Conference. Washington, D.C., March 31-April 2 — Contact: ATLIS Performance Resources, Inc., Rockville, Md. (301) 770-3000, ext. 305.

Client/Server and Distributed Computing: Designing the Application. Washington, D.C., April 1-2 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 4-APRIL 10

Apple Enterprise Computing Conference. San Francisco, April 5-7 — Contact: Apple Enterprise Computing Conference., Mountain View, Calif. (415) 966-8978.

Communications Tokyo '93. Tokyo, April 5-9 — Contact: Ron Atkins, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-4586.

Data Warehouse '93. Washington, D.C., April 5-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 11-APRIL 17

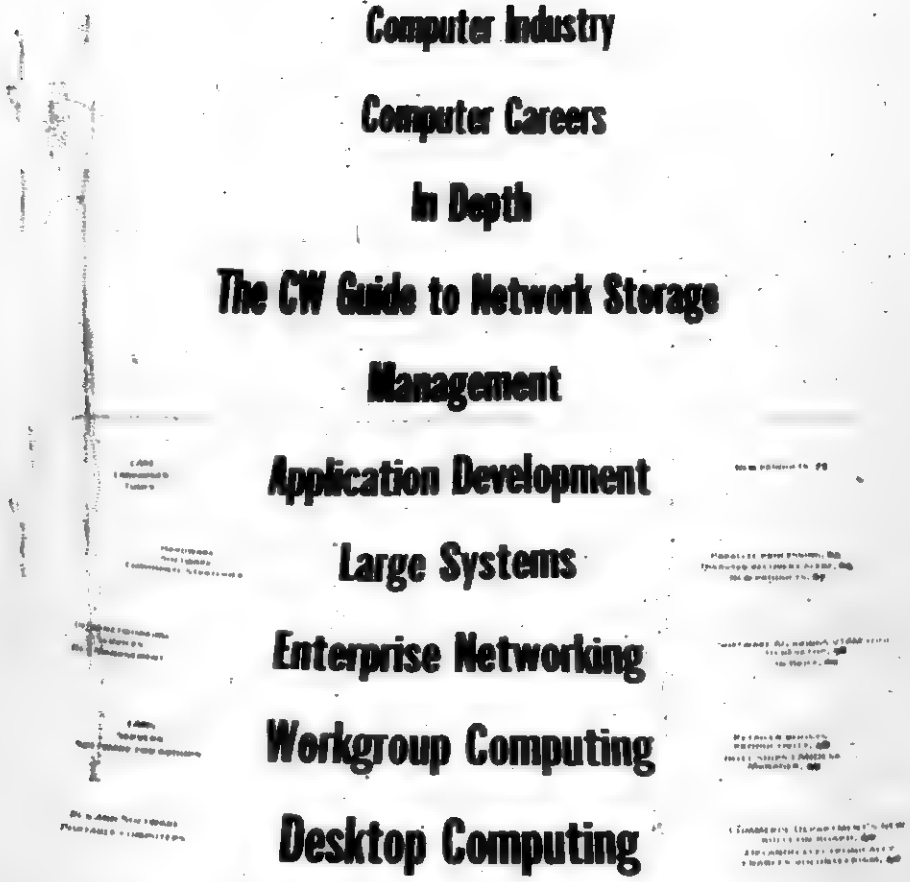
Software Performance Engineering. Santa Fe, N.M., April 13-16 — Contact: L&S Computer Technology, Inc., Austin, Texas (505) 999-3811.

International Conference and Exhibition on Multichip Modules. Denver, April 14-16 — International Society for Hybrid MicroElectronics, Reston, Va. (703) 471-0066.

APRIL 18-APRIL 24

The Fifth Annual Data Administration Management Association (DAMA) International Symposium. Boston, April 18-21 — DAMA International Symposium, Boston, Mass. (508) 987-7132.

Patricia Seybold Group Spring 1993 Conference. Boston, April 18-23 — Contact: Deborah Hay, Patricia Seybold Group, Boston, Mass. (617) 742-5200.



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To ~HELL~ *with* tradition

Japanese users turn to downsizing as the recession takes its toll

By Lori Valigra

A recession can have a bright side. Just ask Japanese computer users. The prolonged downturn in Japan's economy has enabled that nation's information technology managers and users to reap some long-overdue benefits.

Japan's computer market has been dominated for some time by only a handful of large corporations such as Fujitsu Ltd., Hitachi Ltd., NEC Corp. and IBM Japan Ltd. Though famous for cozy, supportive relationships with their customers, vendors (which offered mostly proprietary systems) could set and keep equipment prices high, at virtual monopoly prices. Users had invested so much in software that such pricing practices were tolerated.

But vendors are bowing to many pressures: the recession in Japan, soft demand, shrinking user budgets and price wars among foreign PC competitors (see story page 69).

This means users are getting a windfall: Vendors are now more responsive. They are willing to negotiate prices and rethink their mainframe-centric ways — changes that dovetail with companies' interest in client/server and other downsizing approaches. Vendors are even willing to help customers set up multivendor installations. These moves would have been unheard of even a couple years ago.

Mobil Sekiyu K.K., for example, needed to install proprietary software on a network including IBM equipment. "IBM sent engineers to work at the other vendor's premises for free to make sure the software would work. It was not a big sale for them. But IBM decided to listen to the customers and do anything it takes to get along with them," says Charles F. Cronheim, director of information systems at Mobil Sekiyu, the Tokyo subsidiary of Mobil Oil Corp.

"Anything it takes" includes negotiating prices on equipment so customers can stretch shrinking purchasing budgets. Price negotiations come in handy as the Japanese join the worldwide trend to replace mainframes with client/server systems and bring more computing power to individual departments.

According to a 1991 survey of 1,400 multiuser sites by research firm IDC Japan, there was a clear movement to

Japanese users, *page 68*

Valigra is a Knight Science Journalism Fellow at MIT and the former Tokyo bureau chief at International Data Group's International News Service.

Look who's changing

Tight times make vendors and prices more flexible.

The predictability and order of a virtually monopolistic computer market, run by a small group of large companies selling proprietary systems, became history this year in Japan.

Ironically, the breakup of IBM, once known as *kamisama*, or god, by many Japanese, has sparked some fundamental changes in the Japanese computer market.

For one, price competition has entered the picture (see story page 69), brought on by a long recession and user movements toward both smaller systems and ones purchased from multiple vendors. This has meant that the myriad of middlemen and other layers accepted as normal business practice in the past have been under scrutiny since the end of the 1980s boon in Japan — the time of the so-called "bubble economy."

"Japanese firms are now in a state of shock. Until last year, when the 'bubble' burst, they had a structured and orderly domestic market that could tolerate inefficiencies and a half-dozen middlemen between the manufacturer and the end user. They have been hard hit recently from different angles all at once," says Charles F. Cronheim, director of IS at Mobil Sekiyu in Tokyo.

Previously hesitant to negotiate prices, the Japanese subsidiary of IBM, called IBM Japan, and its competitors have had to change with the times. That includes negotiating prices, working with other suppliers in multivendor installations and focusing on solutions using smaller systems.

Though IBM Japan had been talking of change for many years, Cronheim says the bad news deluging the parent company lately has caused it to wake up and realize it has no choice but to change. "Since the middle of last year, IBM Japan started to behave in a manner that sug-

Changing, *page 68*

Japanese users

CONTINUED FROM PAGE 67

smaller platforms expected in 1992. Some 16% of respondents said they were moving applications off centralized hosts, while 21% were focusing most new application development on small systems.

Also, sales of small business computers, such as IBM's Application System/400 and Fujitsu's K series, were expected to rise 12% to 15% in 1992, up from 10% in 1991. On the other hand, mainframes such as IBM's 370/390 and Fujitsu's M series went from sales of 7% to 9% in 1991 to a predicted 5% to 6% for 1992.

The downsizing trend may accelerate as firms take advantage of more affordable PCs. Though Japan is well-known for making and exporting inexpensive PCs, ironically, software and hardware prices have been high for Japanese users. NEC, which owns 50% of Japan's business market for PCs, had kept prices artificially high during the past decade, market watchers say. Those users who bought NEC products had little choice: NEC is the only PC company in Japan that offers thousands of software titles for nearly any application.

Shaking the foundations of Japan's monopolistic market are newcomers Compaq Computer Corp. and Dell Computer Corp., which since last fall have introduced a series of price cuts that now make PCs affordable to Japanese user firms on a one-per-employee basis.

"1993 may be the year of big changes in the use of PCs in major Japanese companies," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines (JAL) in Tokyo. Compaq and Dell's PC prices are "half or one-third that of current PCs, so it is cheap to distribute one PC per employee." JAL's IS department already has one PC per employee, and that usage rate is expected to spread companywide in the next few years.

Private sector companies in Japan average four employees per PC, according to the Japan Electronic Industry Development Association.

Like its U.S. counterparts, JAL has seen a flood of red ink in the past year. To help stem the hemorrhaging, the airline company decided to change direction in information processing last June. In a plan due to be implemented by 1998, JAL is moving to network server systems for departments or business areas and to PCs. JAL has 13 mainframes and about 2,000 PCs used as dumb terminals.

There's no stopping progress

In a survey of 1,400 multiuser sites, IDC Japan found that investments in new equipment remained strong despite Japan's economic troubles. Survey respondents registered an 8.5% growth in their budgets in 1992, up from 7.5% a year earlier. Of note: Budgets in the financial industries rose 5.3% in 1991 and 8.7% in 1992. Wholesalers and retailers, which saw budgets fall in 1991 to 2.1% and 3.3%, respectively, expected rises to 6.7% and 12.1% in 1992.

The airline, a former monopoly in Japan, recently began 10 client/server pilot projects to decide which systems look most promising. It is using networks of Apple Computer, Inc. Macintoshes to perform maintenance on pilot training simulators and IBM OS/2 systems for flight operations. The company is using Microsoft Corp.'s Windows in a general ledger application and is looking at Unix and DOS V, a product that bridges Japanese and English DOS. The pilot projects should be completed in about a year, according to Matsubara.

"Downsizing is definitely happening in Japan. We've purchased our last mainframe upgrade," says Mobil Sekiyu's Cronheim. The firm bought its first computer in Japan in the 1950s and now uses an IBM 9121-440 and a 3080-200J, as well as about 1,500 PCs.

But as U.S. companies have known for years, the task of downsizing can be monstrous. "It's hard to rationalize because you must move a lot of functions off a mainframe before you can shut down a data center," Cronheim says.

Firms such as JAL, along with banks and security companies, typically have invested in more than 10 million lines of proprietary system source code.

"Rebuilding mainframe software assets would be very expensive," Matsubara says. He figures it would cost his company about $2 billion or $3 billion.

"There is no way to change quickly to downsizing platforms. It would take about 10 years," he adds. He says U.S. companies are ahead in moving to smaller platforms because of the popularity of PCs in U.S. offices. Japanese companies are still on a learning curve.

Better late than never

Slow and steady is better than not at all for many. Mobil Sekiyu and several other foreign multinational corporations in Japan are consolidating mainframe processing to trim costs and eventually begin the downsizing process.

"We'll have a lot of mainframes in one place and then can adjust capacity as demand goes up or down," Cronheim says. Mobil Sekiyu will consolidate worldwide operations in the next couple of years and probably locate the international data center in the U.S., he adds. Users will then pay for access to the mainframes rather than new on-site hardware.

Cronheim says locating the center in the U.S. would save 40% of the cost of placing it in Japan and 10% to 15% of the cost of locating it in Europe.

Once the consolidation is done, Mobil Sekiyu will be able to transfer some jobs to PCs and better realize downsizing economies, Cronheim says. •

Changing

CONTINUED FROM PAGE 67

gests they are really serious about changing. My direct sales representative can now pick up the phone, call IBM Japan's vice president in charge of Asia/Pacific and actually talk to him," he adds.

Last October, IBM Japan appointed a new president, Kakutaro Kitashiro, and promoted former President Takeo Shiina to chairman and chief executive officer. At the same time, IBM Japan split into three independent companies: IBM Japan; IBM Japan General Business Co., charged with targeting midsize companies and personal users; and IBM Japan Services Business Co.

On the whole, the restructuring has been well-received by Japanese users. "I'm not worried about IBM because it has various good products: mainframes, office computers, workstations and personal computers. I think IBM can change with market changes," says Hisatsune Ichimura, manager of the system planning department at Nomura Securities Co. in Tokyo.

IBM's changes have caused introspection at end-user companies as well. "The restructuring of IBM has a good effect on us. The airline business is a host-oriented industry. Eventually, though, we will be changing direction," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines (JAL) in Tokyo.

That direction for JAL includes more PCs, network servers and a shift to client/server (see story at left).

"By 1995 to 1996, large hardware vendors must shift their income structure from mainframe-oriented hardware to client/server," says Yuji Ogino, chairman of consulting firm IDC Japan and editor of the *IDC Japan Report* in Tokyo. Mitsubishi Electric Corp., for one, recently stopped development on mainframes and moved to client/server systems. "A new focus on software and service revenue will offset the loss of hardware sales," Ogino says.

Evidence of that shift is already piling up. For example, IDC Japan predicts that mainframe sales will grow a paltry 0.7% annually between 1991 and 1996. In contrast, PC/workstation sales are expected to grow 8.5%, software 22.5%, application tools 20% and services 8.3% during that same time.

—Lori Valigra

Japan tries out U.S. cost-busters

Downsizing, especially to client/server setups, isn't the only global trend making a push in Japan. Other practices that have been standard fare for U.S. IS managers are only now making headway in Japan in response to tight times:

• **Consolidating, Japanese-style.** During the next three to five years, Nomura Securities in Tokyo will reduce the number of its computers, in some cases replacing two old mainframes with one more powerful new model. "We can cut maintenance, electric power and space costs and reduce the number of operators," says Hisatsune Ichimura, manager of the system planning department at Nomura Securities. The company currently has 30 mainframes.

• **Renting excess capacity.** The recession has pinched Japanese financial companies particularly hard. These companies had ramped up computer capacity in anticipation of business demand, only to see business fall off, leaving excess capacity behind. Some companies, such as Nomura Securities, are turning ill fortune into profits, renting capacity to outsiders.

• **Paying for support and service or doing it yourself.** In the past, when a Japanese company bought a product, it could expect lots and lots of hand-holding, including free support and service. That is changing. With hardware becoming a commodity, Japanese vendors are looking to make more revenue from services and software. This goal is at odds with the thrust of users, who are trying to get good service while trimming service and maintenance costs.

Some Japanese companies are taking matters into their own hands, creating in-house support and service groups. Nomura Research Institute, for example, supplements Nomura Securities' IS department of 15 with about 300 of its own system engineers. Japan Airlines has its own software development subsidiary, Japan Creative Systems.

• **Using standard and packaged software.** Japanese companies are realizing some savings by turning to industry-standard software such as DOS V for PCs and Unix for key business areas. The trend is growing. "A lot more people are advertising for Unix vacancies now, both at end-user companies and in industry," says Phil Hordle, head of information technology at Barclays Services Japan Ltd., a Tokyo subsidiary of Barclays PLC.

• **Farming out functions.** IBM Japan, NEC and Fuji Xerox Co. have been offering systems integration services for end users with multivendor installations. The range of services and prices available in Japan will be a boon for end users. Charles F. Cronheim, director of IS at Mobil Sekiyu, says, "We'll have the opportunity over the next few years to reduce costs by negotiating better deals, talking with new market entrants and seeing new service." — *Lori Valigra*

Rising sun, falling prices

Compaq leads onslaught of PC price cuts in Japan

By Lori Valigra

Compaq Computer Corp., known for high-priced PCs until it sparked a slide in U.S. PC prices in 1992, has taken its mission to Japan. The price-cutting explosion the company set off may heat up the downsizing trend occurring in Japanese user companies, which have traditionally been big iron shops.

"The price of personal computers has been almost halved in the past 18 months in Japan," says Phil Hordle, head of information technology at Barclays Services Japan Ltd., a subsidiary of Barclays PLC. "It's a real free-for-all for users."

Last fall, Compaq challenged NEC Corp., which holds a commanding 50% share of Japan's PC market, with products priced as low as $1,032 — half NEC's price tag. From October to December 1992, Compaq sold 3,500 units in Japan, says Yuji Ogino, editor of the "IDC Japan Report" in Tokyo.

Following Compaq's moves, IBM Japan introduced a $1,597 PC. In January, Epson Corp. unveiled an NEC-compatible priced 40% below NEC's comparable machine. NEC followed with a $1,758 unit. Even Apple Japan cut prices 20%.

The real shaker came on Jan. 21, when Dell Computer Corp. launched a series of products with a low-end tag of $790. Its sales are both direct and—in a rare move in Japan — mail order, cutting out at least a half-dozen middlemen. In the middle of February, Compaq trimmed its price to $952, including software. More price cuts are rumored to be imminent.

'Scared to death'

The moves have chilled PC makers in Japan, the second-largest PC market in the world at $5.4 billion. "They are all scared to death. The computers are being sold at half the price in Japan and through direct sales, cutting out distributors," says Charles F. Cronheim, director of IS at Mobil Sekiyu K.K. in Tokyo.

During Japan's steep economic boom in the 1980s, middlemen were tolerated, even largely ignored, as part of normal business. Belt-tightening at purchasing companies has shifted focus on the layers of fat in the distribution system.

"This stampede has really awakened the Japanese," Cronheim says.

Mobil Sekiyu has a few Dell and Compaq computers now under evaluation. "Supplier loyalty is a thing of the past in PCs," Cronheim says.

Hordle explains that until a year ago it was difficult to negotiate prices, even with foreign suppliers: Because NEC's price tag was so high, off-shore firms could maintain high prices and still come in under NEC.

And because NEC had more than 5,000 software titles for its market-leading PC9800, 2,500 of which are for business applications, loyalty to NEC remained solid. By comparison; NEC's purported challenger, DOS V, a bilingual English/Japanese version of DOS for IBM PC ATs, has less than half the titles.

Still, the impact of low prices could dramatically erode NEC's big software lead during the next several years. "Much software will be converted from NEC to DOS V, and then we can use DOS V in our daily environment," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines in Tokyo.

DOS V has about a 10% market share now, including versions from IBM and Compaq, one consultant says. The product paved the way for U.S. PC makers to offer Japanese systems.

"DOS V came at a very opportune time. We had a lot of PC ATs and Japanese word processors. But with DOS V, we could bring in reasonably cheap personal computers and get a lot more out of them. We got rid of the Japanese word processors," Hordle says. Dedicated Japanese word processors are comparatively expensive.

DOS V, as well as Microsoft Japan's Japanese Excel and Japanese Word, have enabled foreign end-user companies to run DOS programs from the head office while using Japanese language processing in Japan, Hordle says.

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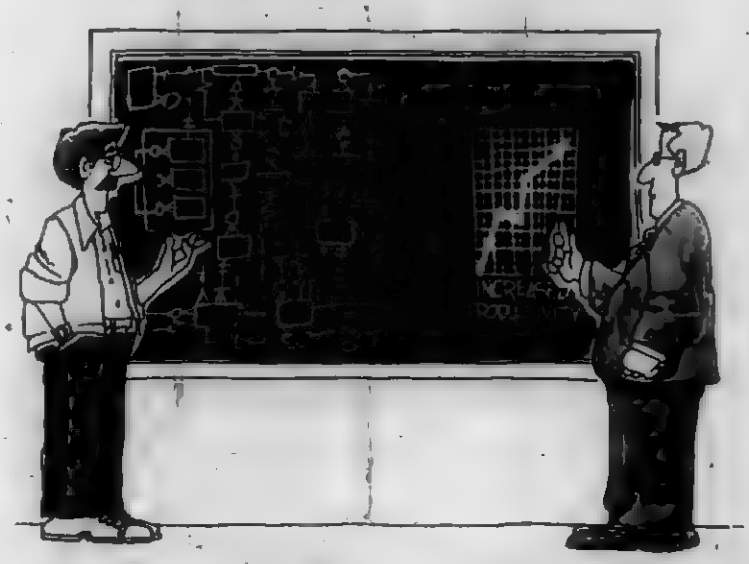

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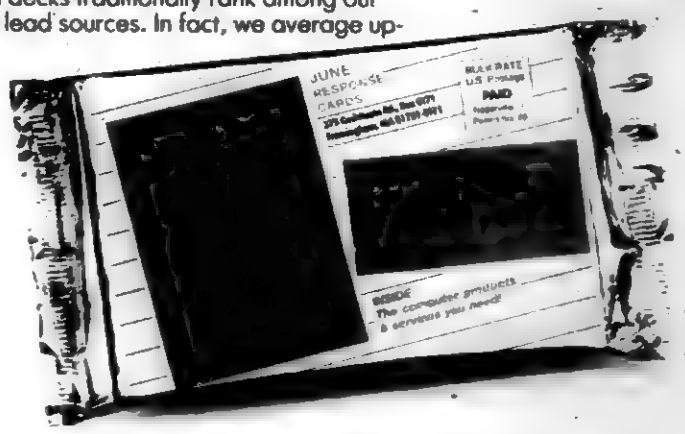


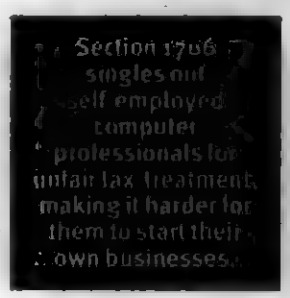
1706 inconsistent with growth plan

By Sally J. Cusack

■ In last month's State of the Union address, President Clinton emphasized change. And change in Section 1706 of the Tax Reform Act of 1986 is something independent contractors hope to see.

Clinton's speech, in which he made a push for small business and entrepreneurship, gave proponents ammunition with which to repeal the section, which makes it difficult for technical professionals to retain their independence because it exempts them from an employment tax safe-harbor provision.

"The IRS crackdown on independent contractors, particularly in the computer industry, is directly contrary to the president's emphasis on increasing the number of small businesses and encouraging high-tech industries to grow," says Harvey Shulman, a Washington, D.C., attorney who is working to modify or repeal Section 1706 on behalf of the National Association of Computer Consultant Businesses.



Shulman says the president is encouraging small business, "but if people can't start out as self-employed contractors, how does it all begin?"

Howard Stein, executive vice president at Comsys Technical Services, Inc. in Rockville, Md., says that if such a law had been in effect when Comsys got its start in 1979, "we might not be here today. It would have been a lot harder to succeed."

One of the main reasons Section 1706 has drawn so much criticism is that it singles out the self-employed in software development, programming, systems integration and technical consulting for unfavorable tax treatment.

"It's a big issue when smaller organizations try to contract directly with an employer," says Allen N. Bradley, a partner at the Atlanta law firm Venema, Towery, Thompson & Chanbliss. While there are no hard numbers available, Bradley and others contend that Section 1706 has squashed entrepreneurship by putting hundreds of smaller firms out of business and forcing thousands of independents to become full-time employees.

The biggest impact of Section 1706, Bradley says, is that it has moved larger companies to stop using independent contractors, which closes off an avenue of opportunity for the many small technical consultants who work through brokers.

Kent Faling, owner of Computer Design Professionals, a consulting and software design company in Atlanta, experienced firsthand how the law can affect the flow of the consultant/employer relationship.

"I had a job I was following up on about a month ago that said that I would have to find a broker to obtain the job. The hiring party wanted to avoid 1706 issues," Faling says.

But Nick Cvetkovic, president of NBC Associates, Inc. in Cherry Hill, N.J., says the reason Faling and others are not able to secure contracts is because the companies don't understand the law. He says most companies don't realize that Section 1706 applies only if a three-party relationship exists between a contractor, a broker and a firm.

Cvetkovic hasn't been personally affected by the law. "I've contacted 47 brokers in the last six months, and in no cases was 1706 a barrier to doing business," he says. Most of the firms he deals with are small (10 to 100 employees) consulting firms, and it is the larger firms that tend to shy away from independents.

Stein agrees that most third-party service firms prefer to avoid independent contractors since the enactment of Section 1706. Since 1987, 99% of Comsys' payroll has been W-2 employees, he says. Prior to 1986, Comsys hired almost entirely from a pool of independents.

Unfairly applied

While Section 1706 hasn't hurt Comsys, Stein says he opposes the section because it unfairly singles out technical professionals. Cvetkovic agrees, even though he hasn't found it to be a barrier. But he says the energy being expended on the repeal of Section 1706 would be better spent educating clients.

Acknowledging his own cynicism, Stein says, "If you don't have the forces in Washington behind you, you'll have a tough time."

If Cvetkovic is right, technical professionals would be well-advised to investigate Section 1706 before venturing out on their own. Section 1706 doesn't affect independents who understand the ins and outs of the law, he says.

Kelly E. Sewell, assistant editor, features, contributed to this article.

Cusack is a free-lance writer in Marstons Mills, Mass.

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Industry currents

Tables turning for textile industry

By Stefanie McCann

■ Information systems job opportunities are beginning to pop up in the textile industry, thanks to increased customer demand and the threat of competition. Some see this as a sign of greater growth to come.

Now that technology is finally taking hold in an industry traditionally far behind in this area, IS job openings are becoming available, says Deborah Poole, corporate director of information services at Guilford Mills, Inc. in Greensboro, N.C.

Some textile companies are embracing electronic data interchange (EDI) to stay in contact with customer sites and to aid in order-taking. Others have systems on the factory floor to track orders or to monitor quality. Still others are using computer-aided design/manufacturing (CAD/CAM) to design sheets and fabrics.

Textiles

Where the jobs are: Primarily in the Southeast, especially North Carolina, South Carolina and Georgia.

Salary range: $30,000 to $40,000 for programmer/analysts with up to five years' experience.

Valued skills: Cobol, EDI, computer-aided software engineering, CAD/CAM; PC knowledge.

Industry outlook: Within the next five to 10 years, late-blooming textile companies will catch up to other manufacturing industries.

Speedy delivery

All of these changes boil down to one goal: Textile companies need to get their products to customers faster while still maintaining quality or they risk losing business. After they take an order, many must fill it within 24 hours. This new standard for rapid response has meant a much greater reliance on IS.

West Point-Pepperell, Inc., for example, is reducing its turnaround time on sheet designs by moving design onto CAD/CAM workstations. "What used to take weeks to design with pen and paper can now be done in a day with CAD/CAM," says Norman Williams, director of EDI services.

IS staffing at the West Point, Ga., manufacturer of domestic goods (such as sheets and towels) is expected to expand by 8% or 9% this year, according to Williams.

Additionally, West Point-Pepperell has 12 people dedicated to EDI, most of whom were programmer/analysts trained in EDI by the company. In fact, many other textile companies now use some form of EDI to communicate with their various plants, retailers and vendors.

Carolina Mills, Inc. in Maiden, N.C., is beginning to expand its use of EDI by asking more of its customers to use it. When it has all its customers up and running with EDI, the company predicts it will increase its seven-person IS staff. But Barry Perryman, operations manager, says he will do most of his hiring from within before turning to the outside.

Spartan Mills, a Spartanburg, S.C., manufacturer of yarn and finished dyed fabrics, has gradually grown from two to 24 systems analysts in the last seven years, according to John Couch, systems development manager.

Right now, Spartan Mills is most interested in acquiring IS talent who can advance its migration to client/server and have knowledge of SQL, Unix and products such as Powersoft Corp.'s PowerBuilder.

Guilford Mills is seeking expertise in small systems development and relational databases. The company is planning to move from a mainly Application System/400 environment to open systems by using a fourth-generation language to revamp its applications. Once it selects its vendors and products, it will look for IS professionals with expertise in those areas.

To attract qualified IS professionals, textile companies offer salaries that are competitive with other industries. Programmer/analysts with three to five years' experience earn from $30,000 to $40,000 a year.

Spread thin

Not all textile companies are adding staff as they increase investment in technology, however. Some are trying to stretch existing staff over a larger systems base. For example, Dixie Yarns, Inc. in Chattanooga, Tenn., is making a big push to use systems to integrate the manufacturing process, according to David Brandt, technical services manager. To do this, Dixie Yarns is writing various manufacturing applications using Microsoft Corp.'s Foxpro, a relational database language. These applications include lot tracking and inventory control.

Dixie Yarns also uses Unix-based systems to monitor the speed of spindles, while it checks for thin or thick spots in the yarn or any imperfections within the yarn. These systems also give production figures, weight and a product's location on the line.

Unfortunately, IS is largely seen throughout the organization as a cost center and not a process center, Brandt said. He is being forced to look into intelligent subsystems that can be controlled remotely because he does not have a large enough staff to monitor them locally.

Nevertheless, in an industry that's been held back for so long, Dixie Yarns seems to be the exception. As textile companies continue to advance, job opportunities are sure to follow.

McCann is assistant researcher.

Training challenge

Training is one of the bigger challenges facing IS staffs at textile companies. This is because the education levels of employees, who range from plant workers to top administrators, vary greatly.

Guilford Mills provides intensive corporate training classes for all levels of its employees.

Greenwood Mills, Inc. in Greenwood, S.C., created an easy-to-use system to meet employee needs. The IS staff realized that workers on the plant floor had limited formal education and almost no computer training. So they created a system that let workers access information with less keying, says Jack Hill, director of system services. —Stefanie McCann

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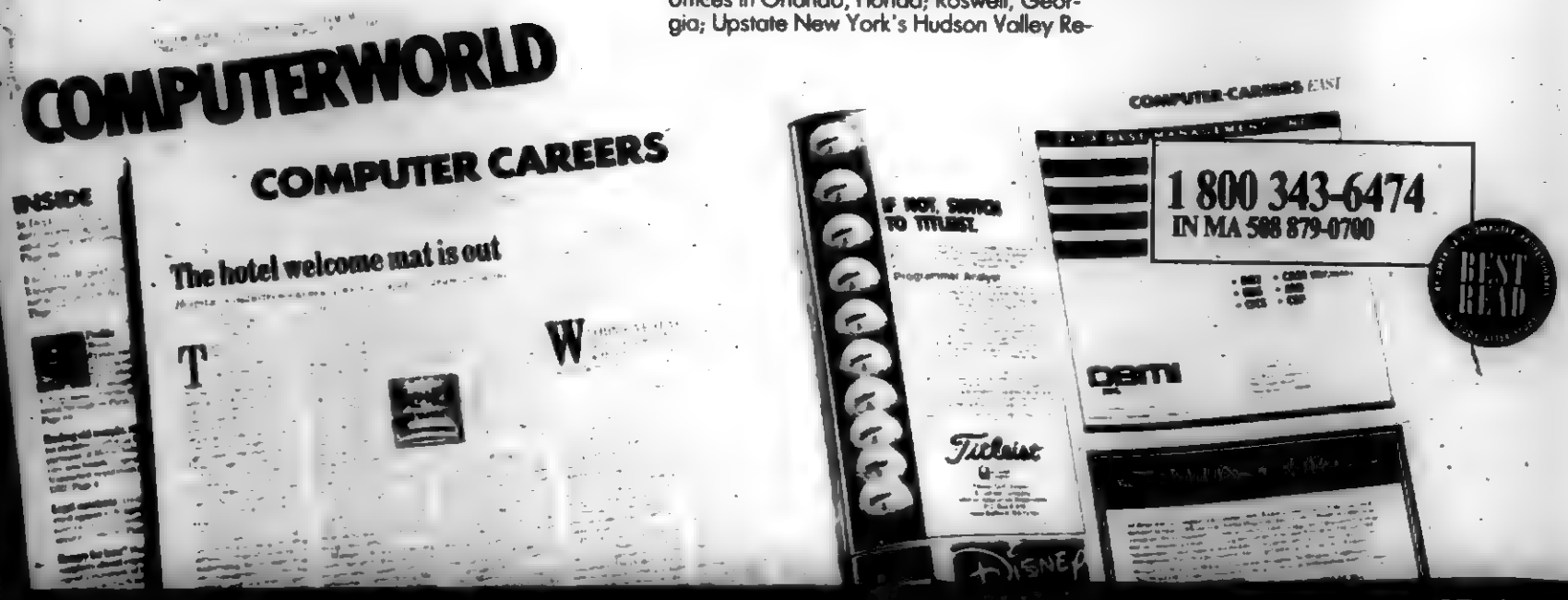

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Computerworld/CompTech Career Index

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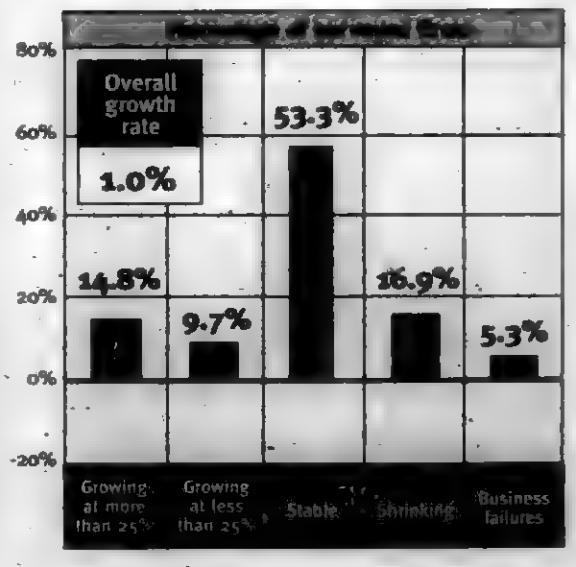

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BUY the RIGHT notebook

By Mark Leaser

RAPID TECHNICAL ADvancements and sharp price drops in notebook computer technology challenge the buyer looking for a deal. Do you wait for lower prices, or do you buy now? Is it more cost-effective to get a feature-packed system all at once, or add a little at a time? Fortunately, there is a right way to buy a new notebook computer. Guidelines for a smart purchase are listed below.

Timing Timing is everything, so buy early in the life cycle — but not too early. Purchase a new notebook model two to three months after it has been released to avoid the high prices that usually accompany a newly released product. More importantly, you get it at the beginning of its useful life cycle, which in terms of features is about 18 months.

Color If you plan to resell your notebook within two years, consider color. Within a year, standard notebooks will be equipped with active-matrix color screens that produce brilliant, crisp colors, and by then, most buyers will demand it. Although this technology is expensive, active-matrix color notebook prices are falling faster than any other type of notebook.

Stay away from color screens based on passive-matrix technology. These notebooks are much less expensive, but the color quality is not as good.

Service plan Notebook computers break more often than PCs do, so consider the manufacturer's service plan carefully. Don't buy a machine from a manufacturer that requires you to bring it to a dealership for repair. The reason? Most dealers are not adequately equipped with parts to provide fast turnaround. Instead, look for vendors that offer nationwide, on-site service or allow the machine to be shipped back to them for repair or replacement.

Memory Check the maximum amount of memory that can be installed. Look for notebooks that are upgradable with special memory cards that are easily snapped in. Also, find out if you can buy memory from third-party suppliers, which often costs less than the original manufacturer's memory.

Hard disk Don't skimp on the hard disk; upgrading a disk drive after the fact is expensive. The other consideration is speed. Look for a hard drive with an average speed of 17 msec.

The battery Most users want a battery that will last all day, even though they rarely use battery power at all. If you really need battery power, buy a notebook with a nickel metal-hydride battery rather than a nickel cadmium battery. Nickel metal-hydride batteries recharge completely every time you charge them, while NiCad batteries develop a "memory" that prevents them from recharging unless they are depleted.

Brand names Always buy from one of the leading manufacturers to save money. The price differential between name brands and third-party machines is narrow. You will find a well-established market for a used system if it's a leading brand.

Ruggedness Make sure your notebook will stand up to wear and tear. Unfortunately, some companies manufacture notebooks with flimsy port covers that break during normal use such as during printer hook up. Also investigate the sturdiness of the flip-down monitor. Some monitors are easily bent by reclining airplane seats.

Modems Many manufacturers offer internal modems and fax modems, but be sure the installed manufacturer's modem will work with your software and that adequate documentation and technical support is supplied. You may even be able to save money by purchasing a modem from another company.

Docking stations Many notebook manufacturers offer docking stations that allow notebooks to be used with a full-size keyboard and monitor. They also give you direct access to your local-area network and printers.

Docking stations are very expensive, however. As an alternative, consider a device called a port extender that gives you most of the docking station capabilities. Also, before buying a docking station just to provide access to a LAN, consider a pocket-size LAN adapter that connects to a notebook's parallel port.

Leaser is president of the Executive PC Institute in San Diego, which specializes in sales force automation.

Windows checklist

Few manufacturers offer adequate machines for using Microsoft Corp.'s Windows. For the best buy, follow these guidelines:

- Look for no less than an 80M-byte hard disk; 120M bytes is more prudent with at least 4M bytes of random-access memory.
- Test screen quality. Check out active-matrix color.
- Minimum processor is a 386SX, 25-MHz system. Don't get hung up on power-saving chips; most people do not use batteries often.
- Pointing devices should be integrated within or below the keyboard. Avoid devices that hang off the side. One exception: Apple Computer, Inc.'s PowerBook integrated trackball and wrist rest.
- Stay away from notebooks that require two keystrokes for common functions such as page up and page down.

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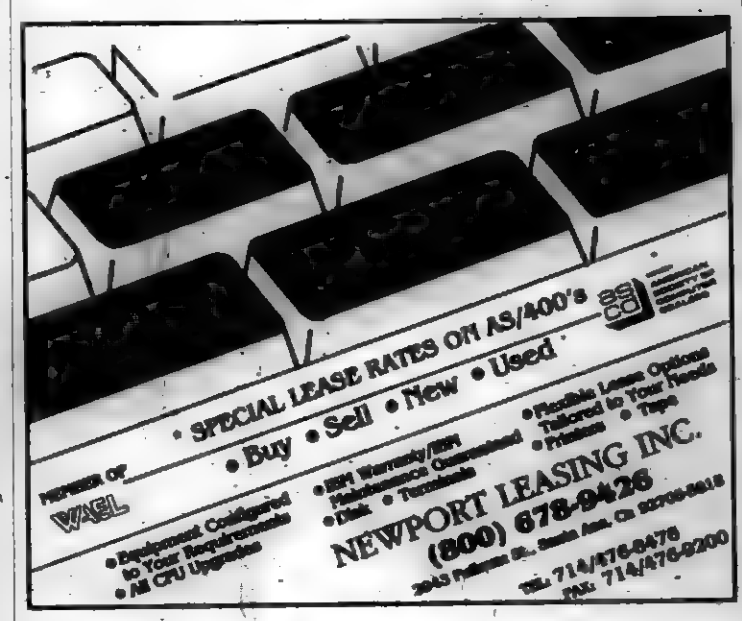

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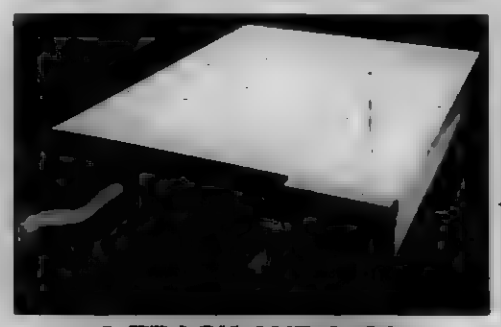

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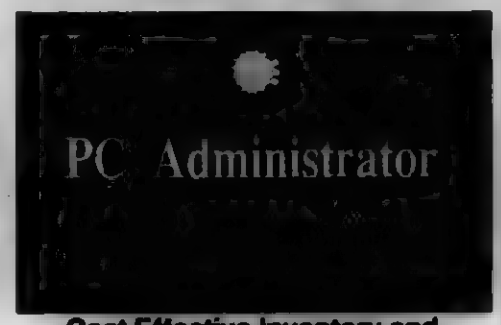

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Seattle, WA (206) 622-9558

Poorman-Douglas Corp.
Portland, OR (503) 245-5555

Prime Clinical Systems, Inc.
Pasadena, CA (818) 449-1705

Professional Health Care Systems, Inc.
Los Angeles, CA (213) 578-7000

Serving Software, Inc.
Minneapolis, MN (612) 623-4038

Source Data Systems, Inc.
Cedar Rapids, IA (319) 393-3343

Synetics Corp.
Wakefield, MA (617) 245-9090

Versyss, Inc.
Westwood, MA (617) 461-6400

Carl Zeiss, Inc.
Thornwood, NY (914) 747-1800

INSURANCE

Agena Corp
Seattle, WA (206) 525-0005

Agency Management Services, Inc.
Norwell, MA (617) 982-9400

Delphi Information Systems, Inc.
Westlake Village, CA (818) 706-8989

Input Output Computer Services, Inc.
Waltham, MA (617) 890-2299

Insumet, Inc
Emeryville, CA (510) 652-3771

ISI Systems, Inc.
Andover, MA (508) 682-5500

Sigma Imaging Systems, Inc.
New York, NY (212) 476-3000

IMAGING

Burns Consulting Group
Scituate, MA (617) 982-1888

Laser Recording Systems, Inc.
Mountain Lakes, NJ (201) 402-9500

United Systems and Software, Inc.
Maitland, FL (407) 875-2120

LIBRARIES

CLSI, Inc.
Newtonville, MA (617) 965-6310

MANUFACTURING

Ask Computer Systems, Inc.
Mountain View, CA (415) 969-4442

Bell Atlantic Software Systems, Inc.
Sudbury, MA (508) 443-7311

Data 3 Systems
Santa Rosa, CA (707) 528-6560

Diog-Remix
Anaheim Hills, CA (714) 282-6422

Expandable Software, Inc.
Santa Cruz, CA (408) 261-7880

GE Consulting Services, Inc.
Rockville, MD (301) 340-5100

Matra Datavision, Inc.
Tewksbury, MA (508) 640-0940

Micro-MRP
Foster City, CA (415) 345-8000

Racal-Redac, Inc.
Westford, MA (508) 692-4900

Software Horizons, Inc.
Burlington, MA (617) 273-4711

SPECTRUM ASSOCIATES
Woburn, MA (617) 932-0932

Symmetrix, Inc.
Lexington, MA (617) 862-3200

The Peak Technologies Group, Inc.
Columbia, MD (410) 992-9922

Waters
Marlboro, MA (508) 624-8450

MANUFACTURING SOFTWARE

Effective Management Systems
Milwaukee, WI (414) 359-9800

North Coast Automation, Inc.
Cleveland, OH (216) 473-3800

NETWORKING

A-net
Eugene, OR (800) 444-9796

RETAIL

Comtek Systems, Inc.
San Antonio, TX (512) 340-8253

Concept Systems, Inc.
Philadelphia, PA (215) 563-1425

Data Management Facility Co., Inc.
Irwindale, CA (818) 813-1620

SALES FORCE AUTOMATION

Gateway Systems Corporation
East Lansing, MI (800) 333-9366

SCHEDULING/PLANNING

Summit Solutions, Inc.
Chesterton, IN (219) 929-4189

SECURITY

Z-Lock Mfg. Co.
Redondo Beach, CA (310) 372-4842

SOFTWARE DEVELOPERS

Cadre Technologies, Inc.
Providence, RI (401) 351-5950

Stepstone Corp.
Sandy Hook, CT (203) 426-1875

Vanguard Software
Hudson, MA (508) 562-7711

TRAINING

Carl A. Argila, Ph.D., Inc.
Los Angeles, CA (800) 347-6903

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale, FL (305) 587-2270

UTILITIES

Kaye Instruments, Inc.
Bedford, MA (617) 275-0300

OASIS Technology, Inc.
Oxnard, CA (805) 988-1020

WHOLESALE DISTRIBUTION

Daly & Walcott, Inc.
W Warwick, RI (401) 823-8400

Arthur Ellingsen & Co.
Arlington Heights, IL (708) 506-0555

National Distributor Systems, Inc.
Stratford, CT (203) 378-6010

SI Handling Systems, Inc.
Easton, PA (215) 252-7321

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Percent

Spinnaker Software	75.0	Exabyte Corp.	-19.4
Antel Communication Corp.	35.3	Micro Focus	-18.9
Walker Interactive Systems(L)	21.7	Computer Peripherals	-18.4
Symix Software Assoc.	21.1	Label Corp.	-15.8
Rastergps	18.9	McAfee Associates (L)	-14.8
Ross Systems	18.8	CB Software	-12.5
Cheyenne Software Inc.	14.3	Dell Computer Corp.	-12.2
Wyse	14.0	Standard Microsystems Corp	-11.8

Dollar

Intel Corp.	5.88	Micro Focus	-8.00
BMC Software Inc.	4.38	Cabletron Systems	-6.00
Wellfleet Communications	4.25	Dell Computer Corp.	-4.50
Cheyenne Software Inc.	3.75	Compaq Computer Corp.	-3.75
IBM	3.75	Compaq Computer Corp.	-3.13
Powersoft	3.50	Standard Microsystems Corp	-2.38
Sybase Inc.	3.25	Apple Computer Inc.	-2.13
Chipcom Corp.	3.13	Data Race Inc.	-2.13

Tech stocks fall, bounce back

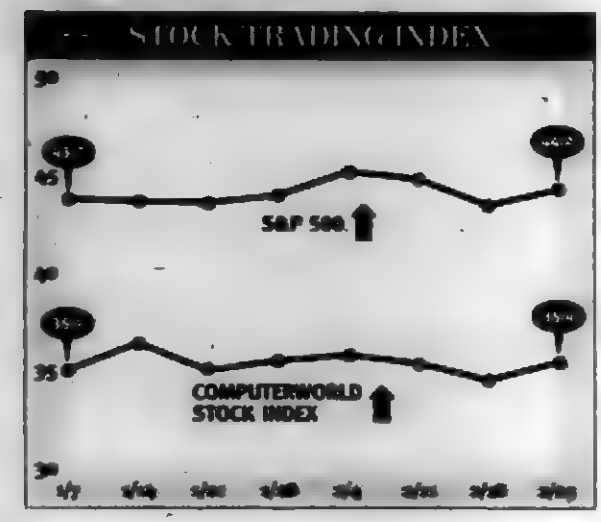
Computer industry issues experienced at least a temporary pause in their recent slide, with a number of stocks rebounding significantly in the middle of last week.

The decline in share price during the past three weeks affected stocks in growing high-tech industry sectors such as internetworking equipment and client/server software. BMC Software, Inc. (BMC) sank from almost 80 in early February to the high 50s last week. On Wednesday, the stock regained 3 ⅞ points and finished at 62. Cisco Systems, Inc. (CSCO), sailing at a 52-week high of nearly 95 in early February, fell into the low 80s before picking up 4 ¾ points to close at 85 Wednesday. Other wilting stocks that perked up included Microsoft Corp. (MSFT) and PeopleSoft (PSFT).

Analysts attributed most of the recent declines to general market conditions rather than problems with technology vendor fundamentals. "The market has been bouncing around, and as uncertainty grows, people want to minimize their risk, which hits technology stocks hard," said James Mendelson, an analyst at Morgan Stanley & Co.

Analysts mentioned BMC Software as an example of a fundamentally strong company that has been on a share-price roller coaster. "I think their drop has been strictly due to the fallback of the NASDAQ market," said Barry King, a research director at Ladenburg, Thalmann & Co.

Mendelson said many technology stocks had been on a prolonged upward course. "The valuations were getting up there. BMC was in the 30s back in the summer, and there are a lot of others out there that have been on big runs," Mendelson said. —*Derek Slater*



Exch	52-Week Range			Feb.26 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS & NETWORKING						Jan. '93
OTC	34.63	9.63	3 COM Corp.	29.25	-0.38	-1.3
NYS	76.63	56.25	American Info Techs Corp. (H)	75.00	2.00	2.7
NYS	55.75	36.63	AT&T	55.75	2.25	4.2
OTC	3.25	0.75	Antel Communication Corp	2.88	0.75	35.3
OTC	24.50	10.25	Banyan Systems Inc.	17.50	-1.25	-6.7
NYS	56.75	40.25	Bell Atlantic Corp. (H)	55.00	0.75	1.4
NYS	56.38	43.38	BellSouth Corp. (H)	56.38	2.63	4.9
NYS	6.75	3.63	Bolt, Beranek & Newman	4.50	-0.13	-2.7
OTC	18.50	10.00	Brooktrout Technology	15.50	0.00	0.0
NYS	92.25	42.13	Cabletron Systems	79.00	1.25	1.6
OTC	34.50	17.75	Chipcom Corp.	31.50	3.13	11.0
OTC	94.75	33.00	Cisco Systems Inc.	87.25	2.75	3.3
OTC	27.75	5.50	Compression Labs Inc.	14.00	-0.88	-5.9
OTC	3.44	0.88	Data Switch Corp.	3.00	-0.19	-5.9
NYS	22.38	13.75	Digital Comm. Assoc.	18.13	0.13	0.7
OTC	14.75	7.25	Digital Systems Int'l Inc.(L)	7.25	-0.63	-7.9
OTC	28.50	4.00	DSC Communications	25.88	1.25	5.1
OTC	10.88	4.75	Fibronix Int'l Inc.	7.88	-0.38	-4.5
OTC	37.50	10.50	Frekey Corp.	13.25	-0.75	-5.3
OTC	4.38	1.50	Gandalf Technologies Inc.	3.38	-0.38	-10.0
OTC	2.88	0.69	Gateway Communications	1.69	0.19	12.5
NYS	10.50	2.88	General Datacomm Inds.	8.00	0.00	0.0
ASE	4.88	2.00	Go Video	2.50	-0.25	-9.1
NYS	37.75	28.88	GTE Corp. (H)	36.50	0.50	1.4
NYS	76.25	62.50	ITT Corp.	75.88	1.50	2.0
OTC	43.38	29.50	MCI Communications Corp.	40.13	1.25	3.2
OTC	13.50	2.25	Microcom Inc.	4.75	0.00	0.0
OTC	24.25	8.00	Netrix Corp. (L)	10.25	0.13	1.2
OTC	19.00	9.63	Network Computing Devices	15.00	-1.25	-7.7
NYS	16.50	8.13	Network Equipment Tech.	8.38	-0.88	-9.5
OTC	23.25	8.00	Network General	13.25	-1.63	-10.9
OTC	15.75	8.50	Network Systems Corp.	11.75	0.63	5.6
OTC	50.00	13.25	Newbridge Networks Corp.	48.50	0.13	0.3
NYS	48.13	30.50	Northern Telecom Ltd.	43.50	0.63	1.5
OTC	33.50	22.50	Novell Inc.	29.00	1.50	5.5
NYS	91.00	69.13	Nynex Corp. (H)	90.75	2.88	3.3
OTC	37.50	34.50	Octel Communications Corp.	36.00	0.75	2.0
OTC	9.00	3.38	Pemtil Data Comm Networks	4.63	-0.38	-7.5
OTC	48.75	10.25	PictureTel Corp.	25.00	0.38	1.5
DTC	16.75	7.00	Proteon Inc.	7.63	-0.50	-6.2
NYS	30.38	10.16	Scientific Atlanta Inc.	20.50	1.13	5.8
NYS	75.63	56.63	Southwestern Bell Corp	74.13	1.88	2.6
NYS	28.25	20.75	Sprint Corp.	28.00	0.88	3.2
OTC	27.00	8.75	Standard Microsystems Corp	12.75	-2.38	-15.8
OTC	18.50	6.88	Stratacom Inc.	14.75	-1.50	-9.2
OTC	95.50	18.75	Synoptics Communications	80.00	2.50	3.2
OTC	7.13	4.25	Telebit Corp. (L)	5.13	-0.50	-8.9
OTC	9.38	2.13	Telematics Int'l Inc.	7.63	-0.38	-4.7
OTC	25.50	13.38	US Robotics	18.50	-1.25	-6.3
NYS	43.75	32.88	US West Inc. (H)	43.63	1.75	4.2
OTC	46.00	12.00	Wellfleet Communications	39.25	4.25	12.1
OTC	22.00	7.00	Xircom	8.50	0.75	9.7
DESKTOP WORKSTATIONS						Jan. '93
OTC	8.00	3.13	Advanced Logic Research	3.25	-0.38	-10.3
OTC	68.50	41.50	Apple Computer Inc.	52.88	-2.13	-3.9
OTC	24.25	11.25	AST Research Inc.	17.00	-1.25	-6.8
NYS	16.25	5.25	Commodore Int'l	5.38	-0.38	-6.5
NYS	58.50	22.25	Compaq Computer Corp.	45.50	-3.13	-6.4
OTC	49.88	15.00	Dell Computer Corp.	32.38	-4.50	-12.2
NYS	85.00	50.25	Hewlett Packard Co.	74.75	0.63	0.8
NYS	33.00	14.13	Silicon Graphics	28.38	0.00	0.0
OTC	41.00	22.50	Sun Microsystems Inc.	35.38	1.13	3.3
NYS	32.13	22.25	Tandy Corp.	25.13	-0.13	-0.5
NYS	11.13	5.00	Zenith Electronics	7.38	0.25	3.5
OTC	22.75	2.75	Zeos International Ltd.	4.75	-0.63	-11.6
APPLE SYSTEMS						Jan. '93
ASE	20.13	6.63	Amdahl Corp	8.00	0.25	3.2
NYS	15.63	4.75	Convex Computer	5.50	0.13	2.3
OTC	7.13	1.88	Cray Computer	3.25	-0.38	-10.3
NYS	45.00	19.00	Cray Research Inc.	26.25	1.00	4.0
NYS	13.00	7.13	Data General Corp.	12.25	-0.25	-2.0
NYS	63.13	30.38	Digital Equipment Corp.	47.75	2.88	6.4
NYS	38.63	26.63	Harris Corp.	36.50	0.75	2.1
NYS	100.38	45.88	IBM	54.00	3.75	7.5
OTC	19.50	5.50	Kendall Square Research	17.00	1.25	7.9
NYS	110.00	83.00	Matsushita Electronics	89.00	-1.25	-1.4
OTC	17.00	6.00	Pyramid Technology	14.25	0.25	1.8
OTC	24.00	11.13	Sequent Computer Sys.	19.38	-1.38	-6.6
OTC	16.38	1.38	Sequoia Systems Inc.	2.50	0.00	0.0
NYS	53.38	29.50	Stratus Computer Inc.	31.38	-1.13	-3.5
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.50	4.0
NYS	13.25	7.75	Unisys Corp	12.38	0.63	5.3
ASE	6.88	0.06	Wang Labs Inc. (B)	0.81	-0.06	-7.1
SOFTWARE						Jan. '93
OTC	58.75	25.25	Adobe Systems Inc.	44.63	1.63	3.8
OTC	30.00	10.25	Aldus Corp.	18.00	0.50	2.9
OTC	19.75	6.63	American Software Inc.	6.63	-0.88	-11.7
OTC	25.63	9.75	Ask Computer Systems	23.50	0.63	2.7
OTC	56.50	26.50	Autodesk Inc.	48.00	1.50	3.2
OTC	28.00	3.50	Bachman Info. Systems	3.75	-0.50	-11.8
OTC	43.00	34.00	B&S Systems Inc.	40.75	-0.25	-0.6
OTC	84.13	37.25	BMC Software Inc.	64.38	4.38	7.3
OTC	28.25	17.00	Boole & Babbage	25.00	-1.50	-5.7
OTC	75.00	17.50	Borland Int'l Inc.	21.00	-0.50	-2.3
OTC	9.50	3.00	CE Software	3.50	-0.50	-12.5
ASE	35.00	9.38	Cheyenne Software Inc.	30.13	3.75	14.2
OTC	19.50	8.25	CompSott	14.50	-1.00	-6.5
OTC	10.25	5.63	Cognos Inc.	7.00	0.13	1.8
NYS	27.38	10.88	Computer Associates	25.75	1.25	5.1
NYS	12.38	4.00	Computervision Corp.	4.63	-0.13	-2.6
OTC	18.50	6.75	Comsmare Inc.	9.50	0.63	7.0
OTC	17.25	10.75	Corel Corp.	12.13	0.50	4.3
OTC	43.00	6.00	Easel Corp.	8.00	-1.50	-15.8
OTC	25.25	12.00	4th Dimension	19.00	1.00	5.6
OTC	25.50	11.75	Frame Technology	13.00	0.00	0.0
OTC	22.25	12.50	Group I Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta (L)	27.75	0.25	0.9
OTC	8.75	3.50	Hogan Systems Inc.	7.75	0.38	5.1
OTC	25.75	12.25	IMRS (L)	13.25	1.00	8.2
OTC	34.75	18.50	Information Resources	30.25	-0.88	-2.8
OTC	42.00	12.13	Informix Corp.	31.25	0.25	0.8
OTC	21.25	11.00	Intergraph Corp.	12.00	-0.50	-4.0
OTC	14.13	7.75	Interleaf Inc.	9.75	-0.50	-4.9

Exch	52-Week Range			Feb.26 3 PM	Wk Net Change	Wk Pct Change
OTC	18.25	7.50	Intersolv Inc. (L)	8.50	-0.25	-2.9
OTC	19.50	9.50	Knowledgeware Inc.	10.75	0.25	2.4
OTC	54.75	28.75	Legent Corp.	45.75	0.25	0.5
OTC	38.75	14.75	Lotus Development	26.88	3.00	12.6
OTC	23.00	15.50	MathSoft	19.25	1.63	9.2
OTC	23.25	9.38	McAfee Associates (L)	9.38	-1.63	-14.8
OTC	8.38	1.88	Meca Software	7.00	0.63	9.8
OTC	20.25	5.25	Mentor Graphics	9.38	-0.25	-2.6
OTC	46.00	27.25	Micro Focus	34.25	-8.00	-18.9
OTC	20.50	6.50	Microgratx Inc.	7.88	-0.38	-4.5
OTC	95.00	65.50	Microsoft Corp.	83.25	3.00	3.7
OTC	36.38	12.00	Oracle Corp.	32.25	2.50	8.4
OTC	63.75	25.25	Parametric Technology	39.50	1.88	6.8
OTC	40.50	22.50	Peoplesoft	29.00	2.50	9.4
OTC	11.00	3.50	Phoenix Technologies	5.00	-0.13	-2.4
OTC	38.75	29.75	Powersoft	36.75	3.50	10.5
OTC	25.00	11.25	Platinum Technology	16.75	-0.50	-2.9
OTC	61.50	29.00	Progress Software Corp.	50.00	3.00	6.4
OTC	22.25	2.94	Quarterdeck Office Sys. (L)	3.25	0.00	0.0
OTC	29.75	11.75	Rainbow Technologies Inc.	18.13	0.63	3.6
OTC	22.75	4.00	Rastergps	7.88	1.25	18.9
OTC	17.25	3.63	Ross Systems	12.63	2.00	18.8
OTC	27.25	8.50	Saphens USA Inc.	22.00	0.25	1.1
OTC	26.25	6.75	Software Publishing Corp.	12.13	0.25	2.1
OTC	9.13	2.00	Software Toolworks Inc. (H)	6.81	-0.81	-10.6
OTC	5.63	0.75	Spinnaker Software	2.63	1.13	75.0
OTC	18.50	3.25	State of the Art	11.25	0.00	0.0
NYS	23.63	13.75	Sterling Software Inc.	20.00	-2.00	-9.1
OTC	23.25	8.00	Struct. Dynamics Research	12.75	0.38	3.0
OTC	62.25	21.00	Sybase Inc.	56.13	3.25	6.1
OTC	48.75	5.88	Symantec Corp.	10.88	-0.88	-7.4
NYS	13.50	5.25	Systems Center Inc.	8.25	-0.13	-1.5
OTC	25.50	10.00	System Software Assoc.	13.63	2.38	21.1
OTC	10.13	2.50	Trinzic Corp.	4.00	0.00	0.0
OTC	22.75	9.13	Viewlogic Systems	17.75	-0.25	-1.4
OTC	23.75	8.13	Walker Interactive Systems(L)	18.50	1.88	11.7
OTC	4.38	1.38	Wordstar	2.38	0.06	2.7
SEMICONDUCTORS						Jan. '93
NYS	22.50	7.38	Advanced Micro Devices (H)	21.75	0.13	0.6
NYS	18.75	8.63	Analog Devices Inc.	16.88	0.25	1.5
OTC	20.13	7.63	Atmel Corp.	17.38	0.75	4.5
OTC	13.38	3.25	Chips and Technologies	3.44	-0.06	-1.8
OTC	39.75	16.25	Cirrus Logic	25.00	-6.00	-19.4
NYS	16.88	7.38	Cypress Semiconductor Corp	10.25	0.00	0.0
NYS	16.13	7.00	Dallas Semiconductor	14.00	0.13	0.9
OTC	118.00	46.50	Intel Corp.	117.00	5.00	4.5
NYS	12.25	6.88	LSI Logic Corp.	11.38	0.25	2.2
NYS	25.75	12.88	Micron Technology (H)	24.50	0.13	0.5
NYS	63.00	36.44	Motorola Inc.	58.75	1.38	2.4
NYS	14.13	8.25	National Semiconductor	11.00	0.63	6.0
OTC	25.25	8.25	Sierra Semiconductor	13.38	-0.63	-4.5
OTC	38.50	22.25	SynOpsys	32.25	1.00	3.2
NYS	99.25	31.50	Texas Instruments	56.88	1.88	3.4
OTC	10.00	6.00	VLSI Technology	7.00	-0.13	-1.8
OTC	7.63	2.13	Weitek	7.13	0.88	14.0
ASE	9.63	3.50	Western Digital Corp.	8.29	-0.88	-9.6
OTC	35.25	14.50	Xilinx	30.75	1.75	6.0
OTC	27.84	12.50	Zilog Inc.	21.50	-2.13	-9.0
PERIPHERALS AND SUBSYSTEMS						Jan. '93
OTC	28.75	10.38	American Power Conversion	24.25	0.63	2.6
OTC	30.25	20.25	Banctec Inc.	26.75	0.25	0.9
OTC	22.00	9.25	Cambex Corp.	10.50	-0.75	-6.7
ASE	18.38	6.25	Cognitronics Corp.	14.00	-0.38	-2.6
NYS	25.50	16.63	Conner Peripherals	16.63	-3.75	-18.4
OTC	38.50	10.75	Creative Technologies Inc.	31.00	2.75	9.7
OTC	30.75	14.25	Data Race Inc.	19.63	-2.13	-9.8
ASE	19.66	4.75	Databam Corp.	9.00	1.00	12.5
NYS	28.75	7.25	EMC Corp.	23.13	-0.50	-2.1
OTC	10.50	5.38	Emulex Corp.	6.50	-0.75	-10.3
OTC	19.25	13.25	Evans & Sutherland	15.13	0.13	0.8
OTC	39.25	12.00	Exabyte	13.38	-0.25	-1.8
OTC	36.00	7.89	Intelligent Info. Systems	21.50	0.17	0.8
OTC	11.13	4.75	Iomega Corp.	4.75	-0.63	-11.6
OTC	34.75	5.75	IPL Systems Inc.	7.50	-0.50	-6.3
OTC	23.25	10.75	Komag Inc.	22.50	0.75	3.4
OTC	19.63	8.00	Maxtor Corp.	8.00	-1.00	-11.1
OTC	12.63	7.13	Micropolis Corp.	8.25	-0.88	-9.6
NYS	109.75	85.50	3M Corp	104.50	0.75	0.7
OTC	7.75	4.00	Printronix Inc.	7.00	0.25	3.7
NYS	17.13	6.88	QMS Inc.	14.38	-0.25	-1.7
OTC	17.88	12.33	Quantum Corp.	15.13	-0.75	-4.7
OTC	17.75	3.75	Radius Inc.	5.13	-0.25	-4.7
NYS	16.25	7.50	Recognition Equipment	13.00	-0.88	-6.3
OTC	13.88	6.00	Reson Inc.	6.00	-0.50	-7.7
OTC	22.38	12.00	Seagate Technology	15.75	-2.00	-11.3
NYS	74.00	18.38	Storage Technology	20.50	0.88	4.5
NYS	25.25	16.50	Tertronix Inc.	24.75	1.00	4.2
NYS	88.88	66.75	Xerox Corp.	82.75	0.88	1.1
SERVICES						Jan. '93
OTC	23.50	12.36	American Mgmt. Systems	19.25	0.88	4.8
NYS	5.38	3.00	Arkcom Inc.	3.25	-0.25	-7.1
OTC	35.75	16.00	Analysts Int'l	32.50	1.00	3.2
NYS	55.88	38.75	Auto Data Processing	53.88	-1.38	-2.5
NYS	17.75	8.97	Ceridian Corp.	14.88	-0.13	-0.8
NYS	18.64	12.50	Comdisco Inc.	15.75	0.63	4.1
OTC	13.00	6.75	Computer Horizons	9.75	-0.25	-2.5
NYS	80.50	57.00	Computer Sciences	74.75	0.00	0.0
NYS	10.13	7.13	Computer Task Group	7.38	-0.13	-1.7
NYS	40.50	27.00	CompUSA Inc.	26.25	-1.75	-6.3
OTC	18.75	6.00	Corporate Software	12.00	0.50	4.3
OTC	30.75	7.75	Egghead Discount Software	8.13	-0.50	-5.8
NYS	35.88	25.25	General Motors E (EDS)	30.63	0.88	2.9
OTC	25.50	9.25	Inacom Corp.	22.50	1.75	8.4
OTC	27.00	8.25	Intelligent Electronics	14.13	0.25	1.8
OTC	14.88	6.63	Medisil	10.75	-0.25	-2.3
OTC	15.75	5.75	Microage Inc.	13.00	1.00	8.3
OTC	48.00	21.66	Paychex	37.50	1.50	4.2
NYS	83.75	59.75	Policy Management Sys.	77.75	2.50	3.3
NYS	32.75	16.81	Reynolds and Reynolds	31.25	1.75	5.9
OTC	32.00	22.00	SEI Corp.	27.75	-0.75	-2.6
OTC	24.38	16.88	Shared Medical Systems	22.75	0.00	0.0
OTC	14.38	5.75	SHL Systemhouse	8.75	0.38	4.5
OTC	29.25	18.25	Software Spectrum Inc.	25.00	1.50	6.4
OTC	32.50	20.75	Syncard Data Systems	31.75	1.63	5.4
NYS	3.50	1.13	Ultimate Corp.	1.88	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Andersen uptick

Citing growth in client/server computing and business process re-engineering, **Andersen Consulting** last week reported 1992 revenue of $2.7 billion, a 16% increase from the year-earlier period. More than $1 billion came from client/server consulting, up from $870 million in 1991, according to George Shaheen, managing partner. The Chicago consultancy expects its client/server business to approach $1.9 billion this year.

Zeos records Q4 loss

Zeos International Ltd. posted a fourth-quarter net loss of $7.1 million, including a $1.1 million write-off for the closure of its Occidental Systems subsidiary. The loss widened the company's 1992 deficit to $28.2 million. Sales in the fourth quarter were $46.9 million, down 47%. Overall, 1992 sales declined 10% to $206.1 million.

Intersolv in the red

A $13.2 million write-off of software development costs pushed **Intersolv, Inc.** into the red to the tune of $8.8 million in its fiscal third quarter. The Rockville, Md., application development tool maker earned $2 million in last year's third quarter. Sales in the period ended Jan. 31 fell 7%, to $20 million.

SHORT TAKES **Spinnaker Software Corp.** in Cambridge, Mass., agreed to acquire **Power Up Software Corp.**, a San Mateo, Calif., desktop publishing and personal organizer software maker.... **KnowledgeWare, Inc.** completed its acquisition of **Mategys Mathematics Systems SA**.... **Network Systems Corp.** in Minneapolis won a suit brought by the **Internal Revenue Service** over its accounting practices in the 1983-1985 period.

Clinton plan stirs optimism

Industry execs praise overall strategy but voice doubts over spending cuts

By Gary H. Anthes and Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Silicon Valley executives have the ear of President Bill Clinton — and they plan to make the most of it.

Last week, a core group of computer industry executives discussed a $17 billion technology plan with Clinton and Vice President Albert Gore at the headquarters of Silicon Graphics, Inc.

James G. Treybig: *Clinton's plan should benefit all users*

The four-year high-tech plan fleshes out many of Clinton's campaign promises about creating a new partnership between government and industry. These include tax incentives, promotion of high-performance computer hardware, software and communications technology, development of a new national high-speed data network and the use of national laboratory facilities for commercial research.

The National Bureau of Economic Research reported that a permanent increase in the R&D tax credit would boost long-term private spending on R&D by 5% to 10%. The R&D credit in the 1980s raised R&D spending by $2 billion a year while costing the U.S. Treasury $1 billion annually, the bureau said.

Partnership forged

The generally pro-business plan underscores a growing relationship between the technology-savvy Clinton administration and the computer industry, a partnership largely absent in the Reagan/Bush era. The technology program could speed the development of new technologies that would benefit users, some chief executive officers said.

James G. Treybig, president and CEO of Tandem Computers, Inc. and one of 13 CEOs in the Computer Systems Policy Project, worked through the alliance during the presidential campaign to help Clinton develop his technology policies. Clinton "has not backed off anything we agreed to," Treybig said last week. "The concepts are the same — investing in jobs, creating companies, moving the government more toward commercial technologies and encouraging the development of the data highway."

Treybig said the Clinton plan should benefit users of information technology by fostering a healthy industry, which would lead to lower prices, greater vendor stability and more innovation from stepped-up research and development.

"We can either stay on the sidelines or be a participant," said Kenneth Coleman, senior vice president at Silicon Graphics. "The new administration views technology as a natural resource to be supported, nurtured and protected, and that's different from what we're used to."

But Silicon Graphics CEO Ed McCracken warned that Clinton's combined high-tech and economic plan could run into trouble in Congress. "If he isn't able to get it through the Congress, then we've got an old tax-and-spend Democratic program," he said. "But if we can keep it clean, the administration's program is quite good."

Treybig said Tandem had analyzed Clinton's tax proposals and concluded it could live with them — with one key qualification. "We can afford more taxes, but only if he fixes the economy," he said, adding that doing so will require deeper spending cuts than the president has so far proposed.

Indeed, a number of executives voiced reservations about the spending side of the president's plan. "The spending cuts are not real and deep enough," said Mitchell E. Kertzman, chairman and CEO of Powersoft Corp. in Burlington, Mass., and a past chairman of the American Electronics Association.

However, Kertzman praised the economic plan for its likely impact on the cost of capital. "We are seeing very good proposals, both in the specifics like capital gains and tax credits, but also in the commitment to reduce the deficit, the largest single contributor to the cost of capital," he said.

Kertzman also said users — increasingly moving to distributed computing — would benefit from the technology and infrastructure likely to flow from the administration's program.

Tom Gannon, director of technology planning and development at Digital Equipment Corp., agreed, saying the president's proposed national information infrastructure would help DEC's corporate customers compete. "It will provide the ability to access all kinds of information [in order to] develop more accurate customer requirements, respond to a changing economic climate and provide a more timely interface to clients, vendors and contractors."

Michael Maibach, director of government affairs at Intel Corp., said Clinton's plan touched too lightly on regulatory reform. "We need just-in-time government, not red-tape-bureaucratic government," he said. With ever decreasing product cycle times, a delay in getting government approval to build a new semiconductor plant could be a showstopper for Intel, which is investing a whopping $1.6 billion this year on plant and equipment, he pointed out.

President Clinton's economic plan is available on IBM-compatible PC disk from the Economics and Statistics Administration, an arm of the U.S. Department of Commerce. It can be ordered by calling (202) 482-4529.

Up with technology

President Clinton's $17 billion high-tech program proposes to do the following:

- Create a national information infrastructure based on a national broadband "data highway." Accelerate development of the network, originally sponsored by Vice President Al Gore when he was a senator.
- Improve computer hardware, software and communications technology for education, training, health care and manufacturing.
- Boost federal spending on civilian R&D from 41% to 50%.
- Significantly increase funding for the government's Advanced Technology Program, which provides matching grants for industry-led R&D projects, and for R&D programs at the National Science Foundation.
- Earmark 10% to 20% of the budgets of the national laboratories to partnerships with industry.
- Create a national network of manufacturing extension centers.
- Make the R&D tax credit permanent.
- Reinstate an investment tax credit permanently for small business and temporarily for large companies.
- Reduce the capital gains tax rate for long-term investors in small companies and consider other ways to reward "patient capital."
- Reform antitrust laws to permit joint production ventures.

Wysiwyg

PRESENTS

What Is Your Favorite Office Toy?

Sandra Kurtzig
Chairman
The ASK Group, Inc.

"My lawyer doll. Sometimes lawsuits come up, which I have no control over. This doll has velcro arms and legs, so I can take my frustration out on the lawyer doll by pulling its arms and legs off."

"My favorite is my water gun, which shoots invisible ink or water. I have been afraid to use the ink, though. I have used it to shoot water at people when I'm angry. I've also shot users during a meeting to cool them down."

George Brenner
VP and Director of Corporate Information Services
Universal City Studios

PHOTO: ALAN LEVERSON

PHOTO: ALAN LEVERSON

Scott McNealy
President and Chief Executive Officer
Sun Microsystems, Inc.

"A golf club that I swing that has IBM engraved on it. I try not to bump it too hard on the furniture."

"Whenever I'm on the phone I play with paper clips and Scotch tape. I like to bend the paper clips or roll a piece of tape into a ball, and sometimes take the paper clips and stick them together with tape."

Mary Olivet
Manager of Information Processing
National Football League

PHOTO: ANDY FREEBERG

The Fifth Wave *by* Rich Tennant

Inside Lines

Failed memory

The IBM PC Co. has sent a letter to customers detailing memory parity problems on some of its low-end 325T ValuePoint systems. The 325T Model 6384 in specific serial number ranges can fail to produce memory parity error messages under certain conditions. Because the error occurs on DOS-only systems and IBM ships ValuePoints with Windows or OS/2 preinstalled, an IBM spokeswoman said, a customer would have to strip Windows or OS/2 from the ValuePoint to create this problem. No other ValuePoints or 386SLC-based systems have this glitch, she added. While IBM cautioned that the problem has caused no system failures, the company has created a service disk to fix it, which customers can obtain by calling (800) 845-4268.

Not so fast

Although Lotus' Improv spreadsheet is being warmly received at 18 sites, one key component remains in the lab: A promised SQL interface for Improv that will allow the spreadsheet to access data stored in relational databases won't arrive until an update to Improv is delivered on April 20, said John Landry, Lotus' director of technology. The SQL interface for Improv is based on code from Pioneer Software in Raleigh, N.C.

Neighborly gesture

WordPerfect is expected to use Interop '93 Spring in Washington, D.C., next week to disclose plans to integrate its WordPerfect Office package with the Novell Message Handling System (MHS) and global directory in NetWare 4.0. The Novell pact will be a key element of WordPerfect's drive to create groupware applications using standard PC applications, relational databases and E-mail transports, said David Clare, marketing director for electronic messaging at WordPerfect. Using Version 4.0 of WordPerfect Office as a base, the company said, it plans to link its messaging system with MHS, as well as support VIM and MAPI interfaces. WordPerfect Office 4.0, which includes E-mail, personal calendaring and group scheduling software, is due this spring.

Wider NOStrils

Network General is expected at next week's Interop show to fill some gaping holes in its enterprisewide LAN analysis strategy. One big piece will be extending its expert systems support from stand-alone Sniffer to Distributed Sniffer so users will now have help analyzing LANs enterprisewide from a central location. Network General will also finally announce Sniffer support for popular SNMP-based network management platforms such as HP's OpenView, along with support of the SNMP Remote Network Monitoring standard.

Group therapy

DECUS is developing plans for restructuring the organization to meet changing market requirements that have led to a cash shortfall. A number of options are under consideration, including overhauling the entire organization and providing members with additional access to information on other vendors' products. Decisions will be made later this year and are unlikely to go into effect until well after DECUS' symposium in June.

Bill Clinton and Al Gore showed Silicon Valley folks last week that they can talk in bits and bytes as well as the locals can. During a demonstration of Silicon Graphics' visualisation hardware and software, company co-founder Tom Davis showed how a picture of George Bush and Dan Quayle could be transformed into a picture of the current presidential team. "That's called morphing, right?" piped up Gore, who has specialised in technology and environmental concerns. Clinton later remarked on the value of high-speed networks, such as the Internet, in hooking workstations to remote computers. He was viewing a UCLA visualisation of a section of Los Angeles that will be rebuilt after last spring's riots. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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Tim Treneff, VAX Systems Manager,
Kaiser Aluminum & Chemical Corporation,
Rod, Bar & Wire Division.

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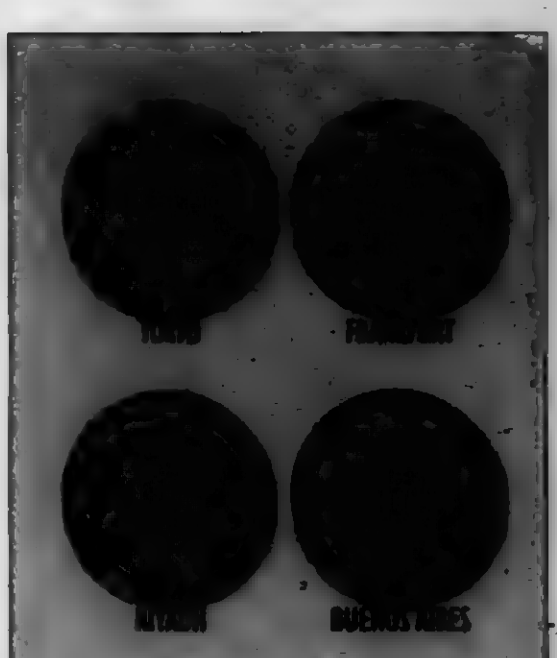

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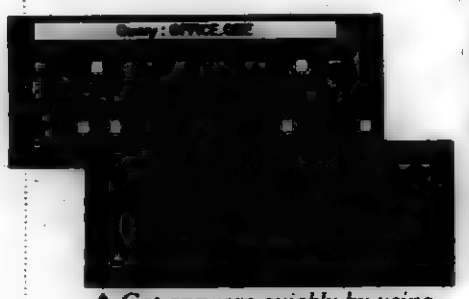

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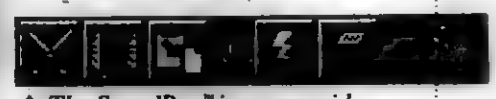

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UMI

COMPUTERWORLD

What should IBM do?

Industry VIPs give Big Blue an earful

Survey

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March 8, 1993, Vol. 27, No. 10, 144 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Inside

INTERVIEW
Eckhard Pfeiffer took a stumbling, bumbling **Compaq** and set it back on a high-speed growth track. Now on his mind is the IS role in client/server, information technology's payoff and his firm's drive to the top. *Page 28.*

IN DEPTH
What should IBM do to fix itself? *Computerworld* asked 24 industry VIPs for their advice. Users who say IBM's service has worsened suggest getting a technical CEO (see chart below). *Page 115.*

EXCLUSIVE READER SURVEY: USERS SOUND OFF

DO YOU THINK IBM SHOULD HIRE A CEO WITH A TECHNICAL RATHER THAN SALES BACKGROUND?

Base: 100 IBM users who spend at least half their budgets on IBM. Of the 100, 10% have been users one to five years; 10% for six to 10 years; 79% for more than 10 years.

Source: First Market Research Corp.

IBM selling off software to raise cash, cut costs

By Johanna Ambrosio
ARMONK, N.Y.

■ IBM last week said it has sold two of its software packages to third-party vendors. Some observers said the deals are an indication that IBM may sell other pieces of its software inventory in an attempt to cut support costs, reduce head count and raise cash.

"You're seeing a reinspection of the product line," said Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "They're getting rid of products that aren't making money and selling to vendors with a better cost structure that are willing to move the product forward.

"They're not through with this process. There are other major packages" that will also be sold, he added.

From the customer's perspective, most industry watchers agreed, there is little need for panic. In both deals last week, IBM sold its packages to vendors that focus on those particular markets as their only business and thus will pay close attention to enhancing the product and providing services to the customer base. This trend will likely continue as IBM sells other software, they added.

IBM, *page 10*

ATM prices fall

Cuts expected to lure users away from FDDI technology

By Joanie M. Wexler
WASHINGTON, D.C.

Source: The Yankee Group

Stung by recent reports that Asynchronous Transfer Mode networking is not yet ready for prime time, vendors will hack ATM local-area networking prices nearly in half at the Interop '93 Spring show this week — a move likely to accelerate ATM use and further curb user interest in Fiber Distributed Data Interface.

The efforts will be led by market leader Fore Systems, Inc. in Pittsburgh, which plans to pare the per-port price of its ForeRunner ASX-100 switch from about $4,700 to less than $3,000, said Mark Juliano, director of product marketing. The company will also drop the price of its corresponding Sun Microsystems, Inc. Sbus ATM adapter card from $3,995 to $1,995, he said.

"That's bringing ATM prices very near those of FDDI," observed Bob Hines, vice president of engineering at Bear, Stearns & Co., a New York investment banking firm using two Fore switches and one from competitor Adaptive Corp. to test the performance of multimedia trader applications.

The lower ATM costs will be "a tremendous help to me in selling ATM to upper management," Hines said.

ATM, *page 12*

APPI takes first stroll

By Joanie M. Wexler
WASHINGTON, D.C.

Users will witness the industry's first demonstration of Cisco Systems, Inc.'s controversial Advanced Peer-to-Peer Internetworking brainchild at the Interop '93 Spring trade show here this week.

The prototype event, which will run APPI data across the show's multiprotocol Shownet, could prove to be a milestone in the Cisco-led "open" challenge to IBM's Advanced Peer-to-Peer Networking. APPN is IBM's scheme for merging IBM Systems Network Ar-

APPI, *page 12*

Enterprise networking

NetWare 4.0 to roll

By Michele Dostert
WASHINGTON, D.C.

When Novell, Inc. unwraps its long-awaited NetWare 4.0 network operating system at Interop '93 Spring this week, the company might be surprised to find that despite a successful beta test, the old fear of .0 releases could hold back some corporate migrations.

And there is also the possibility that some users who want just directory services may opt for a product from Banyan Systems, Inc. (see story page 14). Together, those developments could cramp Novell's efforts to use NetWare 4.0 to gain the same prominence in the enterprisewide downsizing platform market that it currently enjoys in the workgroup file-and-print segment.

Beta-test users, although enthusiastic, still have a wish list they hope Novell will consider in future 4.0 releases, including support for Transmission Control Proto-

New and improved

NETWARE 4.0 FEATURES
- Directory services.
- Optional NLM memory protection.
- Management reports to SNMP or NetView applications.
- Enhanced auditing.
- Graphical administration utilities.
- Routing/WAN improvements.
- CD-ROM/Optical support.
- Multiple language support.

NetWare, *page 14*

PC development

Writing for Windows gets easier as developers leave DOS behind

By Christopher Lindquist

Buggy, bland or behind: Those were the words often used to describe the first round of Microsoft Corp. Windows applications following Windows 3.0's successful May 1990 debut. But almost three years later, a DOS-weaned developers community has finally climbed the learning curve and is producing Windows products that are more stable and easier to use.

Mark Katzenberger, Windows product manager at Pacific Gas & Electric Co. in San Francisco, said he has seen considerable improvement in Windows applications since the company standardized on the platform in 1991.

As an example, he pointed to Ventura Publishing, Inc.'s first Windows version of Ventura Publisher. It "was very much like their Gem product," he said. "They made a lot of decisions that sort of slighted Windows users" in order to accommodate the installed base.

Plenty of company

Ventura was not the only company to be accused of that.

WordPerfect Corp.'s mainstream word processor and Lotus Development Corp.'s 1-2-3 for Windows both seemed targeted more at keeping former DOS users happy rather than taking full advantage of Windows features. Both products have been receiving more positive reports as more fully Windows-capable versions become available.

Windows, *page 76*

Newspaper

INTEROP '93 SPRING

Wide-area links and interoperability will dominate Interop this week. Users looking to blend SNA with LAN-based networks will see IBM APPN's "open" rival, APPI, in action. *Page 1*. Also, ATM on LANs will suddenly get a whole lot cheaper, endangering FDDI's status. *Page 1*

BETA TESTING

Beta testers of Novell's NetWare 4.0 are enthusiastic, but some customers are expected to wait until upgrades of 4.0-compliant LAN-to-host and NLMs are available. *Pages 1 and 14*. Notes 3.0 beta-test sites urge patience as Lotus irons out remaining glitches. *Page 8*

OPERATING SYSTEMS

IBM fired a few volleys last week in its battle against Microsoft for desktop supremacy. OS/2 2.1 is going into another beta test as IBM charts a course to derail Microsoft using its Workplace Shell Utility. *Page 4*. It now appears the problems that cropped up in the initial wave of Windows applications are solved. *Pages 1 and 16*

BOMBING AFTERMATH

The massive explosion that rocked the World Trade Center complex exemplified how firms with solid disaster-recovery plans in place were minimally impacted. *Page 6*

VIEWPOINT

There's a good reason why many IS groups aren't performing as expected, says columnist Michael Schrage: Expectations are unrealistic and schizophrenic. *Page 31*

CW GUIDE

Today's internetwork management products are better integrated than ever before, thanks particularly to SNMP. However, obstacles remain, including the fact that a lot of the promised integration won't work unless you have a highly technical staff putting it all together. *Page 101*

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A PUBLICATION OF IDG

DEC's OLTP software opens to OSF/1, NT servers

By Melinda-Carol Ballou

■ Digital Equipment Corp. will be targeting the open systems on-line transaction processing market later this month with an announcement of the Open Software Foundation's OSF/1 and Microsoft Corp.'s Windows NT server support for its Application Control and Management System (ACMS).

Although ACMS has offered support for a wide range of non-VMS clients in the past, servers for the company's transaction processing system could only be hosted on proprietary VMS systems. Internal sources said that to rectify that situation, the company will be announcing a new, "open" application programming interface (API) for ACMS.

A version of the product will be shipping shortly on the company's OSF/1 platforms, as well as on Microsoft's Windows NT for both Intel Corp. and Alpha AXP platforms later this year. The new API will allow ACMS to be portable across platforms, and it will be supported on VMS and ultimately on other, non-DEC operating systems, depending on customer demand, the sources said.

DEC will need to run ACMS on non-DEC platforms, such as those from Hewlett-Packard Co., and clearly target the markets if it is to make any impact outside of its existing base, analysts said.

While some analysts raised concerns about portability of legacy ACMS applications to the new, open ACMS, DEC sources said they will provide migration tools to facilitate the process, as well as development tools such as DECadmire and JYACC, Inc.'s JAM fourth-generation language.

DEC officials refused to comment on the details. DEC's ACMS installed base numbers 6,000 licenses.

Flexibility appealing

For ACMS users seeking to supplement their current ACMS sites with DEC's Alpha platforms running Windows NT, VMS or OSF/1, the more open version of ACMS is likely to prove attractive. "It would give us some flexibility," said Stanley Rose, a vice president at Bankers Trust Co. in New York. "But I think we would be most interested in seeing it on NT Alpha and Open VMS platforms."

A user at a major airline said that while his company is evaluating OSF/1 platforms from DEC, it is not considering migrating any VAX applications until the operating system has proven itself.

In the open systems marketplace, however, analysts give DEC's ACMS high marks for technology in terms of management, queueing capabilities, redundancy and security. ACMS compares favorably with transaction processing monitors in that arena, such as Transarc Corp.'s Encina or Unix System Laboratories, Inc.'s Tuxedo, said Jim Johnson, chairman of Standish Group International in Hyannis, Mass.

New support
NCR Corp. will this week announce enhancements to the company's Top End transaction processing system: support for 3270 terminals and the Windows Dynamic Link Library.

Symantec executives charged with stealing Borland trade secrets

By Kim S. Nash

SANTA CRUZ, CALIF.

Symantec Corp.'s chief executive officer and top application development tools developer pleaded innocent late last week to a combined 32 criminal counts of allegedly stealing trade secrets from Borland International, Inc.

Former Borland Vice President Gene Wang and Symantec CEO Gordon Eubanks were indicted by a Santa Cruz County Criminal Grand Jury for violations that include breaking trade-secret laws and receiving stolen property, said Art Danner, district attorney. Wang and Eubanks were released on $100,000 bail, pending trial dates not yet scheduled.

Investigators "spent hundreds of hours going through a roomful of material seized" after Borland accused Wang of sending marketing and product development secrets to Symantec's Eubanks while Wang was still at Borland, Danner said.

After Wang left Borland for a high-level post at Symantec in September, Borland sued Symantec, charging that Wang sent sensitive, proprietary C++-related information to Eubanks via electronic mail [CW, Sept. 7, 1992]. Wang was later barred by a court order from holding a similar position at Symantec, where he is now head of application development.

Symantec denied all charges then and now. "The charges simply mean that a court will determine whether there has been a violation of the law. This does not mean that there has been any criminal wrongdoing," a Symantec spokesman said.

Eubanks and Wang were unavailable for comment.

A Borland spokesman declined to comment, saying, "This is a criminal matter, and it's in the hands of the district attorney."

Limited competition

Except for C++ language compilers — the area that Wang was in charge of at Borland — the firms rarely compete head-on. The case will likely be argued on subtle points pertaining to the definition of "trade secret" under a California law enacted in 1967 by then-Gov. Ronald Reagan.

The state statute takes a narrow view of trade secrets as "technical or scientific" information vs. a broader "business" construct that would include marketing and sales data.

Borland's separate civil suit against Symantec could result in large fines for Symantec, said Jean Marie R. Pechette, commercial litigator for Gordon & Glickson PC, a Chicago law firm.

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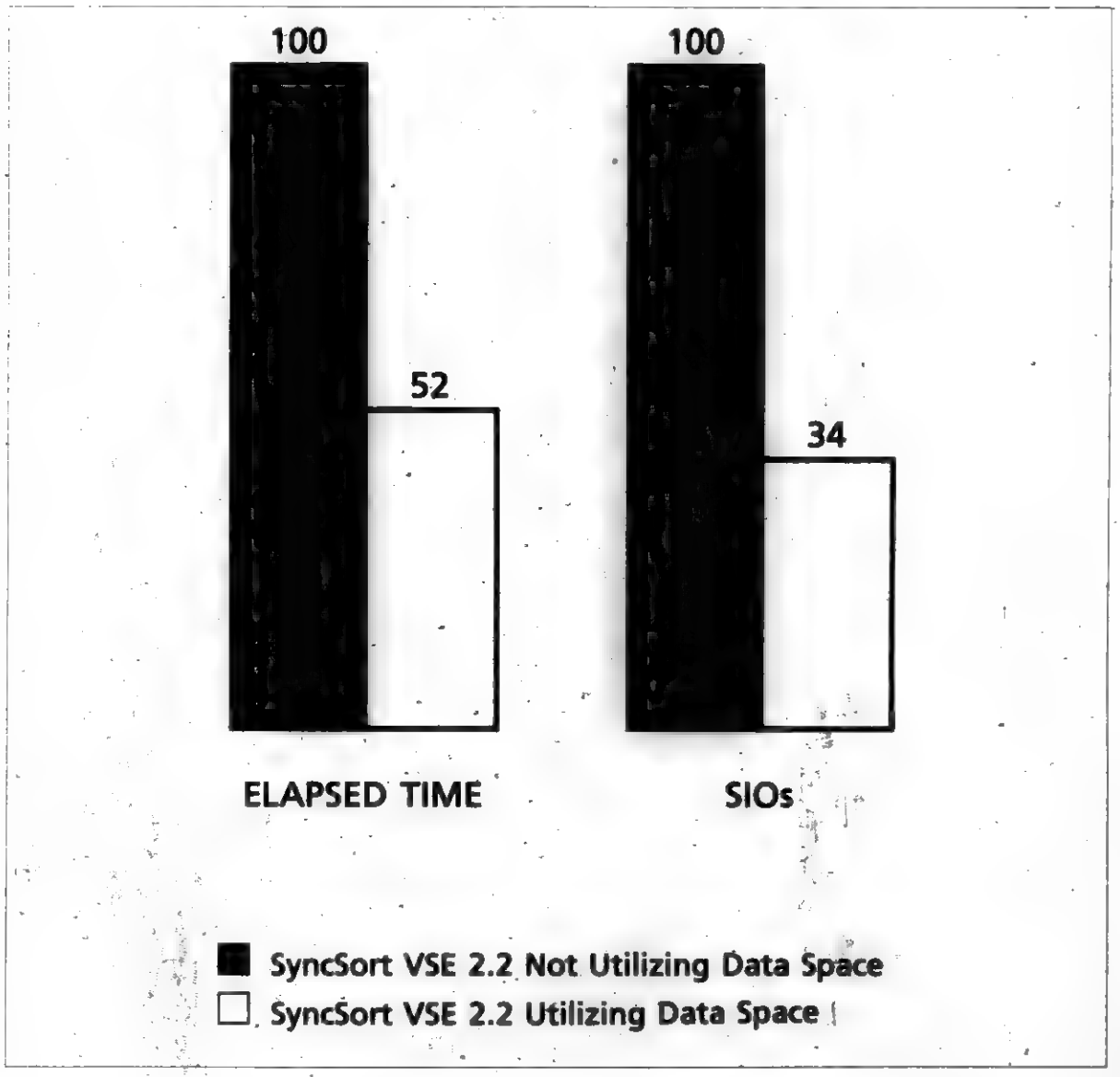

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Second OS/2 2.1 beta ready

By Christopher Lindquist
PHOENIX

IBM will update and redistribute its OS/2 2.1 beta code by midmonth, according to company officials. The company's goal is to have a "rock solid" OS/2 ready to take on challenges from Microsoft Corp., Next, Inc. and Novell, Inc.

The first OS/2 2.1 beta code was released in December, but while beta-test users said it was an improvement over OS/2 2.0, they also voiced the opinion that IBM should have another beta test to make sure the product is solid.

Source: International Data Corp.

At a developer's conference last week, IBM announced that a second beta-test copy will soon ship, though it denied that the OS/2 2.1 tweaks came as a result of user pressure.

Microsoft's continuing delays in the release of Windows NT has given IBM some breathing room, noted Lee Reiswig, president of IBM PC Co.'s Personal Software Products Division. The delay "has given us more time to refine the product, and we're taking [the time]," he said.

John Soyring, director of software development programs at IBM's Personal Systems Products Division, noted that with Microsoft's pending Windows NT and Next's new NextStep for the Intel Corp. platform, the competition in the 32-bit operating system market is going to become fiercer.

Novell another player

IBM will also face direct competition from Novell's entry into the Unix market. As a result of that increased competition, IBM wants to make sure OS/2 2.1 is completely solid before it is released, Soyring said.

Users on CompuServe seemed generally happy with the announcement of the new beta-test release, especially given IBM's statement that the new beta-test copy would be available free of charge to anyone who had ordered the previous beta-test software via IBM's toll-free order line.

"It's a nice feeling that IBM is taking care of its supporters," one user on CompuServe said.

Though IBM released no official shipment date, Reiswig said OS/2 2.1 would ship before NT, which is expected to arrive about midyear.

OS/2 2.1 is expected to ship with many new and enhanced features. Among the improvements discussed at the conference were the following:

IBM PC Co.'s Lee Reiswig: *OS/2 2.1 will ship before Windows NT*

- Windows 3.1 support, including performance improvements that allow Windows applications to run at speeds similar to native Windows, and an improved migration facility that will better prepare Windows applications for running under OS/2.
- An enhanced 32-bit graphics subsystem, including a palette manager that will allow applications to better display their color schemes, and improved driver performance.
- An increase in the number and types of display drivers supported.
- Support for a variety of new printers and port-sharing for use with security devices.
- Increased support for portable computers, including Personal Computer Memory Card International Association 2.0 card support, advanced power management features and a large pointer for use on LCD displays.
- Improved CD-ROM and multimedia support, including use with sound boards.
- A fix to better manage the OS/2 initialization files.

News editor Alan Alper contributed to this report.

Desktop operating systems

WorkPlace Shell gives IBM Windows alternative

By Michael Vizard
SOMERS, N.Y.

IBM is devising a desktop operating system strategy with the ultimate goal of promoting its WorkPlace Shell utility across multiple operating systems in direct competition with Microsoft Corp.'s Windows.

During the next couple of years, IBM will put its 32-bit WorkPlace Shell on top of DOS, OS/2, AIX and forthcoming Taligent operating systems, company executives said. The WorkPlace Shell is being positioned as a multiplatform alternative to a Microsoft Windows interface, which is currently limited to DOS, and the as yet unshipped Windows NT and Cairo object-oriented operating system from Microsoft, said Lee Reiswig, president of IBM PC Co.'s Personal Software Products Division.

OS/2, AIX, Taligent and IBM's implementation of DOS will eventually share a common microkernel architecture, according to Larry Loucks, IBM director of software architecture for Personal Systems.

IBM's microkernel implementation is based on the microkernel developed by the Open Software Foundation (OSF) based on technology created at Carnegie Mellon University in Pittsburgh.

By providing a microkernel architecture, IBM intends to make it easier for users to swap out hardware platforms because each operating system shares the same basic kernel functions.

"Honestly, we're very excited about IBM's strategy. They are essentially talking about letting you run any operating system you want on any platform you want," said Wayne Dunn, manager of end-user support at the Massachusetts Bay Transportation Authority in Boston.

What's coming

IBM intends to deliver a point release of OS/2 this year that will support symmetrical multiprocessing on dual-processor Pentium boards, which are due from Intel Corp. later this year.

IBM's strategy is being driven by the premise that it will no longer have access to Windows source code. Its access to that code is set to expire in September under terms of the dissolution of the IBM/Microsoft alliance for OS/2. At that point, IBM will deliver a Windows implementation on top of IBM DOS by cloning the Windows application programming interface (API).

Because it is cloning the Windows API, IBM's implementation of Windows will be at least one revision behind Microsoft's own version of Windows.

At the low end of IBM's desktop operating system strategy is a new version of IBM DOS that will be bundled with disk compression and antivirus and backup utilities from major third-party vendors.

"In IBM DOS 6.0, we've tuned the kernel code so that it is 20% faster than Microsoft DOS 6.0, while still maintaining file compatibility," Loucks said.

Due out this year, IBM DOS 6.0 will compete directly with Microsoft DOS 6.0 by giving users a choice between using the WorkPlace Shell utility or IBM's implementation of Windows.

Reiswig said IBM intends to position its existing OS/2 — Version 2.0 — as a preemptive multitasking operating system that already delivers the features that Microsoft is promising in DOS 7.0, which is now being developed. Following OS/2 2.0 will be a portable version of OS/2 based on a microkernel architecture that will be positioned against Windows NT [CW, Feb. 8].

Occupying the next rung in the IBM desktop hierarchy will be AIX. IBM will continue to position AIX as a high-end workstation operating system.

At the high end of IBM's lineup will be the forthcoming Taligent object-oriented operating system, which will compete against Microsoft's Cairo. Taligent is a joint project between IBM and Apple Computer, Inc.

Layered environment

Although the Taligent operating system is not due for two years, IBM said it intends to layer the higher level functions of the Taligent file system on top of its existing operating system environment beginning this year, according to Larry Loucks, IBM director of software architecture for Personal Systems.

The first iteration of that technology is the System Object Model (SOM) technology that IBM currently provides in OS/2. In the second half of this year, IBM intends to provide a distributed object model that will be based on a specification being created by the Object Management Group.

"SOM technology will also show up on MVS, OS/400 and Windows as well as other Unix environments," Loucks said.

Those environments will be supported by an object-oriented version of its Rexx scripting language that will provide developers with a visual builder for creating applications using a point-and-click interface, Loucks said.

—*Michael Vizard*

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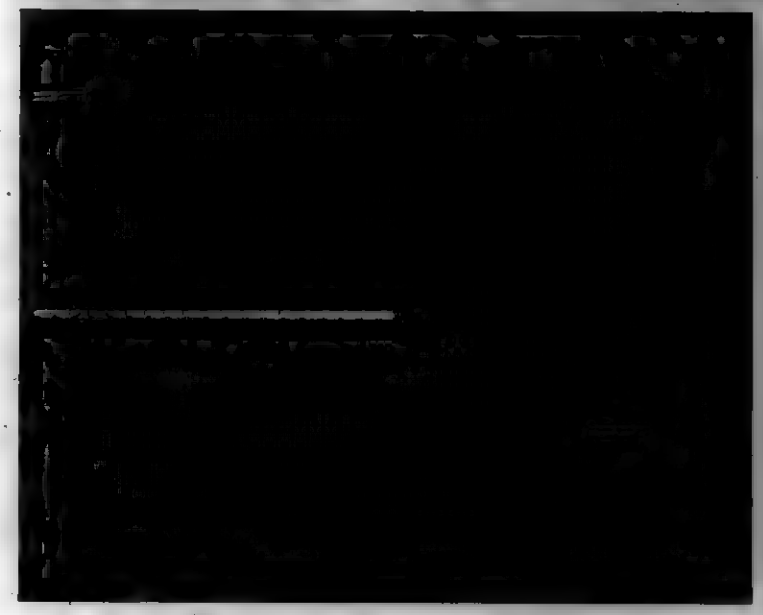

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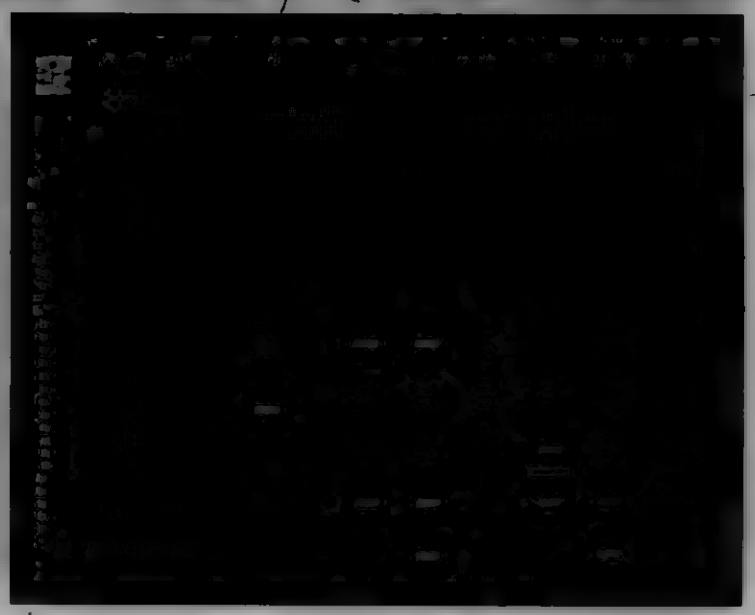

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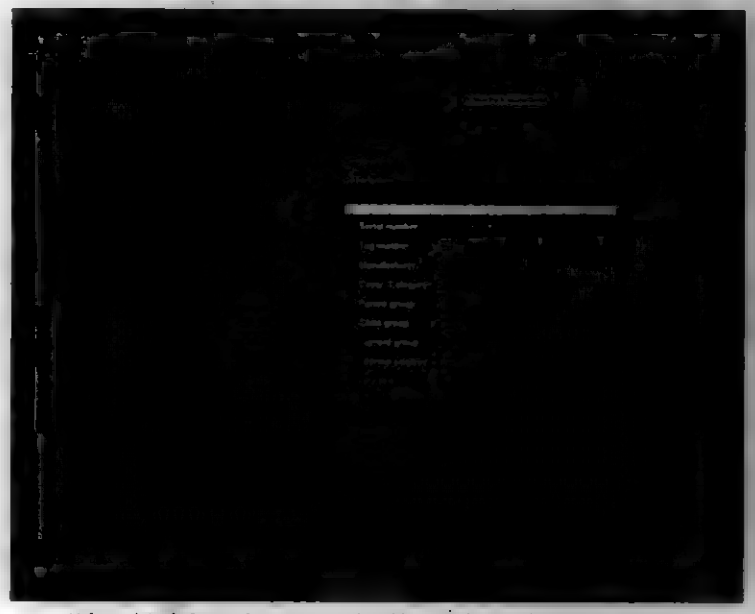

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News Shorts

Lotus expands license, support options

Lotus Development Corp. this week will let loose another volley in its service and support contest with **Microsoft Corp.** and other PC software vendors. Lotus will expand its license and service program to include a corporate help desk support service, an option to allow users to call Lotus support directly and an option that provides sites with a dedicated Lotus support person, the company said. Microsoft earlier this year launched a broad MS-Select program that included a number of service and maintenance options [CW, Feb. 1].

Newton due by summer

Apple Computer, Inc. vice president Gaston Bastiaens said last week that the company expects to have its Newton personal digital assistant on store shelves by this summer for "significantly less than $1,000." The 1-pound Newton uses an object-based handwriting-recognition system that can read printed notes and then automatically add an appointment to a calendar, dial a phone or send a fax. Programming tools for Newton will be available in the next two months, Bastiaens said.

Tool makers unite

Several development tool vendors, including **Intel Corp., Microsoft Corp., IBM** and **Borland International, Inc.**, have joined together to form the Tools Interface Standards (TIS) committee. The goal of the group is to investigate and promote development tool interface standards that enhance "interoperability and portability among the tools provided by TIS-compliant vendors." The standards will be aimed at 32-bit Windows, OS/2 and Unix, and they will affect such tools as debuggers and compilers.

APPN alternative

Data Connection Ltd. last week became the first vendor besides IBM to offer software for implementing IBM's Advanced Peer-to-Peer Network (APPN) Network Node and End Node specifications. The UK-based company will demonstrate its APPN products at the APPN/APPC Interoperability Showcase at Interop '93 Spring in Washington, D.C., this week. In other Interop news, **Interphase Corp.** in Agoura Hills, Calif., and **Technitrol** in Philadelphia will demonstrate Fiber Distributed Data Interface over copper products based on the most recent draft of the emerging ANSI specifications.

SHORT TAKES **Texas Instruments, Inc.** and **Price Waterhouse** are expected to ship RE for IE, the first module in a set of software re-engineering tools announced six months ago.... American Software, Inc.'s chief financial officer, Neal Miller, resigned last week to join **Tandem Computers, Inc.**.... **Computer Discount Warehouse**, a 10-year-old marketer of MS-DOS products in Northbrook, Ill., said last week it will relocate to a 100,000-sq-ft headquarters and warehouse in Buffalo Grove, Ill., next January.... William Sumner was named senior vice president of information systems at **Sony Pictures Entertainment**, a subsidiary of **Sony Corp.** in Culver City, Calif. He succeeds Peter Schemente, who resigned.... **Bachman Information Systems, Inc.**'s chief operating officer, Bob Hughes, resigned after three months in that position .... **Hewlett-Packard Co.** said it plans to start offering software called SharePlex/IX in May that will enable HP 3000 minicomputer users to backup their systems with HP 3000s that they have in place at other sites.

News shorts, *page 16*

World Trade Center bombing

Most data safe from blast

By Thomas Hoffman
NEW YORK

The massive explosion that rocked the World Trade Center complex Feb. 26 forced many companies to reroute information systems and telecommunications to alternate sites and disaster-recovery backup facilities.

Despite the widespread impact of the disaster, most firms reportedly did not lose any data and were able to resume operations by Monday morning.

But data center disruptions did occur at several large Japanese banks and The Coffee, Sugar and Cocoa Exchange, Inc. (CSCE). The explosion at 12:18 p.m. forced most of the trading exchanges to halt trading one hour earlier than usual [CW, March 1]. The Commodities Exchange, Inc. (Comex) stopped trading at 2:30 p.m., but it was able to clear all trading transactions by Monday, according to Jerome J. Jordan, vice president of computer operations at Comex.

Small data loss

The New York Cotton Exchange temporarily lost its IBM 3270 link to its offices in Chicago, but communications were re-established within a few hours, according to Jack McLaughlin, manager of operations and statistics. McLaughlin said the exchange lost a small amount of data over its three Novell, Inc. NetWare v3.11 local-area trading networks when the power went out Friday afternoon, and the exchange was unable to complete settlements that day.

In addition, the Cotton Exchange, like other Trade Center tenants, had to bring in portable air-conditioning units to chill an IBM 3275 front-end processor because the explosion had cracked the complex's 6-in. water pipes, which feed heating and air-conditioning units.

The explosion also knocked out 149 terminals used by members of the National Association of Securities Dealers (NASD), but the terminals were eventually restored with dial-in backup communications. In addition, NASD stopped trading on its small order execution system for three hours, according to a NASD spokesman.

The CSCE's data center, located on the fifth floor of 4 World Trade Center, shut down momentarily when the explosion occurred, according to Patrick L. Gambaro, senior vice president of floor operations and systems. Fortunately, the CSCE's complex of fault-tolerant Tandem Computers, Inc. processors protected data, which the CSCE also stores on backup tapes. After placing Sungard Recovery Services, Inc. on disaster alert Friday afternoon, the CSCE officially declared a disaster with Sungard on Saturday.

During the weekend, CSCE completed settlements on all transactions that had occurred Thursday and Friday and was able to resume trading by noon on Monday.

The explosion also wreaked havoc with 10 banks in the World Trade Center that were trying to settle payments and transactions over the Clearing House Interbank Payments System (Chips) at The New York Clearing House Association.

To make matters worse, the clearinghouse was experiencing a record day on Friday, with $1.49 trillion and 220,000 payments processed, according to George F. Thomas, senior vice president and director of data processing.

After the explosion, four banks used the clearinghouse's backup data center in Manhattan to complete their transactions. Chips, which normally stops processing payments at 4:30 p.m., had its hours extended until 10 p.m. to process an additional $90 billion in transactions, Thomas said.

AP/Wide World Photos

Bankers from the Sumitomo Bank *transfer computer equipment to a van after removing it from their offices at the World Trade Center*

Disaster recovery services in demand

Following the recent bombing of the World Trade Center, demand was high for disaster recovery services.

Comdisco Disaster Recovery Services, Inc., which is based in Rosemont, Ill., and has a large backup facility in North Bergen, N.J., accepted three customers totaling 615 employees with eight specific applications. These were the Bank of California and two large Japanese banks, which are both using Comdisco's facilities to maintain their money transfer and item processing operations.

The Comdisco customers all required midrange platforms ranging from IBM to Hewlett-Packard Co. minicomputers. As a result, the World Trade Center disaster is smaller than other disasters Comdisco has handled from both a millions of instructions per second and a direct-access storage device standpoint, according to Douglas Cogswell, executive vice president at Comdisco.

The Newport Financial Center in Jersey City, N.J., received two clients who set up backup data centers: Hokaido Taku Shuko Bank and Daynard, Inc., a shipping company, according to Ronald Bowman, vice president and director of real estate at Newport.

In addition to the Coffee, Sugar and Cocoa Exchange, Sungard Recovery Services had five customers declare disasters, according to a Sungard spokeswoman. The American Bureau of Shipping transferred personnel to the NCR Corp./AT&T Crisis Management Center in Rockville Park, N.J. — *Thomas Hoffman*

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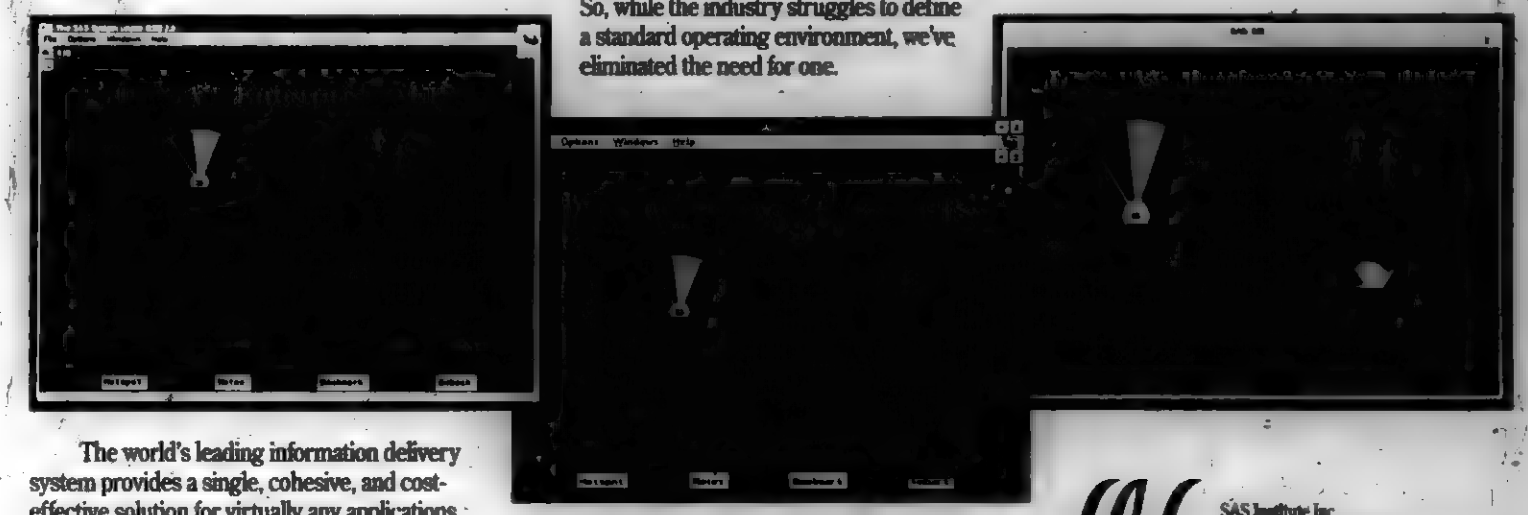

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Pfizer gains support

Outsources application maintenance to distributor

By Michael Vizard
NEW YORK

■ As part of a plan to focus information systems management on business issues rather than tactical support, Pfizer, Inc. in New York has outsourced PC software support to Corporate Software, Inc. in Canton, Mass.

Under terms of the contract, Corporate Software will provide day-to-day support for 1,400 PCs running Microsoft Corp.'s Windows and DOS and IBM's OS/2.

"We have been spending far too much time on installing software and dealing with memory management issues on PCs," said Russ Baris, director of pharmaceutical systems at Pfizer. "The pact provides us with better use of the software on our systems and allows our staff to focus on the strategic parts of Pfizer business."

"It's crazy to pay someone $100,000 a year to be a systems analyst and have them spend their time answering questions about WordPerfect," said Esther Dyson, president of EDventure Holdings, Inc. in New York. "Supporting PC software users is critical to the mission getting done but not to designing the mission."

Pfizer is organized under a structure where IS personnel act as systems consultants to business units, Baris said. Outsourcing software support gives Pfizer clout when it comes to resolving technical problems, he added. "We've experienced tremendous frustration trying to get any one software vendor to accept responsibility for a problem. And every company we've talked to about client/server has expressed the same frustration," Baris said.

The pact

Corporate Software is a $300 million company with 10% of its revenue coming from services, according to Chief Executive Officer Morton Rosenthal.

Since making the switch, Baris said, user feedback has been positive, in part because Corporate Software has installed a help desk at its Canton facility.

Pfizer intends to sign up for a CD-ROM software distribution service being created by Corporate Software. "Our service is designed to allow employees to focus on business problems, and we'll take care of the tactical issues," said Randy Burkhart, vice president and general manager of the services business unit at Corporate Software.

Groupware

Notes 3.0 requires simultaneous upgrades

By Michael Vizard
CAMBRIDGE, MASS

As Lotus Development Corp. approaches the release of Notes 3.0, sites beta-testing the groupware package are finding that they will have to simultaneously upgrade every server in their organization to Notes 3.0, rather than migrate applications piecemeal by deploying Notes 3.0 servers alongside existing Notes 2.0 servers.

Notes 3.0 was scheduled to ship this month. But users are reporting that the ship date has been moved back to April 1 to give Lotus extra time to address remaining technical issues.

Specifically, sources close to Lotus reported that while Microsoft Corp. Windows support for Notes 3.0 is ready, Lotus is still ironing out bugs for supporting Apple Computer, Inc.'s Macintoshes as client support. Unix support is slated for the second quarter.

Lotus still plans to announce its Notes 3.0 delivery schedule on March 24. The company said an April 1 shipment does not represent a major slip in its plans to ship Notes 3.0.

Despite bugs in the Macintosh client and the complexity of upgrading many servers, beta-test users are pleased with Lotus' progress.

"The latest beta release looks quite tidy and stable. I think they are over the hump on delivering 3.0," said Seth Pinsky, director of scientific computing at SmithKline Beecham Corp. in King of Prussia, Pa. "Notes 3.0 is similar to writing a major new operating system, which means you have to decide what things to ship in the initial release and what to fix later. If it was up to me, I'd ship it now," he added.

But Pinsky said Notes sites should be careful how they deploy Notes 3.0 beyond their initial pilot project because Notes is a monolithic groupware application where requests have to be synchronized across a wide number of clients and servers. "You want to make sure all your servers are running 3.0 first. Then you can worry about adding support for stuff like the hierarchical naming service after the dust settles," he said.

Even better

Major new features in Notes 3.0 include the following:
- Support for Macintosh clients.
- Support for Unix servers and clients.
- Support for Partial Database Replication.
- Creation of 16-byte databases.
- Improved macro facilities.

Other concerns stem from Lotus' decision to adopt a new user interface. "Notes is one of the products that caused users to adopt Windows in the first place, so changing where options are located on the screen presents some problems," said Jeff Bernknopf, president of TeknowSolve, Inc. in Somerset, N.J.

"It's going to take careful planning to make the transition. Notes 3.0 wants you to convert everything to the Notes 3.0 file format, so you have to be careful about mixing and matching file formats," said Norman Weizer, president of Weizer Associates in Lexington, Mass.

Beta-test sites are also urging information systems managers to exercise patience in deploying 3.0.

"We're just beginning the beta period for 3.0, but we have a hard time getting it up and running. It's just now beginning to stabilize," said Richard LaValley, senior manager of advanced technology at MCI Communications Corp. in Richardson, Texas.

Personal computers

New Prolineas debut, but backlog persists

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. will today introduce its fastest ever product refresh, unveiling new ProLineas nine months after the originals were announced. Unanswered, though, is the question of whether Compaq can meet demand for these products, as the company remains oversubscribed on its original ProLineas.

The new ProLineas will appear this week featuring local bus graphics and higher speed processors aimed at improving graphics performance for users of Microsoft Corp.'s Windows and other graphical interfaces.

Now featuring

The new ProLineas come with local-bus graphics and a 1,024 by 768 display. Compaq also improved its DeskPro/I and DeskPro/M systems by adding a built-in Ethernet controller in the I model and making it an option on the M.

"The local bus stuff will open other vendors' eyes," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Giusto said Compaq was the first vendor to put local bus on its low-end line.

Compaq will also announce new 486SL-based versions of its Contura notebooks (see chart below).

Compaq has eliminated list pricing. Estimated base pricing on the ProLineas starts at $1,099 for a 25-MHz 486SX-based PC with a 120M-byte drive. A 33-MHz/66-MHz DX2-based system starts at $1,899.

Compaq's pricing is still aggressive in the overall market.

For their part, users said they were pleased with the products.

"We like Compaq as a vendor, and we're glad to see them being aggressive with these new products," said Theodore M. Kassel, vice president of information systems at Sysco Frosted Foods, Inc, a food wholesaler in Albany, N.Y.

But users and analysts both raised the specter of supply problems. While Compaq officials said the company is keeping pace with current ProLinea demand, it acknowledged that "current" means it can build to meet new orders in two to three weeks.

"Shipping into the channel and meeting demand are two different things," Giusto said. "This might make some end users look to other vendors. If you can't deliver product, it's of no use."

Compaq officials said many customers with orders for ProLineas will receive the new versions instead. A Compaq spokesman said much of the backlog for ProLineas will be filled with the new models.

Some customers suggested that they were tired of Compaq putting their orders on hold. "Compaq really is making good stuff, and these new products have enhancements we're excited about," said Douglas Murphy, director of MIS at Comcast Corp.'s data center in Miami. "My major concern is them making major announcements that get everyone excited, and yet they can't meet demand."

Murphy said his firm's secondary supplier, AST Research, Inc., while also backlogged, has been better able to get him product and has won business when Compaq has been unable to deliver. He said he is considering other suppliers because of Compaq's supply problems.

Louis Kahn, network administrator, division of immunization, at the Centers for Disease Control, said, "I like Compaq, and I still will buy Compaq. But in the recent past, they have been severely delayed in shipping equipment to me, which is unacceptable."

Compaq uses a new passive-matrix color screen technology on one of its new Conturas, which offers performance near that of existing active-matrix color screens.

Coming up threes

Compaq has three new Conturas based on the 25-MHz 486SL from Intel Corp.

Screen	Weight/ features	Price*
9.5-in., passive monochrome	6.2 lbs./Upgradable screen, keyboard mouse	$1,999
9.5-in., advanced passive-matrix color	6.7 lbs./Keyboard mouse, NiMH** battery	$2,699
8.4-in., active-matrix color	6.7 lbs./NiMH** battery, built-in trackball	$3,299

* All prices are estimates; Compaq no longer has list pricing on most products. All are shipping now. ** Nickel metal hydride

CW Chart: Janell Genovese

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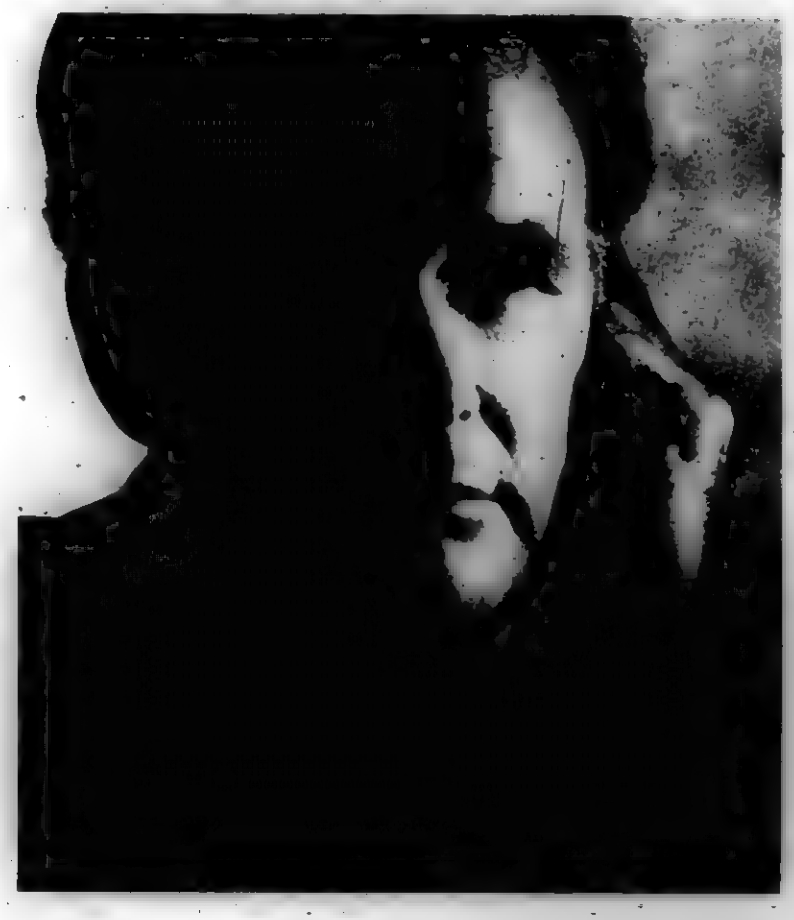

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IBM plan

CONTINUED FROM PAGE 1

In addition, IBM is making other moves to strengthen its bottom line. These include a new company, announced last week, that will copy and distribute third-party software products. IBM also recently started charging some independent software vendors for technical support and is selling specific programming routines or pieces of programs to both vendors and users.

One of the two packages, Mapics — manufacturing software for the Application System/400 minicomputer line — was sold to Marcam Corp. in Newton, Mass. The deal was actually announced in October but was consummated last week. The other package, a problem-diagnosis utility called CICS Problem Determination/MVS, was sold to Compuware Corp. in Farmington Hills, Mich.

None of the players released the financial details of the transactions, and most industry watchers agreed that the individual deals probably do not amount to much for a company of IBM's size. But given the up-front cash or equity investment in the third party, revenue from recurring software sales and the savings to IBM in development and support costs, "when you add it all up, it can be a significant number," said Jay Stevens, an analyst at Dean Witter Financial Services Group, Inc. in New York.

The packages may not actually be losing money; they just may not be making the kind of profit IBM had hoped for. Mapics, for example, has some 13,000 customers. And even the CICS software is profitable.

"Size is relative," said Greg Strouse, a Compuware marketing director. "The numbers would have made any small vendor happy, but it wasn't what IBM was after."

Although specifics of the two deals differ, there are some similarities: Most importantly, third-party vendors now own the rights to the software and any revenue from the installed base.

In the Mapics case, IBM received 1.6 million shares of outstanding Marcam stock — approximately 16% of the company. In addition, IBM can name a person to Marcam's board, although it has not yet done so. Marcam will also pay IBM royalties tied to Mapics' profits.

Approximately 150 Mapics developers and support personnel — still on the IBM payroll — are in a separate company called Mapics, Inc., which Marcam may buy in three years.

Marcam will keep Mapics and its existing manufacturing package, Prism, as separate products, but some "technology will be shared," said John Cingari, Marcam's director of marketing. Marcam will provide further information about future product plans at a Mapics user group meeting in April.

So far, so good, some customers said. Tom Pietrocini, president and chief executive officer of Bally Engineered Structures, a large Mapics installation in Bally, Pa., said support and service have remained "great" during the transition. "We expect some of the Prism technology will complement Mapics, to our gain," he said. "We wish the marriage well."

For its part, Compuware is taking the opposite tack: It is consolidating the package it bought from IBM with others it already owns or acquired earlier, Strouse said. A beta-test version of the combined product should be out within a year, he added.

Further, Compuware will continue to jointly develop the package with IBM's laboratory in Hursley, England. Compuware had originally written the package for IBM in 1969.

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Corrections

The mainframe computers Choice Hotels International is eliminating are not from Amdahl Corp. as reported [CW, Feb. 22]. They are from Hitachi Data Systems Corp. Choice Hotels is also replacing an Amdahl front-end communications processor.

A story about Microsoft Corp.'s SQL Server for Windows NT [CW, Feb. 22] incorrectly identified Chris Kalish, who is program manager for technical support at Pepsi-Cola International in Somers, N.Y.

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Integrated net management edges closer

By Elisabeth Horwitt
WASHINGTON, D.C.

■ Yielding to users' demands for an integrated suite of network management tools, a bevy of niche software vendors have agreed to make their products run on leading network management platforms from Hewlett-Packard Co., Novell, Inc. and others.

The ties, some of which were announced last week and some of which are slated to be announced at this week's Interop '93 Spring trade show, often feature a Simple Network Management Protocol (SNMP) twist.

Novell's NetWare Management System (NMS) gained its first router management capabilities with last week's introduction of Router Manager for Cisco by StonyBrook Services in Bohemia, N.Y. The Windows-based software runs under NMS and is said to automatically monitor Cisco Systems, Inc. router activity.

The product is also said to automatically portray Cisco router configurations on NMS' topological map. Router Manager is available now and is priced at $1,995, which includes an SNMP agent to manage one Cisco router. A similar product for managing Wellfleet Communications, Inc. routers is due out around the end of next month, StonyBrook said.

The ability to manage Cisco routers from NMS is key to ITT Fluid Technology Corp., which is implementing Novell NetWare local-area networks and Cisco routers to interconnect some 20 locations across North America, according to Andrew Kiolbasa, coordinator of end-user computing for the industrial and marine pumps and equipment manufacturer.

"NMS is really starting to move" in gaining support from key hub, router and network management application vendors, Kiolbasa said.

Also introduced last week were the following:

•Hughes LAN Systems, Inc. announced Version 5.1 of its Monet network management software, which has the ability to forward alarms to SNMP-based platforms such as HP's OpenView and Sun Microsystems, Inc. subsidiary SunConnect's SunNet Manager.

Monet can then act as a middleman, polling large groups of LAN nodes and sending important alerts and data to a central SunNet Manager or OpenView system, Hughes said.

•HP announced a Sun SPARCstation version of its OpenView Probe Manager, which allows HP LanProbe II/SNMP users to monitor Ethernet LANs from either Sun or HP workstations.

Rallying support

The SNMP Remote Network Monitoring (RMON) standard promises to standardize the way different network monitoring and analysis tools report key data to a central management system; however, industry support has been slow in coming. Among RMON supporters are ProTools (Network Control Series) and HP (LANprobe). LAN management products expected to support the standard by year's end include Concord Communications, Inc.'s Trakker and Novell's LANtern and NetWare Management System, but not its LANalyzer for Windows.

On the way

The following products are scheduled to be announced at this week's Interop:

•ProTools, Inc. will announce that its OS/2-based Network Control Series software will be able to send alerts to IBM's NetView, via integration with IBM's LAN Network Manager, a spokeswoman said. This will extend the reach of NetView beyond Token Ring management to Ethernet and distributed LAN installations, she added.

•Intel Corp. and HP will take the wraps off plans to integrate Intel's LANdesk Manager, a PC LAN network and systems management product, with OpenView.

•Isicad, Inc. will announce that it has integrated its Command physical network management and help desk applications with SunNet Manager.

•Hadax Electronics, Inc. will unveil RingTamer Advanced Multi Access Unit (MAU) with built-in SNMP agent, enabling each MAU to report information to an SNMP-based system about ring information, cable and network interface card alerts and event logs.

A Hadax application running under HP's OpenView for Windows enables a PC to manage up to 256 RingTamer MAUs, the Ridgefield Park, N.J., vendor said. The advanced MAU is priced at $2,195, with management software selling for $2,800.

•Network General Corp. will announce a firm second-quarter date for providing its Distributed Sniffer System with an expert system and with SNMP Remote Network Monitoring support. Network General will also announce dates for integrating Distributed Sniffer with popular network management platforms such as HP's OpenView, according to a company spokesman.

ATM tags fall

CONTINUED FROM PAGE 1

Even if FDDI vendors were to respond with price cuts of their own, the move would likely help only users who need very high LAN bandwidth immediately, as ATM is the favored technology for the long haul, analysts said.

The $5,000-per-user cost of ATM compares with about $4,000 per seat for FDDI, a fiber-based LAN that is limited because many users share the network's 100M bit/sec. bandwidth, said Todd Dagres, vice president of data communications at The Yankee Group, a consultancy in Boston. With ATM switched technology, the 100M bit/sec.-and-up speeds are dedicated to a user.

Though its cost remains 20% higher, "ATM is 10 to 15 times faster for a group of 10 workstations," Dagres said. Then again, "FDDI is a $150 million market and is available and proven," he said.

Newbridge Networks, Inc. and SynOptics Communications, Inc. will also roll out ATM switches at Interop, with price tags comparable to Fore's (see story page 83).

The costs "are where they need to be before ATM becomes intriguing on any large scale," said Bill Berry, staff exploration systems analyst at Amoco Production Co. in Houston.

Amoco is another of Fore's 70 customers, most of which are testing ATM in isolated niches for business-critical applications such as "getting oil out of the ground, bringing [Cable News Network] to a trader's desktop" or designing an animated movie at prospective customer Disney Development Co., Juliano said.

Also, Fore switches are in limited use at "about every computer company imaginable, including Blue ones," Juliano said. He said about 20% of the firm's customers are federal government users — defense agencies running war games and simulation applications.

These companies are testing ATM for high-bandwidth engineering and multimedia applications because of the data switching technology's promise of very high speeds, virtual dedicated circuits that accommodate the delay-sensitive nature of voice and video and about 1/1000th the internetworking delay associated with routers.

But, as was the case with FDDI, price/performance ratios will determine how quickly the technology becomes widespread within an organization. For example, another large oil company in Texas using the Fore switch to test seismic applications said, "Price will make an enormous difference to us if we get past our feasibility tests to full deployment. If we can get approximately the same performance out of FDDI, we'll use whichever is cheaper."

But the new ATM price point will "allow people to get started with ATM and set up trials" more quickly, said Valentin Sribar, senior research analyst at consultancy Meta Group, Inc. in Reston, Va. "People will really start experimenting with it next year."

On the other hand, ATM prices are "still three times more expensive than they ought to be, compared with the latency and bandwidth achieved by tying several Ethernets together with a hub," said Brian Bershad, assistant professor of computer science at Fore shop Carnegie Mellon University. Bershad, who is using the switch to "understand how to write operating system software for high-bandwidth, low-latency systems," said users "don't care how much it is if it's under $1,000" per seat. "Above $1,000, people start asking questions."

Money matters

ATM switch maker Adaptive Corp. said it has no plans to drop the costs of its $4,500 adapter cards and $4,500 switch port.

Fore said it sold $4.5 million worth of ATM LAN equipment in calendar 1992, despite industry estimates that the market has reaped just $4 million. Fore will demonstrate interoperability with SynOptics' LattisCell ATM switch and Cabletron Systems, Inc. ATM hub interfaces. Fore's switch does not yet interoperate with Adaptive's ATMX switch.

The ATM Forum standards group is exploring these ATM issues: no management standards; reconciling local- and wide-area ATM addressing schemes; signaling schemes for establishing ATM switched virtual circuits now proprietary.

Source: Meta Group, Inc.

APPI takes stroll

CONTINUED FROM PAGE 1

chitecture networks with distributed local-area network internetworks.

APPI was announced in September [CW, Sept. 7, 1992], primarily as a vehicle for uniting the vendor community in blending some sophisticated features of Transmission Control Protocol/Internet Protocol networks with peer-to-peer IBM communications.

In this week's demonstration, APPI's "Open Network Node" counterpart to IBM's proprietary Network Node routing software will run on an IBM RISC System/6000 workstation in Cisco's booth. The RS/6000 will communicate across the Shownet to another RS/6000 in APPI Forum member Cabletron Systems, Inc.'s booth, explained Michael Zadikian, Cisco's SNA product manager.

Cisco routers will function as directory servers, he said, and peer-to-peer applications on OS/2-based PCs will communicate among them.

"The bottom line with the Interop prototype is that it will show that APPI is no longer just a concept. It is real," Zadikian said.

APPI also aims to protect existing router network investments by preventing users from having to clutter their backbones with APPN routing protocol when they are already running multiple protocols. "Any time you add another routing protocol to your backbone, you add a magnitude of complexity," Zadikian said.

APPI is also intended to prevent SNA users from being shackled to IBM's APPN development timetables. For example, Mark Pozefsky, an IBM SNA product and systems manager, recently told *Computerworld* that IBM already has dynamic rerouting for APPN — "the problem APPI purports to solve" — in development.

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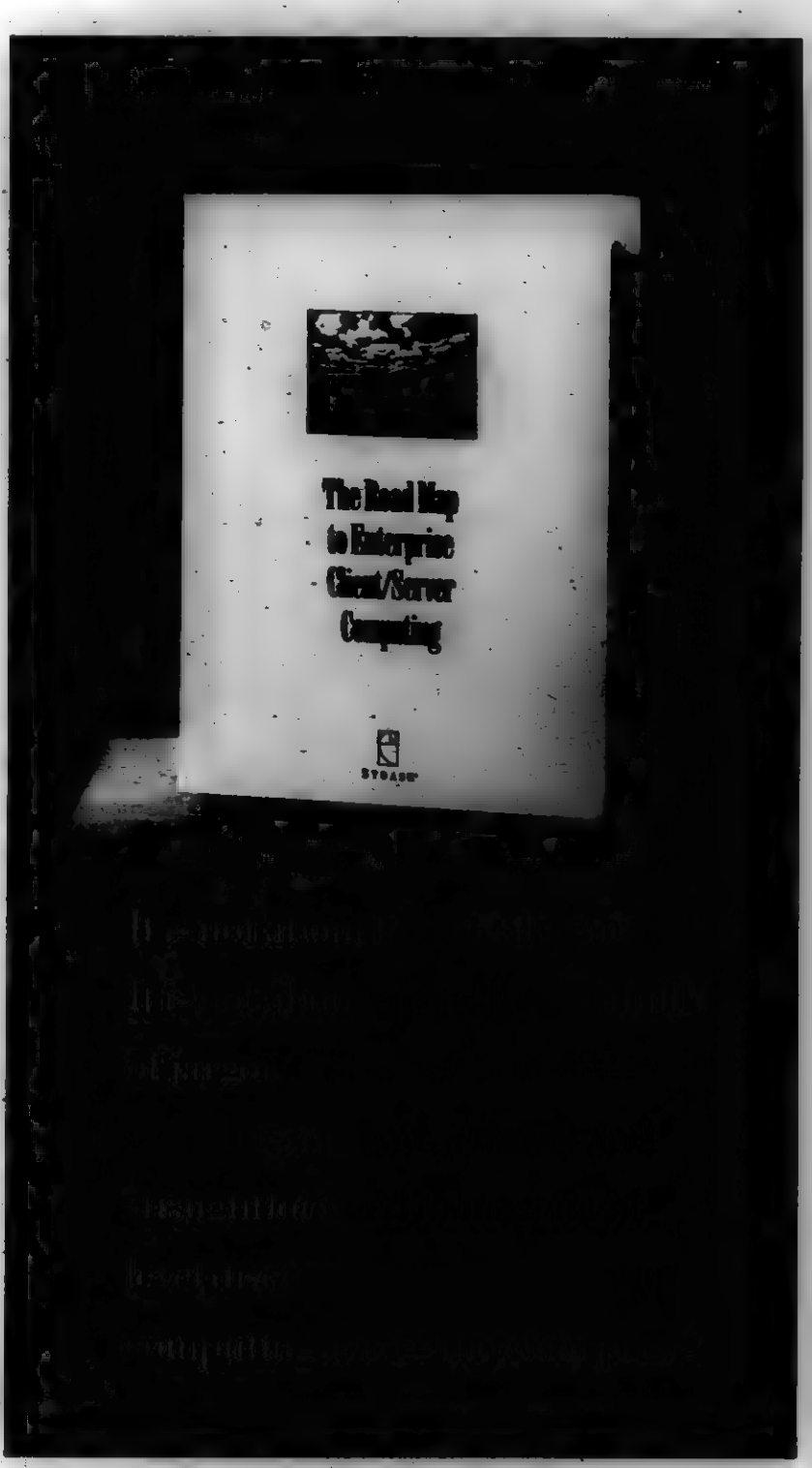

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Big Florida bank chooses IBM hubs

By Jennie M. Wexler
WASHINGTON, D.C.

IBM will reveal this week at Interop '93 Spring here that Florida-based Barnett Banks, Inc. has committed to a corporatewide IBM intelligent wiring hub strategy.

The announcement that Barnett has installed 35 IBM 8250 multiprotocol hubs running about 300 local-area network modules will be made while IBM outlines plans to enhance the hub to decrease users' cost of network ownership and explains the 8250's relevance to the IBM Networking Blueprint, an IBM spokesman said.

The 8250 is the hub IBM is honing in conjunction with Chipcom Corp., and Barnett settled on the device largely because of that partnership, said Ron Russell, Barnett's senior network architect.

He said the companies' joint efforts have solved an industry hub/repeater compatibility problem for linking Token Rings across the longer internodal distances afforded by fiber-optic cabling.

Orders rolling in

IBM's 8250 smart wiring hub, based on Chipcom technology, became generally available last November. To date, unit shipments are "in the four digits," said Bob Roth, IBM's manager of LAN systems technical marketing.

Fiber-optic choice

According to Russell, when he was hired eight months ago to implement a LAN interconnectivity strategy at Barnett, he chose to install fiber-optic backbones spanning up to 42 floors in each of the bank's buildings in Jacksonville, Miami, Orlando and Tampa.

In each building, fiber carries concentrated Token Ring and growing Ethernet traffic from each floor into a hub in a central equipment room, where LANs exchange data via a Cisco Systems, Inc. router.

However, Russell explained, there are no industry interoperability standards for different vendors' Token Ring fiber repeaters — devices that extend Token Ring signals across longer communications distances supported by fiber.

Barnett was using several IBM 8230 hubs that support only a single Token Ring each, and "for those locations, I needed a fiber repeater. But oops! The 8230 wasn't compatible with any other hub vendor's repeaters," Russell said.

By the numbers

Barnett Banks, Inc. 1992

IS budget	$142M
IS staff	600
Processor value	$30M
Number of PCs	14,000

Source: *Computerworld Premier 100*

"Enter Chipcom and IBM on a joint sales call saying that IBM is going to market Chipcom hubs under the 8250 name, and its fiber repeater will be compatible with the one on my 8230. Voila!"

Multiple hubs

Barnett's other alternative, Russell said, was multiple hubs on multiple floors to gain the compatible feature functions.

Each 8230 lists for $8,150 to $12,650, depending on the number of users supported and copper wiring grade; an 8250 with multiple LAN modules ranges in price from about $10,000 to $20,000, IBM said.

Because the 8250 supports up to seven managed LANs or seven managed and eight unmanaged LANs, Barnett could buy fewer devices for each equipment room, depending on the level of management desired, according to Russell.

NetWare 4.0

CONTINUED FROM PAGE 1

col/Internet Protocol as a native protocol on a par with IPX/SPX and more management control over users' options.

"We are compiling customer requests and will address many of them in future 4.0 releases," said Bob Young, Novell's product marketing manager for NetWare.

The initial release of NetWare 4.0 does, of course, contain features desperately needed by managers of large multiserver networks, including data compression and archiving, protected memory space for applications, wide-area network protocol support and the NetWare Directory Service. Slated to ship by the end of this month, it will be available in versions for as many as 1,000 users at an undetermined price.

Despite these features, Novell may have to coax sales, at least initially, out of edgy corporate buyers. That is because many of these users, while intending to upgrade their networks eventually, are taking an "after you, Alphonse" attitude.

PC and network managers said they have learned from painful experience never to buy any X.0-labeled release. Keith Herron, manager of microcomputing at Weil, Gotshal & Manges, a large New York law firm, said, "We'd like global directory, sure; but I'll watch CompuServe bulletin boards and wait for the bugs to shake out. We won't move until we're sure 4.0 is fully there."

Beta testers said qualms about the .0 release are unfounded. "I used to swear I'd never buy one either, but this .0 release is stable and fully cooked," said John Miller, network manager at beta-test site Healthcare Compare, a Downers Grove, Ill., cost management firm.

"We renamed it NetWare 4.0 because the directory architecture was so different, but the NetWare 4.0 kernel is the same as the NetWare 3.11 kernel, slightly tuned up," Young said.

Waiting for assurance

Other potential customers are waiting to be sure that the NetWare Loadable Modules (NLM) they currently use on their NetWare v3.11 platform, including wide-area, LAN-to-mainframe database server, backup and administration products, will run seamlessly under NetWare 4.0.

Don Clark, information services manager at Walt Disney Studios in Burbank, Calif., said, "I use NetWare for SAA, NetWare NFS, backup and virus protection NLMs. I want to make sure they work before I upgrade."

Novell said any NLM that runs on v3.11 should run on NetWare 4.0 in unprotected mode, and beta-test users reported no NLM problems in that mode. However, NLMs that will run in 4.0 protected mode — at ring 3 on the Intel Corp. chip — have not yet been certified by Novell.

The vendor said any "properly written" NLM should run in protected mode; as proof, it will release its 4.0-based NetWare for Systems Application Architecture NLM immediately.

Novell said it is still testing its NetWare for NFS and NetWare Asynchronous Communication Server NLMs and will issue 4.0 protected-memory-compliant patches if necessary.

However, perhaps giving weight to NLM concerns, third-party vendors such as Gupta Corp. and Sybase, Inc. acknowledged that their NLMs will not run in protected mode. Both companies plan to release 4.0-compliant, directory-enabled versions of their products by the end of 1993.

Other network managers who said they intend to upgrade are first investing time up front in business analysis and network planning. Because NetWare 4.0 uses a logical, organization-based directory and user-rights scheme, rather than the server-based scheme found in v3.11, NetWare 4.0 beta-test users said it is important to plan.

For example, David Eckert, an analyst and beta-test user at Westinghouse Electric Corp.'s Advanced Technology and Architecture Planning Group, said, "If you want to get the advantages of NetWare 4.0, you have to have an enterprisewide plan. If you don't have people who can think, analyze your business needs and plan your network — and a lot of companies don't — you'll just end up with a big mess. That's not a Novell issue — it's a corporate IS issue."

Sam Calderone, a systems specialist at Texaco Chemical in Houston, plans to upgrade to 4.0 eventually but said his company must first finish planning its architecture and shaking out some wide-area bugs.

Banyan offers NetWare ENS

Possibly the most eagerly awaited new feature of NetWare 4.0 is the NetWare Directory Service, which creates a single, networkwide directory that is replicated and synchronized across all connected servers. It thereby greatly simplifies network administration and management, as well as network connections for the user.

However, NetWare users who desperately want distributed directory services but do not want to upgrade their stable, well-understood NetWare v3.11 networks have another option: Enterprise NetWorks Services (ENS) for NetWare, available from Banyan Systems, Inc. in Westboro, Mass.

ENS for NetWare, which shipped in December 1992, provides Banyan's StreetTalk distributed directory services on the NetWare platform, along with security and management utilities.

Many NetWare users said they intend to evaluate both NetWare 4.0 and ENS for NetWare before making any upgrading decisions, according to Andre Malarcher, an engineer at IES, a systems integrator in Atlanta.

"NetWare 3.11 gives me everything I need except directory services. I'd like to just get those from Banyan, without the expense and bother of upgrading my whole net," said John Cunningham, director of MIS at PMA Reinsurance Corp. in Philadelphia. However, he added that buying ENS for NetWare v3.11 would be a waste of money if he eventually upgrades to get features other than directory.

Cindy Navarrete, a technical support analyst at Lone Star Gas Co. in Dallas, has both NetWare 3.11 and Banyan's Vines networks.

"When we get to where we absolutely have to have directory services on our NetWare LANs, we'll go with ENS rather than upgrade to 4.0; we think ENS is a better product," she said.

But Navarrete is holding out as long as possible, hoping that Banyan will release a version of ENS that will enable users to share files and printers between Banyan and Novell networks. — *Michele Doeterr*

IBM Token Ring adapter said to be fastest in industry

Card can process 48,000 information frames per second; competes with Madge Networks' cards

By Lynda Radosevich

In a move to cement its place as the market leader and regain its standing as technology leader, IBM announced last week what analysts said is the industry's fastest Token Ring adapter card.

However, IBM is second to market with a 32-bit Micro Channel Architecture (MCA) adapter for its Personal System/2 line, behind Madge Networks, Inc. in San Jose, Calif.

Based on a new chip set, IBM's $1,195 LANStreamer 32-bit MCA card operates at near Token Ring speed and can be used to alleviate bottlenecks at heavily used servers, including PS/2 servers. Server congestion affects a "niche market" — mostly companies with branch offices that use larger network servers to connect to corporate networks, said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

Falling prices

IBM and Madge Networks each announced price cuts last week in their Token Ring adapter card lines. IBM dropped the price of its Network 16/4 Adapter from $745 to $685. Madge cut prices on its high-end Smart 16/4 PC Ringnode cards from roughly $850 to $795 per user for a 10-user pack.

While IBM broke a speed barrier, "it's hard to get excited when you have a big installed base [of 4M and 16/4M bit/sec. Token Ring cards] and you're not even using the capacity that you've got," said Bill Conley, manager of corporate information systems at Loral Aerospace Corp., an IBM Token Ring user in Newport Beach, Calif.

For users who are experiencing problems, one testing laboratory said the card delivers. "We found that the throughput [on IBM's new adapter] was 15% higher than the best in the industry," said Kevin Tolly, president of Interlab, a division of Virtual System of New Jersey, Inc., an independent network testing and consulting group in Sea Girt, N.J.

To achieve the high speeds, which IBM clocked at 48,000 frames per second, the company abandoned its Token Ring Protocol Interface Controller (Tropic) for a new controller that moves data directly between computer memory and the local-area network rather than through intermediate buffers. IBM said it will continue to use the Tropic chip in its lower end cards, and the new cards are fully compatible with other IBM and compatible Token Ring cards.

Typically, adapter cards limit data throughput to about 20% of the media speed. This card "gets you closer to 50% to 70%," said David Passmore, vice president and service director of local-area communications at Gartner Group, Inc. in Stamford, Conn. "This alleviates one bottleneck, but there still are a lot of high-level processing bottlenecks that the adapter card wouldn't help."

The LANStreamer MC 32, which is expected to ship before the end of this month, also provides a prioritizing mechanism that gives higher priority to real-time applications such as multimedia, IBM said.

The company plans to license the LANStreamer technology this year to National Semiconductor Corp. to produce the chip for use in other vendors' Token Ring products, said Bob Roth, manager of LAN systems marketing at IBM. Also, IBM said it plans to produce cards with XT/AT and Extended Industry Standard Architecture buses but would not say when.

Other IBM announcements include $177 10Base-T and $196 thin coaxial Ethernet adapters shipping this month.

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News Shorts

FAA in new holding pattern

The Federal Aviation Administration said last week it has decided not to scrap a major portion of its troubled air traffic control system modernization project, as it had threatened to do in December in the wake of delays by IBM Federal Systems Co. to provide debugging software. The FAA announced a 14-month delay in the $6 billion project and management shakeups at both the FAA and IBM. A spokesman at IBM said the new delay, added to an earlier 19-month slippage, would not increase the government's cost.

LAN gateway/router supports TCP/IP

Elcon Technology Corp. is expected this week to announce the InterConnect Server, a combination local-area network gateway and router that will support Transmission Control Protocol/Internet Protocol traffic and other LAN protocols over a Systems Network Architecture backbone. The initial release will be a Novell, Inc. NetWare Loadable Module, with OS/2, Unix and Microsoft Corp. Windows NT versions to come.

New UltraLite coming today

NEC Technologies, Inc. will introduce the UltraLite Versa notebook computer today. NEC claims that through power-saving techniques and hardware, users can get five to 10 hours of battery life from an active-matrix color notebook and eight to 12 hours from a monochrome system. The Versa notebook also has built-in local bus graphics, an industry first. The base price for the Versa, with an 80M-byte hard drive, is $2,650.

Porting program from SPARC

SPARC International, Inc. last week announced a new program to assure binary compatibility between Scalable Processor Architecture (SPARC) applications and hardware. The program, dubbed SPARCware, is aimed at moving the current SPARC base of applications to the Unix System V Release 4 operating system and the latest version of the SPARC Compliance Definition.

ASK reorganizes, readies open tools

The ASK Group, Inc. last week said it is merging product development in the company's Ingres packaged applications and Ingres database divisions with its Data 3 Systems unit. The reorganization will also reduce one or more layers of management, depending on the corporate unit, Ingres said. The revamp precedes by one week ASK's expected disclosure of an initiative to build "open" development tools that work with database engines from many vendors.

SHORT TAKES A new promotional package has been announced by Borland International, Inc., which is bundling Quattro Pro for Windows and Paradox for Windows for a suggested retail price of $199.95.... Microsoft has released what it said is the first of its 32-bit high-level languages, the Microsoft Fortran PowerStation. It allows developers to create 32-bit, protected-mode MS-DOS applications using a Visual C++ integrated development environment.... Victor J. Goldberg, IBM vice president of management systems, will retire on March 31 after 34 years with the company, during which time he helped form IBM's National Distribution Division.... IBM announced availability of a Device Driver Development Kit for OS/2 2.1, which is intended to help developers write device drivers for peripherals such as mice, video displays, printers and storage devices.

Unix programmers aid NT

By Christopher Lindquist

Microsoft Corp.'s Windows NT is not just for PC developers anymore. Unix programmers, long the wallflowers of the commercial world, now find their more sophisticated skills appreciated by users and vendors writing increasingly complex applications.

"PC Windows developers write these nice little apps," said George Brown, manager of product marketing at AutoTester, Inc. in Dallas.

However, "big companies are using [Windows] as a front end to client/server." That adds yet another level of complexity that can befuddle Windows developers who come from the DOS world.

To begin with, Unix programmers have long built applications that were used in both highly technical and mission-critical environments, so their emphasis on quality control has been extreme.

For example, employees at Rogue Wave Software, a maker of class libraries for C++ compilers that run on many platforms, has noticed a difference in the questions asked by Unix customers vs. PC customers.

"The Unix guys want to make sure there is a test suite for every single class," said Dan Whittaker, vice president of marketing at Rogue Wave. "None of the PC guys did that."

Well-rounded background

And a representative of a company that makes software testing tools noted the majority of Unix developers have a strong math and engineering background that many PC programmers lack.

Judith Hurwitz, president of Hurwitz Consulting in Newton, Mass., agreed that both Unix and large-systems developers tend to be more sophisticated.

She sees vendors hiring developers with that kind of experience, "particularly if the application they are building is not a simple PC tool."

Indeed, Microsoft hired David Cutler, one of the architects of Digital Equipment Corp.'s VMS operating system, to head the development of Windows NT. And Microsoft is also actively courting Unix application vendors, such as Intergraph Corp., to port their products to Windows NT.

This increased interest in Unix is not lost on Unix developers.

Joseph DeSantis is vice president of research and development at Liant Software Corp., which makes tools to help port applications across multiple platforms. He said the Unix developers he works with are expressing great interest in Windows NT for a couple reasons: It offers a large market opportunity, and it has the sophistication they need to successfully move their applications.

Writing for Windows gets easier as developers leave DOS behind

CONTINUED FROM PAGE 1

"We've learned a lot of things," said Steve Weitzeil, director of development for WordPerfect for Windows. These include getting developers to switch from a procedural (DOS) to an event-driven model of programming (Windows) and to learn how to better implement graphical user interfaces.

Input process

Procedural programming uses the general form of "data in/process the data/output an answer." Event-driven programming is just that: an event, such as a mouse click, occurs, and a subroutine deals with it. Input can come from all directions, and the application must be capable of dealing with it. If applications do not deal with input properly, errors can occur, the system can crash, and users can lose data.

"The message handling and the event-driven scheme are the hardest things to adjust to," said Bill Jones, director of product management of Lotus' word processing group.

"You start talking about your code as people: 'I'll talk to him and he'll say this to me.'"

That leap in paradigm means creating a Windows version of a DOS application can be like creating a whole new application, complete with the requisite bugs found in all new applications.

"When we went to Windows ... it was almost like starting over again," said Greg Harrelson, software quality assurance manager at Contact Software International, Inc. in Carrollton, Texas, maker of the Act line of contact management software. "We went from a highly evolved product to a fledgling."

Interface important

The user interface was also an important consideration for the makers of WordPerfect and the Ami word processor, which is now a Lotus product called Ami Pro for Windows.

"There's a lot more thought that needs to go into the interface," Weitzeil said.

For example, developers must decide when to conform and not to conform to Windows interface standards in order to assist previous users in the transition to Windows. Partly as a result of this extra thought, WordPerfect now has a usability lab aimed at testing the interfaces before they ship.

Step ahead

Over at Ami, work on that word processor started in 1988, long before Windows 3.0 arrived. That, combined with a development team used to event-driven programming under Unix, gave Ami Pro a large jump over the competition when Windows 3.0 hit the market, according to Jones.

That early start also gave the Ami team time to find out just how much impact the user interface design can have on product architecture and development schedules — something for which developers who hit the Windows market later were not totally prepared.

"Windows is so rich in terms of what you can do for the user," Weitzeil said.

That richness means developers have many more choices to make, and making more choices takes more time.

Unlike DOS

Another major hurdle to Windows development is the added complexity of dealing with an environment where a developer cannot assume that his is the only application running, as was most often the case under DOS.

That was the case at Contact Software. After the release of Act for Windows, reports filtered in that the product was incompatible with a Windows-based CompuServe navigation package.

Whichever package was loaded first would prevent the other package from running. It took a considerable amount of time to find a debugging tool that could solve the problem.

Harrelson added that writing programs for Windows is hardly an easy proposition simply because of Windows' scope — it handles everything from memory management to printer drivers. And tracking down errors can be a hit-or-miss proposition.

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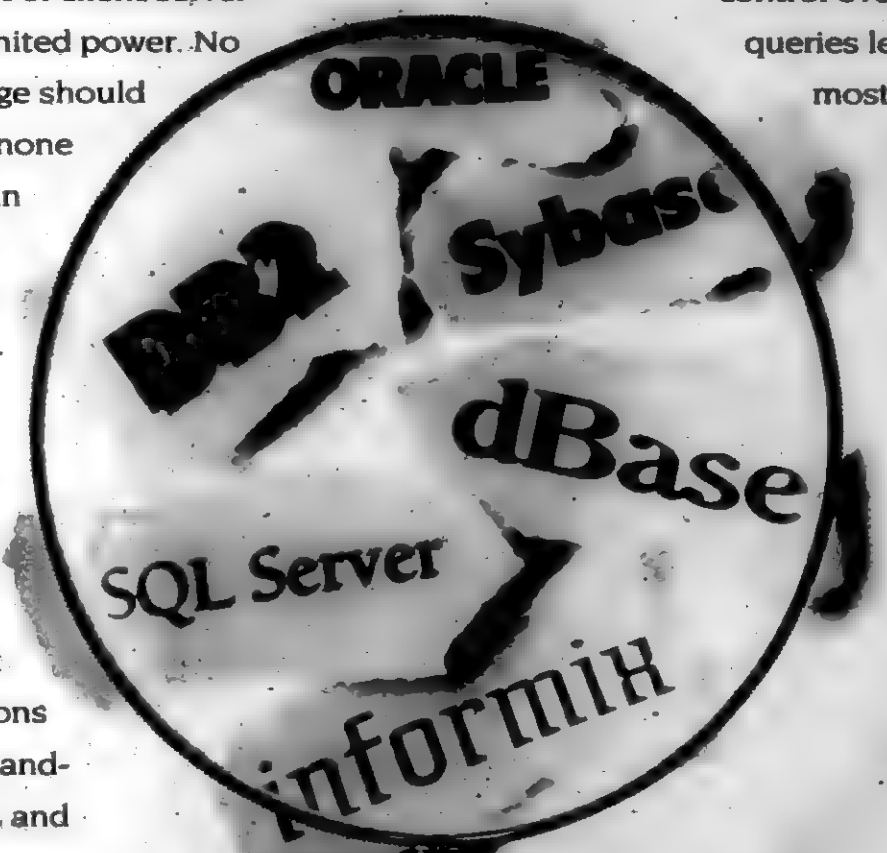

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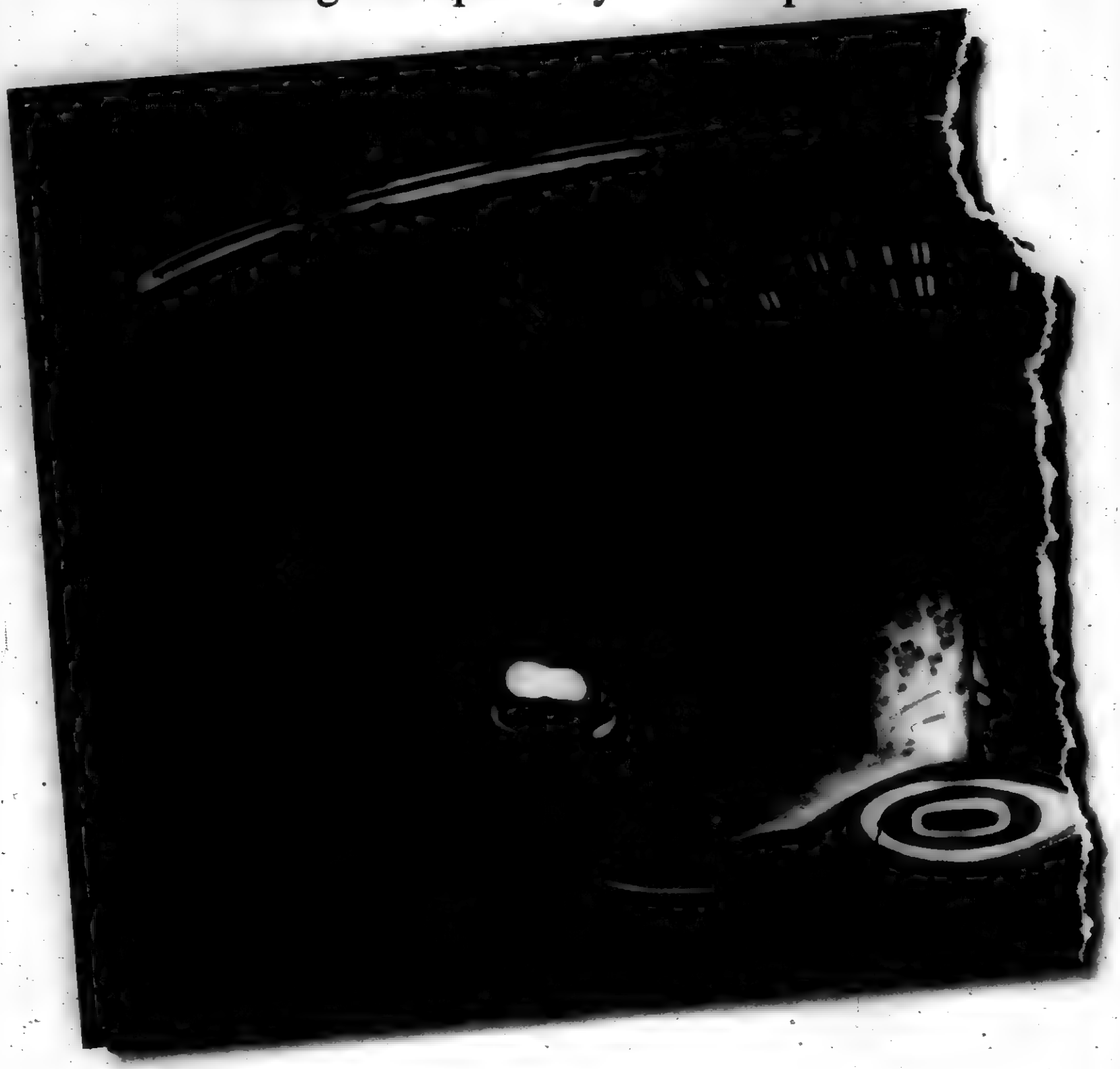

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Mainframes

UPS breaks ground with 8-way system

By Jean S. Bozman

PARAMUS, N.J.

In a quest for increased capacity, United Parcel Service, Inc. has powered up a new eight-processor Amdahl Corp. mainframe to host growing IBM DB2 database applications.

The eight-way, 368 million instructions per second computer was created by bolting two four-way processors together last month. It is one of nearly 20 such Amdahl machines installed worldwide. There are now more than 30 eight-way machines installed worldwide, including early-support IBM systems.

The Amdahl 5995-8650M machine was acquired through a lease after a three-way bid between Amdahl, IBM and Hitachi Data Systems Corp. "We obtained it as one serial number, but it arrived as two four-way machines," said Rino Bergonzi, vice president of information services at UPS. Accordingly, the machine carries only one MVS software license from IBM, Bergonzi said.

"It's working very well," he said, adding that he was aware there were some initial manufacturing problems associated with the big computer's channels last fall. "They brought in twice the number of channels we needed, and we didn't have any problems at all," Bergonzi said. The eight-way processor takes up 600 sq ft in the 15,000-sq-ft computer room.

The Paramus data center also houses a 4-year-old Amdahl 5990, while the Mahwah, N.J., data center has two IBM Enterprise System/9000 Model 900s and one ES/9000 Model 820.

The price for leasing the eight-way computer, while undisclosed, was discounted from the list price, which was $90 million last year, according to Amdahl. The company reduced the list price to $21 million last month.

Twice the power

The Amdahl 8650M arrived as two four-way machines last year: One Amdahl 4550M processor arrived in June, and the second arrived in August. UPS began using them for production applications last year. "For five months, they were running side by side as two physical machines," said operations manager Ed Zolcinski.

Space needed

Capacity was the key to the acquisition because UPS' DB2-based package tracking systems are already among the largest in the world — and growing. UPS' largest DB2 application, which controls about 2T bytes of data, runs on an IBM ES/9000 Model 900 machine at the Mahwah center. But other DB2 package tracking systems, including those for priority packages, now run on the Amdahl eight-way processor.

UPS plans to benchmark some of its DB2 applications and said it expects them to run at speeds as high as 1,000 transactions per second, Bergonzi said.

Eventually, UPS may decide to swap DB2 applications between the IBM and Amdahl machines, said Vern Higberg, vice president of information systems at the Mahwah data center.

UPS IS managers might elect to move growing DB2 applications to the bigger Amdahl 5995M machine as needed, Higberg said. Even now, UPS technicians swap applications during disaster-recovery testing periods at the Mahwah and Paramus data centers.

UPS can use the eight-way processor as a single-system image machine; however, it is now running in three logical partitions under Amdahl's Multiple Domain Feature.

"At this point, we don't see a need to go to an eight-engine [application] domain," explained Nick Gray, computing resources manager. "There is some desire to go to five or six engines."

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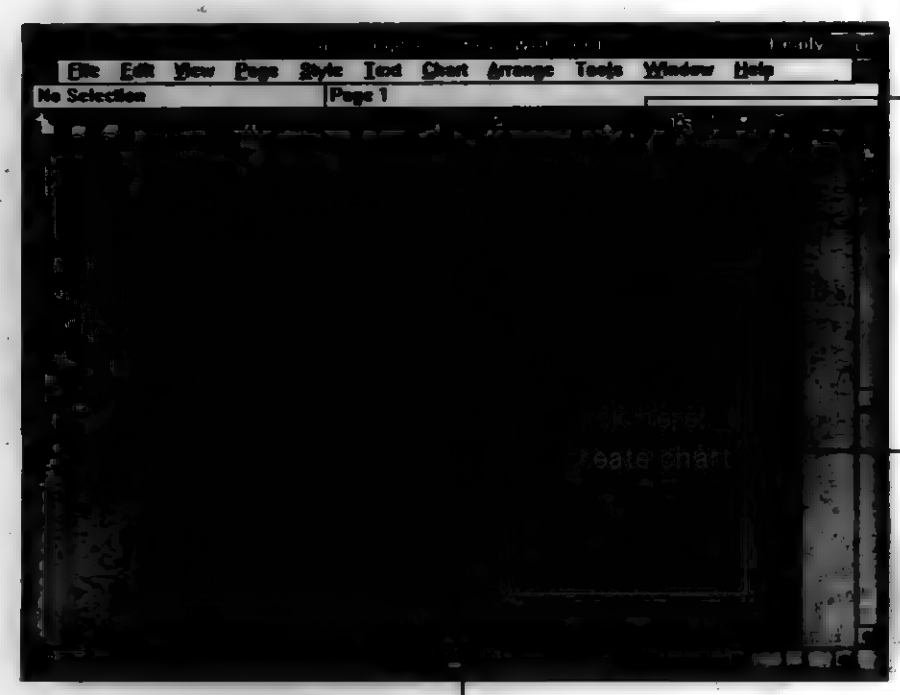

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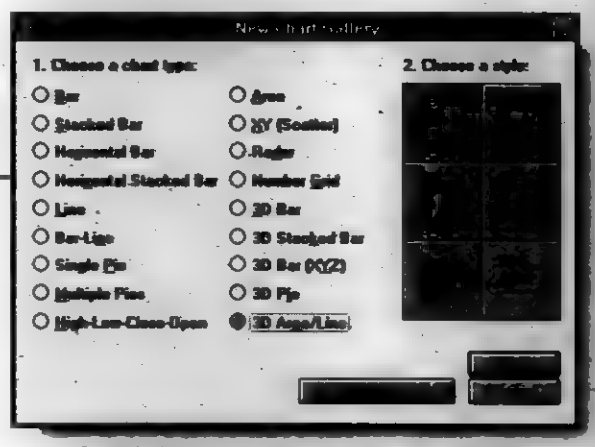

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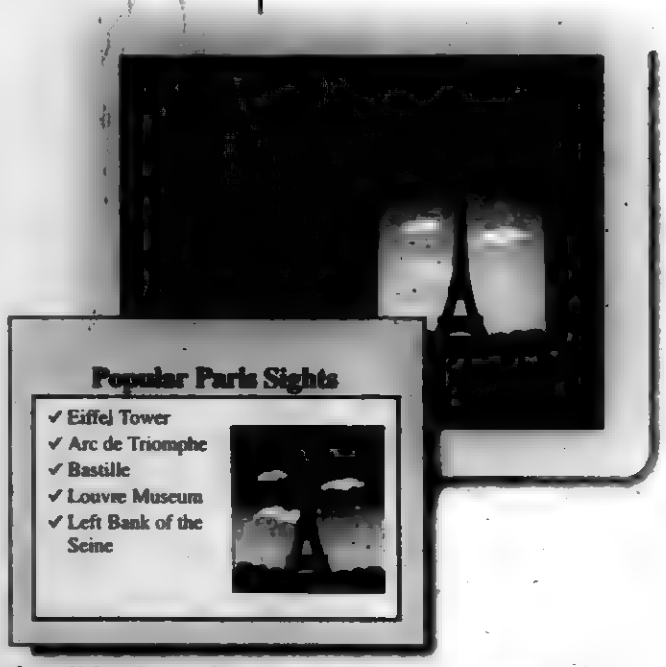

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Police snag Microsoft bandits

By James Daly

Microsoft Corp. and Northern California law enforcement officials recently raided the offices of several alleged software pirates, netting 18 tons of counterfeit manuals, disks and components relating to Microsoft's DOS 5.0 operating system and Windows Version 3.1.

The bootleg products were produced under the OEM trade names of Spring Circle and BTL. Neither holds replication rights for Microsoft products, Microsoft officials said.

The raids, which were disclosed last week, took place in late January and February and were conducted by the San Jose and Concord, Calif., police departments with officers from the Federal Bureau of Investigation and the Internal Revenue Service. The raids occurred at more than six Bay Area locations, including JT Litho, a printing and production house in Concord, and the homes of at least two of the principals involved in the production of the counterfeits.

According to Microsoft spokeswoman Alison Gilligan, "We're still investigating all the evidence we've gathered and are looking at civil, and possibly criminal, charges. But no one has been charged at this point."

More raids planned

Jim Lowe, a Microsoft corporate attorney, said similar raids against bootleg production facilities are expected to continue as the software industry gets tough on software piracy. "During the next several months we anticipate more raids, both here and abroad," he said.

Lowe added that users should be on constant alert for counterfeit products, which can be defective or carry viruses. Because Microsoft does not license OEMs to distribute DOS or Windows without a computer system, consumers should be on the lookout for such products available on a stand-alone basis.

Those accused in the high-profile raids could face stiff new fines for software piracy. Congress recently made software copyright infringement a felony, upping the maximum term of imprisonment to five years and possible fines to $250,000. Under earlier law, willful infringement was subject to a maximum fine of $25,000 or imprisonment of up to one year or both.

OSF receives funding pledge

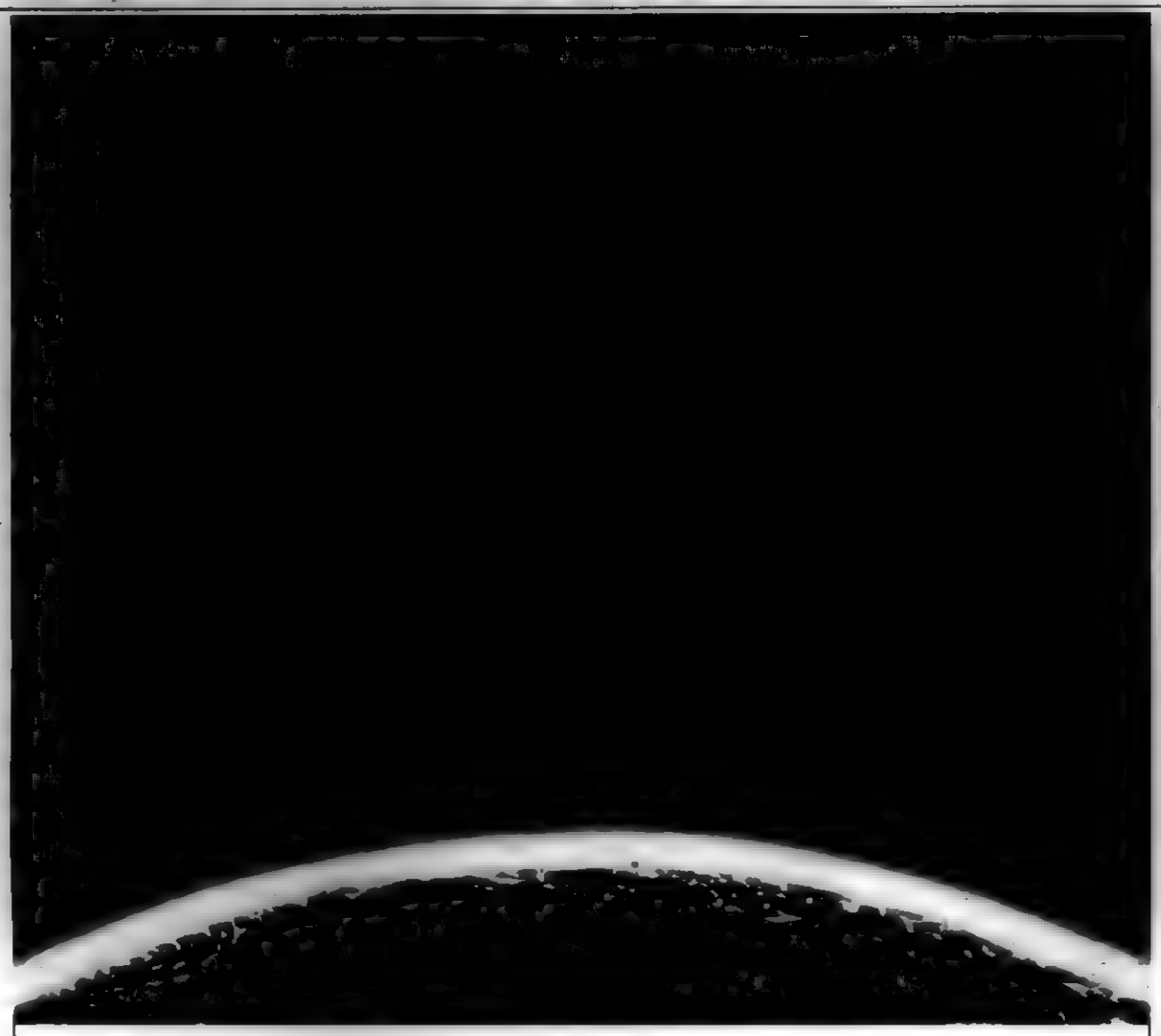
By Maryfran Johnson
CAMBRIDGE, MASS.

The Open Software Foundation (OSF) last week reached an agreement with its key vendor sponsors for funding through 1994 and 1995, sources close to the company confirmed.

IBM, Hewlett-Packard Co., Digital Equipment Corp. and Hitachi Data Systems Corp. have each agreed to provide $5 million per year for the next two years. Although the sponsors had discussed a variety of conditions attached to their money — such as prepayment of OSF royalties on source-code technology — in the end, the group agreed to no-strings-attached funding.

The additional $20 million per year support will bring the OSF's budget to roughly $55 million next year. Negotiations are still ongoing with Siemens/Nixdorf Information Systems, Inc. and Groupe Bull, which are being asked to ante up the same $5 million per year. Decisions are expected from those companies by May, sources said.

Although the OSF originally planned to be self-funding by this year, the new target date for that is 1996. In 1992, the nonprofit organization earned more than $30 million in licensing fees, royalties and other software services connected to the Motif graphical user interface, the OSF/1 operating system and the Distributed Computing Environment.



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Eckhard Pfeiffer

Face to Face

Compaq's CEO on client/server, big iron and why his firm is going to kick butt

Q. How do you see the role of the information systems director in the emerging client/server environment?

A. I've had a lot of interaction with corporate customers recently and also with people who have special roles in guiding CIOs and MIS with PCs. And the general perception in the MIS community is that it is very chaotic out there. On one side, they see what is happening with IBM and with its mainframe and minicomputer business. And where [the degradation of those businesses] is happening so fast, it is very unsettling for the IS department.

Obviously, the big challenge for them is to be very competitive, to be ahead of the technology game, because information technology today is by its nature a competitive factor. The decisions they make today are so far-reaching that once you really lock in a strategy, it is going to carry forward for quite a while. It's a really gut-wrenching situation.

About the networked PC environment, MIS asks, "Where do we get the support? Who is going to deliver *what* to make us as IS directors feel comfortable? What do we need to do with our own setup to deal with these changes? When will client/server computing be reliable enough for the mission-critical environment?"

Q. What of the fate of the mainframe in the corporate environment?

A. Certainly the mainframe will play a significant role, primarily in terms of storage of data, security and reliability requirements. But the trend is so obvious to bring all this to the level of the networked environment that the installed base may decline.

Q. Is the networked environment really ready for prime time?

A. The total infrastructure around the PC and microprocessor-based systems today is not sufficiently clear and developed and secure to make that [mainframe replacement] happen in the near future. 'Rapidly' is even maybe too aggressive. But pretty steadily, we certainly will see a declining need for traditional mainframes.

In parallel, a lot more focus will bring the missing elements to the PC, client/server environment. Certainly that is our direction at Compaq.

Q. Networks imply coordination. Does this mean a more centralized view of IS/information technology planning?

A. It seems to go in cycles. I believe that network orchestration today requires a lot of central guidance. But once you reach a certain level of systems performance, you can delegate again [the] defined conditions of what can be hooked into the system and how it is going to be done. It doesn't need to be strongly centralized at that point.

I believe that decentralization has been growing and will continue growing as this technology moves forward.

Q. Lots of questions have been raised about the benefits of PCs and their overall return. Are those benefits quantifiable?

A. Definitely. I've seen lots of statistics that establish a significant cost advantage for the move to client/server, compared with more traditional solutions, such as mini- or mainframe-based solutions or, more importantly, the proprietary environment. That's really been the big cost factor [with traditional systems].

A lot of that is highly valued by corporate users in terms of having a guaranteed solution, a well-protected service component. And people will pay for that. But if you stay in that environment, you are going to be outdated while your competitors have the benefits of much lower costs.

Eckhard Pfeiffer says PCs in the corporate world may have a slower return on investment than anticipated, but they do have paybacks

Q. But can you quantify the benefit?

A. With desktop systems, it is very difficult. I think there is a lot of investment that may not have been fully utilized to the level of capability of the systems, given various cycles of hardware and software development. And that may slow down the return on investment.

On the other hand, if you look at the last 10 years and at the penetration of PCs in the corporate world, I believe there is an indirect payback — namely, running your business, making decisions, having facts on hand, achieving levels of up-to-date information — all of which are hard to measure. But how can you escape that? How can you not keep up?

So companies need to deal with that by defining the level of investment and trying to determine what kind of return they want to get out of it. Are you a more successful company because [IS] is bringing more to the strategic decision-making process? Answering this question will remain an eternal struggle.

Q. What are your goals for Compaq in the near term?

A. Compaq has a unique opportunity to become the industry leader of the PC standard. The traditional leader, IBM, today is in very difficult shape, and they have been a leader only in volume. IBM has not been a leader in PCs since 1986. After we fought the [Micro Channel Architecture] battle successfully, what IBM then did was follow and be late and incomplete with its product offerings and pricing and OS/2.

To be the leader, you *have* to make a commitment to technology, or you can only be a follower. For a company that doesn't provide for significant R&D, there is a built-in limit as to how far you can go and how soon before someone else can challenge and outperform you on your other strengths.

If we are No. 2 today or No. 1 tomorrow in terms of volume leadership, there is no reason why we shouldn't have the lowest material costs, which are an 85% to 90% factor of total cost. We have significant leverage there. If you [then] control labor, overhead and global logistics, you have the formula for total cost leadership.

Q. Will you catch IBM and become the leader?

A. We are on a steep uphill growth path. We have very, very ambitious plans and a massive strategy laid out. I'm not anticipating IBM will just slow down and let us pass.

Q. Except you want to make money doing it.

A. Exactly, exactly. I'm glad you are saying it because when I do, it sounds like I'm being too negative about our competition.

Interview by Bill Laberis, *Computerworld*'s editor in chief. His MCI Mail address is 534-6060.

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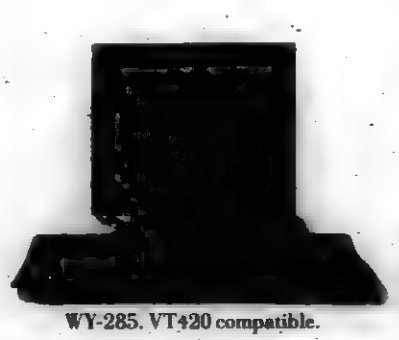

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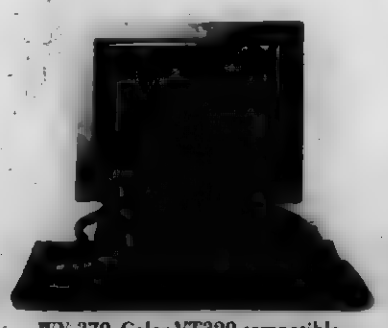

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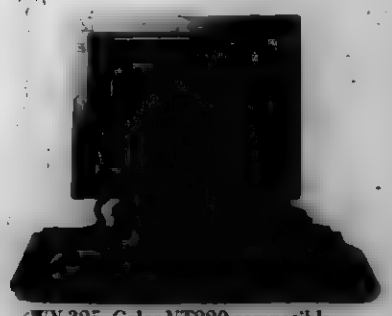

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Technical times

Last week a top executive from IBM's CAD/CAM business addressed some big users on future directions. Some comments conjured up an image from the zany movie

Monty Python and the Holy Grail — specifically, the scene where the medieval body collector hears a cry from his wagonload of bodies: "I'm not dead yet."

It's not unusual for companies these days to spend time trying to convince their customers of their viability, vitality and staying power. But to hear this sort of line from IBM, followed of course by a lot of chest-pounding about how no one else knows customers' needs like IBM. . .

Anyone who has been associated with the information technology business for the past few years has to be startled by the turn of events at IBM. To put it in perspective, in the last two years IBM has gone from being the most profitable company in the world to one that piled up losses last year equaling the size of Sun Microsystems and Oracle combined — about $5 billion.

This week's In Depth section picks the brains of some of the most concerned people in the information technology business — namely, IBM's biggest customers. We also sample two dozen industry chiefs and observers and ask the $64 billion question: "What should IBM do to *fix* itself?"

You can read all about it, beginning on page 115. But what struck me while reading the section was that the advice these people give to Big Blue is well-suited for the IS community and particularly the CIO.

Consider this remark from Steve Jobs: "IBM went through a period of forgetting they were a technology-based company. It's a very dangerous thing." And this ONE from former big iron bigot George DiNardo: "IBM permeated the entire company with salesmen instead of technicians when technology was becoming paramount."

How many of you CIOs out there spend more than 30% of your time on technology issues, at a time when technology change reigns supreme? Take note from IBM: Ignore the major technology shifts or just leave the technology to someone else, and you'll be out of a job before you can say "John Akers."

Or how about this quote from James Martin: "Move at lightning speed into client/server" and "get rid of the whole management culture that surrounds MVS and move into something more advanced."

What great advice for CIOs! But how can they do this if they spend so much time on management issues and on "selling" the IS concept to upper management? The answer is they can't, and somebody else will probably be brought in to do so.

Finally, this from Howard Anderson of the The Yankee Group: "Pacify the customer." More great advice. And if both the CIOs and IBM don't pay more attention to technology and less to sales and management, it will be as useless as these other great suggestions.

Bill Laberis

Bill Laberis, *Editor in chief*

Response to RAID review

Overall, your Firing Line evaluation of NCR's 6298 RAID subsystem [CW, Jan. 11] was in-depth and informative.

I did want to note, however, that the description of RAID-5 included a common misconception: RAID-5 "is best for high I/O operations that involve writing and reading large numbers of small data blocks at random disk locations."

On the contrary, tests have shown time and again that RAID-5 performance drops rapidly as the number of writes increases.

My company constantly tests RAID systems from most of the major vendors as well as our own RAID products. In a system environment comprised completely of disk reads, RAID-5 performs on a par with other disk arrays. As disk writes are added, performance decreases.

If as few as 25% of the I/O calls are disk writes, RAID-5 performance drops by more than 60% compared with other disk arrays. When the I/Os are completely write requests, performance decreases by a total of 88%.

RAID-5 does have its place. It is the most cost-effective RAID level for capacities of more than 3G bytes. (RAID-1 offers the best price/performance ratio for 2G bytes and below; from 2G to 3G bytes is a gray area.) Users who need the utmost in performance in all situations should turn to a combination of RAID-1 and RAID-0 — which we term RAID-10. This RAID level is, however, expensive.

The bottom line: The fault tolerance of RAID can be achieved only at the cost of either a higher price-per-megabyte or decreased performance. There's no such thing as a free lunch.

Joseph Shay, Ph.D.
EOCS, Inc.
Tinton Falls, N.J.

Wrong to write

George Pajari's letter to the editor [CW, Feb. 22] is full of fallacies and misrepresentations. Next's alleged "utter disregard of open systems standards" that he mentions is simply untrue.

Granted, NextStep is not X/Open-compliant, but it meets a laundry list of other industry standards. Moreover, if it were truly X-compliant, I highly doubt that NextStep would be the vastly superior operating system that virtually all industry analysts say it is.

First and foremost, NextStep is based on standard Unix, the same version of Unix that IBM will adopt as the kernel for future versions of OS/2 and AIX. All Next machines provide industry-standard networking and connect running Transmission Control Protocol/Internet Protocol and Network File System.

Next has also built in full support for Novell and AppleTalk networks. NextStep connects to all the major database servers via the Database Kit. And unlike most other systems, NextStep has always utilized standard PostScript to provide one unified imaging system from display through printing.

Pajari's time would be better spent doing some research before he publishes his next letter to the editor.

Franklin Rimalovski
Durham, N.C.

Double standard

Christopher Lindquist hit the bull's-eye in his article "2.1 better be good, OS/2 users say" [CW, Feb. 15]. It doesn't matter how good OS/2 is. Because it came from IBM, many will be taking shots at every flaw, regardless of size. This is not true with products from Microsoft.

Take Microsoft Access as a prime example. Here is a product that has some major bugs in it: You cannot use it with files on a file server, just to name one. If IBM released the identical product with the same bugs, the company would have been crucified.

Microsoft is now enjoying the "de facto standard" leadership today that IBM enjoyed until about eight or 10 years ago. The playing field was not level then, and it's not level now. NT will be the winner — not because it will be the better operating system but because it comes from Microsoft.

NT has already been declared the better operating system, and it's not even in the marketplace yet.

Jim Herman
Everett, Wash.

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Keep it short, stupid

Michael Cohn

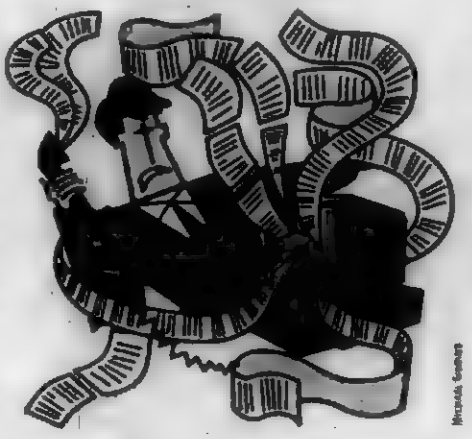


Illustration: Brigitte Sombert

Information systems professionals have problems like anyone else.

Lawyers get flat tires; so do we. Accountants catch colds; so do we. Stockbrokers stain their silk ties; we stain our polyester ties.

We also have problems no one else does, such as having cubicles in the basement.

But this paltry day-to-day stuff isn't all that folks like us have to deal with. Worst of all are the small but bothersome and downright stupid things that happen in high tech every day.

•Forwarded E-mail

I'm all for E-mail. Cuts my work in half. Send me important stuff and I'll read it. Send me junk and I'll delete it. But please, please, do not send me forwarded E-mail.

There's nothing worse than the dreaded E-mail message that's been forwarded five times. I'm then obligated to page through screens of FYIs, thought-you-should-knows and what-do-you-make-of-this's before getting to anything vital, like the information that the garage will be pressure-washed on Sunday.

If you have something to say, send it. If you've got something to forward, leave me alone.

•Long phone mail messages

Phone mail is even better than E-mail. Leave me a phone mail message, I'll get back to you later. Leave me a phone mail, I'll check it tonight. But for goodness sake, get to the point. Don't repeat yourself six times. Don't go next door to get a file. Net it out! I may want to check phone mail from my car phone or a pay phone. I may want to get it done during this century. So say what you've got to say and then get off my phone mail.

•Budgets

Look, we're IS guys. We build networks. We grind out code. We don't want to know about budgets and forecasts. We have no time for operating expenses. Sure, someone needs to worry about what we spend. That's fine, just as long as it's not us.

If you want us to be CFOs, give us nicer offices. But when it takes 11 months to work out a 12-month IS budget, keep us out of it.

•Leading-edge users

Please understand how IS works: We fight fires seven days a week, and whenever there isn't a blaze, we attack the three-year backlog. You can't get too close to the leading edge when you're always a hose-length from the hydrant.

The last thing we need is some dangerous executive browsing through *Popular Mechanics* on the flight to Phoenix and then wanting to know if we can transmit three-dimensional images across global networks onto wireless, high-resolution workstations, like they're doing on page 79.

•Vendor mail

Vendors aren't bad, especially if you need hockey tickets or are building a mug collection. But their mail drives me crazy. I get tons of it. Mail about special offers, mail about upgrades, mail about seminars — I could spend all day wading through the stuff.

The funny thing is, at home I get very little mail — an occasional coupon or a birthday card from my Aunt Zelda. Most of the rest my wife reads, throws out or sticks on my dresser until it decomposes.

So to all you vendors out there: Please stop sending me mail. I simply don't have the time to read it. Better yet, send it to my house. Maybe my wife will read it.

Cohn picks up his E-mail at a very large computer company in Atlanta.

Why IS ends up chasing its own tail

COUNTER-INFORMATION *by* Michael Schrage

All those tiresome arguments over outsourcing and strategic architectures confirm that most IS departments would rather debate trendy cliches than manage fundamental issues. The compu-cliches have successfully obscured the key defining questions: Should an IS organization be designed and managed as a cost center or a profit center?

Nothing — not strategy, not personnel, not budget — is more important in determining an organization's cost-effectiveness than its economic (dis)incentive structures. Unfortunately, most companies simply refuse to commit to what kind of "business" they want their IS organizations to be.

One Fortune 500 executive (who shall remain nameless) boasts that his company's IS department is now run "like a profit center," complete with return on investment. But in the next breath, he acknowledges that IS is spending a small fortune developing enterprisewide "strategic systems." He finishes by whining that his IS managers don't know how to "manage IS like a business."

Appropriately managed, cost centers are an excellent way to build competent information infrastructures. Similarly, profit centers assure an IS department's responsiveness to market forces. However, trying to combine the two approaches is inviting organizational schizophrenia, and policies that promote schizophrenia hardly qualify as enlightened leadership. You may as well ask sumo wrestlers to become pole vaulters — just don't complain about snapped poles.

Because strategically selfish managers blend the worst of greediness and desperation, most companies insist that their IS departments be both cost centers and profit centers — and reward them accordingly. In other words, they want a schizophrenic mutant. And yet they are shocked — shocked! — at how troubled and unstable schizophrenic mutants turn out to be. Of course, they don't call it schizophrenia. They'd prefer to call it "balance."

Call it the Iron Law of Perverse Incentives: Organizations are ultimately punished for whom and what they reward. When a company like Salomon Brothers lavishly rewards risk-takers who are great at cutting corners, they end up with traders who make illegal transactions. When IBM rewards salespeople for moving iron, we get a company that is slower to market systems integration. When IS departments reward programmers for "on-time" delivery, they get timely software with bugs.

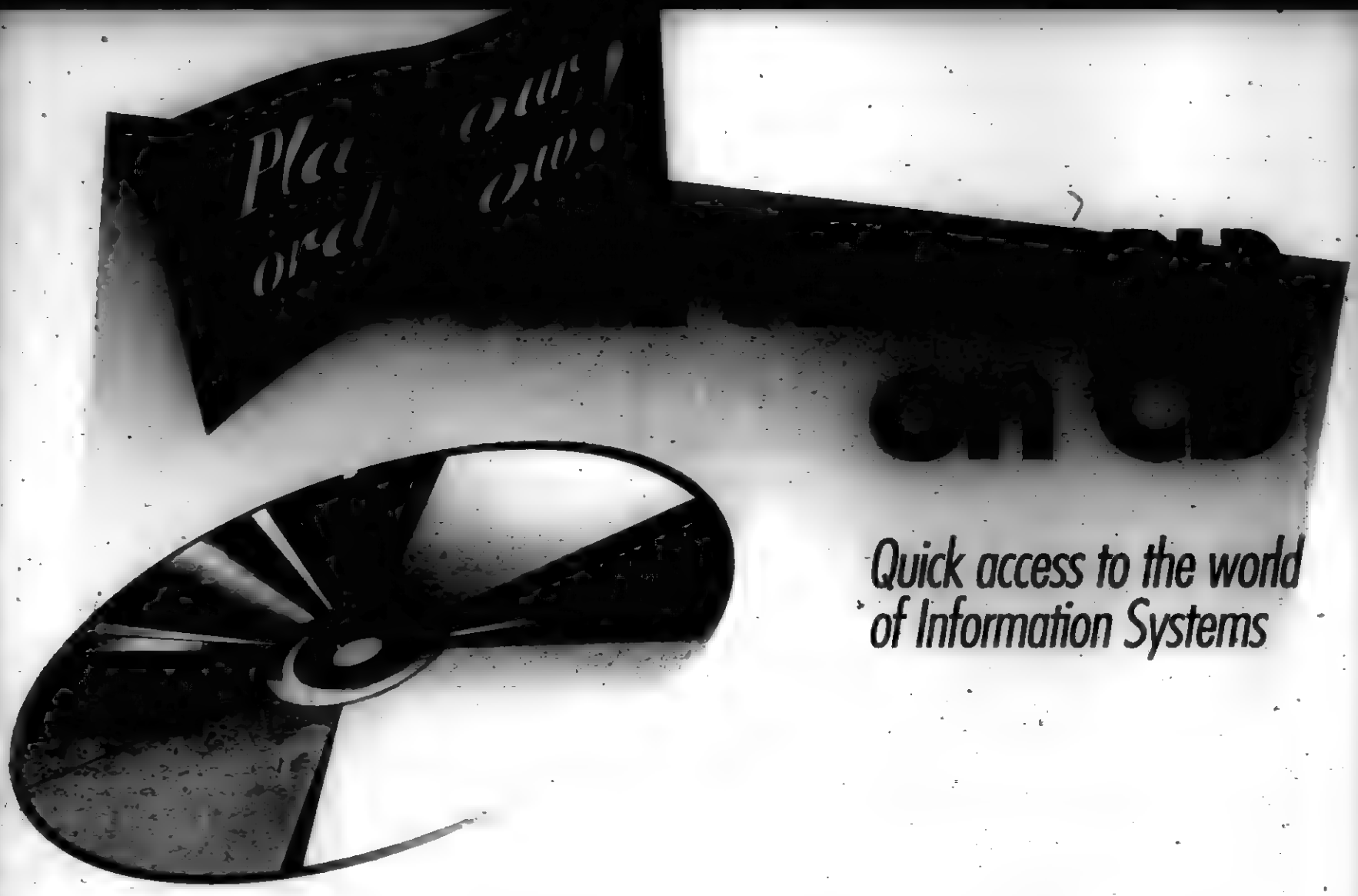
Mixed incentives, like mixed signals, yield mixed results. Even companies that do a superb job of designing and implementing technical architectures often do a thoroughly superficial job of designing and implementing the business architecture. "Running IS like a business" too often means, "please run IS like a loss leader."

Indeed, when an IS department actually succeeds as an internal profit center, you'll often hear the other senior executives carp that the success comes straight out of their budgets.

No wonder *Computerworld* keeps doing stories about high CIO turnover. At some point, you have to ask whether the turnover comes from the incompetence of the people or the incompetence of the mission.

My best guess is that the root problem here is a serious lack of courage among both top managers and the IS departments in the face of shrinking budgets and rising expectations.

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990).



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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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13. Treasurer, Controller, Financial Officer

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Charles Babcock

Client/server challenges

Client/server computing is easier to discuss than to implement, which puts it in a class something like the weather: Everybody talks about it, but not many people are doing anything about it on a systemwide scale.

In part, this is because there is still a lot of confusion about what client/server really is. For many, the term is synonymous with downsizing mainframe applications to PCs. But true client/server has more to do with getting two distinct sets of processes to work together, often with a host machine still part of the picture.

What we are talking about is more than downloading read-only data from a host or exchanging files between PCs. Client/server implies distinct processes, closely linked over a network, operating at elevated efficiency. Two or more computers interact on the same task, using a swift and reliable connection that involves only two or three protocol layers.

To maximize efficiency, the operating system is broken apart with a specific set of processes installed on a server. When called, they quickly execute a given set of tasks and deliver results to remote computers. The result is not a distant handshake but a true collaboration.

Those are the basics, but to me, full client/server goes one step further, splitting apart the application for execution on two (or more) separate processors.

Tricky tasks

Some accounting software vendors have accomplished this, with both host and PC pieces. But accounting is a straightforward task with predictable data types. The more complicated tasks that client/server might undertake remain beyond the reach of many early implementations, and the path to their enactment is still strewn with trip wires for the unwary.

What happens, for example, when an application with many branches and data types needs to make calls to the server, and the hardware has changed from big endian to little endian, introducing file format incompatibilities? Format translating software can be added, but it would complicate the overall design.

How about a situation in which the server with access to the corporate data goes down and no alternative server can be tapped? The full definition of client/server implies a redundancy that wasn't available on the mainframe, so multiple servers may be needed.

Client/server should be able to work across more than one type of LAN, and in an early implementation, it could. But not all LANs are upgraded at the same time, and a new version of one might not work with an older version of another.

The point is, if one piece of this interrelated structure changes unexpectedly, it impacts the other parts, and long-sought efficiencies can evaporate. In fact, the expense of a client/server application could actually be higher than a host system if it requires frequent support and troubleshooting.

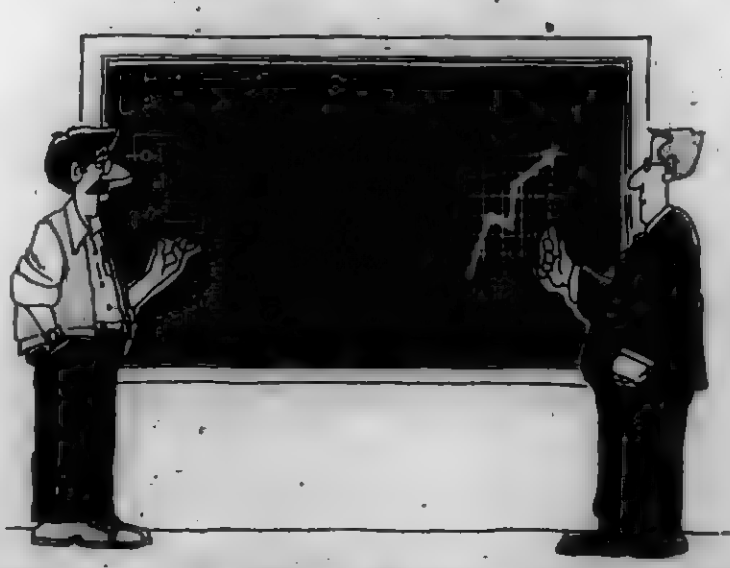
None of these obstacles should bar a move toward client/server. They should be considered, however, because they will be difficult to circumvent without careful planning.

Starting small and implementing client/server on a departmental level is a good way to lay groundwork and can produce rapid savings if it forestalls the purchase of another host machine. Using proven standards — the C language, SQL, relational databases — and building an infrastructure with an eye toward the future will make it easier to tackle enterprisewide systems down the road.

Don't let the unknown parts of client/server stymie you. The idea of doing the appropriate processing at the appropriate level will not be going away, and there's enough here now for you to get a strong start in the right direction.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2787.

The world's largest object lesson for both kinds of people...



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David Coursey

AT&T moves to the front

"Just stand back and watch!" That's what I used to say to skeptics in the dark days following the breakup of the world's finest telephone system. "Sure AT&T isn't a leader in computing," I'd say as the company stumbled around the PC business and losses began to mount. But after a respectable pause I would always add, "Yet."

That was in 1985, when the company briefly romanced the market with an Olivetti-made XT, the 6300, and about the same time Convergent remarketed the ill-fated Unix PC, one of the more clueless products ever introduced as a desktop machine for offices. If the deal was supposed to be one where AT&T gave up the local phone monopolies in exchange for a free run at IBM and the computer biz, well, things weren't going very smoothly.

Still, since divestiture, AT&T has been learning from its mistakes. Sure, the company dumped its own computer systems organization at almost the exact moment it seemed to have finally turned the corner. But who can argue the NCR buyout isn't the largest successful merger this industry has seen?

The NCR acquisition reversed AT&T's previous computer-related losses and added bottom-line profitability, giving AT&T a significant international presence by leveraging the roughly 60% of NCR's revenue that is generated outside the U.S.

NCR also provides real-world marketing and product strategies for AT&T Bell Laboratories' technology. And don't underestimate the importance of NCR's vertical market experience in retail, banking, point-of-sale and other markets in AT&T's future plans.

No, the NCR buyout hasn't been perfect. Many good AT&T people and products were sidetracked, but compared with some other mergers, these must have seemed quite acceptable losses to the AT&T brass.

AT&T also has a finger in seemingly everything that's cool. The best pen-based machines are built around AT&T's Hobbit processor, and the company owns a piece of EO, Inc., which is building Hobbit-based products. The AT&T videophone, despite considerable limitations, has been a success and now sells for less than $1,000. AT&T wants to invest $3.8 billion for a 33% stake in McCaw Cellular, once again giving it the ability to sell dial tone. Bell Labs continues to pioneer new technologies, including gigabit data networks and multimedia. Add close ties to the Japanese, who often join with AT&T in start-up ventures, and you have the potential for significant growth.

Coursey, *page 38*

Simulations growing up

By Ellis Booker

Since its introduction in 1989, SimCity has enthralled a half-million players who would have yawned through a textbook on urban planning.

Now Orinda, Calif.-based Maxis, developer of SimCity and a half-dozen other games, is hoping to extend its reach into business and government sites with sophisticated simulations that model complex organizational systems.

Last July, Maxis formed a business simulation unit that has quietly signed up a handful of commercial and government users and has built a few prototype games.

"We try to provide a crude overview of the entire system," said John Hiles, vice president and general manager of the firm's business simulations unit. He said he expects the Monterey, Calif., unit to bring in between $2 million and $3 million in revenue this year.

None of its business simulations have yet made it into a production application, Hiles said, but interactive simulations are increasingly accepted as a tool for training and instruction.

Over the years, the award-winning game maker has seen its most popular object-oriented simulations find their way into schools to help teach core concepts of, for example, urban planning (SimCity) and biology. SimAnt models an ant colony in a suburban backyard.

Chevron Corp., the furthest along of its commercial customers, spent several months with Maxis creating a model of the major activities at its huge refinery in Richmond, Calif.

According to Susan Gustin, a training specialist at Chevron U.S.A. Products, SimRefinery makes visible the interrelationships within the plant and is targeted at nontechnical staff.

Slick picture

Among other things, the simulation shows the changing relationships between the type of crude oil going into the plant, various processes inside the refinery and the products that are produced for sale. "Some of these relationships aren't at all obvious until you play the game a bit," Gustin said.

The Electric Power Research Institute, an industry research and development organization in Palo Alto, Calif., has just begun a design study for development of a product it will call SimPower.

"The idea is a game that models the typical electric utility," said David Cain, the institute's manager of computer products. Cain said the turnover in the power industry has meant that many managers are moving to senior positions without a well-rounded background in all as-

Simulation, *page 37*

Game rules

The Maxis Business Simulations unit works as follows:

- **A two-month design** study conducted with the customer includes scheduling a mock-up and mission statement.
- **Development takes** six months.
- **A finished game** costs about $300,000.
- **Prototypes are** currently on PCs running DOS; work is in progress for the Apple Computer, Inc. Macintosh. Microsoft Corp.'s Windows may be supported in the future.

Reviews mixed on Compaq direct sales

By Michael Fitzgerald

■ Compaq Computer Corp.'s forthcoming push into direct distribution reinforces the notion that PC makers need to sell their products through almost every distribution channel to remain competitive. But that is not eliciting much excitement among the customer base.

"Channel conflict is going to be a thing of the past because everybody's going to be in every channel," said Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass. Henning said that with so many vendors using a multitude of channels, there will be fewer of the direct vs. reseller battles of the past.

Sources close to Compaq's direct marketing project, codenamed Gemini, said the firm initially will sell certain models of ProLineas and DeskPro/is through a toll-free telephone line. It plans to include other products as it gains experience.

Compaq would confirm no details, but Gian Carlo Bisone, the director of North American marketing at Compaq, said that when the firm does go direct, the DeskPro/M and SystemPro products would not be likely candidates for direct sales. He also emphasized, "We are not walking away from the resellers. We are selling to the 7% ■ 12% of the market that wants to buy through a catalog or on the phone."

Dealer margins

"There is a perception that buying direct will save you 20% to 30% [over purchasing from dealers], but with the collapse in dealer margins, this is not the case," Bisone added.

Meanwhile, competitors are gearing up for Compaq's kickoff move [CW, Feb. 15], expected on March 15.

"There's more to marketing directly to your customer than answering the phone," said W. Dean Kline, a spokesman at Dell Computer Corp. in Austin, Texas. "We have 3,000 Dell employees involved in supporting the customer, and they'll probably have several hundred."

Customers, including Compaq users, were not overly excited by the news. "We may be interested, but it'll depend on how they put the program together," said Dawn Kroll, technical buyer at Chemical Banking Corp.'s Geoserve division. Chemical buys PCs from a number of sources, including Compaq and Dell, and Kroll said a reseller, with its smaller customer base, may pay more attention to each customer than a large direct vendor can.

Henning and other analysts said they see plenty of issues that Compaq will have to overcome to be successful in the direct response market.

The main issue is this: "They're no longer going to be insulated from their customers," Henning said. "Customers are going to be calling them, asking lots of questions they're going to feel they don't have to answer."

"I don't see any reason why Compaq can't handle direct response," countered Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. "They already have invested in the telephone network infrastructure and support staff to technical end-user issues."

Sources close to Compaq's direct marketing group said the company will establish a toll-free number when direct sales begin. They also said some 3 million pieces of mail will be sent out this week, and Compaq will have some 40 sales people taking calls.

Enabler aids Mac memory

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. will help Macintosh users quell their voracious system memory appetites with the introduction of the 32-bit System Enabler, a system software extension that provides access to System 7.1's powerful memory features.

The Enabler allows users of Macintosh II, Macintosh IIX, Macintosh IICX and Macintosh SE/30 with System 7.1 installed to take advantage of 32-bit addressing and access up to 128M bytes of physical random-access memory. Macintosh II customers with System 7.1 could access up to 68M bytes of RAM.

With the seemingly insatiable appetites of today's software, one of the harshest realities Macintosh users face is the machine's finite memory.

Apple's System 7 helps with two memory-extending options: virtual memory, which substitutes hard disk space for RAM, and 32-bit addressing, which is the extended ability to use memory and refers to the number of digits used in the new memory-addressing scheme. The Macintosh was using 24-bit addressing.

When 32 bit-addressing is turned on, the Macintosh can use up to 128M bytes of real RAM memory and 1G byte of virtual memory. Unfortunately, Apple officials said, not all applications are compatible with 32-bit addressing, so 32-bit addressing will have to be turned off when using an incompatible application.

The Enabler will be licensed free through user groups or on-line services such as AppleLink, America-OnLine and CompuServe. Customers can obtain disk-based copies directly from Apple by calling (800) 892-4649. A $10 shipping and handling fee will be applied to phone orders, Apple officials said.

Coursey

CONTINUED FROM PAGE 35

AT&T is also the firm best positioned to make the dream of "one-world networking" come true, providing an infrastructure capable of getting information from any place to any other place. It is also the only one embracing the concept of a single network identity per user, allowing one mailbox to support voice, data, image and other media.

The long-range goal is for the network to be able to translate one medium into another, allowing voice messages to be delivered as faxes if the recipient so chooses. And just last week I saw a new AT&T product called "PassageWay." It provides a connection between some of the company's PBXs and desktop PCs.

Finally, your applications can dial your office telephone and control its features. Caller-ID information can be fed back to desktop applications, allowing an incoming call to pull up an appropriate database record. Later this year, AT&T and Novell plan to release a NetWare Loadable Module providing the same features to LAN users.

So, yes, where AT&T is concerned, I'm a believer to the point that I even buy its long-distance service. If you believe the opposition's ads, that means I'm paying too much. But when I pass a "How much America is saving with MCI" billboard, I feel like I am investing in the company best able to link computers and telephones in ways that make both more powerful.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His E-mail addresses are: 558-4480 on MCI Mail; 76711,23 on CompuServe; and DCOURSEY on America Online, AppleLink and AT&T Mail.

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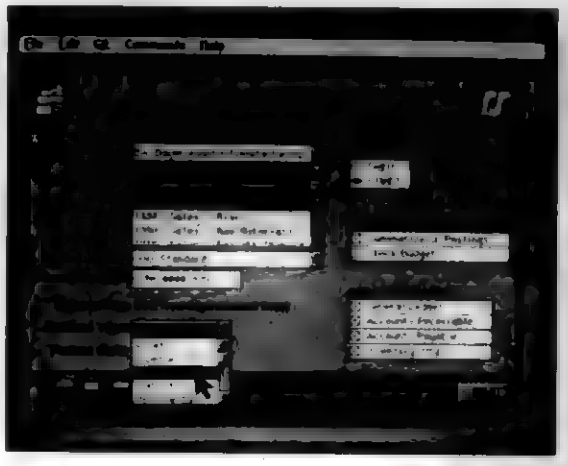

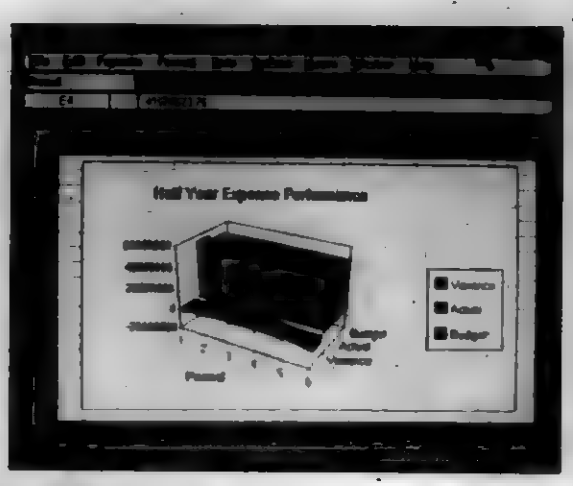

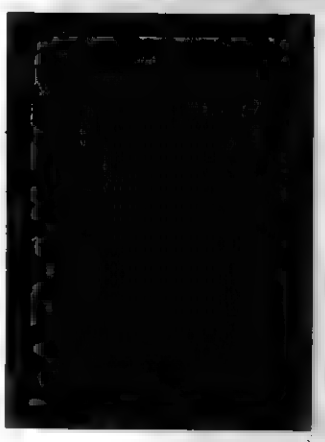

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Electronic publishing moves ahead

By Michael Vizard
PHOENIX

Significant advances in the distribution of electronic documents are about to come on-line, but a host of issues surrounding copyright laws and access charges will probably slow their acceptance by traditional publishers.

Driving major changes in the distribution of electronic documents will be the arrival of typeface translation technology, code-named Acrobat, from Adobe Systems, Inc. in Mountain View, Calif. After several years of development, Acrobat will be beta-tested on Microsoft Corp. Windows and Apple Computer, Inc. Macintosh platforms during the next few weeks, with ports for DOS and Unix to follow shortly, said Adobe Chief Executive Officer John Warnock.

"Right now, information is trapped on machines and the only way to get it out is through paper. Acrobat will eliminate the need for copies by creating one copy of a document on a server that can be viewed in full text form from any client," he said.

As a result, a single copy of a magazine can be viewed by everyone on the network, perhaps eliminating a firm's need to have hundreds of subscriptions to one publication.

Because of technologies such as Acrobat, publishers will have to adopt business models similar to those in the audio and video industries, where the copying of audiotapes and videotapes is widespread, Warnock said.

"The technology is definitely ahead of the copyright laws," said Michael Mellin, publisher at the Random House Reference and Electronic Publishing unit of Random House, Inc. in New York.

In fact, Adobe's technology may be usurped by technology from No Hands Software in Belmont, Calif. Using what it describes as Digital Paper technology, No Hands provides a pixel-for-pixel swap that allows any file format to be transformed into any other file format. Available now on the Macintosh, the Common Ground pixel translation software is expected to be ported to Windows and DOS this summer, according to the company.

And Interleaf, Inc. in Cambridge, Mass., already has a universal viewer technology for use with documents running on Unix servers. In addition, Folio Corp. in Provo, Utah, this spring will deliver Views 3.0, a document database for Windows, Macintosh and DOS systems that includes a universal viewer.

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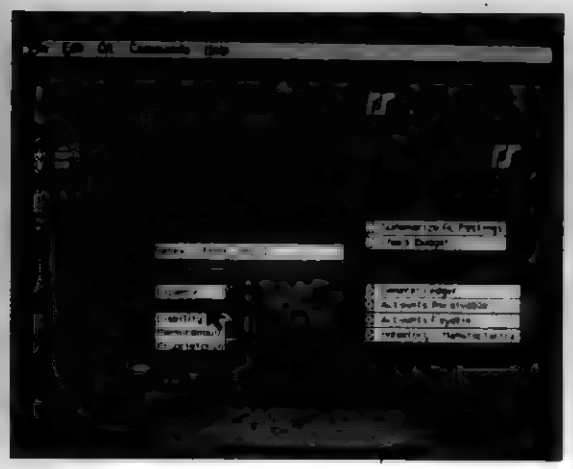

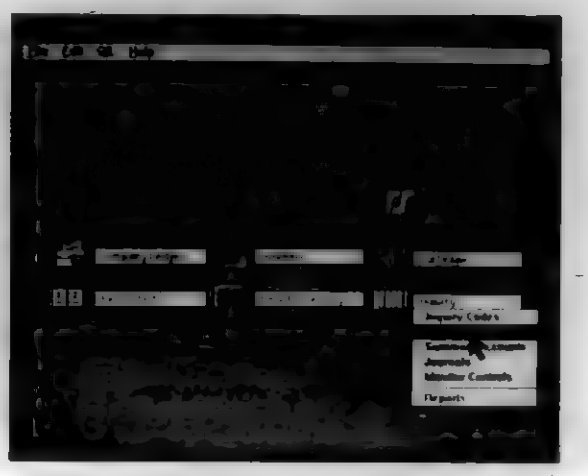

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Simulations

CONTINUED FROM PAGE 35

pects of the business. "They have relatively little exposure across the business units, so this 'game' will give people a feel for those other parts," he said.

While SimPower will not be a precision tool — "you wouldn't want to bet your company on its predictions," Cain said — it might be linked to other heavy-duty analytical simulations in the future. Several users exploring Sim variants mentioned the possibility of linking the game to analytical or predictive models already used in their industry or company.

Still another prototype was developed for the Logistics Management Institute, a government-sponsored, not-for-profit environmental research and consulting agency. In this simulation, the player can view the environmental outcomes of events at several locations — waste dumps, power plants and industrial sites.

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Future of groupware

Lotus, Microsoft push groupware visions

By Michael Vizard
SALT LAKE CITY

Lotus Development Corp. and Microsoft Corp. squared off over the future of groupware computing at the fifth annual Emerging Software Technology seminar held here late last month.

Sponsored by the Information Technology Association of America (ITAA), the conference brought together Lotus and Microsoft representatives to pitch their respective visions of groupware computing, which Lotus defines as its Notes offering, while Microsoft pushes Windows for Workgroups.

> "Vendors are like politicians; no politician is going to tell you things you don't want to hear."
>
> *Richard Buttermore*
> *Complete Business Solutions*

"Notes is a messaging service plus a full distributed object database," said John Landry, senior vice president of development at Lotus.

In contrast, Windows for Workgroups seeks to extend the Windows operating system to include a scheduler and an electronic-mail messaging system, said Tom Evslin, general manager of the Microsoft Connectivity Business unit.

According to Landry, the replication services provided by the Notes object database distinguishes Notes from groupware offerings that are based solely on mail messaging services. Notes has three levels of replication services that allow servers to copy databases, a client to copy a database from a server or only a partial copying of the database to either a client or a server. That latter capability will arrive with Notes 3.0 this month.

These replication services are unique, Landry said, because a Notes database on a server is able to synchronize updates across multiple Notes databases.

"Notes is a document-oriented system, so conflicting updates don't happen all that often. When they do, they are highlighted by pointers," Landry said.

Evslin said Microsoft will be able to provide similar capabilities using SQL databases in the 1994 time frame. He declined to specify how the company intends to add synchronized replication services to a SQL database other than to say that "messaging will be an important transport to accomplish this goal." He added that delivering this capability will be tied to the delivery of full messaging application programming interface (MAPI) support in Windows.

Direct approach

Forty-eight percent of workgroup application revenue is funneling through the vendor direct channel, making it the current largest distribution channel. But International Data Corp. predicts the systems integrator/VAR channel, which currently accounts for only 34% of application revenue, will grow to 58% by 1996, making it the fastest growing channel.

Currently, SQL databases support read-only replication services. "Notes is a different model of computing with replication services that are not possible in an RDBMS," Landry said.

Landry also said that because Microsoft's development efforts are tied to MAPI, the groupware applications Microsoft will deliver will be tied to Windows and Apple Computer, Inc. Macintosh platforms. Notes, on the other hand, supports those platforms in addition to IBM's OS/2 and Unix.

Focus on distribution

Evslin conceded that Notes runs across more platforms than Microsoft's offering will, but he also noted that developers are likely to concentrate on where the broadest distribution of applications are, which is on Windows and Macintosh platforms. In the 1995 time frame, Microsoft is also expected to deliver Cairo, an object-oriented operating system that will include many Notes-like features in the operating system.

In the long term, Landry said, the firm plans to add support for data pumping technology to Notes, support for Version 2.0 of the Object Linking Extension protocol and more robust directory services based on the X.500 protocol.

"Directory services will subsume what has been traditionally the functions that have been down in the database or operating system, such as looking up a network node address," Landry said.

And both Landry and Evslin agreed that application programming interfaces to these directories will provide interoperability between Notes and Windows for Workgroups.

"Electronic mail and messaging will become the hub for running applications that used to be on the mainframe. We're just beginning to scratch the surface of groupware applications," Evslin said.

Attendees listened to the presentations with skepticism.

"With Notes, you have to wonder how well it will scale and how much disk storage it will require to support. There are also integration issues with other systems," said Richard Buttermore, a programmer/analyst at Complete Business Solutions, Inc. in Farmington Hills, Mich. "Vendors are like politicians; no politician is going to tell you things you don't want to hear," Buttermore said.

As for Microsoft, the company's promises for next year were categorized as more fear, uncertainty and doubt (FUD) by Martin Ennis, a Notes user who is manager for information technology at ITAA.

"It's like the old days with IBM. Microsoft has become a master of FUD," Ennis said.

LAN compatibility key to system success

Windows NT, OS/2 and UnixWare need access to NetWare and Vines

By Michele Dostert

As corporate desktops move toward 32-bit multitasking operating systems, Microsoft Corp.'s Windows NT, IBM's OS/2 and Novell, Inc.'s UnixWare will be competing for user hearts and minds.

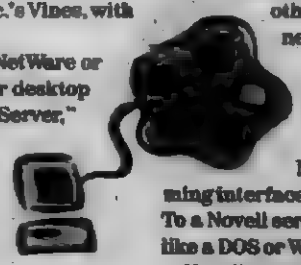
Users choosing a new operating system will be looking at more than just graphical user interfaces and application programming tools; they will also be considering how a desktop interacts with their local-area network operating system.

Although these competing desktop operating systems have their own associated LAN operating system — Windows NT has LAN Manager, OS/2 has LAN Server, and UnixWare has both NetWare and Transmission Control Protocol/Internet Protocol (TCP/IP) with a Network File System — they must also prove their compatibility with existing LANs, of which Novell's NetWare owns about two-thirds of the market, and Banyan Systems, Inc.'s Vines, with roughly 12.2% of the market.

Popular LANs

According to the market analysts at Business Research Group in Newton, Mass., Novell's NetWare LAN operating system is installed at 69.9% of all corporate sites, and the competing Banyan Vines is installed at 12.2% of the sites.

"Nobody who has been using NetWare or Vines is going to throw it off their desktop and learn LAN Manager or LAN Server," said Jamie Lewis, an analyst at The Burton Group, a LAN research firm in Salt Lake City. "Instead, they'll expect NT or OS/2 or UnixWare to run with what they already have."



For its part, Novell is stressing its commitment to support all popular desktop systems equally. At its developer's conference this month, Novell will be offering sessions on using OS/2, Windows NT and UnixWare, as well as DOS and the Apple Computer, Inc. Macintosh System 7, on NetWare.

"Sure, Novell has an interest in seeing Unix on the desktop," said William Donahoo, director of marketing for Novell's Desktop Systems Group. "But we would never try to push people toward Unix by minimizing our support for the other desktop platforms; we would never compromise NetWare in that fashion."

UnixWare desktops can access NetWare servers via built-in NetWare Core Protocols, NetWare application programming interfaces (API) and IPX/SPX transports. To a Novell server, a UnixWare client looks just like a DOS or Windows client.

Novell supports OS/2 via the OS/2 Requester, which is available from Novell and contains NetWare transport, utilities and APIs to Net-

LAN compatibility, *page 40*

LAN compatibility

CONTINUED FROM PAGE 39

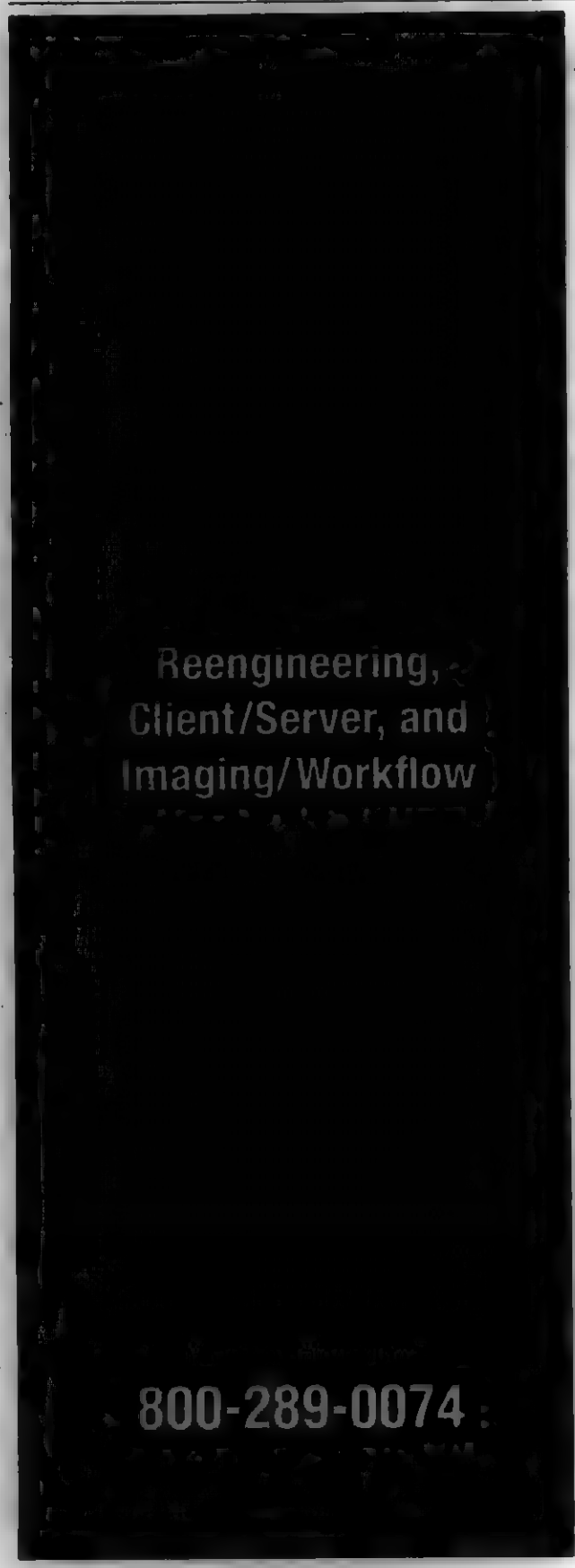
Ware services such as directory services. OS/2 users can thus write distributed applications that use OS/2 for information processing and NetWare network services for transport and directory.

Novell has built a Windows NT requestor, which it is currently shipping in software development kits and to corporate beta testers of Windows NT. The NT requestor works like the OS/2 requestor and supports NT's multiple redirector capacities, giving users access to TCP/IP, IPX/SPX or NetBEUI-based LANs.

Donahoo said it has not yet been decided whether Microsoft will bundle the NT NetWare Requestor with Windows NT, or whether Novell will sell it as a separate product, as it does with the OS/2 Requestor. "However it's distributed, the NT Requestor for NetWare will be widely available on the first day NT ships," he said.

According to Nancy Carpuccio, client product manager at Banyan, OS/2 users are currently supported as full clients on Vines networks, with access to all Vines services. Unix clients can access file and print services on Vines via a Vines for Santa Cruz Operation Unix server, and Banyan is working to implement full Unix client support.

Carpuccio said Banyan has committed to fully support Windows NT as a Vines client, with NT support from Banyan scheduled to ship within two quarters of NT's ship date.



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Microcom, Symantec to ship remote communications software

By Lynda Radosevich

Two market leaders will announce overhauled versions of their remote communications software today. Microcom, Inc. in Norwood, Mass., will start shipping this week Carbon Copy for Windows 2.0, and Symantec Corp. in Cupertino, Calif., will introduce the first Microsoft Windows version of PCAnywhere.

Both products are aimed at mobile users, telecommuters and remote offices that need access to corporate networks and office PCs.

Carbon Copy for Windows Version 2.0 lets users on a network control and communicate with other PCs on the network, Microcom said.

For example, Marek Kloczewiak, a research professor at Thomas Jefferson University in Philadelphia, used a beta-test version of Carbon Copy for Windows 2.0 and a 9.6K bit/sec. modem from Microcom to access his university computer from home.

"There are times when I'm working at home at 12 o'clock at night and use Carbon Copy to transfer files from the university network so I don't have to drive to work at midnight," Kloczewiak said. "I can transfer files using the click of the mouse like in [Microsoft Windows'] File-Manager."

Other new features in Carbon Copy for Windows 2.0, which lists for $199, include data compression that reportedly increases files' transfer speeds and asynchronous communication server support that will let users share a network modem for remote connections.

PCAnywhere for Windows adds support for Microsoft Windows including drag-and-drop file transfers. (A script language lets users automate routine functions.) It composes data and collects errors and has the same file transfer and general communications functions as the DOS version. Its list price is $199.

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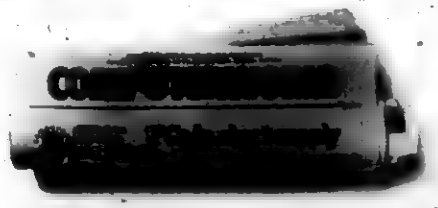

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Tallgrass Technologies Corp. has started shipping Version 2.0 of Enterpriz, its workstation-based storage management software.

Entire networks, including multiple file servers and workstations, can be backed up and restored by the product.

A Tape Rotation Manager, Tape Activity Reporter, Restore Navigator, Open File Backup and Auto Scheduler are among Enterpriz 2.0's features.

Enterpriz 2.0 for Novell, Inc. NetWare costs $895. Enterpriz for Banyan supports Banyan Systems, Inc.'s Vines Versions 4.0 through 5.0 and costs $2,195.

▶ *Tallgrass Technologies*
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Lenexa, Kan. 66214
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Applications

Computervision Corp. has started shipping Version 7.0 of the VersaCAD Design software for Sun Microsystems, Inc. SPARCstation workstations.

Designed for a variety of markets, including architectural, construction and engineering, the software is a two-dimensional drafting and 3-D modeling package. Features include new 3-D modeling macros, multiple built-in drawing objects and geometry construction utilities for trimming or extending circles, arcs and lines to a common point.

VersaCAD Design Version 7.0 costs $2,495.

▶ *Computervision*
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Legler Systems Co. has announced Version 4.1 of its Accounts Receivable System.

According to the company, the product was designed for the Unix-based platform and the PC local-area network environment.

Features for the financial application software include auto-recall of prior report parameters, automatic customer number coding, automatic revenue coding and a pop-up window on any field. Data files can be distributed to the client PC and to multiple servers.

A two-concurrent-user configuration starts at $295.

▶ *Legler Systems*
23 Charles Hill Road
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Unix

Fifth Generation Systems, Inc. has released Fastback Unix, a backup-and-restore utility for Unix operating systems.

The product has an assortment of features that include a built-in scheduler for unattended backups, on-line backup of multiple file systems in multiuser mode, 50% to 85% data compression and a full-screen file-tree browser and wild cards for tagging files and directories.

The ability to run either in the foreground or the background and to back up links instead of duplicating files is provided.

Fastback Unix costs $345.

▶ *Fifth Generation Systems*
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LAN hardware

IDEAssociates, Inc. has announced price cuts for its midrange and mainframe terminals.

While lowering prices by 10%, the company has also broadened the traditional concept of connecting coax or twin-axial transaction processing terminals to an IBM host in a hierarchical Systems Network Architecture by adding Token Ring and Ethernet local-area network-attached workstations.

PC applications that are in Novell, Inc. NetWare and Microsoft Corp. Windows environments can run simultaneously with host-based transaction processing applications by using the IDEA LANstation. Terminals and LAN-attached workstations with local storage now comprise the transaction processing workstation.

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There is. PowerBuilder lets you build a fully scalable client/server platform, mixing and matching workstations, PCs, and mainframe, mini, and LAN-based servers to put the power where you need it — whether for big mission-critical applications or small, single-user programs. It supports DB2 on a mainframe, XDB on a PC and anything in between.

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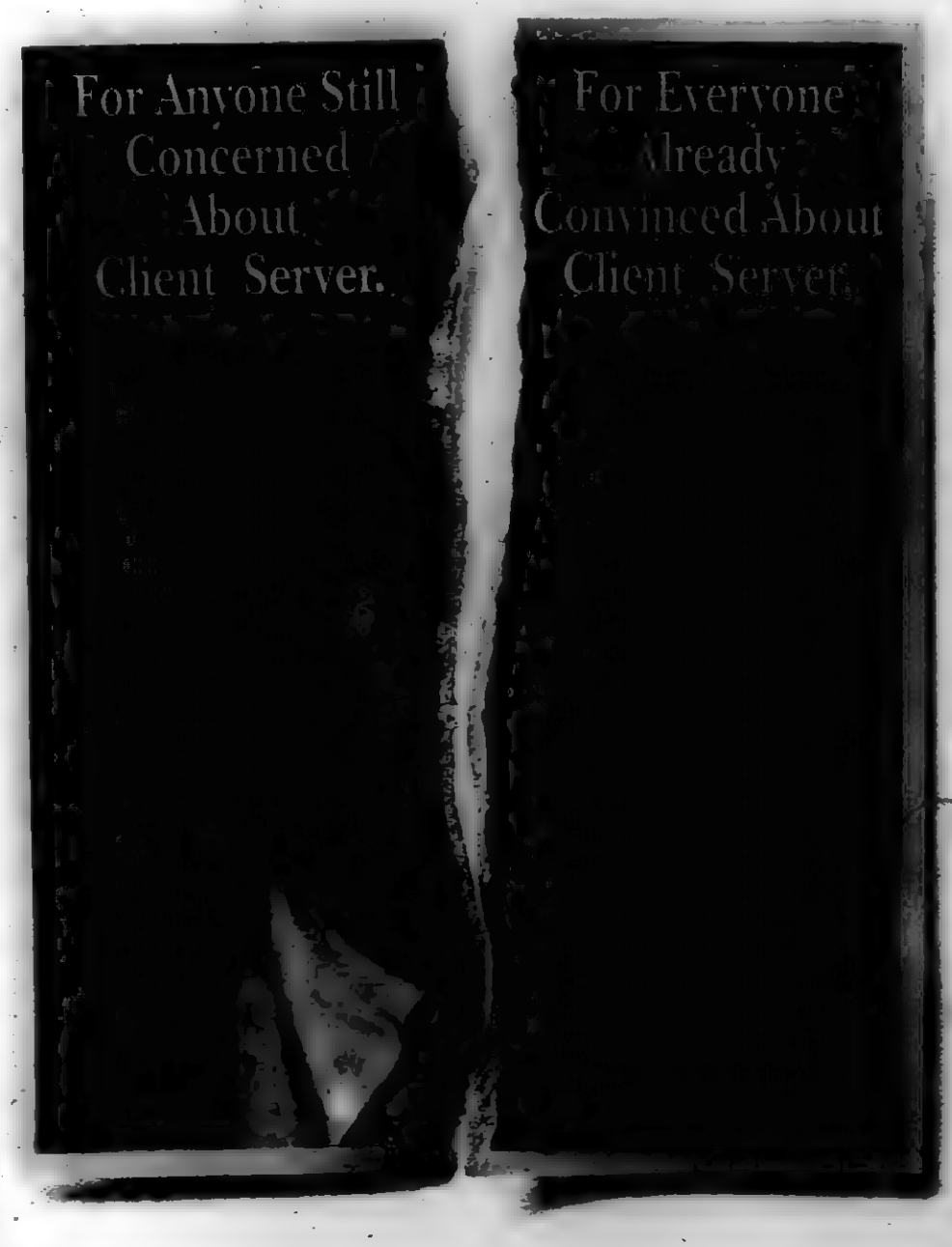

"I'm already excited about the possibilities of client/server. But there are so many competing solutions, and the last thing I want is to get dead-ended by someone's proprietary framework."

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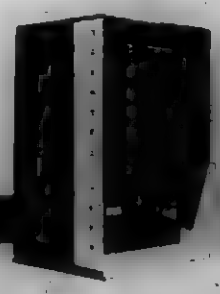

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We created the first truly fault-tolerant hub. And we've been building high levels of fault tolerance into all our new hubs, modules and transceivers ever since. Because when you're talking about big mission-critical networking, any downtime is too much downtime.

JANUARY 29, 1990

We were the first to introduce a multi-protocol, multi-network intelligent switching hub. Suddenly, it became possible to run up to 3 Ethernet, 7 Token Rings or 4 FDDI networks, software configurable, in a single hub.

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We were the first to put Port Switching into an intelligent hub. With it, you can do moves, adds and changes, within or across networks or segments with a couple of clicks of a mouse. Without it, you get to make trips to the wiring closet and move cables. A lot of trips.

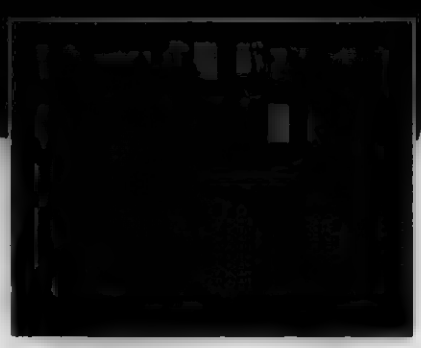
MAY 13, 1991

First with network self-healing. With our Network Control System software, our built-in fault tolerance and our Port-Switching technology, your network can not only tell you there's a problem, but is also smart enough to route itself around it automatically. Network service continues without interruption, while you schedule the fix at your convenience.

Chipcom has always seen networking differently than its competitors. Which, given the difference in our backgrounds, isn't surprising.

Instead of building products aimed at departmental LANs, Chipcom has always designed and engineered its products for networks of thousands of nodes. So it's only natural that while others see networking from the bottom up, we view it from the top down. While they think in terms of an average network life of three years, we see a corporate asset good for ten years or more. While others regard some downtime as acceptable, we find it unthinkable.

Because we see the network as a whole, we recognize that, while installation price is important, it really represents only 10–20 % of overall networking cost. So even though Chipcom's ONline System Concentrators cost no more to buy than less functional hubs, we encourage our customers to ignore outdated formulas like price-per-port, and to think instead about long-term savings, concentrating on the 80–90 % represented by network operation and maintenance.



And only the Chipcom architecture offers the combination of engineered-in reliability, the highest degree of fault tolerance, TriChannel™ flexibility, Port Switching and ONdemand™ Network Control System that results in huge savings over the life of your network.

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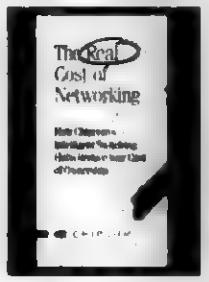

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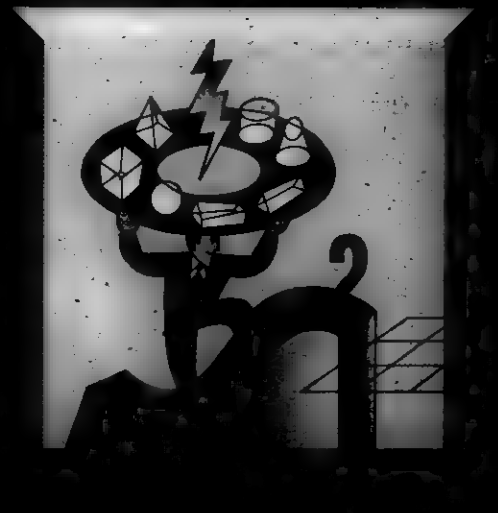

Dear Friends,

Since its debut in March 1992, IBM's award-winning OS/2 has become one of the most popular 32-bit operating systems in history. The reason is simple: unprecedented support from users who want to run existing DOS and Windows applications, as well as new 32-bit OS/2 applications, seamlessly and simultaneously from a powerful, easy-to-use object-oriented graphical user interface called the Workplace Shell.

Software developers should appreciate OS/2's ability to fully exploit today's high-performance personal computers with priority-driven, preemptive multitasking and multithreading capabilities that maximize 32-bit processors more efficiently. OS/2's unsurpassed stability is enhanced by its exclusive Crash Protection to help keep errant applications from bringing down other applications or the entire system. And its 32-bit virtual memory allocates up to 512 megabytes per application.

This robust environment, combined with the extensive array of OS/2 programming tools, the System Object Model (SOM) for object-oriented programming and enablement for LAN, pen and multimedia technologies, make OS/2 a leading development platform for software designers, technical coordinators, independent programmers, corporate developers, MIS managers ... in short, any software professional who doesn't want to be left behind.

All of us at IBM Personal Software Products want to thank the software developers who have produced over 1,000 applications designed specifically for OS/2 Version 2.0 that are commercially available today, and the ones who are readying OS/2 applications for release in 1993 and beyond. With your help, OS/2 will continue as the new standard of excellence for desktop, workgroup and enterprise computing ... an operating system that enables users to operate at a higher level.

Sincerely,

Leland R. Reiswig, Jr.
President
Personal Software Products

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Introduction

The introduction of the IBM Personal Computer in 1981 radically and irrevocably altered the computer landscape. Now, as we enter the second decade of the PC revolution, more dramatic changes are on the horizon as advanced software and operating systems are empowering users as never before.

The key dynamic in the second decade of the PC revolution is interconnection. Networking, workgroup computing and enterprise computing on PC networks are primary examples of this dynamic. Several other critical trends will further foment change.

One of them is the ongoing and phenomenal improvements occurring in PC hardware. Starting with Intel's 8-bit 8080 microprocessor, PC hardware has increasingly improved even as its costs decreased.

The growing sophistication of users is also driving change. Confronted with advanced applications like multimedia and message-based computing, they are calling for desktop-based solutions that will keep them in the technological forefront .

Big business knows it too must change. Corporations are reengineering their business processes and downsizing their computer applications to fit on the smaller, less expensive platforms demanded by users.

The burgeoning popularity of graphical user interfaces (GUIs) is a double-edged agent of change. On one hand, GUIs increase productivity through the ease of use and application integration. On the other, they frustrate developers because of the operating system limitations they reveal.

Finally, the introduction and growing acceptance of standards for employment of object-oriented technology in the personal computer environment enables a major breakthrough for the application backlog problem.

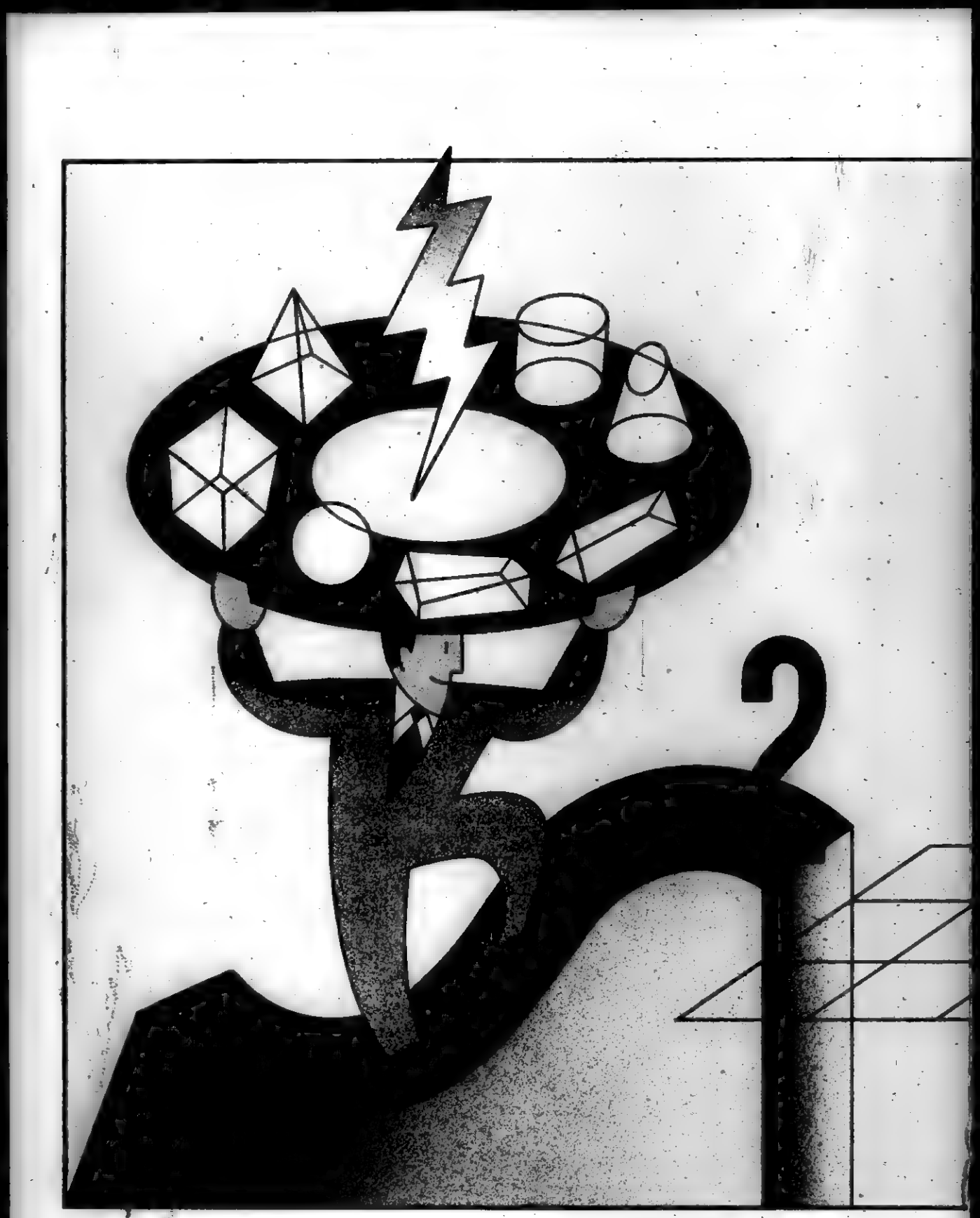
These new forms of computer usage will quickly outstrip the capability of the existing base of computers to handle them, primarily because of the limitations of the PC's 12-year-old operating system, DOS (IBM/DOS, MS/DOS, DR/DOS, etc).

As a result of these barriers, and the need to overcome them, the market is primed to accept a new type of desktop operating system, a 32-bit system that combines the ease of use and low cost of 16-bit operating systems with the functionality of minicomputer and mainframe operating systems.

This White Paper discusses the architecture and advantages of 32-bit operating systems, as well as describes a number of applications in depth. It also lists, in the directory at the bottom of each page, over 1,000 applications for the IBM OS/2 2.0 operating system already shipping from over 400 vendors.

This IDC White Paper was written independently of the Computerworld *editorial department by IDC's Brent Williams, Director, PC Software Program, and John Gantz, Senior Vice President, Personal Systems Group.*

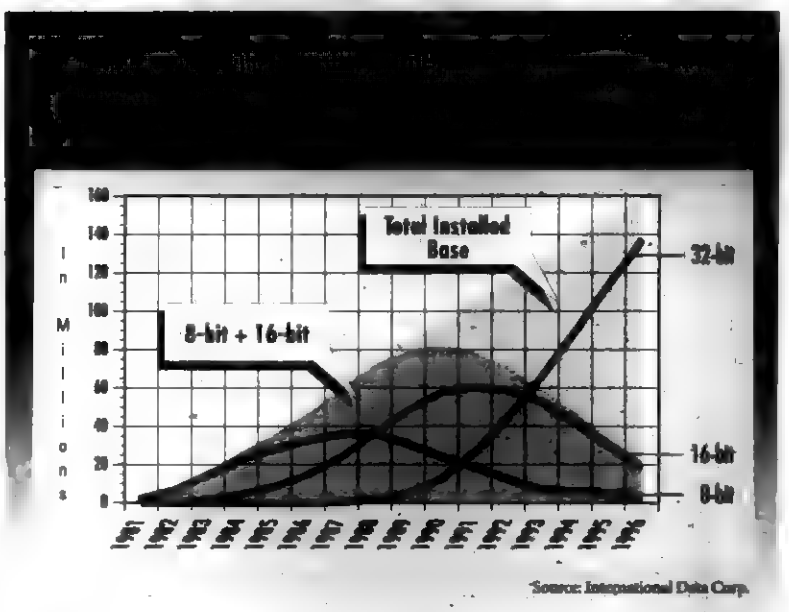
For more information on the White Paper Program, please call 508-879-0700.



For PC users, these are the best of times and the worst of times. The advent of graphical user interfaces (GUIs) and the continued decline in hardware prices combined with continuing increases in computing capacity all offer great promise for the new era of enterprise computing. In this era, the basic cost of a unit of processing power is a tenth of what it used to be.

But creating an economic advantage when shifting from a mainframe environment to a PC environment is not always an easy task. Today's systems — at least the ones running under DOS — suffer from the constraints of the aging DOS operating system. Windowing GUIs can help, but only so much. New operating systems are needed ... 32-bit operating systems.

There are several forces driving the development of 32-bit systems. 32-bit hardware, based on the Intel 386 chip and more powerful versions, is flooding into the market.



Source: International Data Corp.

Sometime this year the worldwide installed base of 32-bit personal computers will surpass that of 16-bit computers; in the next five years, over 110 million 32-bit computers will be added to the base. Until recently, most of these 32-bit systems ran 16-bit operating systems but this growth means that the hardware base is now more than ready for 32-bit software.

Sometime before the 1993 Fall Comdex show the number of 32-bit Intel-based systems installed in the world will outnumber 16-bit systems. In the next five years, over 110 million 32-bit systems will be added to the base. All that 32-bit hardware needs 32-bit operating systems.

Even as the installed base of 32-bit hardware grows, a new generation of powerful 32-bit architectures is coming on stream. In the next year, for instance, Intel will begin shipping its Pentium chip, whose architecture will provide a quantum leap in performance. Such new chips, accompanied by new system bus types, can clearly deliver more performance via operating systems more advanced than DOS.

The average system configuration is going up. Today the average PC is sold with 4.2M bytes of memory and 96M bytes of hard disk. In two years that will change to over 7M bytes of memory and 200M bytes of disk, with a substantial number of units combining double digits for memory with 400M bytes of disk. Previous operating system resource constraints will shrink before this growth in system capacity.

New generations of software tools, database management systems and 32-bit operating systems are lowering the barriers to true client/server computing.

New generations of software tools, database management systems and 32-bit applications are lowering the barriers to true client/server computing and the use of PCs in enterprise transaction processing systems. This will help smooth the path toward downsizing.

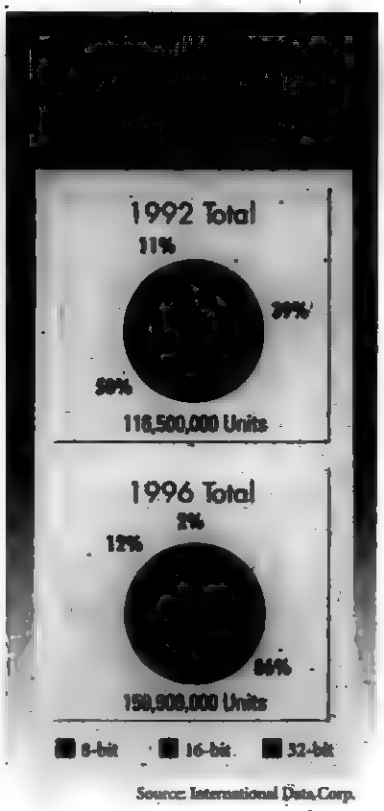
The growth of PC LANs and internetworking has led to a new infrastructure for enterprise computing on PCs. As of last year, according to survey data from International Data Corp., over 60% of installed PCs in commercial use were linked by LANs. By 1996 that number is forecasted to be over 80%.

Desktop applications are getting more complex. Today's word processor, like that described later from DeScribe, Inc., routinely handles compound documents, electronic mail and cut-and-paste tasks from other applications. The linking of applications over networks by groupware, as with the calendaring system, Relish — offered by Sundial Systems and described later — increases the demand made on an operating system for system services.

Without a doubt, the hardware is available and ready to soak up the complex, demanding applications. This combination of hardware and software implies a need for an operating system with new performance capabilities, new system services, new development aids and new system management tools. Even though the 32-bit operating system plays a prominent role in delivering ease-of-use, ease-of-development and ease-of-management benefits to users, the constellation of layered software, systems services and vendor support that comes with 32-bit systems is equally important.

GENESIS OF THE 32-BIT OPERATING SYSTEM

Developed in the late '70s, the first desktop operating systems processed data and instructions in the microprocessor eight bits at a time. They were the operating systems that ran on the Tandy, Apple, Commodore, Vector Graphic, NEC and other computers based on Intel 8088, Zilog Z-80 and other chips. They typically had an upper limit of 64K bytes of main memory and supported very simple I/O devices like dot matrix printers and floppy diskette drives.



Source: International Data Corp.

In late 1981, with the introduction of the IBM PC and its quick acceptance as a de facto industry standard, operating system technology began shifting to 16-bit hardware and DOS became popular.

Early IBM PC hardware looked little different from the competing 8-bit microcomputers available at that time — the original IBM PC had only 16K bytes of memory — except that the upper limit of addressable memory was 10 times the maximum limit available with 8-bit machines. But it was clear, even then, that the constant decline in memory prices would continue and that over time the IBM PC family and its competitors would be endowed with substantially more memory. That increased memory would greatly enhance the function of application software.

This greater PC memory capacity was not that easy to access. The segmented memory architecture of the early '80s was difficult to work with because a program required two independent elements to access a given memory location. The Intel 8086 microprocessor and its descendants were designed to accommodate this while offering upward compatibility with Intel's 8-bit 8080 microprocessor, a popular early-generation microprocessor chip.

Also, while the segmented memory model offered far more memory than was available with first-generation systems, no memory object could be greater than 64K bytes in size. This limit was not a serious problem initially, but in the late '80s as programs and files got bigger, it became difficult to live with.

About the same time, several innovations appeared including various DOS extenders that allowed access to larger amounts of memory. These utilities permitted greater memory capacity but required sophisticated programming to access it because of the segmented architecture. None of these innovations did away with segmented memory.

Some of the GUI environments, like Microsoft Windows 3.X, added some of the attributes of 32-bit systems to the basic operating environment enhancing programmer and user productivity. But even with Windows, DOS had limitations. They included relatively poor memory protection compared with that available in 32-bit and other operating system architectures. They also included limited multitasking and small application program size.

Meanwhile, as the '80s progressed, the hardware changed. The Intel 80386 microprocessor, riding the continual miniaturization wave, went far beyond its 16-bit predecessors in terms of the performance and functions it could incorporate on a chip. For instance, the 80386 contained two nearly independent modes of operation: an upward-compatible 8086 and 80286 mode plus a new native 80386 architecture that closely resembled the architecture of larger hardware systems. The native 80386 mode contained features long considered state-of-the-art in mainframe systems such as virtual memory and memory protection.

The developing hardware technology set the stage for a leap forward in operating systems. The first operating systems available to exploit the 386 hardware were variants of 32-bit Unix-based operating systems. They were useful in special situations but not attractive as an upgrade for rank-and-file DOS users. This was because of the complexity of Unix, the need for training and the lack of shrink-wrapped applications.

In order to be attractive to developers and users, a 32-bit desktop operating system must build on DOS while adding significant new features. Microsoft's Windows 3.1 operating environment provides some 32-bit enhancements to DOS including graphical interfaces but it is not an across-the-board 32-bit implementation. For instance, it provides some memory protection when it is run in enhanced mode on an Intel 80386 but does not support protected call interfaces.

In order to be attractive to developers and users, a 32-bit desktop operating system must build on DOS while adding significant new features.

As of today, OS/2 from IBM is the best-selling 32-bit operating system available for Intel-based microcomputers. Microsoft is expected to announce its 32-bit operating system, Windows NT, with the same interface as Windows but 32-bit internals. Windows NT is not expected to be available until mid-1993 at the earliest and applications that

take full advantage of its capabilities may take even longer to appear. Microsoft will also have to work out the kinks that invariably plague new operating system software.

Market demand for 32-bit operating systems is being driven by increasingly less expensive but progressively more enhanced hardware technology.

The various versions of Unix, including new ones designed for desktop use, provide the basics of 32-bit operating systems. However, instead of using the 32-bit nature of the operating system to provide an advanced, object-oriented user interface, Unix provides interfaces based on existing standards.

Some announced but yet-to-be-delivered Unix implementations such as NextStep 486 from NeXT will provide significant graphical environments on top of Unix. These implementations will insulate users from the current, unfriendly Unix user interface but they will lack the DOS upward compatibility it takes to realize large-scale commercial success.

As a result, the only available 32-bit operating system for Intel platforms is IBM's OS/2 Release 2.0 introduced in 1992 at the Spring Comdex show. While much of the discussion in this White Paper is generic to all 32-bit operating systems, many explanations referring to systems services and other features that result from 32-bit systems center on OS/2.

Key advantages of the new 32-bit operating systems include:

- Elimination of the segmented memory model and its replacement with the less-complex, flat memory model
- The ability to implement more robust multitasking
- More efficient implementation of virtual memory
- Installable file systems
- The ability to handle more and larger objects.

While users routinely report 30%-50% performance increases after switching from a 16-bit to a 32-bit version of OS/2, they also report other advantages including the ability to handle more objects. This means a graphics program can have a larger library of shapes. And the flat memory model allows the program to paint the screen faster.

In part, market demand for 32-bit operating systems is being driven by increasingly less expensive but progressively more enhanced hardware technology.

However, enhanced hardware technology is not the only market driver for 32-bit systems. Market demand is also springing from a need for new capabilities from desktop machines. In particular, desktop machines must be able to handle mainframe applications downsized to run on client/server networks. Because many of the applications being downsized are "mission-critical" and must meet rigid requirements for availability and security, a mature operating system architecture is needed to accommodate them.

In addition, because applications are getting more and more complex, new development paradigms — specifically object-oriented programming — are needed to keep programmers productive. Object-oriented programming adheres to the credo of software developers over the last four decades: push more

Partial List of OS/2 2.0 Applications Available as of December 31, 1992

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RRMS RESORT RESERVATION
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THE GEM RESTAURATEUR - ACCOUNTS PAYABLE
THE GEM RESTAURATEUR - FOOD COSTING
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14. Other _____

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15. Manufacturing
16. Finance/Insurance/Real Estate
17. Mining/Construction
18. Transportation/Public Utilities/Communications Systems
19. Wholesale/Retail/Trade
20. Military/Government
21. School/University
22. Medical/Law
23. Petroleum/Refining/Agriculture
24. Other _____

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31. Programmer/System Analyst
32. Network/Telecommunication Mgmt.
33. PC Systems Support
34. Systems Integration
35. Corporate/Financial Mgmt.
36. Office/Administration Mgmt.
37. Sales/Marketing
38. Engineer/Scientist
39. Manufacturing/Production
40. Government/Public Administration
41. Education/Training
42. Purchasing
43. Distribution
44. Other _____

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51. Business Specific (Specify) _____
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53. Communications
54. Database
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56. Development Tools
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58. Electronic Mail
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62. Information Management
63. Multimedia
64. Network Management
65. Spreadsheets
66. Utilities
67. Word Processing
68. Other _____

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NUMBER OF EMPLOYEES IN MY ORGANIZATION
70. Under 25
71. 25-49
72. 50-249
73. 250-999
74. 1000-4999
75. 5000 or more

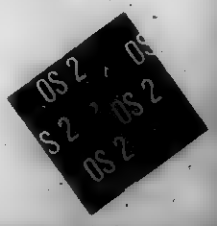
CIRCLE ONE ONLY

NUMBER OF PCS/WORKSTATIONS IN MY ORGANIZATION
80. Less than 10
81. 50-249
82. 250-999
83. 1000-2500
84. 2500 or more
85. I Do Not Own

CIRCLE ALL THAT APPLY

DESKTOP OPERATING SYSTEMS

	Today	In 6 MOS
DOS	–	–
OS/2	–	–
WINDOWS	–	–
UNIX/XENIX	–	–
MACINTOSH	–	–
OTHER	–	–



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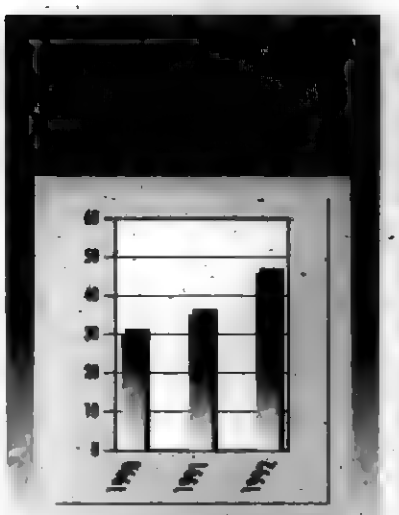
work onto the machine so the programmer is freed from low-level details. Object-oriented programming shows significant promise but requires more machine resources than carefully hand-written code. This means operating systems that can deal with increased resource requirements are needed. OS/2 2.0 is up to this task.

These emergent technology trends also require control. Good downsizing management does not ignore security, management controls or software engineering controls and practices developed through decades of experience. Because desktop users are accustomed to user-friendly environments, they will demand flexibility and ease of administration that current centralized systems do not have. This means the operating system will be required to have more built-in features. Again, OS/2 qualifies.



Source: International Data Corp.

In the last few years the complexity of applications running on desktop (and mobile) computers has increased considerably. A good measurement of that complexity is the number of applications running on LANs.

32-BIT HARDWARE: THE FOUNDATION

32-bit operating system designers maintain a relatively short list of critical characteristics. Once these are present, designers must add ease-of-use, development and administration services on top of them. Thus, in order to understand 32-bit operating system architecture, it is also necessary to understand the enabling hardware. This hardware is composed of several critical components.

Memory Protection — One of the key features of the Intel 80386 is memory protection, which prevents one task's memory from corrupting another's. This kind of corruption can be a significant problem for developers attempting to simulate 32-bit operating system characteristics in a 16-bit architecture. Such problems occurred with Terminate-and-Stay-Resident (TSR) pop-up utilities under DOS. When memory corruption occurs, the consequences are frequently drastic. They may include damage to data — damage that may require the machine to be rebooted.

With memory protection, each running application receives its own memory space which no other application may access. If the running application attempts an invalid memory access, the operating system steps in and takes corrective action, which may include shutting down the application, or, during application development, starting the system debugger to help isolate the problem. Note that 32-bit operating

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	8-bit	16-bit	32-bit
[redacted]	64K bytes with Flat Memory Model	64K bytes-16M bytes with Segmented Memory Model	Gigabytes with Flat Memory Model
[redacted]	Low	Moderate	High
[redacted]	Character	Character or Graphical Usually Single-threaded	Character or Graphical Multi-threaded
[redacted]	Spreadsheet, Word Processing	Spreadsheet, Word Processing, Data Access, E-mail	Spreadsheet, Word Processing, Data Access, E-mail, Client/ Server, Groupware, Software Development
[redacted]	Disk Check/Format, Line Editor, etc. Hierarchical File System	Disk Check/Format, Line Editor, etc. Hierarchical File System	Disk Check/Format, Line Editor, etc. Installable File System, Memory Protection, Virtual Memory, Task Segmentation, Backup and Restore, Multi-protocol Network Support
[redacted]		Some 32-bit Characteristics Through Clever Programming	Capacity for Handling Large Objects

Source: International Data Corp.

systems do, however, allow communicating applications to use a shared-memory facility, where applications specifically invited to do so may access parts of another application's memory.

Memory protection eliminates many problems found in 16-bit operating systems. For example, the device drivers that control the network may be insulated from the effects of an errant application program because each is in its own address space. As a result, the operating system can stay up in the face of errors from one of its components. In OS/2 2.0, this capability is used to ensure that the operating system as a

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MI/CDS
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MI/CONTACTS/INDIVIDUALS
MI/CONTACTS/INSURANCE
MI/CONTACTS/PATIENTS
MI/CONTACTS/VENDORS
MI/DISK INVENTORY
MI/FORMS MANAGER
MI/FORMS MANAGER/W2S
MI/HOURS
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MI/INVOICING
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MI/LIBRARIAN
MI/MEDICAL BILLING
MI/MEDICAL DIAGNOSES
MI/PAYROLL
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Source: IBM Personal Software Products Division

whole is unaffected by the crash of a single component such as a Virtual DOS Machine running under a window on the OS/2 desktop. If the DOS application crashes the Virtual DOS Machine, only the DOS window is affected. Other applications, including other DOS machines, are unaffected.

Page-oriented Virtual Memory When applications demand increasing amounts of memory to represent increasingly complex objects such as desktop publishing documents or linked spreadsheets, mainframe-like virtual memory techniques are desirable. The memory management of the Intel 80386 allows the hardware to signal the operating system when more of an application's memory needs to be swapped to or from a secondary storage device. Hardware support is a prerequisite for successful implementation of virtual memory, but the operating system must be able to manage the tasks being swapped to disk. 32-bit systems can do this.

Larger Address Space — Because of the demand to run more and more complex applications, 32-bit hardware must support large amounts of memory. Recent experience, particularly on machines used for network servers, suggests that the 16M bytes capacity limit of Intel 80286-based systems is far too small for many uses and places a severe limit on scalability.

In 32-bit mode, the 80386 can support up to several gigabytes of memory per process, and much more than that on a complete machine. These new limits are so far beyond current capacities that exceeding them will not become a problem for some time. The combination of virtual memory and large address space is helpful when operating system designers want to create object managers to serve applications that manage complex groups of objects, such as those found in CAD or graphics programs.

8086 Emulation Mode — The Intel 80386 has a facility which may be used to emulate an 8086 microprocessor in an arbitrary location in memory. This capability was specifically designed to allow multiple DOS sessions to be active at once. Because OS/2 takes advantage of this capability, several independent DOS application windows may be open at once, and OS/2 will provide true multitasking between them. It is this emulation facility that lies at the heart of OS/2's ability to run 16-bit software, including Windows applications.

16-bit Emulation Mode — The Intel 80386 chip can also emulate 16-bit applications. It is the 16-bit emulation facility that allows easy portability of OS/2 1.X programs to OS/2 2.0.

Both the 8086 and 16-bit emulation capabilities allow a well-designed operating system to be compatible with many predecessor operating systems. The result is an enormous cost benefit to users because their old applications will, for the most part, continue to work in the new 32-bit environment. The cost of upgrading to 32-bit applications can be amortized over time.

Because of the demand to run more and more complex applications, 32-bit hardware must support large amounts of memory.

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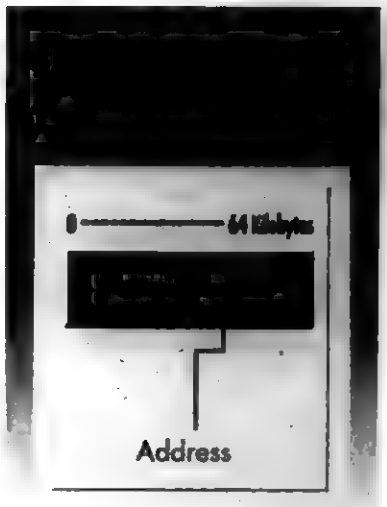
32-BIT OPERATING SYSTEM CHARACTERISTICS

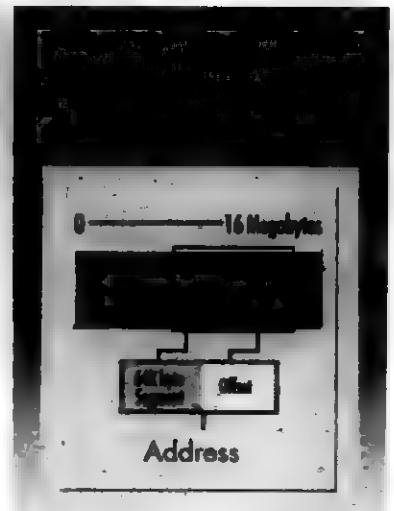
Most 32-bit minicomputer and mainframe operating systems have for years included important features such as the flat memory model and protected call interface which were unfamiliar to the desktop operating system user. They have also provided extensive multitasking and multithreading capabilities. Although some OS/2 Version 1 users were exposed to multitasking and multithreading, DOS users were not. The 32-bit environment enhances the robustness of multitasking and multithreading. These features and the protected call interface are all described below.

Multitasking — Multitasking is the ability to run several programs at once — a good way to use the expensive resources of the system. Multitasking allows designers of productivity and other types of applications to create a very natural user interface selection style. This latter ability allows the user to switch between tasks seamlessly. In addition, the ability to run operations, such as printing, in background mode also helps increase personal productivity.



Source: International Data Corp.

8-bit microprocessors used a flat memory model but the available memory was extremely small.



Source: International Data Corp.

16-bit microprocessors have addresses that are composed of a segment part and an offset part. Objects are limited to 64K bytes without additional programming. The programmer must design applications to be aware of memory architecture even if coding in a high level language.

Multithreading — For certain types of system software an even greater degree of control over sharing the computer between tasks is required. Using multitasking techniques would entail too much switching to be practical. The answer here is multithreading, a procedure also known as lightweight processes. A thread is created within

Partial List of OS/2 2.0 Applications available as of [illegible]

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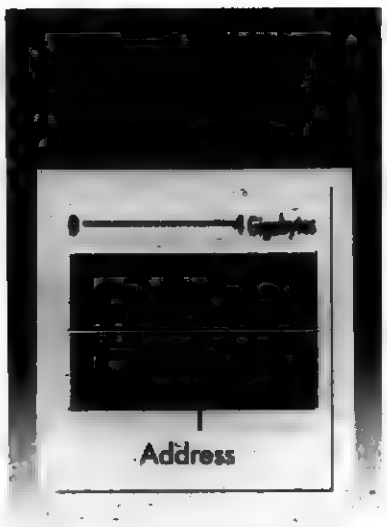
Source: IBM Personal Software Products Division



Source: International Data Corp.

32-bit microprocessors deliver a flat memory model of enormous size to each process running on the system. The operating system provides effective virtual memory support so programmers can use available memory without special programming.

a process and shares the task's memory with other threads.

Multithreading does take a little programming effort so it is not likely to be desirable in all functions of an application. However, there are situations, such as background printing of reports in an accounting application, where it is a highly-visible time saver.

Protected Call Interface — As PCs find increasing use in networks and workgroup applications, it becomes more and more desirable to have operating systems that can support a variety of environments. Examples include sites wanting to use a single operating system on the desktop but also requiring support for multiple network protocols.

In order for the vendor to provide such flexibility, it must provide a standardized, well-defined method that will allow various network protocols to access systems services such as network I/O. This is done through a protected call interface. This software protects the interface between the user of a system service and the operating system code ensuring that only proper requests are made.

The availability of a protected call interface makes other system services much more secure and hence useful. These include:

- Dynamic Link Libraries
- Portable Device Drivers
- Installable File Systems
- Secure Systems

Dynamic Link Libraries — With a robust protected call interface it is possible to provide interchangeable software components in a special library. This Dynamic Link Library (DLL) can provide services to any application that knows how to access it. DLLs provide openness because different DLL components from different vendors can be installed on the fly. Changing to a different network protocol, for instance, can be as easy as copying the appropriate DLL. This makes OS/2 installation highly open and modifiable.

Portable Device Drivers — A good example of a DLL can be seen by viewing how an operating system like OS/2 handles printer drivers. With the drivers implemented as DLLs, it is possible to install new printers or remove old ones without having to take the system down or engaging in difficult installation tasks. This increases system availability and also simplifies administration. Printers can be installed and

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A 32-bit operating system may contain over three million lines of code developed by teams of individuals from around the world. Given the normal incidence of bugs per line of new code, it is unrealistic to expect a new operating system to be bug-free from the beginning. Generally, the longer the code has been around the more chance that bugs resulting from unique environmental conditions will have surfaced. In this way, DOS has grown more reliable over the years. While there are a number of programming techniques and practices for building quality into complex software programs, it is nevertheless still a daunting task.

Some of the tools include:
- The use of re-usable code
- Support of standards
- Computer-aided software engineering (CASE)
- Investment in quality control and testing.

Even with all these in place, it will take thorough field use to fully debug a complex program — one of the selling points of OS/2 2.0. It has been in the market about one year and before that it was beta-tested by well over 20,000 users.

added by relatively untrained field personnel, which greatly reduces the IS support burden.

Installable File Systems — Another advantage of the DLL is its ability to support installable file systems. This gives users flexibility in selecting an appropriate device layout. OS/2, for instance, supports standard File Allocation Table (FAT) file system disks, such as those used by DOS, to provide backward compatibility.

However, the DOS file system is not particularly fast for larger files, so OS/2 also provides the High Performance File System (HPFS) driver. HPFS incorporates improved uses of cache memory and directory structuring to maximize throughput. Other installable file systems exist for CD/ROM drives and other media.

Thanks to the protected call interface, applications do not need to differentiate between various file systems. For example, applications would not have to be modified if the developer wished to support either Unix or Sun NFS file systems.

Secure Systems — Because the protected call interface restricts the type of access that may be made to system services, it is possible to add new levels of security — up to and including military-level security — to the operating system.

NEW SERVICES ENABLED

All of the preceding 32-bit operating system characteristics will be available to personal computer users. But what are the implications? What specific features and services do these characteristics enable in the new desktop operating systems?

In the case of OS/2, 32-bit capabilities are important, but that importance shows up in what IBM provides on top of that 32-bit architecture. These "layered services," such as command language interpreters, are the features that application developers will use most often. The underlying services discussed above (flat memory model, multi-

Partial List of OS/2 2.0 Applications

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ARTEC'S LDIP/CPP

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C COM INC.
219-258-1000
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COMPUTER LOGICS
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PEP OS/2
PEPGATE OS/2

CONNECTIVE STRATEGIES INC.
703-802-0023
PRI-MPG MULTIPROTOCOL GATEWAY
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CREATIVE SYSTEMS INTERFACE INC.
508-872-0965
AAI

CREATIVE SYSTEMS PROGRAMMING CORP.
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DIRECTTALK/2 -16 LINE
DIRECTTALK/2 -24 LINE
DIRECTTALK/2 -4 LINE
DIRECTTALK/2 -8 LINE
DIRECTTALK/2 COMMUN.
DIRECTTALK/2 MESSAGE
DIRECTTALK/2 TXT-SPC.
DIRECTTALK/2 V.REQOG.
FAXROUTER/2
LAN ENABLER
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NETVIEW DM/2 EXTENDED
NETWARE SERVICES OS2
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Source: IBM Personal Software Products Division

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Run DOS applications. Run Windows™ applications. Run OS/2® applications. Run them at the same time, in separate windows on the same screen. With OS/2, you can experience a whole new level of freedom and flexibility.

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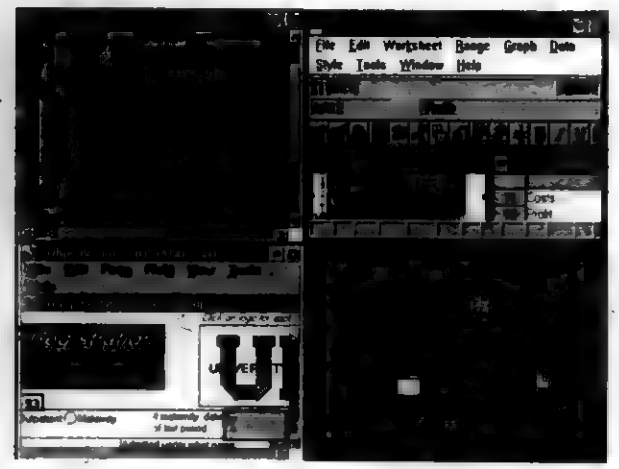

DOS and Windows support is built in to OS/2, and you can explore over 1,000 OS/2 applications as well.

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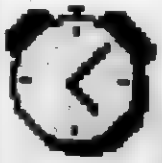
working within the 640K barrier, take advantage of more of your computer's memory.

Use the PMSeek feature to search for files. Use the built-in ICON editor to custom-design your own icons. Use the Productivity Alarms object to schedule automatic backups,



start a communications session at a specific time or run programs when you want. OS/2 lets you take full advantage of the latest 386 and 486 technology.

To find out more or to order OS/2, call **1 800 3-IBM-OS2.** In Canada, call **1 800 465-1234.** With OS/2, you can stop dealing with the limitations of the past, and start rising above them.

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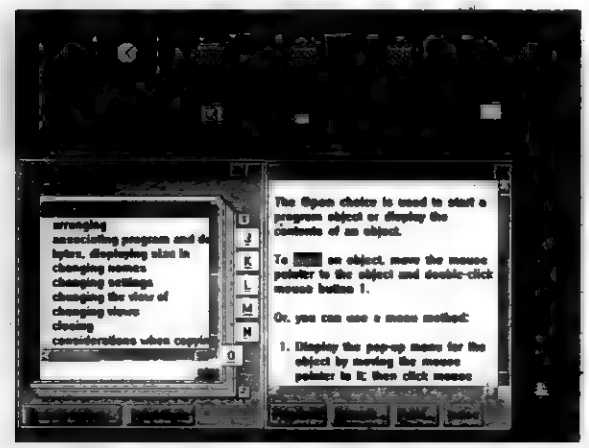
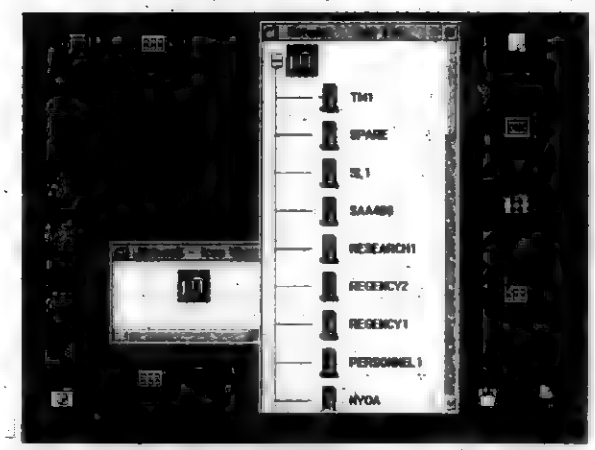
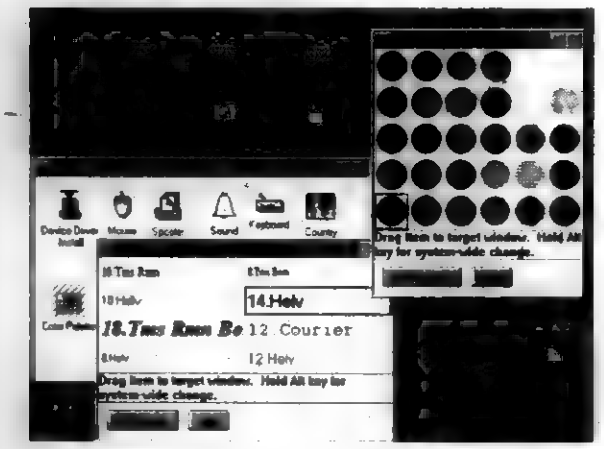


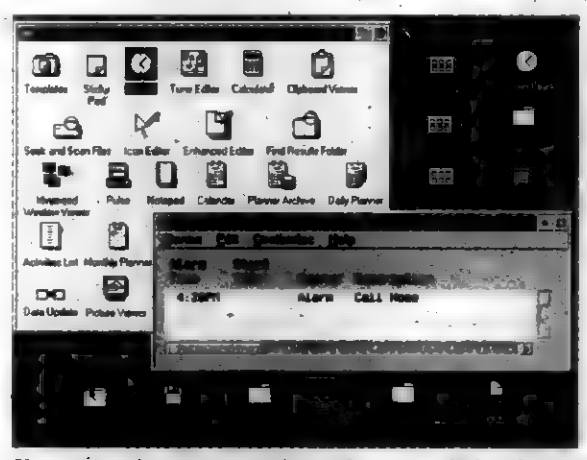
In the Workplace Shell, everything appears as an object. It's a simple, intuitive, more efficient way to work.



With built-in networking features, OS/2 was designed to excel in both standalone and connected environments.



Organize and customize your desktop to look and work the way you want it to.



You can set alarms to remind you of events with the Alarms function in the Productivity folder.

tasking, multithreading, protected call interface) are important but usually transparent to users.

For corporate users who plan to downsize mainframe and minicomputer applications onto single or networked personal computers, the 32-bit architecture enhances the process. Some examples in the OS/2 environment include:

- The availability of full-function SQL databases. Full-function SQL databases generally require 32-bit operating systems characteristics and installable file systems.
- CICS support. Without multithreading and installable device drivers, connecting CICS for OS/2 sessions with the mainframe would not be possible.
- The REXX command language interpreter. Available on IBM mainframes for years, it also utilizes the 32-bit flat memory model and other 32-bit operating system characteristics. When combined with available COBOL compilers, the REXX command language interpreter provides a powerful means for moving mainframe applications to the PC without the high initial investment required to replace all the old software engineering tools including dozens of REXX scripts with batch files written in a less powerful language.
- The Transarc Encina TP monitor. This is scheduled for future OS/2 support. The installable device drivers and protected call interface technology in OS/2 allow the OS/2 kernel to be extended for the new Encina services with minimum effort.

Thanks to the protected call interface, applications do not need to differentiate between various file systems.

ADVANCED PROGRAMMING TECHNIQUES

IS departments and software vendors want to build intuitive, graphical applications that significantly improve user productivity. To do so requires writing significantly more code than is needed to build character-based applications with equivalent function.

The problem is that any time the amount of code written to implement an application is increased by an order of magnitude, the incidence of bugs, module linkage complexity and quality control requirements also go up by a similar order of magnitude. The very real danger is that graphical interface construction may well increase rather than decrease the development backlog.

For corporate users who plan to downsize mainframe and minicomputer applications onto single or networked personal computers, the 32-bit architecture enhances the process.

One of the new techniques for dealing with code quality in complex programs is object-oriented programming. Fortunately some new 32-bit operating systems are designed with the object model in mind. Certainly OS/2 2.0 is.

It is important to understand

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DIGITAL VISIONS CORP.
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how object-oriented programming improves program quality. Several fundamental object-oriented notions can, when properly used, simplify construction and testing of complex applications. Three of the most common are Rigorous Object Definition, Safe Object Initialization and Deletion, and Inheritance.

One of the new technologies for dealing with code quality in complex programs is object-oriented programming. Fortunately, some new 32-bit operating systems are designed with the object model in mind.

Rigorous Object Definition — Object-oriented programming is based on the fundamental concept that an object is a well-defined structure that contains both data and all the valid operations that may be performed on that data.

By requiring such explicit declaration of both data and operations, object-oriented languages can use the structure of the language to prevent the inappropriate changing of system data, i.e., objects can be defined to protect themselves from being used erroneously. Now programmers cannot arbitrarily reach in and change data in an invalid manner. A common cause of application faults — corrupted or invalid data — is thereby eliminated making applications significantly more reliable.

Safe Object Initialization and Deletion — In developing graphical applications, objects, whether graphical interface objects or application data objects, must frequently be created or deleted. Managing objects dynamically involves a very different style of programming than is used with COBOL where data storage is neither created nor deleted during program execution.

Object-oriented programming helps ensure that objects are created and destroyed cleanly. In many environments, when an area of storage is allocated for an object, its contents are uninitialized, meaning it contains leftover data discarded from a previous program but left in memory.

Developers using older programming languages must write code that initializes all the components of an object everywhere in the application. This repetitive initialization leads to hard-to-find program bugs in a production application. The same holds true in the deletion of objects.

In object-oriented programming, the language assists the programmer in deleting data by providing a single defined memory deletion procedure which can be written to guarantee correct object destruction.

To programmers coming from other environments, this capability may seem arcane but given the extreme difficulty in isolating and fixing these problems in a procedural application, most developers find this initialization and destruction technology essential for building reliable applications.

Inheritance — Inheritance allows the developer to define a set of objects and to specify what common elements and operations may be shared between them. For example, a general object called a "motor vehicle" may be defined in an inventory program with data elements including "top speed," "fuel capacity" and "paint color," and with operations such as "create a new motor

Partial List of OS/2 2.0 Applications

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AM SQL/WORKBENCH
AM/HOSTVIEW

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OPENBOOKS

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CODECHECK/2-32
PVSACC/2-32

Source: IBM Personal Software Products Division

32-bit Architecture

	16-bit	32-bit
[illegible]	< 1 Million Lines of Code	3-4 Million Lines of Code
Developer Needs	Toolkits, GUI Training, System Training, Betas 4 Months Early	Toolkits, GUI Training, System Training, Betas 9 Months Early 16-bit Compatibility
Channel Needs	Technical Support, Training, Marketing Support	Technical Support, Training, Marketing Support, Major Account Planning, Installation and Customization Services
[illegible]	X	2X
Interoperability	Primarily Homogeneous Environment	Must Work with other Systems, Therefore Interoperability Features and APIs
[illegible]	Relatively Simple; Storefront Support OK	More Complex, Enterprise Level Support Desirable
[illegible]	No	Yes

Source: International Data Corp.

vehicle" and "set vehicle paint color."

Definitions for specific types of vehicles may be created with data and operations inherited from the base type. Thus a "passenger car" type and a "motorcycle" type may be defined with each inherited from the "motor vehicle" type. The programmer only has to specify the differences between types in writing a program. A "passenger car" object would have a field for the number of doors; a "motorcycle" object would not. Redundancy in application code, the amount of code and chances for coding and design errors can be significantly reduced this way.

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BUZZWORDS INTERNATIONAL INC.
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WINGEN DBMS STRIVE
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FMEDIT 32

DATA CODE ENGINEERING
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DIGITALK INC.
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215-588-9400
COBOL SPII

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NETALYZER

GLANCE AG
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M2OC/C MODULA-2 TO C TRANSLATOR

GPT SYSTEMS INC.
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GPTOOLS

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EASYTREE VOICE AUTOMATION SOFTWARE SET

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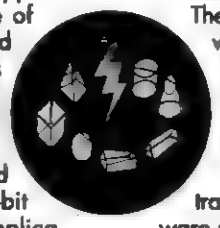
The new features available from 32-bit operating systems imply, for several reasons, new levels of user, developer and channel support.

For example, the use of these systems for downsized mission-critical applications means that system uptime and mean-time-to-repair take on new importance. For users and vendors used to dealing only with 16-bit personal productivity applications, gearing up to support these applications can be quite an effort.



Some of the things to look for in support:

- Tiered coverage levels allowing up to 24-hour, seven-day-a-week support, and the infrastructure to support it.
- Full-fledged development programs, including online access to bug-free data bases, contract support for ports and conversions, loaners and development system discounts.
- Professional services to help with installation and system tuning. These services should be provided by either the vendor or the reseller and may even include application development and programming.
- Technical support and training for resellers and software partners. This support and training should cover the basic operating system, GUIs, development tools and optional features.
- Joint selling and marketing programs for resellers. These programs should clarify the vendors' support commitment to users.
- Broad geographic coverage. This includes not only maintenance and call-in technical support, but also professional services and installation support.

IBM's SYSTEM OBJECT MODEL

IBM's OS/2 supports C++ and other leading object-oriented languages, as do most other operating systems, including nearly all 16-bit versions. However, OS/2 goes significantly beyond simply supporting the language in taking advantage of the technology.

Specifically, OS/2 provides operating system services to manage the creation and inheritance of objects. By providing object management services at this level, rather than at the language level, OS/2 offers developers unique benefits, such as the ability to access object libraries across applications. OS/2's System Object Model (SOM) manages user-created objects, internal operating system features and the objects that users manipulate in the graphical Workplace Shell desktop manager. There are several very important advantages to this SOM technology.

First, OS/2's object-oriented mechanisms are language-independent. This means that COBOL programmers or 4GL programmers can use the same inheritance mechanism used by C++ programmers. As a result, programmers can develop object-oriented programs without the need to get trained on C++, and they can use tools that are largely familiar to them.

Second, objects and their definitions are automatically shared across applications, while in a C++ application, inheritance only holds with-

Partial List of OS/2 2.1 Applications

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SPM/2 2.0
TDRS

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COMMONBASE
COMMONVIEW
GLOCKENSPIEL C++

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32 BIT INTEK C++ FOR OS/2

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C++ VIEWS

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MOZART

OBJECTIVES INC.
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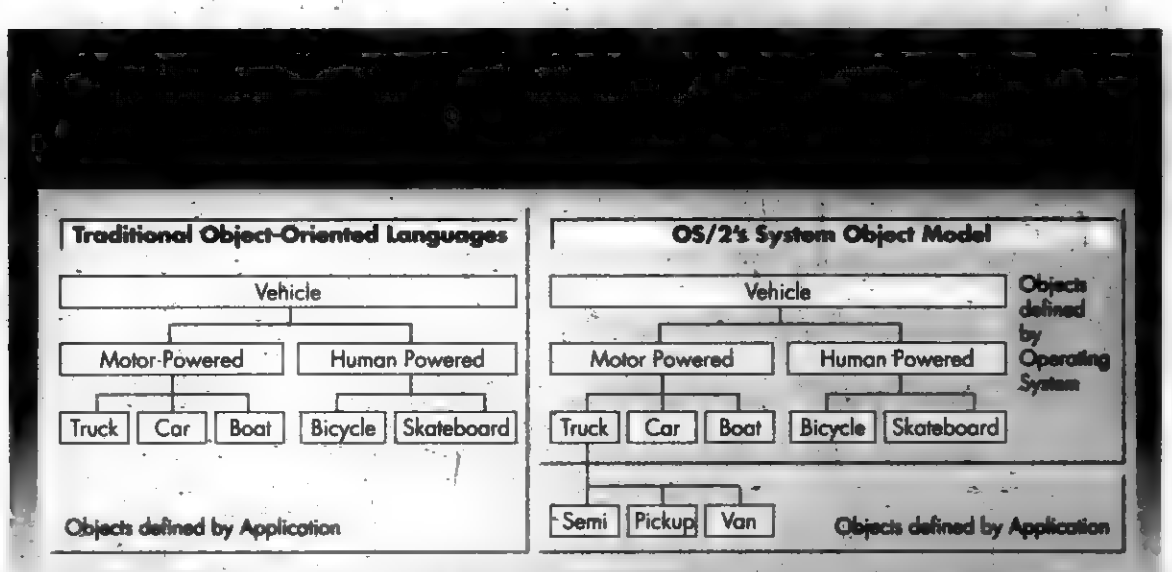
MACROSCOPE

OBJECTSHARE
415-855-9036
WINDOWBUILDER/V PM 1.1

ONTRACK COMPUTER SYSTEMS INC.
800-752-1333
DR. SOLOMON'S ANTIVIRUS TOOLKIT FOR OS/2

Source: IBM Personal Software Products Division



Source: International Data Corp.

Traditional object-oriented languages provide a way to express relationships between similar objects. Drawbacks are that all applications must be written in the one language. Also managing changes to objects in more than one application is difficult.

With OS/2's System Object Model, objects supplied as standard or optional parts of the operating system may be enhanced or extended by application developers writing it in any language. The operating system protects and manages sharing of objects across multiple applications.

in one application. When the application terminates, the objects and their interrelationships disappear.

With the SOM, OS/2 owns an object, not an application. Objects on the desktop are preserved automatically until they are needed again. This feature can be seen in the drag-and-drop capability that lets users drag objects from one application and drop them into another. This would be impossible were it not for the built-in capabilities of the operating system.

Third, anyone can inherit from system objects. For example, OS/2 provides a definition of a folder object on the desktop, which corre-

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BAKVPWIZ

PEDAGOGIC SOFTWARE
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REXX UTILITY LIBRARY

PROGRAMART CORP.
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APMPOWER

PROMINARE INC.
416-363-2292
PROMINARE ANALYST
PROMINARE BUILDER
PROMINARE DESIGNER
PROMINARE DEVELOPMENT SYSTEM
PROMINARE EDITOR

QUERCUS SYSTEM
408-867-7399
PERSONAL REXX FOR OS/2 2.0
REXXLIB FOR OS/2 2.0

RIMSTAR TECHNOLOGY
617-631-7398
RIMSTAR PM:EDITOR

ROBIN SYSTEMS
215-698-3169
RSI CLIENT/SERVER DEVELOPMENT
RSI/DB2-DBA

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SOFT & GUI INC.
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COMMAND LINE
ERROR MANAGER

SOFTWARE QUALITY AUTOMATION
800-228-9922
SQA:REPLAY
SQA:ROBOT

SOFTWARE RECORDING CORP.
214-363-6181
AUTOTESTER

SOLUTION TECHNOLOGY INC.
407-241-3210
FORMSREADER DATA STATION/32
FORMSREADER/32

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619-587-3713
SOURCELINE TM FOR OS

STEPHEN BEST
+(61) 62812147
BILLBOARD V1.1

STEPSTONE CORP.
203-426-1875
OBJECTIVE-C

SUB SYSTEMS INC.
617-438-8901
SPELL TIME
TE DEVELOPER'S KIT

SUCCINCT SYSTEMS INC.
902-649-5144
SIZEIT

SYMANTEC CORP.
800-441-7234
ZORTECH C++ FOR OS/2

SYNETIK SYSTEMS
800-596-1718
BENCHTECH FOR OS/2

TBL ENTERPRISES-ELOGRAPHICS
404-932-1222
TOUCH SCREEN DEVICE DRIVER

THE INTERNATIONAL USER GROUP
+(44) 285641175
APITRACE VERSION 2.10
BUSINESS GRAPHICS LIBRARY FOR OS/2 2.0
OS/2 2.0 SYSTEM MONITORING TOOLS

THE PERISCOPE COMPANY INC.
404-875-0800
PERISCOPE/REMOTE FOR OS/2

THE STERLING GROUP
800-3SHIELD
DISKSHIELD
INSTALLSHIELD
LOGSHIELD
MEMSHIELD
RESOURCESHIELD
TESTSHIELD

TOM SAWYER SOFTWARE CORP.
510-848-0853
GRAPH LAYOUT TOOLKIT FOR OS/2

VIASOFT INC.
602-952-0050
VIA/INSIGHT 2

WATCOM
519-886-3700
C9.01/386
FORTRAN

WOLVERINE SOFTWARE CORP.
703-790-3910
[illegible] PROFESSIONAL

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With OS/2 Release 2.0, IBM introduced a new metaphor for interacting with the operating system. The new Workplace Shell replaced the old "program starter" metaphor that appeared in OS/2 1.X and in some 16-bit operating environments. It replaced it with a direct object-manipulation model that is characteristic of cutting-edge user interface technology.

In the new approach, objects appear either on the user's desktop or in folders that correspond to directories. The objects may include:

- Application data, such as word processing documents or spreadsheet numbers
- System resources, such as disk drives, printers and multimedia boards
- Operations that can be performed on other objects, such as the "shredder" icon that deletes unneeded objects.

Objects that appear in the desktop of the Workplace Shell can be manipulated through a very natural interface style called "drag and drop." To print a document, for instance, the operator drags the icon representing the document on top of the icon representing the desired printer. The underlying operating system makes the necessary arrangements between the program that created the document which may need to format it for a printer and the printer driver itself. Thanks to OS/2's multitasking, the document will print in background mode while the user continues working on other tasks.

The Workplace Shell is notable not only because of the elegance of the underlying user interface model but also because of the depth of sophistication with which it is implemented. For example, the Workplace Shell allows each item on the desktop to be extensively customized. As an example, icons can be redrawn to represent different printers.

The Workplace Shell's features are made possible by the underlying OS/2 System Object Model (SOM). This helps the operating system architecture create, manipulate and manage objects. It offers a significant increase in developer productivity when writing natural desktop applications. With SOM handling storage and inheritance, objects and controls created by IBM for inclusion in the Workplace Shell can be extended by third-party developers to create new types of objects.

sponds to a directory on the disk. A developer of an electronic mail system could create a new type of mail folder which would be derived from the operating system's folder type but which might add an additional facility for notifying the user that new mail messages have been received.

APPLICATION ADVANTAGES OF 32-bit ARCHITECTURE

In addition to boosting raw performance as a result of the flat memory model, the combination of 32-bit hardware and software enables a number of distinct application features. One example is background printing. In some systems it is implemented through the use of printer buffers, which allow the computer to do something else while the printer is printing. For 32-bit systems with powerful multithreading and multitasking resources, background printing also includes the often formidable task of formatting.

Partial List of OS/2 2.1 Applications

XVT
303-443-4223
XVT
XVT-DESIGN

ZINC SOFTWARE INC.
801-785-8900
ZINC APP FRAMEWORK

DEVICE DRIVERS

ADAPTEC
408-945-8600
SCSI 1520 DEVICE DRIVER
SCSI 1540 DEVICE DRIVER
SCSI 1640 DEVICE DRIVER
SCSI 1740 DEVICE DRIVER

AMERICAN MEGATRENDS INC.
404-263-8650
SCSI DRIVERS(SERIES 15)
SCSI DRIVERS(SERIES 46)

ARCHITEXT
512-490-2240
ARCHITEXT FONTS

ARTEC SYSTEMS, INC.
407-997-9007
LDIT FOR ALLEN-BRADLEY
XT/XT2

ATI TECHNOLOGIES INC.
416-756-0718
ATI 8514 ULTRA
GRAPHICS ULTRA PRO
GRAPHICS ULTRA+
VGAWONDER XL24

BUSLOGIC
408-492-9090
BTSCSI.ADD

CIPRICO INC.
800-SCSI NOW
OS/2 2.0 SCSI DISK DRIVER

COLORGRAPHIC COMMUNICATION CORP.
404-455-3921
DUAL FLAT PANEL ADAPTER
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TWIN TURBO ACCELERATOR

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703-435-3000
CRYPTLINE CONTROLLER
SCSI DEVICE DRIVER

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ISDN DRIVER

DISTRIBUTED PROCESSING TECH. (DPT)
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DPT20XX.ADD
SCSI/EISA/ISA CACHING

DISK CON
SMARTCACHE SCSI
DEVICE DRIVER

DYNATECH AUTOMATION SYSTEMS INC.
416-636-3000
MER

FTG DATA SYSTEMS
714-995-3900
ADVANCED PXL
SUPPORT SOFTWARE

FUTURE DOMAIN CORP.
714-253-0400
MCS-600/700 ADD DRIVER
TMC-16IX ADD DRIVER
TMC-7000EX ADD DRIVER
TMC-8XX ADD DRIVER

IBM CORP.
800-426-9402
SOUNDBLASTER DD MMPM

IMPACT ZONE
510-785-6700
PCMCIA ETHERNET ADAPTER
DRIVER

INTEGRA TECHNOLOGIES INC.
408-980-1371
OASAS V2.0

JANUS SYSTEMS
805-484-9770
OASIS
OASIS (2.0)
TIGA BOARD PM DRIVER

LCS/TELEGRAPHICS
617-225-7970
DEVICE DRIVER FOR
DIGITIZERS

ORCHID TECHNOLOGY
800-767-2443
FAHRENHEIT VA

PERSONAL SYSTEMS SOFTWARE INC.
203-693-0404
OS/2 2.0 DEVICE DRIVER
C-CALLABLE LIB.

RACAL-DATACOM
800-LAN TALK
ES3210 32 BIT EISA ADAPTER
INTERLAN AT SERIES 8/16
ISA ADAPTERS
NI 5210 SERIES 8/16 EB

Source: IBM Personal Software Products Division

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14. Other _____

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15. Manufacturing
16. Finance/Insurance/Real Estate
17. Mining/Construction
18. Transportation/Public Utilities/Communications Systems
19. Wholesale/Retail/Trade
20. Military/Government
21. School/University
22. Medical/Law
23. Petroleum/Refining/Agriculture
24. Other _____

CIRCLE ONE ONLY

TITLE/FUNCTION
30. MIS Director/Manager
31. Programmer/System Analyst
32. Network/Telecommunication Mgmt.
33. PC Systems Support
34. Systems Integration
35. Corporate/Financial Mgmt.
36. Office/Administrative Mgmt.
37. Sales/Marketing
38. Engineer/Scientist
39. Manufacturing/Production
40. Government/Public Administration
41. Education/Teaching
42. Purchasing
43. Distribution
44. Other _____

CIRCLE ALL THAT APPLY

APPLICATIONS I AM INTERESTED IN
50. Acctg/Personal Financial
51. Business Specific (Specify) _____
52. CAD/CADCAM
53. Communications
54. Database
55. Desktop Publishing
56. Development Tools
57. Device Drivers
58. Electronic Mail
59. Games/Entertainment
60. Graphics
61. Integrated/Workgroup
62. Information Management
63. Multimedia
64. Network Management
65. Spreadsheets
66. Utilities
67. Word Processing
68. Other _____

CIRCLE ONE ONLY

NUMBER OF EMPLOYEES IN MY ORGANIZATION
70. Under 25
71. 25-49
72. 50-249
73. 250-999
74. 1000-4999
75. 5000 or more

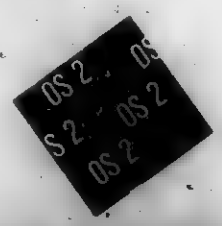
CIRCLE ONE ONLY

NUMBER OF PCS/WORKSTATIONS IN MY ORGANIZATION
80. Less than 10
81. 50-249
82. 250-999
83. 1000-2500
84. 2500 or more
85. I Do Not Know

CIRCLE ALL THAT APPLY

DESKTOP OPERATING SYSTEM

	THAT	IN 6 MOS
DOS	—	—
OS/2	—	—
WINDOWS	—	—
UNIX/XENIX	—	—
MACINTOSH	—	—
OTHER	—	—



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Because OS/2 is managing the inheritance process, a common object definition can be used by many vendors or applications without extensive prior coordination. Also, because the operating system manages relationships between objects, those objects may be accessed by any programming language, not just through a traditional object-oriented language like C++ or Smalltalk. The net effect of the Workplace Shell and the System Object Model is that the boundaries between the operating system and applications are blurred. This results in a much more natural interaction between the user and the system since it is no longer necessary to interact one way with the system and another with the application.

This background printing capability is particularly useful when dealing with complex documents or workflow software. Even preparing documents with special document preparation software, like that from DeScribe, Inc., may take several minutes for a very long and complex document. Hence the value of doing it in full background mode.

This capability is also useful when individuals using integrated office automation software need to change tasks or are frequently interrupted. Even in downsized computer applications full background printing can help make an application successful. Many downsized applications still require substantial paper reporting which often requires a lot of preparation time. This allows large, complex reports to be generated easily and then queued for printing.

Multitasking communications — useful for both server-based and workstation-level communications — is another important background task enhanced by 32-bit architectures. Because OS/2's multitasking capabilities are designed to allow precise tuning of resources between sessions, it is easy for communication programs to transfer files in the background without dropping data, even at high-speed transfer rates. This capability is important not only in site-to-site file transfers, but also in new workgroup applications that need to support modem-based access for portable or remote PCs. ■

THE ROYAL BANK OF CANADA: 32 BITS AT THE BRANCHES

As the second largest bank in North America with assets of over $120 billion (U.S.) and more than 50,000 employees, the Montreal-based Royal Bank of Canada is also one of the world's largest information processing firms.

It has a full complement of mainframes, a wide variety of bank automation systems and over 21,000 PCs. The bank's 1,600 branches and 100-plus headquarters departments all employ token-ring LANs to support branch banking applications and corporate mainframe communications. So information-intensive is the bank that it installs 10 LANs a week and presently supports a total of some 2,000 LANs.

Beginning in 1991, branch office servers and LANs that were first

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ULTRASTOR CORP.
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MSGVU/PM

DIGITAL COMMUNICATIONS ASSOC. INC.
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SELECT PM CLIENT

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813-643-1500
EMC2/TAO LAN V3.3

ICRA INC.
703-552-0255
TECOMAC MAIL

LOGICON INC.
703-486-3566
LMDS

NBS SYSTEMS
203-741-2244
TOSS/LAN

TECHNOLOGY DEVELOPMENT SYSTEMS INC.
708-382-9190
LAPCONTROL
NETSWITCH

GAMES AND ENTERTAINMENT

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702-359-1303
TRADE WARS 2

SLY INDUSTRIES INC.
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ZAPPED V2.0, ICONPAK I & II +4 ICON SETS

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GRAPHICS

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ICON EXPRESS UTILITY AND LIBRARY

COREL SYSTEMS CORP.
800-836-DRAW
CORELDRAW

MICROGRAFX INC.
800-733-3729
DESIGNER FOR OS/2
DRAW FOR OS/2

PDR ADVANCED TECHNOLOGY
606-223-5800
DOCMANAGER/2
VPMASTER

PRODUCTIVITY SOFTWARE RESOURCES
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PQ PERSONAL QUERY 2

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APHRT

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used as personal productivity and local branch application devices began replacing traditional branch office banking terminal controllers. Now the LAN-based PCs are used for executing branch office applications generally developed by headquarters IS staff and deployed in "workbenches" tailored for individuals. These applications include personal productivity, local processing and access to large corporate databases and transaction systems. Another major application is getting workbench updates to the right users. This is done by distributing the software onto LANs.

"While we have OS/2 on our servers, we're evaluating LAN Server and NetWare for OS/2. Most of our networked devices are DOS-based. But we'll soon begin upgrading at the desktops — we have pretty much topped out on DOS."

George Oliver
manager of information delivery technology
The Royal Bank of Canada

The first LAN configurations in the branches were based on IBM's LAN Server 1.3 running on the OS/2 1.3 operating system. Their counterparts in the headquarters offices were also based on LAN Server or Novell's NetWare.

"We started looking at LANs seriously around 1989," notes George Oliver, manager of information delivery technology for the bank. "At the time the only server operating systems that could really provide us the linkage with our mainframe SNA systems were OS/2 and LAN Server. We hook into them now using LU 6.0 and IMS Fastpack."

The bank is currently moving into the second generation of LAN usage by implementing the 32-bit OS/2 2.0 operating system on servers at its branches. The resultant enhanced functionality includes:

- The addition of electronic mail gateways on the branch servers
- Higher levels of remote system management, diagnostics and software distribution by headquarters staff
- Increased performance from existing hardware
- Faster application development and customization of workbenches.

"While we have OS/2 on our servers, we're evaluating LAN Server and NetWare for OS/2," says Oliver. "Most of our networked devices are DOS-based. But we'll soon begin upgrading at the desktops — we have pretty much topped out on DOS." OS/2, Oliver notes, will also "take the handcuffs" off the bank's software developers, who have been working with a patchwork of purchased and home-grown DOS development tools.

Partial List of OS/2 2.0 Applications

SLY INDUSTRIES INC.
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EDGE EFFECTS

THE CROSSLEY GROUP
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DEVELOPER'S BUSINESS GRAPHIC TOOLKIT

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VIA/DBE

ZSOFT CORP.
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PUB PAINTBRUSH

INFORMATION MANAGEMENT

AMERICAN MANAGEMENT SYSTEM
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IMAGE & RECORD MNG

CIRRUS TECHNOLOGY
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UNITE
UNITEFAX

DELPHI MANAGEMENT ENGINEERING INC.
619-592-9220
SOFTWARE ENGINEERING ENVIRONMENT (SEE)

DELPHUS INC.
201-267-9269
4CX-11

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617-965-6590
POWERIMAGE

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FUTURCAST - EIS

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MIK-EIS
MIK-REPORT

OAKTREE SOFTWARE CO.
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TYME MYNDER

PACIFIC MICROELECTRONICS
415-948-6200
MAC-IN-DOS

POC-IT MANAGEMENT SERVICES INC.
310-393-4552
MICROMAN II PROJECT & STAFF MGMT.

SAS INSTITUTE INC
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BASE SAS SYSTEM
SAS/ACCESS AS/400
SAS/ACCESS FOR DBM
SAS/ACCESS PC FILE
SAS/AF
SAS/ASSIST
SAS/CALC
SAS/CONNECT
SAS/EIS
SAS/ENGLISH
SAS/ETS
SAS/FSP
SAS/GRAPH
SAS/IML
SAS/INSIGHT
SAS/LAB
SAS/OR
SAS/PH-CLINICAL
SAS/QC
SAS/STAT

TYDAC TECHNOLOGIES
613-226-5525
SPANS-GIS 3D VIEW
SPANS-GIS BUILDER I
SPANS-GIS BUILDER II
SPANS-GIS CONTOURING
SPANS-GIS D. TRANS
SPANS-GIS INTERATION
SPANS-GIS MAP I
SPANS-GIS MAP II
SPANS-GIS MULTI-CRIT
SPANS-GIS NEIGHBORHD
SPANS-GIS NETWORK
SPANS-GIS PNT AGGREG
SPANS-GIS PNT MODEL
SPANS-GIS SURFACE GN
SPANS-GIS TOPOLOGICA
SPANS-GIS VISIBILITY
SPANS-MAP

Source: IBM Personal Software Products Division

One example of how the 32-bit version of OS/2 improves performance at Royal Bank can be seen in the number of devices a single server can support — it will go from 40 to over 60. Better performance will also permit faster distribution of code changes and software fixes.

"Another area where we like OS/2 2.0," says Oliver, "is in remote system management. If we have 2,000 LANs we don't want 2,000 individuals in the branches having to become programmers. OS/2 2.0 allows us to do more from our end. In addition, it has spurred a new market for third-party remote system management software. Now we don't have to write all our own."

In continually updating branch software and functional workbench applications, the bank has discovered the utility of IBM's System Object Model (SOM). The SOM allows Oliver's team to easily provide individuals with preconfigured PCs that fit their specific needs.

"We can use prerecorded installation parameters to ready a machine for a new employee or someone with a new job function," notes Oliver. "Since configuring systems with graphical user interfaces is not something you necessarily want end-users to do, this eliminates a lot of risk and hassle."

But perhaps the biggest benefit of the 32-bit OS/2 for the bank is the freedom it provides programmers. Now they work less on developing infrastructure software and tools and more on developing applications.

COREL: FASTER DRAWING, BETTER PICTURES

It takes substantial computer power to produce complex art work for CAD applications, business graphics, commercial art and advertising, or publishing. It also takes skilled computer graphics artists and the ability to jump back and forth between packages.

Corel Corp. of Ottawa, Canada, is the market leader in drawing and illustration software for IBM PCs with graphical user interfaces (GUIs). This is largely because it has eliminated much of the jumping back and forth. The $70 million (U.S. dollars) firm has taken off since its main product, CorelDRAW, was announced in 1989.

The company's success has been the result of a combination of things including the rapid adoption of GUIs, CorelDRAW's ease of use and the increased growth in the PC and Macintosh drawing and illustration software market. (That market is now worth over a billion dollars a year in vendor revenues.) The latest version of the product is CorelDRAW 2.5, a 32-bit offering that takes advantage of OS/2's flat memory model and better hardware performance. As a result, overall product performance is increased by 25%. In addition, the use of OS/2 2.0 removes a significant limitation to previous versions and to the

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RELISH
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THE FAR VOICE

HAGER WORKS INC.
508-422-9754
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IBM CORP.
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ACTIONMEDIA II UPGRADE

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MMPM/2

MEI-SHU COMPUTER & COMMUN. CORP.
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VOICE 123

MULTI MEDIA MANAGEMENT INC.
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HOME VISION

NETWORK TECHNOLOGY CORP.
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MEDIASCRIPT OS/2 DESKTOP PRODUCTION TOOL
MEDIASCRIPT OS/2 PROFESSIONAL EDITION

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508-663-0666
SUPER VIDEO WINDOWS, VEDITOR EXE

PHILLIPS VIDIWALL
+(31) 499061111
SCREENPLAY

RED SHARK
212-679-0611
NYMBUS MULTIMEDIA TOOL SUITE

SPECTRUM AUTOMATION
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AUTO CORRECTOR
HELP DESK ATTENDANT
S-A HELP DESK
VOICE ALERT
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Windows 3.0 versions.

"Perhaps the biggest advantage we see with CorelDRAW 2.5," says Gennady Kleyner, an application specialist with SAGG Computers and Electronics, a CorelDRAW OS/2 reseller and training firm, "is the way it does away with limits to the number of objects you can have in your drawing. Under Windows it's around 20,000; with OS/2 it's over five million." SAGG, which is also a systems integrator, found that performance is 30%-40% faster with OS/2 2.0 than with Windows because of the full 32-bit nature of OS/2.

In addition, with a package like CorelDRAW which performs multiple graphic art tasks, the system's multitasking and multithreading capabilities come in handy. For instance, customers can work on two drawings at a time.

"Since our bread-and-butter is the CAD user," notes Kleyner, "the ability to work on a CAD program and CorelDRAW at the same time is valuable. You can save all sorts of artist and engineer time involved in the typical sequential process of generating a design and then getting a picture of it. Since most of our clients are running CAD programs, the hardware resources needed to run CorelDRAW are not often an issue."

The bottom line: performance enabled by the 32-bit features of OS/2 2.0 pay off for Corel not only in increased speed — allowing the company to generate more art work — but also in the increased productivity of both artists and engineers who can now work on multiple tasks simultaneously without the limitations that used to hold them back.

INNOVATIVE DATA CONCEPTS: TOOLS FOR ALL SEASONS

One of the most popular applications for IBM and compatible PCs is developing other applications. So popular in fact, that the sale and support of application development tools in this environment generates well over $2 billion a year. And each year more and more programmers find themselves working on PCs.

The market is populated with numerous vendors and various types of development tools. One of those vendors, Innovative Data Concepts (IDC) of Hatboro, Penn., markets the TesSeRact series of development tools. These tools include a user interface development system, printer control system, editor, screen designer and file manager. All of them are designed to run in a 32-bit environment.

Designed from the ground up to work in PC environments, the TesSeRact tools are also highly portable. For example, code written for DOS applications is easily modifiable to run on OS/2, Windows and Unix. During the fall of 1992, IDC implemented TesSeRact CXL (TCXL), the user interface development system for IBM OS/2 32-bit graphical and non-graphical systems. Based on an event-driven ar-

Partial List of OS/2 2.0 Applications

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chitecture, TCXL works with virtual windows, virtual memory, dialog controls, mouse support and other features. It contains a library of more than 500 multipurpose functions.

One set of TeaSeRact tools can be used to generate applications in DOS, Windows, character-mode OS/2 or OS/2 with Presentation Manager. Functions pulled from the library are not machine or operating system-specific.

"OS/2 makes a great debugging platform," notes Chip Rabinowitz, IDC founder and vice president of research. "And the 32-bit version increases the performance of our software, depending on the type of system for which you're writing." Typically that performance improvement amounts to more than 20%. "But the real advantage," Rabinowitz adds, "comes from the ability to write the application once and have it run on multiple platforms."

"OS/2 makes a great debugging platform. And the 32-bit version increases the performance of our software depending on the type of system for which you're writing."

Chip Rabinowitz
founder
Innovative Data Concepts

One of IDC's customers, EmmaSoft Software Company of Ithaca, N.Y., especially likes the way applications developed under TCXL can be ported to other platforms. This is because one of EmmaSoft's key products is "Catalog-on-a-Disk," a catalog editing and publishing system that allows EmmaSoft clients to send product catalogs on disk to their computer-using customers.

"I tried developing a Windows version of my product," says EmmaSoft founder Dan Veanar. "But the learning curve was too long and costly. I found with TCXL I could develop for OS/2, DOS and Windows without having to learn all that complex Windows programming. To reprogram all I have to do is put in about 10 minutes of time identifying DOS-specific calls and exchanging them with Windows or OS/2-specific calls."

So satisfied with TCXL is Veanar that he is rewriting his application from scratch to take advantage of TCXL's new capabilities — many of which are made possible by the new capabilities of OS/2 2.0.

"This will allow me to send out more frequent product upgrades and enhancements to my customers," concludes Veanar.

There is a nice progression here: from 32-bit OS/2 to enhanced development tools to faster product release for an application vendor.

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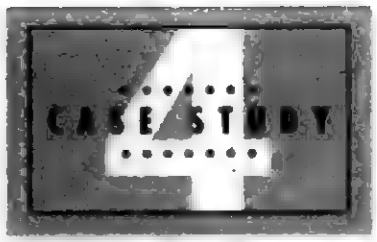

DIGITALK: THE CASE FOR REUSABLE SOFTWARE

Software developers have long understood the value of reusing application software code. Value is a relative thing, however, as this approach is an expensive one. Moreover, the tools available for application development are usually more optimized for easy designing than for reusability.

Now Digitalk, the Los Angeles-based company that markets Smalltalk/V, a popular object-oriented language, has introduced an OS/2 2.0-compatible product called Parts Assembly and Re-use Tool Set (PARTS) Workbench. Using it, application developers can produce object-oriented applications with GUIs by calling up software components from a parts library, or catalog, and "wiring" them together by drawing lines between them.

The software components themselves can be constructed by developers and brought in from other programs and languages — including COBOL — or from a built-in 60-part library that comes with PARTS Workbench. PARTS Workbench offers a way to create objects from any kind of programming language and then insert them into a dynamic link library. Once the parts are in the library, creating applications is a matter of pointing and clicking.

PARTS Workbench offers a way to create objects from any kind of programming language and then insert them into a dynamic link library. Once the parts are in the library, creating applications is a matter of pointing and clicking.

The PARTS Workbench is the first in a Digitalk family of programs slated for 1993 delivery. Other programs include a version optimized for the 32-bit features of OS/2, as well as a database interface and a communications interface. In addition, there will be a locator for keeping track of parts, and a "wrapper," software that allows programmers to reengineer COBOL legacy code to create more modular and maintainable programs.

Digitalk believes that the increased programmer productivity PARTS offers over conventional object-oriented programming is comparable to that offered by conventional object-oriented programming over 3GL programming.

While such vendor claims are subject to scrutiny, the fact that PARTS offers a new, extended capability for application development in a graphical user environment is not.

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Source: IBM Personal Software Products Division

SUNDIAL SYSTEMS: HIGH PERFORMANCE CALENDARING

What do Warner Lambert, University Hospital in Augusta, Ga., William Mitchell College of Law, St. Paul, Minn., and *Infoworld* magazine all have in common? They all use a 32-bit calendaring system, called Relish, from Sundial Systems of Seal Beach, California.

Using OS/2 2.0's Workplace Shell and 32-bit capability, the software provides real-time individual, group and resource scheduling. Since Relish is based on a database architecture rather than a file structure, it provides location transparency, meaning users need not know where an object such as someone's calendar is stored in order to access it. It is also not necessary to open an appointment file in order to manipulate the calendar. Instead, each note to the system is treated as an object, and can be manipulated using the operating system's drag-and-drop features.

In addition, users are able to conduct queries-by-example against the calendaring database. This allows the ad hoc development of project views or appointments.

The Relish architecture, even in its single-user configuration, is client/server-based with the client handling user interface issues and the server handling data management. In the single-user version, the client/server architecture helps in switching between tasks and windows.

Because Relish was designed from the ground up as an IBM Presentation Manager-compatible application and then extended to 32-bit OS/2 and Workplace Shell, it is superior to older programs using a less modular architecture and having less built-in object orientation.

The list of over 1,000 applications in this White Paper illustrates the here-and-now aspect of OS/2 2.0. With two million units shipped since introduction a year ago, according to International Data Corporation estimates, OS/2 2.0 now leads the way for 32-bit operating systems.

Major new applications for OS/2 2.0, such as WordPerfect 5.2, Lotus' AmiPro and ccMail, and Borland's C++ are coming online in 1993. Other key applications like Lotus' 1-2-3 and Freelance Graphics for OS/2 Release 2.0 became available in early February. The availability of these and many other applications will solidify OS/2 2.0's position even more.

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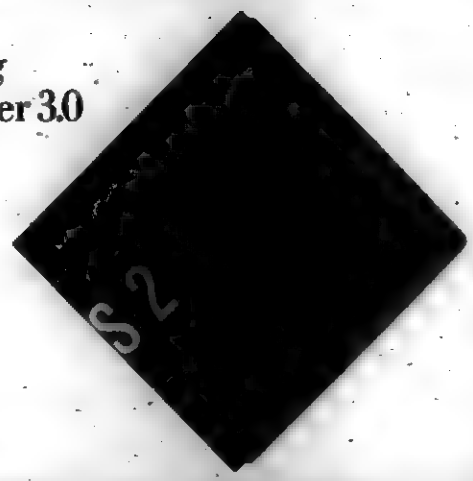

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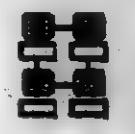

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For more information, call 1 800 3-IBM-OS2.* OS/2 LAN Server 3.0 does so much more than other network operating systems, it wins by a LANslide.

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Michael Fitzgerald

Wireless — like Magic

"What is it?" my editor asked.

"It's in the story," I replied.

"Well, the story says it's nothing. Even if it's vaporware, you have to tell me what it's supposed to be."

Sigh. I was seriously wishing this General Magic company would make itself disappear. How could I make my editor understand that even it doesn't know for certain what it hath wrought?

So I tried again.

"It's whatever you want it to be. This will be all things to all people, and use of it will guarantee eternally rising corporate profits, ever-improving personal productivity and stable marriages. It's very flexible that way. I guess that makes it a panacea."

He was not amused.

I finally decided that General Magic and its spawn are meant to be a sort of communications Swiss army knife for the digital world, and that appeased my editor. But what is a digital Swiss army knife? The only thing clear about General Magic is that it involves wireless communications (another well-established technology). Everything else hits the realm of fantasy.

Apparently fantasy is in these days — the General Magic

Fitzgerald, *page 81*

OpenView with Ease

HP management applications provide continuous monitoring

By Elisabeth Horwitt
PALO ALTO, CALIF.

Some recently announced Hewlett-Packard Co. products promise to make it a lot easier for network administrators to pinpoint and correct traffic bottlenecks across an enterprisewide networking installation. The only caveat is that an HP EtherTwist hub or bridge has to be planted on every network segment.

HP introduced the first three applications that run on its OpenView network management platform and make use of HP's Embedded Advanced Sampling Environment (Ease).

Announced last March, Ease is a flash-erasable, programmable read-only memory technology that sits in all EtherTwist products and continuously samples traffic flow through their ports.

The traffic samples are then forwarded to OpenView, where the new applications can analyze them and use expert system technology to advise network managers on where the problems are and how to correct them, HP product manager Magdy Aseem said.

HP's announcements should strike a chord among companies that are moving applications down to local-area networks and want "excellent continuous monitoring like they have with an IBM Systems Network Architecture network," said Rick Villars, a director at International Data Corp.

Price is right

Both SynOptics Communications, Inc. and Cabletron Systems, Inc. provide similar traffic sampling technology on their hubs; however, such products are said to cost $9,000 or $10,000 per hub, while HP's is virtually free.

"The question is how willing HP will be to open up this technology or come up with a low-cost version" that can be implemented on other vendors' systems, so that the technology is not limited to HP networks, Villars said.

The OpenView Resource Manager application provides a real-time view of all network segments concurrently across the enterprise, showing traffic trends such as heavy users and overloaded segments. Priced at about $4,000, it is scheduled for second-quarter availability.

OpenView History Analyzer compiles historical data, such as network services and protocols used, so that network managers can track network traffic trends and proactively meet changing bandwidth needs, HP said. Priced at up to $6,000, it is scheduled for third-quarter availability.

OpenView Traffic Expert learns the network's behavior under ordinary circumstances, through Ease samples. It can then build a

OpenView, *page 81*

Local tint in mobile computing

By Kevin Burden

Frequent fliers have typically been the premier users of mobile technology, even though they may never get on a plane.

The term "frequent flier" is just one of eight labels for mobile professionals offered by market research firm BIS Strategic Decisions in Norwell, Mass.

According to a report by BIS, frequent fliers — those who regularly travel beyond their metropolitan areas — actually represent a smaller market for mobile technology than those who travel within their building or campus.

Of 27.3 million mobile professionals, 58% spend the majority of their traveling time locally. The opportunities are there for companies that can extend the computing environment to those simply away from their desks. These groups include the following:

- "Collaborators" are the most ambulatory. They spend up to 85% of their time working with others and frequently require responses within the hour.
- "Corridor cruisers" are usually less technical than collaborators and spend over half their time away from their desks working with others in the same building.

"These workers represent a sizable opportunity for vendors," said William Ablondi, vice president of BIS' Personal Computing Market Advisory Service. "Their technology usage currently consists of pagers, portable computers and voice mail."

Source: BIS Strategic Decisions

However, Ablondi noted, the subnotebook may be the piece of technology custom-made for these two groups.

But the subnotebook's success could depend on their connectivity capabilities. The ability to link into E-mail while in another part of the building is a vital feature, Ablondi said.

Overall, 40% of all mobile professionals are directly engaged in purchasing products or wield a lot of influence over what is bought, the report said.

Forum strives for standard telco software

By Joanie M. Wexler

The Network Management Forum recently kicked off an initiative to solicit a common, industrial-strength business software infrastructure for telecommunications carriers. The goal is to allow the fiercely competitive firms to cut operational costs while simultaneously improving their levels of service.

The forum's objective is similar to that of the Open Software Foundation with its Distributed Computing Environment and Distributed Management Environment — except on a larger and more functional scale — in that they both aim for plug-and-play software services regardless of hardware platform.

By issuing specifications to which the industry would write uniform business software specifically for carrier companies, the telcos hope to gain the ability to buy off-the-shelf software for administering their sprawling, complex networks, said Keith Willetts, Network Management Forum chairman. This would allow them to divert financial and human resources to writing value-added applications, he said.

Better prices, service

The end-user benefits should emerge in the form of lower prices, passed on from operational savings within the telcos, and higher quality services, said Ed Webb, director of technology integration at Bell Research Communications, Inc., the research and development arm of the seven regulated telephone holding companies.

The platform specification will include standard software components such as programming languages, communications protocols, operating environments, database access languages, look-and-feel interfaces and distributed transaction processing protocols, Webb said.

According to the forum, all work is expected to be completed within two years.

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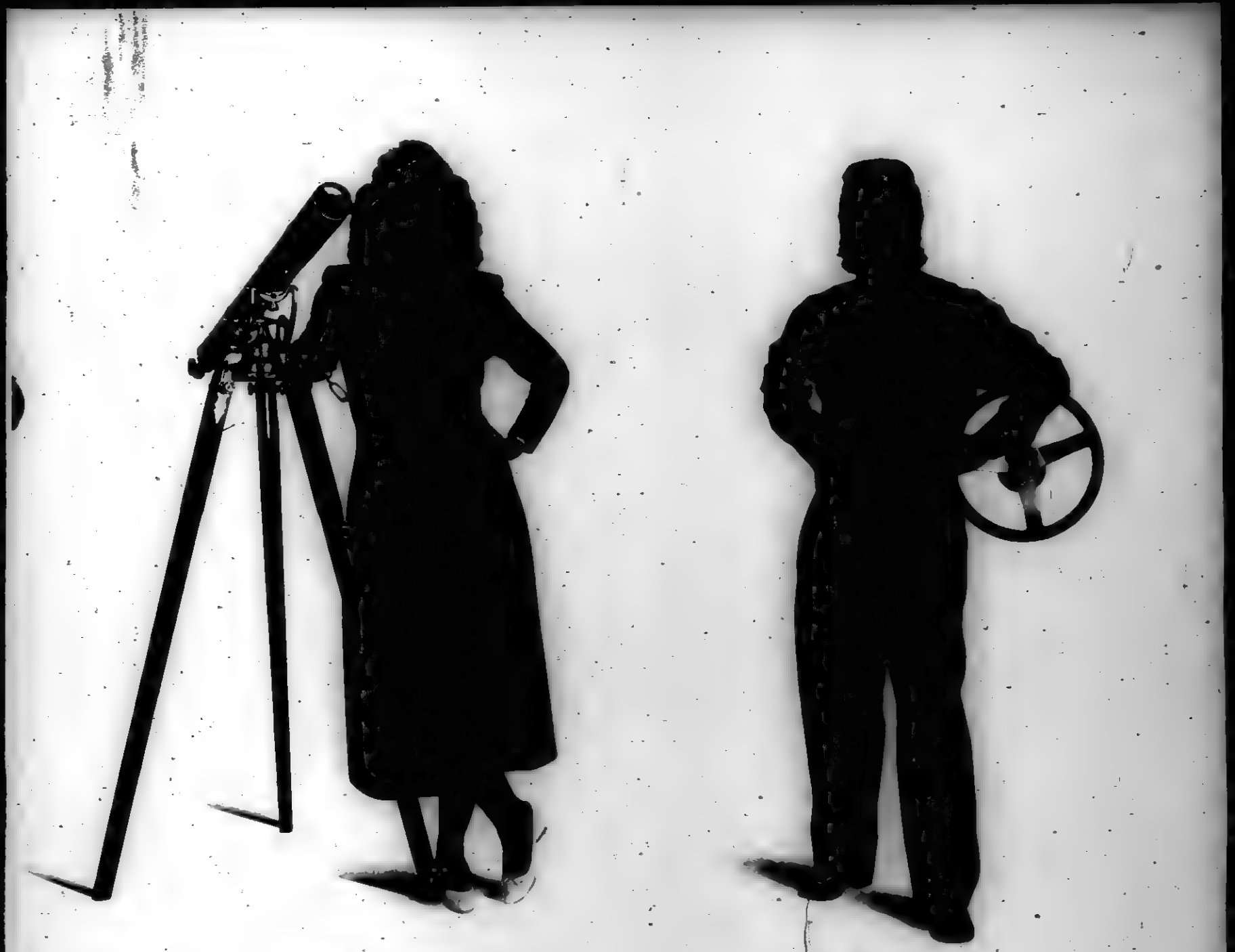

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OpenView with Ease

CONTINUED FROM PAGE 77

set of rules for a well-behaved network and generate a printed report prescribing actions to improve performance, HP said.

Priced at $8,000, it is scheduled to ship in the fourth quarter.

Protocol analysis

All three applications can analyze Transmission Control Protocol/Internet Prptocol, Novell, Inc.'s IPX and Digital Equipment Corp.'s DECnet protocols.

Traffic Expert and Resource Manager will also support Apple Computer, Inc.'s AppleTalk.

HP customers that purchased EtherTwist hubs and bridges before April 1992, when Ease became available, can migrate to Ease via a software upgrade, HP said.

In Brief

E-mail prizes

Electronic Mail and Micro Systems presented awards last week in Washington, D.C., for the best new E-mail products based on votes by 300 members. Winners were SoftSwitch, Inc.'s EXM for hardware, Microsoft Corp.'s Mail 3.0 for software, CompuServe Mail Hub for service, RAM Mobile Data for messaging company and the Clinton/Gore press campaign for event of the year.

Peers to peers

IBM will hold the first Advanced Peer-to-Peer Networking implementors workshop April 14-15 in Chapel Hill, N.C. It will focus on helping vendors understand and implement the IBM architecture.

Fitzgerald

CONTINUED FROM PAGE 77

press/analyst conference drew names. Big names: Apple. AT&T. Matsushita. Motorola. Philips. Sony. Penn and Teller. Todd Rundgren. Me.

OK, so I'm not a big name. But Penn and Teller, that magical duo, were in the audience not to check out the competition but because, as the ever-supercilious Penn told me, "It might be interesting." Teller, in keeping with the act, said nothing. Rundgren was there in his role as General Magic's Sonic Avenger, which means he consults with them on how to incorporate audio features into their software.

Change of mind-set

The others — Apple, AT&T and all the rest — hope that backing General Magic will conjure up dominance of (and profits from), you guessed it, a new way of computing that will change the world. A "paradigm shift," folks.

General Magic co-founder Marc Porat talked about how "friendly" the new software will be and how it will work with everything that exists today and is yet to come, allowing us worker types finally to get real work done, no matter where we are.

Just imagine: a world where you can find the people you need to find at the moment you want them, with all the information they'll want in your hands. The deals you'll make! The friends you'll win! The promotions you'll get! All because these selfless companies are going to make it happen sometime in the next 10 to 40 years.

That's right, the next 10 to 40 years. We reporters secretly don't believe this timetable. We hate to think we showed up to see something that does not exist, since there is no news in being told, in effect, that Rome was not built in a day.

Accordingly, I predict that within two years General Magic will make wonderful products that do exactly what it claims but will be sued for intellectual property theft by the Science Fiction Writers of America and be barred from shipping anything.

If General Magic is right and this market will take that long to develop, well, they told us so. They also told us that their goal, a paradigm shift, "is almost impossible to pull off, and most attempts fail."

Sounds to me like the company has basically predicted its own death.

They don't think that, of course. The press conference was really a kind of General Magic self-actualization seminar. Porat, of the new GM (as opposed to the old, stodgy carmaker), talked about feelings, about how people will have the power, about Gestalt, of all things.

What are General Magic's prospects, really? Porat talked about wireless communications, how it has failed in the marketplace. But he said institutional and regulatory issues have hindered wireless, not the technology, and that given another generation, wireless will be everywhere.

It's a good point, and he could be right. If he is, a communications-oriented company like General Magic could find a huge market. The question is, will people take to the new way of doing things that General Magic represents?

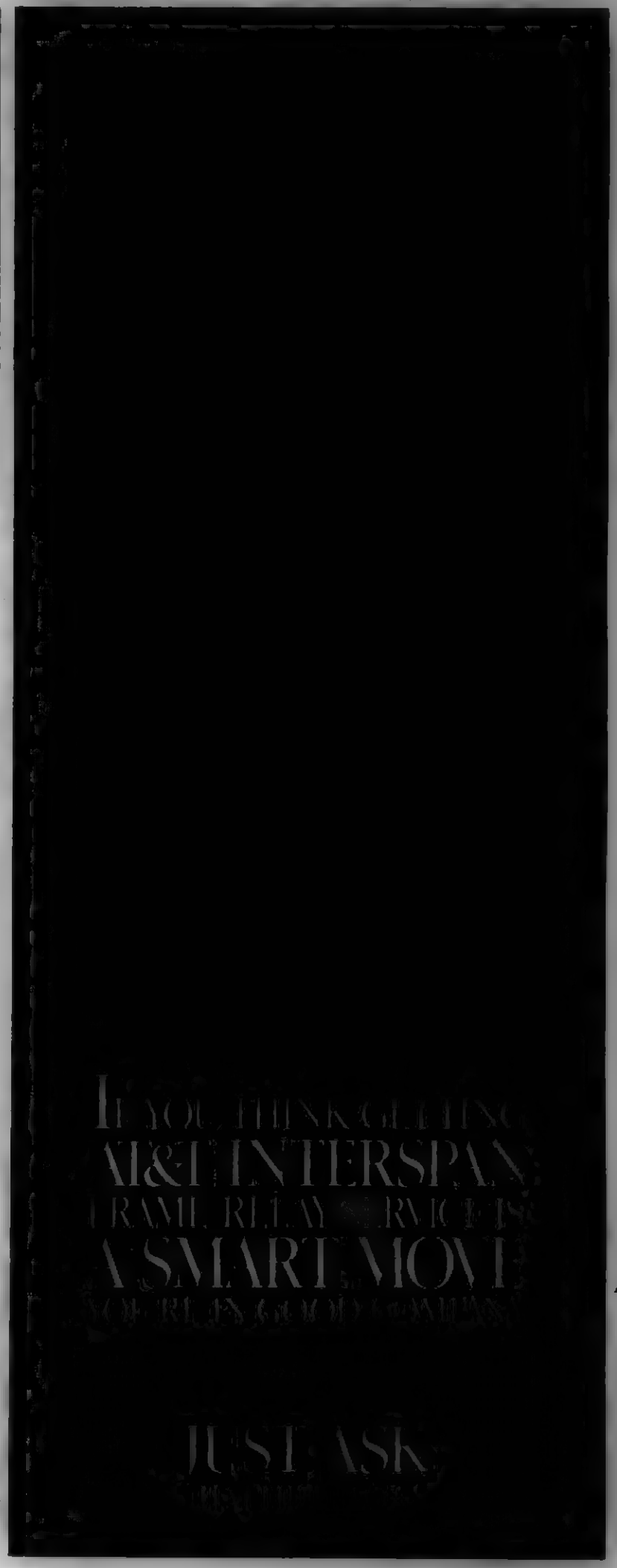
"It depends on the attitude of the people who use it," said Dick Shaffer, publisher of the "ComputerLetter" and computing's answer to George Will.

Maybe Shaffer is right, and we'll all develop good attitudes toward being available at all times and in all places.

Good attitudes guarantee nothing, though. Anyone who has ever lost a plane ticket would certainly have a better attitude if airlines would simply cancel out the old ticket and issue a new one, but they won't, despite their well-established technology.

Changing attitudes may require more than a little magic.

Fitzgerald is a *Computerworld* senior writer.



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Mainframe links

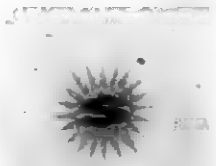
Phaser's assets rise at rival firms

By Elisabeth Horwitt

Phaser Systems, Inc., Ray Noorda's long-struggling NetWare-to-SNA software company, officially ceased operations last month, with Syzygy Communications, Inc. and BlueLine Software, Inc. divvying up its assets and marketing rights. Financial details of the purchase were not disclosed.

Noorda, Novell, Inc.'s chief executive officer, bought Phaser Systems' original incarnation, Dialogic Systems Corp., in the late 1980s and helped it out of Chapter 11. However, Phaser Systems never really took off from there.

"Our feeling is that Phaser tried to sell technology rather than products to users, rather like selling nuclear fusion as a way for ma and pa stores to solve their energy problems," said Steve Jackowski, Syzygy's vice president and chief technical officer.



Bargain deal
Syzygy's chief technology officer figures the Phaser deal gave his company about $50 million worth of other people's investments in NetWare-to-SNA software development.

Share and share alike

Syzygy and BlueLine will share the rights to market Phaser Systems' products, which provide NetWare users with links to IBM mainframes, virtual disk capabilities and connections between NetWare local-area networks based on IBM's PU2.1 and LU6.2 protocols.

Syzygy plans to incorporate Phaser Systems' software into middleware products it is developing to integrate IBM mainframe and LAN installations, Jackowski said. Syzygy plans to be an OEM for the software, which will allow mainframe users and CICS applications to transparently access databases and files on NetWare servers, Jackowski said.

BlueLine plans to use Phaser Systems products to speed up its plans to extend its Vital Signs for VTAM, its IBM Systems Network Architecture (SNA) network performance monitor, to the LAN environment, according to Willard Cecchi, the Minneapolis company's president and CEO.

Likely applications for a LAN version of Vital Signs for VTAM include centralized backup as well as monitoring of NetWare servers' performance, Cecchi added.

BlueLine hopes to announce a product within three months, Cecchi said. BlueLine also announced an alliance with Novell that will primarily integrate its LAN management products with Novell's NetWare Management System.

Although personnel were not part of the deal, both companies said they were taking on a number of former Phaser Systems people.

SynOptics unveils ATM strategy

By Martin LaMonica

SynOptics Communications, Inc. recently detailed in a press release to the French press its strategy to integrate Asynchronous Transfer Mode (ATM) technology into corporate backbone networks — a plan it intends to lay out for U.S. users this week at Interop Spring '93.

The Santa Clara, Calif., firm will introduce its LattisCell family, which includes a 16-port ATM switch and two network management applications that will be available in the third quarter.

SynOptics also reportedly plans to ship an ATM adapter card at the end of the year that allows Sun Microsystems, Inc. SBus computers to run ATM over very high-speed, fiber-based Synchronous Optical Networks.

The LattisCell switch supports dedicated 155M bit/sec. speeds across a 5G bit/sec. internal switching matrix. Marketed as a backbone for distances of about a mile or for smaller fiber-based workgroups, the switch will cost about $1,500 to $2,000 per port, depending on whether customers are running copper or fiber cabling. This compares with $3,000 to $4,500 per-port prices from ATM local-area network vendors Fore Systems, Inc. and Adaptive Corp.

The $3,495 LattisCell Network Management Application is based on the Simple Network Management Protocol and Sun's SunNet Manager platform. It is said to integrate the management of Ethernet, Token Ring and Fiber Distributed Data Interface LANs feeding into SynOptics' ATM switch.

SynOptics' $4,495 Connection Management System connects directly to Sun SPARCstations to administer switched and permanent virtual circuits.

LaMonica is an IDG News Service correspondent, European bureau.

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THE WORLD

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N.Y. saves big with client/server

In Brief

Merger closes

Raxco, Inc. and UIS Ltd., two providers of system management software for Digital Equipment Corp. platforms, announced the completion of a merger. The new company will be called Raxco, Inc., and its combined product line will support DEC VAX/VMS, Alpha/Open VMS and Unix environments, officials said.

Multiuser Unix system

Norwood, Mass.-based systems integrator Innovative Information Systems, Inc. has developed and installed a multiuser Unix system based on The Santa Cruz Operation's Unix and Compaq Computer Corp. hardware to support 55 offices of parent company CDI Corp. CDI is a Philadelphia-based, $900 million technical human resources company. The system provides database information supporting CDI's marketing and recruiting operations.

By Michael Vizard

As information systems departments begin to navigate the complexities of deploying client/server applications, it is becoming more important for IS managers to find role models.

One pioneer in the use of the client/server computing model is the Employee Benefits Division of the New York State Department of Civil Service, which now handles on-line claims from more than 1.2 million employees. Implemented in 1990, the solution chosen by the benefits division comprises an employee management system based on financial accounting software from PeopleSoft, Inc. in Walnut Creek, Calif.

The PeopleSoft client/server solution generates an estimated $1 million savings annually by reducing the maintenance and administrative costs associated with maintaining the previous paper-based system. Created in the 1970s, the older terminal-based system was tied to an IBM mainframe.

"In government, you only get a chance to make significant changes once in a while. So when you get the chance, you make as big a jump as you can without jumping off the cliff," said Henry J. Nahal, director of telecommunications and information management at the department.

To allay fears associated with adopting a new architecture from start-up, Nahal said he negotiated a contract with PeopleSoft that basically said, "no work, no pay."

The server portion of the PeopleSoft software runs on top of an IBM DB2 database running on an IBM mainframe at the offices of First Data Corp., which provides time-sharing services in Omaha. The client systems, which consist of PCs running Microsoft Corp. Windows, are linked to the IBM mainframe using T1 leased lines.

In Albany, N.Y., the division has 150 80386SX- and 80486SX-class PCs linked by a Vines network operating system from Banyan Systems, Inc. in Westboro, Mass. Linked to Albany via 9.6K bit/sec. modems are 275 client PCs at various state agencies and local municipalities.

"We've evaluated purchasing servers ourselves, but the cost of time-sharing on the IBM mainframe is still a much cheaper alternative overall," Nahal said.

"We have a Unisys mainframe here, but PeopleSoft doesn't run on a Unisys mainframe — at least not yet," Nahal added.

The department cuts down on costs associated with accessing the server by processing data on the client using the PeopleSoft client software on Windows PCs.

"Because the administrator is typically working on-line with the employee, we can make sure all the data required is entered correctly the first time. These claims usually require 20 to 30 pieces of data spanning four or five screens," Nahal said.

"We now have an ad hoc query capability we never had before, and the data is more reliable because it was processed on-line. It use to take up to six weeks to make any kind of change to the data. We wanted an electronic paperless system to process claims," he said.

Today, the new systems allow users to process claims on-line while also verifying employee eligibility requirements.

This is particularly important because each labor union has a different contract with the state providing different levels of coverage and deductibles.

New York, page 89

ON SITE

New York State Department of Civil Service

Challenge: To convert paper- and mainframe-based system to on-line, paperless office system that is capable of supporting ad hoc queries.

Technology: PeopleSoft client/server accounting software running on PCs linked to a DB2 database on a remote IBM mainframe.

Results: A more flexible system that offers tighter controls and quicker response to employee claims. Overall savings is estimated at approximately $3 million a year.

Bridging the IS Continental Divide

Systems integrators help multinationals

By Thomas Hoffman

■ Multinational user companies with transcontinental information systems operations seem to be finding it easier to work with centrally located systems integrators. Users said they prefer to have a single point of contact for equipment and services rather than separate suppliers on a country-by-country basis.

"We're faced with having installations in quite a lot of different countries. If we try to source our hardware needs locally, it takes a lot of effort," said Ian Butterworth, regional vice president responsible for international information technology at Holiday Inns, Inc. in Brussels.

Holiday Inns' primary data center is located in Atlanta, but the hotelier maintains IS operations in its management offices in Brussels and Hong Kong, as well as in each of the company's 200 international hotels. To better support these operations, Holiday Inns relies on International Computer Group (ICG), a Paris-based systems integrator.

Opening up

"Anybody who offers IT solutions to businesses is going to have to step up to the bar with more international offerings. There's going to be more growing coordination of services deliveries across geographies and across continents," said Steven Clancy, associate director of desktop support services at Dataquest Worldwide Services Group in Framingham, Mass.

ICG formed an alliance in January with Inacom, Inc., an Omaha computer reseller and systems integrator. The alliance was designed to allow U.S.-based multinationals to coordinate the design, purchase, installation and support of their global information systems through one source — Inacom.

Butterworth said Holiday Inns used ICG last year to install IBM's OfficeVision systems in its Hong Kong offices. ICG coordinated the effort from Paris by using a slew of computer equipment suppliers in the Pacific Rim.

> Multinational user companies are finding it easier to rely on systems integrators that provide a single point of contact for IS equipment and services.

Butterworth said the arrangement suited him just fine. "For me, it makes the difference between dealing with one contact and five different hardware vendors. It's a hell of a lot easier to deal with one central contact, and it helps us focus on where our IT spending is going," Butterworth noted.

Far-flung offices

Twentieth Century-Fox Film Corp. takes a similar approach to global IS projects. The Los Angeles-based motion picture producer has 30 offices worldwide, with 15 of those requiring information systems.

According to Jean-Pierre Salib, director of systems responsible for all foreign subsidiaries in MIS, Twentieth Century-Fox has used ICG as a single point of contact for hardware and services in France, England, Holland, Italy, Spain and Germany. Using a central IS provider has helped the filmmaker in several key areas, Salib said.

Because Twentieth Century-Fox works exclusively with ICG to provide equipment and services internationally, the vendor is aware of the user's standard hardware and software guidelines. Twentieth Century-Fox, Salib said, uses Compaq Computer Corp. PCs, workstations and file servers and Hewlett-Packard Co. LaserJet printers throughout its organization.

Salib, who is based in Paris, said it is easier for him to deal with ICG in Paris than it is to deal with other vendors across different time zones. Plus, because Twentieth Century-Fox does not have an IS staff for its smaller offices in Europe, the company relies on ICG to provide services such as network administration.

Analysts said they believe other vendors will eventually be forced to adopt the Inacom/ICG approach as a centralized equipment and services provider.

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Minis bridge gap between city, county

HP 3000s enable users to share resources easily

By Mark Halper
VANCOUVER, WASH.

City governments do not always get along so swimmingly with the government of the county that surrounds them.

And the discord that characterizes political relations between city folk concerned with urban matters and county residences focused on suburban or rural affairs can easily extend into the computer room if the two sides have to share resources, noted Richard Maw, director of the Vancouver/Clark County Washington Consolidated Computer Center.

Richard Maw *chose HP minis to end mainframe congestion*

As a case in point, Maw recalled that the city of Vancouver and Clark County used to share an overburdened IBM 3031 mainframe.

"If the city or county wanted to put on a new program, the other entity would say, 'Wait a minute, that could affect *my* response time,'" he said.

To each their own

So Maw devised a simple solution to enable Vancouver to share data with its county brethren. He purchased separate Hewlett-Packard Co. minicomputers for each and linked them together.

The dual HP 3000 computers enable each party to load its own programs without affecting the other. At the same time, the two sides can access data they often need from each other, using an HP software program called Network Software.

Converting from an IBM environment to an HP Turbo Image database running under the HP MPE operating system, however, was no simple task.

Vancouver/Clark County started making the switch in 1984, long before many of today's modern conversion tools were available. Maw remembered arduous hours of manual conversion of the city and county's programs, including payroll, tax assessment, general ledger, purchasing, utility billing, automobile licensing, elections and animal control.

"We simply rewrote every program," he said. "It took us over a year."

Making matters worse, the computer center hired a systems integrator to help with the conversion only to have the integrator back out nine months into the job.

"They found they had underestimated the job," said Maw, who declined to identify the integrator. Vancouver/Clark County subsequently replaced it with Telstar, Inc., a Boise, Idaho, integrator.

The conversion also prompted some of the 28 information systems staff members in Maw's department to leave, mostly because they were uncomfortable adapting to life in a minicomputer environment.

"I lost some staff in transition," Maw recalled. "Some elected to stay in the mainframe world."

Now, eight years and several client/server additions later, the workday life for Maw's staff — which now totals 11 individuals — has changed substantially.

His department spends little of its time undertaking the system programming and data entry chores that were its raison d'etre in the mainframe era.

Now they devote much of their efforts to PC support and application programming, Maw said.

And the technology landscape has shifted in a client/server tilt, a move up from the rudimentary multiuser system that the city/county operated when the HP 3000s first arrived.

According to Maw, the 3000s initially supported about 450 terminals and printers.

About five years ago, Vancouver/Clark County began adding PCs, connected in islands of local-area networks sharing spreadsheet and word processing applications within groups. But the system did not distribute the work across the entire computing milieu.

That began to change about two years ago, Maw said, as Vancouver/Clark County began installing servers distributing applications and files among PCs running DOS. Some of the servers are HP Unix workstations, and others are PCs running LAN Manager, Maw said.

Over the nine years, Maw has upgraded the city's 3000 about four times. On the county side, he has implemented two upgrades and added a second HP 3000 to support what he said has been "phenomenally fast" growth of population and activity. The population of the combined entities is roughly 305,000.

Meanwhile, three years ago, a separate division in the county installed an HP 9000 Unix minicomputer to run a geographic information system (GIS) for mapping purposes.

Maw said the group chose a Unix box instead of MPE because the GIS software it selected ran only on Unix.

Why, then, did it decide on an HP Unix box?

According to Maw, the county decided that an HP Unix machine would have an easier time communicating with an HP 3000 than would another brand of Unix.

Despite Unix vendors' claims of "openness," cross-brand communication can be tricky, especially when a relatively proprietary machine like the HP 3000 is part of the mix.

ON SITE

Vancouver/Clark County Washington Consolidated Data Center
Vancouver, Wash.

Challenge: To allow city and county governments to share data and employ staff to operations other than mainframe system programming.

Technology: HP 3000 minicomputers replaced an IBM 3031 mainframe.

Results: Officials say they now spend little time on system programming, and files needed by the city and county are more easily accessed.

N.Y. saves big with client/server

CONTINUED FROM PAGE 87

Since deploying the system, Nahal has expanded it by linking pharmacies directly with the benefits office in Albany. His long-term goal is to bring doctors' offices and hospitals on-line as well.

Although Nahal said he is pleased with his current client/server implementation, the process of moving to the new computing model was not entirely painless.

"We were lucky. There were a few wounds, but none of them was mortal," Nahal said.

Difficult issues

Like most IS professionals, Nahal has struggled with the memory management issues created by running Windows on PCs and the performance issues created by splitting applications across processors on a network.

Nahal said he has two people dedicated to maintaining PC applications in the Albany office.

To reduce the costs associated with maintaining PCs at remote sites, Nahal has mandated that those PCs be restricted to running only PeopleSoft client software.

In addition, Nahal said, performance was initially hampered by the single-threading nature of the SQL interface to DB2, which was provided by Gupta Corp.

"It use to take three calls to establish a link to the database, and nanoseconds quickly add up to seconds. Today, Gupta establishes the link with one call, so it's much faster," Nahal said.

Nevertheless, Nahal said he realizes that flexibility has come at the expense of speed.

"The PeopleSoft application will never be as fast as a 3270 application, but it's a trade-off."

"The most important thing you have to remember [is] that client/server is a cultural change. You can train people all you want, but if somebody has been doing a job one way for a lot of time, it takes time for them to master the new system. You have to set up help desks, make people PC-literate and realize you're essentially running a customer service application," Nahal said.

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Software measurement

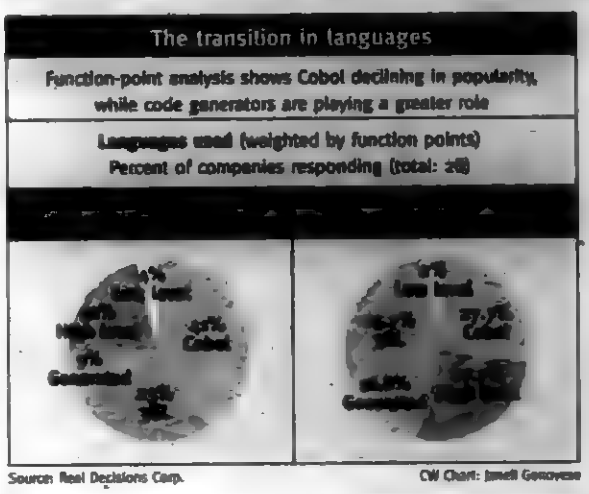
The lines-of-code alternative

By Garry Ray

How do you move toward "continuous improvement" when you do not know what to improve?

You can't, of course, which is why growing numbers of application development managers are adopting a software measurement technique called "function-point analysis."

Although it is not a panacea for all development problems, function-point analysis is helping to improve development techniques at a rapidly expanding list of companies, according to its advocates. Users claim the metric provides better estimates of their software assets, outsourcing alternatives and development costs.



This is the '90s

Devised by IBM statistician Allan Albrecht in the early 1980s, function-point analysis is an alternative to the mainstay lines-of-code (LOC) metric widely used throughout the 1970s and 1980s.

"In the days of one machine and one language, lines-of-code was not a bad thing," said Andy Belden, program manager of the corporate information technology group at General Electric Co. in Fairfield, Conn. He is also president of the fast-growing International Function Point Users Group (IFPUG) in Columbus, Ohio.

Belden explained that with the LOC technique, development managers counted the lines of code used in a Cobol or PL/1 project. The issue was "how much code are we producing," he said.

IFPUG membership has increased 150% — to 500 companies — in the last four years.

But today's "plethora of languages makes it difficult to use LOC," Belden said. Simply stated, fourth-generation languages (4GL) can do more than Cobol or C, in fewer lines of code.

Function-point analysis uses the methodology defined by Albrecht and refined in IFPUG's "Counting Practices Manual" to determine the number of inputs, outputs, inquiries, files and external interfaces used in an application. It also provides a set of conversion factors that allow older LOC measurements to be converted to function-point measurements.

For example, a 1,000-line Cobol program would have about 10 function points, while a 1,000-line C program would have about eight.

According to A. Duane Hastings, a Morristown, N.J., consultant to the financial services industry, the benefit of the function-point technique is that companies "can begin to quantify [the development process] with some degree of language independence."

On a wider scale, a standard productivity measure allows companies to compare their development efforts with others that are using function-point metrics.

That is the thinking at Real Decisions Corp., a Darien, Conn., consultancy that has been tracking development productivity since 1989 using function points, said Robert Waldman, director of application development and support.

With a database of 57 development groups in 43 client companies, Real Decisions has used the metric to provide comparisons in a number of areas.

For example, in a recent seminar, Waldman said that function-point analysis indicated that "the most effective developers are those who have had new development technology in place for three to four years, and who are using it within a corporate methodology."

At the same time, Waldman said, "people who bring CASE tools into the shop [initially] see a significant drop in productivity."

Total assets

Other companies are reviewing their inventory of production applications — including Cobol, Fortran and 4GL programs — to determine their total asset value.

After three years using function points, Walter Viali, manager of Texaco, Inc.'s Information Systems Enabling Center, said the technique "is showing us the value of our software assets when the value of information technology is being questioned in general."

Viali said function-point measurement is also crucial to the larger corporate mission of total quality management, often cited by others using function points.

Rich Finkelstein

Driving RDBMSs

In order to work with multiple types of back-end database servers, most front-end tools use SQL drivers. Typically, a vendor has to build one driver for each database server because each server has a unique SQL language implementation.

This makes building drivers expensive. In many cases (such as Microsoft's Access drivers) the vendor does not want to go through the expense of optimizing the drivers for a particular database server.

One way vendors hope to address this problem is by designing a standard API that can be used to access any database server. The vendor

Finkelstein, *page 92*

EZshell eases Unix development

By Melinda-Carol Ballou

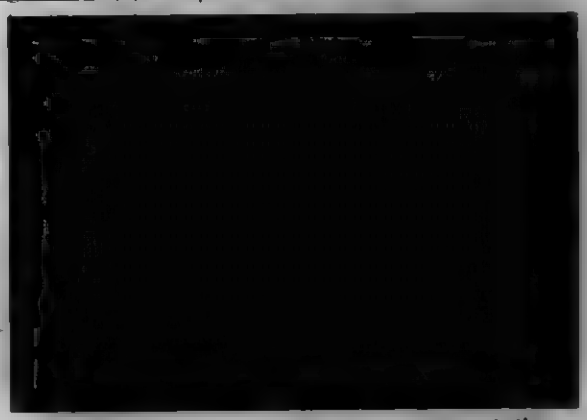
For systems managers and developers weary of arcane, awkward Unix commands and interfaces to the operating system, Touch Technologies, Inc. this month introduces EZshell — an advanced, intuitive shell that provides editing and command functions

EZshell offers greater functionality than is available with existing shells such as "sh," "csh" or "ksh," which are unforgiving about spelling errors and provide minimal assistance regarding command syntax, company officials said.

"It takes a lot of time to type commands and look up things in the manual, and EZshell does it for you," said Paul Falstad, a senior product and development engineer at Touch Technologies.

EZshell offers single and multiline editing capabilities, full command recall, extensive command history search capabilities and single-keystroke intelligent command completion. Other features include full "vi" and "emacs" compliant editing, spelling correction, information prompts and shorthand syntax for ease of use and rapid development.

Users agreed that EZshell facilitates the development process. "It speeds up working with the systems [via] command completion capabilities — you just hit the tab and it assigns the most likely command you need to use without having to type out the whole thing," said Tim Talbert, a beta-test site user at a major aerospace company in the Midwest. "It will also list options for a command."



EZshell offers *greater functionality than existing shells*

Because EZshell is upwardly compatible with "ksh" and "csh," Unix shells, files and shell scripts developed with them will continue to work with EZshell, officials said.

EZshell is priced at $595 for workstations and at $1,495 for servers and multiuser systems. The product is shipping now for Digital Equipment Corp. VAX and DECsystems running Ultrix, and for Sun Microsystems, Inc. SPARCstations and servers running the Sun operating system. Development is under way for other platforms.

Finkelstein

CONTINUED FROM PAGE 91

or customer could then use this one interface and not have to worry about developing individual drivers for each target database server — as long as the RDBMS vendor provides a program for translating the standard API commands into the RDBMS-specific commands.

The idea sounds great in theory, but there is probably more science fiction here than reality.

Before it is possible to implement a standard, there must be a standard to implement. The goal of the SQL Access Group was to produce such a standard. However, several vendors have taken matters into their own hands, announcing competing standards that are "based" on the SQL Access Group standard with "extensions." Among these are Microsoft's ODBC, Oracle's OracleGlue and Integrated Database Application Programming Interface, which is sponsored by Borland, IBM, Novell and WordPerfect. All of these groups are vying for control of the standard, so the result is that there is no standard.

But even if there were a standard, it is clear that no standard can be broad enough to encompass all possible backend database server functions.

As time progresses, database servers and their respective SQL languages are looking less and less alike. Most vendors are augmenting their SQL product with nonstandard procedural capabilities as well as object-oriented extensions. This will make it even more difficult to link applications to database servers using standardized interfaces.

In the end, customers should look for front-end products that are optimized for their chosen database server. It is unlikely that any vendor could build drivers that work well with more than three or four database servers, so any vendor who claims support for "50" RDBMSs must be looked at with some degree of suspicion.

However, if the software tool is simple or is only reading the database (such as a decision-support tool), it may be possible to build interfaces to a larger number of RDBMSs.

Potential customers should carefully review the quality of the RDBMS interface and speak to references. It is important to find production applications so that it is possible to properly judge the performance and stability of the product.

Finkelstein is president of Performance Computing, Inc., a DBMS consultancy in Chicago.

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Segue tool eases quality testing

By Garry Ray

With its recent release of QA Partner, Seque Software, Inc. in Newton, Mass., intends to make it easier to perform software quality assurance testing.

The program takes a different approach to graphical user interface testing than its predecessors, according to company officials. Rather than comparing on-screen bit maps to stored reference screens, the tool uses its built-in 4Test scripting language to communicate with the underlying messaging system of the graphical environment. For example, the scripting language can "ask" the environment whether a particular dialog box exists on the screen.

QA Partner is available now for Microsoft Corp.'s Windows, Apple Computer, Inc.'s Macintosh and the Open Software Foundation's Motif. It will also be released for SunSoft, Inc.'s Open Look, IBM's OS/2 and Microsoft's Windows NT later this year. Pricing ranges from $1,495 to $4,995.

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Application development tools

Bailey and Bailey Software, Inc. has introduced Version 4.0 of Protoscreens, a prototyping product.

The product includes an automated interface evaluation component that records, real user responses, collecting nonsubjective data. The information determines the best balance between user productivity and user preference, the company reported.

Protoscreens features include code generation and a Photo utility. On-line reference material is also provided.

Photoscreens runs on any IBM PC or clone and costs $225.

▶ *Bailey and Bailey Software*
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Micro Focus has announced Micro Focus Cobol/2 for Unix with Toolbox on Data General Corp.'s line of Avilon servers.

The product includes a visual source-code debugger called Advanced Animator and a text editor for Cobol programmers called Micro Focus Editor. Also provided are Screens, an interactive screen painter; Session Recorder, a keystroke recorder; and playback utility. Multiple dialect support and conversion tools designed to ease the move into open systems for proprietary Cobol dialects are also included in the compiler, the company reported.

Pricing begins at $5,000.

▶ *Micro Focus*
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(415) 856-4161

IntelligenceWare has released Iconic Query, an iconic database access tool.

According to the company, a what-you-see-is-what-you-get query approach is introduced that enables users to point and click at visual scenes instead of using a query language. A library of icons is included that can be assigned to a variety of tables. Variables such as terms of sale and field items can be related with a Hypertext capability. Bit maps, drawings and icons represent relationships and entities. The product is currently available on IBM PCs and compatibles that include Borland International, Inc.'s dBase and Paradox drivers.

Iconic Query costs $290.

▶ *IntelligenceWare*
5933 W. Century Blvd.
Los Angeles, Calif. 90045
(310) 216-6177

Momentum Software Corp. has added AIX/ESA support to its XIPC distributed application development tool set.

According to the company, the product uses standard mechanisms such as shared memory segments, message queues and semaphores for multitasking InterProcess Communication (IPC) located in various forms of IBM's OS/2, Unix and VMS. IPC functionality is added, and asynchronous functionality is provided. Event-driven graphical user interfaces such as Microsoft Corp.'s Windows and the X Window System are supported.

XIPC is priced from $46,200 with AIX/ESA support.

▶ *Momentum Software*
401 South Van Brunt St.
Englewood, N.J. 07631
(201) 871-0077

Code libraries

Classic Software, Inc. has released Version 1.0 of the VBtrv Custom Control Library.

The product is an access library that can be used with the Novell, Inc. Btrieve Record Manager running under Microsoft Corp.'s Visual Basic for Windows. According to the company, the complete functionality of Btrieve Version 5.1 is provided, and VBtrv incorporates event-logging facilities and other extensions to Btrieve needed for commercial-quality database applications.

Features are available via library function calls or through toolbox controls, and the Visual Basic program accommodates both the library interface and the custom control interface.

VBtrv Version 1.0 costs $249.

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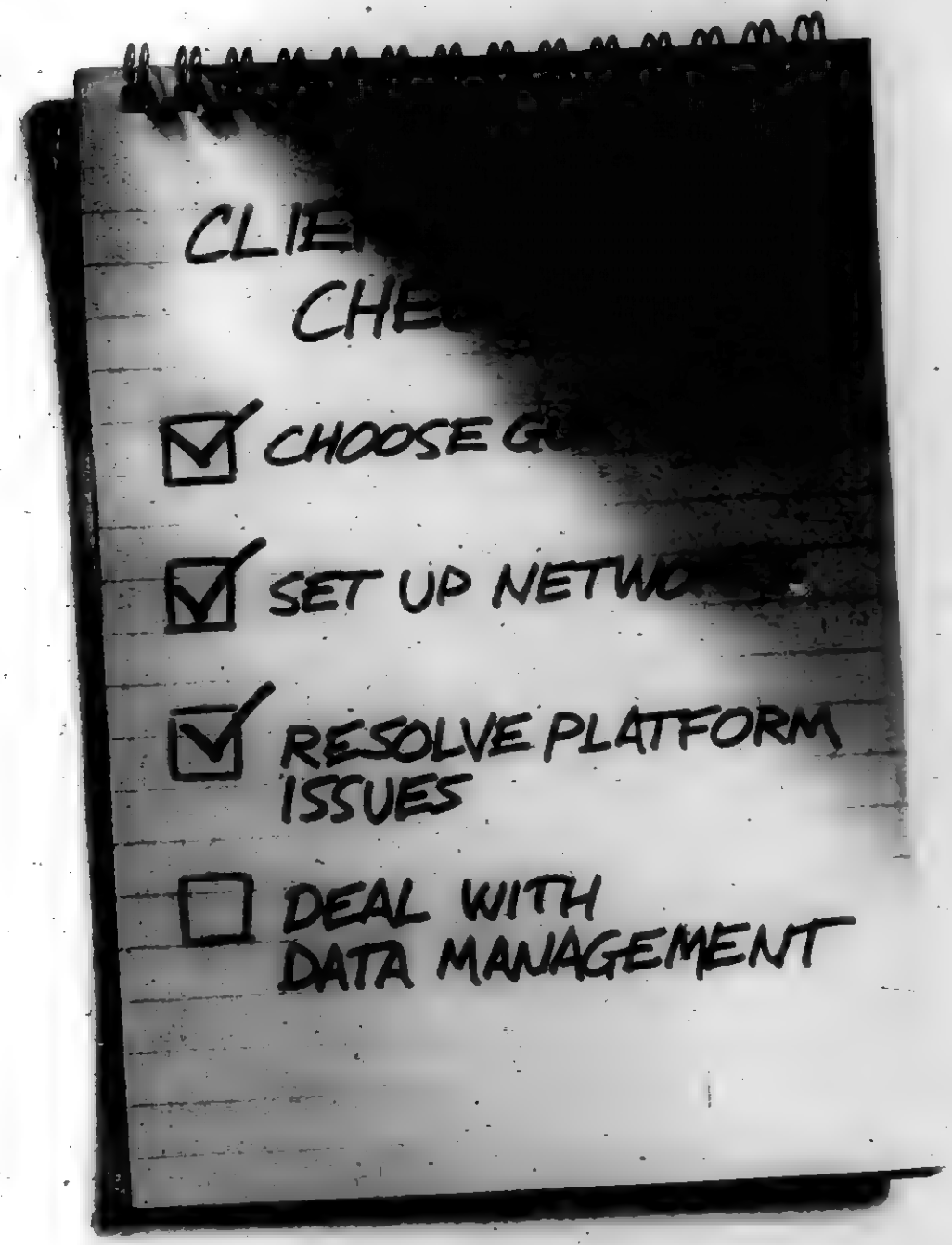

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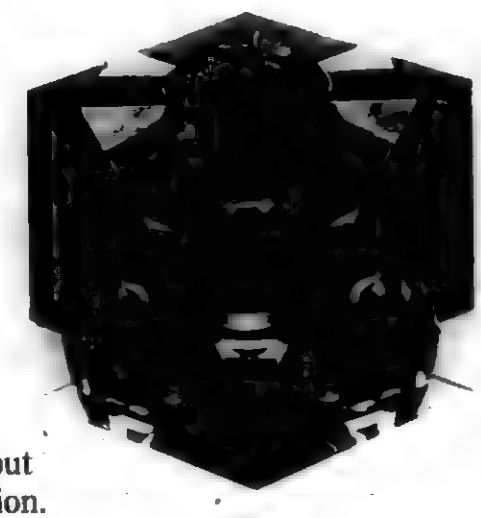

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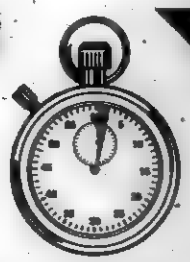

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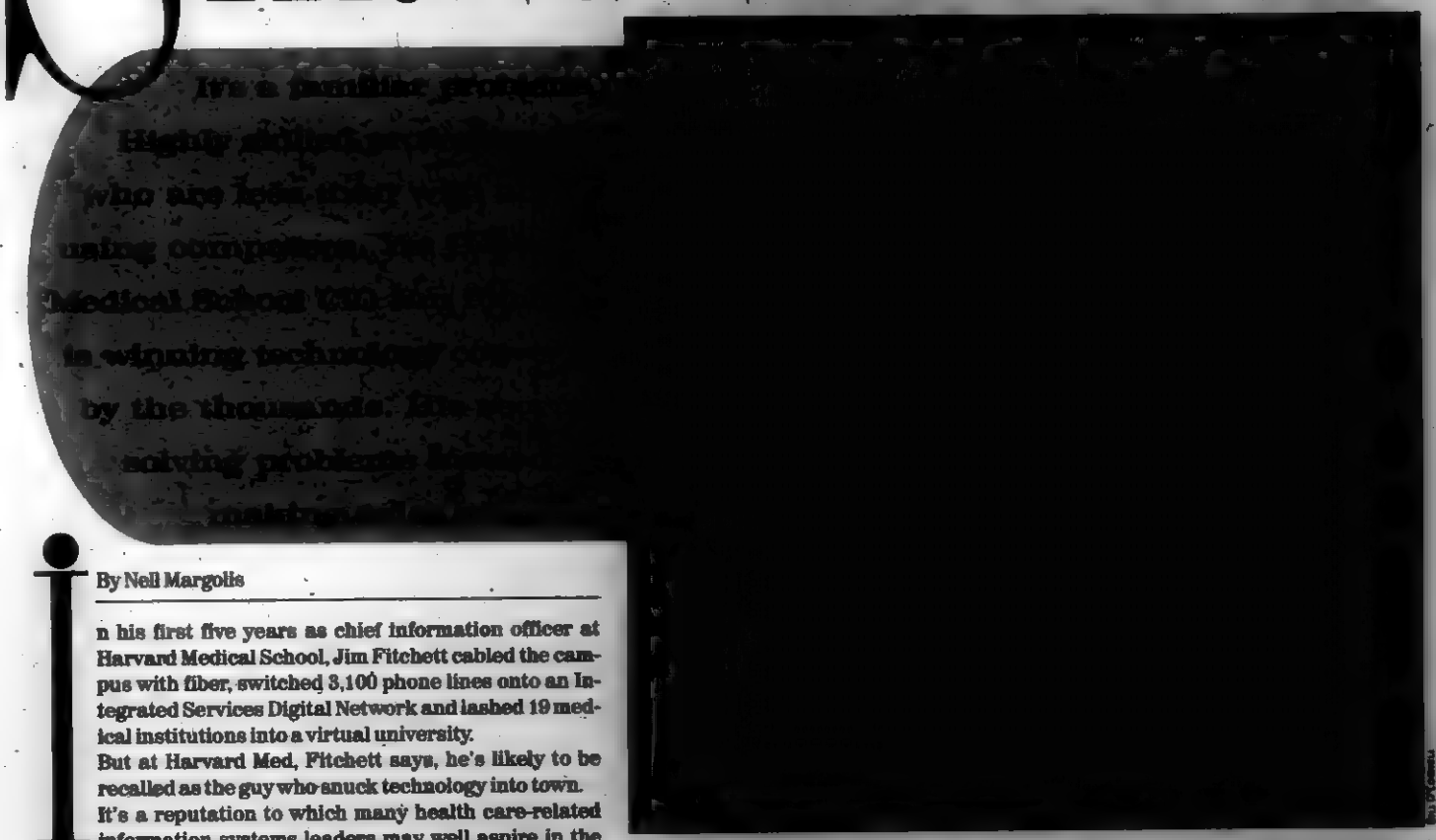


By Nell Margolis

In his first five years as chief information officer at Harvard Medical School, Jim Fitchett cabled the campus with fiber, switched 3,100 phone lines onto an Integrated Services Digital Network and lashed 19 medical institutions into a virtual university.

But at Harvard Med, Fitchett says, he's likely to be recalled as the guy who snuck technology into town.

It's a reputation to which many health care-related information systems leaders may well aspire in the next several years, as they discover what Fitchett found out when he arrived at Harvard in 1988: While erudite in other areas, doctors and medical researchers often don't talk tech.

"Technology is just not part of the culture here," says Audrey Bernfield, who was shocked when she left computer-savvy Stanford University to take a job as director of enrichment programs at Harvard Medical School. "People here seemed to feel that if they could pick up their telephones, call peers they already knew and ask 'Who's doing cellular biology research?', who needed computers and databases?"

Holding back progress

The problem isn't new, solved or limited to Harvard Medical School (or to medicine, for that matter). On the contrary, many industry observers see medical professionals' unfamiliarity with computers as a huge obstacle for thousands of IS leaders now poising to introduce information technology into the troubled health care arena.

One participant at a late February meeting of the Jackson Hole Group — credited with devising the Clinton administration's managed-care scenario — commented that "health care was 20 years behind" other major industries' use of IS, says Alice Lusk, a vice president at Dallas-based outsourcer Electronic Data Systems Corp. "I would argue more like 50," she says.

How do you surmount resistance like that? Fitchett, who was hired from his previous post as IS vice president at St. Lawrence University in Canton, N.Y., with a mandate to put some serious IS clout behind Harvard Med's gilt-edged academics, says he didn't try to tackle the issue head-on.

Harvard's Jim Fitchett: *'What it all boils down to is . . . collaboration'*

"I didn't have to sell users on technology," the executive says. "What I had to do was find out what problems they needed to solve and work out ways to get there from here. If the ways were technological, well, that didn't have to be the up-front emphasis." And any whizbang technology that didn't address a crying need at Harvard Med simply dropped out of the agenda.

In fact, Fitchett says, the list of truly pressing needs translated into one word: "Communication."

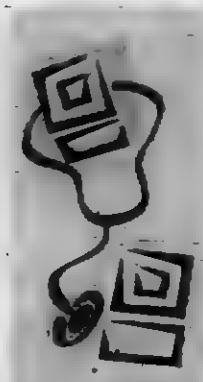
Information, of course, is the lifeblood of medical research — especially information about what research is being conducted where and by whom and possible sources of funding. Fitchett knew the potential payoffs of electronic mail could be huge, but his enthusiastic proposals died on the drawing board. So he stopped plugging the idea and instead plugged into a communications network already up and running ultra-reliably: the faculty grapevine.

First (and most importantly), Fitchett enlisted well-regarded peers to sell the school's administration on E-mail. Then he set up two pilot studies, sat back and waited for word to spread.

Medicine, *page 98*

Strong medicine

CONTINUED FROM PAGE 97



Messaging up a storm

Users across LMA Net — the Novell-based network that forms the backbone of the 29-institution virtual university spearheaded by Harvard Medical School CIO Jim Fitchett — through a series of gateways that allow them to communicate regardless of disparate hardware platforms. Since January 1992, Fitchett says, Transmission Control Protocol/Internet Protocol has been LMA Net's fundamental communications protocol. Last year at this time, he says, Internet messaging traffic out of Harvard averaged 400 messages per day. By July, the number was 10 times that. By October, Harvard was logging some 15,000 transactions.

"What started getting around was that suddenly, queries that might have gone days without a response were being answered within four hours. Suddenly, people who had questions in the middle of the night could get answers."

Today, Fitchett estimates there are some 2,500 users on the Lotus Development Corp. CC:Mail system, adding proudly: "They tell me they couldn't live without it."

That isn't simply because online messaging is portable and speedy, Fitchett says. "E-mail has completely changed the culture around here. The span of control researchers have over their work has expanded enormously."

Linking isolated experts

Unlike many leading medical schools, Harvard does not have its own teaching hospital. Instead, it relies on a series of affiliated institutions in the greater Boston area, with a staff of more than 10,000.

"With a setup so huge and geographically dispersed," Fitchett notes, "no one was able to fully take advantage of the vast expertise that was potentially available but practically unreachable and often even unfindable."

Enter the CIO with the Longwood Medical Area Network (LMA Net), an Ethernet-based network that ties Harvard and eight affiliates together into a virtual university. Ten additional institutions are linked through E-mail and shared databases.

Fitchett's 32-person IS department has spent the last three years refining and expanding the network, which makes wide-scale information sharing available via E-mail and gives users access to the Internet's worldwide academic research network and a growing list of libraries and databases.

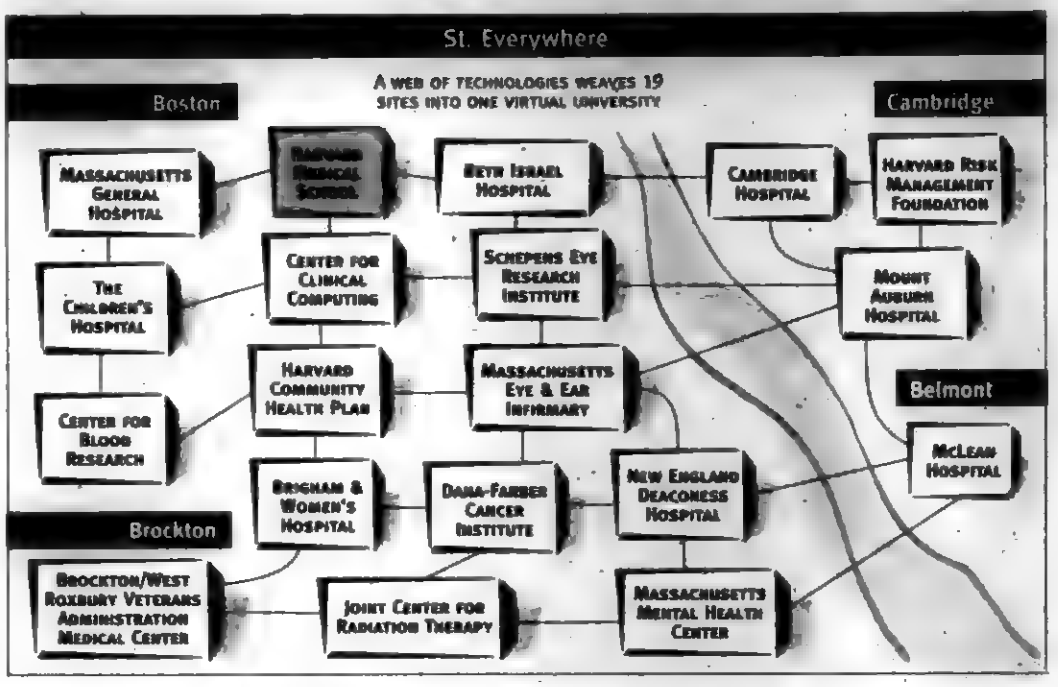
One of the biggest hits was SIMON, a networked research database (see story below). Communication across LMA Net also has permitted the creation of joint programs in the nuclear medicine, neonatology, alcohol and substance-abuse disciplines and many others.

"For scientists now, it's almost expected that you have an E-mail address," says Dr. Lawrence C. Madoff, a bacterial vaccine researcher at Brigham and Women's Hospital.

"What it all boils down to," Fitchett says, "is one critical activity: collaboration. We didn't invent it — but we made it instantaneous."

Fitchett says converting users to technology depends in part on faith in the CIO. "Users have to have the sense that, 'Hey, this guy is on our side and he knows what he's talking about.'"

Perhaps the best way, he says, is to enlist a knowlegeable champion. "You've got to find that ... key person who has significant credibility with the people you're trying to reach — and then you've got to trust him," he says.



On the SIMON project, for example, Fitchett and Bernfield enlisted the help of S. James Adelstein. As executive dean for academic programs at Harvard, Adelstein commanded the kind of insider respect that wasn't readily accorded the CIO from St. Lawrence University or the projects director from Stanford, each of whom bore the additional stigma of hailing from the alien world of technology.

Fitchett tried to keep Adelstein's role simple. "All he had to do was talk to people and use the technology himself," he explains. "The very fact that he showed interest was a tremendous credential for the project."

Nearing his fifth year at Harvard Med's CIO office, Fitchett says he believes he has boosted his credibility, but not so much that users will follow him unquestioningly. "If nothing else, a CIO is a salesman," he says. "It's appropriate that there be checks and balances."

Despite his successes, reminders of techno-oblivion still lurk beneath the ivy. That point was driven home recently when a faculty group was introduced to a new bibliographic search facility that provides easy on-line access to some 6,000 scholarly journals.

"As I expected, the audience was thrilled with the idea that so much information would be at their fingertips," Fitchett recalls. "I thought we had a hit. But then, one faculty member asked, 'Do I need a computer to use this?'" ■

Even the early implementation of LMA Net is a big improvement over the borrowed Unix-based, dial-in system his lab previously used, Madoff says. "You'd have to keep dialing if lines were busy."

Today, Madoff uses the network, among other things, to connect his Apple Computer, Inc. Macintosh with genetic database servers at Massachusetts General Hospital and to find colleagues doing similar research. He looks forward to using the Internet to participate in a national multicenter study on Group B Streptococcus.

A not-so-simple SIMON

One of the most dramatic signs that Harvard Medical School's formerly technology-shy users have taken to E-mail is SIMON, a new medical research community database.

Introduced last fall, SIMON now has some 2,700 users, according to Audrey Bernfield, co-creator and Harvard Medical School director of enrichment programs. She says the aim is to let users do more research better and faster and to serve as a matchmaker between research projects and funding sources.

Like the initial E-mail effort, SIMON — pitched as a technology initiative — originally met with scant enthusiasm, Bernfield says. So she and CIO Jim Fitchett switched gears and hinted at what the database could accomplish.

"All you need is access to information to get faculty excited," Bernfield notes.

Adds Fitchett: "We surveyed all assistant, associate and full professors with regard to their research interests and their willingness to take on students to do research in labs," Fitchett says. "Then, we entered the survey data in the database. Suddenly, there's an answer to a question that used to loom large: How do you find people who are doing research in the area you're interested in?"

What's more, Fitchett adds, "when we receive notices of funding opportunities, SIMON lets us track down who's doing the kind of research the sources are willing to fund. You might know four potential grantees yourself — but log on to SIMON and you might find 12."

During a recent funding cycle for pediatric AIDS, Bernfield says, SIMON was pressed into service. It turned up 14 potential candidates, four of whom applied for grants.

In addition to furthering research, Fitchett adds, SIMON can help speed medical products and cures to the public by making research information readily available to companies who can in turn develop products as quickly as possible.

And success seems to breed success. "What we're seeing is contagion instead of resistance," Fitchett says, "which means a widened pool of enthusiastic students looking at a greater number of funding opportunities."

"Five thousand *could* be on it," she says. "We're talking to the [Harvard] School of Public Health and MIT." — *Neil Margolis*

Calendar

MARCH 21 - MARCH 27

Apollo Users Group International Conference. Chicago, March 22-24. — Contact: Information Resources, Inc., Chicago, Ill. (312) 559-2360.

The Data Warehouse: Design and Implementation. San Francisco, March 22-24 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The International DataEase Users Conference and Exposition. Orlando, Fla., March 22-24 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The Second International Conference on Software Methods. Orlando, Fla., March 22-24 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

EDI 2000. Boston, March 23-24 — Contact: EDI 2000, Dallas, Texas (214) 475-1838.

Business Solutions Conference and Expo. Boston, March 24 — Contact: Microsoft Corp., Seattle, Wash. (800) 677-4697.

Hands-On Unix Internetworking. San Francisco, March 24-26 — Contact: American Research Group, Inc., Cary, N.C. (919) 380-0007.

Software Methodology for the 1990s Conference. Washington, D.C., March 24-26 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7080.

CeBIT '93. Hannover, Germany, March 24-31 — Contact: Hannover Fairs USA, Inc., Princeton, N.J. (609) 987-0092.

Intelligence Files

Capturing CIM's benefits

Although computer-integrated manufacturing (CIM) has been a technical success in some firms, few would claim it has been a business and financial success.

Flexible, computer-controlled manufacturing technology can allow the firm to produce customized products for customers on a job-by-job basis. In essence, this makes manufacturing akin to a service business where customers are offered a wide menu of choices rather than rigid product designs. But this will require manufacturers to shed their traditional thinking in areas such as design, engineering, finance and human resources.

Source: "Using CIM for Competitive Advantage," Joel D. Goldhar, Illinois Institute of Technology, Chicago.

Focus on EDI transactions

Many companies focus on the number of trading partners they have linked to their electronic data interchange (EDI) networks, when the performance goal should be the percentage of transactions using EDI.

If a manufacturing company has between 10% to 50% of its transactions on EDI, while the rest are still in a paper process, it has to maintain two ways of doing business. The advantages of the EDI system are mostly eaten up by the inefficiencies and labor costs of the paper transactions, says an EDI manager at R. J. Reynolds Tobacco Co.

Source: "Transactions, Not Just Partners!" James M. Pitts, *EDI World*, February 1993.

'Soft' IS training

In the information systems training field there are courses for "hard" skills, such as how to program in C++, and courses on "soft" skills, such as interpersonal relations and management. A new survey of 200 IS executives indicates they plan to increase spending on "soft" or non-technical training in 1993.

However, the survey also identified areas of misalignment between current training programs and the skills that IS executives are seeking. For example, the IS executives assign a high priority to implementing total quality management (TQM) programs but not to TQM training.

Source: Announcement by Informational Technology Educational Services, Inc., Waltham, Mass., Feb. 19, 1993.

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Fruit salad anyone?

There are plenty of highly functional network management products to choose from. The only thing that's not on the menu is an end-to-end, do-it-all option.

Linda Ruiz

These are the best and also the worst of times to be managing a large internetwork. Never have there been so many competent management products available, yet still the prospects are dim for getting a single one of these products to manage the total network on an end-to-end basis.

Today, a surprisingly large number of competitors are cooperating with one another. Generic management systems such as Hewlett-Packard Co.'s OpenView Network Node Manager (see reviews page 110), SunNet Manager from SunConnect, a division of Sun Microsystems, Inc., IBM's NetView/6000 and Cabletron Systems, Inc.'s Spectrum can manage equipment from most network elements, eliminating the need to buy a management system from each. In the near future, users can also expect a variety of new distributed management applications (see Q&A with network management expert James G. Herman, page 106).

A key enabler of all these new products is the Simple Network Management Protocol (SNMP), which pulls together a significant amount of disparate information onto a single platform. Considering that the Common Management Information Protocol is still considered complicated, it's the best way to go for now.

But beware of any SNMP management system bearing enterprise management pretentions, especially if you have something called Systems Network Architecture (SNA) or DECnet in your network. NetView has incorporated gateways to non-SNA data through its new RODM feature, but it can be an awkward process (page 105). Some of the generic management systems advertise SNA monitoring as well, but others are limited to the display-level integration (page 105). T1 and voice are also still managed through separate, stand-alone management systems (page 103).

Will everything eventually come together? Customers certainly hope so. In our Buyers' Scorecard survey of 100 users of local-area network protocol analyzers, 57% of the respondents said it was "very important" to them to be able to integrate network management functions on a single platform. The most important functions to integrate were interconnected LANs (56%), LAN systems management (55%) and WAN/telecommunications functions (47%). Users also had high hopes for these elements being integrated in the next two years.

It's well worth concentrating on those product categories where vendors really do make an effort to cooperate with one another to help users build an SNMP-based, enterprise management scheme. To that end, we asked two experts to make recommendations for two fictional scenarios to solve this common user problem (pages 103, 105). We've also highlighted some of the most cooperative product categories throughout the section: Look for the "good citizen" mark. Even protocol analyzers — still primarily stand-alone — are starting to take on some distributed capabilities (page 112). For an idea of user satisfaction on the stand-alone versions, see Buyers' Scorecard (page 113).

Most important, remember that the real work starts only after you've selected your products. No product can help you with integration unless you have in-house experts and well-trained technicians. ●

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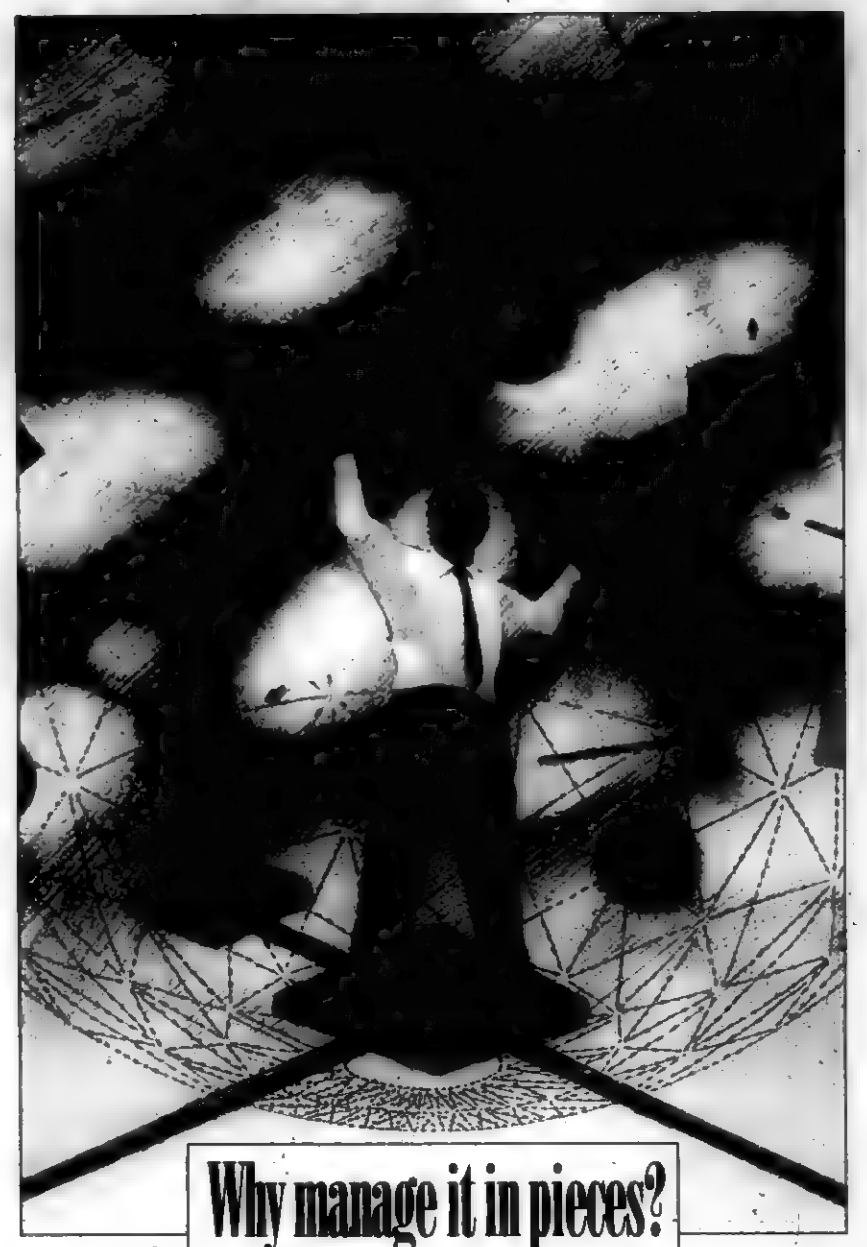

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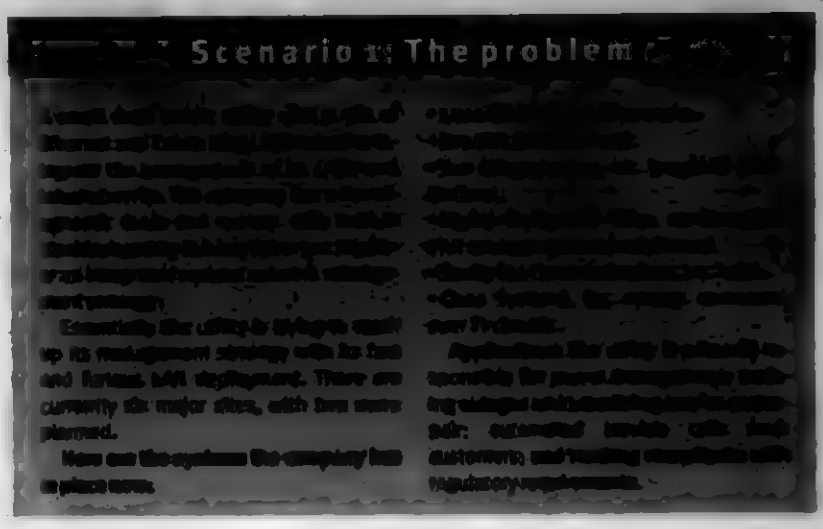
Internetwork Management

Two problems, two solutions

It's not possible to give good, generalized advice on network management equipment, not to mention an entire network management system. That's why we went straight to two experts to ask them to give some specific advice to two fictional companies that have very typical scenarios.

The first company is trying to get control of local-area networks that have spread like wildfire throughout the enterprise. The second company is a bit more advanced; it wants to integrate its IBM Systems Network Architecture (SNA) management with its internetwork traffic.

The two consultants from whom we solicited advice have very different backgrounds, which makes for a rich mixture of opinion. In both cases, we asked the experts to name specific products that exemplify the features and functionality they endorse for a given situation. Thus, no product named is an actual product recommendation but rather an example of a product that meets the criteria at hand.



Scenario 1: John Morency's solution

A six-step plan

THE UTILITY COMPANY has already taken a positive first step by using the LAN hubs to provide a focused, structured approach to connecting its PCs, workstations and midrange systems. The next steps to take include the following:

•Support objectives for the network: The company needs to assess the most important support objectives for the network. It is extremely important to obtain agreement and support from the business managers in defining and setting both service and budgetary objectives.

•Simple Network Management Protocol (SNMP)-based platform: The company then needs to establish the basis for the company network management system. If a support objective is to integrate both base systems and network management, the predominance of DEC systems in this configuration would strongly point to the DEC Polycenter framework. The disadvantage of this approach would be its lack of general portability to base operating systems not supplied by DEC, such as Sun Microsystems, Inc.'s SunOS, Hewlett-Packard Co.'s HP/UX or IBM's AIX.

But if the requirement is mainly for network management with *some* basic systems management functions for the Unix environment, then either HP's OpenView or SunConnect's SunNet Manager would supply the prerequisite functionality for the target network entities.

If platform portability and conformance to industry standards is important, OpenView would be the better choice because of its standards support and greater portability.

•Inventory database: The next step would be to select a software package that will help establish an effective inventory database for all hardware and software attached to or using the network. If HP's OpenView is the management system of choice, then Isicad, Inc.'s Command product would be a good choice for building the configuration database. If SunNet Manager is selected, then Auto-Trol Technology Group's Konfig should be considered. For Polycenter, the Polycenter System Census product might be the best bet, although it is not clear this product supports the same scope of functionality as does either Isicad or Konfig.

•Fault and performance management: A fourth step would be to identify the set of add-on packages to the base network management system that will support effective fault and performance management services for Ethernet, Token Ring, the Unix workstations, the SynOptics hubs and the Cisco routers (these would constitute the initial set of entities to be integrated). All identified network management systems support basic fault management functions. But to derive the most benefit, create effective links with configuration management and trouble ticket systems.

In the Polycenter environment, recommended help desk systems include UIS, Inc.'s UIS-Helpline and Target Systems Corp.'s Hotline. For OpenView, a number of choices exist, including Remedy Corp.'s Action Request System (ARS), Answer Computer, Inc.'s Apriori and Peregrine Systems, Inc.'s PNMS III. SunNet Manager principally supports the Remedy ARS product. Remedy ARS may well be the best choice because it can really be used independently of the network management system.

•Nonintegrated management packages: Fifth, the company should identify the set of separate packages that could be accessible to users through either asynchronous terminals or X Window System. These include a hardware and software inventory management package for the IBM PS/2s; some form of 3270 terminal access to IBM's NetView or Systems Center, Inc.'s NetMaster on the mainframe for monitoring and controlling the terminals on the SNA network; system management tools on the DEC VAX systems; and the T1 multiplexer management system.

Possible choices for PC hardware and software inventory packages include Horizons Technology, Inc.'s LAN Auditor or Brightwork Development, Inc.'s LAN Automatic Inventory. A number of DEC system management packages are available for the Polycenter environment.

Most capabilities provided by these configuration management products are not directly accessible by SNMP today, so actual use would likely require a separate PC or Apple Computer, Inc. Macintosh supplemented by a product such as Quarterdeck Office Systems' DesqView/X for the PC or Cayman System, Inc.'s XGator for the Macintosh to support remote display and control functionality to the Unix workstations. This approach entails high resource costs.

•T1 management: T1 multiplexer packages tend to be stand-alone and vendor-dependent, although this may well change in the next few years. Currently, the major problem with T1 management systems lies in their requirement for a separate, dedicated hardware/software system on which to operate. However, a number of time division multiplexing vendors will be opting to standardize their offerings on industry-standard network management systems during the next 12 to 18 months.

Methodology

Morency's view

John Morency is a principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass. His expertise spans local- and wide-area networks, systems management, network management and transaction processing. Here is his company's methodology:

Network management is a means to an end: the delivery of high-quality computing services to end users. It should be coincidental that the services are distributed.

Thus, we offer these recommendations as a tried-and-true means of delivering to your company the best value for its investment in network management.

Step 1: Partner with knowledgeable end users to determine the service metrics that give the business the most value.

Step 2: Prioritize the metrics that you derive. What is most important: continuous availability? 2- to 3-sec. response time? quick response to problem reports? rapid turnaround?

Step 3: Relate the network management platform and layered applications you select to the optimal achievement of the metrics you've established. For today's complex internets, SNMP management is practically mandatory. What's more difficult is selecting the right set of layered products. A formal request for proposal process is one way.

Step 4: In most network environments today, equipment diversity is common. Thus, a strong temptation is to establish a network management environment that tries to be all things to all people.

But it makes more sense to select a bounded number of service goals relative to a bounded number of network entities to gain early success. It is then easier to build on the success you've already established.

Scenarios: Atul Kapoor's solution

Allow for migration

IN THIS CASE, the customer is running two parallel networks — a LAN and an SNA network. While LAN users access SNA applications on the mainframe, the networks are operated and managed independently.

The customer has no immediate objective for managing both networks with a single system; however, any recommendation must allow migration to an integrated management system for both types of networks in the future.

The task of recommending a management system is much simplified in this case because the customer has followed the bottom-up approach and selected network elements that already have management smarts. As a next step, we look for element management systems from vendors whose equipment is in the network. In this case, each element provider also has very capable element management systems. Thus our recommendations are as follows:

• **For LAN hubs:** The company should use any one of several management systems from SynOptics. Because it has Sun workstations on the network — thus presumably familiarity with them — it could use SynOptics' Optivity application.

For Cisco routers, it could use built-in capabilities of routers by using a Telnet session. The Transmission Control Protocol/Internet Protocol-based Telnet session can be established from any Unix workstation and can provide access to management information such as routing tables, traffic statistics, bridge filters, etc. However, management of router networks does require personnel to be knowledgeable in Internet Protocol, subnetwork address masks and router protocols such as Open Shortest Path First.

• **SNMP manager:** To further enhance and consolidate LAN and router network management, we would also recommend a Simple Network Management Protocol manager (SNMP). While almost all SNMP managers will get the job done, IBM's NetView/6000 is recommended because it is easier to use and administer than other SNMP managers.

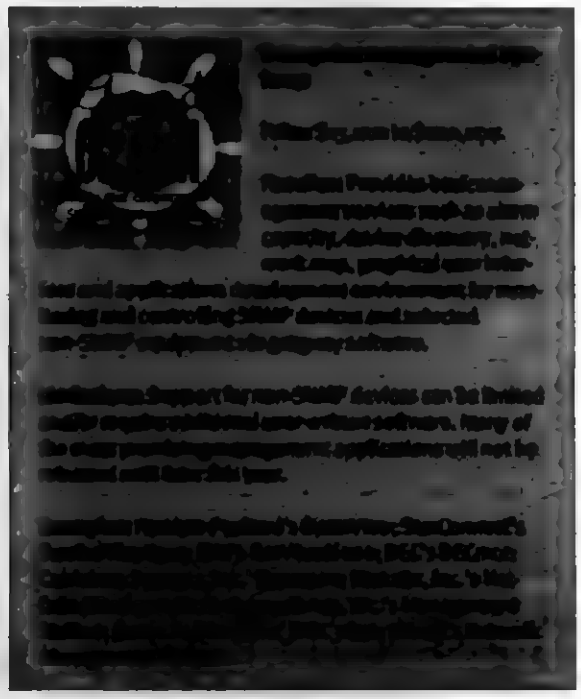
In view of possible integration with NetView, NetView/6000 is even more attractive because of its richer interface with NetView. NetView/6000's alarm editor makes it easier to customize alarms for forwarding to NetView.

However, selection of NetView/6000 would require the use of the RISC System/6000 and AIX/6000. If the customer does not have experience with these products or is otherwise willing to invest in a new platform, it could use SunConnect's SunNet Manager or Hewlett-Packard Co.'s OpenView, both of which can run on a Sun workstation.

• **Non-Unix SNMP manager:** If a non-Unix platform is desired as an SNMP manager, the customer could consider Proteon, Inc.'s non-Unix SNMP manager OneView, which has a NetView interface even better than that of NetView/6000. Another attractive product is VisiSoft's Visinet, which comes in both OS/2 and DOS/Windows versions and can manage both Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager.

• **SNA network:** For managing the SNA network, the choices are much simpler: IBM's host-based NetView (which is a totally different product from NetView/6000 and has no direct support for SNMP management) or Systems Center, Inc.'s NetMaster. Historically, NetMaster's strengths have been ease of use, less overhead and lower cost. However, more recently, NetView has been more nimble in adding new functions and automation. Addition of Resource Object Data Manager to Version 2.0 of NetView certainly adds a significant new dimension. RODM is a powerful new object-oriented SystemView feature of NetView that manages and controls both SNA and non-SNA network elements from the OS/2-based Graphical Monitor Feature (GMF). The GMF provides a graphical view of the network.

Looking toward the future, NetView is likely to have support for IBM's Advanced Peer-to-Peer Networking sooner than for NetMaster. It would be worthwhile for the customer to look at functionality and price/performance of both products and evaluate which one best meets customers' specific objectives and the management style of its enterprise. •



Methodology

Kapoor's view

Atul Kapoor is principal at Kaptronix, Inc., a Haworth, N.J., consulting firm specializing in LAN/WAN/SNA integration and management and the development of client/server applications for SNA and Unix. Here is his company's methodology:

Network management covers a wide variety of services. To keep the scope of my advice manageable, I am focusing on network surveillance and alert management. Functions such as performance, change, accounting and configuration management are not discussed.

As a basis for developing a management solution, I use AT&T's Unified Network Management Architecture (UNMA) as a model. The key concept in UNMA is to look at the solution at three levels: network elements (including hubs, routers, adapters, etc.), element management systems (including hub managers, router managers, etc.) and an integration system (such as AT&T's Accumaster, IBM's NetView, etc.). We slightly modify the model to include intermediate aggregation systems (such as SNMP management systems).

With this model as a reference, the most important decision a customer makes is the selection of network elements. Network management system selection and design is a bottom-up procedure.

The next step is to ensure that the elements are complemented by a smart element management system provided by the vendor. Then the process can be moved up to an intermediate aggregation system and an integration system.

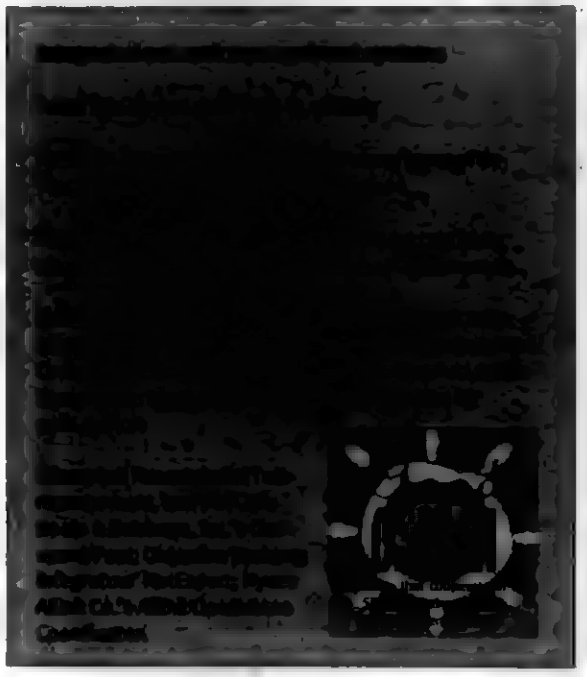
Given a long list of competent products, how does one select a specific system to manage the network? Most of the differences fall into intangibles, such as ease of use and administration.

Many of these differences are significant only within a specific customer context; thus it is imperative that each customer look at various solutions within the context of its own networks and management policies and not simply generic product evaluations.

Though we live in a multivendor world, it is still a sound policy to minimize the number of vendors involved. It reduces the number of platforms for which you need in-house expertise and provides for a stronger relationship with the preferred vendor.

Thus, an important consideration was to use a management system from a vendor that was also a major provider of network elements in the customer network.

The important thing to realize about the recommendations on these pages is that they are specific to given network configurations. If the same customers had a preponderance of Cabletron equipment, for instance, Spectrum could have been the management system of choice.



Glossary

SNMP: Defines protocols/message formats to report network management data in a TCP/IP network.

CMIP: Common Management Information Protocol defines protocols and message formats for reporting network management data in an Open Systems Interconnect network.

DME: Distributed Management Environment is an effort by the Open Software Foundation to define application programming interfaces and management applications for distributed environments.

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Internetwork Management

Scenario 2: The problem

A Fortune 500 multinational financial corporation wants to integrate its host and LAN internetwork management. There are 32 regional centers, each of which is responsible for local management but is also required to report to centralized IBM NetView.

This company has a strong internetwork management system in place now but wants to more fully integrate its strategy with IBM's NetView.

Here is a list of the systems controlled by each regional center:

- 15 to 500 workstations, including RISC System/6000s and machines from Hewlett-Packard and Sun Microsystems, Inc.
- Four to six bridging routers, including IBM 6611s and ones from Cisco.
- Two to four hubs, including ones from SynOptics Communications, Inc. and IBM.
- Up to 200 SNA devices, IBM hubs.
- Mix of Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI), TCP/IP and SNA applications.

Applications: The applications run by this financial corporation include accounting, securities, banking, transaction processing and electronic mail.

Scenario 2: John Morency's solution

Use NetView links

AS IN SCENARIO 1, I would advise the company to select an SNMP-based platform for managing the Ethernet, Token Ring and FDDI LANs.

•Collocating SNA and internetwork managers: Management of the SNA network has been in place for some time and appears to work well, so there is no strong reason to modify existing operational procedures.

Given the strong centralized management culture of the corporation, it makes the most sense to move the SNMP management workstations to the same operations areas as the existing NetView management terminals. However, this solves only a very small part of the problem.

•Single display of SNA and internetwork management: The longer term preferred operational model is one in which 3270 sessions and LAN management windows coexist on the same display device. Because of that, it's important to start training operators in Unix workstation technology very early in the process. A practical recommendation is to allow three to six months of workstation and terminal coexistence to provide the operations staff with ample learning time.

Inherent in this approach is the fact that the best degree of integration that can be achieved between mainframe host-based NetView and the SNMP management world is display-level integration. There simply is no form of common command capability or database integration.

While it is true that most major SNMP-based management systems have some level of interoperability between themselves and NetView, it tends to involve mainly bidirectional alert exchange with the additional means to invoke automated shell scripts or Command Lists in response to one or more received event or alert conditions. Thus, in order to fully correlate network alerts that have an impact on both the LAN and SNA environment, some form of dual display support is required.

•NetView links to SNMP platforms: Getting the operations staff started with configuration and fault management on the LANs is the most practical starting point. Through use of NetView links (provided by products such as Peregrine Systems, Inc.'s Open SNA product for HP OpenView, Systems Center, Inc.'s Polycenter SNA Manager for DEC's Polycenter and BrxSNM from Brixton Systems, Inc. for SunConnect's SunNet Manager), initial LAN management can occur through the more familiar interfaces provided by NetView.

These recommendations also assume no initial network-level integration between the SNA network and the enterprise internetwork. When an operations staff undergoes a major learning transition such as what has been outlined, it is important to keep things as simple and separate as possible prior to asking the staffers to assume additional management complexity inherent in a merged multiprotocol backbone that includes SNA traffic, especially performance management for SNA 3270 terminal sessions. •

Scenario 2: Atul Kapoor's solution

NetView/6000 strongly urged

THIS CUSTOMER HAS a much larger and complex network than the previous scenario. Again the customer has selected management-smart network elements, thus making the job of network management much easier.

•LAN and router management: For LAN and router network management, IBM's NetView/6000 is strongly recommended. It is also recommended that NetView/6000 be supplemented with SynOptics' LattisView application, which runs on top of NetView/6000 for SynOptics-specific management.

•Distributed, client/server-based capability: The next recommendation (and a strong reason to choose NetView/6000) is to add IBM's System Manager/6000 to the management solution. It adds a distributed, client/server-based capability to the management architecture that lets the customer deploy distributed management functions as necessary.

Such a capability is highly desirable and necessary in a network of this size and complexity.

With this combination of management products, the customer can manage all major network elements in its interconnected LANs — SynOptics hubs, IBM 8240 and 8250 (FDDI) hubs and Cisco routers.

Notice that no additional management system is recommended for Cisco routers. This is not because Cisco does not have a good management system but rather because the routers provide such a rich set of information on the Telnet session, which, when coupled with an SNMP manager such as NetView/6000, makes it unnecessary to invest in an additional management system.

•Display of network topology: NetView/6000, as other SNMP managers, can automatically discover network topology and display it graphically, along with network alarms and statistics.

•Problem management: It is recommended that the customer consider NetView/6000 Trouble Ticket Manager, a comprehensive application for problem management that, product name notwithstanding, is much more than just a trouble-ticket management system.

•SNA management: For SNA management, NetView is recommended because of its distributed architecture (NetView-to-NetView communications) and the added object-oriented Resource Object Data Manager (RODM) for integration of multivendor management data and the new enhanced Graphical Monitor Facility.

However, the use of RODM, which is initially available only for non-SNA, does require extensive systems administration and customization. •

Internetwork Management

Applications on the way

Now that we have some network management platforms in place, we're finally starting to see some cooperation among vendors of management applications. This year, users can expect to see a variety of new distributed applications from industry veterans such as Hewlett-Packard Co. and IBM, as well as from a host of new internetwork management players.

Philadelphia-based freelance writer Julia King spoke with network management expert James G. Herman about what kinds of applications users can expect this year, as well as how they can prepare for their arrival. Herman is a principal at Northeast Consulting Resources, Inc. in Boston.

Q. SNMP has become the de facto standard for network management. Yet there are widespread user complaints about its inadequacies, such as its focus on only the most elementary management functions and vendors' various implementations of the protocol via customized management information bases (MIB). Can we expect these weaknesses to be remedied in 1993?

A. The problem is that we need to put more data functionality in front of the user and hide the details of the actual data items that are set to do something. Most SNMP products are like microscopes. What we really want is a much higher level of functionality.

Remedy Corp.'s Network Health Profile product is an example of what we need. Its basic goal is to shield the user from having to know quite the same level of detail about these different kinds of MIBs. In order to make our management systems more friendly, we need to increase the quality of application software running on our management products.

Q. What are some other types of applications that are needed?

A. At the lowest level, we will see a proliferation of SNMP agents on the desktop and on servers that will give us basic visibility into the systems world. The Desktop Management Task Force (DMTF) has come out with a specification that sets forth how to structure agents for desktops and servers. You'll begin to see DMTF agents coming into the marketplace by June 1993 at the latest.

Q. What else do you see happening in the application arena?

A. In '93, platforms [such as HP's OpenView and IBM's NetView/6000] will offer increased capabilities such as the ability to distribute management information via distributed databases, but I think we're going to see tremendous pressure to reduce the number of platforms. There simply are too many.

Q. Can you predict the winners?

A. Well, the current winner with the largest installed base is SunConnect, with SunNet Manager. Most people would agree with me that HP will probably overtake Sun, or at the very least, the two will equalize by the end of '93. The winners will also be those that have committed themselves to research and development.

Q. What kinds of management applications will be made available to plug into these platforms?

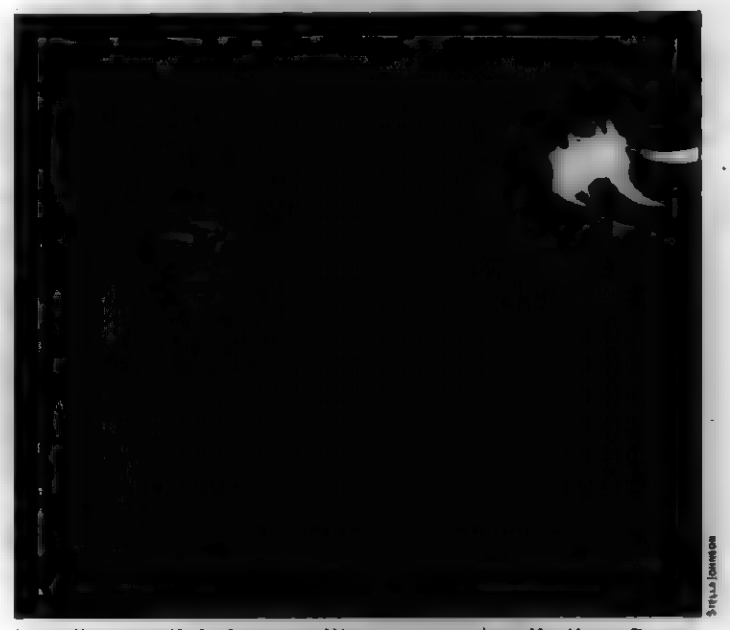
A. There are device-specific and device-independent applications. Device-specific applications are created by a vendor to improve the manageability of its device. These are reasonably small applications that can be managed from at least the top couple of platforms.

Q. What about device-independent applications?

A. Device-independent applications — those that manage network functions regardless of the devices attached to the network — are, of course, what users have been waiting for. There are about four of these management processes.

The classic one is problem resolution. The classic device-independent application for that work process is a trouble-ticket system. But the very notion of a trouble ticket is a piece of paper to be handed from one person to the next. With automation, you're not supposed to take the paper process and turn it into the exact equivalent. What you want, really, is a problem management system.

One of the reasons I believe Remedy has been so successful is that its conception of the product is that it's groupware for network managers.



Stella Johnson

James Herman *calls for better quality management application software*

The second process is change implementation: moves, adds and changes. The third process is capacity planning. This is one of the proactive processes aimed at preventing rather than reacting to problems. For this you need various kinds of systems that do regular measurement, trending and analysis of traffic patterns.

The fourth area is billing and accounting systems — collecting usage and configuration data.

Those are the four main areas where I think you'll see device-independent applications come through. They're going to be focused primarily on a set of processes that span dissimilar devices and dissimilar networks.

Q. Are these applications available?

A. There are about 25 applications in this category, with products available now from Remedy, NetLabs and ProTools, among others.

There is one problem I have to caution people about in this area. All the wonders of platforms only happen when you've got open agents in all the systems that you're trying to manage. As soon as you try to cut over to integrating management of proprietary environments, you lose almost all the benefits of the technology we've been talking about.

Q. So how do users manage networks as they make the transition to open systems?

A. Some vendors are focused on trying to manage the legacy environment in a more integrated way. The three important ones are International Telemanagement, Inc., with MaxM Systems; Boole & Babbage, Inc.; and Nynex Corp. with its Allink product. All three link to legacy management systems via custom-engineered interfaces that can extract at least some of a proprietary system's management data.

Q. What should users be looking for in these combinations that will help them manage both legacy and open management systems?

A. If your legacy managers and stand-alone legacy management system are expected to stick around for a while, you might consider upgrading these proprietary management systems to have a Common Management Information Protocol (CMIP) interface to talk to an open management system on a peer-to-peer basis. This is essentially the philosophy of the OmniPoint program of the Network Management Forum, which is to take your stand-alone managers, put CMIP interfaces on them and have a real ability to communicate via CMIP with other stand-alone managers.

The problem with this approach is that most legacy management systems don't offer upgrades. But where upgrades are available, the CMIP interface route is going to become the only way to integrate. It's an expensive solution because you have many different management systems with complicated CMIP interfaces.

Q. Are there any advantages to moving from SNMP to CMIP?

A. Quite the opposite. In general, SNMP products are cheap, and they were easier to develop, whereas CMIP is still seen as complicated.

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Internetwork Management

Technology Analysis: HP's OpenView a bit pricey but highly flexible

Reviews	Ease of use	User interface	Performance	Fault management	Configuration management	Management information bases tools	Application programming interfaces	Multiprotocol support	Overall value
Corporate Computing* 10/92	Quick and easy	Usual collection	Good starting point	Overly simple icons	Maps are easy to navigate	Handy	NC	Enhanced	Relatively expensive
Network Computing* 10/15/92	Hard to beat	NC	Took a nosedive	Uncommon features	Straightforward and simple	Flexible	Good news	Impressive group	Overpriced for its capabilities
LAN Times 1/11/93	Clear path to simplification	Standard	NC	Supports user-defined thresholds	Proactive	Easy to incorporate	Extensive	Several key environments	Leading platform
Users									
Glenn Hunt, Idaho Dept. of Revenue	Good	Good	Good	Good	Fair	Fair	Fair	Good	Very impressed with it
Dennis Booth, Black Brug Co.	Good	Very good	Very good	Good	Very good	NC	NC	NC	Very easy to use
Don Tonelli, Fidelity Investments	Very good	Very good	Good	Good	Good	Very good	Good	Good	Meets all of our needs
Xavier MacKitchin, Trinova Corp.	Good	Very good	Very good	Good	Good	Good	Very good	Good	Very good
Danny Allen, Electric Power Research Institute	Very good	Very good	Good	Good	Fair	Very good	NC	NC	Good product for the money
Analyst									
Nina Lytton, Open Systems Advisors	Very good	Very good	Good	NC	NC	Good	NC	Very good	Strong entrance

Key: Very good Good Fair Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. *Reviews focused primarily on Network Node Manager.

Hewlett-Packard Co.'s OpenView network management system is among the leading platforms for integrating internetworking control functions. It stands out among the market leaders because of recent additions to improve its capabilities, such as the Network Node Manager (NNM), which supplies the product with Simple Network Management Protocol (SNMP)-based management of Transmission Control Protocol/Internet Protocol networks and nodes.

OpenView's competition includes Cabletron Systems, Inc.'s Spectrum; Netlabs, Inc.'s Netlabs/Manager, IBM's AIX NetView/6000; and SunConnect's SunNet Manager.

Performance: Significant performance degradation was noticed when *Network Computing* tested OpenView's NNM application on a medium-size Internet Protocol (IP). While running NNM on HP/Apollo Series 700 hardware and Sun Microsystems, Inc. SPARCstations, *Network Computing* said performance and functionality were satisfactory until somewhere in the realm of 1,800 to 2,000 nodes, where they started to dwindle. *Network Computing*'s suggestion was to increase disk space, swap space and system random-access memory.

Fault management: OpenView uses visual alerts and pagers provoked when user-defined thresholds are crossed. The condition of cables, modems, hosts, routers and other network devices is marked by color-changeable icons.

Configuration management: *Corporate Computing* described OpenView's topology maps as easy to navigate. Housed in a database, IP-addressable network nodes are found by an Autodiscovery feature that employs "ping" and various protocols.

Management information base (MIB) tools: A gallery of MIB tools is provided, including standard SNMP MIBs and a MIB compiler. *Corporate Computing* was partial to the Browse MIB command. To determine the most appropriate fit between the agent and the MIB, users can investigate, query and place dissimilar MIB values on selected network agents with this option.

Application programming interfaces (API): Access to additional network management services and OpenView's databases can be made through APIs. According to *LAN Times*, extensive documentation and library routines are included, along with technical support.

Multiprotocol support: Environments range from gateway support for Digital Equipment Corp.'s DECnet, IBM's Systems Network Architecture or IPX to management protocols.

Overall value: OpenView costs $15,000, with network management module prices varying depending on a user's choice of vendor agents.

While a few reviewers wondered if the cost might be a bit on the steep side, the overall consensus was that OpenView's flexibility ranks among the best.

Summary by Lisa Davidson.

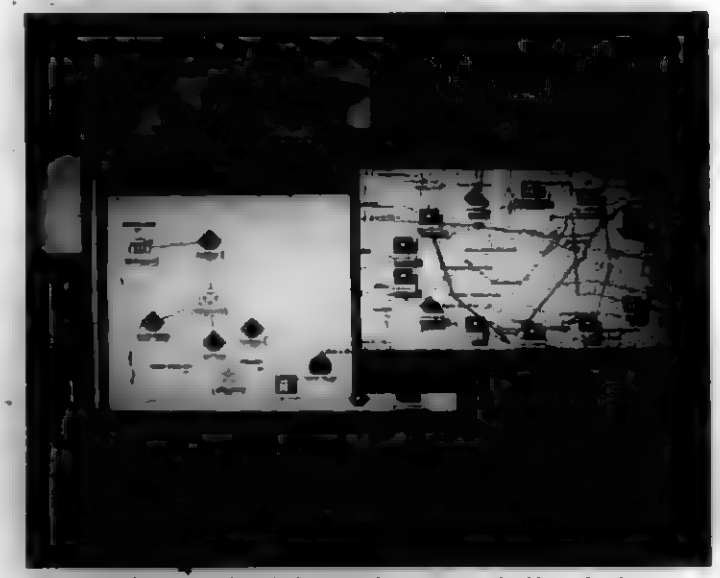
HEWLETT-PACKARD RESPONDS

Scott Safe, OpenView's marketing communications manager:

Performance: As you add more nodes, you definitely need to add more memory. Polling activity and sizing up front are key factors. It does not make sense to poll a PC the same way you would poll a critical application.

MIB tools: Any MIB can be incorporated into OpenView with three mouse clicks.

Overall value: For $7,000, you can purchase the HP SNMP Management Platform; the OpenView NNM costs $15,000. The products are very value-priced. You would have to buy two or three applications from other vendors to get the equivalent functionality OpenView gives you off the shelf.



HP's OpenView uses visual alerts and pagers marked by color icons

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Mona Erafko, ATI Financial	Very good	Very good
Robert Herwick, Hambrecht & Quist, Inc.	Very good	Good

Hewlett-Packard's reported revenue for fiscal year 1992 was $16.4 billion

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*Survey was conducted by Reliability Ratings, Needham, MA. The data is quoted from a publicly available 40-page report, Reliability Ratings, the research company, is not affiliated with Dell Computer Corporation and does not endorse its products.
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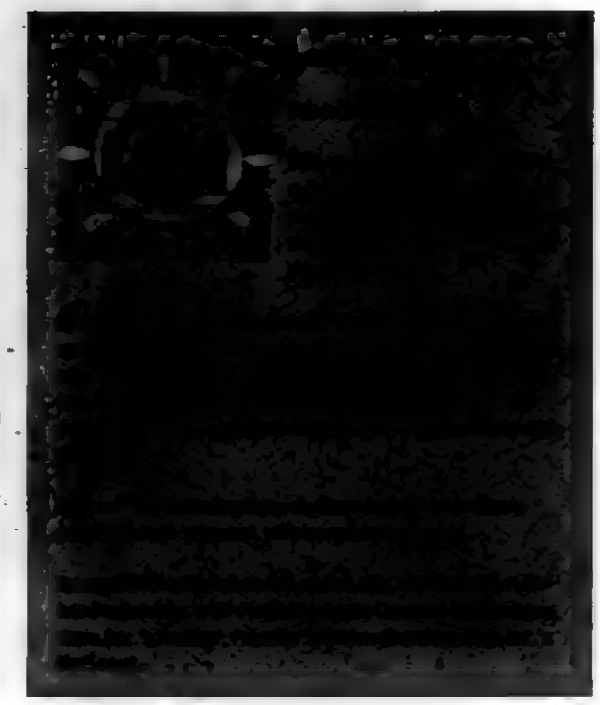
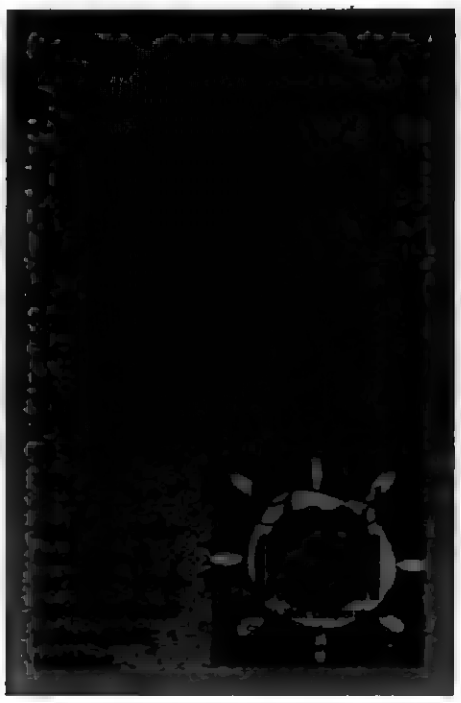
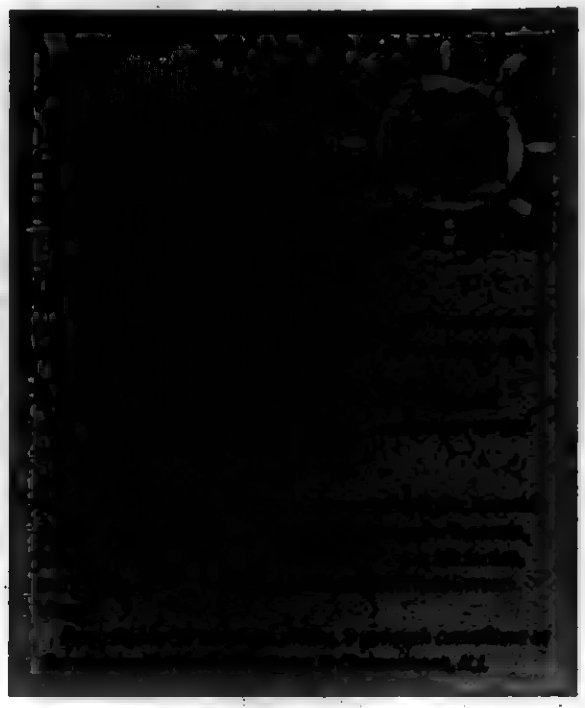
Internetwork Management







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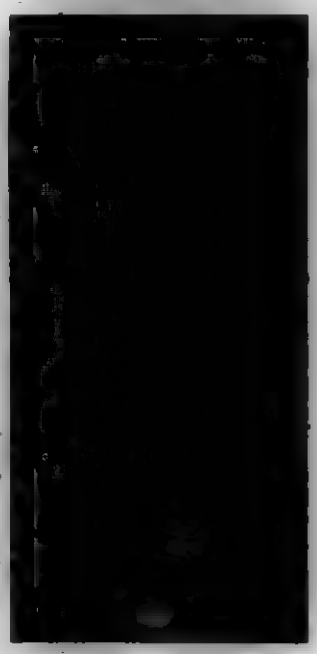
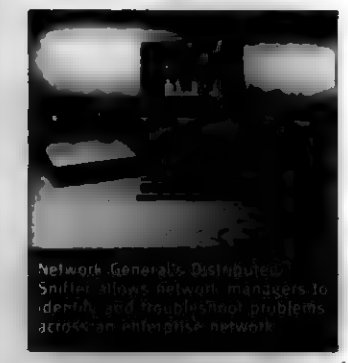


Here are some of the significant trends developing in several areas of network management



● **INTERNETWORK MONITORS** When you're running mission-critical applications over a multiprotocol network, you can't afford downtime. That's why it's important to identify trouble before it starts. To that end, internetwork monitors continuously monitor and collect internetwork traffic data, as well as record and analyze activity in real time.

As opposed to protocol analyzers — which are usually brought on-site after a problem occurs — internetwork monitors automatically activate a protocol analysis, tracer or similar routine when a problem occurs.

This capability is provided by only a few products, one of which is Metrix Network Systems, Inc.'s NetMetrix Internetwork Monitor 3.0. Running on a standard Unix platform, the Internetwork Monitor software integrates and correlates data from RMON agents to provide complete end-to-end visibility of a multisegment network. Traffic patterns can also be seen at every layer of the OSI stack.

● **PROTOCOL ANALYZERS** Everyone agrees that it's a pain to lug a protocol analyzer from LAN to LAN to get a protocol analysis reading. To that end, vendors such as Network General Corp. have put remote probes on the network that communicate back to a central-site analyzer, omitting the need for travel.

What's really new is the degree of analysis these tools now demonstrate. At one time, tools could identify only the geographic location of a particular problem. Products can now tell you which LAN — and even which router or bridge — is experiencing a specific problem.

One of the first products to do better analysis is Network General's Distributed Sniffer. It adds critical functionality to single-vendor management systems by examining all aspects of the communications process instead of just a single set of devices or protocols.

● **SMART HUBS** One of the more interesting developments to occur in smart hubs in the past year is per-port switching. Instead of a network manager physically moving wires every time a piece of networking equipment needs to switch ports on the LAN, hubs with this capability allow the manager to make the switch through a remote management station.

Bytex Corp.'s Series 7700 is one of the first hubs to deliver per-port switching. Similarly, Ungermann-Bass, Inc. recently introduced the DragonSwitch, an Ethernet switching module for its Access/One Enterprise hub.

Other smart hub developments to look for are remote management capabilities along the lines of Proteon, Inc.'s ProNet BOSS, which incorporates a remote bridging router to manage LAN traffic remotely; other hub/router hybrids such as SynOptics Communications, Inc.'s as-yet unshipped RubSystem; and Asynchronous Transfer Mode upgrades from almost every major smart hub vendor.

Compiled by assistant editor Julie Rare

Internetwork Management

Buyers' Scorecard: Users rate satisfaction with top protocol analyzers

By Derek Slater

A key piece of the network management puzzle is the protocol analyzer, which allows administrators to monitor traffic on their local-area networks and, increasingly, on wide-area networks as well (see chart page 112).

Basic protocol analyzer functions include packet filtering, capturing and decoding. More advanced products often incorporate expert systems capabilities that help the user determine how to solve network problems. Analyzers also vary in the number and type of LAN protocols they support.

In the Buyers' Scorecard user satisfaction survey, Network General Corp.'s Sniffer edged out Novell, Inc.'s LANalyzer and Hewlett-Packard Co.'s HP LAN analyzers for the top user satisfaction score. Sniffer earned an overall score of 76, followed by LANalyzer with 75 and HP with 73.

The three vendors in the survey dominate the LAN protocol analyzer market, with Network General alone holding close to half the market, according to Infonetics Research, Inc. in San Jose, Calif.

However, the number of products vying for a piece of the pie has skyrocketed during the past several years. In particular, there is a growing trend toward software-only protocol analyzers, which are less expensive if often less robust.

Hardware-based protocol analyzers such as Sniffer and HP's LAN analyzers tend to be more suitable for heavy-duty use on complex enterprise networks. More than 75% of the respondents said they support at least 100 LAN nodes with their analyzer.

Protocol analyzers

NETWORK GENERAL'S SNIFFER — SCORE 76

NOVELL'S LANALYZER — SCORE 75

HEWLETT-PACKARD'S HP LAN ANALYZERS — SCORE 73

Network General

Sniffer users said they particularly liked the company's move to expert systems technology with the Expert Sniffer version. The product outscored its competition in ease of use, although it was mentioned as a weakness of all three products.

Sniffer earned high scores in support for a variety of LAN protocols and in providing detailed levels of packet analysis. The product is available as a software-plus-adapter set as well as in turnkey form; users said that the turnkey version is more expensive than other solutions emerging in the market.

Network General has also created a distributed version of Sniffer that increases users' ability to handle multiple networks from a single point.

Novell

Novell's LANalyzer software received highest satisfaction ratings in cost of acquisition and maintenance and in service and support. Users said the product's close ties to NetWare are a strength but that LANalyzer lacks some advanced analysis and reporting features.

Hewlett-Packard

HP offers a broad variety of protocol analysis products, including the LANProbe II, which is tightly integrated with HP's OpenView network management platform. Other models support LAN or WAN protocols, depending on the user's needs. Respondents reported using a number of different HP systems.

The HP products topped satisfaction ratings in the most important category to users: accuracy of traffic reporting. They scored below the others in ability to work across multiple networks.

Ratings in order of importance

9.2	[illegible]
8.9	[illegible]
8.9	[illegible]
8.6	[illegible]
8.3	[illegible]
8.3	[illegible]
8.1	[illegible]
8.1	[illegible]
8.1	[illegible]
8.0	[illegible]

METHODOLOGY

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their protocol analyzers in 16 specific categories; they were not asked to compare or rate one product directly against another in the Scorecard.

All categories were factored into the final scores. The scores for each product in the seven most important categories are listed in the tables below. User names were obtained from a combination of vendor and nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 50 users for Sniffer, 30 for LANalyzer and 20 for HP's analyzers.

To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

Computerworld thanks the following firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Infonetics Research, Inc.

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.

Network General's Sniffer

RESPONSE BASE: 50 USERS

9.0	[illegible]
9.0	[illegible]
8.4	[illegible]
8.4	Support for physical LAN types
8.3	[illegible]
8.3	[illegible]
7.5	[illegible]

Would you buy the program again?

LIKELY — REASON: Meets our needs/Best product: 46

UNLIKELY — REASON: Too expensive: 4

Novell's LANalyzer

RESPONSE BASE: 30 USERS

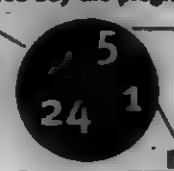
8.4	[illegible]
8.3	[illegible]
8.3	[illegible]
8.1	[illegible]
8.0	[illegible]
7.9	Support for physical LAN types
7.7	[illegible]

Would you buy the program again?

LIKELY — REASON: Does the job/Good product: 24

UNLIKELY — REASON: Lack of reporting features: 5

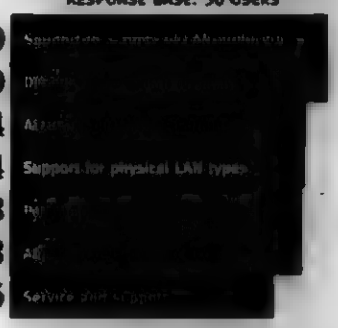
DON'T KNOW: 1

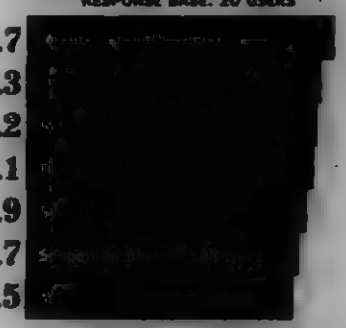


HP's LAN analyzers

RESPONSE BASE: 20 USERS

8.7	[illegible]
8.3	[illegible]
8.2	[illegible]
8.1	[illegible]
7.9	[illegible]
7.7	[illegible]
7.5	[illegible]





Would you buy the program again?

LIKELY — REASON: Meets our needs/Reliable: 15

UNLIKELY — REASON: Too expensive: 5

GOLDEN GATE PARK AT 5:30 IN THE MORNING IS A

STRANGE PLACE TO BE TRANSFERRING DATA,

SYNCHRONIZING FILES AND BACKING UP 60 USERS.

Well, not really. Not with fully automated LapLink® V, the newest, smartest, most powerful file transfer solution available. LapLink is at work even when you're not. With its new SmartXchange™ recorder and scheduler LapLink will automatically backup and transfer files, or connect with a remote computer. For quickly updating files and directories, LapLink is equipped with an intelligent Synchronize feature. No more hassles with different versions of files on your computers. And with LapLink V you're better connected than ever. You can transfer files by cable, modem, or peer-to-peer over a Novell® network in DOS or Windows.™ What's more, since LapLink runs in the background under Windows it's always ready to send or receive information. And when it comes to security, LapLink V knows who has clearance — even down to the directory level. If the name LapLink still makes you think of laptops and colored cables, you're in for a major surprise. To find out how you can make time for that morning jog for just $169.95, call us today at **1-800-472-8650.**

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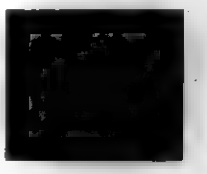

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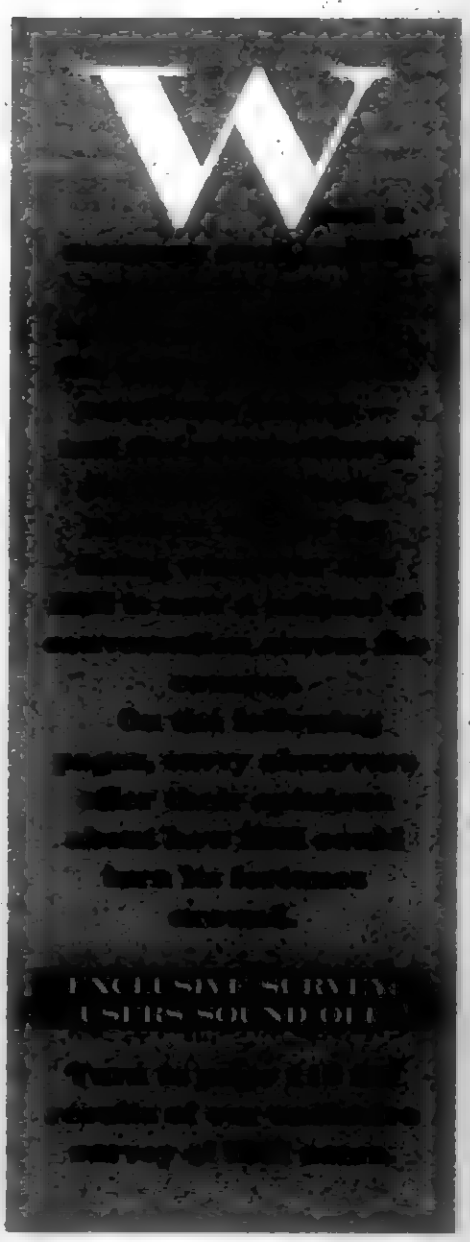
What should IBM do to fix itself?



Steve JOBS

♦ Chairman of Next, Inc.

"I think IBM still has a lot of life left in it.

IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the '90s is a software decade. Every problem at IBM is a hardware problem. Every challenge and every opportunity is a hardware question. No one understands the software industry.

I'm not saying they should turn into a software company. I'm talking about something much more subtle. They need to focus more on their software strategy and see how it can change and unify the company.

For instance, none of their machines up and down the line use the same software. An AS/400 doesn't run one of their desktop applications. I don't know, maybe they ought to build a mainframe processor with lots and lots of Intel chips and run it in parallel.

IBM also has a very fragmented product line from a developer's point of view. So I think that leveraging third-party developers is going to be very important.

I'm not sure if one person can bring about that sort of change. Obviously the one person they pick will pick a new team, and a team could make that change. I have the greatest respect for Nick Donofrio [general manager of the Enterprise Systems business].

IBM went for a long period of time forgetting they were a technology-based company. If you have sales and marketing people run the firm, sooner or later it catches up with you. It's a very dangerous thing. You can't take your eye off the ball."

INTERVIEW BY JAMES DALY

Esther DYSON

♦ Editor of "Release 1.0" newsletter.

"They need to break it up for real. It's not good enough to have the businesses all still owned by the same board. You can't really compete that way.

As long as you are part of a holding company, you have conflict of interest among divisions. A holding company with cigarettes and food is one thing, but a holding company made up of different computer companies really can't work.

You just can't do it because everybody knows, 'Well, yeah, in theory we're competing, but if we lose the sale to this group, it's OK because it's still part of the parent company.' You can't get rid of that attitude as long as it's based on reality.

They have to sell off or spin off all the parts. That's what they did with Lexmark, and I think that worked very well. They ought to do it with

Dyson, *page 116*

Dyson, *continued from page 116*

the rest of the company as soon as possible. These things are painful, but so is slowly sinking.

You can't avoid pain, and they've been trying to.

There is nothing magic. Just be a small, focused business, and go for broke. Go after a target market instead of trying to serve the world."

INTERVIEW BY
JOANNE KELLEHER

Kenneth JOHNSTON

Author of Busting Bureaucracy *and IBM veteran (1959-1969).*

"Restructure into smaller, customer-focused units. You'll know you have it right when each unit is so organized that it can create a tightly focused mission statement.

Make extensive use of teams, both cross-functional and multidisciplinary, to unleash the talents of IBM's extraordinary employees. Empowered teams can exploit IBM's hidden strengths.

Dismantle the hierarchical staff units and place research and development, manufacturing, accounting, purchasing and all other staff functions within the mission-driven units so they will be self-sufficient.

Do not fear interunit competition; it will assure the long-term success of the most customer-focused units.

Install a new set of measurements of success that track customer satisfaction and loyalty, rather than profits. Technology units would be measured on customer feedback regarding innovation, product quality and responsiveness.

To rebuild public and employee support, IBM should create a business unit to revitalize public education. The unit could provide the software, hardware and propose open standards for a centralized data bank of instructional programs. IBM may be the only private sector organization that has the resources, talent and capability to revolutionize education in the U.S. and throughout the world.

Finally, IBM should stop being panicked and paralyzed by the present crisis. For all its bureaucracy and other faults, IBM has an enormous pool of talent and a long history of respect for its people and the pursuit of excellence. IBM may be just a few challenging decisions away from becoming the greatest business organization on Earth."

INTERVIEW BY MITCH BETTS

Tom PETERS

Co-author of In Search of Excellence

"Prayer would be my strongest suggestion. No, seriously, the company has desperate problems and a lingering mainframe attitude. The new CEO should be an outsider and a technologist who understands the industry because IBM is up to its ears in technology problems.

It is sheer madness to think that a $65 billion company could be agile enough to compete across the board. So the new management should take steps toward literally breaking the company up into a half-dozen or more pieces. At the very least, it should sell significant shares of a half-dozen pieces to the public.

That company cannot be run as a multipurpose, all-things-to-all-people monolith in Armonk [N.Y.] anymore. More cuts in the work force are needed, too. Even after the current cuts are finished, they probably still have 50,000 too many bodies to support the revenue they've got now."

INTERVIEW BY MITCH BETTS

Howard ANDERSON

President and managing director at The Yankee Group.

"IBM has to have one hell of an agenda:

Pacify the customers, keep them in the fold. Whatever the new CEO does, IBM needs to communicate with its customer base. If that stops, everything else is bogus.

Send a message to the IBM troops that there is a leader at the helm with a vision.

Come up with a plan for drastic action: a three- or four- or five-part plan that works and has some benefits to the corporation.

Quell a mini-rebellion among the stockholders. Emphasize the return to profitability, return to leadership.

Send a message to those people IBM really needs — senior vice presidents, others — that they are part of the plan. IBM can't start passing out raises like cotton candy, but the CEO can certainly make the top people feel part of a team."

INTERVIEW BY
JOHANNA AMBROSIO

James MARTIN

Industry guru and former IBM executive.

"IBM should use its enormous research capabilities to break into or more fully develop its presence in areas such as client/server, object-oriented technology, downsizing, outsourcing and broadband networks. [For example,] they should move at lightning speed into client/server by building a powerful superserver like a [Sun Microsystems, Inc.] SPARCstation 2000.

IBM has taken daring actions in the past, under the leadership of [T. J.] Watson with the System/370 architecture. They need someone at the helm like Watson now. If IBM is managed by committee, it won't survive more than a few years.

Bill Gates is very much like Watson. He knows what he wants and is a dictator. He surrounds himself with brilliant people who can implement his vision. IBM needs to move back to that type of management. But, and this is an important but, the company may be too large to have one great dictator. Maybe it needs 13 dictators to set free in autonomous companies concentrating on different technologies.

Eventually, they need to get rid of the whole [management] culture that surrounds MVS and mainframes and move into something more advanced. But they still have to support their customers, so you can't just close it down. It has to be closed down with a migration path, so that means it can't happen quickly.

Many of the winning ideas in the computer industry are coming from start-up corporations, not giants. IBM has to have the ongoing ability to form partnerships with new companies that have good ideas. And one partnership in one area is not enough. It needs lots of partnerships, but they have to be good for the partner, too, or they won't work. That's something that *has* to change."

INTERVIEW BY KIM S. NASH

Bob DJURDJEVIC

President of Annex Research.

"The key for IBM will lie in doing away with the system that produced the people who have made the bad decisions.

They say they want to transition from being a hardware company to a services company. That's a good idea. But when you look at IBM, you still see essentially a manufacturing company, with business lines structured around the hardware product lines. So the new CEO should break it up not into just nine companies, but maybe 109 companies, each to meet the needs of a different group of customers. That's how service companies are structured.

Then, among those 109 companies, they need to sell off the operations that don't fit the company's strategy. Get rid of the ones that are burdening IBM with financial problems.

The mainframe business, including services and software, is better than 80% of the profit. Next is the AS/400 line. Then we believe the Adstar storage business was marginally profitable in 1992.

The rest of IBM is more or less losing money. The greatest money loser is the Personal Systems division.

Certainly, it wouldn't be wise to peg the business on mainframes if you define the mainframe business in the static sense. But the direction of IBM's [recent] product announcements is away from the mainframe being a stand-alone processor and toward it playing a role in customers' open networks.

It is false to assert, as some have, that the mainframe is dead but accurate to assert that the centralized, single-purpose mainframe is near its end. IBM's announcements attest to that. Now they need to deliver on those announcements."

INTERVIEW BY DEREK SLATER

Ben ROSEN

High-tech venture capitalist and chairman of Compaq Computer Corp.'s board of directors.

"There's a lot IBM could do; it's not a hopeless cause. But I don't want to be the one to help the competition! I think everyone at IBM knows what to do. I just think they're reluctant to do it with any alacrity."

INTERVIEW BY NELL MARGOLIS

Erich BLOCH

Distinguished fellow at the Council on Competitiveness; former director of the National Science Foundation and IBM scientist.

"IBM needs to disaggregate into focused units. It has to recognize that the computer field is splitting up — workstations are quite different from networking, which is quite different from supercomputers and so forth. They can't be in all fields, so they have to be more selective than they were.

They have to recognize their strengths and weaknesses . . . and they need to bring new management in because the old management really let the company down. Akers left, but it was two years too late."

INTERVIEW BY MITCH BETTS

Bob Metcalfe

Inventor of Ethernet and founder of 3Com Corp.

"I'm rooting for IBM.

I remember when IBM had its hands around the throat of the computer industry. Now I know what it's like to have Intel and Microsoft with their hands around the computer industry. And I want to go back.

Intel and Microsoft are still youthful offenders and aren't on the other side of an antitrust investigation like IBM is.

IBM needs to choose a new leader from inside, somebody like Jim Cannavino [senior vice president, Personal Systems].

It should be someone inside because he knows where all the bodies are buried, but the person has to have some distance from Akers so can he have some objectivity.

IBM's predicament is not nearly as bad as it is reputed. It's silly to think that a company as big as IBM could be on its last legs.

They have done the things that they need to already, such as the OEM-ification of their technology and their decentralizing of the business units."

INTERVIEW BY CAROL J. HILDEBRAND

George DiNardo

IS consultant at Coopers & Lybrand, former CIO at Mellon Bank Corp. and reformed mainframe bigot.

"IBM permeated the entire company, from the bottom to the top, with salesmen instead of technicians in an era when technology was becoming paramount to the CIO. They are sales, sales, sales. Thus, technology deliveries have been terrible.

A good vendor brings to you a good box and a good programmer productivity tool. IBM is stubbing its toe and risking the company because it doesn't have a productivity tool. [At Mellon,] I got almost no help from IBM for the one critical (and most expensive) resource — the programmer. To help itself, IBM has to offer programmer productivity tools of substance within its mainframe world.

The company also needs to concentrate on RAID [redundant arrays of inexpensive disks] for storage. RAID is very critical to eliminating the backup tasks that big-iron shops have to do each night. Come on — with RAID, you don't have to worry about that. The damn thing never breaks.

IBM should create its large computer environment as either a mainframe or a server. But I'm talking about structuring it. Productivity tools, software tools, showing everybody how they can use that big DB2 database as a structured tool.

IBM should then say, 'Here's how to do client/server. We've got the big monster server, all these PCs [we hope they have IBM on them, but we don't care], these clients. Here, take these tools that enable you to take a PS/2 running OS/2, and we'll show you how to code that bear in C++. Forget your repository. What we'll have is a whole repository of object-oriented code out on the PC, and any time you want to restructure, just call this object or that object in.

Could you imagine what that would do?"

INTERVIEW BY LORY SOTTOLA BIX

Stephen K. SMITH

Financial analyst at PaineWebber, Inc. in New York.

"The Top 10 things for IBM's next CEO to do:

1. Get a clear mandate from the board of directors, including the ability to further downsize [including layoffs], change the corporate culture and get rid of the current organizational structure.

2. Bring in your own team of professional managers, each experienced at running a multibillion-dollar business unit.

3. Bring in a top-notch CFO — lack of computer industry experience a plus. Seek someone with experience in restructurings.

4. Don't get carried away if IBM's stock price goes up on your appointment. That doesn't mean the problem is fixed! Set a realistic, two-year agenda.

5. Listen to the real customers, not just the IS managers of IBM's Top 10 mainframe customers. Get your passport out: Two-thirds of IBM's customers are outside the U.S.

6. Ask 'What is the most efficient, lowest cost way to deliver and support each product?' and downsize accordingly.

7. Make sure you really understand why IBM's debt has ballooned in the past five years. IBM has been using cash to offer attractive financing to help sell mainframes to generate the revenue growth to cover the cost of its 200,000-strong, mainframe-oriented sales and service organization. Then figure out what to do to make the mainframe business the cash cow.

8. Don't be fooled into thinking the 'services' business will be IBM's savior. This is already a low-margin business; it's going to get more crowded, and it's an area where IBM clearly doesn't have a monopoly on smarts.

9. Don't dress mutton as lamb. IBM software is largely mainframe and minicomputer software. [Can you name a hot PC software product written by IBM?] IBM's 'networking business' is really mainframe networking. Find out just how much of these businesses are really just pieces of the mainframe and minicomputer businesses.

10. Stop protecting dying businesses."

INTERVIEW BY THOMAS HOFFMAN

Phil WHITE

CEO of Informix Software, Inc. and 15-year IBM veteran.

"They have to decide what they're going to be good in — to do five things vs. 50 — and make sure they're going to resource them adequately. Today, they're just downsizing everything. They should say: 'We're going to be the best integration company or the best mainframe company or the best Unix company.'

What makes IBM strong is that they all believe in what they're doing. I think that the strength of the company is its people. But I really think they should say, 'It'll be painful, but we're going to sell these entities or write them off,' because if you're writing off several billion, you can write off another couple hundred million and then really focus the resource on doing a few things really well."

INTERVIEW BY JEAN S. BOZMAN

ON AKERS' SUCCESSOR

Steve Jobs

"The one person they pick will pick a new team, and a team could make [changes]. I have the greatest respect for Nick Donofrio [general manager, Enterprise Systems]."

James Martin

"They need someone at the helm like [T. J.] Watson now. If IBM is managed by committee, it won't survive more than a few years."

Bob Metcalfe

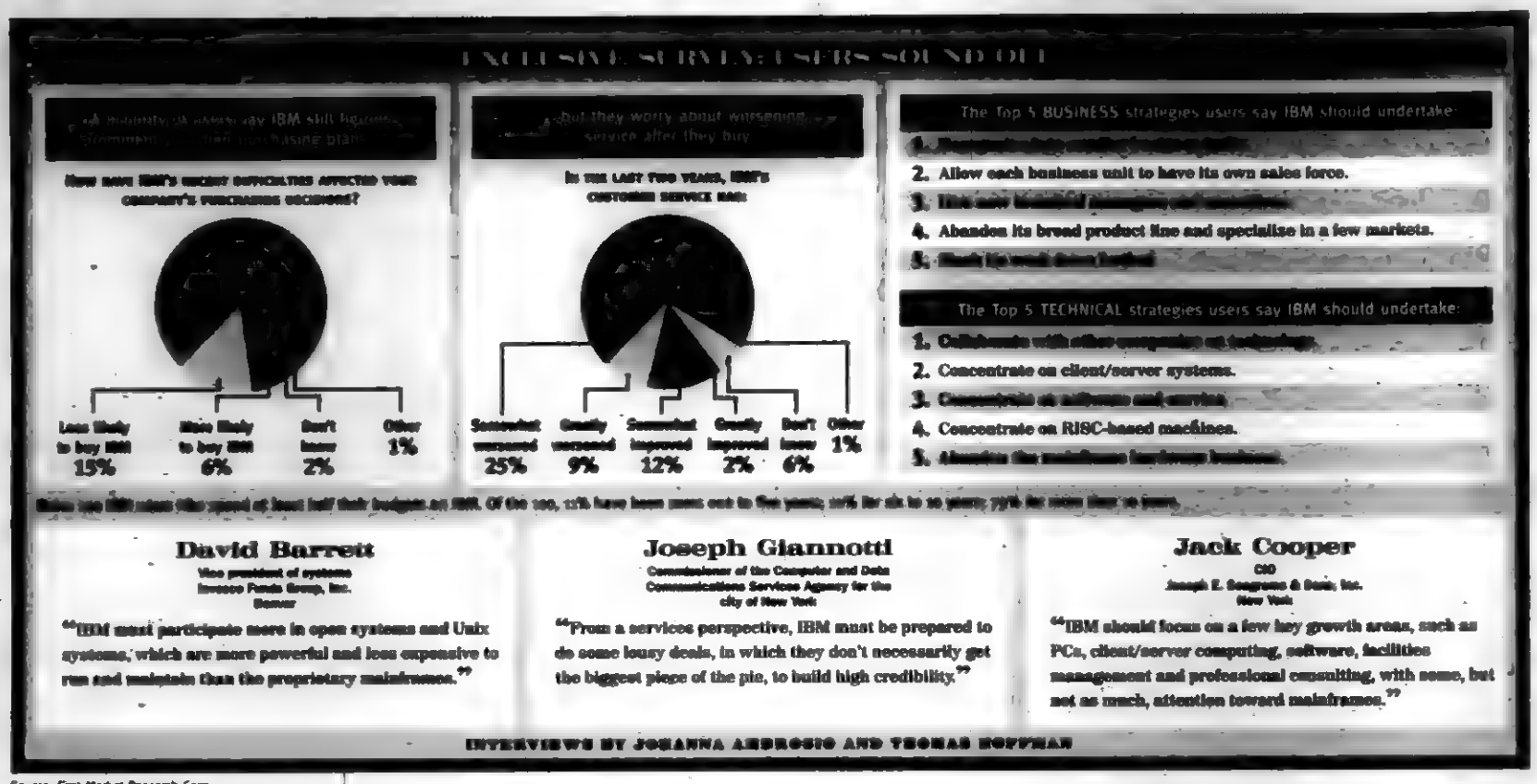
"IBM needs to choose a new leader from inside, somebody like Jim Cannavino [senior vice president, Personal Systems]. It should be someone inside because he knows where all the bodies are buried."

Tom Peters

"The new CEO should be an outsider and a technologist who understands the industry because IBM is up to its ears in technology problems."

Will Zachmann

"Putting Rose Perot in charge, things like that — those are outrageous suggestions. If they bring in somebody from outside who is totally focused on short-term results and does what's been done at Prime or Wang, [IBM] could be history."



Source: First Market Research Corp.

James MOORE

President of GeoPartners Research, Inc. in Cambridge, Mass.

"Change the car, not just the driver. IBM is not an example of basically right culture and right ways of doing business. It needs an effective transformational leader [who can] re-engineer IBM from bottom up, keeping the confidence of people while doing very drastic things.

Their brand [name] is still an immense asset if they can convince the world they are really transforming themselves."

INTERVIEW BY JOHANNA AMBROSIO

Sam ALBERT

Management consultant in Scarsdale, N.Y.; previously worked at IBM for nearly three decades.

"You have to take a large battleship and make it into an armada of autonomous, smaller entities where accountability can translate into revenue, profit and market share. Whoever comes in to captain the fleet will have a different job from Akers, who captained the battleship. The new leader will have to have experience with conglomerates.

For one thing, the new person has to work on accelerating the speed with which IBM will transform itself from International Business Machines to International Business *Services* Corp. — and 1993 is the most important year in the history of IBM.

IBM is almost like a start-up company now. And like any start-up, it has to keep the engine running while it lays the track. The question remains, though: Can IBM do all of this at a time when it's looking for a new CEO? Very possibly. I have witnessed IBM doing things at double-time and triple-time that I have never seen before.

Integrated Systems Solutions Corp., IBM's outsourcing subsidiary, will be a $4 billion business in 1993, after only having started in 1991. That's a very fast start-up.

[Overall,] however, IBM has not been shifting resources and investment into those [businesses] that will yield the best return in the shortest time. It never decided on what were the 10 top areas to be in. It now has to lop off ships in the armada that won't make it to their destinations. And no, mainframes isn't one of them.

I'm not saying IBM should pump money into mainframes, but it takes a lot of service business to equal the income from one ES/9000."

INTERVIEW BY KIM S. NASH

Frank GENS

President, Technology Investment Strategies Corp.

"The No. 1 thing is inject a new corporate culture into 300,000 IBMers, one that's based on a business model for the '90s, not the '70s: commodity components, standards, being best at a few things instead of mediocre at many things.

I would tell Adstar [IBM's storage subsidiary] to sell its best 3-in. drives to EMC. I would have IBM Credit Corp. lease Amdahl mainframes and DEC computers or get out of the leasing business. I would tell the Enterprise Systems group it's time to talk to Microsoft about licensing NT on an ES/9000. Selling to your competitors is appropriate, and sourcing from them is appropriate.

I'd also focus on bringing in more mid- and high-level hires from the outside. IBM desperately needs people who know what it's like to compete from the No. 2 or No. 10 spot in a market instead of No. 1."

INTERVIEW BY PAUL GILLIN

Edson DeCastro

Former chairman of Data General Corp.

"My gut feeling is that IBM's future is in its own hands. It's not in any sense a lost cause, but it will take some real guts to make those decisions [to cut infrastructure and reposition the company more strongly into services].

"The only way through it is just to do it, not to protect the revenue base. But now it will cost more than it would have if they had started when they should have."

INTERVIEW BY JOHANNA AMBROSIO

Ray NOORDA

CEO of Novell, Inc.

"IBM can't forget what they are — the biggest and best service and support company. They're in the process of doing the right thing — identifying business segments and giving them autonomy, profit-and-loss accountability and latitude. They have to recognize that this is a time of change."

INTERVIEW BY MICHELE BOSTERT

Cari Christian

Executive director of the United Shareholders Association, a shareholder rights group based in Washington, D.C.

"IBM's problem is that management is entrenched, the company continues to lose money for shareholders, and there is nothing the shareholders can do.

Our members submitted four proposals to IBM in October:

- We asked that the company split the CEO and chairman of the board position and that the chairman be an outside director. When you've got the chairman of the board serving as the CEO of the company, you've got a conflict of interest.
- We asked that the company create a nominating committee [which picks the executive committee] made up specifically of independent directors.
- We asked that the company create another committee of the board, made up strictly of independent directors, that would look at the strategic future and the plan of the company.
- We asked that the CEO pay package be tied to the stock performance of the company. You'll find a lot of compensation packages, and Akers' was one of them, tied to performance goals, not stock price. Managers might reach all their goals, but the stock price may not go up. Managers take home these nice comfortable pay packages while the shareholders get none of the benefits.

We submitted these proposals and went into negotiations with IBM. The company agreed to create an independent nominating committee. They have a committee that looks at the strategy of the company. They are replacing the CEO, and we're also hoping they will replace Akers as chairman because they need to have an outside director as chairman.

Our philosophy is that the company has taken steps they need to. We don't want to micro-manage. We'll stand back and keep an eye on what happens."

INTERVIEW BY LORY SOTTOLARIZ

Will ZACHMANN

President of Canopus Research, a Duxbury, Mass., research firm.

"The hysterical panic over IBM is unjustified. I think it's in much better fundamental shape than people think. The last thing IBM needs is some random drastic changes from outside the company — that's the one way IBM could be destroyed. That doesn't mean IBM doesn't have a lot to do. But splintering it into separate pieces, putting Ross Perot in charge, things like that — these are cockamamy suggestions. If they bring in somebody from outside who is totally focused on short-term results and does what's been done at Prime or Wang, [IBM] could be history.

What IBM needs to do is more of what they're starting to do: flatten the organization, speed up product development, be more aggressive in pricing and thoroughly embrace standards.

There is plenty of evidence that IBM is doing all of the above. They've been making cuts in staff, reducing the bureaucracy, speeding up their decision-making and increasing business unit independence."

INTERVIEW BY MICHAEL FITZGERALD

Gordon BELL

Former Digital Equipment Corp. VAX development team chief and head of research and development. He is currently an independent consultant.

"Breaking up IBM is absolutely the right thing to do — you can't do it in any other way than by managing the thing in parts. And [IBM needs] an independent sales force. The idea of having one salesman for PCs, for AS/400s and for mainframes is kind of ridiculous.

You also have to let the business units be strongly competitive with each other because all forms of computing are largely interchangeable with one another.

As IBM attempts to recover, it must be dramatically more entrepreneurial. It must define a process that encourages and allows people to perform new ventures in a large organization."

INTERVIEW BY MELINDA-CAROL BALLOU

Egil JULIUSSEN

Co-author of the Computer Industry Almanac.

"IBM must compete with itself, no matter what the consequences. The RS/6000 systems should compete with the mainframes and the minis because if they don't do it, someone else will.

I call this the Self Impact Syndrome. It's been the biggest cause of failure in the whole computer industry. They generally have not introduced products they should have because it would impact their profitable business, but in fact that's what they should do.

It's better to take away your own customer than to have someone else take it away from you.

And there are a lot of new product and market segments that are emerging. What IBM has to do to enter those is put up a few people hidden from under the scrutiny of top management. Kind of like how the IBM PC was originally done. I call this the 'isolated skunkworks approach.'"

INTERVIEW BY JOYCE CHUTCHIAN FERRANTI

Paul B. CARROLL

Wall Street Journal *reporter on leave of absence to work on his book on IBM called* Big Blues.

"What IBM needs to do is to decentralize far more radically than it has up to now. You have to give all operations complete autonomy.

I don't think Akers' idea of a unified sales force that presents 'one face' to the customer works anymore. The main reason is that you don't have the individual [IBM] companies completely responsible for all their own costs. You just have this free-floating sales expense that gets allocated.

I think there are ways to deal with that. I think you could give a mainframe salesman some sort of incentive if he refers a customer to the RS/6000 business. Customers want a single point of contact, but you could cut the main sales force down to some kind of skeleton crew that could bring in technology experts.

The problem at IBM is the culture. I don't think you can have somebody who's a product of the [IBM] culture dismantle the culture. I think a lot of the [IBM] line-of-business people ought to go.

It's like the Soviet Union going from a centrally planned economy to a capitalist economy. You need to denationalize all the IBM companies and let them go at each other. I think they also need to get rid of the full-employment policy. They lost a lot of good people over the years because they let those people decide whether they wanted to go."

INTERVIEW BY JUAN S. BOEMÁN

Larry ELLISON

President, CEO and founder of Oracle Corp.

"Everyone recommends that IBM break up into many more companies. This is the most stupid idea I've ever heard. It's very much like talking to an army that's having difficulty and saying what we really need to do is to divide our army up into 12 armies and let them do whatever they please and that will help us win the war.

They're not too large. You can't be too large, you can't be too good-looking or too rich. The idea is nonsense. IBM has a management problem. To manage it, they need to have a coherent strategy.

They need to accept that mainframes are on their way out. Any new manager could turn IBM into the most profitable company on earth, even within 90 days. All you have to do is get rid of half the people in the dying mainframe business.

Then, given all the huge profit infusion from the once-again-profitable mainframe business, you use that to aggressively pursue open systems.

They should say, 'The mainframe stuff is dying, so let's cut the costs way back, scale down the overall distribution organization, start pushing some great Unix workstations, great PCs. Let's sell PCs like Dell.' There's no reason why they can't build PCs as cheaply as Dell when they've got great [economy of] scale."

INTERVIEW BY JUAN S. BOEMÁN

Outsourcing: To be? Or not to be?

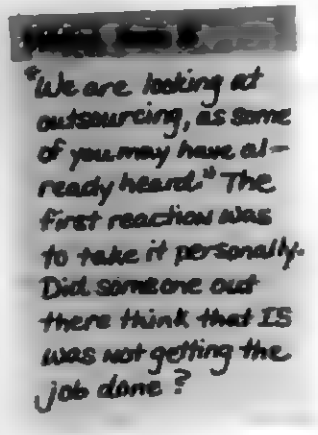
■The threat of being outsourced is a very real fear in information systems shops across the country. Dana Crenshaw, a programmer/analyst for an organization in Georgia, experienced the fear firsthand last summer. His department learned that it would be audited to determine if its work should be outsourced. What follows is Crenshaw's account of what it was like for him and his co-workers to hear that announcement, have their work scrutinized and wait for the outcome.

Friday, June 5
This week was filled with meetings, and nobody expected anything out of the ordinary at today's weekly gathering of our department, applications development.

About halfway through the meeting, the manager of the IS department knocked on the door to interrupt the meeting. This was way out of the ordinary.

Members of the operations department walked in and took their places around the table. The fact that the entire IS staff was present should have warned us that this meeting was something beyond the norm. Our IS shop is divided into two groups: operations and applications development. Our two departments rarely meet, so everyone was thinking, "What in the world could this meeting be about?" We soon found out.

"We are looking at outsourcing, as some of you may have already heard," the head of IS said. The first reaction to this was to take it personally. Did someone out there think IS was not getting the job done? Was someone in the user community or community at large offended by something we did or did not do? Unfortunately, no one was making any efforts at all to reassure us.



The boss went on to explain the steps involved in deciding whether to outsource. A company would be hired to audit our department. The audit would determine if the entire department should be outsourced, or just certain functions. In addition, the auditor would recommend changes to enhance our department. Once the audit was complete (Oct. 8 was the deadline), and if outsourcing was recommended, bids would be accepted. We were told that as part of any outsourcing contract, the service provider would be required to employ the current staff for six months.

We were not very excited to hear about the outsourcing and even less excited to hear about the "six months" clause. Most people assumed that few, if any, employees would be kept longer than that.

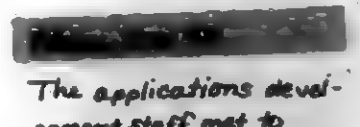
Friday, June 12
The applications development staff met to discuss the implications of last week's announcement. There was a strong feeling that the threat of outsourcing was probably just a tactic to send us a message: "It's time to shape up."

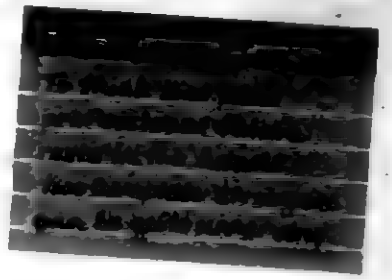
We discussed the problems we were having and solutions to those problems. There were three major concerns: First, people were worried that if they requested help, it would be held against them. Second, employees who should be facilitators are in many cases inhibitors. Third, follow-through does not happen consistently. We scheduled a meeting with our supervisor, the manager of operations and the head of IS to share our findings. We said these situations would improve if there was more honesty and openness, acceptance of each others' ideas, better communication and better follow-through on commitments. We also invited them to monitor our progress.

Monday, July 13
Our boss decided that none of our vacancies will be filled until after we know if the department will be outsourced. The decision made sense because anyone who has a job would be jeopardizing a lot to accept another job that may be eliminated. But that doesn't make our job any easier. We currently have five vacancies on a 12-member staff.

Tuesday, July 28
Our boss called a meeting late in the day after meeting with the analysts and managers.

I believe this new open door policy (the boss meeting with the entire staff) will be very effective. His objective is to keep the staff from panicking and abandoning ship before they know whether it is actually going to sink.





To some it was a relief, but on the whole it still left feelings of uncertainty. He told us an audit company would be selected at an Aug. 14 meeting.

Friday, Aug. 15
I attended my first executive meeting yesterday. By the looks on several faces, my appearance surprised many, including my boss. But there were matters of the heart being decided, and I felt compelled to be present.

Eventually, the meeting progressed to the issue of outsourcing. The chairman announced that a company had been selected to conduct the IS audit and would begin the process in a few weeks. I found it odd that there were no questions and/or concerns voiced by anyone, including myself. If I had voiced my thoughts, I would have told them they didn't have to do the study — that the problem was management.

But I remained silent, as did the others, and the package was approved unanimously.

Wednesday, Aug. 19
We finally met two of the three members of the audit team. The senior member was a partner who won't be here often but who will assist in some of the interviews. The second member was the project leader, who has the monumental task of reading our documentation. I'm sure he'll be sleeping well.

From our perspective, we were sitting before two men who would be telling us in two months whether we'd still be working here. To think that your professional future rests in the hands of two strangers can be quite unnerving.

Tuesday, Sept. 15
The audit team has been interviewing us individually, and today I was interviewed. We spoke for an hour and a half on issues ranging from my personal background to the evolution of our department, from training issues to management procedures and policies. It really felt good to finally be able to state my perceptions without any fear of chastisement. I found it reassuring that some of my answers confirmed what the project leader had discovered from speaking with others.

At the same time, I needed to state that not all comments have been negative. For the most part, we enjoy working here.

Friday, Sept. 25
Interviews have now been completed and all members of our department have had the chance to say what they see, feel and think. As each one of us completed his interview, the rest of us eagerly awaited the opportunity to ask a minimum of two questions: "How did it go?" and "What did you say?"

The answers were consistent: "Management has been lacking, while promotions and training have been scarce."

Now all we can do is wait.

Next week, Crenshaw reveals the outcome of the audit.

Career advice for the '90s

Computer groups help job research

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is R. Max Steiner, a marketing director at Contract Solutions, Inc. in Salem, N.H.

Q: My background is in IBM mainframes. How can I find companies that have IBM mainframes, CICS, IMS and the kinds of software and hardware I am experienced in?

A: Marketing your skills to the proper audience is the best way to avoid the headaches involved in a career search. Locate a computer organization whose membership is made up of IBM mainframe users. Two such groups are Guide International Corp. in Chicago, (312) 644-6610; and Share, Inc. in Chicago, (312) 822-0932.

Also, many high-tech publications produce listings of companies that describe the company's product or service and its technical platforms.

Q: I'm a certified public accountant with much business and tax experience. I'm 37 and interested in changing careers to be involved in the computer industry, specifically information systems. What's the best way to determine the kinds of opportunities out there?

A: First determine if your technical skills are compatible with your career goals. What systems are you familiar with? What languages can you program in? Accomplishing this career switch will be challenging. Try researching one of the large accounting firms and target its IS department. This would seem to be an environment where your CPA experience would be appreciated.

Q: I've done some development but not much recently. However, I've attended courses in C++, X Windows and object-oriented development and design. I'm having a tough time getting back into the development area because I've been out of it for a while. How can I break in?

A: Check to see if your employer has any development projects in these areas. If so, find a sympathetic ear and discuss your goals.

In all likelihood, you will need to do this in addition to your current job responsibilities, but at least you will be able to gain professional experience.

You could also volunteer at a nonprofit organization whose database could use some attention.

Q: I have a computer science degree and have been a computer operator for three years. My company has hired a recent graduate to do part of my job, and I have been left with less work. My manager shows her things that I don't know. What can I do? I'm not sure I belong in the advancing world of technology.

A: After investing in a college education, you probably do belong in the "advancing world of technology." Approach your manager and express an interest in assuming more responsibilities. Let him know that you would like to learn at the same pace as your peer. Show initiative, and perhaps you'll be rewarded with new challenges. If you are discouraged because you feel ignored, that will show. Your manager may see this as a lack of enthusiasm and may not want to invest in new training.

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What to do when you feel you are ready for a promotion

■ Make sure you and your boss are working toward the same goals. Ask him what qualities he looks for in employees he would consider promoting and what specific skills you need to work on to attain those qualities. If your boss says you need to work on your analysis or leadership skills, set goals to make improvements in those areas.

Andrew Blakeslee, programmer/analyst
Carnett, Jacksonville, Fla.

■ Make an extra effort to communicate the value you are adding to your company by meeting periodically with your manager. Never assume your boss knows exactly what you are doing, and never wait until your review to point out your achievements.

Dave Ballentin, systems analyst
The Boeing Co., Redmond, Wash.

■ Meet with your manager and create a list of specific skills that you need to improve. Then find ways to acquire them, such as taking a training program offered by your company.

Joan Steinberg, manager, technical services
Edgcomb Metals Co., Philadelphia

■ Take the opportunity to present yourself as someone who is ready for a promotion by supporting your achievements with facts such as user satisfaction.

Henry Gaskins, senior project leader
RailInc—Association of American Railroads
Washington, D.C.

Compiled by Erin Callaway, a Computerworld intern.

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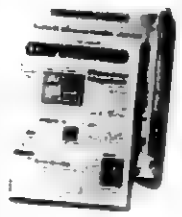

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The service industry continues to hire more workers than any other segment, while manufacturing continues to trim the fat

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How to spot bogus software

playing it SAFE

By Alice Bredin

How hard is it to sniff out counterfeit software? Very difficult, it seems, even for the pros. Microsoft Corp., for example, recently came up against a suspicious copy of MS-DOS Version 5. After the piracy department put it through a thorough examination, they found the print quality to be slightly off — a flaw only a trained eye could detect.

Because that information was not enough to label the software a fake, the designer of the software packaging's hologram was ushered in to confirm that the 2-in.-wide hologram on the front of the package was a fraud.

At Microsoft, hologram designers are often called on to verify software's authenticity, which goes to show how hard it is to pick out a good counterfeit. And it's getting harder. Software counterfeiters are more sophisticated — and more prevalent — than ever. They have learned to create serial numbers, print documentation and design packaging that is nearly identical to the real thing.

Organizations that track counterfeiting don't have figures for the volume of counterfeit products on the market. However, "we are seeing more counterfeit software of higher quality than we've seen in the past," says Robert Holleyman, president of the Business Software Alliance (BSA), a Washington, D.C.-based coalition of software publishers that fights piracy worldwide.

The primary targets are DOS, Microsoft's Windows and computer games. Most counterfeit software is manufactured in Taiwan, Indonesia, Singapore and Thailand. Although sales of these fakes are more common overseas, it's a problem in the U.S. too.

It's important for buyers to report fraudulent software. The reason? It's usually the only way dealers will find out that they're selling bogus items. More importantly, the risk is high for virus infection or investigation by one of the regulatory associations.

Avoid buying bogus software by eluding...
...dealers that sell only a few products at really low prices.
...salespeople selling door to door.
...software sold at prices that are "to good to be true."

Sold through the mail, by dealers or by sales representatives, counterfeit software is hard to spot. A good indicator of a counterfeit, experts say, is price. Counterfeiters sell software at a drastic discount, usually for less than half of what you usually see them sell for. "Look at retail price. You can legitimately expect to pay $250 if the retail is $400. If that same product is going for $100 or $150, you should be suspicious," says Peter Beruk, litigation manager at the Software Publishers Association (SPA), a trade association of software publishers in Washington, D.C.

Once you've bought the software, clues get more subtle, but they are still discernable. The most obvious: shrink-wrapping that doesn't fit, a photocopied manual or a missing registration card. You should also check for a missing registration number when you load the software. Or if you purchase multiple copies, check for duplicate registration numbers.

A final word of advice is to carefully select where you buy. Avoid storefront operations that open quickly and sell just a few varieties of extremely cheap software. Bogus salespeople may even seek you out. Recently, counterfeiters have been traveling the California coast making sales calls. "To be safe, people should always buy from a reputable, authorized dealer," Beruk says.

Bredin is a free-lance writer based in New York.

tips

Counterfeit tip-offs:
- Shrink-wrap doesn't fit right.
- Registration card is missing.
- Manual is photocopied.
- No registration number when loading the software.
- Duplicate registration numbers on multiple copies.

You've bought counterfeit software. Now what?

➤ Get rid of it.

➤ Call the dealer who sold you the product. Some dealers may unknowingly purchase a counterfeit product, in which case the onus is on them to refund your money or replace the product.

➤ If the dealer has disappeared or you are getting unsatisfactory assistance, go to the manufacturer. A Microsoft representative says the company often makes sure buyers get back their money or a new product.

➤ Call the BSA or SPA hotline and register the counterfeit so they can pursue the frauds. If it's a Microsoft product, call its hot line. Those numbers are: SPA, (800) 388-7478; BSA, (800) 688-2721; and Microsoft, (800) 662-6796.

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LTE-286	$675	$700
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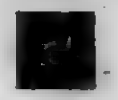

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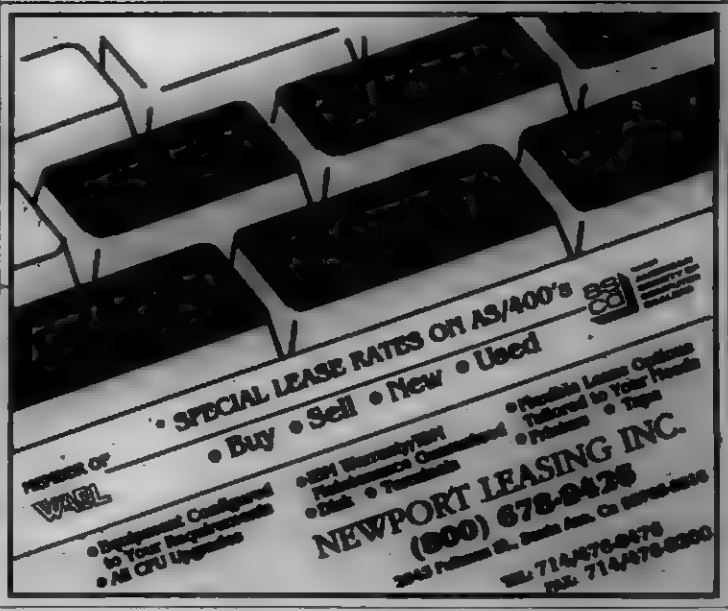

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Gainers

Percent

Ultimate Corp.	48.8	Spinnaker Software	-19.0
MRS	28.3	AST Research Inc.	-13.2
Cray Computer	28.1	BMC Software Inc.	-13.0
Software Toolworks Inc.	27.0	McAfee Associates (L)	-12.0
Teradyne Corp.	21.9	IPL Systems Inc.	-10.0
Storage Technology (L)	18.3	Network Corp.	-9.8
Xilinx	17.9	Compression Labs Inc.	-8.9
Novell Inc.	17.0	Bytecom Corp.	-8.3

Dollar

Synoptics Communications	8.75	BMC Software Inc.	-8.38
Network Equipment Tech.	8.38	Autodesk Inc.	-2.25
Policy Management Sys.	6.38	AST Research Inc.	-2.25
Cabletron Systems	6.25	Progress Software Corp.	-2.00
Cisco Systems Inc.	6.00	Bytecom Corp.	-1.88
Xilinx	5.50	DGS Systems Inc.	-1.75
Storage Technology (L)	5.25	U S West Inc. (H)	-1.50
MRS	3.25	Compression Labs Inc.	-1.25

Bullish on videoconferencing

Recent product announcements have drawn attention back to videoconferencing equipment companies, which suffered through a dismal 1992 on the stock market.

PictureTel Corp. (PCTL) went through the wringer last year. The market-share leader saw its share price drop from a high near 50 early in 1992 to a low of 10.

Competitor Compression Labs, Inc. (CLDX) experienced similar difficulties, falling from a high in the mid-20s to a low of 5.

Two factors caused the drops last year, according to James Reynolds, director of research at Wedbush Morgan Securities: first, a general decline in technology stocks, and second, disappointing financial results, particularly in Compression Labs' case.

Both stocks have recovered to a degree: PictureTel has hovered between 23 and 28 in 1993, closing Wednesday at 26. Compression Labs closed at 13. Analysts said the near-term prospects for these former highfliers are mixed.

Alex. Brown & Sons, Inc. analyst John Rohal recently rated PictureTel's stock a Buy, while Compression Labs earned a Neutral rating. "In relation to their earnings, neither stock is terribly cheap right now. They could both trade in a narrow range for a while," Reynolds said.

The battle in the marketplace is currently joined at the low end. Boston consultancy The Yankee Group identifies considerable demand that has been pent up by the equipment's premium price tags. PictureTel's new Model 150 system, due to ship this quarter, and Compression Labs' recently announced Eclipse products each address this end of the market.

"There's a little bit of a cloud over each of them right now," Reynolds said. The Eclipse system impressed analysts with its price/performance, which puts pressure on PictureTel; however, the new Eclipse models will not ship until June, which casts uncertainty on Compression Labs' earnings.

The long-term potential of the market is great, The Yankee Group said. Videoconferencing is used by almost half of the Fortune 1,000 corporations. The Yankee Group pegs the 1993 market at $430 million, up from $330 million in 1992. By 1998, it predicts a market worth $1.1 billion.

PictureTel owns as much market share as its next two competitors combined, according to Alex. Brown data, and it notched better financial results in the most recent quarter. Rohal said would-be competitors have hit snags in their efforts to develop technology for seamless communication across heterogeneous platforms. That gives PictureTel and Compression Labs an opportunity to build a solid lead in the marketplace. — *Derek Slater*

Exch	52-Week High	52-Week Low		March 5 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up 4.4
OTC	34.63	9.63	3 COM Corp.	31.50	2.25	7.7
NYS	76.63	56.25	American Info Techs Corp.	74.88	-0.13	-0.2
NYS	57.00	37.50	AT&T (H)	57.00	1.25	2.2
OTC	3.25	0.75	Artel Communication Corp.	3.25	0.38	13.0
OTC	24.50	10.25	Banyan Systems Inc.	18.75	1.25	7.1
NYS	56.75	40.25	Bell Atlantic Corp.	55.13	0.13	0.2
NYS	57.13	43.38	BellSouth Corp. (H)	56.63	0.25	0.4
NYS	6.75	3.63	Bolt, Beranek & Newman	4.50	0.00	0.0
OTC	18.50	10.00	Brooktrout Technology	17.25	1.75	11.3
NYS	92.25	42.13	Cabletron Systems	85.25	6.25	7.9
OTC	34.50	17.75	Chipcom Corp.	30.25	-1.25	-4.0
OTC	94.75	33.00	Cisco Systems Inc.	93.25	6.00	6.9
OTC	27.75	5.50	Compression Labs Inc.	12.75	-1.25	-8.9
OTC	3.56	0.88	Data Switch Corp. (H)	3.50	0.50	16.7
NYS	22.25	13.75	Digital Comm. Assoc.	19.50	1.38	7.6
OTC	14.75	7.00	Digital Systems Int'l Inc. (L)	7.88	0.63	8.6
OTC	28.50	4.00	DSC Communications	27.00	1.13	4.3
OTC	9.50	4.75	Fibronics Int'l Inc.	8.38	0.50	6.3
OTC	37.50	10.50	Fluent Corp.	11.75	0.50	4.4
OTC	4.38	1.50	Gandalf Technologies Inc.	3.31	-0.06	-1.8
OTC	2.06	0.69	Gateway Communications (H)	1.97	0.28	16.6
NYS	10.50	2.88	General Datacomm Inds.	8.63	0.63	7.8
ASE	4.63	2.00	Go Video	2.96	0.06	2.1
NYS	37.75	28.88	GTE Corp.	36.13	-0.38	-1.0
NYS	78.25	62.50	ITT Corp. (H)	78.25	2.38	3.1
OTC	43.38	29.50	MCI Communications Corp.	41.50	-1.38	-3.4
OTC	13.50	2.25	Microcom Inc.	5.00	0.25	5.3
OTC	26.25	8.00	Netrix Corp.	9.25	-1.00	-9.8
OTC	19.00	9.63	Network Computing Devices	15.00	0.00	0.0
NYS	16.00	8.13	Network Equipment Tech.	8.75	0.38	4.5
OTC	23.25	8.00	Network General	15.38	2.13	16.0
OTC	15.75	8.50	Network Systems Corp.	11.25	-0.50	-4.3
OTC	56.75	13.25	Newbridge Networks Corp.	56.75	8.25	17.0
NYS	48.00	30.50	Northern Telecom Ltd.	45.00	1.50	3.4
OTC	33.50	22.50	Novell Inc.	30.00	1.00	3.4
NYS	91.63	69.13	Nynex Corp. (H)	91.63	0.88	1.0
OTC	37.50	14.50	Octel Communications Corp.	28.75	2.75	10.6
OTC	8.50	3.38	Period Data Comm Networks	4.75	0.13	2.7
OTC	48.75	10.25	Picturetel Corp.	24.50	-0.50	-2.0
OTC	16.25	7.00	Proteon Inc.	7.75	0.13	1.6
NYS	30.38	10.16	Scientific Atlanta Inc.	23.00	2.50	12.2
NYS	75.63	56.63	Southwestern Bell Corp.	75.13	1.00	1.3
NYS	29.13	20.75	Sprint Corp. (H)	29.13	1.13	4.0
OTC	27.00	8.75	Standard Microsystems Corp.	20.25	2.50	14.1
OTC	18.50	6.88	Stratacom Inc.	15.13	0.38	2.5
OTC	95.50	18.75	Synoptics Communications	88.75	8.75	10.9
OTC	7.13	4.25	Telebit Corp.	5.00	-0.13	-2.4
OTC	9.38	2.13	Telematics Int'l Inc.	8.00	0.38	4.9
OTC	29.50	13.38	US Robotics	20.00	1.50	8.1
NYS	43.88	32.88	U S West Inc. (H)	42.13	-1.50	-3.4
OTC	46.00	12.00	Wellfleet Communications	40.00	0.75	1.9
OTC	22.00	7.00	Xircom	8.50	0.00	0.0
PCS AND WORKSTATIONS						Up 0.1
OTC	7.75	3.00	Advanced Logic Research (L)	3.25	0.00	0.0
OTC	65.25	41.50	Apple Computer Inc.	55.50	2.63	5.0
OTC	24.25	11.25	AST Research Inc.	14.75	-2.25	-13.2
NYS	16.25	5.25	Commodore Int'l.	5.38	0.00	0.0
NYS	58.50	22.25	Compaq Computer Corp.	45.00	-0.50	-1.1
OTC	49.88	15.00	Dell Computer Corp.	31.13	-1.25	-3.9
NYS	85.00	50.25	Hewlett Packard Co.	77.50	2.75	3.7
NYS	33.00	14.13	Silicon Graphics	30.00	1.63	5.7
OTC	41.00	22.50	Sun Microsystems Inc.	35.13	-0.25	-0.7
NYS	32.13	22.25	Tandy Corp.	26.13	1.00	4.0
NYS	9.75	5.00	Zenith Electronics	7.50	0.13	1.7
OTC	16.75	2.75	Zeos International Ltd.	4.88	0.13	2.6
LARGE SYSTEMS						Up 0.9
ASE	20.13	6.63	Amdahl Corp.	8.13	0.13	1.6
NYS	14.88	4.75	Convex Computer	5.75	0.25	4.5
OTC	7.13	1.88	Cray Computer	6.00	0.75	23.1
NYS	46.00	19.00	Cray Research Inc.	28.50	2.25	8.6
NYS	13.50	7.13	Data General Corp. (H)	13.50	1.25	10.2
NYS	60.50	30.38	Digital Equipment Corp.	46.75	-1.00	-2.1
NYS	38.63	26.63	Harris Corp.	35.63	-0.88	-2.4
NYS	100.38	45.88	IBM	55.88	1.88	3.5
OTC	19.50	5.50	Kendall Square Research	16.38	-0.63	-3.7
NYS	110.00	83.00	Matsushita Electronics	87.75	-1.25	-1.4
OTC	17.00	6.00	Pyramid Technology	15.75	1.50	10.5
OTC	24.00	11.13	Sequent Computer Sys.	19.50	0.13	0.6
OTC	16.38	1.38	Sequoia Systems Inc.	2.66	-0.06	-2.5
NYS	52.00	29.50	Stratus Computer Inc.	33.50	2.13	6.8
NYS	16.88	9.88	Tandem Computers Inc.	13.13	0.25	1.9
NYS	13.50	7.75	Unisys Corp.	13.50	1.13	9.1
ASE	6.88	0.06	Wang Labs Inc. (H)	0.81	0.00	0.0
SOFTWARE						Up 1.7
OTC	56.50	25.25	Adobe Systems Inc.	45.13	0.50	1.1
OTC	30.00	10.25	Aldus Corp.	20.25	2.25	12.5
OTC	19.75	6.63	American Software Inc.	6.63	0.00	0.0
OTC	26.13	9.75	Ask Computer Systems	26.13	2.63	11.2
OTC	56.50	26.50	Autodesk Inc.	45.75	-2.25	-4.7
OTC	28.00	3.50	Bachman Info. Systems	4.00	0.25	6.7
OTC	43.00	34.00	BGS Systems Inc.	39.00	-1.75	-4.3
OTC	84.13	37.25	BMC Software Inc.	56.00	-8.38	-13.0
OTC	28.25	17.00	Boole & Babbage	29.25	0.29	1.0
OTC	71.50	17.50	Borland Int'l Inc.	23.00	2.00	9.5
OTC	9.00	3.00	CE Software	3.75	0.25	7.1
ASE	35.00	9.38	Cheyenne Software Inc.	31.75	1.63	5.4
OTC	19.50	8.25	ChipSoft	14.50	0.00	0.0
OTC	10.25	5.63	Cosmos Inc.	6.25	-0.25	-3.6
NYS	27.38	10.88	Computer Associates	25.00	-0.75	-2.9
NYS	12.38	6.00	Computervision Corp.	5.38	0.75	16.2
OTC	18.50	6.75	Conshare Inc.	9.75	0.25	2.6
OTC	17.25	10.75	Corel Corp.	14.00	1.88	15.5
OTC	43.00	6.00	Easel Corp.	9.13	1.13	14.1
OTC	25.25	12.00	4th Dimension	20.25	1.25	6.6
OTC	25.50	11.00	Frame Technology (L)	14.00	1.00	7.7
OTC	22.25	12.50	Group I Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta	27.50	-0.25	-0.9
OTC	8.75	3.50	Hogan Systems Inc.	8.13	0.38	4.8
OTC	25.75	12.25	IMRS	17.00	3.75	28.3
OTC	34.75	18.50	Information Resources	29.38	-0.88	-2.9
OTC	42.00	12.13	Informix Corp.	34.50	3.25	10.4
OTC	21.25	11.00	Intergraph Corp.	12.50	0.50	4.2
OTC	13.63	7.75	Interleaf Inc.	9.75	0.00	0.0

Exch	52-Week High	52-Week Low		March 5 3 PM	Wk Net Change	Wk Pct Change
OTC	18.25	7.00	Interpoly Inc. (L)	8.25	-0.25	-2.9
OTC	19.25	9.50	Knowledgeware Inc.	10.50	-0.25	-2.3
OTC	54.75	28.75	Legent Corp.	45.75	0.00	0.0
OTC	38.75	14.75	Lotus Development	27.00	0.13	0.5
OTC	23.00	15.50	MathSoft	19.50	0.25	1.3
OTC	29.25	8.25	McAfee Associates (L)	8.25	-1.13	-12.0
OTC	8.38	3.88	Meca Software	7.50	0.50	7.1
OTC	20.00	5.25	Mentor Graphics	9.50	0.13	1.3
OTC	46.00	27.25	Micro Focus	33.38	-0.88	-2.6
OTC	20.50	6.50	Micrografx Inc.	7.75	-0.13	-1.6
OTC	95.00	65.50	Microsoft Corp.	83.75	0.50	0.6
OTC	36.38	12.00	Oracle Corp.	34.25	2.00	6.2
OTC	31.88	12.63	Parametric Technology	29.00	0.50	1.7
OTC	40.50	22.50	Peoplesoft	30.50	1.50	5.2
OTC	11.00	3.50	Phoenix Technologies	5.00	0.00	0.0
OTC	39.75	29.75	Pilot Software	30.50	-0.25	-0.7
OTC	25.00	11.25	Platinum Technology	17.00	0.25	1.5
OTC	61.50	29.00	Progress Software Corp.	48.00	-2.00	-4.0
OTC	21.00	2.94	Quarterdeck Office Sys.	3.06	-0.19	-5.8
OTC	26.50	11.75	Rainbow Technologies Inc.	21.00	2.88	15.9
OTC	22.75	4.00	Rasterops	7.50	-0.38	-4.8
OTC	16.25	3.63	Ross Systems	12.75	0.13	1.0
OTC	27.25	9.50	Sapiens USA Inc.	24.25	2.25	10.2
OTC	26.25	6.75	Software Publishing Corp.	13.75	1.63	13.4
OTC	9.13	2.00	Software Toolworks Inc.	8.31	1.50	22.0
OTC	5.50	0.75	Spinnaker Software	2.13	-0.50	-19.0
OTC	15.00	3.25	State of the Art	11.75	0.50	4.4
NYS	23.63	13.75	Sterling Software Inc.	21.00	1.00	5.0
OTC	22.00	8.00	Struct. Dynamics Research	14.00	1.25	9.8
OTC	62.25	21.00	Sybase Inc.	58.50	2.38	4.2
OTC	48.75	5.88	Symantec Corp.	11.00	0.13	1.1
NYS	13.50	5.25	Systems Center Inc.	9.25	1.00	12.1
OTC	25.50	10.00	System Software Assoc.	12.75	-0.88	-6.4
OTC	10.13	2.50	Trimdc Corp.	4.88	0.88	21.9
OTC	22.75	9.13	Viewlogic Systems	18.00	0.25	1.4
OTC	23.75	8.13	Walker Interactive Systems	10.00	-0.50	-4.8
OTC	4.38	1.38	Wordstar	2.31	-0.06	-2.6
SEMICONDUCTORS						Up 1.7
NYS	23.50	7.38	Advanced Micro Devices	23.50	1.75	8.0
NYS	18.75	8.63	Analog Devices Inc.	17.88	1.00	5.9
OTC	20.13	7.63	Atmel Corp.	18.50	1.13	6.5
OTC	12.75	3.25	Chips And Technologies	3.38	-0.06	-1.8
OTC	39.75	16.75	Cirrus Logic	25.75	0.75	3.0
NYS	16.88	7.38	Cypress Semiconductor Corp.	10.75	0.50	4.9
NYS	16.13	7.00	Dallas Semiconductor	14.88	0.88	6.3
OTC	120.00	46.50	Intel Corp. (H)	117.63	0.63	0.5
NYS	12.50	4.88	LSI Logic Corp.	12.50	1.13	9.9
NYS	26.00	12.88	Micron Technology (H)	25.88	1.38	5.6
NYS	63.00	36.44	Motorola Inc.	61.00	2.25	3.8
NYS	14.13	8.25	National Semiconductor	11.38	0.38	3.4
OTC	21.25	8.25	Sierra Semiconductor	13.25	-0.13	-0.9
NYS	38.50	22.25	SynOptics	31.13	-1.63	-5.5
NYS	59.25	31.50	Texas Instruments	59.13	2.25	4.0
OTC	10.00	6.00	VLSI Technology	7.13	0.13	1.8
OTC	7.63	2.13	Xilinx	7.00	-0.13	-1.8
ASE	9.63	3.50	Western Digital Corp.	8.50	0.25	3.0
OTC	36.25	14.50	Xicor	36.25	5.50	17.9
OTC	37.84	12.50	Zilog Inc.	25.13	3.63	16.9
PERIPHERALS AND SUBSYSTEMS						Up 1.4
OTC	28.75	10.38	American Power Conversion	25.88	1.63	6.7
OTC	30.25	20.25	Banctec Inc.	25.50	-2.25	-8.7
OTC	20.75	9.25	Cambex Corp.	11.50	1.00	9.5
ASE	18.38	6.59	Cognitronics Corp.	14.50	0.50	3.6
NYS	25.50	16.13	Conner Peripherals (L)	18.00	1.38	8.3
OTC	38.50	10.75	Creative Technologies Inc.	31.50	0.50	1.6
OTC	90.75	14.25	Data Race Inc.	21.00	1.38	7.0
ASE	19.63	6.75	Databank Corp.	8.25	-0.75	-8.3
NYS	28.75	7.25	EMC Corp.	24.88	1.75	7.6
OTC	10.50	5.38	Emulex Corp.	6.63	0.13	1.9
OTC	19.00	13.25	Evans & Sutherland	16.00	0.88	5.8
OTC	59.25	12.00	Exabyte	13.13	-0.25	-1.9
OTC	26.00	7.09	Intelligent Info. Systems	22.25	0.75	3.5
OTC	10.00	4.38	Iomega Corp. (L)	4.63	-0.13	-2.6
OTC	14.75	5.75	IPL Systems Inc.	6.75	-0.75	-10.0
OTC	23.25	10.75	Komag Inc.	23.25	0.75	3.3
OTC	19.63	7.13	Maxtor Corp. (L)	7.50	-0.50	-6.3
OTC	12.38	7.13	Micropolis Corp.	8.25	0.00	0.0
NYS	109.75	86.50	3M Corp.	107.25	2.75	2.6
OTC	7.75	4.00	Printronix Inc.	6.88	-0.13	-1.8
NYS	17.13	6.88	QMS Inc.	15.25	0.88	6.1
OTC	17.88	12.13	Quantum Corp.	15.38	0.25	1.7
OTC	12.75	3.75	Radius Inc.	4.75	-0.38	-7.9
NYS	16.25	7.50	Recognition Equipment	12.88	-0.13	-1.0
OTC	13.88	5.75	Rexon Inc. (L)	6.00	0.00	0.0
OTC	22.38	12.00	Seagate Technology	16.38	0.63	4.0
NYS	72.50	18.00	Storage Technology (L)	34.75	3.75	18.3
NYS	25.25	16.88	Tektronix Inc.	24.63	-0.13	-0.5
NYS	88.88	66.75	Xerox Corp.	83.13	0.38	0.5
SERVICES						Up 0.7
OTC	23.50	12.16	American Mgmt. Systems	20.38	1.13	5.8
NYS	5.38	3.00	Vanacom Inc.	3.75	0.50	15.4
OTC	35.25	16.00	Analysts Int'l.	32.25	-0.25	-0.8
NYS	55.88	38.75	Auto Data Processing	53.63	-0.25	-0.5
NYS	17.25	9.41	Ceridian Corp.	14.75	-0.13	-0.8
NYS	17.38	12.50	Comdisco Inc.	17.00	1.25	7.9
OTC	13.00	6.75	Computer Horizons	10.25	0.50	5.1
NYS	80.50	57.00	Computer Sciences	74.50	-0.25	-0.3
NYS	9.75	7.00	Computer Task Group (L)	8.13	0.75	10.2
NYS	40.50	22.00	CompuUSA Inc.	29.75	3.50	13.3
OTC	18.50	6.00	Corporate Software	12.00	0.00	0.0
OTC	30.75	7.63	Egghead Discount Software (L)	8.00	-0.13	-1.5
NYS	35.88	25.25	General Motors E (EDS)	30.38	-0.25	-0.8
OTC	25.50	9.25	Inacom Corp.	20.63	-1.88	-8.3
OTC	27.00	6.25	Intelligent Electronics	14.88	0.75	5.3
OTC	16.38	6.63	Mempel	10.63	-0.13	-1.2
OTC	15.75	5.75	Microage Inc.	13.25	0.25	1.9
OTC	40.00	21.66	Paychex	39.00	1.50	4.0
NYS	84.13	59.75	Policy Management Sys.	84.13	6.38	8.2
NYS	35.00	16.81	Reynolds and Reynolds (H)	35.00	3.75	12.0
OTC	32.00	22.00	SEI Corp.	29.50	1.75	6.3
OTC	24.38	16.88	Shared Medical Systems	21.63	-1.13	-4.9
OTC	14.38	5.25	SHL Systemhouse	9.13	0.38	4.3
OTC	29.25	18.25	Software Spectrum Inc.	24.38	-0.63	-2.5
OTC	33.25	20.75	Sungard Data Systems (H)	32.25	0.50	1.6
NYS	3.50	1.13	Ultimate Corp.	2.63	0.75	40.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

IPL president resigns

Robert Norton, president and chief executive officer of storage subsystems vendor IPL Systems, Inc., resigned unexpectedly last week. Norton, who has presided over IPL for the last seven years, will stay on indefinitely until a successor is found. IPL said it remains committed to its current strategy of focusing on IBM Application System/400 storage. In calendar 1992, IPL earned $3 million on revenue of $53.6 million, off 66% and 11%, respectively, from the comparable period last year.

Clearpoint cuts back

Layoffs continue at Clearpoint Peripheral Resources, Inc., a memory and disk drive manufacturer in Hopkinton, Mass. It laid off an additional 40 people last week on top of the 105 employees cut in the last six weeks [CW, Feb. 22]. A spokesman said scaled-down operations will continue and that the company will try to work its way out of "a serious cash-flow problem."

Oracle, user settle

Oracle Corp. has reached an out-of-court settlement over a breach of contract suit filed by tiremaker Bridgestone/Firestone, Inc. in Nashville. The settlement provides that no additional money will be paid by either of the corporations. Bridgestone had sued Oracle in February 1991 for $10 million, charging that Oracle failed to deliver its database and tools in time to meet project requirements. Oracle had sued Bridgestone for nonpayment of $1.5 million in license and consulting fees.

SHORT TAKES SHL Systemhouse, Inc. in Ottawa has raised $32 million from E. M. Warburg Pincus in New York. . . . Delrina Corp. has closed a $12.5 million private placement.

Radio-frequency emancipation

Bill opens way for data highway

By Michael Vizard
WASHINGTON, D.C.

■ A bill designed to free up radio frequencies for commercial use was passed by the U.S. House of Representatives last week. The measure, which now goes to the Senate, is touted by its sponsors as critical legislation that will enable homes and small businesses to link PCs into a yet-to-be-built national data highway.

Speaking at the recent 1993 PC Forum sponsored by New York-based EDventures Holdings, Inc., Rep. Edward J. Markey (D-Mass.), chairman of the House Telecommunications Committee, said the measure will free up 200 MHz of radio spectrum bandwidth for wireless communications currently reserved for the Pentagon.

Markey said the PC industry needs to become more involved in the federal legislative process because this type of legislation will help the PC software industry grow.

For example, the freeing up of radio spectrum bandwidth will encourage the use of electronic services that will be delivered to PCs over a fiber-optic data highway, which the government is expected to help fund during the next three to five years.

Long way off

However, those services will not be available on a widespread basis unless there is a medium to connect homes and businesses with the national data highway.

"The most optimistic estimates from the phone companies are that it will be the year 2015 before we have fiber to the home. It is simpler to build an I-95 data highway than it is to run fiber from that network over the last 100 feet to your home," Markey said.

"Radio spectrum is a hotly contested federal resource. And there are other industries spending a lot of time and money exercising their freedom of speech rights in Washington," he added.

But Markey's claims that the measure to free up radio spectrum for wireless communications, which was authored by Rep. John Dingell (D-Mich.), would be needed to ensure the growth of the PC industry was met with outright derision in some quarters.

Giant leap

Ameritech's decision to open its regional network to competition is a major step toward lowering charges. "The biggest cost of moving data from New York to San Francisco is the cost of moving the data from the local phone system onto the nationwide carrier system," said Rep. Edward J. Markey.

"Fiber is going to be right outside your door so you can tap it within the next three years. The cable companies will bring it," said Andrew Heller, chief executive officer of Hal Computer Systems in Campbell, Calif.

"What I resent is the assumption that the computer companies, cable companies and telecommunications companies are not already at work on these problems without the help of the government," added Robert Frankenberg, vice president and general manager of Hewlett-Packard Co.'s Personal Information Products Group.

And while new technologies may mean that running fiber to every home in America may be unnecessary and that the advances the phone companies are making with existing wireless bandwidth may make the need for another 200 MHz moot, the computer industry should focus on the existing investment in telecommunications and make it "dance to the tune of the computer industry," according to Craig McCaw, chairman of McCaw Cellular Communications, Inc.

DEC's OEM storage hopes high

New products, focus keys to building company's revenue

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. is hoping that a growing presence in OEM storage products will help it rebound from tough times.

DEC's OEM storage business totaled $500 million in calendar 1992, accounting for about 3% of the company's overall business. Charles Christ, vice president of DEC's storage business unit, said he expects the business to rise to $1 billion in 1994 because of the greater range of products and large deals that he expects to clinch as a result.

Toward that end, the company recently announced seven new products, including three low-profile 3½-in. drives, one half-height 2.1G-byte, 3½-in. disk drive and a 10G-byte, 5¼-in. tape drive. The firm also unveiled two new members of its OEM subsystems product set — its next-generation redundant arrays of inexpensive disks storage subsystem and a modular desktop storage subsystem for workstations and high-end PCs.

First on the block

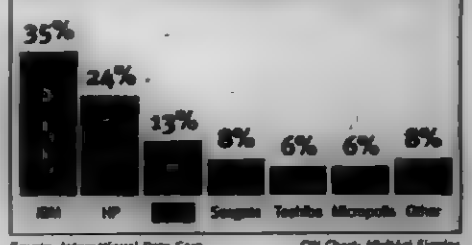
Christ said his organization was the first independent business unit spun off by DEC. During his tenure, he has reduced staff by 45% and cut back on unmarketable products, such as 9-in. drives and those targeting only the VAX market. Instead, he has focused on standards, high-end 3½-in. drives and the modular storage strategy, known as DECstorm.

"I give Charlie Christ very, very high marks because he took a look at a company that wasn't very flexible and had a fair amount of core competency and a fair amount of fat that needed to be trimmed, and he determined what the company was good at and what the market required," said Crawford del Prett, manager of storage strategies at International Data Corp., a market research firm in Framingham, Mass.

Drive to the top

DEC hopes its reinvigorated OEM business will help it catch up with IBM and HP in small form-factor disk drives

Percent of 1992 3½-in. 16-byte shipments
Total: 220,000



Source: International Data Corp. CW Chart: Michael Siggins

Christ said the company hopes to sign OEM pacts for as many as 200,000 to 300,000 units shortly with a large "PC/workstation" OEM and is having discussions with at least three others. DEC finalized lesser deals covering 25,000 to 45,000 units during the past few months with a range of OEMs, including Dell Computer Corp. and Compaq Computer Corp.

The independence of the storage unit is proving attractive even to competitors such as Sun Microsystems, Inc., which is considering cutting a deal with DEC for an as-yet unannounced 3½-in. drive, Christ said.

Analysts said they believe DEC has the right formula. "I'll be darned if they aren't doing pretty well," said Phil Devin, vice president of storage technologies at Dataquest, Inc., a market research firm in San Jose, Calif. "Companies like DEC and Hewlett-Packard, Co. and IBM have pinpointed a particular area and have gone after it. Since they're not participating in the high-volume, price-sensitive, low-margin part of the market, they have the luxury of making some money."

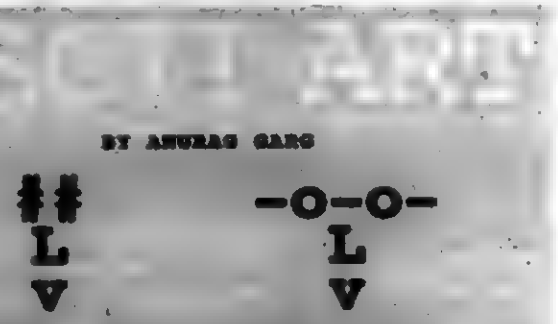
Wysiwyg

THE DOCTOR IS IN

NCR Corp.'s Controller Division calls its computer hot line the "doctor's office." The staff specializes in deliveries (new equipment), brain surgery (operating systems) and face-lifts (visuals), according to **Steve Hanger**, divisional director of information systems and services.

ASCII ART

BY ANURAG GARG



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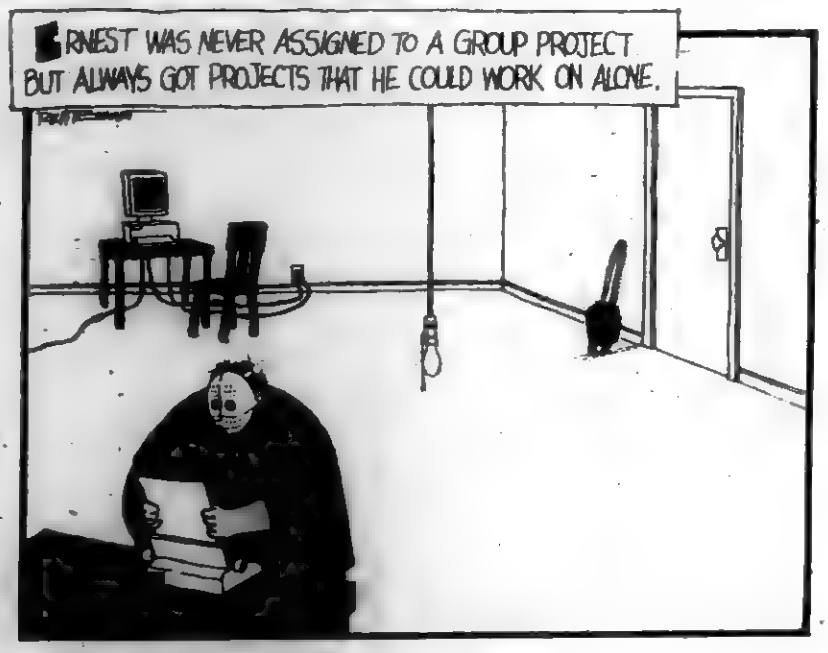
AS THE (COMPUTER) WORLD TURNS

Ever thought of being a star? You might want to talk to Ted Nelson (inventor of the term "hypertext"), who is working on "Silicon Valley Story," a work-in-progress. Nelson is never without his video camera, recording everything from casual dinners to product introductions. The film will star Nelson as a major nerd who can't quite make relationships work and include Doug Engelbart, inventor of the mouse, playing Nelson's father.

Source: *Wired* premier issue 1993

The Fifth Wave *by* Rich Tennant



Inside Lines

Not so fast...

Despite earlier reports, Dell Computer was not put on the Gartner Group's initial Problem Watch, the consultancy's list of troubled companies. Jonathan Yarmis, vice president and service director of Gartner's PC service, said Dell remained under investigation, however. Under Gartner's criteria, which include financial performance, product quality, organizational issues and service and support, six companies were on the list: IBM, Olivetti and Memorex Telex hit the list for financial reasons; Groupe Bull and Zenith Data Systems for financial reasons and problems in European desktop quality; and Grid Systems for organizational reasons.

Mac seedlings to sprout

Look for Macs clones a lot sooner than you might have expected. An Apple official said the company is going to license its Macintosh compatibility module "very soon." The component will allow high-end machines using the impending Apple/IBM/Motorola-developed PowerPC chip to run Macintosh applications software. San Jose, Calif.-based Radius and DayStar Digital in Flowery Branch, Ga., are reportedly the leading third-party vendors in line for the module license in order to make RISC-based accelerator cards.

A noted object of desire

IBM has asked Lotus to deliver a runtime version of the Notes object database. The runtime version will allow users to run applications on top of Notes without having to purchase an entire Notes database system. Notes Workgroup Manager will allow IBM to layer the Notes replication services on top of a distributed system service that will span OS/2, DOS, AIX and Taligent, said Art Olbert, IBM's product director for LAN systems.

Where SNA meets LANs

Router vendor Wellfleet Communications said it will support IBM's Data Link Switching scheme for peer-to-peer SNA routing in its next software release, due out in the third quarter. It intends to make the announcement this week. Competitor Proteon will enter the "backbone router" market this week with its CNX 500, which supports up to 20 networks.

More coexistence

IBM's MultiProtocol Transport Network (MPTN) protocol is expected to solidify this week with IBM's announcement of the first MPTN products, plus an endorsement from several leading vendors, including Oracle. The first MPTN products will enable TCP/IP Sockets applications to communicate over an SNA backbone, and vice versa, via an OS/2 server.

Easier said than done...

The time has come and gone but Computer Sciences Corp. (CSC) has still not closed its mammoth $1.5 billion outsourcing deal with Australian Mutual Provident Society. CSC is not so sure it will get the job after all. Its main competition at this point, according to one source, is the Sydney-based insurance company's internal IS shop, which has strongly objected. The tentative accord last fall called for CSC to provide data processing services for 10 years and to take over Australian Mutual's data processing subsidiary, an outsourcer which it once jointly owned [CW, Jan. 18].

If Steve Jobs had decided two years ago to turn Next into a software company, there might not be a Taligent today. Lee Reiswig, IBM's Personal Software product group honcho, claims he couldn't do what market conditions finally did: force Next out of the workstation business. IBM licensed the rights to Next's NextStep object-oriented operating environment in 1992, but never exercised its option. In July 1991, IBM joined with Apple to form Taligent, through which it is developing an object-oriented programming environment. Jobs "had the best technology two years ago; I'm not sure he does today," Reiswig opined. Phone, fax or CompuServe News Editor Alan Alper with news tips at (508) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 879-8585.

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Tim Treneff, VAX Systems Manager, Kaiser Aluminum & Chemical Corporation, Rod, Bar & Wire Division.

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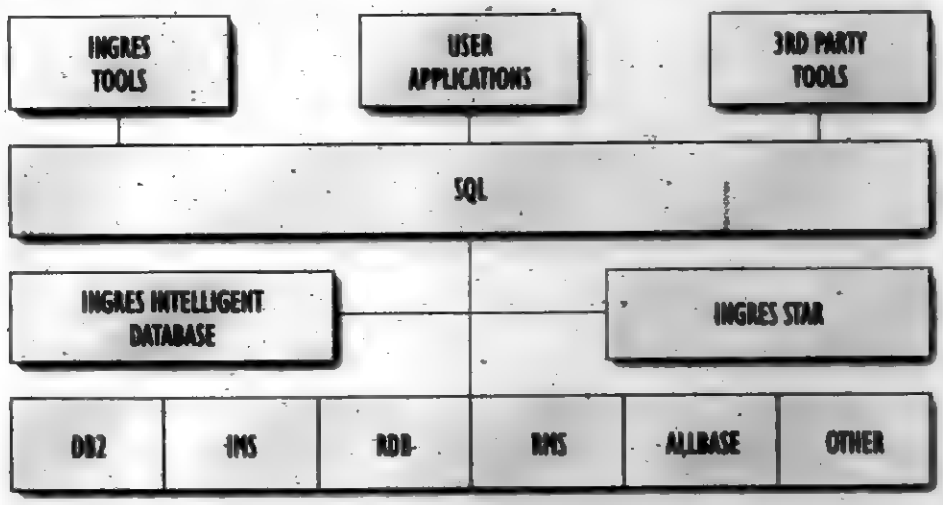

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COMPUTERWORLD

Inside

UNIFORUM
The Unix world gathers this week to sample an open systems menu that emphasizes client/server software and interoperability with legacy systems. *Page 2*

NETWORK CONSOLIDATION
One year after launching a global effort to consolidate telecommunications and network systems, **Citicorp** has exceeded its original $50 million cost-savings goal by $10 million. *Page 6*

COMPUTERWORLD SPECIAL REPORT

RE-ENGINEERING
An exclusive *Computerworld* survey reveals that only one-third of companies now re-engineering are attempting wide-scale redesign. Most choose low-cost projects. *Page 102*

IN DEPTH
Do vendor IS shops practice what their firms preach? Information systems chiefs at **IBM, Intel, Oracle, Sun, Novell** and **Microsoft** reveal their technology ups and downs. *Page 109*

Oracle GUI tools arrive

A single application said to fit all platforms

By Jean S. Bozman
NEW YORK

Oracle Corp. will perform a magic trick on a stage here when it announces a new integrated tool set today. It will show users how to transform their character-based programs running on dumb terminals into graphical user interface-based client/server applications that can run on a variety of workstations and PCs.

The tool set, called the Cooperative Development Environment, is expected to ship this summer, according to Oracle Chief Executive Officer Lawrence Ellison.

Users have anticipated the tool set for more than a year, and they already own some elements of CDE, including several Oracle computer-aided software engineering tools.

Two new products, Oracle Book and Oracle Browser, address online documentation and end-user database queries, respectively.

The CDE environment integrates all 14 Oracle tools by grafting them onto several layers of client/server software. The environment allows programmers to develop an application and to de-

Oracle, *page 10*

Pieces of the puzzle

Key modules in Oracle's Cooperative Development Environment:

- **Oracle Forms Version 4.0:** An enhanced version of SQLForms.
- **Oracle Reports Version 2.0:** A report writer adapted to support GUIs.
- **Oracle Graphics Version 2.0:** A software layer that can import charts and other images into standard report forms.
- **Oracle Book Version 1.0:** Allows users to incorporate video, scanned images and sound into shared electronic documents.
- **Oracle Browser Version 1.0:** A data query tool supporting GUIs.
- **Oracle CASE Dictionary Version 5.0:** A data repository.

Source: Oracle Corp.

IBM to extend database reach

By Johanna Ambrosio
SAN FRANCISCO

IBM will attempt to grab a piece of the client/server database market with tomorrow's expected announcements of a relational database that runs under AIX and a more distributed version of its mainframe-based DB2 software.

About 60% of Fortune 500 firms are building data warehouses or are planning to do so, consultant Bill Inmon said.

Other parts of the announcement, an IBM spokesman confirmed, include additional third-party support for its Information Warehouse data access architecture introduced in September 1991. Software vendors including Platinum Technology, Inc., Candle Corp. and Information Builders, Inc. will unveil tools, the spokesman said.

Still, some observers predicted that the company's battle for a slice of the client/server database pie will be difficult.

The company is essentially a late entrant into both

IBM, *page 16*

CA gives in, cuts encryption keys

By Thomas Hoffman
ISLANDIA, N.Y.

■ Responding to user requests, Computer Associates International, Inc. last week disclosed plans to remove all disabling code from its mainframe software.

The disablement feature will be replaced with an automated console messaging system that will notify clients if CA software is nearing licensing expiration or is being used outside of contractual parameters. The messaging systems will not cause system shutdown on the date of license expiration, as did the disabling code, said Sanjay Kumar, CA's senior vice president of planning.

Disabling — or encrypted — code is used by some software ven-

CA, *page 1*

SNA routing battle grows

By Elisabeth Horwitt
WASHINGTON, D.C.

IBM's Advanced Peer-to-Peer Networking and Cisco Systems, Inc.'s Advanced Peer-to-Peer Internetworking squared off in a battle of demonstrations last week. Each side argued that it had the most open, widely supported and commercially viable protocol for interconnecting SNA and TCP/IP devices over the same backbone.

Interviews with Interop '93 Spring attendees reveal that APPN is gaining ground rapidly among both vendors and users as a peer-to-peer follow-on to the Systems Network Architecture networking protocol that can support Transmission Control Protocol/Internet Protocol devices if necessary.

In contrast, APPI so far seems to have made little impression on its target market: companies that want to take advantage of APPN's advanced SNA routing and directory features without having to implement the complex protocol on their TCP/IP backbones.

"We will support APPN, but we're not sure about APPI," said Jim Tretter, telecommunications manager at Multifoods, a Wellfleet

SNA, *page 14*

Federal computing initiative

Critics seek guiding light, program input

By Gary H. Anthes
WASHINGTON, D.C.

The federal government's advanced computing and communications initiative, long the province of a few high-tech agencies, is beginning to percolate into mainstream government. Along the way, it is finding applications unimagined by its founders a few years ago.

However, some observers say the High Performance Computing and Communications program lacks direction and consensus, despite enthusiastic pledges of support from President Bill Clinton and Vice President Al Gore.

The program was codified into law in 1991 under the sponsorship of then-Sen. Gore. Agencies involved at the onset were the Defense Advanced Research Projects Agency, NASA, the U.S. Department of Energy and the National Science Foundation.

Two key goals were to build parallel pro-

Dr. Donald A. Lindberg, *HPCC coordinator, wants his office to be active in the advanced computing plan*

HPCC critics, *page 20*

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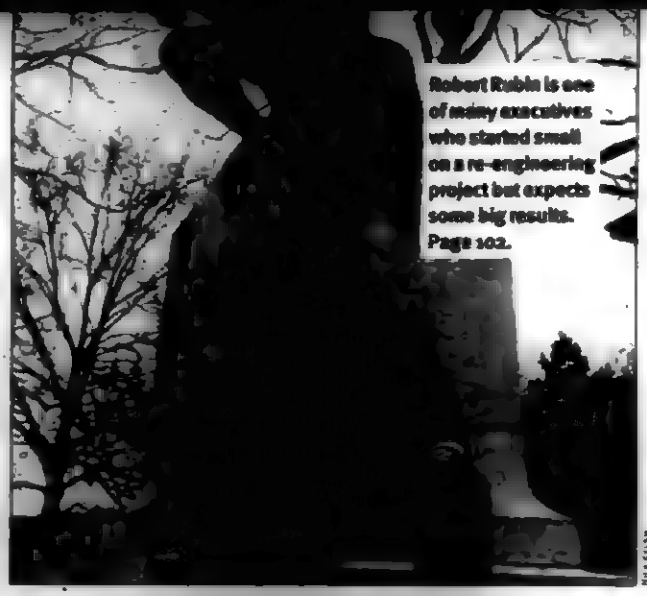

Robert Rubin is one of many executives who started small on a re-engineering project but expects some big results. Page 102.

INTEROP

Attendees at last week's Interop '93 Spring saw Cisco and IBM, with APPI and APPN, respectively, engage in a battle of the internetworking demos. *Pages 1 and 14.* Casting its lot with IBM, Boeing taps Big Blue's MPTN to reduce the number of internetworking protocols. *Page 14.* Despite an overall compatibility theme, the show revealed that router interoperability is still in its infancy, while Novell users touted NetWare 4.0's ease of use and management. *Page 12*

MICROCOMPUTING

Desktop vendors continued to jockey for position last week as IBM, Apple, Motorola and others formed the PowerOpen Association to push the PowerPC RISC technology and lure software developers. *Page 16.* Separately, IBM and Compaq traded price cuts while PC software developers vied for IS loyalties with a variety of license and support options. *Page 4*

DEVELOPMENT TOOLS

Oracle finally unwraps its broad-based graphical tool set for client/server application development this week *(Page 10)* while Software AG rolls out a Unix-based tool set. *Page 24.* A busy HP, meanwhile, lined up support from 15 CASE vendors that agreed to target commercial Unix users by porting their tools to HP's SoftBench framework. The plan is to offer a "workable" open systems version of IBM's ill-fated AD/Cycle. *Page 10.* Working with Ellery Systems, HP also has a plan to make DCE migration a lot easier. *Page 8.* ASK is building a new generation of 'open' application development tools. *Page 10*

VIEWPOINT

Ease of use is still a goal and not a reality, says columnist Elaine Bond. That's why training has to be a priority. *Page 33*

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UniForum preview

Unix show highlights client/server

By Maryfran Johnson
SAN FRANCISCO

■ With an emphasis on the escalating corporate interest in open systems technology, the UniForum 1993 show opens here this week.

"The world of Unix is becoming ever more present in the world of data processing," said Donald Brungard, vice president of MIS at American National Can Co. in Chicago. "We have a corporate mandate to find out what it takes to downsize and provide interoperability between Unix-based platforms and mainframe-based platforms."

UniForum

Highlights of the show, which is expected to draw 40,000 attendees and more than 350 vendor/exhibitors, include the following:

- Microsoft Corp.'s first appearance at UniForum, where it will demonstrate the Windows NT operating system, which already has the Unix industry in a competitive uproar.
- Glimpses of new technology from firms such as Sun Microsystems, Inc., which will show off its upcoming 64-bit Scalable Processor Architecture, and Digital Equipment Corp.'s Unix clustering deal with Encore Computer Corp.
- Software products that stress multiplatform connectivity, graphical development tools and ways to run Windows or Apple Computer, Inc. Macintosh applications on Unix hardware.
- UniForum's first Technology Managers Conference, which has more than 100 information systems executives signed up to hear about client/server applications and tools in open systems environments.

James Holtman, vice president of technology architecture at Cincinnati Bell Information Systems in Ohio, will speak at the technology managers conference about building complex on-line transaction processing systems.

"When you have a number of legacy systems, one criterion in choosing these tools is the ability to run in multiple environments such as Unix, MVS and DOS/Windows," Holtman said. Tools that span several platforms are particularly important, he added, for users with large volumes of corporate data on proprietary mainframes and midrange systems.

Users from companies such as San Francisco-based Charles Schwab & Co., which is heavily committed to using Open Software Foundation technologies such as the Distributed Computing Environment (DCE), will be watching for DCE applications.

"I'll be real interested in DCE-enabling software and development tools," said Ken Richmond, senior technical lead at Schwab's software manufacturing group. "I haven't seen a lot of vendors' products for DCE yet."

One of the first companies with a commercial DCE application to show at UniForum is Atrium Technologies, Inc. Its Dazel distributed software product acts as a network delivery engine for Unix, Macintosh and DOS/Windows environments. Using DCE services, Dazel will automatically deliver information to printers, fax machines, electronic mail, voice and pagers.

Several users said they will watch for software products that improve access and interoperability between legacy systems and open systems. Object-oriented products are also likely to attract attention.

DEC will use Encore technology to build Alpha clusters

By Melinda-Carol Ballou
SAN FRANCISCO

Extending the reach of OSF/1, Digital Equipment Corp. will this week unveil its strategy for Unix-based Alpha clusters using technology supplied by Encore Computer Corp. in Fort Lauderdale, Fla., DEC sources said.

DEC will also use UniForum to make good on a promise to ship both OSF/1 and a range of Alpha AXP platforms running the operating system, sources added.

OSF/1-based Unix clusters will likely begin shipping in stages later this year, DEC sources said.

The agreement with Encore, details of which are expected to be made available this week, will allow DEC to incorporate Encore's Memory Channel interconnect as the memory backplane for DEC's 7000 and 10000 class of Alpha AXP machines, according to DEC sources.

This initial implementation will target OSF/1-based platforms but is likely to apply to Alpha-based clusters on other operating systems later on, they added.

DEC will also use Encore's Integrated File System software, which acts as a traffic cop to allow files to be shared across the system and manages disk access.

Memory Channel is currently rated at 106M byte/sec. on Encore Infinity 90 clusters with effective data transfer rates of 98M byte/sec. The combined DEC/Encore effort on OSF/1-based clusters will offer effective rates of about 200M byte/sec., sources said.

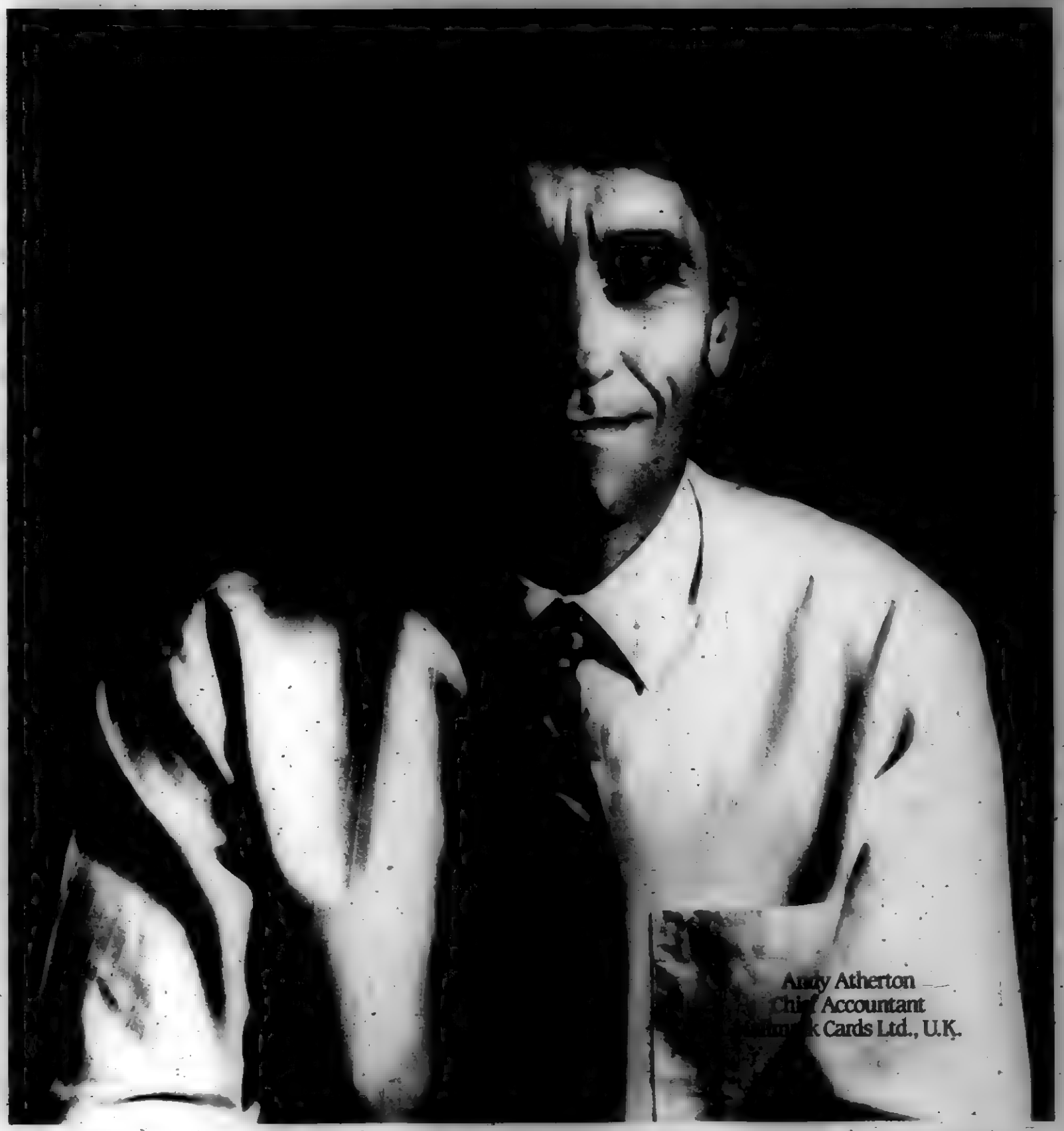
Because the nodes are tied together through shared memory, users are able to have near-linear scaling and direct node-to-node speed with very little latency.

These speeds leapfrog what is currently available on Unix clusters, according to industry analysts.

"You can see how piece by piece, the Unix world is trying to replicate the robustness of the proprietary world," said Bill Bluestein, an analyst at Forrester Research, Inc., a consulting firm in Cambridge, Mass. "The question is, what will be the cost of cluster licenses in the Unix world?"

Although pricing for the clusters was not yet available, the cost for the Alpha AXP line of systems on OSF/1 is identical to the pricing on Open VMS: starting at $14,995 for a low-end Model 3000 and ranging to $344,000 for a DEC 10000 on OSF/1.

DEC will also demonstrate a 200-MHz workstation said to run at 160 SPECmarks and a low-end desktop system. Both systems are expected to ship next month, sources said. The desktop system is expected to be priced slightly under $5,000.



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Make way for a faster dBase IV

By Michael Vizard
SCOTTS VALLEY, CALIF.

Borland International, Inc. last week made overtures to soothe restless dBase IV customers by delivering a substantially faster version of the product.

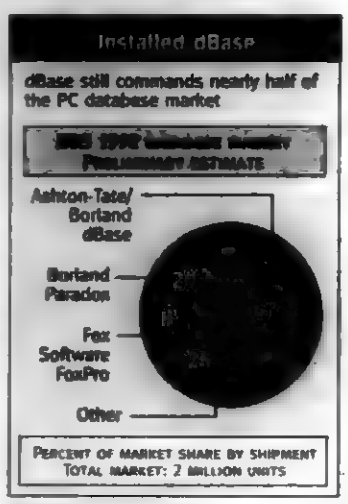
In addition, Borland made good on Ashton-Tate Corp.'s promise to deliver a dBase compiler for DOS that will allow applications to be widely deployed without incurring royalty fees.

"This is the first time I've ever been able to use a compiler without having to change a single piece of code," said Terry Martin, director of information systems at Asyst Technologies, Inc., an environmental systems provider for semiconductor manufacturers in Milpitas, Calif.

Much faster

Version 2.0 of dBase IV for DOS is 10 times faster than the previous release, and its available memory has been expanded to 16M bytes. In addition, Borland has borrowed filtering technology from its InterBase relational database that dramatically speeds indexing and querying.

"There are about 660,000 lines of code in dBase IV, and we've touched about 200,000 lines of that in the new release," said Vince Mendillo, dBase IV product manager. The new release was designed to keep software developers who have been moving to dBase from Microsoft Corp. and Computer Associates International, Inc. in the Borland camp.



Source: International Data Corp.

"In tests we did, we found this release is essentially identical in performance to [Microsoft's] FoxPro for DOS," said Paul vonFange, a senior systems analyst at 3M Co. in St. Paul, Minn.

"We're still anxiously awaiting the Windows version of dBase IV, but they've done a very nice job with this version of the DOS product," said Bob Davies, president of SBT Accounting Systems, Inc. in Sausalito, Calif.

Davies said SBT sells a mid-range accounting system that uses dBase IV on DOS and Unix platforms. It also has a high-end version of the accounting package that uses the richer facilities of Microsoft's FoxPro on DOS and Windows.

"Supporting both databases is driving us crazy," Davies said.

Davies said that once Borland delivers its Windows implementation, which will support the dBase language and the object-oriented environment that Borland provides in its Paradox relational database and Quattro Pro spreadsheet, SBT may reevaluate its course.

And even though Microsoft has a significant head start in the Windows market, Borland should be able to leverage its installed base if it delivers its Windows implementation this year, said Bill Kesselring, an industry analyst at Dataquest, Inc. in San Jose, Calif.

"It's taken a year and a half for Windows to build momentum, so I think the critical mass will still be there when Borland delivers later this year," Kesselring said.

Roughly 30% to 40% of the speed improvements in the new release are attributable to the increased available memory, while the rest of the performance enhancements are due to the filtering technology and streamlining of dBase code, said Vince Mendillo, dBase IV product manager.

Lotus fires back at Microsoft with support plan

By Michael Vizard
CAMBRIDGE, MASS.

The PC software industry's maneuvering to capture the loyalties of information systems directors moved forward last week as Lotus Development Corp. disclosed a series of programs designed to make it easier to maintain Lotus applications.

The Lotus initiative, which involves three support options that will be offered through Lotus resellers, was designed to help counter Microsoft's recently disclosed MS-Select program [CW, Feb. 1].

The first option was designed to supplement an existing help desk at a customer site. The second provides a dedicated support specialist from Lotus, while the third allows end users at a site to call Lotus personnel directly.

Both the Lotus and Microsoft programs are part of a trend in which software vendors offer support options to help offset the loss of profits incurred by the ongoing bruising price war, said Bob Johnson, associate director of PC software services at Dataquest, Inc. in Framingham, Mass.

Ready to commit?
Lotus must also contend with programs from WordPerfect Corp. and Borland International, Inc. WordPerfect's program requires customers to have more than 500 PCs and commit to purchasing more than $10,000 worth of software. Borland requires a $200,000 commitment over two years to participate in its program.

The companies that provide higher levels of service are the ones that will survive, said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge.

"In the absence of any product differentiation in the traditional desktop application market, services, support and other business practices will drive the purchasing decision," Woodring said.

Flexible discounts

Unlike Microsoft, which offers a series of maintenance programs on top of tiered volume discounts, Lotus will negotiate discounts on an individual customer basis.

For example, Continental Bank in Chicago chose Lotus over Microsoft because Lotus was more aggressive and flexible, according to Andy Kerr, director of corporate technology.

"While the individual costs of software and suites are important, the nonproduct costs associated with acquiring the software, supporting it and maintaining it are critical. It's kind of a chicken and egg situation," Kerr said.

Lotus executives said their strategy was designed to be as flexible as possible when dealing with large IS accounts.

"It's not that easy to come up with a standard contract for large accounts because these types of accounts typically want to negotiate every aspect," said Sidney Turner, Lotus' cross-product marketing manager.

Direct sales

Compaq's PCs coming in the mail

At a glance

IBM PC Co. and Compaq took steps to prove they are serious about playing the low-price game. Analysts said the moves did not signal another price war.

IBM cut prices up to 20% on its desktop systems, while Compaq cut its desktop pricing up to 22% and low-end notebook pricing by 9%.

Advanced Logic Research, Inc. in Irvine, Calif., also cut prices on selected models to ensure a 10% to 20% differential compared with equivalent Compaq systems.

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. will officially begin selling some PCs via direct mail next Monday, and it may be surprised by who calls.

Several information systems managers at major corporations expressed interest in Compaq's DirectPlus mail-order program, though it targets small and home-office users.

Going direct "gives them a big edge in our world because with our distributed business model, the direct channel has always worked better for us," said Bill Lodge, project leader at Turner Corp., an international construction company based in New York. Turner buys primarily from Dell Computer Corp.

"We would like to be able to buy systems [directly] from Compaq," said John Geyer, director of systems at Financial Guaranty Insurance Corp. in New York. Financial Guaranty buys from Compaq through dealers.

"Dealers seem to me an unnecessary step in the chain. I don't think we'll really benefit in price, but to get automatic feedback on delivery times is something I would like," Geyer said.

Under DirectPlus, Compaq will sell select models of its ProLinea, DeskPro/I and Contura PCs via a toll-free telephone number. The company expects to distribute more than 2 million catalogs starting this week.

Barbara Krumland, a nine-year Compaq veteran who is vice president of DirectPlus, said Compaq will initially offer only models that "are caught up in terms of demand." Compaq is said to be having difficulty meeting demand for some of its products.

Geyer and other users said they are interested in seeing Compaq expand its offerings before they begin purchasing machines directly from the company.

What's coming

Krumland said Compaq will add other models as it catches up with demand and will likely add the DeskPro/M line to its direct-mail offerings in the second quarter. On-site service will be handled through a contract with GE Service.

DirectPlus also includes 34 popular software titles, and Compaq has created three different hardware/software bundles. Krumland said Compaq may expand its software title selection but probably only slightly. She pointed to this as a significant distinction between Compaq and the five direct resellers it has worked with since last November; those companies handle more brands of PCs and software than Compaq.

Compaq expects 7% to 10% of its business to come from DirectPlus by year's end, according to Krumland.

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News Shorts

1-2-3 for Windows 2.0 reaches test sites

Lotus Development Corp. last week began delivering beta-test copies of 1-2-3 for Windows 2.0. Scheduled to be released in the second quarter, Version 2.0 is a full-blown Windows implementation of 1-2-3 said to include version management and tracking utilities designed to make it easier to share spreadsheets, provide support for in-cell editing and allow on-sheet charting. Also included in the new release is client and server support for the Object Linking and Embedding protocol.

Carrier wars rage on

In the ongoing legal tumult among the long-distance telecommunications carriers, **MCI Communications Corp.** last week asked the **Federal Communications Commission** to halt AT&T's attempts to penalize its customers who seek to change carriers. MCI cited alleged AT&T tactics such as threatening to withdraw account support for Fresh Look candidates — those who might opt for a different carrier for 800 service once 800-number portability among carriers takes effect. Meanwhile, WilTel has filed suit with a federal court. The carrier seeks damages from AT&T resulting from an alleged AT&T mail campaign intending to woo WilTel customers by challenging the legality of their WilTel contracts.

Microsoft adds TrueType Mac fonts

In an escalation of the font wars between **Microsoft** and **Adobe Systems, Inc.**, Microsoft will deliver an add-on TrueType font package this week for the Apple Computer, Inc. Macintosh that will give the company a common set of 102 fonts for both Windows and the Macintosh. Windows and the Macintosh operating system come bundled with TrueType fonts, a situation that is putting pressure on Adobe's dominance of the font market. The add-on font package from Microsoft is priced at $99.95.

Borland trade secrets withheld from suit

Santa Cruz County Court officials in California last week gave **Borland International, Inc.** the temporary right to keep private certain product and marketing information allegedly stolen by **Symantec Corp.** executives Gordon Eubanks and Eugene Wang. Spencer Layton, Borland's vice president of business development, told the court that the information contained in Wang's MCI Mail messages to Eubanks has "independent economic value, [and] Borland's competitors could most certainly obtain economic value from a knowledge of these trade secrets."

London Exchange cancels project

The London Stock Exchange has suffered its second major computing disaster in six months with the cancellation of a $580 million project to build a paperless trade settlement system. The Taurus project, begun in 1989, would have cut the time needed to settle trades from three weeks to two or three days. The project was killed after Andersen Consulting advised the Exchange that the project would take another three years and a good deal more money to complete. Last September, the exchange withdrew a system that would have provided X.25 links to brokers and banks.

SHORT TAKES **NCR Corp.** cut prices 11% to 19% on its NCR 3170 notebook computers.... **Seer Technologies, Inc.**, a Cary, N.C., application developer formed by a venture led by IBM and The First Boston Corp., plans to take a stab at the general computer-aided software engineering market, branching out beyond tools for building financial applications.

News shorts, *page 16*

Citicorp reaps net benefits

Global consolidation helps bank save more than $60 million

By Thomas Hoffman
NEW YORK

■ One year after launching a global effort to consolidate more than 100 telecommunications networks, Citicorp has reduced costs by $60 million, some $10 million more than originally estimated, bank officials said last week.

The bank said its better than expected savings were achieved by the following measures:

- Signing MCI Communications Corp. as its primary U.S. long-distance telecom carrier, which is expected to save the bank $50 million over four years.
- Consolidating five worldwide telecom centers into one.
- Blending eight help desks into one.
- Standardizing on networking platforms and protocols.

The Citicorp Global Information Network (CGIN) initiative is a key component of Citicorp's cost-cutting endeavors, which include software and hardware asset management programs [CW, March 1]. CGIN is an effort by Citicorp to develop a single global backbone for all company networks based on the Open Systems Interconnect (OSI) standard so Citicorp's products and services can be accessed through any location on the network.

Citicorp executives said the consolidations have resulted in minimal staff reductions. CGIN currently has 1,100 network and telecommunications staff members worldwide.

Network advantage

The CGIN project is also meant to give Citicorp a competitive advantage as the $219.3 billion bank-holding company further expands its directory service to end users and customers. The directory service is a repository for all network objects, including topology, users, systems and resources.

Citicorp has worked with Bellcore for the past year to analyze how it can better use directory database access through a single application programming interface (API), according to Howard Brooks, Citicorp's senior telecom officer.

For example, Brooks said Citicorp's traders — 400 of whom are currently being transferred from one site in New York to another — will be able to access data from both legacy and distributed systems environments using a single API. That research is based on the X.500 protocol, with pilot goals determining the costs and complexities of linking directories to one another.

Analysts said that although Citicorp's cost-cutting endeavors are not unique, the firm's X.500 research appears to be leading-edge.

"That would be a step ahead of what most banks in the U.S. comparable to Citicorp's size have done," noted James Moore, president of Mentis Corp., an Eden, Md.-based market research firm that focuses on banking technology. Most banks rely on the X.25 protocol, said Moore, who added that X.500 represents a significant upgrade in technical capabilities such as speed and bandwidth.

During the past year, Citicorp has also standardized on such network protocols as OSI, X.400 and DECnet. In addition, Brooks said Citicorp signed a contract last year with Novell, Inc. to standardize on and install Novell local-area networks throughout Citicorp's enterprise systems in 93 countries.

Brooks said the deployment of CGIN is nearly complete, save for a handful of smaller countries that have not yet been fully linked, such as Russia. Those countries, according to Brooks, should be linked by the end of the second quarter.

Mary Kay colors All-In-1 with Notes make-over

By Michael Vizard
DALLAS

One of the world's leading cosmetics suppliers last week said it will revamp its office automation system with a splash of Lotus Development Corp.'s Notes groupware.

Mary Kay Cosmetics is integrating Notes into its monolithic Digital Equipment Corp. All-in-1 system to support task forces that are quickly formed and disbanded at the conclusion of a particular project.

"We have groups that form quickly for about a month or so and then disband. Notes allows us to support those kind of activities," said Bill Dewberry, director of office systems at Mary Kay.

Mary Kay intends to link its Notes environment, which is currently running on 350 PCs linked via DEC's Pathworks network software, to the VAX systems over an All-In-1 gateway for Notes that DEC will deliver next month.

However, Dewberry said that rather than rely on Lotus mail offerings for his network, he intends to run WordPerfect Corp.'s WordPerfect Office as his mail transport. "The Notes application is really intended to provide us with some supplemental capabilities we didn't have before. We don't intend to use Notes as a mail package," he said.

On the move

Among the first applications Dewberry deployed using Notes was an executive travel-tracking system. Executives are equipped with portable PCs that allow them to be updated on decisions made at any meeting they miss while away.

"With Notes, they can respond to the meeting the minute they dial in. The ability to synchronize databases on portable PCs across international boundaries was one of the big reasons we went with Notes," Dewberry said.

"To build this application, DEC quoted a proposal that would have cost $15,000 to $20,000. Using Notes, we built it in three days," he said.

More Notes

Currently, Mary Kay has Notes running on three OS/2 servers, with up to 170 users accessing those servers. Short-term plans call for installing another server and boosting the number of Notes users at the company to somewhere between 250 and 300, Dewberry said.

Working with Syntrex Technologies, a network integration subsidiary of Phoenix Technologies, Inc. in Valley Forge, Pa., that resells Notes, Dewberry said he expects to deploy 15 applications, including an inventory tracking system for capital equipment, a purchase order system and a help desk.

Dewberry was unable to say exactly how much Mary Kay will ultimately spend on its Notes project, but thus far, he said, the company has spent about $250,000.

CA cuts keys

CONTINUED FROM PAGE 1

dors — including SAS Institute, Inc., Legent Corp. and CA — to warn customers of upcoming license expiration dates and unauthorized software use, such as software moved to unlicensed CPUs. Fear of administrative foul-ups caused by either vendors or users has heightened user concern that mission-critical applications could be halted by means beyond their control [CW, Nov. 30, 1992].

Suggestions heard

The decision to remove the disablement feature came following suggestions from CA's chief information officer conferences, CA's Client Executive Advisory Council — a nine-member group that advises CA on client issues — and individual users, Kumar said. The move comes almost one year after CA began revamping its tiered-pricing structure at the request of large users [CW, April 20, 1992].

"The message is we're listening; we're responding," Kumar said. CA's removal of disabling code is expected to take 180 days, he added.

CA has not put any disabling code into its nonmainframe products. The company intends to address authorization issues for its Unix, PC and distributed applications customers at an undetermined date, Kumar added.

CA's Total Client Care (TCC) program, launched in November 1991, is an on-line problem detection service available through CompuServe. TCC may prosper with the demise of encrypted keys.

Kumar estimated that 2,000 to 3,000 CA customers have registered for TCC since its inception. That is about 15% of CA's installed base. "I'd be willing to bet that this percentage will go up. The disablement feature was a real impediment to joining TCC, even with the pricing options" offered under the program, said Fred Joy, a senior analyst at Meta Group, Inc. in Westport, Conn.

Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla., registered for TCC more than a year ago. Although the rental firm has not experienced any problems with the encrypted code, information systems executives there said they were still thrilled by CA's announcement.

"I think it's an outstanding step forward in rebuilding the customer trust relationship. We are incredibly finicky about properly licensing everything, and we appreciate being treated [by the vendor] with the same level of respect," said Tom Loane, Alamo's vice president of computers and communications.

Val Morgan, a database administrator at a large aerospace firm in the Pacific Northwest, had voiced concern over encrypted software in the past. Morgan said he was "ecstatic" about CA's plans. Though his organization has not yet signed up for TCC, he said, CA's reversal on requiring disabling code for TCC-controlled software "is certainly going to ease the path."

Other users said they were relieved to see the messaging system replace disabling code.

"That's how we would have hoped the [authorization] mechanism would have worked all along," said Douglas E. Underhill, assistant vice president of technical planning at CSX Technology, Inc. in Jacksonville, Fla. CSX also has yet to sign up for TCC.

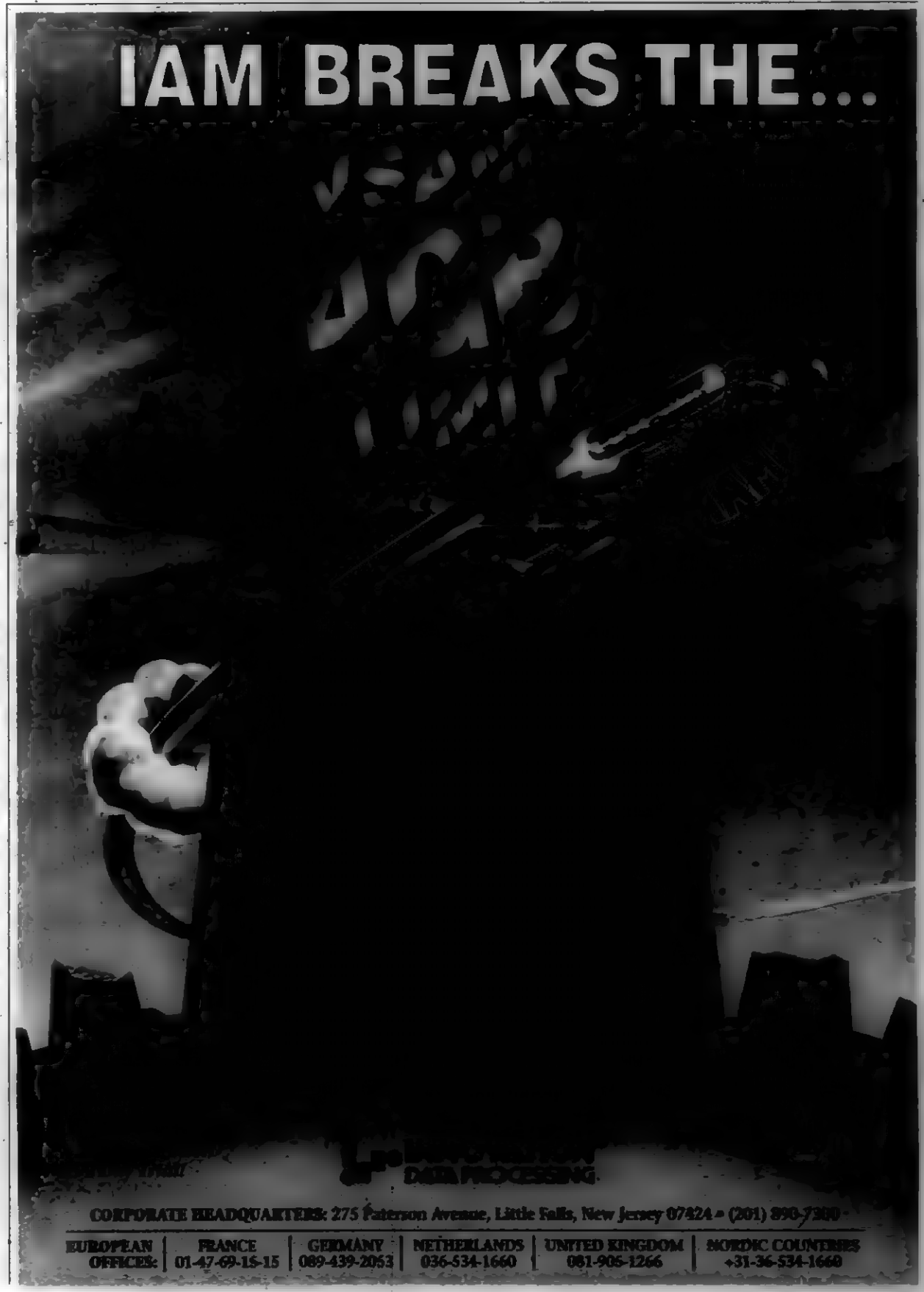
Underhill and other users predicted that CA competitors that have not formally withdrawn disabling code from their software will most likely be forced to do so. "Given CA's size, it would be a trend that's difficult to buck for smaller [independent software vendors]," Underhill said.

Vienna, Va.-based Legent announced plans last month to replace its existing encryption method with an as-yet-undetermined process.

SAS Institute has no plans to replace its encrypted keys.

Correction

A story on page 102 contains an error caught after the page went to press. Only one-fourth of the 100 firms polled are attempting full-scale re-engineering. Of those engaged in re-engineering, the number tackling full-time projects is one in three.



DCE migration made easier by development plan

By Elisabeth Horwitt
WASHINGTON, D.C.

A development environment introduced last week promises to take much of the pain and long-term grunt work out of moving corporate systems to the Open Software Foundation's Distributed Computing Environment (DCE).

Hewlett-Packard Co. and Ellery Systems, Inc., a Boulder, Colo., application development tool vendor, announced Ellery Open Systems for DCE at the Interop '93 Spring show. The product is said to eliminate the need to completely rewrite existing applications to make use of DCE's distributed environment.

The vendors claimed it will also buffer the nontechnical programmer from DCE programming complexities such as Motif and remote procedure calls. And it will cut typical DCE system development time from approximately a year to weeks, Ellery claimed.

In addition, legacy applications reportedly can go on accessing the data in a traditional, non-object-oriented way, facilitating gradual migration to DCE.

The product puts Ellery's application development environment on top of HP 9000 Series 800 business servers running DCE. The product will support major platforms from companies such as IBM and Digital Equipment Corp. when they fully support DCE, Ellery Executive Vice President Geoffrey Shaw said.

Green application

In order to prove the platform's — and DCE's — viability and usefulness, HP and Ellery worked with several universities to develop a distributed, DCE-based application. The application, called Earth Data Systems, is said to enable earth scientists throughout the country to pool resources and share data in real time. This allows the scientists to work on problems such as deforestation modeling, ozone depletion and climate change.

Project planners said they hope to have a "collaborative data browser" up and running by November that will use DCE's remote procedure call to let scientists browse across "data collected by different satellites, in different formats, residing on different types of systems," said Mark Abbott, associate professor at the College of Oceanography at Oregon State University.

Long term, Earth Data Systems will be extended to "any earth science in the academic and government worlds, and then to businesses like forestry and logging," Abbott added.

User workstations will connect over the National Science Foundation's NSFnet, which supports backbone speeds of 45M bit/sec. The system will run initially on HP 9000 Model 800s.

The DCE platform also enables scientists to collaborate with voice, data and video, "instead of [one user] sending [another] the results and him replying, 'That's not quite right,'" Abbott said.

HP and Ellery plan to use the Earth Data Systems project as training for working with users and dealing with human, administrative and management issues that crop up in a real distributed computing environment, Murphy said.

The system, now in prototype, will eventually connect scientists at NASA Astrophysics, the Earth Ocean Space Institute at the University of New Hampshire and several other universities around the country.

"[Earth Data Systems] does make it easier to develop DCE-based environments or applications," said Pat Aucoin, computer systems specialist at Lockheed Corp. The Houston-based company is working with NASA on a knowledge-support system that will use Earth Data Systems on top of DCE, he added. The idea is to connect the user transparently to whatever information is needed for a given project, no matter where, on what system or in what agency it resides around the world, Aucoin said.

Ellery Open Systems for DCE is priced at $9,900 for the development kit, with client licenses at $395 per seat. Quantity discounts are available, Ellery said.

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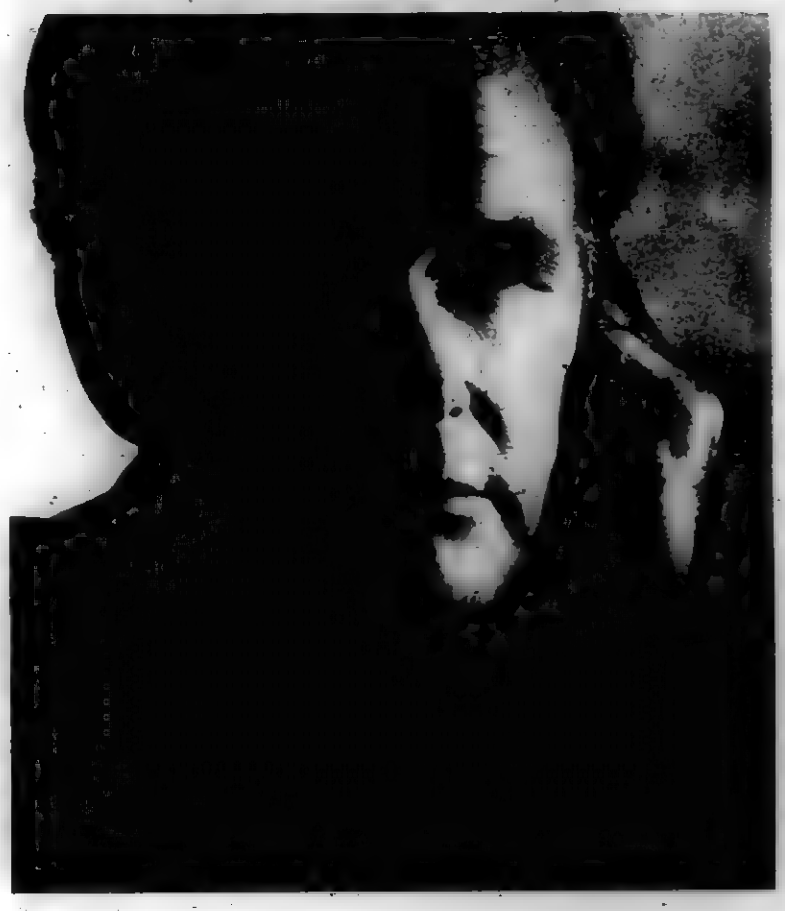

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ASK to build open tools kit

By Jean S. Bozman
SANTA CLARA, CALIF.

The ASK Group, Inc. last week told users that it plans to build "open" development tools that work with database engines from many vendors.

At the same time, ASK said it would ship by this summer a version of its Manman/X suite of manufacturing and financial applications that will work with the Oracle Corp. relational database and is developing a version for Informix. ASK's move was inevitable, given the strength of the worldwide open systems market, said Pier Carlo Falotti, chief executive officer. ASK derived most of its $432 million in revenue last year from sales of its Unix-compatible Ingres Products Division database.

The initiative is also necessary because most of Ingres' key features have been matched by Oracle, Sybase, Inc. and Informix Software, Inc., analysts said.

Users at the ASKUS International, Inc. conference said they are interested in ASK's open systems strategy. But many who have used minicomputers for years said they had no immediate plans to move to Unix, to open systems of to new databases.

"I've been a wait-and-see person for many years, and I'm still waiting to see," said Alan J. Ginsburg, corporate information systems manager at Atari Corp. in Sunnyvale, Calif. Atari runs its worldwide Manman manufacturing applications on centralized Digital Equipment Corp. VAXs, Ginsburg said. "Open systems hasn't yet become a reality," he said. "It's a wonderful concept, but I want to use mature technology."

Others want to learn about the "open" tools and new Manman/X versions to support a variety of systems in remote business units. "We are resistant to making an early jump to a Unix platform," said Jim Crear, IS director at Instrumental Laboratory, Inc., a Lexington, Mass., medical-equipment maker that runs Manman manufacturing software on Hewlett-Packard Co. MPE/IX systems. Before moving to Unix, Crear said, he wants to see more Unix management tools on the market and more Manman functions to migrate to the Manman/X suite.

Eric Carlson, president of ASK's Applications Division, said ASK's open systems strategy was designed to match the reality that several brands of relational databases are being used within most major corporations. It may also spur applications competitors such as SAP America, Inc. to consider using the Ingres relational database as one of the engines that drive their packaged software, Carlson said.

Gang of four

ASK is forming a new tools division with its own engineering, product development and marketing staffs, headed up by Eric Carlson, president of ASK's Applications Division. It will be one of four product divisions. The other three are the Ingres Database Division, the ASK Computer Systems Applications Division and the Data 3 Applications for IBM AS/400 Systems. Management and administrative functions will be shared by the four product groups.

CASE

Partners hop on to SoftBench

By Kim S. Nash
SAN FRANCISCO

■ Hewlett-Packard Co. last week said 15 computer-aided software engineering (CASE) vendors — including market leaders KnowledgeWare, Inc. and Texas Instruments, Inc. — will target commercial Unix users by porting their tools to HP's SoftBench framework.

The plan, announced at the CASEWorld conference, could become a "workable" open systems version of IBM's ill-fated AD/Cycle and is well-timed to capture client/server downsizing business, observers said.

SoftBench, introduced in 1989, provides messaging standards that let applications development products from different vendors talk to one another. Until now, mainly technical Unix vendors supported the framework, which has sold 20,000 licenses to date.

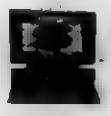
Bringing business-oriented development tools into the fold will make SoftBench more appealing to corporate users interested in moving to Unix-based client/server systems, said Peggy Ledvina, program director for application development strategies at Meta Group, Inc., a consultancy in Westport, Conn.

Because the SoftBench framework makes tools from different vendors more compatible, reconciling new development with maintenance of existing applications is easier, said Dale Lamston, a consultant at Richard Irwin and Associates Ltd. Often, tools to manage or enhance legacy mainframe systems are different from those used to build more modern programs, such as Unix applications, explained Lamston, who helps Fortune 500 companies plan development projects.

SoftBench helps hide the differences between products, he said.

Along with KnowledgeWare and TI, other SoftBench Channel Partners include CGI Systems, Inc. in Pearl River, N.Y., Intersolv, Inc. in Rockville, Md., Legent Corp. in Vienna, Va., and Netron, Inc. in Downsview, Ontario.

HP also announced that Micro Focus, Inc. in Palo Alto, Calif., will build a version of Micro Focus Cobol for SoftBench to help downsizers bridge the gap between mainframe-based programs and under-construction Unix systems.



About 60% of 1992 SoftBench sales were to technical Unix users. Total sales are up 50% so far this year, compared with the same period in 1992, mainly because of the debut of SoftBench 3.0 last June, HP said.

But the timetables vary for when these products will see the light of day because not all of the vendors currently have Unix products. For example, KnowledgeWare has stated its intention to ship a Unix code generator this year, while Intersolv is ready to go with a Unix edition of its version control utility.

SoftBench's commercial facelift looks a lot like AD/Cycle without the infamous repository shadow, said David Sharon, president of CASE Associates, Inc., a market research firm in Oregon City, Ore.

Perhaps the biggest indicator that AD/Cycle is dead is IBM's strengthened commitment to SoftBench; IBM expanded its license from AIX to encompass OS/2 systems as well, Sharon noted.

HP has sidestepped the repository issue altogether by being "committed to a multiple repository strategy," according to Tom Christian, research and development manager for SoftBench. Translation: Users must rely on SoftBench supporters to provide a repository.

Oracle GUIs

CONTINUED FROM PAGE 1

across many client/server platforms. The result is an upgrade to GUI screens and to client/server functionality that leverages the Oracle 7 distributed relational database that first shipped to users in January.

The tool set will allow information systems shops to continue to develop terminal-displayed applications for some business units and to give interactive database access to business units that have Microsoft Corp. Windows-based PCs, Unix workstations and Apple Computer, Inc. Macintoshes.

Some users said the tool set is overdue, but they remain enthusiastic about using it.

"SQLForms 4.0 has been in the works for several years, but I'm certainly excited about it," said Tom Patterson, a software analyst at Quintiles, Inc. in Research Triangle Park, N.C. "If it's good and solid code, Oracle's in good shape."

However, Patterson said, it is important that the tool set work with other vendors' databases — a move observers said they expect the company to make. "Oracle cannot make the mistake of being a proprietary tools vendor," he said.

Michael Fisher, a database administrator at the Fuller Co. in Bethlehem, Pa., said his firm has already begun client/server application development with SQLForms 3.0, Oracle CASE Dictionary 5.0 and the Oracle Version 6.0 database. "We're not waiting for SQLForms 4.0 or Oracle 7," Fisher said. "But we will upgrade to them in time."

Oracle's CDE is a set of integrated tools built on software layers that support many types of front-end client machines.

Shipping in order

The first wave of CDE products will support Microsoft's Windows environment, followed by versions for the Open Software Foundation's OSF/Motif, Sun Microsystems, Inc.'s Open Look, IBM's OS/2 Presentation Manager and Apple's Macintosh. Windows-compatible versions of the CASE tools will ship by year's end, said Farzad Dibachi, Oracle's senior director of product marketing for CDE.

Support for Windows will precede that for all other GUIs, Dibachi said, because of the success of small tools vendors such as Powersoft Corp. and Gupta Corp. in selling Windows client/server software to many large Oracle users.

All the CDE tools generate Oracle's PL/SQL code, which makes the code portable across many platforms, Dibachi noted.

"With one set of source code, they're trying to eliminate the systems integration that has been a real bottleneck for IS to absorb," explained Peter Kastner, vice president at Aberdeen Group in Boston.

The CDE tool set will be used with the Oracle Glue application programming interface and Microsoft's Open Database Connectivity interface to speed the transition of Oracle character-terminal applications to client/server applications, Kastner said.

Managing all of CDE's 14 modules may be difficult for some user sites, and some users said they wonder whether Oracle will offer the CDE tools bundled in one package.

Analysts said some users may have trouble selecting which tools to buy: "You buy each tool individually, so there's a lot of picking and choosing," noted Laurence Fong, an analyst at Alex. Brown & Sons, Inc. in New York. "Part of Oracle's challenge will be simplifying it for the users."

Applications built with CDE tools can connect with several brands of target databases by addressing Oracle servers outfitted with database gateways.

However, truly open applications that can work against non-Oracle relational databases without requiring users to write any database-specific interface code will probably not be available immediately, analysts said.

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NetWare 4.0's ease of use lauded

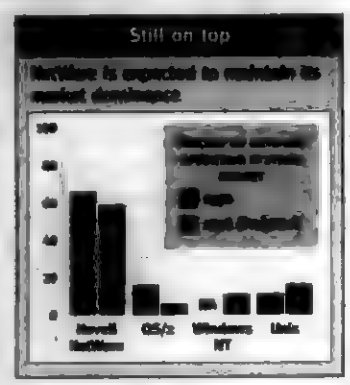
By Michele Doctert
WASHINGTON, D.C.

Network administrators just want to go home on time, according to Ameet Patel, emerging technology analyst at BASF Corp. in Parsippany, N.J. And therein lies much of the appeal behind Novell, Inc.'s NetWare 4.0, agreed a panel of users at last week's formal unveiling of the much-awaited network operating system.

Ease of installation and management topped the list of reasons behind sometimes rapturous commentary from a cast of beta-test users assembled at the show by Novell.

"My administrators were awestruck because the tools worked," Patel said. "An administrator's nightmare is trying to set up WordPerfect on 200 servers with 3.11," he said, adding that Version 4.0's graphical user interface (GUI) utility "simplifies life" by dealing with the real pain of managing global networks.

"The GUI utility is a dream come true," agreed Stanley Jaroski, vice president of business systems review at Citibank NA, which has between 700 and 2,000 NetWare local-area networks in 90 cities running many versions of NetWare.



Source: International Data Corp.

Despite their enthusiasm, these and other NetWare users contacted last week made it clear that they will proceed slowly and carefully with a 4.0 migration. "Technology revolution occurs through evolution," noted Patel, who has equipped his field personnel with a homegrown guide to 4.0 migration. "You really need to plan out your [4.0] environment," he stressed.

Novell is aware of these concerns. Introduced in 1989, NetWare v3.11 had been adopted three years later by only 35% of Novell installations, according to The Burton Group, a network research firm in Salt Lake City.

"That's why we've worked so hard to create a simple, clean upgrade path to NetWare 4.0," said Bob Young, Novell's product marketing manager for NetWare.

For example, installing previous versions of NetWare required first off-loading all server data, then loading dozens of floppy disks, then reloading data and entering user information. NetWare 4.0, by contrast, can be installed on top of existing NetWare 3.X or 2.X servers without off-loading or reloading anything. From the CD-ROM version, the installation reportedly takes about 20 minutes.

A key component of this upgrade is a set of migration utilities that automatically convert the server-centric, bindery-based user information on NetWare v3.11 servers to the logically constructed global directory structure used in 4.0. When NetWare 4.0 is installed on a NetWare v3.11 server, all the user information is thus retained.

"All your users will be there, though you will still have to define other objects, such as printers and servers," said John Shorthall, network architect at beta-test site Air Canada in Montreal. "The graphical management utilities in NetWare 4.0 make it easy to then drag and drop your users into logical groups."

Further, a bindery-to-directory translation utility means NetWare v3.11 and NetWare 4.0 servers can coexist transparently in the same network. "You don't have to do an all-or-nothing upgrade, which would be a major disaster," said Dave Eckert, a member of Westinghouse Corp.'s Advanced Technology and Architecture Planning Group.

He recommended setting up users and objects on the first 4.0 server, then copying the data to others. He suggested that the server data be off-loaded and reloaded to take advantage of NetWare 4.0's disk management and data compression features.

Novell has also taken pains with the NetWare 4.0 client software. Unlike NetWare 2.X and 3.X client software packages, the new NetWare 4.0 client, called the NetWare Client for DOS and Microsoft Corp.'s Windows, is "universal." It can access any NetWare 2.X, 3.X or 4.0 server.

The NetWare Client has been enhanced to include automatic network reconnection and a new GUI that simplifies previously arcane tasks such as mapping to distant servers. Tighter Windows integration allows users to access the LAN from anywhere in Windows by clicking on an icon.

Assistant news editor Patricia Keefe contributed to this story.

Net gains

NetWare-related nuggets picked up at Interop included the following:

Future of 3.X: Novell is "committed to the 3.X line" and will ensure backward compatibility and integration between the 3.X and 4.0 environments.

Cross-platform APIs: Later this year, Novell will add Unix, Microsoft Corp. Windows NT and Apple Computer, Inc. Macintosh support to its cross-platform APIs, which enable developers to write multiplatform applications just once.

Bridging directories: Novell has talked to Banyan Systems, Inc. about bridging their respective directory services and is looking at an X.500 vehicle.

Free help: NetWare Loadable Module certification is free from Novell for the next 90 days. Also free is a planning guide to configuring 4.0 LANs.

NetWare NFS Gateway: Maps the Unix Network File System (NFS) to the NetWare file system structure, letting NetWare users access applications, files and printers stored on Unix hosts. It will be available April 5.

Dataclub: Slated to ship this month, Dataclub will let networked Macintosh users see their connected peer-to-peer machines as a single virtual server, thus simplifying file management.

OS/2 and Windows NT support: The OS/2 requester allows network links from within DOS, Windows or OS/2. NetWare requester for NT will ship when NT does.

User concerns

Router interoperability still in its early stages

By Joanie M. Wexler
WASHINGTON, D.C.

While router vendors such as IBM are clamoring at the door of the ripe low-end internetworking market, interoperability concerns are inhibiting users from opening up to multiple vendors.

IBM last week joined the slew of suppliers vying for business in remote offices by introducing an inexpensive, low-maintenance version of its 6611 Network Processor router. But attendees at Interop '93 Spring said they are still wary of blending different vendors' routers in their networks — an attitude that could cramp the style of vendors such as IBM that are trying to woo branch-office business from established router accounts.

Users said they doubt a slight cost or functional advantage gained by introducing a new vendor into their router networks would be worth the added interoperability and management headaches.

"I wouldn't mix and match vendors; I want more homogeneous interoperability and consistency in downloading new software versions networkwide, and I don't want to deal with multiple vendors," said Chuck Warlick, network engineering specialist at Boeing Computer Services in Huntsville, Ala., a 125-router Cisco Systems, Inc. shop.

The router industry has not achieved true interoperability yet, analysts said, despite vendor efforts to standardize implementations of interrouter communications protocols, such as Open Shortest Path First (OSPF). OSPF lets routers exchange network configuration data in Transmission Control Protocol/Internet Protocol (TCP/IP) networks.

"Right now, OSPF is the only common thread" among the different router products, "and there are scalability problems with that," said James S. Tretter, telecommunications manager at Multifoods, a Wellfleet Communications, Inc. shop in Minneapolis. "Plus, different companies' routers use different configuration management" schemes, he added.

Warlick said he prefers Cisco's Interior Gateway Routing Protocol "because OSPF carries a lot of overhead and could chew up our processing power."

The rollout of IBM's $6,995 low-end 6611 Model 120, due to ship in May, follows an avalanche of router introductions in the past year to accommodate companies looking to affordably bring satellite offices with limited technical staff onto the corporate internetwork.

INTEROP 93 SPRING

Slow start

IBM, which shipped its first multiprotocol router in September, said it has about 60 installed and that development of the Model 120 "has already helped IBM win some business this year," said Jon Field, director of routing systems products. IBM's late start means its installed base compares with about 65,000 for Cisco and 10,000 for Wellfleet.

While the products appeal to the vendors' existing customers, users who fancy another supplier's low-end product fear the "shaky interoperability status" among equipment, Tretter said.

Tretter said he is intrigued by 3Com Corp.'s recently announced Boundary Routing architecture, a scheme that shifts much of the technical complexity from low-end devices into central routers to simplify network management.

However, "I don't trust the interoperability among the vendors," he said. "If I were to do it again, I'd consider 3Com as my backbone router vendor so I could get Boundary Routing."

At the show, a 14-router demonstration backbone mixed only Proteon, Inc. and Wellfleet routers, which cooperated on "those elements that have been standardized: OSPF, [Routing Internet Protocol] and TCP/IP," said George Pornaran, Interop's chief network engineer.

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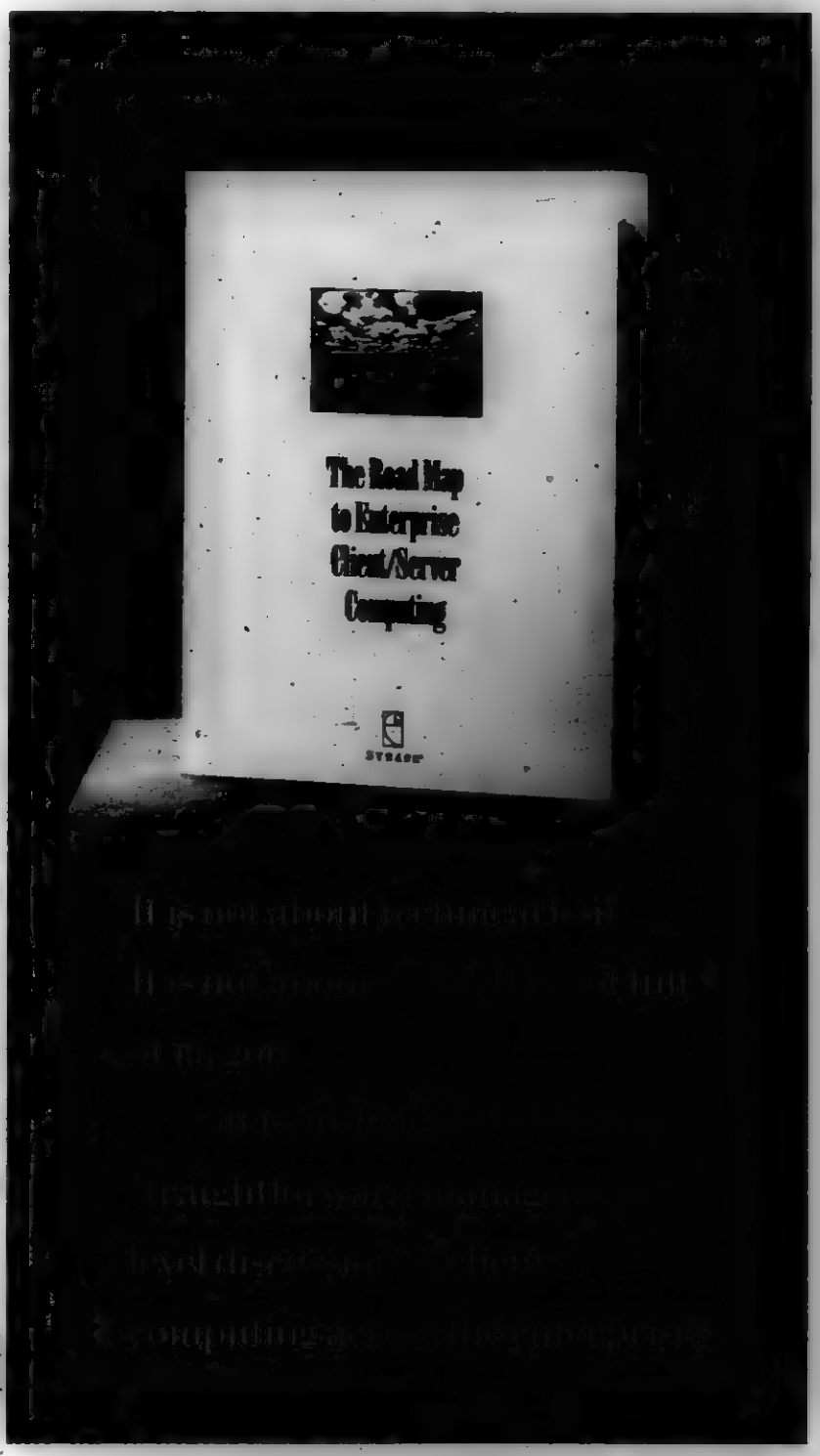

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SNA battle

CONTINUED FROM PAGE 1

Communications, Inc. shop in Minneapolis.

"It's clear that big SNA customers are going to APPN, but it's too early for my clients to know about APPI. There hasn't been enough technical information available," said Harold Hauck, a consultant at Open Systems Computer Consulting in Corte Madera, Calif.

Users faulted both IBM and Cisco for battling rather than harnessing their resources to service customer needs.

Large IBM shops will almost automatically go to APPN, "whether we know it or not, just by migrating to VTAM V2 R4.1," which has APPN support, said Blaine Bauer, a data communications manager at Mobil Corp.

Indeed, a number of SNA shops see a major advantage to migrating their hosts, and other traditional SNA devices, to APPN.

Hudsons Bay Co. is looking at APPN "not as a way to save network manager head count, but because it is more foolproof and flexible," than traditional SNA, said Janusz Szaban, a manager at the retailer. With APPN's automatic directory and routing functions, "users can just plug in their own workstations," he added.

Jeremy Duke, an industry analyst at Dataquest, Inc. in San Jose, Calif., agreed: "APPN is solid, and APPI still has a way to go. If you're an IBM shop, you're probably not going to go to something new like APPI."

The APPN/Advanced Program-to-Program Communications showcase was the first demonstration of distributed networking over multivendor, commercial APPN products. "This proves that APPN is out there and working and that other vendors are participating," Szaban said.

The APPI demonstration over Cisco routers and Cabletron Systems, Inc. hubs involved a prototype specification that lacked key promised APPI features, notably support for APPN End Nodes. End Nodes are able to automatically register their resources on an APPN directory so that APPN Network Nodes, or servers, can automatically route End Node queries to the right resource.

In addition, the prototype specifications were "entirely Cisco's" and therefore proprietary, Hauck said. While Cisco has officially turned control of APPI development to the APPI Forum, the 26-vendor body is not expected to come out with its "open" version of APPI until next year.

Cisco plans to release its first APPI-based products early next year, under the assumption that the forum will not significantly alter its original specifications, according to a Cisco spokesman.

But users faulted both IBM and Cisco for battling rather than jointly harnessing their resources to service their customers' internetworking needs. "We think vendors [such as IBM and Cisco] would be a lot more helpful if they were cooperating" instead of coming up with rival standards, said Barry Oscogne, a data communications manager at Bell Canada.

A big Cisco customer, the telecommunications company is currently struggling with "the experience of moving from an SNA to a multiprotocol backbone," Oscogne said.

"Both vendors, by not cooperating, are eventually adding more complexity to their boxes," Tretter agreed.

IBM claims two products that make APPI redundant: Data Link Switching, which routes APPN packets within TCP/IP, and a utility announced last fall that lets APPN ride on top of TCP/IP. Cisco said APPI lets users have APPN-like routing and directory functions on a TCP/IP backbone.

Boeing taps IBM to simplify routing

By Elisabeth Horwitt

Boeing Computer Services might well have been an ideal customer for Cisco Systems, Inc.'s Advanced Peer-to-Peer Internetworking if APPI had been commercially available 14 months ago.

Instead, The Boeing Co.'s information systems subsidiary became a test site for IBM's MultiProtocol Transport Network (MPTN) products announced last week, which are said to enable Systems Network Architecture (SNA)-based applications to communicate over a Transmission Control Protocol/Internet Protocol (TCP/IP) backbone.

Boeing's MPTN project is part of a multiyear effort to limit the number of transport protocols that run over the company's 300-plus Cisco routers, according to Jim Van Every, Boeing's manager of server interconnect. The company originally hoped to migrate from 17 different protocols to Open Systems Interconnect (OSI); however, those plans are on hold because OSI is still not commercially viable, Van Every said.

Driving Boeing's protocol-curbing efforts is the need to save on the costs of administering multiple protocols on the backbone, Van Every said. "It's a perennial problem for us: managing routers, routing tables and addresses, given that 70% of Boeing people move each year."

While leading router companies such as IBM and Cisco offer products to encapsulate SNA traffic into TCP/IP packets, network administrators still have to track user addresses for both types of protocols, Van Every said. In contrast, MPTN enables one set of TCP/IP backbone addresses to keep track of both TCP and SNA users, he added.

Boeing is now pushing for MPTN support from some of its major computer vendors. "If all computer vendors support this, all that router vendors would have to support is TCP/IP," Van Every noted.

APPN peer plans

Following are Advanced Peer-to-Peer Networking (APPN) products to come:

- **IBM VTAM Version 3, Release 4.2**, expected in June, enables IBM hosts to communicate as APPN Network Nodes.

  The product will also support IBM's MPTN protocol, which is said to enable Advanced Program-to-Program Communications applications to run over TCP/IP and TCP/IP sockets applications to run over LU6.2, IBM said. An OS/2 MPTN server is in the works. MPTN has the potential to run TCP/IP applications over APPN backbones. Application System/400 MPTN software is coming in two years, IBM said.
- **3Com Corp.** demonstrated Network Node on its bridge router, with shipment scheduled for late this year, a 3Com spokesman said.
- **Digital Communications Associates, Inc.** demonstrated a Token Ring gateway that allows PCs to access APPN resources via IBM's Low-Entry Network (LEN) protocol. The company plans to provide Network Node in a future release, a spokesman said.
- **Ingeseon, Inc.** in Boulder, Colo., demonstrated an APPN End Node implementation on a Tandem Computers, Inc. host; shipment date is slated for next month.
- **Sync Research, Inc.** is developing a server that will enable PCs running LEN to access full APPN End Node capabilities without having to crowd their memories with the full End Node stack.
- **Network Systems Corp.** announced that its routers will support APPN Network Node by the end of next year. The routers will be able to encapsulate "non-routable protocols," such as NetBIOS, to go over APPN and TCP/IP backbones by 1996, Network Systems said. — *Elisabeth Horwitt*

Reporter's Notebook

Conflicting router vendor philosophies surrounding how best to transport IBM protocols through corporate internetworks have the industry confused. For example, Wellfleet announced plans to support IBM's Data Link Switching scheme in the third quarter. But Cisco and Advanced Computer Communications have no plans to support what they consider an interim step to IBM peer-to-peer networking.

Eleven vendors that lined up behind the Hewlett-Packard/AT&T proposal for 100M bit/sec. Ethernet committed to build hubs, routers, adapters and other devices and software based on HP's 100Base-VG scheme. Supporters include Banyan, Microsoft, Novell, Proteon, Ungermann-Bass and Wellfleet.

Lining up behind Microsoft's ever pending Windows NT, Beame & Whiteside Software demonstrated its TCP/IP development services for Windows NT, giving Unix developers cause to switch.

The Internet Engineering Task Force says it is about two months away from releasing SNMP Version 2 as a proposed standard. Epilogue Technology promises to have SNMP2 available for its OEMs by next month.

HP, The Wollongong Group and Datability, Inc. jointly announced an enhancement said to enable the TCP/IP Telnet protocol to handle heavy-duty OLTP. Telnet/OLTP is said to decrease by up to 50% the host overhead associated with processing Telnet terminal-to-host sessions and to cut Telnet network traffic by up to 90%. HP will support the protocol on its HP 9000 Series 800 business servers. Wollongong will implement it on DEC systems.

Meanwhile, DEC introduced its FDDI-to-the-desktop GigaSwitch, which allows 34 simultaneous 100M bit/sec. data conversations between high-performance computers or VAXclusters. DEC said it will soon outfit the GigaSwitch with an ATM card that accepts FDDI traffic and converts it to ATM and vice versa. A DEC ATM product family will be available around the middle of 1994, officials said.

All documentation for developers wishing to write their own code for IBM APPN Network Node software will be available this month "for the cost of the printing only — about $300," said Jon Fjeld, IBM's director of routing systems products, at a press briefing. Licensing the code still carries a $400,000 price tag.

Users receive ATM reality check

By Lynda Radosevich
WASHINGTON, D.C.

Despite heavy Asynchronous Transfer Mode (ATM) price cutting and a round of new product announcements, users at Interop '93 Spring last week showed limited enthusiasm for ATM as a high-speed local-area network solution for the short term. However, many were still excited about ATM's long-term prospects.

Kenneth Miller, a telecommunications specialist at the U.S. Army Corps of Engineers in Portland, Ore., attended the show to investigate ATM because "we want to pile everything on our network, including video, data and possibly voice," he said. But after attending a session on ATM in the network, he said he decided that "ATM is not really a sovereign standard yet . . . and FDDI [with its published International Standards Organization standards] is."

> Sending files using ATM technology is like putting paper through a shredder, sending each piece separately and gluing them back together at the end.

Ultimately, ATM could be the LAN technology to combine many different media on one network, Miller added.

Vendor support

The tempering was helped in part by testimony from ATM vendors.

"ATM is essentially an engineering trade-off," said Larry Lang, product manager of ATM product development at Cisco Systems, Inc. in Menlo Park, Calif. "ATM is in a sense a design compromise that is good for carrying data, but it's not the best."

For Larry Smith, manager of operational development at Southern California Edison Co. in Rosemead, Calif., that compromise is too much to ask.

Smith was looking for a stronger network backbone to support pockets of videoconferencing. However, after attending the SynOptics Communications, Inc. ATM switch rollout, he said he was concerned that ATM was optimized for voice traffic and would have to be more mature before he would use it for data-intensive backbone traffic.

Making house calls

John Turner, a professor of computer science at Washington University in St. Louis, said he plans to deliver ATM bandwidth to the desktop to enable electronic distribution of medical images.

The school has put together a prototype network to transmit medical images and uncompressed video at 100M bit/sec. The network uses an Ethernet gateway that allows Ethernet frames to be sent over a multicast ATM virtual circuit and received at other ATM segments at different sites.

"ATM switching is certainly feasible — we built the stuff with graduate students," Turner said at the session.

However, while the early commercial ATM switching products from vendors such as Fore Systems, Inc. in Pittsburgh and SynOptics in Santa Clara, Calif., are well-suited for early deployment, Turner said he would like to see 128 to 256 ports rather than the 60-port hubs currently offered. More ports would help support "several thousand machines" on his network while minimizing the number of components and the complexity level of each network, he said.

For Mark Sanders, who oversees the internetwork architecture at Merrill Lynch & Co. in New York, the issue with deploying an ATM network is timing. Merrill Lynch's approach is to "wait for a standard to emerge to ensure that you are not buying proprietary solutions but buying a solution that will carry you into the next decade," he said.

In the meantime, in an attempt to enable Merrill Lynch to compete with the other brokerage firms by getting financial information to trader desktops faster, Sanders said he plans soon to begin testing Fore Systems' ForeRunner ASX-100 switch.

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News Shorts

DG to announce Unix tape array

Data General Corp. this week will announce a high-performance, fail-safe tape array for Unix that can back up a gigabyte database overnight without operator attendance. Initially available on DG's Aviion workstation line, the redundant arrays of inexpensive disks product offers five drives and will support Sun Microsystems, Inc. and IBM RISC System/6000 workstations within 90 days, company officials said.

USL dealt setback in Unix suit

Unix System Laboratories, Inc.'s (USL) attempt to halt distribution of the BSD/386 Unix operating system variant from **Berkeley Software Design, Inc.** was stymied last week by a U.S. District Court in New Jersey. The court denied USL's request for an injunction to stop distribution of BSD/386, based on a finding that USL was unlikely to succeed in its lawsuit alleging that BSD, based in Falls Church, Va., had infringed on copyrights and trade secrets from USL.

Concurrent wins security validation

Concurrent Computer Corp. in Oceanport, N.J., last week announced what it claims is the industry's first trusted real-time operating system. Concurrent's Trusted OS/32 and OS/32 MTM successfully completed the National Computer Security Center's evaluation and were awarded the U.S. Department of Defense's C2 level of trust.

Boeing shifts to HP hardware

The Boeing Co.'s Commercial Airplane Group said it signed an agreement with **Hewlett-Packard Co.** for Unix minicomputers and workstations to be delivered during the next two years. HP is believed to have bested **IBM** and **Sun** in a yearlong client/server bake-off at the troubled aerospace giant. The contract includes an optional yearlong extension and makes HP Boeing's "majority supplier" of Unix hardware, HP said.

NLM version of InterBase demonstrated

Borland International, Inc. showed a working version of its InterBase 4.0 relational database running as a **Novell, Inc.** NetWare Loadable Module (NLM) at the Interop '93 Spring show in Washington, D.C., last week but gave no pricing or availability details. A **Microsoft Corp.** Windows NT version is also planned. Borland's original plans called for InterBase 4.0 to be adapted first as an NLM, but Borland said last week that it may use the current InterBase 3.3 for the first NLM version.

SHORT TAKES Object-oriented development tools maker **Intellicorp, Inc.** is expected to announce Kappa CommManager, a series of products designed to enable cooperative processing between object-oriented and traditional applications. The first module will let users distribute programs among Unix workstations and PCs running Microsoft Windows.... **BT North America, Inc.** filed a petition with the Federal Communications Commission seeking permission to offer international virtual network services for intercountry transport of data, voice, video and fax, which would give corporate customers private networklike capabilities at a lower cost.... **Wang Laboratories, Inc.** signed an agreement with **HP** under which HP will market and sell Wang software — including imaging and computer-aided software engineering tools — on HP's 9000 Series 800 servers. Wang will also resell HP's platforms under the HP label.... Wireless messaging vendor **Embarc** last week announced a deal with **Pacific Bell Connection**. Pacific Bell Connection is the first local telephone company unit to offer a link to Embarc.

IBM, Apple, Motorola gain allies for RISC chip set

By Maryfran Johnson
BOSTON

The PowerOpen Association, Inc. opened for business last week, adding yet another industry group to the crowded landscape of open systems organizations.

PowerOpen is an alliance of IBM, Apple Computer, Inc., Motorola, Inc., Groupe Bull, Thomson-CSF, Harris Computer Corp. and Tadpole Technology, Inc.

Its goal is to promote the PowerOpen environment, which includes the PowerPC reduced instruction set computing (RISC) architecture and a new PowerPC Application Binary Interface (ABI).

The PowerPC microprocessors will be the follow-on generation to IBM's RISC System/6000 chip. IBM, Motorola and Apple have been developing PowerPC since 1991, and systems based on the new microprocessors will begin shipping late this year and into 1994.

The machines will reportedly run both IBM's AIX and Apple Macintosh applications unmodified. Combining the friendly Macintosh interface with the underlying power of Unix and RISC could put a dent in Intel Corp.'s dominance of PC platforms, analysts said.

While some analysts said they see a powerful combination with the Apple and IBM platforms, others cautioned that tying its fate to the AIX Unix operating system will make it difficult for PowerOpen to develop a broad market of users. IBM's OS/2 operating system is not included in the PowerOpen environment now, but IBM officials said it would eventually move to the PowerPC platforms.

PowerOpen's Dom LaCava *hopes to woo software developers*

The technical cornerstone of the PowerOpen environment is the PowerPC ABI. Once applications are written to this interface, they will run across all PowerOpen platforms, eventually offering binary compatibility from laptop systems to high-end multiprocessors.

Users will be able to work with applications based on the Macintosh interface or on the Open Software Foundation's OSF/Motif interface.

This notion of providing binary-compatible, "shrink-wrapped" applications across a range of hardware systems is the driving force behind several other such groups, including 88Open, Inc., SPARC International, Hewlett-Packard Co.'s Precision RISC Organization and Silicon Graphics, Inc.'s MIPS ABI Group.

"Our main goal is to provide high-value services to software providers," said Dom LaCava, president of PowerOpen and a former vice president at Digital Equipment Corp. Licensing fees and price lists for the porting services software that vendors will need to move applications to the PowerPC platform will be set within 90 days, he said.

IBM to extend database reach

CONTINUED FROM PAGE 1

the OS/2 and AIX database markets, key client and server environments. The OS/2 Data Manager had been bundled with OS/2, but in January IBM renamed it DB2/2 and is now selling it as a separate OS/2-based product. The expected AIX database, called DB2/6000, is based on DB2/2.

As such, DB2/6000 will likely have good connectivity to other IBM databases because IBM relational databases already do or will support IBM's Distributed Relational Database Architecture, a key part of Information Warehouse, analysts said.

Still, the basic client/server database engine IBM is using for both the AIX and OS/2 products is not widely considered technically ahead of the competition.

"They're at least two years behind other server databases in terms of function," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago consultancy. Some Unix data managers have features such as stored procedures and triggers, which IBM's product lacks, he said.

In addition, because IBM has not had its own AIX relational database until now, users with Unix computers have already chosen products from other vendors such as Sybase, Inc. and Oracle Corp.

"I've already spent two years working very successfully with Sybase; IBM is a little late," said Bill Anderson, chief information officer at Prudential Securities, Inc. in New York. For the time being, Prudential is standardizing on DB2 at the high end.

Robyn Turk, a senior vice president at PaineWebber, Inc. in New York, said, "We're standardizing around Sybase as our distributed database management system. We think it scales up." Still, she added, the brokerage — an IBM DB2 user on the mainframe — will "look at whatever IBM introduces to see how it coexists and complements what we already have."

Never too late

Not all observers said IBM is too late for the client/server game. Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said, "Yes, they have missed the traditional PC market. But the database market from the distributed side will be quite different, and IBM will be competitive in the worlds that IBM has always played in. This whole thing hasn't shaken itself out yet."

In addition to Version 3.1 of DB2, which will include the distributed unit of work, and DB/6000, other pieces of the IBM announcement are expected to include:

- A callable SQL interface from within Information Warehouse. It will be based on an interface specified by the X/Open Co.
- A new release of the Data Propagator for the MVS operating system. It will now automatically or selectively update IMS or DB2 data when information in one or the other database is changed.

Many of the Information Warehouse announcements will be in the arena of distributing information off the mainframe. Information Builders, for example, will announce EDA/Extender for OS/2, which will allow PC users to access data in IBM and others' databases.

The Information Warehouse announcements were good news to user John Chatfield, a warehouse architect at the Salt River Project in Phoenix. "It's nice to see IBM put some meat around the Warehouse," he said.

If this tack succeeds for IBM, it may well lure even more users to the Warehouse concept.

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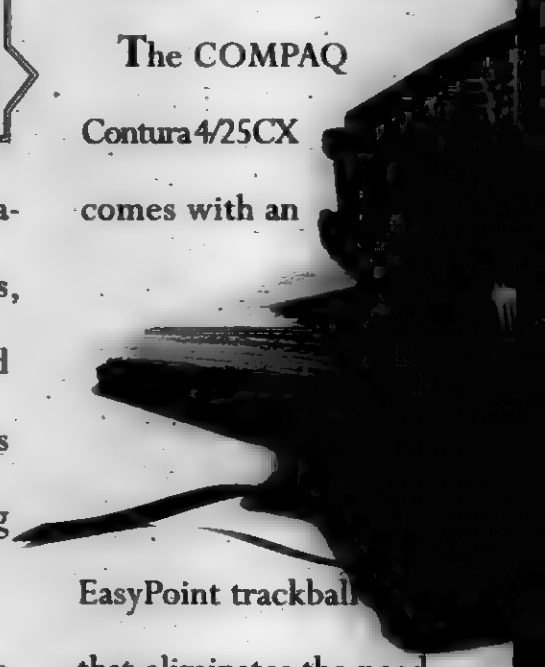

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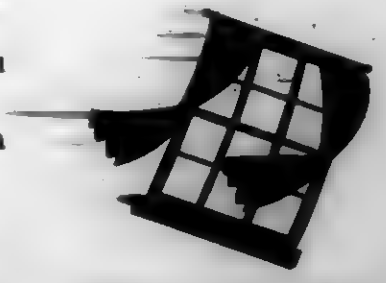

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HPCC critics seek guiding light, input

CONTINUED FROM PAGE 1

cessing supercomputers able to work at a trillion operations per second and a data network connecting research laboratories at speeds of more than 1G bit/sec. The ultimate goal was to tackle superapplications — dubbed "grand challenges" — such as climate modeling, drug design and semiconductor modeling.

Now the program, funded this year at $765 million, is attracting the attention of more down-to-earth users and applications. The U.S. Department of Commerce, which has been tapped by the new administration to be the epicenter of its technology initiatives, has established a formal coordinating group to pull together the needs of the department's dozen agencies and to develop a departmentwide vision for high-performance computing and communications.

"There are a lot of people in the department wanting to weigh in," said Reed Phillips, director of information resources management.

For example, the Census Bureau is testing whether parallel processing computers being developed under the program might be able to reduce the year-long effort required to tabulate the decennial census data; the National Telecommunications and Information Administration said the program may help it in its mission of measuring network performance; the Economics and Statistics Administration said the high-speed network could be used to give libraries free access to its data.

The Patent and Trademark Office would like to make its huge patent database accessible to the public via the HPCC's gigabit network. According to Thomas Giammo, assistant commissioner for information systems, high-bandwidth access to some 6T bytes of patent data would prove extremely valuable to U.S. industry, particularly manufacturers.

High Performance Computing and Communications program federal funding, fiscal 1993
(In millions, by agency)

Defense Advanced Research Projects Agency	$275
National Science Foundation	$226
Department of Energy	$109
NASA	$84
National Institutes of Health	$45
National Oceanic and Atmospheric Administration	$10
Environmental Protection Agency	$8
Department of Education	$6
National Institute of Standards and Technology	$2
	$765

Source: National Coordination Office for HPCC

"President Clinton has said he wants to shorten the time between innovation and product," Giammo said. "That's us; that's what we're here for."

However, Giammo said there is an even chance at best that his application will be approved for funding under the HPCC program. He said the broad national goals that are implicit in the Gore legislation that established the HPCC are at odds with the vision of those in the "inner circle" of the HPCC.

"The [HPCC] has essentially been given to the techie crowd," which sees it primarily as an exercise in technology enhancement dedicated to the development and use of supercomputers, he said.

A senior government official involved in the HPCC, who asked not to be named, called the HPCC program plan "very fuzzy, very sketchy." He said, "What's needed now is some structure — a design for what we're going to do and who's going to do what and how it's going to be funded."

Perhaps in recognition of that need, last September President Bush established the National Coordination Office for HPCC and placed at its head Dr. Donald A. Lindberg, director of the National Library of Medicine.

Doubting Thomases

But some observers say the office is not up to the task of guiding the multiagency effort.

At a Congressional hearing on the HPCC last month, Ken Kay, executive director of the Computer Systems Policy Project (CSPP), an alliance of computer industry chief executives, said, "CSPP is concerned that the new office is chartered to provide coordination, not management, and does not have sufficient resources to provide the oversight that is needed to ensure the program's success."

Lindberg said his office serves much more than a passive coordination role. It performs administrative work, educates Congress, universities and the public and performs planning functions, he said. On the other hand, Lindberg said, he has no desire to be a "superaggressive, obnoxious, heavy-duty manager."

Indeed, many say the remarkable degree of cooperation that exists so far among federal agencies in pursuing the HPCC program stems directly from its bottom-up approach and lack of red tape (see story bottom right).

"The agencies don't think it would be a good idea to centralize management," said Dr. Daniel Masys, director of the Lister Hill National Center for Biomedical Communications at the National Library of Medicine and an assistant to Lindberg on HPCC matters. "Coordination has been sufficient to date."

Masys rejected the notion that HPCC is dominated by supercomputer bigots going after scientific grand challenges, but he did point to "competing axes," especially in the networking part of the program. "Should we put all our resources into the gigabit test beds in order to push up the apex of the pyramid, or should we expand the base? Virtually all of the agencies say the program is doing both."

Double nods

Lindberg acknowledged that getting official HPCC funding for a new application is a complicated matter requiring approval by the agency head and two White House units — the Office of Management and Budget and the Office of Science and Technology Policy.

However, he insisted all reasonable uses of HPCC funds would be considered and that HPCC wannabes were encouraged to participate in HPCC activities as "guests" while negotiating the annual budget process.

The Centers for Disease Control and Prevention, the Food and Drug Administration, the Indian Health Service and the Agency for Health Care Policy and Research currently enjoy guest status in the HPCC program, Lindberg said.

Great divide
Federal funds allocated for the HPCC will be divided among four technology program areas:

- Advanced software and algorithms: $259 million
- High-performance computers: $268 million
- Basic research and human resources: $133 million
- National research and education network: $115 million

Weather forecast favorable at HPCC

Without any grand design or dictate from on high, a number of federal agencies are collaborating under the government's HPCC program to improve weather forecasting and climate modeling.

The National Oceanic and Atmospheric Administration (NOAA) — which includes the National Weather Service — is tailoring computer models for the so-called "massively parallel" supercomputers, which are being developed in part with HPCC funding from DARPA.

Meanwhile, the National Institute of Standards and Technology is developing performance measurement and tuning tools to ensure that NOAA's software takes maximum advantage of the new parallel architectures.

Eventually, data from the models will move from supercomputers at research facilities in Boulder, Colo., to high-end "visualization" workstations at National Weather Service headquarters near Washington, D.C.

This near-real-time sharing of information will be enabled by the HPCC's gigabit network, which is being developed under the direction of the NSF, the DOE and NASA. — *Gary H. Anthes*

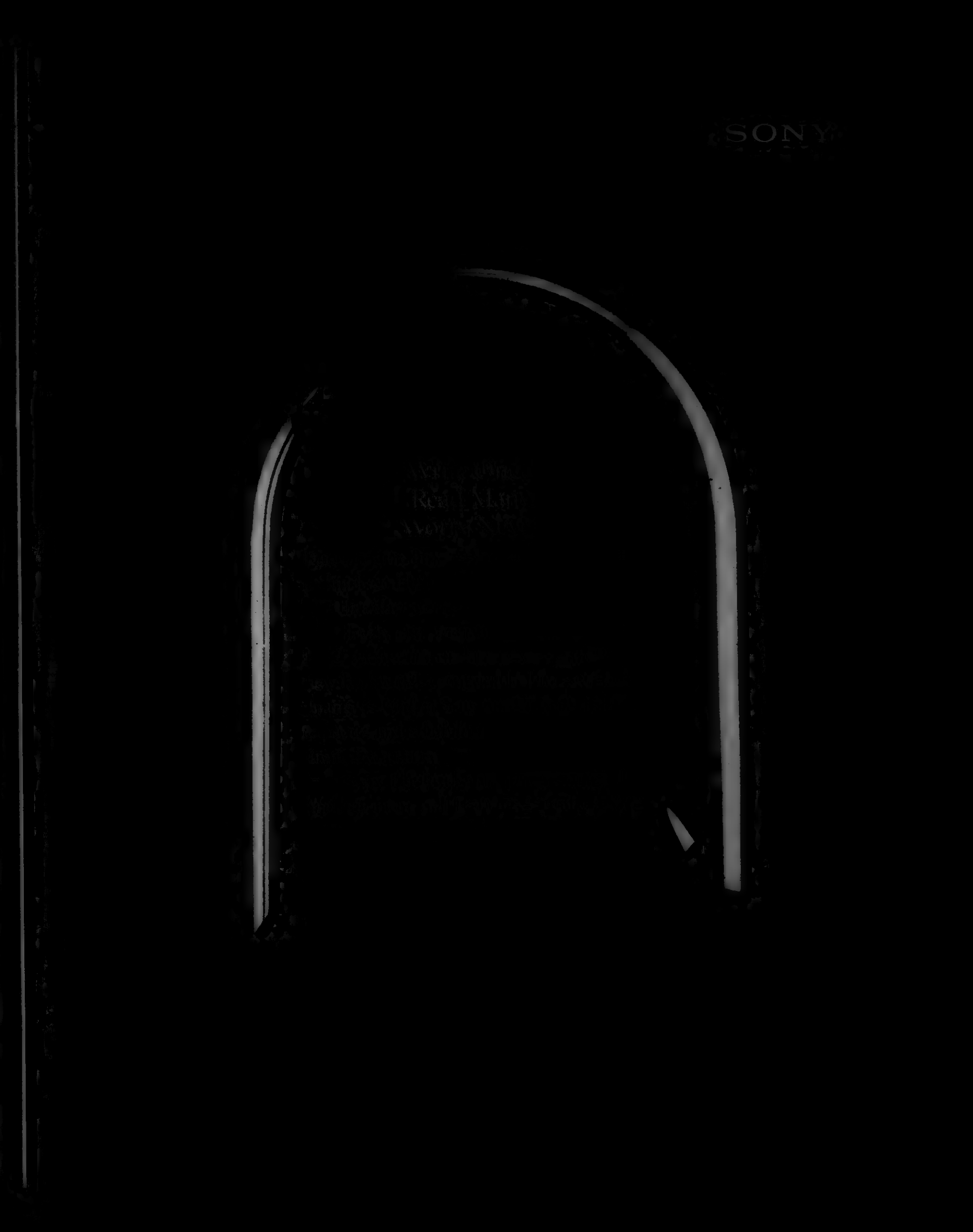
Getting more with Gore (II)

The degree to which the government's HPCC program has moved beyond its scientific supercomputer roots is the subject of some disagreement, but clearly it is headed in a different direction. In one of its first actions this year, a Senate committee introduced a bill, popularly called "Gore II," that extends the scope of Al Gore's 1991 legislation for HPCC — which focused on research, tools and infrastructure — to include applications.

In particular, the new bill stresses education, digital libraries, manufacturing and health care. For example, the bill directs various agencies to develop the following:

- Virtual reality technology for simulating operations and other medical procedures.
- Technology to allow real-time collaboration among multiple physicians at remote locations.
- Connections of primary and secondary schools to the Internet to allow students and teachers to communicate with peers and access databases.
- Advanced systems able to store hundreds of terabytes of data, text, images and sound, while giving thousands of users near-instantaneous access to that information.

Referring to a proposal by the U.S. Patent and Trademark Office to make its patent data publicly available on-line via the HPCC's high-speed network, Dr. Daniel Masys of the National Library of Medicine said, "That kind of application is exactly what [the White House] and Congress had in mind when Gore II was introduced." — *Gary H. Anthes*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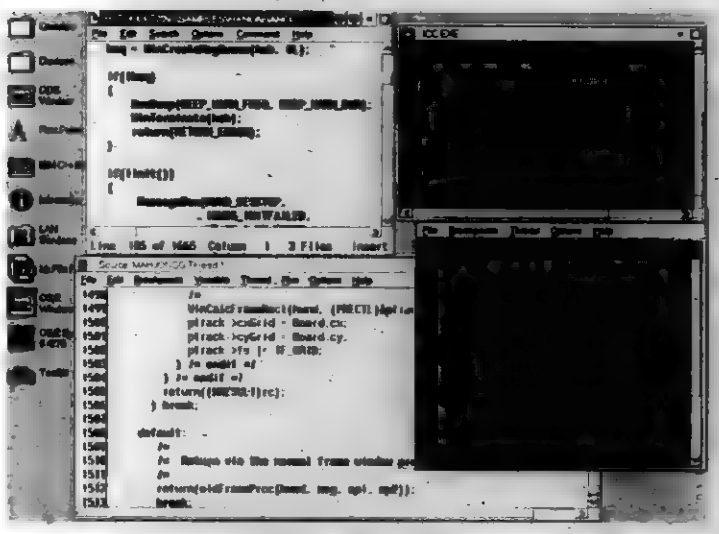

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Multitasking—DOS apps	Time slicing	Pre-emptive time slicing
Multitasking—Windows/PM apps	Cooperative	Pre-emptive
Priority	Static (set by user)	Dynamic
Dispatchability	Process	Thread
System services	Serial	Parallel
Protection between apps	Unprotected	Protected
Kernal protection—DOS/Win/PM apps	Unprotected	Protected
File system	FAT	Enhanced FAT and installable file systems (HPFS, CD-ROM)
User interface	Windowed	Object oriented

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IBM

Software AG extends Unix tools strategy

Company gives users the means to take development off of the mainframe

By Gary H. Anthes
RESTON, VA.

Software AG of North America, Inc. today will unveil Unix versions of Natural Construct, its code generator, and Predict, its data dictionary.

The announcement follows by a year the introduction of Unix versions of its core products — the Natural fourth-generation language, the Adabas database management system and Net-Work, a "middleware" product that facilitates information sharing across disaimilar environments.

Users said the additional Unix offerings will help them migrate their mainframe applications built on Software AG products to distributed environments.

"This is a good move on their part," said Lou Kleynen, vice president of company information systems at Lechmere, Inc. in Woburn, Mass. "It allows us to complete the task of trying to develop mainframe software on something other than a mainframe. Those were the missing pieces."

Mainframe production

The products will help users who want to develop applications in Unix environments but run them on mainframes, said Michele Perry, director of Unix platform environments at Software AG.

"People are still skeptical about Unix system management tools, Unix security and so forth," she said. "They want to offload stuff but leave production on the mainframe."

Kleynen said Lechmere wants to develop applications on IBM RISC System/6000s to free up its IBM 3090/200E mainframe, where developers now eat up 25% of the capacity during the prime shift. He said it would make sense to move existing data dictionaries to RS/6000s both for applications running there and for those that will ultimately run on the mainframe.

Faster than a ...
In December, Software AG reported that a Unix-based Hewlett-Packard HP 9000 Series 800 Model 150 uniprocessor system had run Adabas at 303 transactions per second on the TPC-A benchmark. That was 64% better than the comparable result reported by Oracle Corp.

Randy Ebeling, director of data processing at the University of Texas at Austin, said Predict for Unix will help him port mainframe applications to a Hewlett-Packard Co. HP 9000 server. However, he said, the university will not need the code generator for six months to a year, when it will begin to develop applications on the HP machine.

No speed demon

Analysts said Software AG is not setting any speed records with its foray into the world of open systems, but its approach makes sense given the company's mainframe heritage and technological strengths.

"Bringing these products over to Unix means not only a port but also opening them up to work in the interoperable world of open systems," said Peter Kastner, vice president at Aberdeen Group in Boston. "That takes time. Software AG is going about it very methodically."

The products are available for Unix workstations from IBM, HP, Sun Microsystems, Inc., NCR Corp. and those running The Santa Cruz Operation's Unix. They are each priced from $600 to $34,900.

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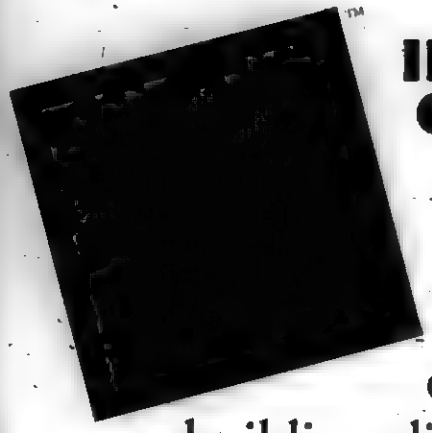

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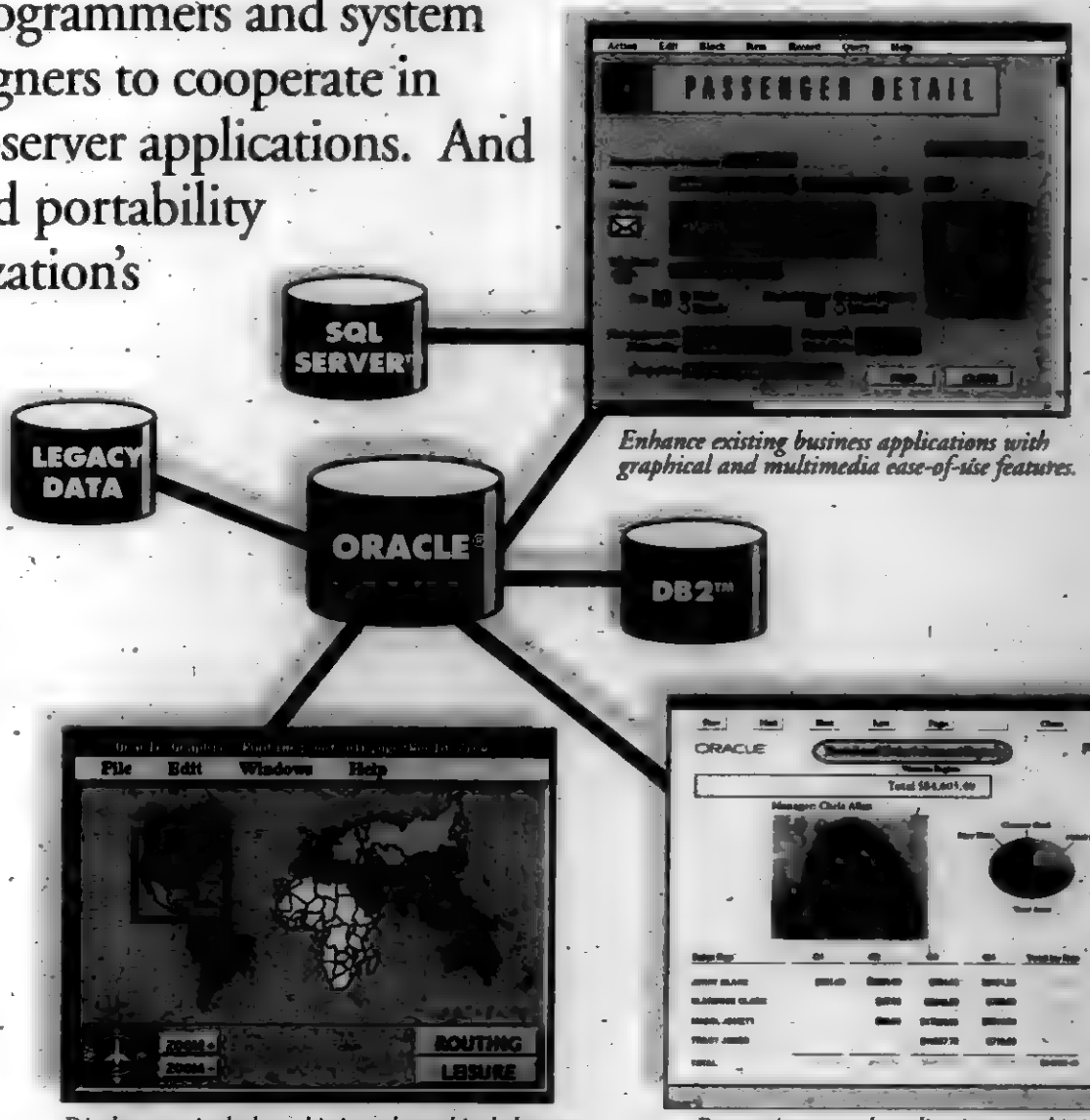

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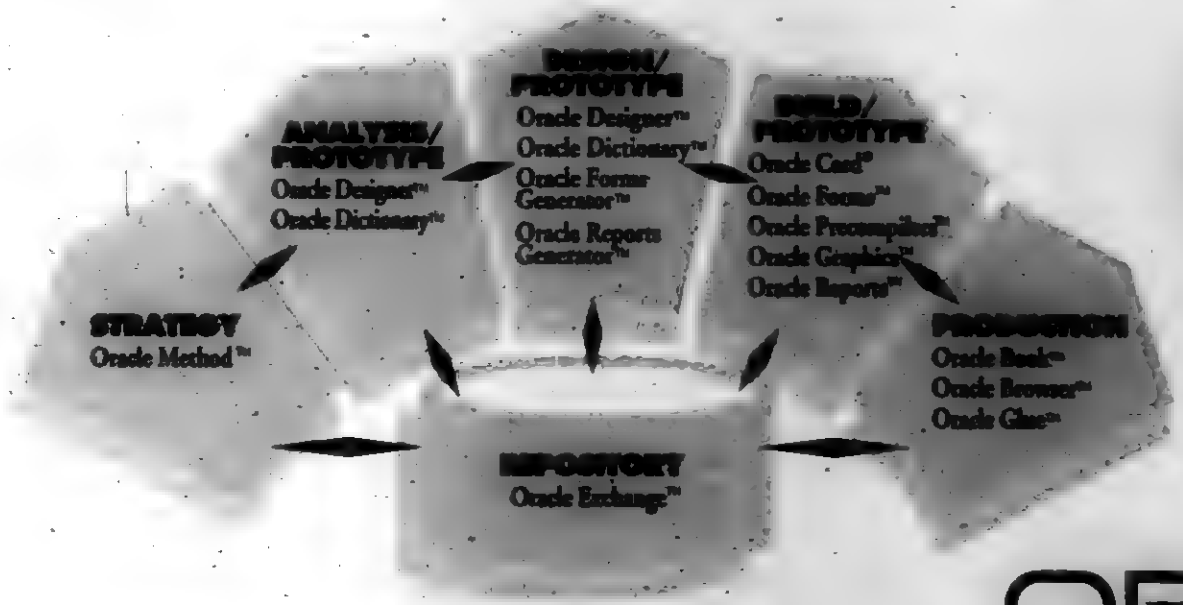

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Look, Ma (Bell) — no hands!

Wireless phones, hearing-aid-size communicators are the wave of the future

By Joanie M. Wexler

For most business users, they will get smaller and lighter. For most residential customers, they will get larger for the sake of video.

But for all of us, Alexander Graham Bell's brainchild will evolve into a different animal during the next decade: a telephone that integrates multiple forms of communications — voice, video, data, image, fax — into one device that will serve as the "graphical user interface" to the telephony world.

In the business sector, observers agreed that device will be a wireless personal communications system with a phone number that dials the roaming individual, not a fixed phone jack in a wall. Some said they expect such devices to be more the rule than the exception seven years from now, as workers are becoming increasingly mobile.

Talkative roamers

A testament to the growth of nomadic phone users came from Eric Schimmel, vice president of the Telecommunications Industry Association, during a recent Subcommittee on Telecommunications and Finance meeting. He said cordless phone sales have risen from 12 million units annually a year ago to 17 million, while cellular phone subscriptions grew from 6 million to 10 million during the same period.

And the building blocks for bringing the various communications streams together are popping up now. For example, Jabra Corp. in San Diego is shipping a $159 product that integrates transmitters and receivers into a hearing-aid size device that sits in a user's ear (see photo). It lets a user — such as a chef preparing a meal — stroll around talking with both hands free.

The same device plugs into the back of an Apple Computer, Inc. PowerBook to turn it into a "portable office, with telephone, fax and messaging, right there in your PowerBook wherever you go," said Randy Granovetter, Jabra's president.

For example, Granovetter described a scenario in which a user finds himself with extra time on his hands in an airport. "You open the PowerBook, plug in the Ear Phone, double click on your communications port software, and leave an electronic message or talk without budging from your seat."

Down the road, Jabra, in partnership with several third parties, expects to offer a spread-spectrum-based station that lets roving users issue voice commands from up to 1,000 feet away.

On the data side, Reflections Technology, Inc. in Boston makes a cube-shaped module for eyeglasses that projects what appears as a full-size computer screen to the wearer's eye.

Jabra's Ear Phone *lets users walk around talking and keep their hands free*

Start-up Fourth Wave Technologies, Inc. in Troy, Mich., is "beep-enabling" Microsoft Corp. Windows applications so that files and messages can be sent to alphanumeric pagers from user desktops [CW, Dec. 21, 1992].

Such developments for business users are emerging from a growing corporate philosophy of "never say die" to accessibility.

"In a few years, we're going to have a limited number of knowledge workers, in that fewer people are taking engineering and scientific courses," said Phillip Evans, director of telecommunications at Perot Systems Corp. in Dallas and former president of the International Communications Association user group. "So we're going to have to make better use of the resources we do have and be able to access them quickly."

Michael Cummins, director of the telecommunications management program in the business school at the University of Miami in Coral Gables, Fla., predicted that to that end, "five to 10 years out, we'll have wireless, portable devices that can plug into a wireline interface when necessary.

"It could be a molded plastic entity with all types of access integrated or it could be modular, like a laptop for which you buy modules for cellular phones or a video display," he said.

A subset of the concept, the AT&T Videophone, is now being sold in office supply supermarkets, Cummins said. "Competing with it in the office market will be a video screen on your PC terminal," provided by videoconferencing equipment makers such as Compression Labs, Inc., PictureTel Corp. and VideoTelecomm, Inc., he said.

He also said miniature codecs — which compress video signals — will be available for laptops in six months to a year.

And for the stationary user, multimedia advocate Apple reportedly intends to plug a digital telephony stream into the back of an as-yet unshipped Macintosh to bring a T1 link to the PC.

For the home market, Philips Home Services International introduced an enhanced phone last November. It has visual and text-oriented features that comply with the Americans with Disabilities Act, making the eventual delivery of home banking and other services to businesses and homes possible.

Going a step further in the residential market, Cummins said he anticipates phones that create the "ultimate couch potato." He sees a helmet-like multimedia headset and glasses that incorporate virtual reality technology to let users simulate "bungee jumping with no fear.

"We've never re-engineered education like we have business. The concept of everyone coming to the master is no longer workable — the education has to come to us. We can't compete globally" without such a system, he said.

What can networks offer?

The shape and timing of the ultimate phone will largely be determined by the network services available to support it.

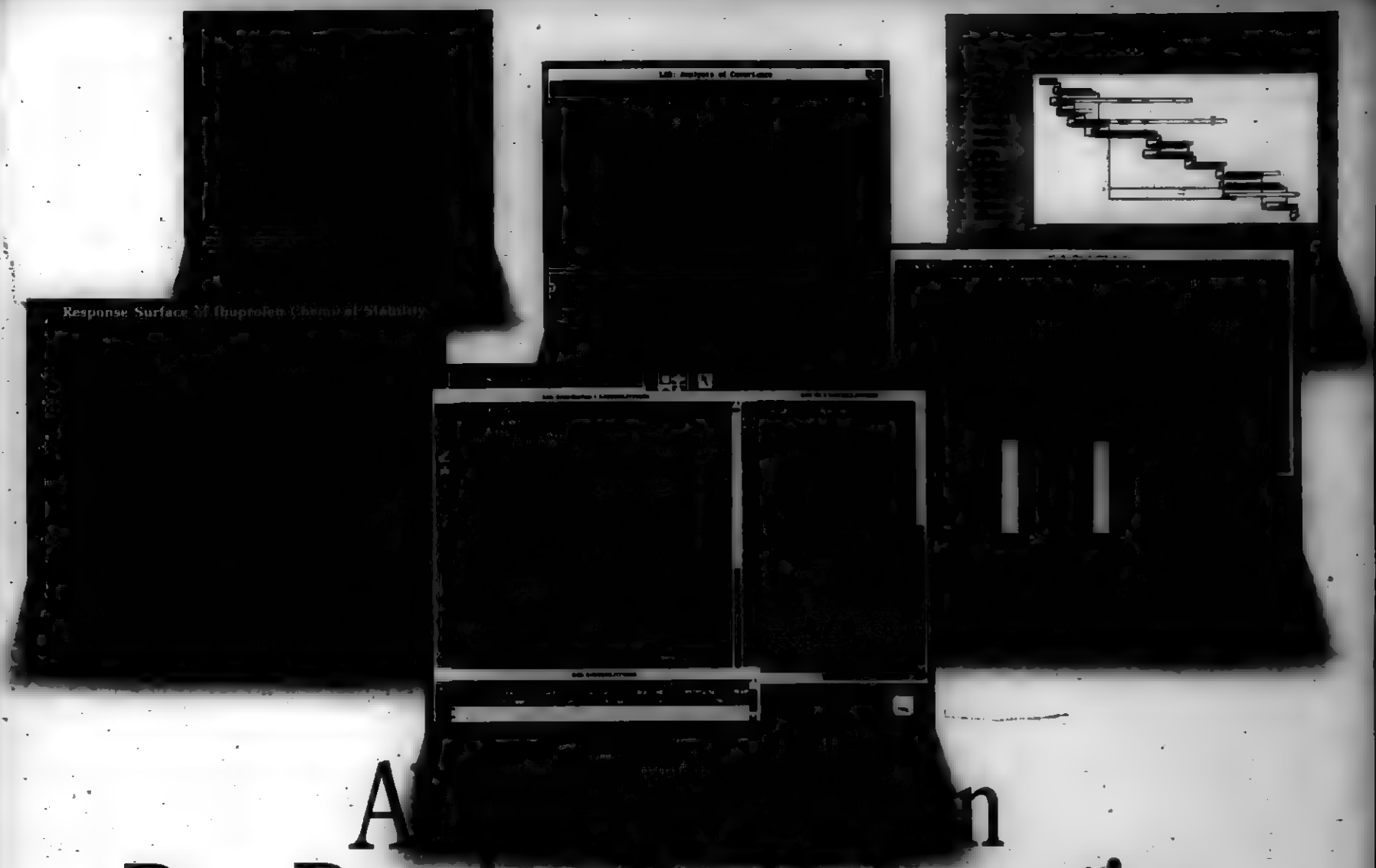
For example, "the public telephone network is getting both better and worse," said Ken Krechmer, principal at Action Consulting in Palo Alto, Calif. "It's better in that [terrestrial lines are] practically all digital, and voice quality is excellent. On the other hand, if you call me on a cellular phone, it's worse. There is no 64K bit/sec. service, and there are dropouts and co-channel interference."

When it comes to wireless, there are also bandwidth and frequency limitations to carrying larger chunks of traffic. One way to accommodate the traffic would be to "segment locations into smaller and smaller cells so you can make more efficient use of limited spectrum," said Phillip Evans, director of telecommunications at Perot Systems in Dallas.

The trend toward single phones with access to several services could finally be the kicker to Integrated Services Digital Network (ISDN).

"With an ISDN line, you can have a videoconference on your PC," said Michael Cummins, director of the University of Miami business school's telecommunications management program. "This would be possible on your laptop if there were more ubiquitous ISDN."

—Joanie M. Wexler



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NetWare on a roll

With the possible exception of Microsoft's Windows NT, no product has been more widely anticipated than Novell's NetWare 4.0, which was announced last week. Scheduled to ship by the end of the month, NetWare 4.0 is the most ambitious corporate information systems product ever fielded by Novell, and reports indicate that it hits the mark.

The new NetWare comes as Novell seeks to solidify its position as the platform of choice for downsized applications. Recent International Data Corp. (IDC) numbers show that it's striking while the iron is hot. One IDC survey found that more than three-quarters of IS managers consider LANs to be high-potential platforms for future information systems. A second IDC survey revealed that about one-third of all organizations downsizing applications today are choosing Novell as their primary platform.

There are good reasons for this. LAN users are faced with three primary operating system options — NetWare, Unix and the upcoming Windows NT — with Banyan as the spoiler. NT is a crapshoot. There's no way to know how complete it will be in the first version. Unix has lots of technical elegance, but the inevitable question is, whose Unix should you choose?

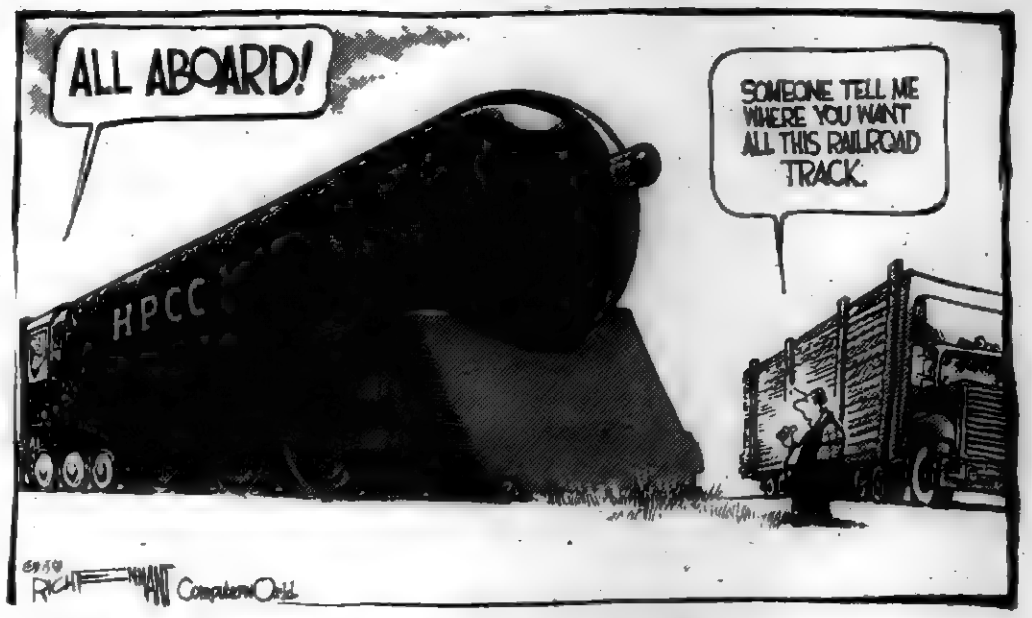
NetWare, in contrast, is a stable, elegant and well-supported network operating system. It has almost 10,000 resellers and a large base of certified support technicians. With the addition of enterprisewide directory services, improved security and increased capacity in Release 4.0, Novell is answering the biggest demands of its corporate customers. Its plans to add native TCP/IP support and improve client connectivity to non-NetWare hosts demonstrates openness. Equally important, Novell's continued willingness to work cooperatively with third parties shows that "not invented here" isn't part of its vocabulary.

The biggest enemy of NetWare 4.0 is user expectations. Anticipation for this product has been so high that anything less than overwhelming success may be seen as unacceptable. That attitude is unrealistic. Corporate users won't embrace a major upgrade of a strategic operating system without extensive testing and staged rollouts. The revisions of 4.0 are extensive enough that it will probably be a year before the largest Novell sites move over completely.

While that process continues, Novell needs to concentrate on giving its customers plenty of information about compatibility glitches and bug fixes. It should work closely with third parties to make sure NetWare Loadable Modules can be ported smoothly to the new release. And it needs to continue efforts to tie NetWare more closely into its customers' other networks.

Novell has the customer loyalty and financial wherewithal to make 4.0 a success. And it certainly has the momentum.

Paul Gillin, *Executive editor*



We do Windows, thank YOU

Hooray for Bruce J. Muckian's commentary, "Windows: Calling it awkward would be kind" [CW, Feb. 22].

After more than a year of frustration with Windows, and more than one instance of either tossing IBM equipment into the trash or trying to teach their reps about computers, I am glad to see someone else notices that the Emperor isn't wearing any clothes.

Neil Edwards
Clearwater, Fla.

Regarding the article by Bruce J. Muckian: I am disappointed that your newspaper would run an article reviewing an outdated version of a particular software.

The article states that Muckian uses Windows 3.0, and he repeatedly complains about problems with Unrecoverable Application Errors (UAE). Windows 3.1, which came out a year ago, eradicated the UAE problem entirely as well as added several new features to Windows.

His and your newspaper's failure to note this was something of a cheap shot. You can't even purchase the 3.0 version of Windows anymore!

More to the point, the reason Windows is the most popular software on the market is simple — it's easy to use and it works.

This is attested by millions of users who have switched to Windows, old DOS programs that are being updated for Windows in droves, and all the major software houses that are supporting the system with their new programs.

Craig Wilz
Life Care Services Corp.
Des Moines, Iowa

I feel Mr. Muckian is truly missing the advantages of the Windows environment.

The biggest concern I have is that he has overlooked the real productivity advantage of Windows. With the Windows environment, you can leave one application without closing it and go into another.

I believe if Muckian recognized this tremendous value, he would not like to go back to an environment that requires one to close the application that is being used and then open the new application that is needed, such as exiting Lotus to go to a word processing application.

I trust no one takes this article to heart. I have been a Windows user for almost two years and I have virtually gone to only using Windows-based software, both personally and professionally.

Having worked in both the DOS and Windows environments, I can truly say that I am more productive and have more *fun* in the Windows arena than I ever did in DOS.

Ric Calson
Fresno, Calif.

The commentary by Bruce J. Muckian resembles that of the old fuddy-duddy rejecting the idea that the car might actually be better than the horse. He is stuck in the history books somewhere; he isn't even found on CompuServe.

To demonstrate this, consider his bio: "He works with Windows 3.0." And he's complaining about Unrecoverable Application Errors? Instead of holding back the clock, he should advance to Windows 3.1 and experience the two-step processing of closing the Windows' windows: Alt F4 and Enter. No mouse required, either.

David S. Mohler
Dayton, Ohio

I almost — I'm sorry — I *did* laugh when I read Mr. Muckian's editorial about his Windows woes. Under his picture you mentioned he works with Windows 3.0."

Is he still working on a vintage 1985 IBM AT? Ask him if Boeing is still selling 707s. And then tell him to catch up with the rest of us.

William H. Hodson
Richmond, Ind.

I can't imagine that Bruce J. Muckian is still using an earlier version of DOS than 5.0. Yes, Windows has its share of bugs. Unrecoverable Application Errors and the new general protection faults, but it packs many features into a fairly reasonably sized package.

The bottom line is that Microsoft has helped the industry grow, mature and standardize. Granted someone is getting rich doing so, but that's what our free enterprise system is all about. If Microsoft fails to meet the expectations of the computer community, I'm sure that any number of companies are poised to take over.

William L. Kellogg
Enfield, Conn.

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Too many deals are lost over the fine print

Thomas J. Buckholtz

They agree on the specifications. They agree on the schedule. They agree on the price. Do they have a deal?

Not immediately. Probably not for weeks. Perhaps not for months. Maybe never.

What frequently happens in the information technology marketplace at this stage is that a customer and a vendor — we'll call them BuyCo and SellCo — bog down in pages of "fine print" known as "boilerplate."

Other markets manage to avoid this kind of stalemate. Haggling over boilerplate for each shipping container would sink international commerce, but that doesn't happen — the international maritime marketplace came to an understanding centuries ago, and so have other industries. We have to be different, however. We go through considerable pain and delay.

First, BuyCo and SellCo must decide whose boilerplate is to be used. (Usually, SellCo wins this first skirmish.) Then, they must agree on who will type the amendments.

Once those points are settled, the real wrestling begins — over whether BuyCo can comply with a requirement to return or destroy all copies of SellCo's software when use ceases; over rights to custom software developed under the contract; over SellCo's liabilities for various possible types of damages; over indemnification against third-party claims of proprietary rights violations; and so on.

BuyCo's project management discusses each issue with SellCo's sales force. They com-

promise, subject to review. Lawyers and management perform their reviews. If they suggest new wording, then even more discussion ensues.

During these discussions, the clock continues to run. BuyCo cannot derive competitive advantage from products and services it has not received. SellCo is not receiving revenue on this would-be deal.

Usually the parties do complete a deal. But, a noticeable fraction of the time, negotiations are abandoned after two to six months.

Once, a company I worked for, recognizing that it was caught in a quagmire, did exactly that. It took us about a week to evaluate a competing product, and three weeks later, we signed a deal with the second company, which found our terms and our boilerplate perfectly acceptable. The originally intended SellCo lost what would have been its second largest sale ever.

Each year, thousands of talented managers, technical staff members and lawyers devote significant time to negotiating computing and telecommunications boilerplate. Is this productive? Is it necessary?

Sometimes it is. Sometimes all this attention to detail significantly improves a deal or prevents a deal that would have been built on false expectations.

More often, however, I suspect the parties would be happy with marketplace-standard wording and the comfort that most business was done based on it.

Let's liberate millions of people-hours tied up in needless boilerplate negotiations. Buyers would be able to spend their money on products and services rather than on negotiations. Vendors would sell more and lower their costs per sale. We'd certainly all be a lot more productive. We might even be more competitive.

Buckholtz is a consultant in Washington, D.C. Until recently, he was commissioner of the General Services Administration's Information Resources Management Service, where he led the deployment of computing and telecommunications throughout the U.S. government.

Pay for training now or regret it later

LISTEN UP! *by* Elaine Bond

Years ago, the major systems vendors led the way in educating users. This education was accomplished in ways that minimized the impact on user organizations. Costs were indirect (reflected in the price of the product). There were a limited number of easily identifiable individuals who needed training. Most important, the rate of change was modest and controlled.

Today, things are different. User organizations have inherited the responsibility for education and retraining, and they must do the job in the face of far greater obstacles. Limited budgets leave very little room for training. Products now come in a dizzying variety. And now entire populations, not just a few technologists, require training.

Rolling out client/server architectures requires significant amounts of training for end users, application developers and operations and support personnel. And training in the specifics of the technology is just the beginning: Personnel must also be trained in new applications and new operational procedures. But for most organizations, training — particularly technical training — is considered overhead, something that is very difficult to cost-justify.

So what can an IS manager do to make the job a little easier?

First, recognize that training is a critical factor in the evaluation and purchase of client/server technologies. Training support (quality and quantity) must be evaluated in product selection. Training costs must be built into project plans. You can pay now by including formal training as an explicit line item or later in low productivity or underuse of the product. Either way, you will pay the price.

We should also seek greater cost-effectiveness in the availability and delivery of training. There are redundancies in product content and certification programs across multiple vendors. This unnecessary duplication could be eliminated by investigating the basic knowledge required for specific tasks and developing appropriate training material built around generic or "core" content. This core content must be widely recognized and accepted.

Once a person is qualified or certified in the appropriate core material, unique vendor or product-specific material can be delivered more efficiently and effectively from both a user and a vendor perspective.

Finally, even more can be done to improve on the already significant gains in "ease of use." People well-versed in training and learning theory should have greater influence on product design.

We hear about the value of cross-functional teams in many other businesses. We know that having manufacturing and service specialists participate in product development improves product quality. Why not have training specialists critique products based on how much it takes to learn how to use them? Human factor labs are a step in the right direction. If they discover that a feature is hard to master, maybe it's not worth the cost to put it in, or maybe there is another way to offer the same capability.

The bottom line is this: In spite of the rhetoric associated with the term "ease of use," more people need more training in more subjects than ever before. And as with most things that are associated with multivendor client/server architectures, we need some new models.

Band is a Chase fellow and senior technology consultant at The Chase Manhattan Bank NA. She is a founder of the user advocacy group Open User Recommended Solutions, or OURS.

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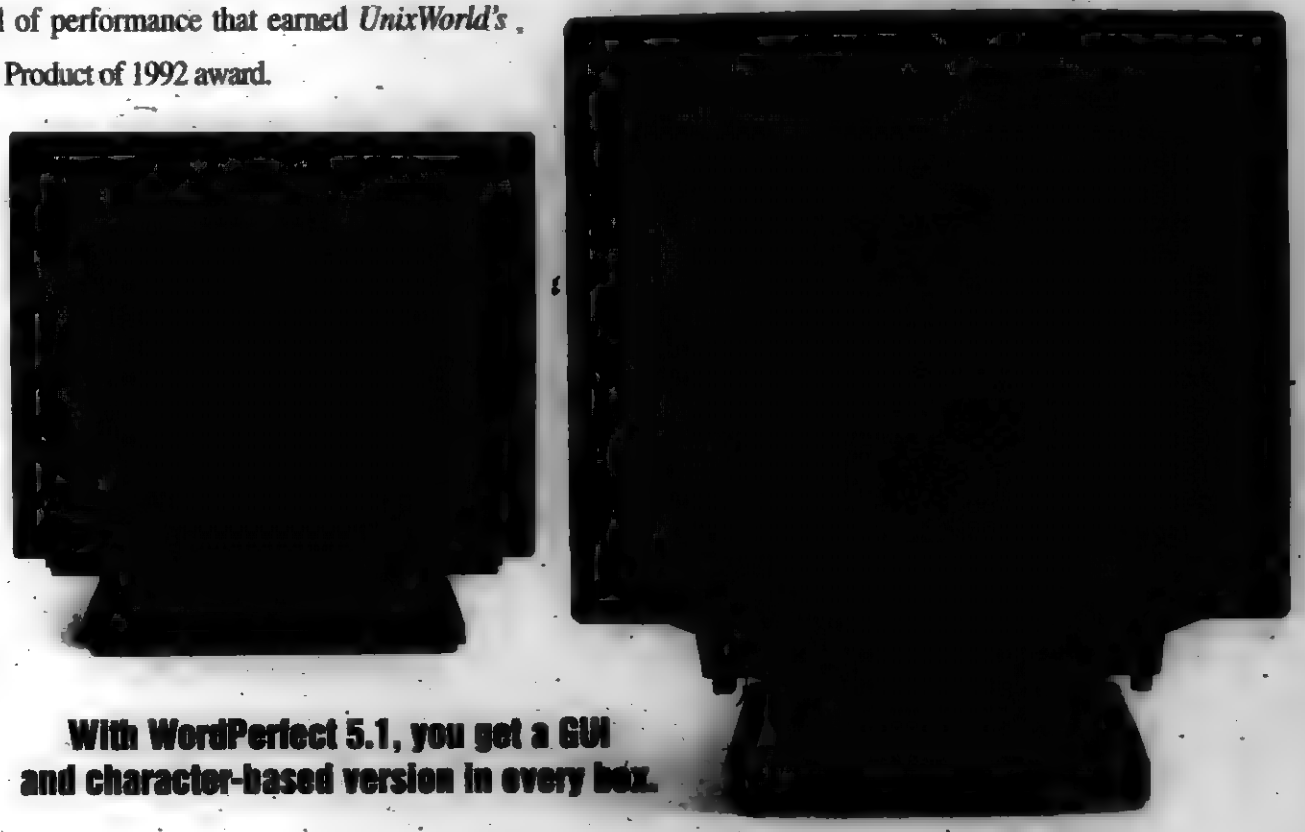

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Charles Babcock

Solaris in NT's shadow

As all eyes watch for Windows NT, the long-awaited new kid on the block, there's a kid already in the neighborhood who deserves a second look.

This is a youngster who is already dressed in 32-bit threads, networks easily among diverse groups and always carries a full box of tools. And it's a rare 1½-year-old that can be described as tested and mature.

We're talking about Solaris, the desktop version of Unix from SunSoft, a business unit of Sun Microsystems. Solaris grew out of SunOS 4.1, which had its roots in the University of California at Berkeley's Unix. Solaris 2.0, however, is compliant with System V Release 4.

SunSoft has great ambitions for Solaris 2.0, even though it tends to hang out on familiar SPARCstations and SPARC-based servers. SunSoft will soon dress Solaris up in new clothes and send it out to mix with that noisy, pedestrian MS-DOS crowd: Just how well the youngster goes over remains to be seen. So far, the PC community has shown little proclivity toward Unix, preferring to be dazzled by the mere prospect of Windows NT.

Solaris sports two or three appealing new characteristics.

At $795 per copy on RISC workstations, it is cheaper than other versions of Unix. And unlike other versions, Solaris' acceptance is being driven by the engine of Sun's hardware sales. In six months, Solaris will have reached a million users, says Ed Zander, head of the SunSoft unit.

If there is a growing appetite for Unix on powerful PCs, Solaris 2.0 for Intel X86 will be launched by the end of this month to meet it. With X86 Solaris, SunSoft customers have the option of designing applications with the same core operating system and networking capabilities on servers and clients. In this sense, Solaris 2.0 and Solaris for X86 will have more in common than Windows and Windows NT in client/server configurations. To encourage that possibility, SunSoft is likely to drop the price of Solaris for Intel X86 below the SPARCstation level to $500 or so, the first version of Unix at PC prices.

As a desktop system, Solaris has its drawbacks. If Windows NT is hungry for memory, Solaris is hungrier. It needs a minimum of 12M bytes of RAM, with 16 recommended. It also needs 200M bytes of hard disk space.

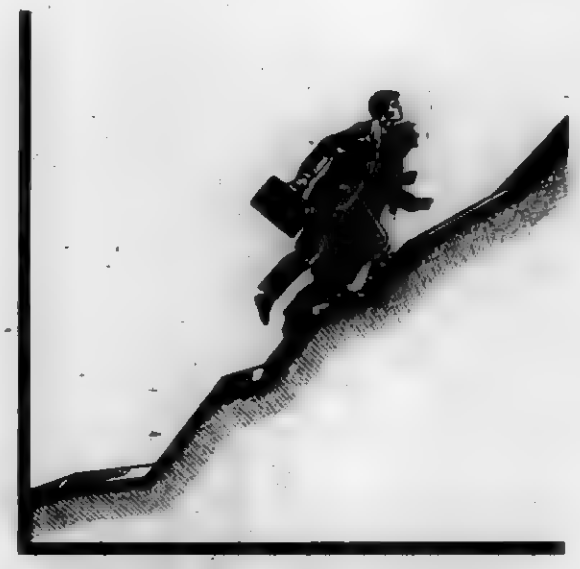
Solaris comes equipped with Sun's Open Look graphical user interface, even though OSF/Motif is the GUI of choice on Unix desktops. Sun SPARCstations serve as the largest installed platform for OSF/Motif, but Sun stubbornly refuses to sell it.

An area where Windows NT has the potential to outshine desktop Unix is in its ability to run with few changes on multiple platforms. There's irony in the fact that a product from fiercely proprietary Microsoft may be able to out-Unix Unix by establishing an open environment, but Windows NT threatens to do just that in the 32-bit arena.

Solaris and the other members of the disjointed Unix community cannot hope to compete with Windows NT on Intel desktops unless they minimize the somewhat artificial distinctions between their brand names. Customers don't know the differences between Univel, Destiny, Xenix, UnixWare, AIX and The Santa Cruz Operation's Open Desktop, but they can grasp that the applications of one won't necessarily run with the others.

No doubt most desktop forecasters are predicting that Solaris will be eclipsed by Windows NT. But how far NT will progress into client/server applications remains an open question. That will be decided by people responsible for implementing client/server applications, who tend to be system administrators and network managers more than end users and who may see merit in Solaris.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.



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Christopher Lindquist

Take it with a grain of salt

Probably one of the biggest advantages of being connected to bulletin boards is getting your questions answered. No matter what your query, there will be someone out there with a solution or a suggestion. And those answers are free. However, remember that the advice may be worth only what you pay for it.

■ Here's something from the "People who have too much time on their hands" file. A guy on a fairly major BBS posted a want ad looking for a minicomputer or mainframe that he could use "to run my house, i.e. lights, water heater, furnace..." A series of incredulous responses followed that asked whether the fellow was prepared to build another house to store his new toy, including cooling systems.

"You're trying to kill cockroaches with nuclear warheads," came one reply. Another stated that a small main-

Lindquist, *page 43*

AST boosts high-end service

By Michael Fitzgerald
IRVINE, CALIF.

AST Research, Inc. recently announced new products and a new service program but coupled them with less than stellar news on its near-term financial prospects.

On the product side, AST replaced its high-end Power Premium PC series with Premmia, which features local bus graphics, enhanced upgradability and Pentium capability.

AST had expected to introduce the Premmia line in January but delayed the release to make some customer-suggested enhancements, such as a shift from normal to buffered serial ports and a network-upgradable flash BIOS.

The delay "hurts [AST] in the market [a little]; one reason they've been doing so well is they've been in the right place at the right time with the right products," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing," a newsletter published in Brookdale, Calif.

Users contacted said they liked the new products, though at least one thought them pricey.

Ashvin Dave, director of database and technical services at Midas International, Inc. in Chicago, said there was roughly a $700 difference between a Bravo and a Premmia based on the same processor, or approximately $300 more than he would have expected.

Pricing on the Premmia systems, which start with a 33-MHz 486DX and range to a 33/66-MHz DX2, starts at $2,095 and tops out at $4,195.

AST used a proprietary local bus scheme that it calls LocalLink, which is based around ATI Technologies, Inc.'s mach32 graphics accelerator. AST claims a 200% increase in graphics performance for Windows applications. It also built in the ability to integrate Ethernet on the motherboard, a strategy it calls "personality modules."

AST Customer Care is a new program in which AST will offer 24-hour, seven-days-a-week toll-free technical support and a three-year warranty for most desktops.

PCs are money in the bank

Texas Commerce Bank speeds loan requests, drops error rate

By Michael Fitzgerald
HOUSTON

When opportunity visits your neighborhood, it can walk right in your door if only the door is open in the first place.

That is the attitude at Texas Commerce Bank NA, where Allen L. Cournyer, senior vice president and manager of the data center, has jumped into personal computing to take advantage of changes in Texas' state banking regulations.

"We're basically in the process of [data center] consolidation as we move from a unit bank environment to a branch banking one," Cournyer said. As recently as 10 years ago, Texas banking laws restricted branch banking to the point that it was difficult even to get automated teller machines installed, he said.

But when Texas legalized branch banking in 1987, Texas Commerce went on a tear to centralize data operations and reduce duplicated functions.

The shift in laws "handed us an opportunity to use new technology, so we've done a lot of re-engineering," Cournyer said.

A big part of the change was the move to a local-area network-based integration project, with a focus on imaging.

To speed its loan-making process, Texas Commerce originally intended to give its loan officers access to seven mainframe-based systems, including credit bureaus and its own internal loan-processing and credit-card systems. It found, though, that it would have to put as many as five terminals on a desk to attach to all these systems. So it opted to put PCs on each officer's desk and design a front end to integrate the various mainframe systems onto the PC.

Texas Commerce found that it was able to use an imaging system from ViewStar Corp. as a front end into the various mainframes. It also found that shifting from a centralized scanner to fax machines in the branch offices helped it save courier time by faxing the files into its five Compaq Computer Corp. fax servers.

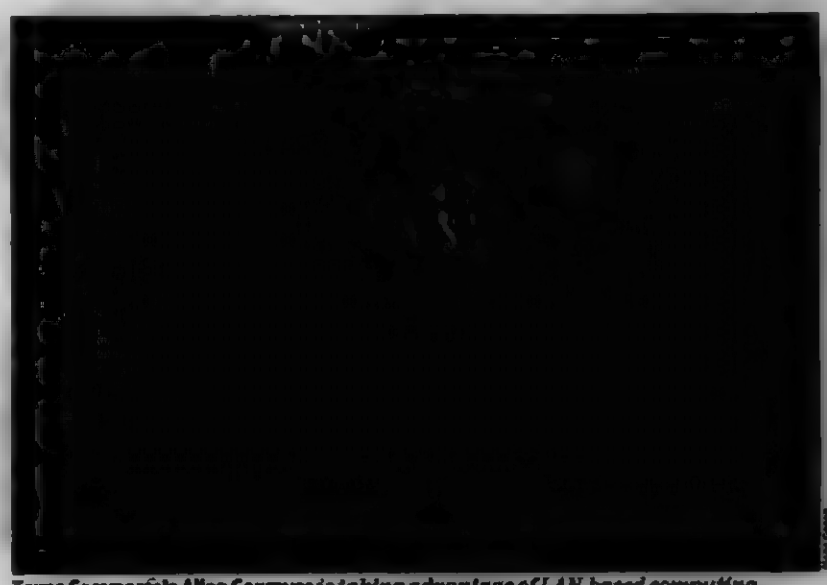
The faxes could be converted to a simple .TIF file, then converted to ViewStar's proprietary imaging format. Faxing over phone lines was less expensive than installing scanners and dedicated T1 lines in each of the bank's 92 branches and transmission was four times faster.

Through applied use of the technology, Texas Commerce said that it has gained obvious benefits.

"We have doubled our volume of business without increasing staff," Cournyer noted. "We've also been able to offer new products as we've gotten better at figuring out how to automate things." One example is the bank's loan-by-phone program.

Cournyer said error rates have also dropped, and perhaps most useful to customers, a personal loan request that used to take up to two days to process now goes through in under three hours. Virtually no paper is generated in the loan-approval process.

Furthermore, the bank wants to move more ad hoc reporting down to the PC level to save on mainframe programming costs.



Texas Commerce's Allen Cournyer *is taking advantage of LAN-based computing*

On Site

Texas Commerce Bank NA
Houston

Challenge: To take advantage of changes in state banking laws and establish itself in consumer lending in Texas by providing faster service.

Technology: ViewStar Corp.'s imaging software and a LAN based on fax servers from Compaq. Seven mainframe databases are linked into this system as well.

Benefits: Able to double its loan volume without increasing staff; able to cut loan processing time from as long as two days to under three hours.

To this end, Texas Commerce is looking into using 5¼-in. optical discs for easy data access. While it has some optical jukeboxes tied to its image system, Cournyer said this limits what PC users can do easily because they cannot access information on a localized disk.

While it is building many new applications in a client/server environment, the bank is not hurtling down the path to "rightsizing." Cournyer said the costs of rewriting applications is still too high for that.

At the same time, mainframes continue to offer certain economies of scale that PCs and LANs lack. For instance, Cournyer said his mainframe storage systems can back up 10G bytes of data a hundred times faster than a LAN.

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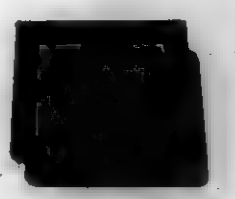

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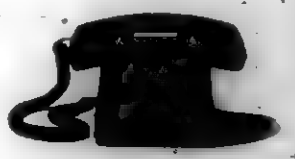

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HELP LINE

Ami Pro 3.0

This is another installment in a series of articles containing questions commonly asked by users and responses from vendor support lines. This week's focus is on Lotus Development Corp.'s Ami Pro 3.0 word processor.

Q: When some EPS graphic files are imported, the frame displays an X and the message "This graphic will not display on the screen. However, it will print on PostScript printers" appears. Why doesn't the graphic image display on screen?

A: Some EPS files do not include a graphic screen representation.

This depends on what application created the EPS. Some applications include a TIFF or Metafile section within the EPS file that will display on the screen, while others do not.

For example, creating an EPS file using Windows' PostScript printer driver does not create a graphic screen representation. Regardless of whether the EPS file is able to display on the screen, it will print to a PostScript printer.

Q: When I import a gray-scale TIFF file, the image is adjusted. How can this be disabled?

A: When a gray-scale TIFF file is imported, Ami Pro automatically adjusts the brightness and contrast settings to produce what the program believes is the best image if AUTOCONTRAST=YES is in the AMIIMAGE.INI file.

If you have made changes to your TIFF file in another program and do not want Ami Pro to make any adjustments in brightness and contrast to imported TIFF files, AUTOCONTRAST must be set to NO.

Note: If changing the AUTOCONTRAST setting to NO in the AMIIMAGE.INI file does not disable autocontrast, copy the file AMIIMAGE.INI from the Windows program subdirectory to the Ami Pro program subdirectory.

Once AMIIMAGE.INI is copied to the Ami Pro program directory, the autocontrast setting will be read.

Q: WordPerfect documents that use the Courier font import into Ami Pro using the TrueType font Times New Roman 12 rather than Courier. How can Courier in WordPerfect documents be maintained when imported into Ami Pro?

A: Remove or remark out with a semicolon (;) the line Courier New = 12 in the [FontIgnore] section of the AMIWP.INI file to allow WordPerfect documents to import with the Courier font.

Q: When Ami Pro 3.0 is started, the error message "Error 51 - macro MACRONAME.SMM, not found" appears. How can that message be eliminated?

A: This message will display when starting Ami Pro 3.0 if the line "AutoMacroLoad=" in the AMIPRO.INI file is set to automatically run a macro that no longer exists.

To prevent this error from displaying, change the Tools/User Setup/Program Load option to a macro that exists, or delete the macro name from the Program Load edit box.

Q: Can the SmartIcon palette created in Ami Pro 2.0 be converted to a SmartIcon set for Ami Pro 3.0?

A: The SmartIcon palette used in Ami Pro 2.0 can be converted to a SmartIcon Set for Ami Pro 3.0.

The Ami Pro 2.0 file, APIB.INI, located in the Windows program directory, can be copied to the Ami Pro 3.0 Icons directory, where it will be available as an Ami Pro 3.0 SmartIcon Set.

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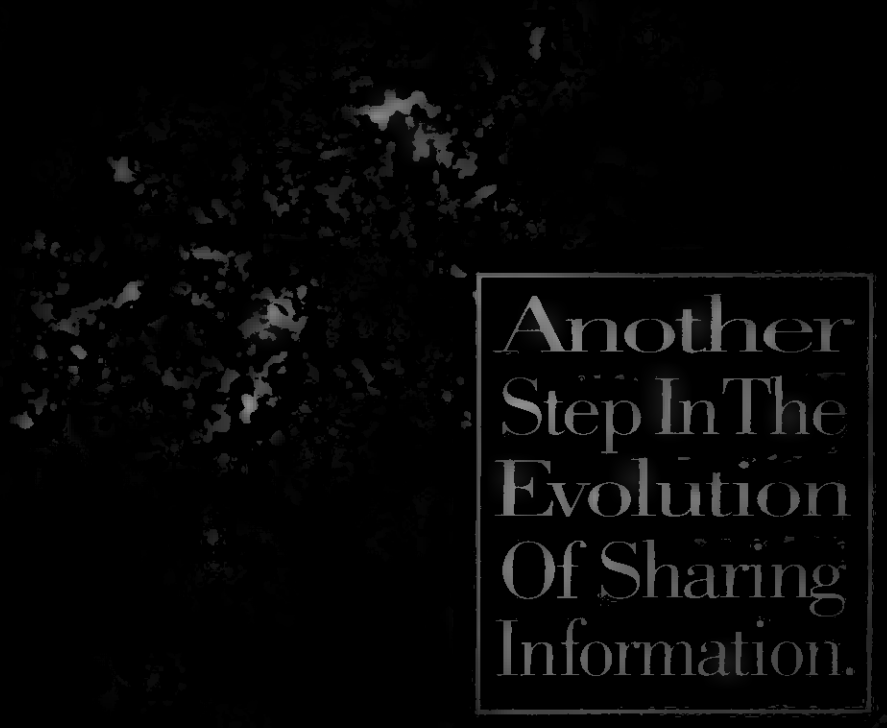
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Step In The
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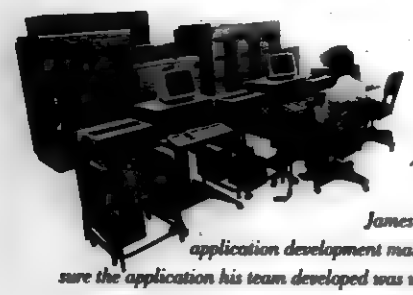
Alan contacts Elizabeth, an independent market analyst in Miami, for interest rate predictions. Since most major vendors support APPC, Alan can choose from a variety of analysts who are supported by different computer systems.

How well you perform depends on how well you communicate. Alan, the company's chief financial planner, is working from his Montana getaway on next year's projections. His company's software is based on APPC, the Advanced Program-to-Program Communication protocol. That puts Alan and his laptop in communication with all the information he needs.



James is the corporate application development manager. He made sure the application his team developed was written in APPC so that it could communicate with other APPC programs running on different operating systems in multiple networks.

Alan asks Susan for next year's marketing budget. Susan uses an APPC application to retrieve data on her LAN for advertising and sales. She then requests corporate data on public relations expenditures.

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Paul Gillin

Tidings from the West Coast

OVER AT CUPERTINO, CALIF.-BASED SYMANTEC, an interesting new technology code-named Bedrock promises to make cross-platform development a whole lot easier.

Bedrock, which won't ship until late this year, will be a development framework based on a collection of more than 1,500 Dynamic Link Libraries (DLL) that span DOS, Microsoft Windows, Windows NT, OS/2, Unix and Apple Macintosh platforms. The idea is that developers will link the Bedrock DLLs, which are basically little packages of pretested code, into their programs at compilation time to fit the appropriate operating environment.

For users, the benefit of Bedrock could be faster availability of new programs across platforms. For developers, Bedrock could make development much faster, although Symantec says program performance takes about a 10% hit.

Of course, all of this is vaporware at the moment, and Symantec doesn't exactly have the marketing muscle of Microsoft or Borland. But it has the right idea at the right time.

NOT EXACTLY DESKTOP COMPUTING but a good idea nonetheless comes from tiny Red Brick Systems in Los Gatos, Calif. Red Brick said IS managers want to give end users decision support access to production data (they do) but don't want to tie up the production database to do it (they don't). Red Brick offers tools to extract production data and run queries against it.

The Red Brick Warehouse consists of a loader for getting data out of the production database, a database server module and a proprietary SQL-based query tool.

Visio *provides templates for common charting jobs*

Red Brick has recently received boosts from deals with HP and IBM, but it's still a small firm, with only 10 customers and expensive ($50,000 and up) technology. Front-end tool support is also thin right now. Still, Red Brick has a good product and a niche, and that's what counts these days.

IT'S NICE TO SEE a product hit the streets that genuinely solves a common problem. Shapeware Corp.'s Visio is a Windows drawing package that is so elegantly simple, you wonder why nobody ever thought of it before.

Visio [CW, Feb. 8] assumes that most of us can't draw basic things like flow charts with the drawing tools that are out there. That's because the tools make you carefully craft each element, type and center text and draw lines to connect the boxes to one another.

Seattle-based Shapeware has the machine do the dirty work. Visio gives you templates for common charting activities. To use, simply drag the shape onto the page and link it to other shapes with a line. The lines stay connected to the shapes even when you move them. At $249, Visio is pricey, but it's truly useful and unique, at least for now.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

Lindquist

CONTINUED FROM PAGE 39

frame might function nicely as a furnace replacement. Of course, if more people thought this way, John Akers might still be planning a future at IBM.

■ The "PC to mainframe" conference on one board was not exactly alight with incisive commentary until someone posted a simple message: "Is anybody out there?" The reply: "Indeed, we are. It just seems mainframers don't have much to say on PC networks."

■ I've finally done some exploring with my new Internet connection. The amount of information available is astounding, and connections with mail service can be had for less than $200 per year. One word of advice: Buy an Internet tutorial before you start. Moving around the networks is often like driving in New York City without a map: You know there's a lot to see, but you have no idea how to get there.

■ And if you had an Internet connection, you could be looking at the verbal warfare occurring in the comp.sys.next.advocacy group.

■ While some Next customers are taking a "silver lining" view by saying that having Next put its efforts behind supporting multiple platforms is best, many users of Next hardware are feeling quite betrayed. The biggest problem appears to be that Next has not defined what its hardware customers should do... er, next.

It's sad to see the only workstation with a sense of style fall out of the market. If you have any epitaphs for Next, send a message via MCI Mail at 549-8464, CompuServe with 72360,2005 or Internet under chrisl@netcom.netcom.

Lindquist is a *Computerworld* West Coast correspondent.

Software piracy

First raid tests felony law

By Kim S. Nash
and Christopher Lindquist
BOARDMAN, OHIO

■ When Rusty & Edie's, the third-largest bulletin board in the U.S., was shut down recently by the Federal Bureau of Investigation, electronic debates raged across CompuServe over whether Rusty & Edie's in fact allowed subscribers to pirate software, as the FBI alleges.

The arguments may be moot, however, because while the FBI decides whether to press criminal charges against the bulletin board service, proprietors Russell and Edie Hardenburgh have been wiped out of business.

At last month's raid on the 6-year-old bulletin board — run out of the Hardenburghs' home — the FBI seized Rusty & Edie's servers, PCs and peripherals supporting 124 incoming nodes and 19G bytes of storage space. The equipment will sit idle in an Ohio warehouse until FBI and Software Publishers Association (SPA) officials comb through the bulletin board service's massive files and documentation to determine whether Rusty & Edie's supported or encouraged illegal downloading of copyrighted software by its 14,000 subscribers worldwide.

The investigation could take several months, said Gary West, a special agent at the FBI office in Youngstown, Ohio.

This is the first raid since Congress raised software piracy from a misdemeanor to a felony in October. Under the law, convicted pirates face up to five years' jail time and $250,000 in fines if they are found to have stolen more than 10 copies of a package with a value of more than $2,500.

The law shows that "the government is now willing to put resources behind this crime," said Ilene Rosenthal, SPA's general counsel. SPA estimates put U.S. losses from software piracy in 1991 at $1.2 billion. Of the 218 audits and lawsuits filed last year against alleged pirates, 54% of them were against bulletin board services, training facilities and schools. The rest were corporate cases.

At a glance
1992 was a busy year for the SPA:

Phone calls per day on the antipiracy hot line: 50

Number of organizations the SPA pounced on: 747

Audits and lawsuits: 218, resulting in $3.9 million paid in fines and penalties

Cease-and-desist letters: 500

"Bulletin boards make up a small percentage, but that doesn't mean they're not important," Rosenthal said, adding that raids on other bulletin board services are imminent.

For an $80 annual fee, Rusty & Edie subscribers could read, upload and download many popular copyrighted business and entertainment programs, Rosenthal said.

Some reservations

Some PC users doubt the charges. "I never saw anything that was a commercial product on the board, but perhaps I didn't have access to some areas," said Lee Parsons, a PC user who belonged to Rusty & Edie's for about six months. "I do know that they made extensive and repeated warnings about uploading [copyrighted material]."

"With a board as large as theirs it could be pretty impossible to track and regulate incoming software, but I know that when I saw copyrighted stuff uploaded, it was removed right away," another former subscriber said.

The SPA contends that "several hundred thousand dollars" worth of copyrighted games and business applications had been downloaded from Rusty & Edie's, including titles such as Broderbund Software, Inc.'s Printshop Graphics, Quarterdeck Office Systems' QRam, Microsoft Corp.'s Flight Simulator and Adobe Systems, Inc.'s Illustrator.

A more exact figure will not be available until the FBI combs through Rusty & Edie's files and documentation. The value of the stolen goods "probably exceeds tremendously" that of the pirated software from the SPA's raid late last year of Davy Jones Locker, a bulletin board service in Millbury, Mass. [CW, June 15, 1992].

In the three months prior to that crackdown, approximately $675,000 worth of software was distributed illegally, Rosenthal said. "And that's a small board, with only five or six lines coming in" compared with Rusty & Edie's 124 nodes, she explained. Rusty & Edie's has logged more than 3.4 million calls since opening in 1987.

[redacted]

Faxes

Bit Software, Inc. has introduced BitFax 4.0 for DOS faxing software.

Features and enhancements for the product include a simplified user interface that offers multiple interface options such as pull-down menus, function keys and keyboard shortcuts with the ALT key. Full compatibility with BitFax for Windows and a "what you print is what you fax" feature are also provided, the company said.

According to the company, a small memory requirement of 80K bytes maintains conventional 640K bytes of memory, enabling users to have a sufficient amount of obtainable memory even when all functions have been loaded onto extended memory.

BitFax 4.0 for DOS costs $89.

▶ *Bit Software*
47897 Fremont Blvd.
Fremont, Calif. 94538
(510) 490-2928

Trio Information Systems has started shipping DataFax, a Microsoft Corp. Windows-based fax software package.

DataFax includes a Captive quick fax capability, a hypertext search-and-find engine and language-sensitive cover sheets that can recognize country codes. Compatibility with most fax modems and optical character recognition with conversion to leading applications are also provided, the company reported.

Pricing for DataFax begins at $79.

▶ *Trio Information Systems*
Suite 615
8601 Six Forks Road
Raleigh, N.C. 27615
(919) 846-4990

Software application packages

The Triangle Software Division of Datawatch Corp. has announced Version 3.9 of Virex antivirus software.

This upgrade is targeted at the recently discovered CPro, a Trojan Horse virus. CPro masquerades as an update to a well-known compression program.

When a user attempts a CPro application, the Trojan Horse will try to format mounted hard disks and floppy disks, succeeding only when it tries to format floppy drives, the company reported.

Version 3.9 of Virex costs $99.95.

▶ *Datawatch*
Triangle Software Division
3700-B Lyckan Pkwy.
Durham, N.C. 27707
(919) 490-1277

Dimensional Insight, Inc. has introduced Diver Release 2.0 for Windows.

The product is a Microsoft Corp. Windows-based interface for CrossTarget, Dimensional Insight's data analysis and reporting solution. While navigating data, users can continually track their location with a pop-up visual display or "console."

Dive-down paths can be saved and recalled, and the product offers expanded graphics, a true calculated field capability and a new grouping feature that restricts and examines chosen groups of data.

Diver Release 2.0 costs $750 per station.

▶ *Dimensional Insight*
99 S. Bedford St.
Burlington, Mass. 01803
(617) 229-9111

The Retail Products Division of Autodesk, Inc. has introduced Release 2 of Generic 3D, three-dimensional conceptual modeling software.

Features include AutoCAD compatibility, linear dimensioning and text lines, cursor alignment/tracking and a sculpt mode editing tool.

"Bite-sized" exercises and tutorials and a library of sample symbols are included. Nested commands enable users to transport an original drawing command across the screen and snap to objects without interruption.

Requirements include an IBM PC AT, Personal System/2, PS/1 or 100% compatible machine; 1M byte of random-access memory; MS-DOS 3.0 or higher; and a hard drive with 7M bytes of available space.

Generic 3D Release 2 costs $399.

▶ *Autodesk Retail Products*
11911 N. Creek Pkwy. S.
Bothell, Wash. 98011
(206) 487-2233

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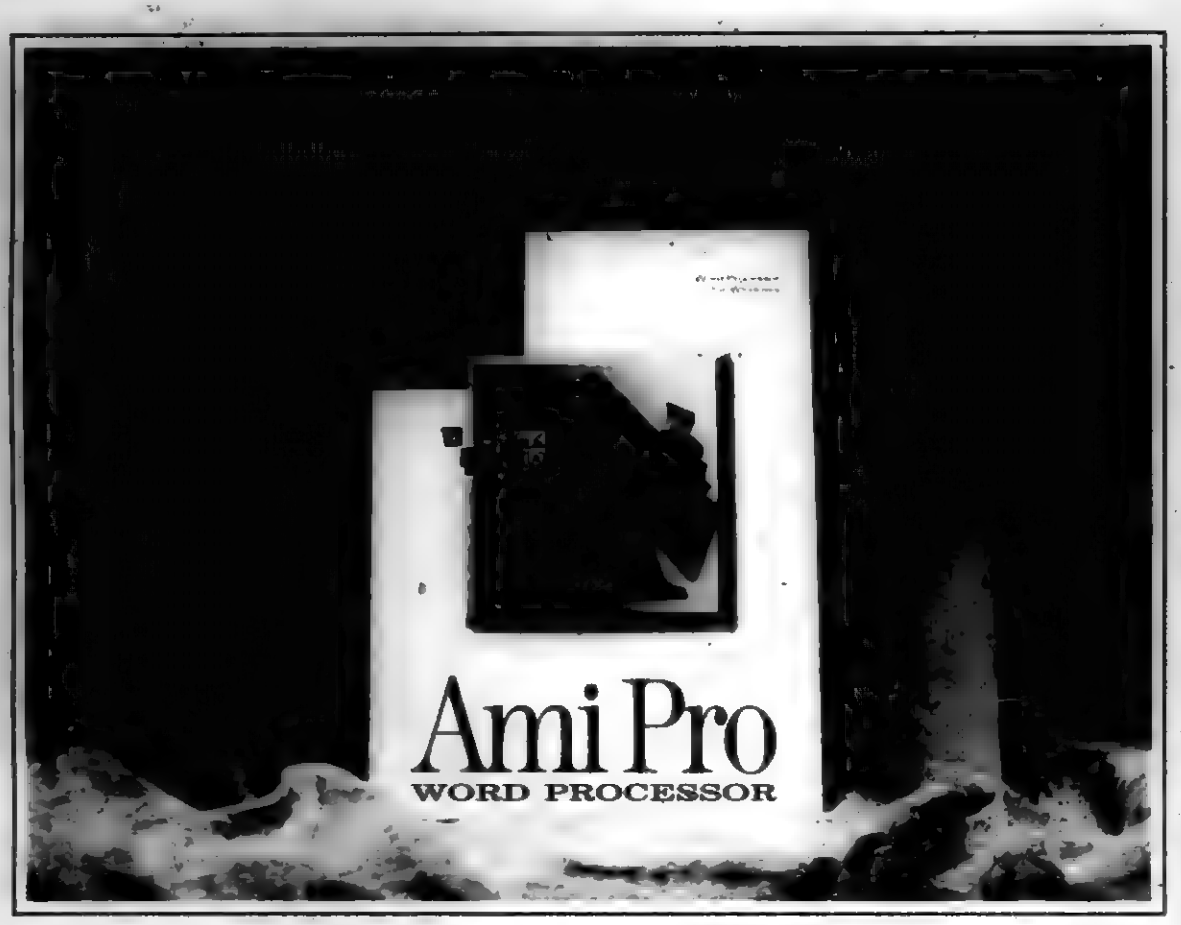
There's quite a battle raging between Word and WordPerfect.

For seco



In the War of the Words, there's one clear winner. Ami Pro.

Word vs. WordPerfect.® It's billed as the battle of the world's two greatest word processors. Hardly. According to most independent judges, Lotus® Ami Pro® 3.0 is the clear and convincing leader of the word processing pack. Word and WordPerfect are following its lead, scrapping it out for second and third.

Check the rankings.

Ami Pro 3.0 is ranked the #1 Advanced Word Processor for Windows™ by the National Software Testing Laboratories. (9/92)†

Recently, in an InfoWorld review, Ami Pro received the highest score ever given for a Windows word processor. (9/28/92)

Lotus Ami Pro captured the 1992 PC Computing MVP Award. (12/92) (Note: The MVP award also appears in the new WordPerfect ad. That's last year's award.)

PC Magazine recently named Ami Pro one of the Best Products of 1992. They said, "No other product can match...the sheer pleasure of using it." Microsoft Word received an Honorable Mention, with the comment "...it's a step behind Ami Pro." (1/93)

Now, perhaps the battle royale between Word and WordPerfect has been put into perspective.

And you probably wonder what it is that makes Ami Pro clearly better?

†Among all word processors tested. Software Digest, Ratings Report, Vol. 9, #6, Sept. 1992. Reprints available upon request. *On weekdays, plus 7AM to 4PM on Saturdays. **Offer expires 9/30/93. Call for

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nd place.

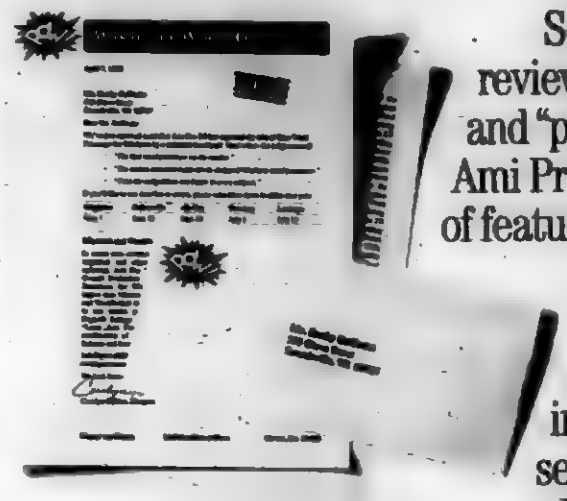
The battle of the features.

Simply put, Ami Pro is a faster, easier, friendlier word processor to use. It does so many things with so little effort, most people never even bother to open the manual.

To name a few, there's real, honest, no ifs-ands-or-buts WYSIWYG. There's Fast Format, for quick repetition of text formats. There are customizable, editable SmartIcons.™ Not to mention SmartClick, where the right mouse button will automatically shift you to the appropriate dialogue box to change fonts, styles or frame formats, based on what you're doing.

There's automatic renumbering of lists. Preview of Style Sheets. QuickStart on-line tutorial. Free 24 hour a day technical support.* And to ease your mind, a 60-day money back guarantee of your complete satisfaction.

And, if you're switching from WordPerfect for DOS, relax. Ami Pro makes it easy with a number of special features. Like seamless conversion of WordPerfect files. And a SwitchKit so that when you type in WordPerfect commands, Ami Pro shows you how to perform the same functions using pull-down menus or one-click SmartIcons.



You call the winner.

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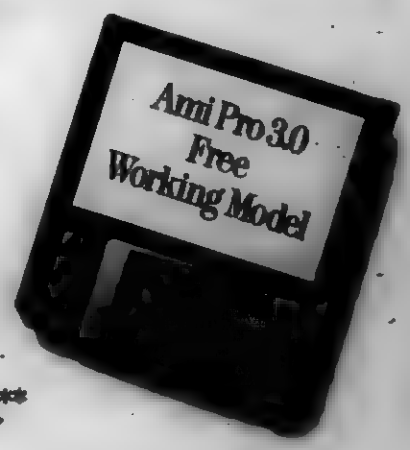

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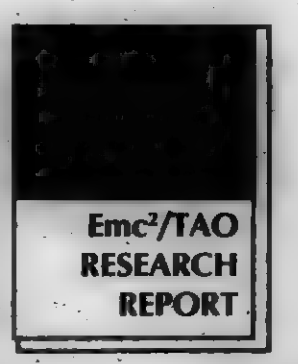


Industrial engineering and manufacturing

CAD/CAM industry copes with slow growth

By Maryfran Johnson
CAMBRIDGE, MASS.

These are unhappy times in the world of computer-aided design, manufacturing and engineering, and the infamous trio of fear, uncertainty and doubt was much in evidence recently at Daratech, Inc.'s CAD/CAM/CAE Strategy Workshops '93.

"There is great risk for users now and a lot of uncertainty and confusion about what to buy and about the future of what they have," said Charles Foundyller, president of Daratech, a market research firm. "There are no safe choices anymore."

In its 1993 forecasts for the CAD/CAM market, Daratech is projecting anemic growth of 2.2% this year — revenue of $8.1 billion over 1992's $7.9 billion. Growth forecasts for the top three market leaders — IBM, Intergraph Corp. and Computervision Corp. — were either flat or less than 2%. Among the top 10 hardware and software vendors, two were projected to grow at rates of 20% or more: Autodesk, Inc. (25%) and Structural Dynamics Research Corp. (20%).

As hardware becomes a short-term investment and users seek out software packages that can share data, many CAD/CAM suppliers are being reevaluated by their customers, Foundyller said. And the next generation of CAD/CAM software, he cautioned, will be largely incompatible with legacy systems.

Stand and deliver

One of the major concerns expressed during a user forum at the conference was the lack of attention being paid to the architectural and engineering market by major system and software vendors.

"Many of us really can't wait for some of these vendors who make promises and then don't deliver," said Sheldon Cousin, chief engineer of information technology at Stone & Webster Engineering Corp. in Boston. "Everybody is saying they can provide the capabilities we need," he added, "but the ones who seem to be fulfilling them are Intergraph and Autodesk."

Stone & Webster, a longtime user of IBM's mainframe-based Catia engineering and design software, recently completed a major power plant design project with a network of IBM RISC System/6000 Unix-based workstations running Catia.

In an industry dominated by IBM mainframes and Unix-based workstations, the rising number of CAD/CAM vendors lining up behind Microsoft Corp.'s Windows NT is another indicator that change is afoot.

"The momentum is with Windows and NT. It's the fundamental open system of the decade," declared James Meadlock, president and founder of Intergraph, which has adopted a dual strategy of offering customers a choice of either Unix or Windows NT. With its own growth stalled, Intergraph is counting on Windows NT to revive its fortunes on the technical desktop.

Out in front
With a projected share of 21.3% in 1993, IBM still leads the revenue race in the CAD/CAM/CAE market, Daratech figures show, but IBM is slipping at 0.6% growth expected this year. Also stalled in '93 is Intergraph, with a 14.6% market share but virtually no growth expected, and Computervision, with 9.6% market share but zero growth anticipated. Vendors rowing up the growth path this year include Autodesk, Cadence Design Systems, Hewlett-Packard and Structural Dynamics Research.

Among the Windows NT followers are companies such as Parametric Technology Corp. in Waltham, Mass. Currently a Wall Street darling because of its rapid growth in the mechanical design market, Parametric offers a single data structure for all applications and thus gives users a degree of integration previously unavailable.

Autodesk's HyperChem does molecular modeling

User-defined

"What [Parametric] has done is listen to users who are doing the design and then build their system around what users wanted," said Joseph Edlinger, an engineering specialist in the automation integration methods group at Bechtel Corp. in San Francisco.

"In the past, this industry's philosophy was that you can't really move users to new technology too rapidly because they'll be unable to absorb it," Foundyller said. Parametric "made it necessary to put new technology on the table now."

Another company determined to take command of wider terrain on the technical desktop is Autodesk, the market leader in PC CAD software with more than 768,000 seats installed. The Sausalito, Calif.-based vendor recently launched a new strategy emphasizing interoperable CAD products that can share data files among packages and across networks.

Industrial and manufacturing users have long clamored for a common underlying data model that would allow the wide variation of CAD/CAM development tools and software to interoperate, noted Ting Liu, a manager at Ford Motor Co.

Autodesk President and Chief Executive Officer Carol Bartz told the audience that vendors must leverage their own strengths by forming "virtual corporations" — short-term, cooperative alliances undertaken to accomplish specific projects for users.

Autodesk took part in such an operation to help build a 4.2 million-sq-ft shopping mall in Minnesota.

NetWare gets management relief with SNMP link

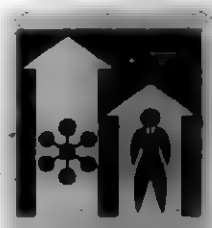
By Michele Dostert
SAN JOSE, CALIF.

Network managers at Novell, Inc. environments who are struggling to manage rapidly growing local-area networks with slowly growing support staffs will get some help from Network Computing, Inc.

The company has announced LANAlert SNMP Manager, a software product that lets users manage any Simple Network Management Protocol (SNMP)-compliant device — including PCs, Apple Computer, Inc. Macintoshes, routers, hubs, bridges, printers and power supplies — connected to a Novell NetWare LAN.

LANAlert SNMP Manager is the newest addition to the LANAlert family, which includes file server, node and remote LAN management products all integrated into a single management console interface.

LANAlert's user-definable exception-only features make it possible to manage large remote networks from a single location without the performance degradation associated with continuous polling, according to the vendor. Performance parameters can be defined for any SNMP device on the network in order to alert network managers of impending problems.



Rapid growth
According to Infonetics Research Corp. in San Jose, Calif., LAN segments are expected to grow 190% by 1995, but IS staff will increase only 10% in the same period.

No RISC

"The advantage of the LANAlert SNMP Manager is that people managing their Novell LANs from a NetWare server-centric view can get all the information SNMP can provide about their devices without having to invest in a RISC workstation and learning a whole new set of Unix-based management tools," said Mitch Kramer, an independent analyst in Sudbury, Mass. "It's integrated with products a lot of LAN managers already use."

The SNMP manager is unique because instead of requiring protocol stacks to be loaded

NetWare, *page 50*

Image-enabled NetWare

Novell has announced agreements with 12 imaging developers to build applications on Novell's upcoming NetWare Imaging Services for NetWare 4.0, which offers document and image management, mass storage and high-capacity storage services. Novell said the high-capacity storage services will ship with NetWare 4.0, while document, image and mass storage components will follow within three to six months.

Companies included in the announcement were Compulink Management Center, Inc., Excalibur Technologies Corp., Global Integrated Systems, Inc., Hewlett-Packard Co., Image Data Authoring Systems, Imagery, Inc., Kofax Image Products, Laser Data, Inc., Watermark Software, Inc., Westbrook Technologies, Inc. and Keyfile Corp.

Artisoft announces LANtastic 5.0

By Michele Dostert
TUCSON, ARIZ.

Artisoft, Inc. recently unveiled a new version of its peer-to-peer local-area network operating system, which is said to be easier to manage, more secure, more scalable and easier to connect to other networks.

LANtastic Version 5.0 will support 500 users per server, up from 300 in Version 4.1. New LAN administration features allow administrators to set up all user accounts on a single server, which then shares the information with other servers, the company said.

"This makes it a lot easier to set up and manage individual and group accounts because they are all stored in one place," said Kevin Cooper, data processing manager at Hecox, Horn and Wheeler, an accounting firm in Sherman Oaks, Calif.

He added that users need only to log on to one server to automatically access multiple server resources. Additional security features extending to the file level allow administrators to customize group and user access rights.

Jack Schoof, Artisoft's chairman and chief executive officer, has no delusions about LANtastic 5.0 taking over the corporate desktop.

"We're not trying to oust the NetWare server. We know that corporate IS will probably mandate it for mission-critical stuff," he said. "We just want to do the best networking for the workgroup and improve our interoperability with client/server environments like Unix and NetWare."

Put up a fight

While Artisoft may not be looking to gain share from Novell, Inc., the new product serves notice that Artisoft is unwilling to lose its peer-to-peer leadership to Johnnies-come-lately such as Microsoft Corp.'s Windows for Workgroups.

"LANtastic 4.1, which supports DOS, Macintosh and Windows clients, already had a considerable edge over [Windows for Workgroups] in networking functionality; 5.0 just raises the bar several notches higher," said Marty Palka, a senior analyst for networking at Dataquest, Inc., a San Jose, Calif., market research firm.

LANtastic users will now be able to bridge to OS/2 High Performance File System, write-once read-many devices and other non-DOS drives by setting up the connection as a LANtastic shared resource.

The new version also allows LANtastic users to bridge into Unix or NetWare environments by running Unix or NetWare client software on a LANtastic server, which can then give LANtastic users access to the NetWare or Unix server files.

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Trinzic Corporation – formed by the merger of AICorp, Inc. and Aion Corporation

Network Computing

CONTINUED FROM PAGE 49

on each designated management station, it uses the SPX/IPX and Apple Computer AppleTalk protocol stacks that Novell installs on each NetWare server. Using server protocol stacks means that the SNMP manager can be accessed from any DOS or Microsoft Corp. Windows PC on the LAN.

Priority list

Although Hewlett-Packard Co.'s OpenView and SunConnect's SunNet Manager are the leaders in SNMP-based management systems, they are not first on Network Computing's development to-do list, according to Darrell Evora, vice president of marketing.

"Our first priority is to integrate LANAlert with Novell's Network Management System," he said. "The Unix-based management systems will come later."

The SNMP manager, which operates as a NetWare Loadable Module on NetWare servers, has a built-in Management Information Base (MIB) compiler, allowing it to support vendor-specific MIBs as well as devices adhering to the MIB I, MIB II or Remote Monitoring MIB standard.

LANAlert SNMP Manager is priced at $995 and is scheduled to ship by the end of the quarter.

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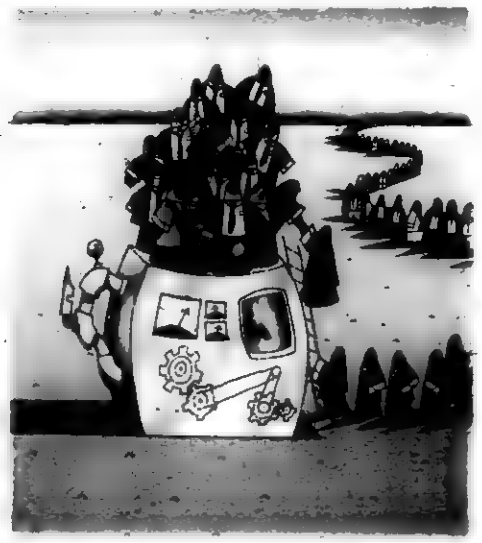

new applications, greater information loads and growing user demands. These same building blocks provide alternate processing sources and data paths that keep the Infinity 90 running continuously throughout your growth. It all boils down to a host computer that can be shaped to your unique enterprise demands while supporting your downcosting and business re-engineering efforts.

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Workflow Software: A Bright Light at the End of the Tunnel

BY SCOTT C. McCREADY

Workflow will be to the 1990s what re-engineering was to the late 1980s. It will only be a matter of time before you receive an FYI from your senior management with an attached airline magazine article. At that point you can begin to relax. At least the perceptory bombardment has past its peak. The bad news is if you haven't conquered workflow by then you will be behind the competitive eight ball.

There's a definite danger that workflow will be viewed as a panacea for all corporate ills. Obviously it is not. The question then becomes, what is it? Undoubtedly some folks will see it as simply another development environment to learn. Instead, we suggest that IS professionals should view workflow software as the best means to link business strategy to IS investments. In a general sense, workflow software is the ability to automate a wide-variety of business processes where exceptions to the process are handled equally as well as routine transactions. In the past, the accepted norm has been that unless one can reduce a process to an algorithm then it cannot be automated. Instead, corporations use tools to cope. Workflow software will turn that traditional theory on its end by allowing companies to automate business processes in a way that most never envisioned.

A TECHNICAL PERSPECTIVE

As a counter-balance to the ballyhooed future of workflow, an early fundamental technical explanation of what workflow is all about might be helpful. The technical underpinnings of workflow software are simple if you can think for a moment in terms of third and fourth generation languages.

In general, third generation languages (3GLs) consist of the following elements:

- Variables, arrays and the ability to combine them in using numbers and arithmetical operations;
- Statements which control the order in which operations are performed (flow of control and conditionals, DO/FOR loops, IF statements, etc.);
- Subroutine capability;
- Ability to store and access data on mass storage media using a file system;
- The capability to interact with an operator via a field or character-oriented statements such as DISPLAY and ACCEPT;

A fourth generation language (4GL), in turn, has all these elements plus the following:

- Instead of file operations, disk access is handled using a DBMS with a standard query language such as SQL;
- Instead of low-level screen interaction, 4GLs typically include an interactive, forms-based package for creating application screens with specified user interactions which tie the form to the application;
- Controlled or menu-based program definition and interpretive testing;
- Add to this a subroutine library for controlling specific devices, a program controlled cut-and-paste facility for exchanging information plus a subroutine library of tools for business modeling. (i.e. cases, queues and priorities) Then, mix well and you have the fundamental elements for a workflow software development environment.

This may sound relatively simple. How this is all packaged by the vendor for the user, however, has a significant impact on the resources needed to employ workflow software effectively.

O-L-O-L-CHANGES

For example, some vendors provide only the case management subroutine library. This library would be called from the 4GL of choice to build the workflow application. Alternatively, the vendor may provide an interactive macro facility for defining cut-and-paste operations which also manages retrieval and display of business information such as documents, scanned images, and faxes. Lastly, a vendor may provide a graphical way to represent the business process using users, work queues, and case types and the relationships that exist among them.

Now that we have a least a baseline technical description of what workflow software is all about, the challenge is to sort out the different vendor claims. At this early stage of the market, every vendor has their own definition of what workflow software is all about. In most cases, it is tempting for the vendors to take the easy way out and simply define workflow as the ability to route information from one person or desk to the next. Routing is the easy part!

The vast majority of effort in getting a workflow system up and running is not in defining the routing rules, rather it is defining and implementing the operations which must take place once a case (e.g. insurance claim, mortgage application) is being worked on at a user's desk. In general, this work has little to do with "workflow" as the user (claims adjuster, loan officer) thinks about it. This has much more to do with user interaction, forms, and procedural development.

FOUR TO ONE

Not to make workflow seem anymore of a challenge than it is, but the average IS shop will need at least three different kinds of workflow software. Furthermore, each of these three different workflow software environments will be designed on fundamentally different architectures. Add the normal complications of supporting a multi-vendor environment and it is easy to understand why workflow software despite its 4:1 productivity advantage over conventional C development may be passed over by some.

However, when IS personnel begin to get inundated with business and technical articles detailing dramatic improvements in both clerical and white collar business operations, it will become impossible for even die-hard C developers to ignore workflow software.

QUESTIONS ???

There is no question that workflow software will have a huge impact on business process automation. However, the risks of employing workflow software without adequate information are tremendous. On the flip-side, the risks of doing nothing are even greater. For more information on workflow software, the strengths and weaknesses of the major products, and to learn how users have successfully employed workflow, please plan to attend Workflow '93. For more information, call 1-800-343-4952.

McCready is a principal at IDC/Avante Technology, a market research firm in Framingham, Mass. The company recently completed a 1200 page report on workflow software entitled, "Workflow Software: The Challenge for the '90s."

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Workgroup software applications

Carnegie Group, Inc. has introduced the NameFinder.

According to the company, the product finds occurrences of names and their variations in real time and historical online text. Written in C language, NameFinder has built-in knowledge of the manner in which names are structured. The variability of factors, including forenames, titles, abbreviations, tag words and case sensitivity, is recognized.

The product is available on the Unix platform, including Hewlett-Packard Co., Sun Microsystems, Inc. and Digital Equipment Corp.'s DECstation.

A source-code site license costs $60,000.

▶*Carnegie Group*
5 PPG Place
Pittsburgh, Pa. 15222
(412) 642-6900

Unix

UniSolutions Associates has released Version 2.1 of Unisol Job Accounting for Unix.

Users can define their own default project, and the disk accounting can perform accounting only for local file systems and can disregard Network File System-mounted directories, according to the company.

New ports include Sunsoft, Inc.'s Solaris 2.1 operating system and Unix System V, Release 4.

License fees for single machines range from $1,600 to $5,500.

▶*UniSolutions*
Suite 1
2103 Matthews Ave.
Redondo Beach, Calif. 90278
(310) 542-0068

In Brief

Build your own SPARC

Adopting a PC market model for the Unix world, Integrix, Inc. in Newbury Park, Calif., announced its "build your own" Scalable Processor Architecture workstation program for OEMs, value-added resellers and system integrators. The new program offers third-party vendors the option to private-label systems by integrating Integrix motherboards, enclosures or complete workstations in their own configurations.

Sun, Sybase make a deal

Sun Microsystems, Inc. and Sybase, Inc. last week joined forces in a deal that provides Sun with an enterprisewide license for Sybase's GainMomentum application development environment.

Sun said it will use GainMomentum tools to develop a new generation of software that takes best advantage of the built-in multimedia features of Sun SPARCstations and SPARCservers. Sun has been using GainMomentum tools for its own client/server network applications, said William Raduchel, chief information officer at Sun.

Sun has also used GainMomentum tools for SunTutor, an interactive training application for first-time SPARCstation users that began shipping in August 1992. GainMomentum is intended for building large-scale client/server applications in less time than those built with languages such as C or C++. It uses a suite of multimedia editors, an integrated object-oriented database and a fourth-generation language.

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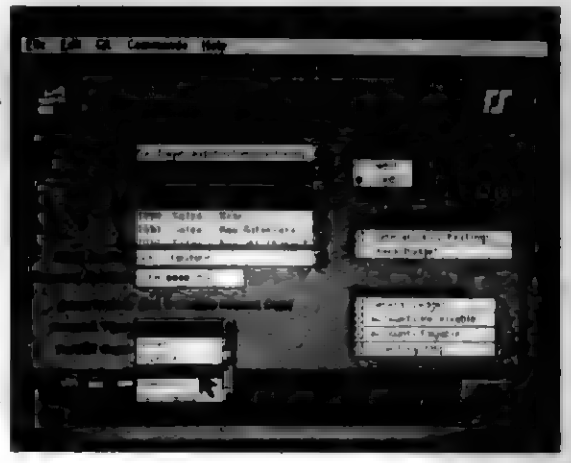

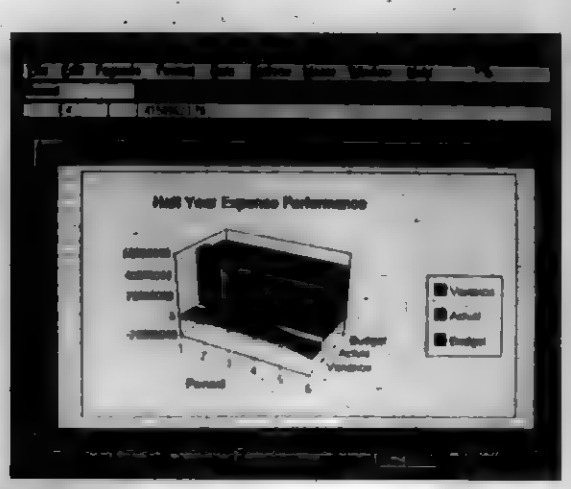

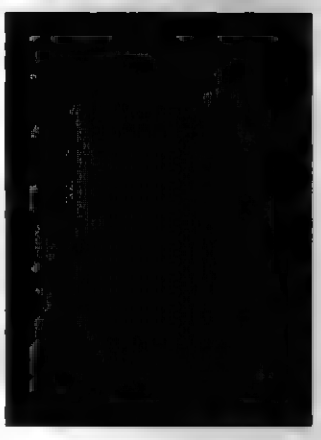

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[redacted]

Applications

Beyond, Inc. has announced BeyondMail Forms Designer 2.0, a Microsoft Corp. Windows-based tool.

The product allows users to create custom forms for BeyondMail. Compatible with BeyondMail for Windows and BeyondMail for DOS, Forms Designer 2.0 has "rule buttons" that automatically trigger work flows such as database transactions, customized form data input and intelligent form routing, according to the company.

Display bit maps for incorporating graphics or company logos into forms and sample templates with forms for conference call notices, travel and vacation requests and purchase requisitions are also provided.

Forms Designer 2.0 costs $995.

▶ *Beyond*
38 Sidney St.
Cambridge, Mass. 02139
(617) 621-0095

Digital Equipment Corp. has introduced DEC MediaImpact multimedia software.

The product was designed for DEC's Unix workstations. The DEC MediaImpact Runtime Kit v1.0 provides computer-based training, multimedia presentations and information kiosk systems.

A what-you-see-is-what-you-get graphical editor and a palette of Open Software Foundation/Motif-based authoring tools are included in the DEC MediaImpact Authoring Kit v1.0, enabling both technical and nontechnical users to build complete multimedia applications in a graphical fashion.

The Runtime Kit costs $350, and the Authoring Kit costs $3,530.

▶ *DEC*
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

Electronic mail

Powercore International, Inc. has started shipping WinMail 1.5, an electronic-mail application.

According to the company, full integration with Novell, Inc.'s NetWare is provided. The product is said to be the first major E-mail package incorporating a DOS client that is mouse- and keystroke-compatible with the Microsoft Corp. Windows-based version.

WinMail 1.5 was designed as a Dynamic Link Library and offers more than 160 message gateways that can be used to send and receive mail because the most recent Novell Message Handling System is supported.

A five-user package costs $495, a 25-user package costs $1,395, and a 100-user package costs $3,995.

▶ *Powercore International*
1 Diversatech Drive
Manteno, Ill. 60950
(815) 468-3737

Storage

Storage Technology Corp. has introduced NearNet, a network storage manager. The product simplifies the management of data located on networks of servers and workstations that are using the Unix operating system.

Direct support is provided for a variety of systems, including those from Sun Microsystems, Inc., Silicon Graphics, Inc., Hewlett-Packard Co., Intergraph Corp. and IBM. The NearNet system can also back up files from other networked systems via the Sun Network File System.

The cost of an average configuration is approximately $200,000.

▶ *Storage Tek*
2270 South 88th St.
Louisville, Colo. 80028
(303) 673-5151

Workstations

Apogee Systems, Inc. has launched Orbiter II+, a 50-MHz Scalable Processor Architecture workstation.

Orbiter II+ features 32M bytes of memory, a 424M-byte hard disk, a GX graphics accelerator and a 19-in. color monitor, the company said. The product works with Sun Microsystems, Inc.'s Solaris 1.0.X software.

Orbiter II+ costs $11,295.

▶ *Apogee Systems*
1815 S. Gadsden St.
Tallahassee, Fla. 32301
(904) 561-5051

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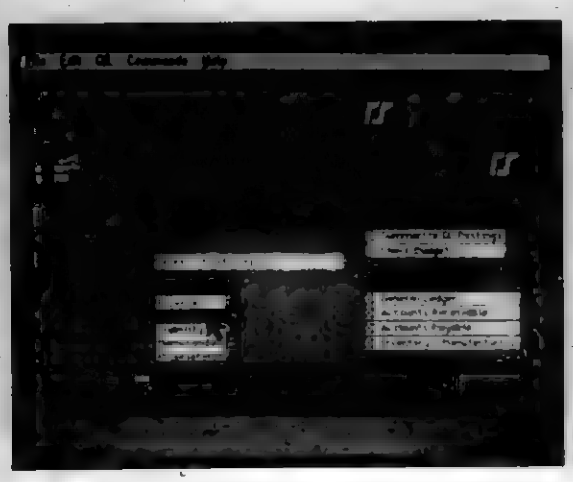

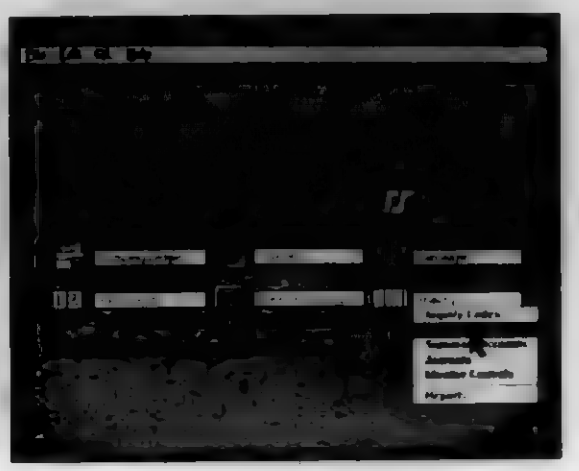

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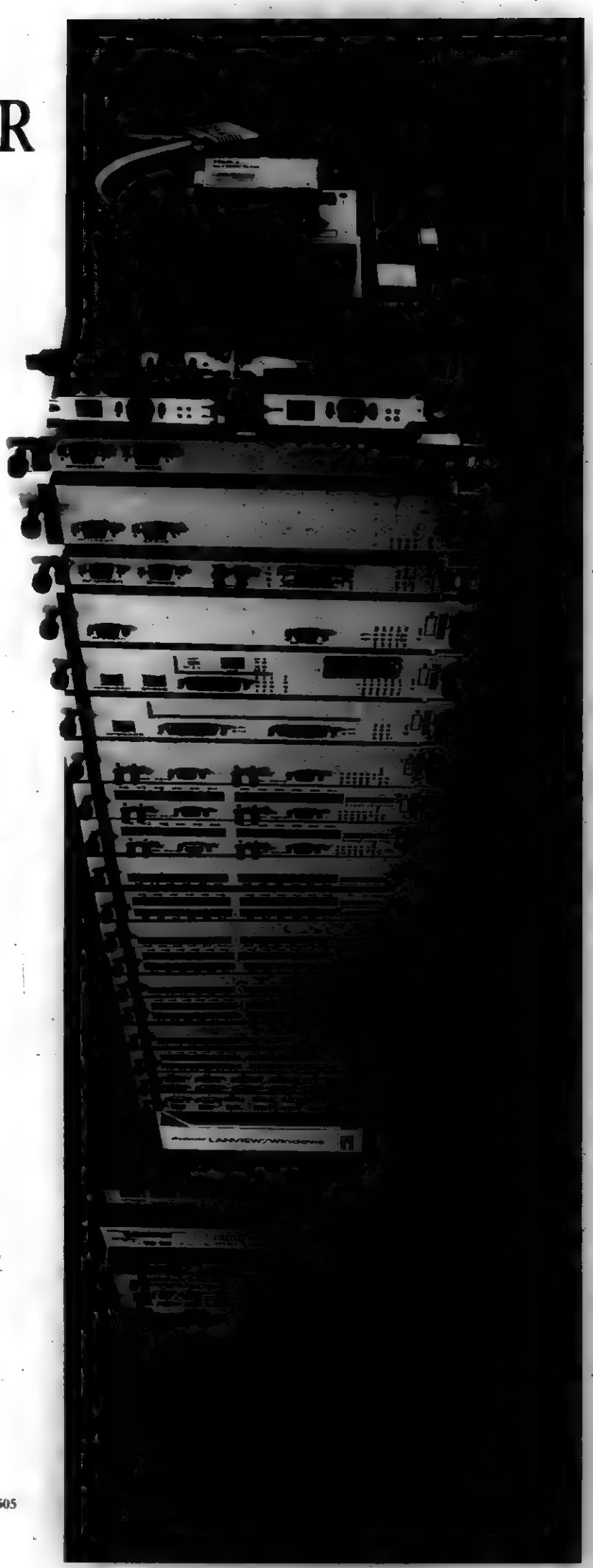

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LAN-to-LAN connection

Fisher-Price fields grown-up network

Toy maker installing links to improve manufacturing and distribution

By Thomas Hoffman
EAST AURORA, N.Y.

■ Fisher-Price, Inc. is in the midst of installing a global network that could hardly be called child's play. The $700 million toy maker expects the new network to help the firm better coordinate its manufacturing and distribution requirements while providing long-term cost savings.

Earlier this month, Fisher-Price installed LAN-to-LAN connections between its manufacturing and distribution sites in Peterlee, UK, and Hong Kong and its East Aurora headquarters, according to Jim Carrier, director of computer technical services. Carrier said Fisher-Price is standardizing on Novell, Inc.'s NetWare v3.11 network operating system with Cabletron Systems, Inc. smart hubs on 15 Ethernet local-area networks running Transmission Control Protocol/Internet Protocol and IPX.

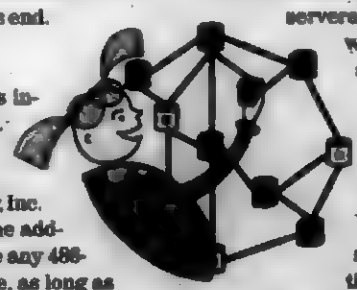
Prior to the networking overhaul, Fisher-Price used remote intelligent processors to link CRTs and printers in the field to a Unisys Corp. A17 mainframe computer over leased lines. Fisher-Price is now installing LANs in eight North American manufacturing and distribution sites, with plans to connect all of those over a wide-area network by year's end.

That's not all

Fisher-Price is also in the process of replacing a Control Data Corp. 860A mainframe used to run computer-aided design and manufacturing applications. The mainframe is being replaced with a network of 50 Hewlett-Packard Co. Series 700 workstations.

486 connection

Carrier said Fisher-Price has installed four of six Intel Corp. 1486-based 50-MHz servers at its headquarters. The company uses DTK Computer, Inc. PCs, Carrier said. However, he added that the toy maker will use any 486-based PCs with the best value, as long as replacement parts are interchangeable.



The WAN was designed to provide Fisher-Price employees improved access to the company's Unisys A17 mainframe, which handles the bulk of the firm's processing, Carrier said. However, Carrier added that Fisher-Price's move to open systems will eventually make the Unisys mainframe obsolete. The company is replacing its proprietary Unisys equipment with Hewlett-Packard Co.'s Unix-based machines, with an eye toward improved processing and increased interoperability, Carrier said.

Although Fisher-Price recently added electronic data interchange, master planning and market research applications to its two HP servers, Carrier said the company will make the switch to open systems a gradual move.

"We intend to do that very slowly over a long period of time," said Carrier, who added that Fisher-Price intends to replace its A17 mainframe with a smaller A series model within the next three years.

In July 1991, Fisher-Price became an independent, publicly traded firm following its spin-off from The Quaker Oats Co. However, Carrier said, the company's independence had little bearing on its move to open systems. "I think we would have done this anyway. IS operations were always handled independent from Quaker Oats," Carrier said.

Joanie M. Wexler

AT&T: Feigned altruism?

I could be generous and simply describe the altruistic air AT&T has assumed in filing a recent lawsuit against its competitors as inconsistent. But "borderline hypocritical" would really be more accurate.

AT&T's suit seeks back damages for business grabbed by MCI, Sprint and WilTel when the FCC required only AT&T — then considered a "dominant" carrier — to file tariffs on basic network services while the other phone companies cut all the clandestine deals they wanted. This has long been a situation AT&T and others have deemed unfair and one that a U.S. district court reversed with a ruling in November.

So it would appear that AT&T is on the mark with the intent of its lawsuit — despite the motion Sprint recently filed in U.S. District Court to dismiss the suit because it smacks of being a "marketing ploy."

While I don't agree with Sprint, I do find it annoying that AT&T is trying to capitalize on the situation by positioning its latest legal action

Wexler, *page 64*

Systems Center adopts LAN focus

By Elisabeth Horwitt
RESTON, VA.

Just like its archrival IBM, Systems Center, Inc. is moving its network and systems management products down to local-area networks so it can continue to manage customers' environments even as they downsize.

"We're moving from mainframe-centric to distributed client/server systems," said John Daily, Systems Center's recently appointed chief executive officer. The company has already laid the groundwork for this move: A year ago it announced Solve:LAN, a group of change, problem and configuration management applications for LAN-based systems.

More recently, Systems Center acquired sole marketing rights to Tangram Systems Corp.'s AM:PM product for updating distributed LAN workstation software. However, both sets of applications are still mainframe-centric, with the Solve:LAN applications running under Systems Center's mainframe-based systems management platform, Net/Master, Daily pointed out.

Later this year, however, Systems Center plans to release Advance Systems Management (ASM), an object-oriented, client/server-based version of Solve: LAN, Daily said.

ASM will give users a choice of running their distributed systems management applications on the mainframe, a client/server LAN platform or a combination of the two, Daily added.

New additions

The company also plans to provide the new platform with new applications, such as asset management and help desk management for LANs, Daily said.

"Systems Center's strategy is to go from a NetView clone to an application solution provider," said Jeremy Frank, vice president of networked systems management at Stamford, Conn., research firm Gartner Group, Inc.

While the vendor has "made some great strides" in that direction, "it's an unpaved rocky road, [going from] the mainframe world to a distributed strategy," he added. The biggest challenge may be dealing with very different sales channels and reorienting "huge staffs of procedure-based programmers" to LAN-based systems, Frank said.

Systems Center is still banking, however, on users choosing to keep their mainframes around as system and network management focal points for many years to come, Daily said. While LAN servers will handle the graphical user interface and some processing, the bulk of applications will reside on the mainframe, he added.

Indeed, Systems Center hopes to attract users and application vendors by offering an easy link between LAN-based management applications and the mainframe network management environment, Daily said.

Systems Center plans to integrate its Solve:LAN platform with popular LAN management systems such as Novell, Inc.'s NetWare Management System, IBM's NetView/6000 and Hewlett-Packard Co.'s OpenView, Daily said. Solve:LAN will support the Simple Network Management Protocol standard by midyear, he added.

Systems Center is considering the Open Software Foundation's Distributed Management Environment as a standardized platform for its distributed management system, Daily said.

SMA

Systems Center is moving away from its SMA roots but is not severing its ties to the IBM mainframe world. "SMA may be regarded as a dinosaur by many in the industry, but I believe strongly that it will still be important 25 years from now," said Robert E. Cook, chairman of Systems Center.

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Competing modem standards confuse

By Lynda Radosevich

Two opposing vendor camps are doing their best to confuse customers looking at new, high-speed modem technology. Each delivers or promises to deliver proprietary modems that run faster than the current 14.4K bit/sec. maximum allowed by the CCITT V.32bis standard.

Both camps are targeting customers who need faster transfer rates for remote local-area network access, file transfers and other high-speed applications and who cannot wait for products based on the upcoming V.fast standard.

Analysts estimated the V.fast standard, which will deliver data transfer rates of up to 28.8K bit/sec., will be completed by the end of first quarter 1994, but products that comply with a "stabilized" standard are expected by December.

Now, 18 companies, led by AT&T Microelectronics, said they will offer modems based on a nonstandardized scheme that will deliver maximum data rates of 19.2K bit/sec. AT&T said it will ship chips for the V.32terbo technology to manufacturers this month. V.32terbo-based products are expected to ship in late spring.

Meanwhile, companies including Microcom, Inc. in Norwood, Mass., Motorola Codex in Mansfield, Mass., Racal-Datacom, Inc. in Sunrise, Fla., and U.S Robotics, Inc. in Skokie, Ill., already ship proprietary versions of V.fast technology that they said will be upgradable to V.fast when the standard is completed. General Datacom, Inc. in Middlebury, Conn., plans to ship prestandard V.fast products in June.

18 companies, led by AT&T Microelectronics, said they will offer modems based on a nonstandardized scheme that will deliver maximum data rates of 19.2K bit/sec.

"V.fast timing got pushed back and vendors got edgy about putting together a faster modem," said Janet Fugazzoto, senior market analyst at BIS Strategic Decisions in Norwell, Mass.

However, 60 vendors representing 75% of worldwide production publicly rejected V.32terbo and expressed support for the upcoming V.fast standard. AT&T said it also supports the V.fast standard.

In a joint statement, the companies said that "the V.32terbo solution stretches the capabilities of V.32 beyond its design limits." V.32terbo vendors lost a bid to the Consultative Committee International for Telegraphy and Telephony (CCITT) for standardization.

Confusing the consumers

The above vendors and analysts agreed that faster, standardized V.fast products will be available so soon after the proprietary V.32terbo products that consumers may be confused and may unknowingly invest in the slower, nonstandard technology.

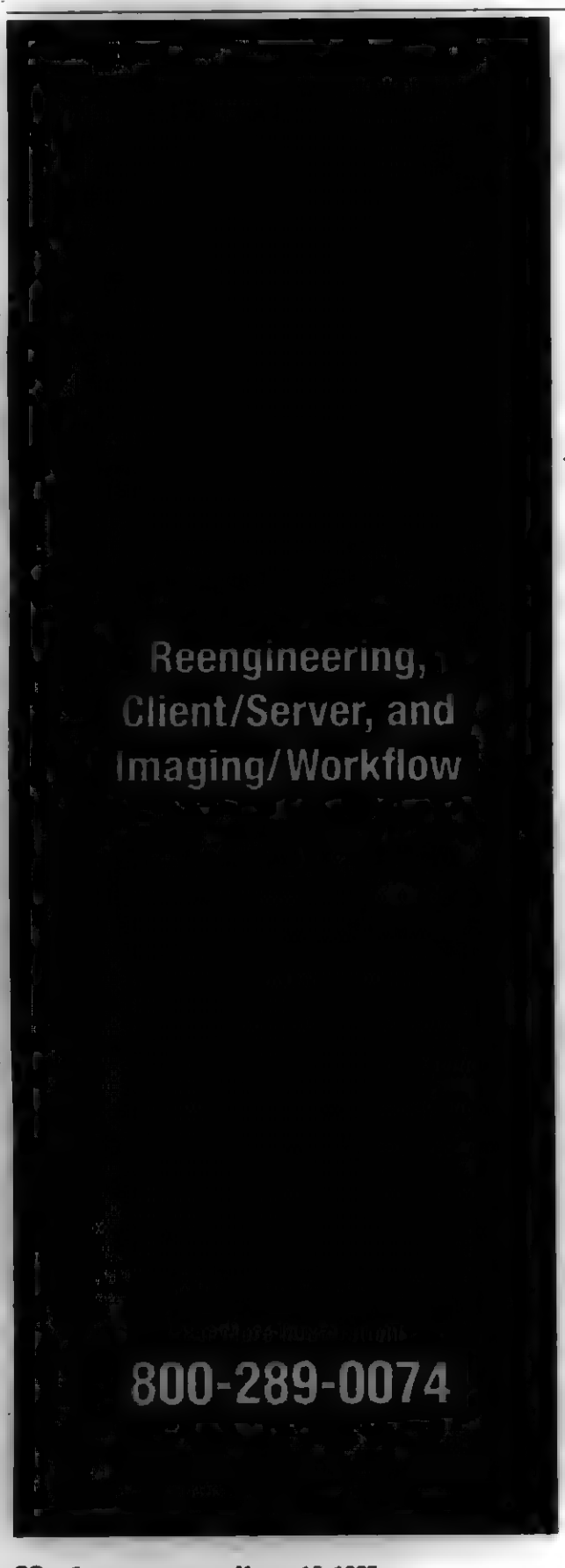
When the V.fast standard is completed, "everyone will say, 'What was terbo?' " said Lynda Fitzpatrick, market research analyst at International Data Corp.

Blanchard Hiatt, a spokesman at AT&T Microelectronics, the chip-making division of AT&T, said he thinks the V.fast standard will not be settled until well into 1994 and that it is easy to extend the current V.32bis standard to higher data rates. Because it is based on the current standard, "V.32terbo design problems for modem makers are nonexistent."

That means V.32terbo products will be delivered sooner and will cost less, said Scott Porter, vice president of sales at Zypcom, Inc. in Hayward, Calif. Zypcom will ship a V.32terbo modem in May for $749 and will ship new V.fast units to the same customers for $299 when the standard is complete, he said.

Proprietary V.fast schemes are no panacea. Priced between $1,200 for a 16.8K bit/sec. data rate and $1,695 for a 21.6K bit/sec. data rate, most will require customers to change processor hardware and will have a roughly $300 upgrade fee.

For BT North America, Inc., a value-added network service provider in San Jose, Calif., the answer is to wait for faster modems based on a completely V.fast standard.



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HEWLETT PACKARD

Proteon eyes backbone router market

By Joanie M. Wexler
WESTBORO, MASS.

Proteon, Inc. staked its claim in the industrial-strength router market last week with the CNX 600, an initiative to the vendor's internetworking family that is aimed at the high-end headquarters internetworking arena.

The CNX 600, slated to ship next month for approximately $22,500, is Proteon's vehicle for providing the large number of local-area network connections and high throughput that users need when accommodating volumes of distributed internetwork traffic through central sites.

Proteon rival Cisco Systems, Inc. recently introduced Cisco 7000 [CW, Jan. 18] as a competitive answer to backbone-oriented internetworking devices from Wellfleet Communications, Inc. and Coral Network Corp.

The CNX 600 has an asymmetrical design, as does Cisco's product. With the exception of Wellfleet, most vendors employ such a design, in which attached LANs contend for some centralized processor resources, which could limit the design's scalability as networks grow.

Proteon will provide the option of adding a second Advanced Micro Devices, Inc. 29030 reduced instruction set computing processor. This will boost Proteon-measured performance from 50,000 to 100,000 packets per second, said Richard Lush, Proteon's director of internetworking product marketing. He said the performance numbers apply to all 17 protocols supported by the CNX 600.

Proteon also announced the Network Management Extender (NME), a $10,000 to $12,000 complementary unit to the vendor's Series 90 wiring hub. The NME, scheduled to ship in June, collectively manages hubs, Token Rings and Ethernets from one platform.

Announcements at Interop mix SNA, LAN protocols

By Elisabeth Horwitt

Users seeking ways to integrate Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM's Systems Network Architecture (SNA) traffic over the same network backbone will find options at this week's Interop '93 Spring show.

IBM is expected to announce the first products based on MultiProtocol Transport Network (MPTN), which is said to enable TCP/IP Sockets applications to communicate over an SNA backbone, and vice versa, via an OS/2 server. In addition, IBM will announce additional third parties — including Oracle Corp. — that have committed to supporting MPTN.

The Advanced Peer-to-Peer Interconnection Forum will have its second meeting at Interop and will announce five new voting members. Eicon Technology Corp. is expected to announce the InterConnect Server, a combination local-area network gateway and router that will support TCP/IP traffic over an SNA backbone, as well as TCP/IP and other LAN protocols over SNA.

The initial InterConnect Server release is a Novell, Inc. NetWare Loadable Module, with OS/2, Unix and Microsoft Corp. Windows NT versions to come.

Priced between $3,000 and $5,000, InterConnect Server will route popular LAN protocols and will support X.25, frame relay and Integrated Services Digital Network links, according to Eicon.

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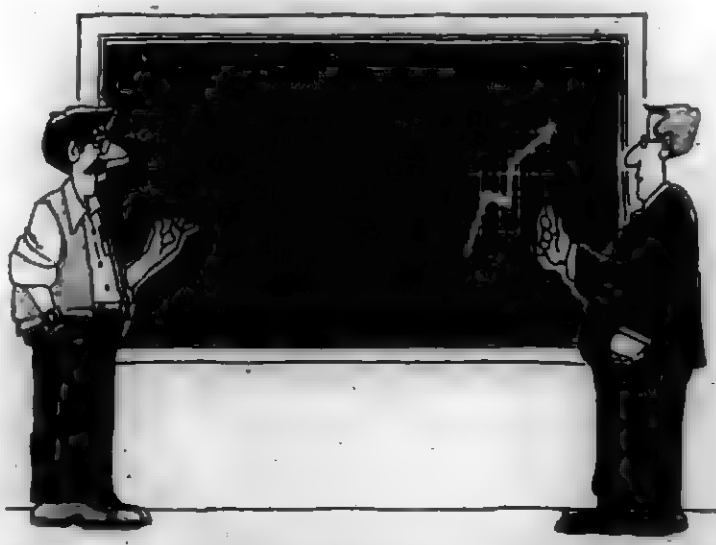

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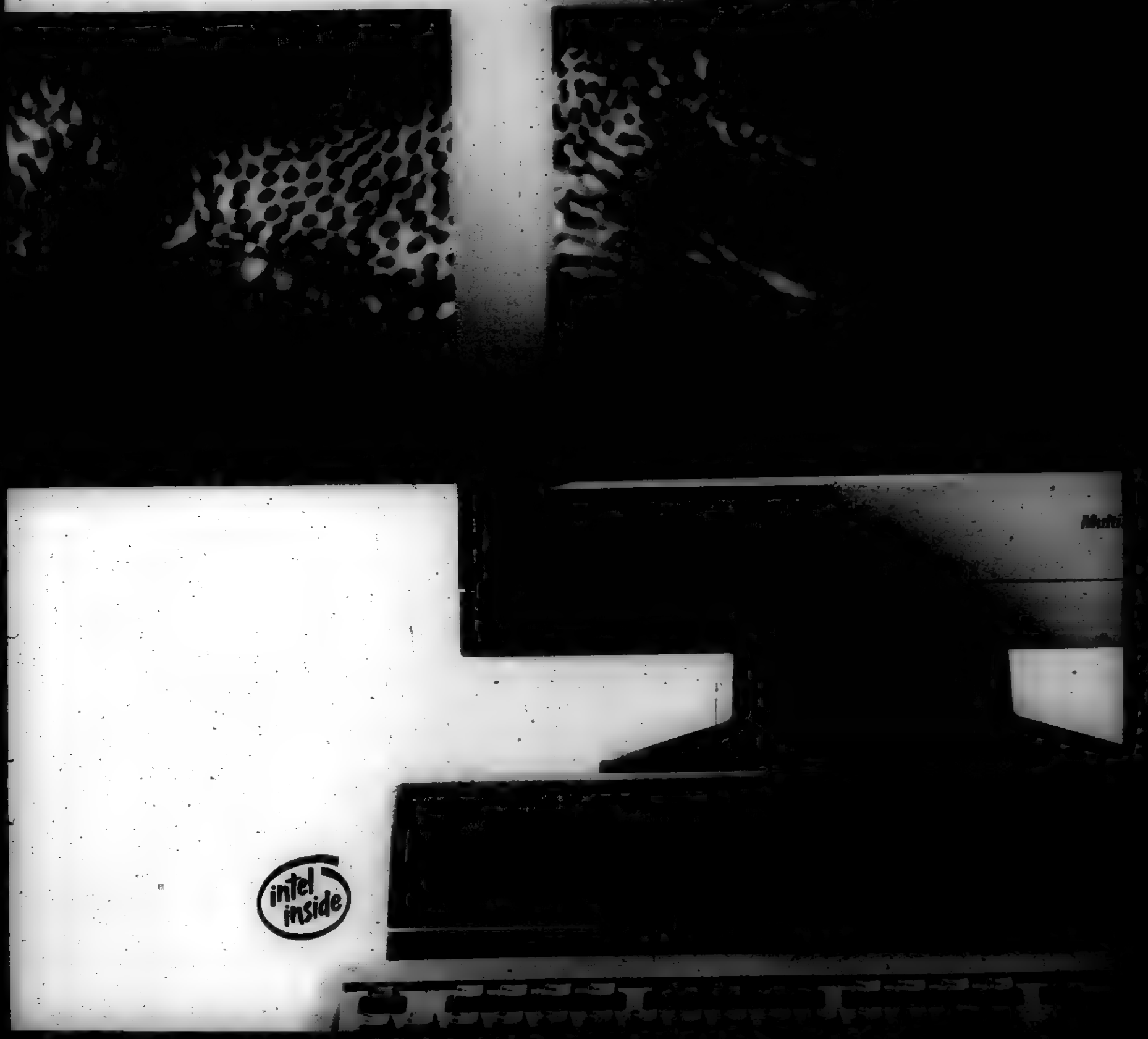


Standards development

Rivals team up for EDI

By Gary H. Anthes

Freddie, Fannie and Ginnie — they sound like the names of genial children playing in a sandbox. But the huge companies bearing those nicknames are among the fiercest of competitors as they fight to boost their shares of an $825 billion market.

But now, the Federal Home Loan Mortgage Corp. (Freddie Mac), the Federal National Mortgage Association (Fannie Mae) and the Government National Mortgage Association (Ginnie Mae) have set aside parochial interests in order to collaborate on a project to standardize the flows of data in the mortgage industry.

They said the benefits will touch all sectors of the industry, including borrowers, lenders, mortgage service providers and even Wall Street firms.

Slings of the bill
Four out of five residential mortgages originated each year in the U.S. are subsequently purchased by three government-chartered corporations, which now hold $1a trillion in outstanding loans.

Cash flow

Freddie Mac and Fannie Mae are congressionally chartered, publicly held corporations established to ensure a flow of funds from the capital markets to mortgage lenders. They buy mortgages from banks and savings institutions, group them into pools and sell shares in the pools as mortgage-backed securities on Wall Street.

Ginnie Mae has the same mission but is part of the federal government under the U.S. Department of Housing and Urban Development. Last year, Freddie, Fannie and Ginnie bought mortgages worth $534 billion.

The three agencies have teamed with the Mortgage Bankers Association of America (MBA) to develop standards for electronic data interchange (EDI) related to the creation, servicing and selling of these mortgages. The goal is to make it easier, faster and cheaper to get information from lenders — who typically maintain three sets of interface systems, one each for Freddie, Fannie and Ginnie — and to make it feasible to get more data for better management of their operations.

Numerous parties are involved in a mortgage from its origination, closing, monthly servicing, possible sale and eventual payoff (see chart). A considerable volume of paper submitted by home buyers when applying for mortgages triggers a flood of data in the form of credit reports, employment verifications, appraisals, title searches and the like.

"The whole industry exists to exchange information," said Mark Fleming, operations vice president at Freddie Mac in Vienna, Va. "That's our business; we don't produce anything except information."

Unfortunately, much of that information remains on paper, and the intercompany electronic interfaces that do exist must be built on a custom basis for each party because of the lack of standards. "Loan origination is very paper-intensive," said David Barkley, director of EDI customer service at Freddie Mac. "Those guys are ecstatic if a credit report is faxed."

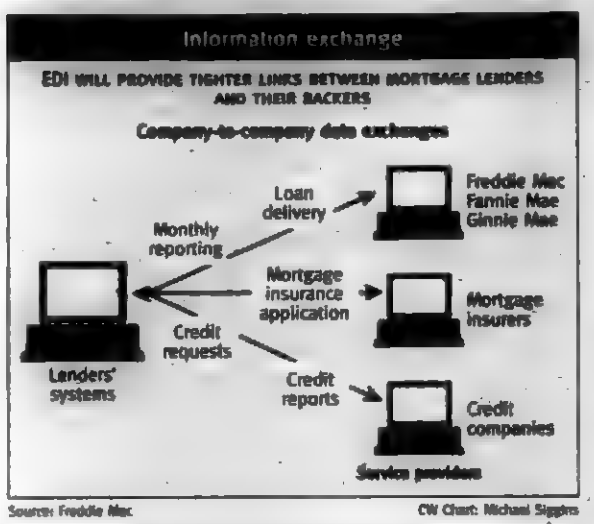
Transaction approval

Freddie, Fannie, Ginnie and the MBA have established a Lending Task Group under the X12 Finance Committee of the American National Standards Institute, where they are working to develop a set of standards for EDI. The mortgage industry has now received X12 approval for the first three of a dozen or so mortgage transaction sets, and implementation has begun at some lender sites.

Officials at Freddie Mac said they are just beginning to do a cost/benefit analysis for the project. However, recent industry surveys said banks and other lenders may be able to trim the costs of dealing with the three agencies by 40% as a result of the EDI standards.

While lenders should see their lives greatly simplified as a result of EDI, there is a troubling side for the three agencies, Fleming said.

"In the past, we could add or change data whenever we wanted to without getting permission or having to conform to dates or definitions. Now, we'll have to anticipate needs and changes much further in advance. That's a little scary; it's an internal challenge."



Source: Freddie Mac — CW Chart: Michael Siggins

Building steam

The mortgage industry's EDI project has a bit more behind it than automating and standardizing data flows. It will greatly increase the amount of information that now accompanies the loans that Fannie Mae, Freddie Mac and Ginnie Mae buy from lenders.

Currently the three agencies get summaries of the loan data, but an official at Freddie Mac said that in the first phase of the EDI project alone, the number of data elements per loan will jump from 30 to 114.

The extra data bears on the credit-worthiness of borrowers and the characteristics of their properties — from details on loan applications, credit reports and appraisals.

"Sooner or later we knew the information was going to be asked for," said Brian Hershkowitz, associate director at the Mortgage Bankers Association of America, which represents 2,600 firms that originate, sell or service mortgages. "Whoever owns the loan is entitled to this information."

Freddie Mac, Fannie Mae and Ginnie Mae hope to develop artificial intelligence systems that will allow them to use this extra data to do a better and faster job of evaluating mortgages. The data-hungry AI programs would not be practical without EDI, said Mark Fleming, operations vice president at Freddie Mac.

Wexler

CONTINUED FROM PAGE 57

as a magnanimous attempt to play guardian of the cost-lowering effects of competition. Consider, for example, the following AT&T PR schmooze-ola:

"When all long-distance companies file their rates publicly, customers can know the service offers available and make choices that best suit their business needs. Secret deals deny customers the advantages of competition."

Quote, unquote, AT&T Business Communications Services President Joseph P. Nacchio.

Actions speak louder than words

I happen to agree with Nacchio. But if he really means this, why, in the case of services such as frame relay and other enhanced network services, does AT&T turn around and protect its price lists like a lioness with newborn cubs?

AT&T's openhearted philosophy of tell-all pricing's being good for the user does a complete about-face in the case of enhanced services — when the law says it's OK to keep the information mum. Not only does AT&T not make its enhanced service price lists public, it requires customers for whom it prices out networks to sign nondisclosures.

In fact, a recent *Computerworld*-chaired conference session at ComNet '93 in Washington, D.C., almost didn't happen because AT&T wouldn't open its kimono and price out on a component-by-component basis a mock frame-relay request for proposal that other carriers, including WilTel and MCI, readily responded to.

Understandably, the other carriers weren't thrilled to lay all their competitive cards on the table for AT&T to inspect without AT&T's returning the favor. Let's face it: AT&T is the most close-mouthed carrier in the industry when it comes to pricing.

AT&T explains away its polar approaches as simply a result of today's inconsistent telecommunications laws — and it does have a point there.

The Communications Act of 1934 requires all carriers to tariff basic network services but issues no such mandates about enhanced services — services in which anything is done to user data by the carrier above and beyond basic transport.

Fair play?

So if it's all perfectly legal, as a business with an almighty bottom line, you gotta do what you gotta do.

But I think it's a cheap shot to try to leverage the situation to make yourself look like a consumer advocate when all you're really trying to do is gain every buck you can in today's cutthroat telecommunications business.

As a side note, it seems incongruous to me that tariffing basic telephone transport service rates encourages competition while the enhanced service business is deemed healthier if prices are kept hush-hush. I'm sure, though, that there's an economist somewhere surrounded by spreadsheets that prove it to be true, or this wouldn't be the law, right?

It's not that I'm advocating that carriers tariff every service they offer — not by a long shot. Tariffs stall deployment and are too verbose for most of the human race to understand anyway. Probably most importantly, they also limit user negotiating power.

But I do think a carrier should be willing to stand up and say what it will charge, say, for a 56K bit/sec. frame-relay link between Kansas City and San Francisco when someone asks. I don't see how such forthrightness could be detrimental to the user community. Do you?

Wexler is a Computerworld senior editor, networking.

Client/server DBMS

Walk, don't run, with it

By Johanna Ambrosio

■ As many large user organizations take their first tentative steps toward the brave new world of the client/server database, users are likening the scenario to that of two people who do not speak the same language trying to describe to one another the inner workings of a lawn sprinkler.

"In the DB2 environment, I'm used to security, disaster recovery and the high availability necessary for production systems," said David Beulke, DB2 database administration manager at Spiegel, Inc. in Westmont, Ill. "But the PC mentality is a whole different ball game. The standards and procedures in place on the mainframe are nonexistent on the PC."

Walter Viali, manager of the Information Systems Enabling Center at Texaco, Inc. in Houston, seconded Beulke's comments. "One of our biggest problems is that we're looking for a set of tools to limit the retraining required. A lot of the mainframe expertise is not easily applicable to client/server."

Other key issues outlined by some database consultants include the following:

- How to bring together the technical know-how required on all fronts.
- Which standards to adhere to, if any.
- The advantages and disadvantages of using "middleware" vs. directly connecting the mainframe to the PC network.

Because of these challenges, many companies find that the easiest and most logical path to client/server database applications is to walk, not run, and to build onto the existing infrastructure step by step.

Case in point

Baxter Healthcare Corp. in Deerfield, Ill., is taking that route. There, the first widespread database application uses Sybase, Inc.'s Microsoft SQL Server under OS/2 on a Token Ring local-area network with Microsoft Corp. Windows-based workstations. Although there is no interaction with the mainframe, it is this basic infrastructure on which Baxter is building its client/server applications.

The first true client/server database application, being developed now, uses SQL Server under Microsoft's Windows NT with Windows clients. The database is "synchronized with a master set on the mainframe," explained Michael Purcell, a software engineer at Baxter. The synchronization, via an existing Systems Network Architecture gateway provided by Microsoft under OS/2, is between the SQL Server and IBM's DB2 on the mainframe. This application will be beta-tested this summer, he said.

A key component of Baxter's client/server architecture will be remote network and systems management tools with the "ability to see and manage all the way down to the workstation," Purcell said. "The hard part is rethinking and re-engineering the strengths of our current central data center to provide equivalent levels of service and sophistication for a very different environment."

Likewise, Spiegel's first client/server database application is a manufacturing system used by approximately 50 people in one department. It consists of the OS/2 database manager, which IBM has renamed DB2/2, connected to IBM's DB2 on the mainframe via Micro Decisionware, Inc.'s (MDI) Gateway product. This is primarily a decision-support application, with download and inquiry only.

The next phase, which will include uploading information, will be used by up to 400 users in different departments. It will tap into other database management systems on the mainframe, including Computer Associates International, Inc.'s CA-IDMS.

One key architectural decision being revisited, Beulke said, is the use of MDI's Gateway. "When we evaluated it last year, it seemed to be the best solution," he said. But now IBM has announced its Distributed Database Communications Services (DDCS), which promises to be "much cheaper and easier than MDI," he said.

Where IBM will charge $4,000 for a DDCS site license, some middleware vendors charge more than $100,000, he said. So Spiegel will look into DDCS for the next implementation of its client/server database application, Beulke said.

Unique issues

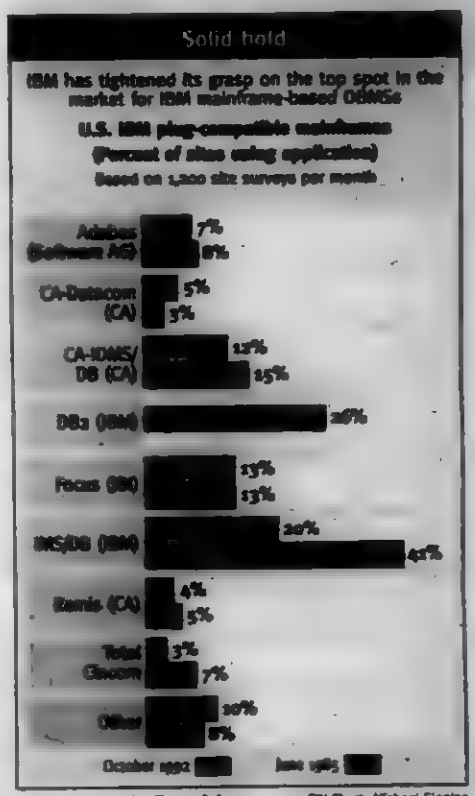
Other users have to face technical issues unique to their environments. Lechmere, Inc. in Woburn, Mass., has Software AG of North America, Inc.'s Adabas on its IBM 3090-200E mainframe. It also has an IBM RISC System/6000 Unix-based computer in each of its 23 stores. The company is about to implement a receiving application in the stores by the end of the month.

Each store has its own database that contains the store's inventory, among other things. Changes are uploaded to a central mainframe file. The application in the stores uses an emulator "to allow the computer to think it's an IBM Series/1," said Lou Kleynen, vice president of IS. "They're basically sequential files, and the emulator allows us to pass the data back and forth."

So, the biggest technical challenge Lechmere faced, Kleynen said, "was accessing data in the flat file. We have an Adabas structure for the new application, but we also need to maintain inventory on this other file. We wound up writing our own code to do that."

Still, the technical difficulties almost pale when compared to other problems. Rich Kolbe, director of MIS at Harley-Davidson, Inc., said, "People who make changes to the software on PCs and LANs have not always been in step with the changes we make to the centralized software. We put our hand on the burner once or twice, and there's an issue of educating the participants so they realize the dependency is there.

"As we come through, we realize we're raising the bar as to what we're expecting from both the end-user and MIS departments."



Source: Computer Intelligence/Infocorp CW Chart: Michael Siggins

Very new

Database consultant Rich Finkelstein estimates that only about 200 or so companies are actively pursuing client/server database applications. "It's very new, and people are experimenting. It's definitely doable, but it's important not to have expectations that are too high."

Somewhere in the middle

No one ever said client/server would be easy, and that may be just as well. Among the many technical problems to resolve are which standards to adhere to, if any; and the advantages and disadvantages of using "middleware" vs. connecting the mainframe directly to the PC network.

Middleware is a term becoming widely used to describe a software package that connects the end user to many different mainframe and minicomputer databases. Middleware generally sits on a server on a LAN.

As such, it can access data no matter where it resides, whether it is in a flat file or must be called using SQL. Gateways, on the other hand, are a point-to-point connection, from one database or product to another.

Rich Finkelstein, president of consulting firm Performance Computing, Inc. in Chicago, said middleware's advantage over direct connection is its "flexibility." On the other hand, he said, middleware costs much more than directly connecting a LAN to the mainframe and is not necessarily as transparent.

For its part, a direct attachment to the mainframe can be limited to a specific number of users.

In any event, Finkelstein noted, customers must be careful about impacting the performance of the mainframe. "Client/server can put an unpredictable load on the mainframe and is very difficult to control," he said.

Another issue is that of standards. "There are competing standards of how to get to data in a distributed environment," said Howard Fendick, an independent consultant. "My sense is that the vendors are all jockeying for position, and it's not clear how these different standards will fit together." — *Johanna Ambrosio*

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Explosion spotlights LAN vulnerability

By Thomas Hoffman
NEW YORK

The majority of operations that were disrupted by the bombing of the World Trade Center last month were based on distributed systems and local-area network topologies. This has led information systems executives and industry observers to speculate that the incident will force companies to pay even greater attention to protecting mission-critical applications on distributed architectures.

"There's no question that anytime you have a disaster like this, people become much more aware of the rigors of protecting distributed technology," noted Craig D. Goldman, senior vice president and chief information officer at The Chase Manhattan Bank NA, which was forced to transfer 100 financial services employees and reroute phone lines to Chase Plaza and other nearby locations.

Most large companies with past disaster recovery experience successfully carried over their expertise to distributed architectures preceding the World Trade Center blast. However, many smaller firms with no prior experience were less fortunate.

Invaluable backups

The New York Clearing House Association (NYCH), which clears roughly $1 trillion in international transactions for member banks each day, had 10 members in the World Trade Center when the explosion occurred.

Four of those banks ended up using NYCH backup facilities in Manhattan to complete $80 billion in transactions on the day of the bombing, according to George F. Thomas, senior vice president and director of data processing at NYCH.

Seventy percent of the systems at the World Trade Center that were affected were composed of Digital Equipment Corp. VAXs, Tandem Computers, Inc. fault-tolerant systems and hundreds of LANs, according to Tari Schreider, chief executive officer at Contingency Planning Research, Inc., a Jericho, N.Y., disaster recovery market research specialist.

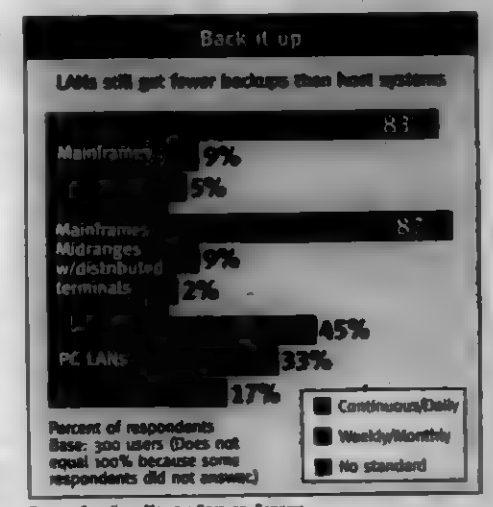
Based on early investigations among World Trade Center tenants, Schreider said most of the organizations that suffered data losses or disruptions to distributed systems were backing up data only on a weekly or monthly basis.

At the Commodities Exchange, Inc. (Comex), all trading information is "shadowed" or backed up and routed over an LU6.2 protocol network to computers at a backup facility. As a result, Comex did not lose any data, according to Jerome J. Jordan, Comex vice president of computer operations.

However, The New York Cotton Exchange was less fortunate. The exchange lost a small amount of data on its three Novell NetWare v3.11 LANs, according to Jack McLaughlin, manager of operations and statistics at The Cotton Exchange.

The availability of disaster recovery products for networks is easing the problem somewhat.

Palindrome Corp. in Naperville, Ill., offers a product called Network Archivist, which was designed to back up and restore data on Novell NetWare and Arcnet LANs. One of its customers, Segal Co., a World Trade Center-based benefits consulting firm, successfully used the product during the disaster, according to a telecommunications manager at Segal who requested anonymity.



Source: Comdisco Disaster Recovery Services

World Trade Center occupants *regroup after explosion forced systems to be moved to backup sites*

Little downtime

Brody White & Co., one of the largest commodity-only brokerages in the U.S., was able to reroute its distributed operations to KL/Datacomp, Inc.'s disaster recovery facility in Roseland, N.J., said Edward Rywell, assistant vice president of corporate computers and telecommunications at Brody White. The company was fully operational two days after the explosion.

Electronic databases: Thinking aids of the future

By Lori Valigra

It was a sign of the times. Two students at MIT walking down the "Infinite Corridor," which links the Cambridge, Mass., school's maze-like campus, were overheard discussing their term papers.

"What are you covering in your paper?" one asked the other.

"I don't know. I'll have to do a keyword search of the databases and see what turns up," was the response.

While computer-generated term papers seem to defeat the purpose of the task — to think — electronic information databases are proving to be valuable aids for industry leaders and scientists. They are a quick way to become an expert on a competitor's finances, products or management without having to wade through stacks of magazines and newspapers. Trends can also be picked out of the records.

It all sounds simple, but is it? Until recently, most of the thousands of databases available via computer networks have had their own syntax, basically requiring an expert to do a thorough search of several different databases.

Even sign-off syntax can vary, said Linda Martinez, assistant engineering librarian at MIT's Barker Engineering Library. Choosing the wrong one — "bye," "logoff," "logout," "exit" — can keep the access time clock ticking and add expense.

MIT, which is one of the more aggressive universities embracing database technology for its student engineers, is tackling the nomenclature problem by using one of the newer database products that allow common commands across many different databases.

MIT is testing FirstSearch, a collection of 29 databases containing article indexes or abstracts. It is a relatively new product from OCLC, a Dublin, Ohio-based nonprofit corporation that started as the Ohio College Library Center.

Cost considerations

Whether easy to use or not, full-text databases can quickly ring up high access charges. Rae Jean Wiggins, a librarian at MIT's Sloan School of Management, said one three-minute search on Nexis cost $31 to download three files.

International Data Corp. expects usit shipments of full-text retrieval software to grow at a 29% annual rate through 1996, largely because of the popularity of CD-ROM.

FirstSearch is menu-driven. After logging onto the system via Internet, users are asked about their field of interest and are given several databases to check using a common set of commands.

The searches turn up a variety of results. For example, a sample search using the keywords "computer and Japan" found 278 references on the FirstSearch news abstracts database, including articles from *The Washington Post* and *The Wall Street Journal*. Using FactSearch turned up 31 references to publications such as *BusinessWeek* and the *Congressional Record*. A search for Disclosure, Inc., which has detailed financial information about companies traded publicly in the U.S., yielded 42 records.

But getting the listings, which can be printed from a PC, is only the beginning.

"After you find the information on the search, then you must find the library where it is located," Martinez said. There are a number of ways to do that. One involves going to WorldCat, the bibliographic database on FirstSearch, or dialing into library on-line catalogs.

Another is getting the full article by accessing an independent full-text database such as Mead Data Central, Inc.'s Nexis or WAIS, the Wide Area Information Servers database located at Thinking Machines Corp. in Cambridge, Mass. Services such as Nexis, however, are expensive and carry strict usage guidelines.

WAIS, which is accessible through the Internet, can search 359 full-text databases. The downside is that its command line interface makes it difficult to use.

Though many of the databases are geared for use by large institutions, some are affordable for small firms, according to Joan Stapleton, a representative at Nelinet, Inc., a Newton, Mass.-based membership organization for New England libraries that brokers OCLC databases in New England.

FirstSearch for non-OCLC members costs $100 per year, plus $450 for each block of 500 searches. In addition, there is a dial-up access fee of $6.40 per hour for those with CompuServe accounts, and a direct-dial charge of $10.80 per hour on a WATS line.

Valigra is a free-lance writer based in Cambridge, Mass.

Wang uses own imaging systems to climb out of bankruptcy

By Melinda-Carol Ballou

LOWELL, MASS.

Wang Laboratories, Inc. will release its reorganization plan this week in an attempt to move out of Chapter 11. In an acid test of its own technology, the company is using a Wang imaging system to handle the hundreds of thousands of documents needed to meet the court's March 16 deadline.

Management and reconciliation of the claims of Wang's creditors involve the services of two other companies: Poorman-Douglas Corp. in Portland, Ore., and Federated Claims Services in Cincinnati. Poorman was appointed to handle claims management between the court and Wang, while Federated Claims provides services to help manage information about the resolution of those claims.

"One of the problems in bankruptcy processing for us was that no one product did it all in terms of bringing in the claims documents as well as reconciling them. We had to go to multiple vendors," said Jean Dixon, MIS consulting analyst at Wang.

The court sent creditor claims information to Poorman, which scanned them into the imaging system. Poorman used the Seaview image document and management system, which was developed by Science and Engineering, a Wang third-party partner, and is based on Wang's Open Image system and Gupta Corp.'s SQLBase database management server. The Open Image system consists of software that allows users to access, update, display and rotate images, as well as application programming interfaces that let users add images and access them across platforms.

Wang employees then updated their IBM mainframe in Lowell to reflect information such as dollar amounts and dates received. Clients at Wang requiring access to the data did so over a local-area network. The LAN was comprised of a Novell, Inc. 486 server and approximately 20 Intel Corp. 80386 clients using Microsoft Corp.'s Windows and accessing the Gupta database server that housed the claims information and a fax server.

Then Federated Claims provided reconciliation of claims and analysis services. That system uses a 486 server running The Santa Cruz Operation's SCO Unix and an Oracle Corp. database.

Users could bring up a claims image in one window while, in a second window, they could access the data needed to resolve that claim.

ON SITE

Wang
Lowell, Mass.

Challenge: To move out of bankruptcy fast and resolve more than 30,000 claims from creditors.

Technology: Seaview claims management software based on Wang's imaging system and Gupta's SQLBase Server and Federated Claims Services' claims reconciliation software, which uses an Oracle RDBMS on SCO Unix.

Results: Wang is expected this week to file its reorganization plan — on time.

Praise from service providers

According to Wang's claims service providers, the use of Wang's imaging products is greatly facilitating the move from bankruptcy to reorganization.

"I cannot express to you the amount of paperwork involved in large bankruptcy cases — with 50,000 creditors, an average eight to 10 pages per creditor per claim and then three copies of each page," said Noel Bosco, an image representative at Poorman. "The advantage with the Wang system is the SQL-based database server, so that accessing large volumes of information is extremely quick and so is the creation of reports."

BEST OF COMDEX FALL '92 BYTE
Finalist

In the short time since ReportSmith™ *hit the streets, one thing is for sure.*

Everyone who's used it and reviewed it has raved over it, while industry analysts have showered it with praise. And they all agree on one simple fact.

ReportSmith *is the best product out there for simplifying database query and creating professional-looking database reports. Period.*

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You'd almost think Windows 3.1 was created exclusively with ReportSmith *in mind. With drag and drop and numerous other visual tools, you can combine text, data, images, graphics, charts and color. Use a scalable font. Create columnar, multi-line columnar, form, and cross-tab reports as well as labels.*

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And the best part of all?

With ReportSmith, *you can do all this without having an intimate knowledge of database structures, languages or access tools. It doesn't matter where your data resides. With* ReportSmith, *it's easy.*

In the words of Josh Mailman, President of MVR, a major database consulting firm, "There's nothing to touch ReportSmith. I'll never use anything else."

And best of all, even though ReportSmith *is an industrial-strength product, you can do it all easily.*

So do yourself a favor: become a winner, even if your name isn't Smith.

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When Less

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Let Digital's Computer Downsizing Solutions Give You More **POWER** *over Your Information*

The business environment of the '90s challenges organizations to work faster, better, and at a lower cost than ever before. Styles of computing that suit large, monolith, routine batch jobs cannot sustain the free flow of information and resources required by businesses today.

Companies need the freedom to provide their employees with access to information when, how, and where they require it. Fortunately, this need coincides with a dramatic increase in performance and a downward turn in the price of computers. Digital helps you take advantage of this price/performance — enabling you to put powerful information tools into the hands of your business professionals.

Our strategy is to provide you with a more flexible and open future. We'll help you plan, design, implement, and manage information environments that are cost-effective — from initial purchase through ongoing management and change.

Enabling Your Company to Work as It Wants to Work

Providing your professionals with the freedom to access information when, where, and how they need it requires the foundation of a disciplined, standards-compliant environment. Whatever your current starting point, Digital can help you quickly and efficiently achieve a standards-compliant environment that is open to the best components now and in the future.

Your professionals use desktop units and applications of choice, benefiting from behind-the-scenes disciplines that enable transparent data flow across multiple vendors' clients, servers, and applications. Digital delivers open computing environments that provide mainframe levels of performance, functionality, reliability, security, and integrity — but with far more flexibility and at much less cost.

Digital offers you the freedom not only to choose the best information tools and products, but also to orchestrate and adapt these into a whole that best suits the way your company wants to work. Take advantage of our unrivaled depth and breadth of connectivity and integration tools, products, and services. We provide:

- **Worldwide consulting, training, and systems integration professionals**
  Our experts work with you to manage and balance the people, business, and technology dimensions of distributing information throughout your business.
- **Multivendor integration**
  You choose the best components to serve your business — from desktop to data center. We can integrate and support almost any client or server your company is likely to own now or in the future. Plus, we have packaged these capabilities into products that deliver integration and interoperability right out of the box. For example, Digital's Network Application Support (NAS) capabilities, such as PATHWORKS, enable you to interconnect multivendor systems and achieve a free flow of information across platforms, sites, and groups.
- **Unbounded capacity at far less cost**
  Utilizing the world's fastest 64-bit RISC microprocessor, our Alpha AXP family of open server and desktop systems give you unbounded capacity — at a fraction of mainframe cost.

Take Advantage of Our Experience

Digital pioneered moving information out from the data center to work groups — whether they're in the same office or around the world. We'll help you achieve the most flexible and cost-effective approaches to your information requirements — today and tomorrow.

For more information on Digital's computer downsizing solutions, call 800-332-8228. ■

What drives companies to move to more cost-effective computing environments?

Two reasons:

Not only do you want to **increase the payback** *of your information technology dollar, but you're also looking to* **increase the productivity** *of your frontline professionals.*

Digital helps you do both.

For Success in Downsizing, Scott Paper Uses the Team Approach: Digital and Unidata

In the late 1980s, Scott Paper — the world's leading supplier of tissue paper products — decided to downsize operations. In fact, company management issued a downsizing directive to every division of its organization, including MIS.

Since the actual downsizing process was left to division managers, MIS at Scott's Everett, Washington, mill focused on improving its computing system as a way to help the Philadelphia-based company cut costs.

With a critical mission at hand, Scott Paper turned to Digital and Unidata for assistance.

The Problem

Operations at the Everett mill were dependent on a multisystem environment — one database system to manage the business applications, and various other computers from different vendors to manage all aspects of production and manufacturing. As a result, MIS had to maintain diverse computing environments, and users had to learn to use several computing systems.

The mill needed a single vendor to provide systems for both business applications and shop floor production. After a thorough evaluation, Scott Paper chose Digital to provide a uniform, integrated computing environment via a VAXcluster system.

Power, Flexibility, and Openness

The Digital hardware implemented at Scott Paper included two VAX 6000 Model 410 systems and three VAX 3000 systems. The VAX 6000, chosen for its industry-leading technology, price/performance, and flexible upgrade path, also provides Scott Paper with:

- A powerful CPU
- Expanded memory and storage capacity
- High-speed networking capabilities.

In addition, the clustering feature of OpenVMS has given the paper manufacturer an efficient, economical way to share data resources.

Unidata Serves as Critical Link

Once Scott decided to standardize using Digital hardware, one challenge remained: how to continue using its older non-Digital database system in the new OpenVMS environment. Careful research led the company to Unidata, a Digital independent software vendor headquartered in Denver, and Creative Computing Solutions (CCS), a Unidata value-added reseller based in Fremont, California.

Unidata provides small, medium, and Fortune 1000 companies with a relational database management system (RDBMS) that supports relations and multidimensional arrays. Unidata's RDBMS operates under OpenVMS and UNIX, is compatible with Scott Paper's previous computing environment, and has enabled Scott Paper to run its main business applications with improved response time.

Plus, Unidata's compatibility with Scott Paper's previous database system allowed this system to be converted to OpenVMS — while retaining the same look and feel for users.

After six weeks of duplicating, testing, and tuning 100 programs and 20 files, CCS converted Scott Paper's old database system to Unidata software and then ported it to the OpenVMS environment. "The conversion went fairly smoothly without any major upsets," stated Wendell Harris, IS Manager, Scott Paper. "And we met all project timelines."

By moving to the OpenVMS environment, Scott Paper has maintained its original database system and reduced its IS costs by 20 percent — a significant contribution to the company's overall downsizing efforts.

The major benefits resulting from Scott Paper's decision to team Digital and Unidata include investment protection, no downtime, no retraining — and, most important, no hassle.

For information on Digital/Unidata solutions, call Terry Truman, Unidata's Director of Channel Marketing, at 303-294-0800. ■

Libbey-Owens-Ford Profits from Digital's Downsizing Solutions

Libbey-Owens-Ford Company's Auto Glass Replacement (AGR) Business Unit has added 69 service centers since 1988, and plans to establish 100 by the end of 1993. This continent-wide service network — including AGR's three giant depots — supplies local auto glass replacement shops that serve customers throughout the U.S. and Canada.

Building market share with this fast-growing service challenges AGR to meet market demand for quick response and competitive pricing by dramatically cutting distribution time-to-market and cost.

These goals drive AGR's move from an in-house application on an IBM mainframe to a Digital client/server environment — an environment that provides nationwide, distributed, real-time inventory management.

Connecting the service centers, depots, and headquarters, the Digital environment integrates and distributes AGR's preferred application packages: Distribution Management from McHugh Freeman Associates, for real-time inventory control throughout the supply chain; and DMI from Distributed Architects Incorporated, for integrated resource planning and order processing in all service centers.

VAX 6000 systems, the field office servers, will link to an Alpha-ready VAX 6620 system at AGR headquarters. "The power of Alpha AXP provides the right, high-performance match for our business strategy … at a far lower cost than a mainframe approach," says Rick Wagner, Senior Manager, IT, Libbey-Owens-Ford.

Digital Helps The Brookings Institution Save over $1 Million

With the help of Digital's computer downsizing solutions, The Brookings Institution's Social Science Computation Center (SSCC) has saved a total of $1.7 million over a six-year period. It spends less annually in areas such as computer maintenance, software, and peripherals.

Digital has been providing Brookings with computing power since 1970 — with the SSCC adopting VAXcluster system technology. But, as PCs assumed an increasingly important role at Brookings, the organization was faced with a dilemma. PC and VAX users needed to collaborate and communicate. Brookings needed to maintain both systems and cut costs at the same time.

The solution? Lower-cost and higher-performance Digital computers are servers to the growing base of PCs and Macintosh systems at The Brookings Institution. These desktop units are integrated with each other and the Digital server via Digital's PATHWORKS networking.

The SSCC has upgraded the VAXcluster system that functions as the server several times, moving smoothly from the VAX 8650 computers down to VAX 4000 systems. Now, with the lower maintenance and electricity costs, Brookings will recoup its equipment costs in two years.

States SSCC Director Jane Fishkin, "The SSCC accomplished this computer downsizing without endangering or impairing the flow of Brookings' most important asset: information."

The ALPHA AXP ANGLE

Taking Care of Business Means Utilizing 64 Bits Today

Why not stop working around your current technology, and start letting technology work for you? Don't waste countless hours maneuvering around the limits of your current computing system. Instead, use Digital's Alpha AXP 64-bit RISC architecture to implement new, more cost-effective ways of solving your business problems now and in the future.

The competitive advantage — it's what every business continually strives for. And that's exactly what Digital's 64-bit Alpha AXP architecture gives you. The power of Alpha AXP systems will assist you in meeting your business requirements today and tomorrow.

Today, Alpha AXP systems — from desktop to server — can dramatically enhance your existing applications. In terms of your business future, Alpha AXP systems open the door to new ways of approaching your business problems, without constraints and on your choice of platforms.

Plus, Digital's 64-bit computing architecture offers an unprecedented 25-year growth path — assuring you that today's investment will be protected well into the 21st century.

Supercomputers Introduce Power of 64 Bits

The unbounded power and precision offered by 64-bit computing was first introduced by costly supercomputers and has been garnering dramatic benefits for a handful of specific industries.

With 64 bits, engineers designing computer simulations are given finer granularity, increased accuracy, and greater interactivity. Thus, what once took months or years to design now takes days or weeks — with animated visualization that borders on reality.

For example, a major U.S. automobile manufacturer that once used real automobile prototypes for crash experiments saved months of time and millions of dollars by implementing electronic crash simulations to collect critical information.

Along the same lines, the unbounded performance of 64-bit computing helped a leading U.S. chemical company create a synthetic catalyst in weeks instead of years — saving the company millions in experimental chemistry costs.

Alpha AXP Makes Supercomputer Power Affordable on the Desktop

Today, Digital's Alpha AXP architecture puts supercomputer power on the desktop for less. In fact, our 64-bit technology has the best performance and price/performance ratio in the computing arena. Now, virtually every industry can access the power of 64 bits to address their business problems.

Technologies that benefit from the power provided by Alpha AXP systems include:

- **Graphical representation**

Used in applications including CAD/CAM, molecular modeling, and computational fluid dynamics, this technology will gain significant design time advantages — resulting in greater productivity and cost savings for industries.

- **Information handling and retrieval plus recognition/interpretation**

Applications using technologies such as unstructured data (document image), EDM, voice, text-image search by content, and knowledge bases will dramatically benefit from the processing power of the Alpha AXP architecture. For instance, the paper mountains of insurance companies can be scanned into EDM servers to reduce search times from days to seconds.

- **Scheduling and multivariable problems**

Utilizing Alpha AXP systems, applications such as inventory and replenishment/logistics, chain management, and crew and maintenance scheduling can be treated in increasing detail in the retail industry and many others in order to garner higher returns.

- **Mathematical computations**

Applying 64 bits to risk analysis, realtime computation, and complex event prediction will allow banking and finance industries to solve larger problems faster, and with greater detail and accuracy.

Organizations Select Alpha AXP Systems as Computing Technology of Choice

Most often, you're not concerned about how technology works, but only that it works to provide business benefits. Many organizations worldwide have selected Digital's Alpha AXP systems for the compute power they offer — power that ultimately enhances business productivity and profit.

Boston Edison Plugs into the Power of Alpha AXP Systems

Boston Edison has recently selected two Alpha AXP systems (the DEC 3000-500 system and the DEC 3000-400 system) to run its primary application, EMS/SCADA. In its search for an open system that offered a distributed workstation-based solution, the company chose an Alpha AXP system over the IBM RS6000 because of the system's price and price/performance advantage. Digital's 64-bit technology will see Boston Edison into the 21st century.

Tampere University Replaces Supercomputer with Alpha AXP Systems

Finland's Tampere University of Technology needed to add more compute power to its engineering computing lab. It found the solution in the 64-bit arithmetics provided by Alpha AXP systems. Sixty-four bits will give the university a new dimension for its technical computing — enabling users to solve more complex problems at a much faster rate. The Alpha AXP systems will be utilized in various physics, electronics, and signal processing simulations, and for structural analysis tasks.

Alpha AXP Architecture Satisfies the Appetite of Garfield

A small company that creates and licenses cartoon animation, PAWS, Inc. uses a computer base of thousands of images — including Garfield,® created by company president Jim Davis. With so many memory-intensive images, PAWS has already reached the 4-gigabyte memory limit allowed by its 32-bit system. According to a company spokesperson, the company needs 64 bits now. Thus, plans are under way to move to Digital's Alpha AXP architecture. Initially, the Alpha AXP system will allow PAWS to double the data it manipulates at one time — ultimately saving time, increasing productivity, and positively affecting the company's bottom line.

Take Advantage of the Power and Affordability of Alpha AXP Technology

Alpha AXP technology can help companies across a broad range of industries improve cash flow, increase profitability, enhance productivity, and gain a competitive edge. With the best price/performance ratio in the industry, it makes good business sense to utilize 64-bit technology today in order to maintain your competitive edge tomorrow. ■

THE H9A00 SERIES FROM DIGITAL

PERFORMANCE AND ECONOMY IN A SYSTEM ENCLOSURE PLATFORM

Digital's H9A00 International Enclosure Series (IES) provides both an economical and a truly high-performance system enclosure platform that is state-of-the-art compliant with European and U.S. standards. You can choose from a range of models designed for particular applications — from "rack-and-stack" models to those ideally suited for LANs and LATs. Or, customize a model to answer your specific business needs.

Well-suited for system configuration either in the data center or office, the H9A00 Enclosure Platform is supported for use by the SF400 Mass Storage Array and DECsystem 5900, plus all Alpha AXP systems, including the DEC 3000 AXP system, the DEC 4000 AXP system, and the DEC 10000 AXP system.

Plus, Digital's H9A00 platform offers a convenient mounting platform with conventional EIA/RETMA mounting formats, with optional metric adapters, or with total metric mounting formats. In addition, virtually every rack-mounting device available in the industry can be easily installed into the H9A00. ■

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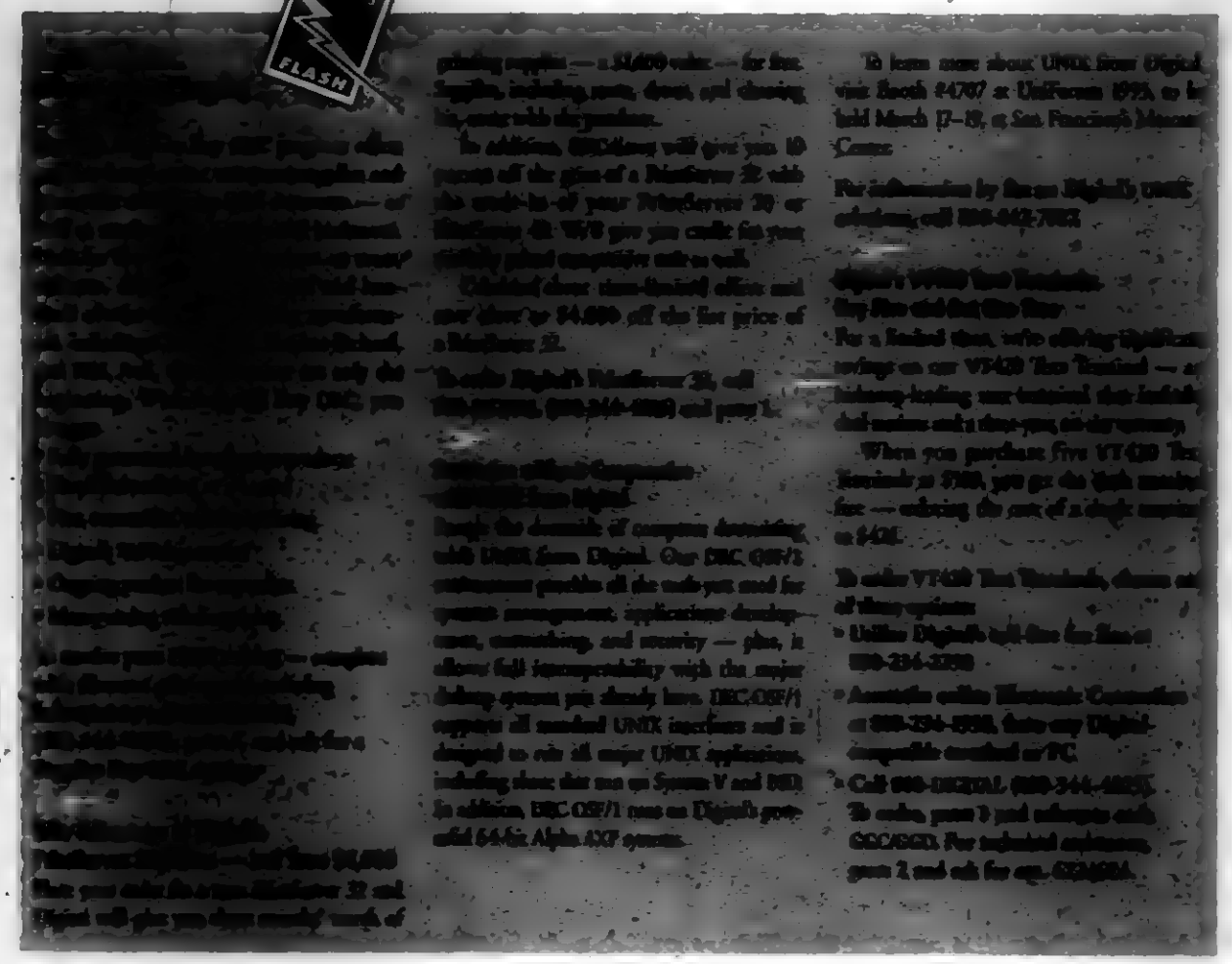
H9A00-AC $2,595	Cab Assy, free standing, operator access, full vented ft dr, stabilizer (120 V 24 A)
H9A00-AD $2,595	Same description as above (240 V 12 A)
H9A00-AE $2,595	Cab Assy, free standing Communications Cab w/dk transparent ft door (120 V 24 A)
H9A00-AF $2,595	Same description as above (240 V 12 A)
H9A00-EA $2,995	Cab Assy, free standing w/o front door, w/front vertical trim and stabilizer (120 V 3-ph)
H9A00-EB $2,995	Same description as above (240 V 3-ph)
H9A00-EC $2,395	Same description as above (w/o power)
H9B00-AC $2,295	Cab Assy, expander (w/o end panels), operator access ft door, stabilizer (120 V 24 A)
H9B00-AD $2,295	Same description as above (240 V 12 A)

ACCESSORIES

Order #/Price	Product Description
H9C00-AB $250	End Panel Assy, non-shielded
H9C00-EA $325	Front Door Assy, op-access, full vented
H9C00-EB $300	Front Door Assy, locking, full vented
H9C00-LA $120	Top Cover, solid (w/o vents)
H9C00-FA $1,000	Frame Assy, 600 mm, non-shielded
H9C00-DA $225	Front Trim, vertical for 600 mm

To order Digital's H9A00 (IES) products or accessories, call 800-DIGITAL (800-344-4825) and press 1.



VAX 10000 Systems Are "POWER PACKED" with Digital's Solid State Disks

It's all there — lightning-fast speed, availability, and security. Now, Digital's EF5x Solid State Disks (SSDs) are embedded in every VAX 10000 system — providing the near-instantaneous access to data necessary to unleash the power of these high-performance systems.

Literally hundreds of thousands of CPU cycles can be idled, waiting for access to critical data that's stored on traditional devices. However, the 0.25-ms access time of the EF5x SSDs provides up to 100 times faster access to data and magnetic disks. The result? Performance of response-time-critical applications is significantly improved, along with your business' bottom line.

The EF5x series of solid state disks supports not only VAX 10000 systems, but all DSSI-based systems experiencing poor performance caused by slow I/O. The EF5x is the same size as RF magnetic disks and plugs-and-plays into VAX 4000 system cabinets, VAX 4000 expansion cabinets, and SF Storage Array cabinets. In addition, an integrated Data Retention System is built in to provide safe, nonvolatile storage for your most critical data — even if power is lost.

From ESE50 Solid State Disks for SDI-based systems to EF5x Solid State Disks for DSSI, Digital has the right, cost-effective devices to support your mainframe-class, distributed, and server applications.

Order#/Price	Product Description
EF51R-AA*/AF** $19,000	107 MB DSSI solid state disk with integrated Data Retention System
EF51R-LA** $33,250	Two 107 MB solid state disks and modular mounting shelf for VAX 10000 and VAX 7000 systems
EF52R-AA*/AF** $32,000	205 MB DSSI solid state disk with integrated Data Retention System
EF52R-LA** $56,000	Two 205 MB solid state disks and modular mounting shelf for VAX 10000 and VAX 7000 systems
EF53-AA*/AF** $35,000	267 MB DSSI solid state disk without data retention

*Factory-installed option
**Field-installed option

To order any of Digital's solid state disks, call 800-DIGITAL (800-344-4825) and press 1. ■

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[redacted]

Power supplies

Para Systems, Inc. has announced the A300 and the A425, which are part of the Minuteman Alliance (A) Series.

According to the company, the products are advanced, simulated sinewave standby uninterruptible power supplies.

The Alliance units are self-diagnostic when turned on. They feature site-wiring fault and a wall socket testing system that tests for improper grounding.

Shutdown software is available for the A425.

The units were designed to protect from overload in AC and DC mode, brownouts, blackouts and spikes.

The Minuteman A300 costs $159, and the A425 costs $259.

▶ *Para Systems*
1455 LeMay Drive
Carrollton, Texas 75007
(214) 446-7363

Utilities

Data 21 has announced CICS.Help 4.4, the Help Presentation Manager for CICS.

According to the company, the product allows for the creation of on-line manuals, hypertext and Common User Access Help and Prompts.

A new Dynamic Database Access feature and/or a command-level exit shows data from DB2, data dictionaries and VSAM as Help text and Prompt selection lists.

Hypertext features include Keyword Search, Browse Topics and Topic Prints. Various authoring platforms can be employed, including IBM's ISPF and TSO and WordPerfect Corp.'s WordPerfect.

Prices start at $14,995 for MVS and $6,995 for VSE sites.

▶ *Data 21*
19120 Van Ness Ave.
Torrance, Calif. 90501
(310) 212-9940

Database management

Softworks, Inc. has introduced the Catalog Solution.

According to the company, Catalog Solution is composed of Version 2.3 of the Catalog Scan and Version 6.1 of the Mechanic VSAM/Volume Data Set (VVDS) Forward Recovery.

Catalog Solution has the ability to locate data sets that need maintenance from criteria such as percentages used and number of extents.

Relational inconsistencies with Volume Table of Contents, VVDS and Basic Catalog Strutures (BCS) are analyzed and assistance is given to resolve them. Upleveling restored VVDSs and BCSs is another Catalog Solution capability.

License fees start at $15,500.

▶ *Softworks*
7700 Old Branch Ave.
Clinton, Md. 20735
(301) 856-1892

I/O devices

MPI Technologies, Inc. has introduced the Blue Kit for the LaserJet 4, a coaxial/twin-axial Intelligent Printer Data Stream (IPDS) emulation package.

The product enables Hewlett-Packard Co.'s 8 page/min. LaserJet 4 laser printer to operate as an IPDS printer in the IBM S/3X-Application System/400 (twin-axial) midrange and S/370 (coaxial) mainframe environments, the company said.

The Blue Kit features "automatic sharing," which allows the LaserJet 4 to be used in three modes: by an IBM mainframe in a non-IPDS mode, in IPDS mode by a mainframe or midrange or by network or PC in a PCL mode.

The Blue Kit costs $2,995.

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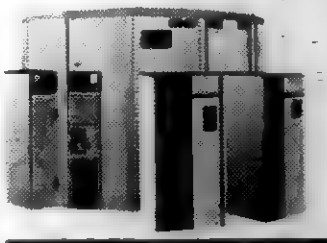

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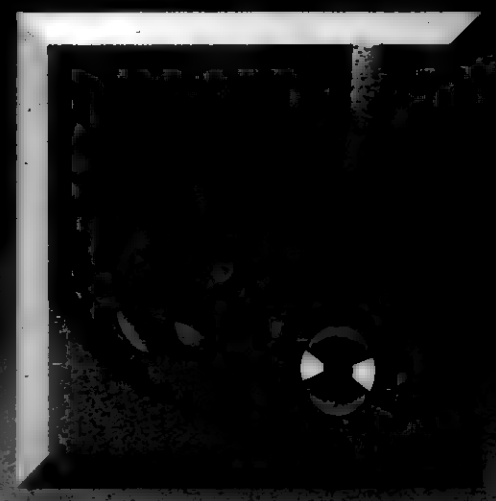
White Paper



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Introduction

More than $50 billion is spent annually on magnetic storage device acquisitions. Total storage expenditures typically comprise between one-third and one-half of IS hardware budgets. Despite these imposing figures, only 5% of the information used today is stored electronically.

This is changing. As the cost per bit of electronic storage continues to decline at more than 20% per annum, the amount of data stored on disk will increase fourfold by 1996. In large measure, this growth is attributable to the millions of standalone desktop computers becoming connected to networks and host-based systems. Users of these computers have a constantly growing need for data accessibility.

Estimates from users running heavy transaction workloads in mission-critical environments indicate that they lose more than $100,000 during every hour their disk-based data is unavailable. While such losses are not common, the opportunity costs and productivity losses associated with data inaccessibility can still be devastating. The bottom line: unavailability of information can make or break a small business and cost a large one millions of dollars.

In today's rapidly changing information technology environment, high availability requirements are no longer confined to the "glass house" of corporate computing. The widespread use of distributed processing has brought high-demand storage requirements to what was previously considered to be the technology hinterlands. More users than ever are clamoring for access to storage, consistent performance, and sophisticated storage management capabilities — and they want them around the clock.

Redundant Arrays of Independent (or Inexpensive) Disks (RAID) is the first step toward ensuring continuous data access. This fault tolerant disk design technology realizes its objective through techniques that dramatically increase the mean time to data loss — but frequently at the cost of system performance. The key to successful RAID deployment is understanding both its advantages and disadvantages. RAID offers a technology balm for users that are caught up in today's Darwinian high-tech economy. At a time when these users need every advantage they can grasp, RAID is beckoning.

This White Paper was written independently of the Computerworld *editorial department by David Vellante, IDC Senior Vice President, Systems, Storage & Software Research.*

For more information on the White Paper Program, please call 508-879-0700.

IDC research indicates that nearly 40% of U.S. mainframe sites are actively pursuing a downsizing strategy by taking one of two courses: actively moving core applications off the mainframe onto smaller distributed platforms or confining new application development to smaller distributed platforms. The two primary motivators for downsizing are cost savings and improvements to end-user access and service. In addition to saving money on hardware and software, downsizing users are finding that their overall access to information is improved.

Obviously, mainframes are the losers in this downsized environment. In fact, IDC research indicates that one in five IBM 4381 mainframes is at risk of being retired over the next 18 months. Many of them will be replaced by Intel microprocessor-based network servers running Novell's NetWare. Others will fall victim to RISC-based servers from companies such as IBM and Sun.

Survey results also indicate that downsized

data requirements are surprisingly mainframe-like. When asked to describe downsized data requirements in terms of their frequency of update and the need for public access, users indicate a very high level of update activity. This suggests heavy transaction processing workloads. Users also indicate a high degree of downsized data sharing.

Clearly, even though mainframes are being discarded in favor of smaller processors, they are leaving behind a computing environment little changed in terms of storage profiles, data availability, performance and storage management needs.

METHODOLOGY

In addition to the extensive use of survey data, this White Paper draws upon IDC's RAID supplier and product database. Information in this database is derived from ongoing discussions with more than 90 suppliers of RAID and RAID-related products. The database contains detailed specifications on more than 250 RAID products.

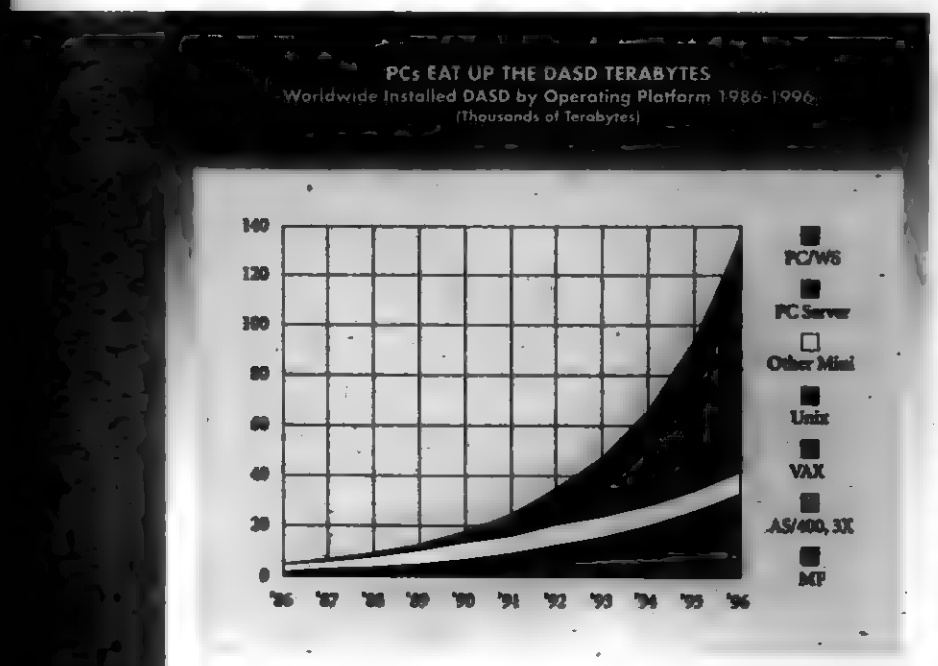
Finally, IDC has tapped its ongoing relationship with the consulting firm, Optimum Configurations, to better understand disk and disk subsystem performance. Optimum Configurations specializes in applying software modeling techniques to solve storage and I/O systems development and marketing problems.

USER STORAGE REQUIREMENTS

While installed gigabyte growth profiles vary within major systems categories, IDC research reveals consistent priorities and a willingness to trade off certain storage features in order to achieve IS proficiency. For instance, two-thirds of surveyed commercial users describe availability — the ability to retrieve desired information when it is needed — as a priority and are willing to pay a premium for it even if it means sacrificing some performance.

Users should evaluate disk subsystem requirements with three things in mind:

- Availability needs, measured by the costs of inaccessibility to disk data.
- Performance requirements, based on the link between I/O transaction volume and revenue generation. For example, the better the airline reservation system performance, the more tickets that can be sold.
- Storage management, including capacity requirements, space management, backup issues, investment protection and staff productivity.



Source: International Data Corp.

Although mainframes are declining, storage requirements are not.

Availability

When it comes to availability, only a minority of users (less than one-third) are unwilling to pay any premium for improvements. Typically, operations need 24-hours-per-day, seven-days-a-week, 52-weeks-per-year uptime, although some get by with availability provided during normal 40-hour-week working hours. The penalty for not having availability can be high, as some users report they have actually lost as much as $100,000 per hour per user when stored data was unavailable. Frequently, these users are operating in a high profile, "bet your business," online transaction processing environment.

Performance Must Be Cost-Justified

Performance often becomes a point of contention, and the ways in which users measure performance vary dramatically. Most users in technical supercomputing environments use transfer rates (and subsequent job run-times) as their primary performance measurement. In commercial environments, response times or I/O operations per second (or both, in combination) are cited as key indicators of performance.

Once a user achieves an acceptable response-time level, any degradation in that level is unacceptable. Less sophisticated customers cite disk drive seek time as a performance measurement, even though it is largely meaningless.

Few Advanced Storage Management Users

A minority of users is considered advanced in storage management sophistication. In fact, IDC estimates that less than 25% of all multiuser and network

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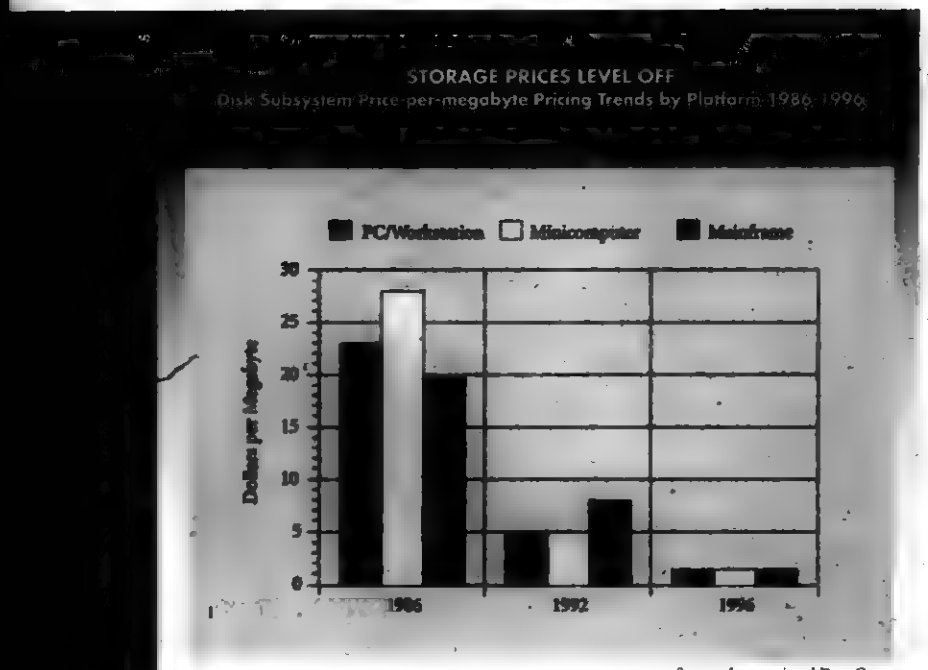

Source: International Data Corp.

New storage technology developments are making mass storage affordable and available to mass audiences.

sites effectively utilize storage management software. Effective use of storage management software requires characterizing, cataloging and managing both active and inactive data.

Ultimately, the most effective storage management environment is one where staff programmer productivity is not reduced by the need to manage rapidly growing storage facilities. In reality, most users are cognizant of overall storage management issues but are more focused on solving problems related to backup storage (typically tape drives).

IDC research reveals a willingness to trade off certain storage features in order to achieve improved availability.

DISK CAPACITY AND GROWTH PROFILES

On-line storage growth rates vary dramatically by host site environment. IDC believes installed disk-based gigabyte percentage growth rates for mid-range and mainframe systems will begin moderating to around 15% and will not revert to previous highs within the next three years. Conversely, network server and supercomputer installed disk-based gigabyte growth will continue to increase at more than 40% per year.

Installed on-line disk capacity growth is often used as a benchmark of storage industry health. This measurement is also often used by customers to plan DASD expenditures and acquisition strategies. In the early-to-mid '80s, yearly mainframe and minicomputer growth rates of 50%-plus were not uncommon. While some mainframe and mini sites continue to grow above the 20% level, on balance, these segments have slowed dramatically. Network server and supercomputer environments, however, continue to explode at a dramatic pace.

In looking at the projected number of installed disk-based terabytes of storage by operating platform between 1992 and 1996, the following points are noteworthy:

- Total worldwide installed terabytes will grow from 34,700 in 1992 to 134,925 by 1996, almost a fourfold increase
- The total number of terabytes installed on PCs and PC-based servers will surpass the total installed on traditional multiuser systems in 1993
- AS/400 and Unix growth rates will increase up to 20%
- PC-based network server capacities are expected to grow at 40% per year, primarily driven by the rapid attachment of standalone PCs.

STORAGE GROWTH BY HOST AND NETWORK ENVIRONMENTS

Network server sites (primarily Novell-based) show dramatic potential and will continue to grow at rates significantly higher than the industry average. The primary reason for this growth is the rapid pace at which standalone PCs are being networked. IDC's Global IT Survey shows that more than 60% of installed PCs are currently connected to LANs, and that nearly 70% will be connected within the next year. The local hard disk capacity installed on LAN-attached PCs does not affect the amount of central disk capacity.

Minicomputer sites are expected to show installed disk-based gigabyte growth rates of roughly 17% over the next year. IDC expects this slower growth trend to continue as users shift investments toward smaller networked platforms. Nonetheless, minicomputer sites will add capacity to existing systems while investing in new CPUs and peripherals.

Unix, Hewlett-Packard's MPE, IBM's OS/400 and potentially Digital Equipment's Alpha are expected to outpace the growth of other minicomputer operating systems. Growth at these sites — which is less than comparable growth at network server sites — is driven by increased user demands and subsequent new applications.

Mainframe growth rates in the early '80s were boosted by a demand for IBM's 3380 line of disk drives. IBM hopes to regain that boost in the '90s by positioning the mainframe as the prima-

ry image processing server platform. If the now-staggering giant succeeds in this initiative, mainframe storage requirements would increase dramatically. To date, however, budgetary constraints and a lack of software have curtailed user investments in imaging.

Until mainframes are embraced by imaging or some other application that consumes large quantities of storage, IS departments will continue to optimize their use of existing DASD. In this uncertain environment, many customers are opting for lower-capacity used DASD, which contributes to keeping the installed gigabyte growth rate below 20% yearly.

Supercomputer storage requirements continue to escalate, driven primarily by the availability of ever-larger and more complex computational problems. IDC's research covers a mix of large supercomputer sites, most of which are dominated by Cray. A significant number of smaller sites are primarily Convex-based. The average combined installed capacities at sites dominated by both of these companies is approaching 50G bytes, and DASD growth at both sites is likely to continue at well above the industry average.

WHAT IS RAID AND WHERE DOES IT FIT?

RAID is an acronym for Redundant Arrays of Independent (or Inexpensive) Disks. Currently, through a combination of formal definitions and informal industry consensus, there are six levels of RAID — zero through five. Each RAID level, except Level 0, reflects a different design architecture while sharing three defining themes:

- RAID is a set of physical disk drives viewed by the operating system as a single, logical drive
- Data is distributed across corresponding physical drives of an array
- Redundant disk capacity is used to store parity information, which guarantees data recoverability in case of a disk failure.

The second and third themes are variable according to each RAID level, and have the biggest impact on disk array performance.

The term RAID was originally described at the University of California at Berkeley in a paper that outlines various RAID configurations and applications. RAID was conceived in an effort to close the widening gap between CPU processing speeds and relatively slow electromechanical disk drives. The intention was to replace a large capacity disk drive with multiple smaller capacity devices and then to "stripe" data across the smaller drives. RAID's method of striping data is unique. In theory, striping provides simultaneous access to data from multiple drives, thereby improving I/O performance and allowing easier incremental increases in capacity. In practice, however, writing parity information can reduce overall subsystem performance.

RAID researchers realized that by allowing multiple heads and actuators to operate simultaneously, higher I/O and transfer rates could be achieved. They also realized that as the number of devices within a subsystem increases, the probability of a device failure is more likely. To compensate for increased drive failure rates and decreased subsystem reliability, the notion of storing parity information was introduced.

PARITY: THE FIRST STEP TOWARD FAULT-TOLERANT DISKS

RAID uses parity information to secure data in the event of a failure. Parity data is created by calculating a logical exclusive-OR (XOR) on actual user data and storing the result on disk. The space used to store this parity information is unavailable for user data. The parity information can be used to rebuild data in the event that a device (or sector) becomes unreadable.

For example, if an array contains a group of five drives, the logical equivalent of four drives is used to store data, and one drive is used to store parity. User data from the first sector of each of the first four drives is XORed, creating parity data stored on the first sector of the fifth drive. This operation is conducted on all user data in an array. In the event of a single disk failure, the lost data can be regenerated from the data on the four remaining drives.

TOP USER STORAGE REQUIREMENTS: CAPACITY AND RELIABILITY

Storage Availability Performance and Management Requirements Across Platforms

Site/Category	PC Servers	Minis	Mainframes	Supercomputers
Need 7x24x52 Availability	49%	53%	57%	Neg L.
Need Availability Over Performance	62%	63%	65%	45%
Need Performance Over Availability	38%	37%	35%	55%
Most Pressing Storage Problems	Capacity/$ Reliability	Capacity/$ Reliability	Capacity/$ Reliability	Capacity/$ Reliability
Storage Management Focus	Automate Backup	Automate Backup	Cost & Performance	Capacity & Performance Management

Source: International Data Corp.

In addition to wanting increased storage capacity and reliability, more and more users are also calling for round-the-clock data availability.

RAIDΩN

Fault-Tolerant Disk Arrays

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"We've evaluated many RAID products over the past six months, and from what we've seen, Micropolis' RAIDION is probably the most modular RAID 5 scheme now on the market."

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June, 1992 LAN

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May 25, 1992 PC WEEK

"The Raidion's low price alone makes it worth considering."

August, 1992 BYTE

Take it from the industry's leading publications: when it comes to reliable, cost-effective, fault-tolerant storage, there isn't another disk array subsystem like RAIDION.

RAIDION's, module-by-module expandability allows the array to be configured to the exact capacity you need, with the flexibility to increase capacity in the future. For example, a three-module RAID level 5 array can be expanded up to 32 modules with a total capacity of 65 Gigabytes.

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Core Disk Technology Trends

Prior to exploring user requirements for disk subsystems, it is useful to understand the fundamental reasons for changes in the storage business. The most significant signal of change is disk price per megabyte by platform. This is reached by plotting the street price per megabyte for a configured disk subsystem by platform (PC/workstation, minicomputer, mainframe) over time.

The following points are of particular interest:

- In 1986, mainframe disks provided the lowest price per megabyte, and minicomputer devices, the highest
- By 1992, mainframe disks had become the most expensive while minicomputer and PC subsystems were about equal
- Mainframe disk prices will decrease, becoming nearly the same as those of minis and PCs.

These trends are typically credited to open systems interfaces such as SCSI, alternative distribution channels for disk drives and increased competition. While these factors tend to decrease subsystem prices, the root cause is increasing disk areal density. Disk areal density is the number of bits stored on a specified space.

Almost 70% of the cost of a disk subsystem is attributed to the disk drives. The controller, fans, power supplies and "skins" will continue to constitute less than 35% of disk subsystem value. A disk subsystem's cost and subsequent pricing will be determined by the amount of data that can be stored on a disk platter.

IDC constantly monitors the capacities per platter for disk drives of varying form factors. This research shows that disk areal densities continue to double every 18 months as they have been doing since 1980. In the near future, they may begin doubling every 15 months as technologies like magneto-resistive heads, glass media and advanced read channels achieve higher popularity. These advanced technologies are no longer available only to IBM mainframe customers.

As a result of these storage technology improvements, IDC believes the following products will be in production and widely available to users by 1996:

- Single-platter 3.5" 1G byte Winchesters priced below $300
- Dual-platter 2.5" 1G byte devices priced below $500
- Four-platter 1.8" 1G byte disk drives priced below $800.

The introduction of these products will dramatically alter the storage marketplace because of their low costs, condensed size and voluminous storage capabilities.

These types of devices, for example, could lead to $15,000 disk subsystems containing dozens of gigabytes of storage in a device the size of a laptop computer. Although industry participants frequently debate the merits of optical storage, flash memories and other alternative storage architectures, magnetic disks are likely to remain the most cost-effective and dominant form of on-line storage well into the next century.

Generating parity works effectively. Because any one group of drives contains the XOR notations of all the other units in the group, lost data can be reconstructed by XORing all the remaining devices in the set. Once a failed disk device is fixed or replaced, the data can be reconstructed and written to the replacement unit.

There are, however, several problems and challenges related to generating parity:

- In order to initiate a full recovery and return to protected mode, an operation (either manual or automatic) is needed to replace failed disk devices. This can be costly and complex.
- Updates to data (writes) are overhead-intensive and may negatively impact performance in many RAID configurations.
- Storing parity information consumes disk space and will add to costs.

Ultimately, these problems can be minimized through a variety of techniques and architectural alternatives.

At the most basic level, RAID falls into the category of large capacity storage subsystems. RAID storage subsystems should be viewed by the user as virtual DASD. If a RAID subsystem is built with all essential levels of redundancy, it becomes fault tolerant virtual DASD.

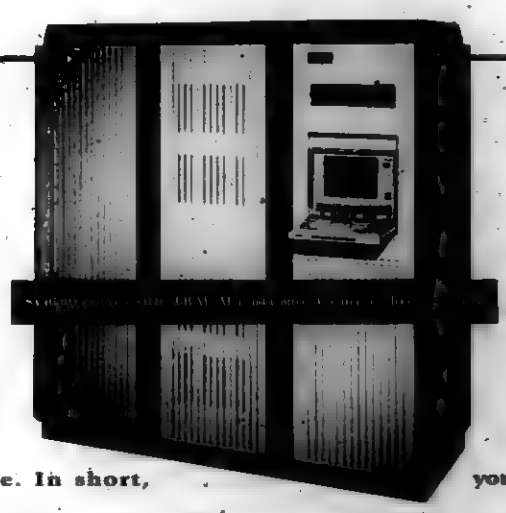
Although originally conceived as a performance enabler, RAID is typically applied commercially as a high availability subsystem. The different levels of RAID technology provide redundancy through various combinations of parity information and data mirroring across drives. Of the six RAID levels that have been defined, only four appear to have a chance of achieving broad industry acceptance: RAID Levels 0, 1, 3 and 5.

RAID Level 0

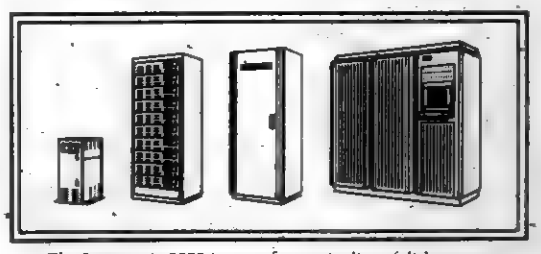
RAID-Level 0 transfers data across an array of disk drives in parallel. This technique has been used for years in various commercial and technical computing environments. Spreading the data over multiple drives allows simultaneous read and write operations, and can result in performance increases. RAID

There's one little word that can strike terror into the hearts and minds of Information Services professionals everywhere: downtime. But thanks to the new Symmetrix 5500 from EMC, it's one word you can virtually banish from your vocabulary.

If your data is mission critical, it's critical you read this ad.



You see, the Symmetrix 5500 ICDA™ is designed with redundant hardware components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime. In short, Symmetrix 5500 brings continuous operation to mission critical sites that need access to data 24 hours a day, seven days a week.



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

And because it's based on EMC's proprietary Integrated Cached Disk Arrays (ICDA™) technology, there's simply no faster way to access data on an IBM or compatible mainframe computer. The Symmetrix 5500 also brings all the features of the Symmetrix Series to mission critical environments: a small footprint, low power and cooling requirements and a two year warranty that add up to reduced cost of ownership and a maximum return on your storage investment.

Downtime can cost your business over $100,000 a day. So, if your data is mission critical, make it your mission to learn more by calling 1-800-424-EMC2, extension LM67C.

EMC²
THE STORAGE ARCHITECTS

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Level 0 does not write parity information and is therefore exposed to increased failure rates.

Availability characteristics depend largely on the number of disk devices used to achieve desired capacities. In general, RAID Level 0 provides protection levels slightly below conventional disk systems and well below other RAID levels

Advantages:

- High I/O rates are achievable, especially with small I/O request sizes
- Appears to the host as a single logical device for easier storage management
- Use of multiple disk actuators allows higher transaction rates.

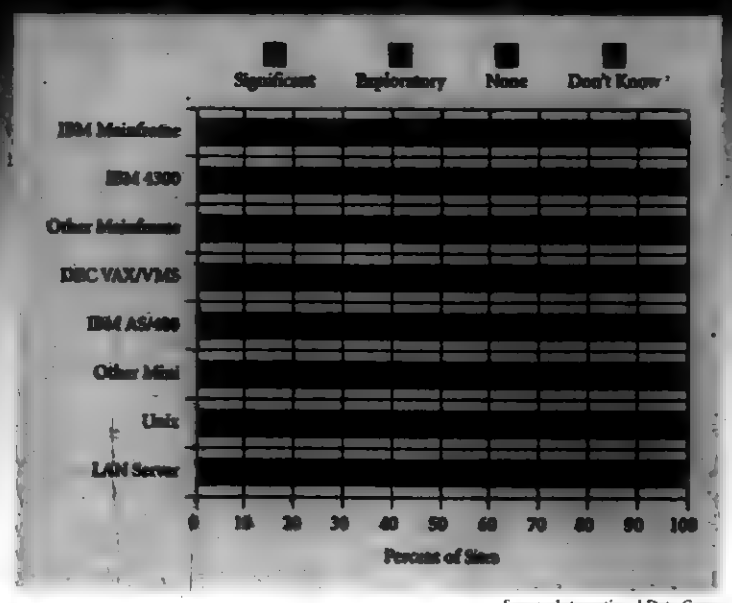
Disadvantage:

- Drive failures result in unrecoverable errors.

RAID Level 1

RAID Level 1, commonly referred to as "mirroring," "dual-copy" or "shadowing," has been available commercially in mainframe and minicomputer environments for years. RAID Level 1 makes an exact copy of the contents of one disk drive on another. In the event of a drive failure, the second drive is accessed for the desired data. While mirroring is typically used to improve data availability, some users actually employ the technique to improve overall subsystem performance.

The main drawback to this level is its cost. The cost of mirroring is very high because twice the normal disk capacity is needed. Even though its expense has limited the use of RAID Level 1, this level is still the most popular form of RAID because it is so effective in mission-critical environments. And RAID Level 1 will remain the most popular form of RAID for at least the next two years. While RAID Level 1 demonstrates good performance characteristics, it also remains difficult to cost-justify.



Source: International Data Corp.

Judging from IDC's survey results, both mainframes and LAN Servers are strong future candidates for RAID technology.

Advantages:

- Copy operations are conducted transparently
- High levels of data availability
- High I/O rates
- Backs up nearly-current data sets.

Disadvantages:

- Requires twice the disk space
- High cost.

RAID Level 3

Like RAID Level 0, RAID Level 3 transfers data in parallel. RAID Level 3, however, generates parity information and stores it on a dedicated device. RAID Level 3 also uses synchronized spindles and parallel data paths. In the event of a drive failure, the parity drive is accessed and data is reconstructed from the remaining devices. Once the failed drive is replaced, the missing data can be restored on the new drive and the subsystem can resume in "protected" mode.

Because data is striped at the bit or byte level, and only one I/O operation can be executed at a time, RAID Level 3 is most useful in applications that require the transfer of large amounts of information quickly, such as imaging and CAD/CAM.

Advantages:

- Capacity overhead for parity is much less than with mirroring, and costs less
- High bandwidth capability and good throughput for large request sizes
- Excellent read and write performance.

Disadvantages:

- Poor performance in transaction environments
- Use in small request size environments results in wasted disk space.

RAID Level 5

RAID Level 5 is rapidly becoming the most popular RAID level after Level 1. It is most applicable in commercial transaction environments where minicomputers and network server platforms are found. Unlike RAID Level 3, however, RAID Level 5 reads and writes data to separate disks independently and allows simultaneous read and write operations to occur. The result is an architecture that is optimized for high I/O rates.

8:34 am

"Six urgent messages on my desk. Looks like the AS/400 took a hit last night. Beautiful…

9:16 am

...Accounting wants to know when the system will be up...

10:00 am

...We've lost some data...was it a disk or controller?...I don't know, we're checking on it, I'll have to get back to you...

10:30 am

...call and tell them we're doing the restore as fast as we can, these things take time, somebody [redacted] Carl down here...

11:08 am

...CEO's calling, wants to discuss 'our little downtime problems'—now...better cancel my 12:00...

12:51 pm

...tell Denver I completely understand, but there's just no way to recover that data—has anyone found Carl...

2:17 pm

...Get New Jersey on the phone —— sure mirroring would help, but we'd still be exposed—— where is Carl?...

4:20 pm

...I know they want it faster...yeah everyone's still down...we're doing the best we can...I'll tell you what we really need...

6:37 pm

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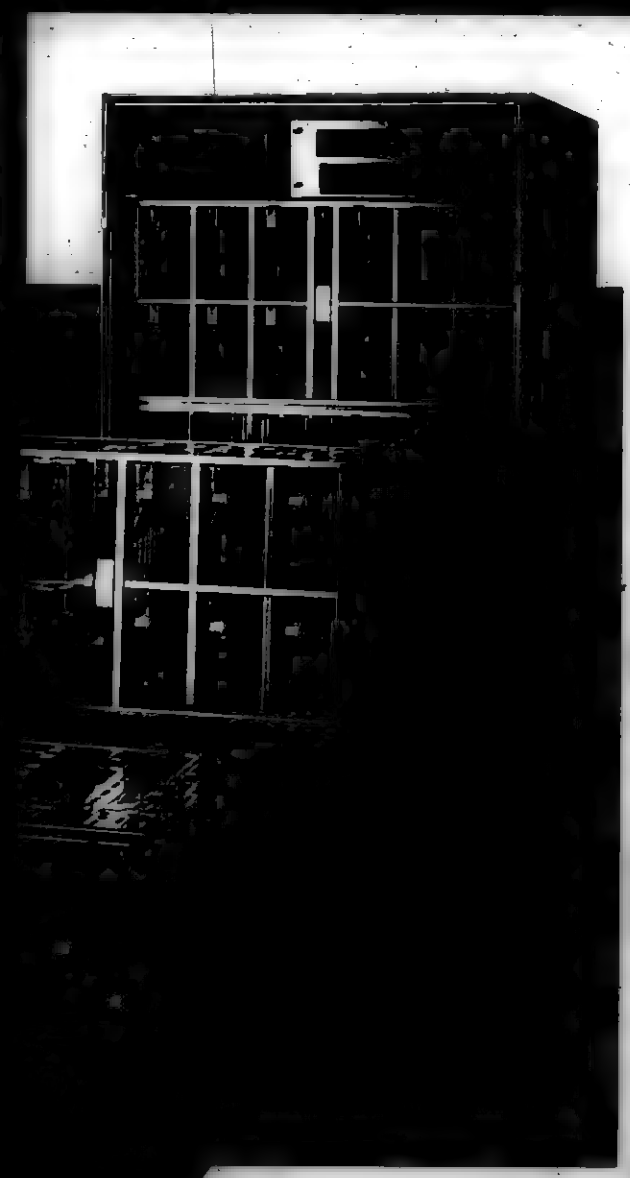

REDUNDANT COMPONENTS. Every key component is duplicated to ensure that if there is a failure in the subsystem, there's another functional device to maintain system integrity. You can even service the system or replace internal units yourself without ever disrupting the system. ALPINE's **CUSTOMER REPLACEABLE UNITS (CRUs)** make it happen. Concerned about power failure or power supply? No problem. ALPINE also has completely **REDUNDANT POWER SUPPLIES AND INTERNAL BATTERY PROTECTION** to keep things running smooth. Concerned about changing technology? ALPINE is designed with the future in mind. Its architecture will adapt and grow with future marketplace technologies. Its **CACHING TECHNOLOGY** ensures superior performance today and tomorrow. And, its **OUTBOARD RISC CONTROLLERS** continuously allow storage management and advanced RAID implementation without host intervention. Is compatibility an issue? ALPINE is designed for **FULL IBM COMPATIBILITY** to support all your applications and to allow easy migration of all your on-line data. The **ALPINE 9600.** A technological reality that is truly the ultimate peace-of-mind AS/400 data storage and protection device.

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RAID Level 5 stores parity information on all drives, interleaved evenly across all devices. This avoids creating a potential I/O bottleneck at, and contention for, the parity drive.

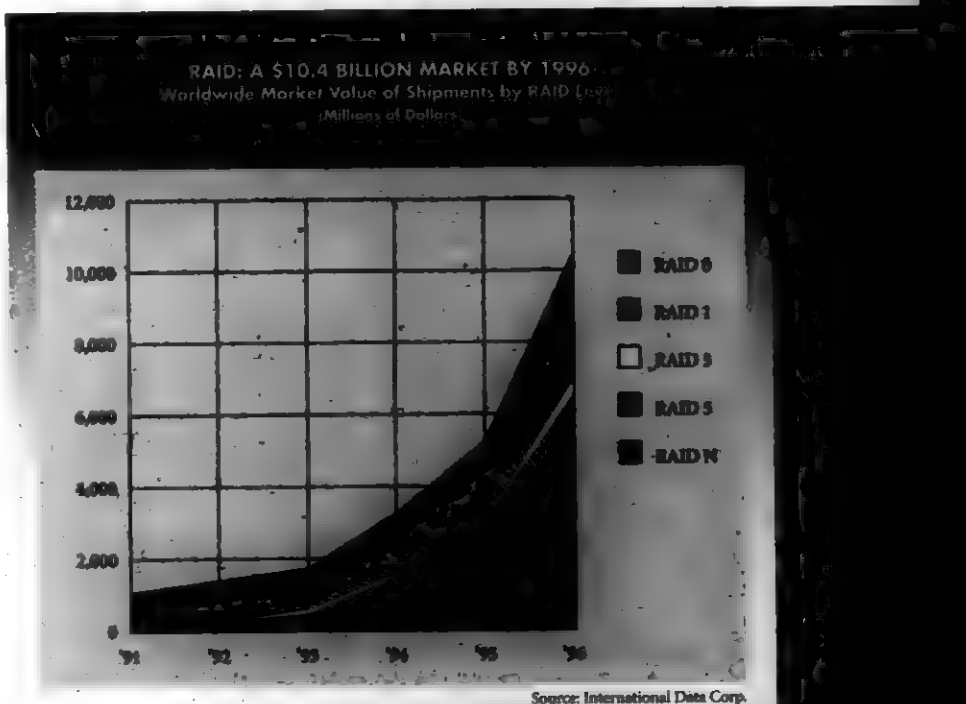
The major drawback of RAID Level 5 is its tendency to degrade write performance. This is referred to as the "RAID 5 Write Penalty" and is explained below. RAID Level 5 is the most balanced implementation in terms of price, availability and performance. The cost of protection can be significantly less than with mirroring, and availability levels are equal to all other RAID levels. If consistent and predictable performance is a primary criterion, RAID Level 5 can probably be configured to meet most performance needs. However, performance will suffer in update-intensive applications.

Advantages:

- Capacity overhead is lower than with mirroring
- High I/O rates
- Excellent performance for read-intensive operations.

Disadvantages:

- Update performance is degraded
- Architecture is not optimized for high transfer rates
- RAID Level 5 Write Penalty.



Source: International Data Corp.

RAID Levels 0, 1, 3, 5 and N are the most likely to produce significant market revenues over the next three years.

The RAID Level 5 Write Penalty

Commonly referred to as the "Read-modify-write cycle," the RAID Level 5 Write Penalty is associated with the need to conduct four operations during a write cycle. RAID Level 5 updates require the following sequence: read old data, read old parity, write new data, write new parity.

While performance also greatly depends on the I/O request size (increased size rapidly degrades transaction rates) and access times, the amount of write activity has the greatest impact on performance due to the read-modify-write cycle.

In addition to the time it takes to conduct four operations, RAID Level 5 write operations incur access-time penalties associated with read-modify-write overhead. In non-RAID Level 5 environments, access times consist of the time it takes to physically access data. Naturally, shorter seeks result in increased transaction levels. In RAID Level 5, only the read component of the read-modify-write sequence is subject to normal I/O request times.

Because a RAID Level 5 write is preceded by a read operation (to read the old data), the access time associated with the write component is primarily a function of rotational latency. This latency period amounts to at least a single disk rotation. Mechanical disk rotation is the largest single factor affecting overall transaction performance.

While optimization techniques like seek-reordering can be used to improve access times, their benefits are all but negated in RAID Level 5 write situations. Generally, the performance of non-cached RAID subsystems is determined by four factors:

- Read/write mix
- Amount of data transferred per each disk access
- Seek command queue depth
- Number of drives in the RAID group configuration.

Of these factors, the intensity of write activity has the biggest impact on non-cached RAID Level 5 performance. Specifically, the higher the write activity, the greater the performance penalty.

Eventually, the RAID Level 5 Write Penalty will be minimized through a variety of write-caching or write-assist technologies.

RAID Level "N"

RAID Level N generically refers to levels beyond RAID Level 5. While the definitions of these levels is subject to debate, the basic design tenets are not. They are twofold: first provide increased levels of data protection and availability; second, reduce or eliminate the RAID Level 5 Write Penalty.

Additional characteristics of RAID Level N will include complex and elegant features such as fault tolerance at all levels for drives, controllers, cache

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RAID Myths and Realities

MYTH: RAID will take over the market tomorrow.

REALITY: For the next 18 months, a pervasive lack of knowledge about RAID technology will prevent it from expanding beyond an important niche market. Today, only supercomputer sites committed significant resources to RAID.

MYTH: Advanced levels 3, 5 and N of RAID will immediately replace RAID Level 1 mirroring capabilities.

REALITY: Many users like mirroring — which involves creating backup by copying the contents of one disk onto another — and are willing to pay its high price in order to realize its utility. Mirroring remains the dominant RAID technology today and its popularity will continue to grow for the next two years.

MYTH: RAID always improves performance.

REALITY: RAID relies on redundancy for fault tolerance, often lowering system performance in terms of capacity and access time. Capacity is reduced because disk space must be used to store redundant data. Access time is increased because extra disk seeks are required to access and update redundant data. In most cases, benchmarks show RAID system performance lags behind non-RAID system performance.

MYTH: RAID data is never lost.

REALITY: No subsystem is perfect. The reliability levels of RAID vary by product and vendor. For example, some RAID subsystems use data caches to improve write performance. If the cache does not have an independent power source, a power loss could cause data stored in the cache to be lost. Another example: Some RAID products use two levels of parity — another backup technique — so two-drive failures can be absorbed. Others use one level. In either case, improperly configured or functionally deficient RAID products may result in data loss. Still, the primary source of data loss is human error. A fault tolerant disk drive, therefore, does not ensure 100% data protection.

MYTH: RAID provides continuous data availability without customer intervention.

REALITY: It is true that most RAID products remain up during disk failures. However, failures to a single RAID Level 1 controller or host adapter attached to both a data drive and a mirrored drive make data unavailable. Moreover, many RAID products require operator intervention to "heal" failed drives or add storage capacity.

MYTH: RAID eliminates cost and concern related to drive failures.

REALITY: Since it relies on a larger number of smaller drives to store the same amount of data as a single, large, expensive disk, RAID is more likely to suffer disk mechanism failures. Each failure may be less severe since the data is recoverable, but the failures will come at a much more rapid rate, potentially invoking unforeseen service costs.

MYTH: RAID is inexpensive.

REALITY: While the "I" in RAID is often said to stand for "Inexpensive," in reality, RAID is more expensive than conventional disk subsystems because of parity overhead and controller complexity. Today's RAID subsystem prices per megabyte range from 5% to 80% higher than non-RAID subsystems.

MYTH: RAID eliminates the need to back up online data.

REALITY: While many RAID products simplify the backup process and lessen its urgency, RAID is not a replacement for normal backup and archival procedures. In addition to off-site archival and data interchange capabilities, tape remains the best backup. Moreover, adding drives to a RAID system often requires a save/restore procedure as many RAID subsystems need to redistribute parity data onto new devices.

memories, backplanes, fans and power. Moreover, the ability to replace any component while the subsystem is operational will also be developed. For the next several years RAID Level N subsystems will be justifiable only in large systems environments.

RAID Level N has yet to reach volume shipment levels. This is at least partly attributable to its cost, which ranges from 35% to 70% over conventional subsystems. Clearly, RAID Level N must be justified by the need for continuous data availability.

Advantages:

- Capacity overhead is lower than with mirroring
- High I/O rates
- Excellent performance for read- and write-intensive operations

Disadvantages:

- Increased cost
- Increased complexity.

RAID Software

Various RAID levels can also be achieved via host software. This approach offers lower cost and the ability of using existing disk and controller resources. The drawback is that no one vendor takes responsibility for ensuring total data availability. This can lead to finger pointing if a device or controller

failure occurs.

Some RAID software suppliers actually pre-package subsystems (drives, controllers, fans, etc.) to provide a tightly integrated offering that eliminates finger pointing.

Software implementations are viewed as lower-performance alternatives because they use CPU processing power. This software performance degradation can be minimized by allocating unused CPU cycles to process redundant operations.

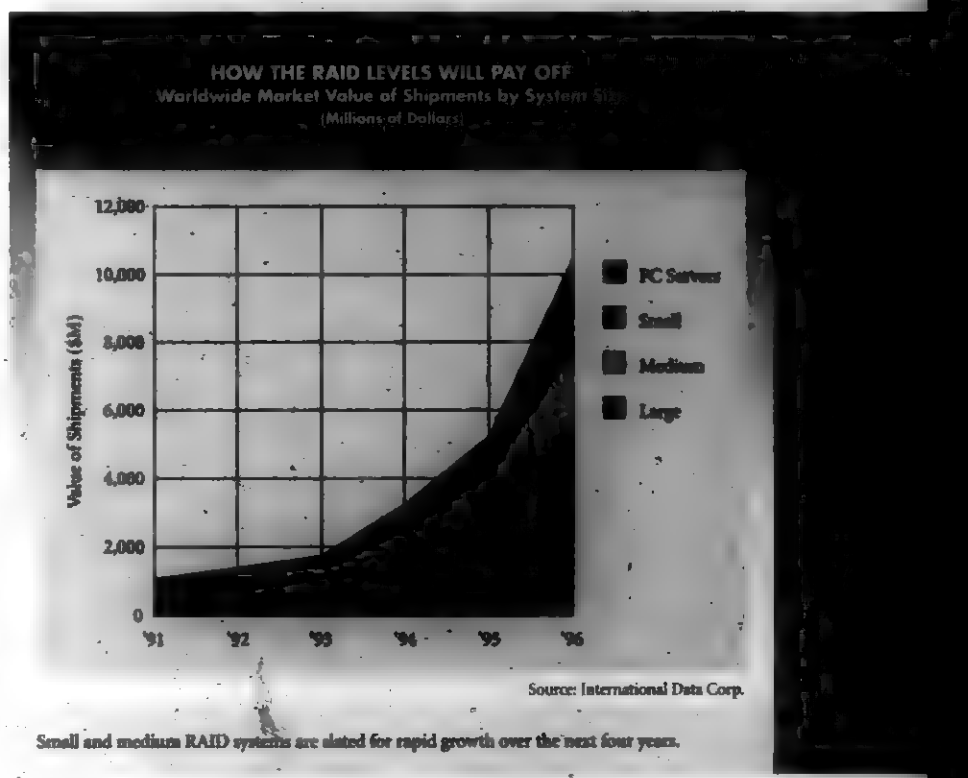
RAID host software is a low cost fault tolerant disk-option. Next-generation operating environments like Microsoft's NT and new releases of Novell's NetWare are expected to incorporate host-based RAID software. Despite performance concerns, RAID software can enable customers to employ existing resources toward realizing fault tolerant disks. To the extent that the highest availability and performance are crucial, however, software-based RAID is not the ideal solution.

Advantages:

- Lower costs
- May allow the use of existing I/O hardware.

Disadvantages:

- Not optimized for performance
- Often not pre-packaged and integrated
- May lack fault tolerance.



Small and medium RAID systems are slated for rapid growth over the next four years.

THE MARKET IMPACT OF RAID

While IDC believes that RAID is largely unsuitable for single-user systems or LAN nodes, awareness and use of RAID is increasing within all classes of host and network systems and servers. In this year's IDC Global IT Survey, respondents were asked to describe their use of RAID over the next 12 months as either "significant," "exploratory" or "none." The following points are based on their responses.

- RAID is perceived as equally applicable in all site environments
- Compared with last year's survey, current RAID awareness and buying intentions are up. This is based on the fact that fewer respondents describe their use of RAID as "none"
- Awareness and intent to buy within the AS/400 base increased dramatically in a year: "Significant" responses doubled to 14%
- LAN sites' expected use of RAID exceeds all other environments based on combined "significant" and "exploratory" responses
- IBM mainframe customers' expected use of RAID decreased. Those citing "significant" dropped from 14% in 1992 to 8% in 1993 due to storage product delays in this market segment.

Although it is not growing rapidly, the worldwide market for disk subsystems attached to multiuser systems and network servers is large. Currently, RAID comprises less than 5% of this business. As more products become available between now and 1996, however, IDC believes that RAID will grow to account for 40% of the market.

CONCLUSION

Conventional disk systems will remain the configuration of choice for the foreseeable future. While non-RAID subsystems will never provide the protection of RAID, many users do not care. Moreover, subsystem designers are finding ways to minimize exposure to failures through techniques like predictive monitoring of devices and caches.

Additionally, many features normally associated with RAID, such as compression, compaction and open data set backup, will find their way into conventional subsystem designs.

Despite ongoing developments in conventional disk technology, RAID offers benefits that simply are not available elsewhere. Mainframe sites that rely on high availability and round-the-clock uptime can realize tremendous productivity increases by implementing RAID. In such high-demand, transaction-oriented environments, RAID technology may be suitable for 70%, 80% or even more of total data.

RAID technology is still maturing, but even at this relatively early point in its lifespan, it provides the critical first step toward high availability: guaranteed disk access. ■

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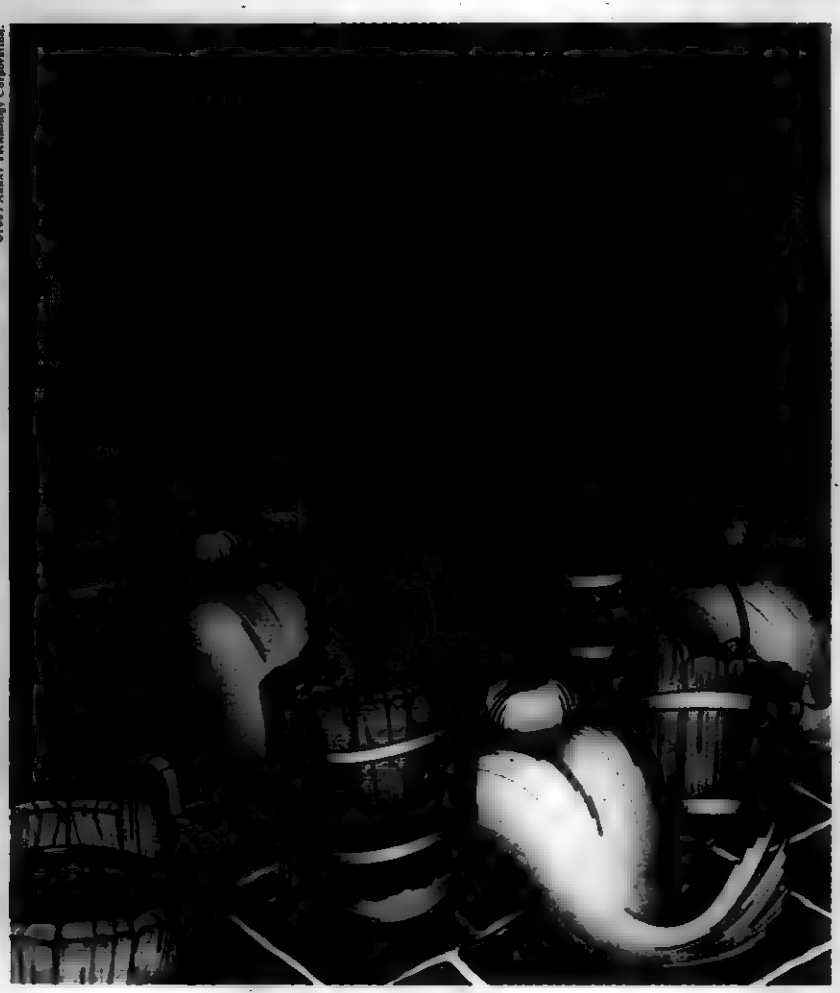

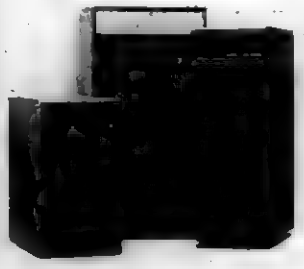

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How to get 'runaway projects' on track

Experts give advice on preventing a systems development effort from becoming a white elephant

By Mitch Betts

VIRTUALLY EVERY LARGE COMPANY and government agency has an embarrassing "runaway project," an information systems development effort that is way behind schedule and way over budget.

It may be known as the black hole, the white elephant, the Golden Fleece, the boondoggle — or it may be too painful to mention at all. Sometimes, it gets the chief information officer fired.

The latest examples of runaways in the news include AMR Corp.'s joint venture to build the Confirm reservation system for hotels and rental car companies, which led to lawsuits and a $165 million write-off (CW, Oct. 12, 1992). In addition, the Federal Aviation Administration continues its struggle to finish the much-delayed Advanced Automation System for air traffic controllers.

What follows is a roundup of expert opinions on how to get runaway projects back on track or prevent them from derailing in the first place.

▶ Jim Wilbern, national director of the 10-year-old Runaway Systems Management practice at KPMG Peat Marwick in Dallas.

"One of the interesting characteristics of runaway projects is that they are usually the largest projects ever undertaken by the IS organization or the vendor involved. People figure they can handle the technology, but they don't realize it's not a technology problem, it's a management problem. Most organizations just don't have the project-management expertise to take it on.

"We try to get organizations to do an assessment, a reality check of where the project is. That slows the project down a little bit, but it only takes one to two weeks. We come up with a strategy of how to put the project back on track.

"One alternative is to cancel the project. Most U.S. organizations don't do that, whereas in the UK and Canada, they're more apt to cancel. In the U.S., there is a bigger fear of losing market share or other business benefits [from canceling a strategic information system]. Also, there is a certain amount of ego or face-saving among senior executives; they would rather put more money in a deep hole than cancel the project.

"The alternative that most organizations have taken is to restructure the project. You need to reconfirm what you signed up for and get user buy-in. You need realistic dates, realistic estimates and a pretty good project plan.

"Another way is to take a second look at commercial software packages that could be installed or tailored, rather than custom-designed software.

"Only 30% of the calls we get are what I would call preventive or proactive, and only 10% of those are from CIOs. Preventive measures include getting users to be sponsors of the project, good planning and installing a change management system, an issue tracking system and a status reporting system.

"We also have an early-warning diagnostic system that gives IS managers a reading of their vulnerabilities so they don't get just the happy news. With the Confirm project, they could have used something like this to buffer the happy news they were getting all of the time."

▶ Albert L. Lederer, chairman of the Department of Decision and Information Sciences at Oakland University in Rochester, Mich.

"Corporate politics plays a huge role in runaway projects because of the pressure to come up with acceptable estimates and schedules to get project funding. We're not very good at estimating in the first place, so it's easy for systems developers to underestimate the cost. That lowball figure sells the project to upper management, but the project turns out to be much bigger or different from what we thought it would be.

"Then, it's almost a no-win situation. You want to revise the schedule, but that means publicly admitting you screwed up the schedule in the first place. If you stop the project midstream, you may lose some knowledgeable people. In the past, you would add more people to it, but there isn't much evidence that adding more people to a late project will bring it back.

"A very popular fix is to find parts of the project you can delay so you can still deliver something resembling what you promised. You can also 'crash' the project, which means working overtime to get caught up.

"What is really needed is more responsibility and less finger-pointing. It's easy to blame someone else who did the estimates or the user requirements or the initial design. But you come closer to finishing projects on time and within budget when the people who do the estimates and requirements are the same people who actually build the system. That develops responsibility and continuity."

Jim Wilbern: *Runaway projects are management problems, not technical problems*

▶ Gregory J. Zawacki, president of Spectrum International, Inc., a Pittsburgh firm that offers a systems development methodology and project management tools.

"Runaway projects can be prevented. I'm positive of that.

"One of the most common problems with runaway projects is that they weren't planned thoroughly at the outset. People did not think of all the things they needed to do, so they actually had a bigger project to start with, but they didn't realize it.

"For example, user training may be omitted or glossed over, when in fact there may be 100 or more users who need training. Another example is documentation, which is often forgotten or thrown together at the end.

"Our methodology has a thorough template of activities that need to be done and included in the estimate. Our estimating process tries to estimate what it really takes to get the job done, not what answer somebody wants to hear.

"At the very beginning, when you probably have done only 2% of the work, coming up with an accurate estimate is almost impossible [see chart]. You don't know enough — you don't even know what the user requirements are — and yet that's when people are asking you for estimates and a schedule.

"Our methodology includes five 'funding points' at different stages in the project's life cycle, where the project manager and sponsor can discuss the status of the project and renegotiate scope, schedule or budget.

"When the project reaches a funding point, and they realize it is bigger than they originally thought, the sponsor has to make a decision. Can I cut the scope? Do I put more resources on it, knowing it will cost more than originally estimated? Or do I sequence it so that I get some of the benefits now and defer some of the benefits?

"If you have to reduce the scope so much that you won't get any benefits, then it makes sense to cancel the project."

▶ William Marks, president of POC-IT Management Services, Inc., a Santa Monica, Calif., consulting firm specializing in project management.

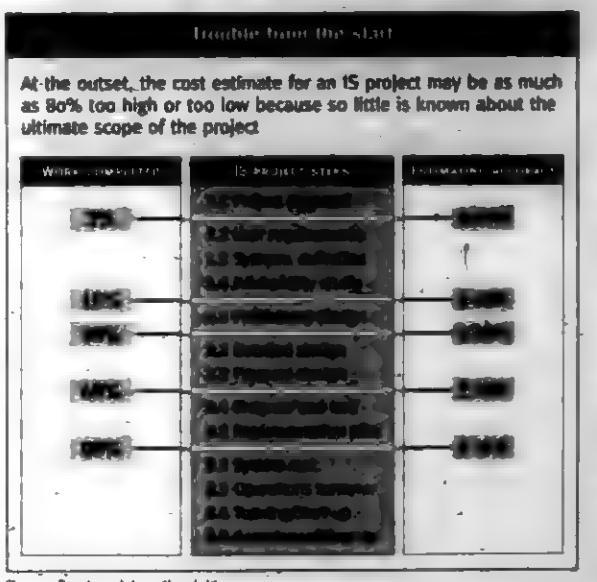
"When a project gets out of control, you should stop and take stock. Make sure you have the sponsorship you originally had or thought you had. Make sure there is a clear understanding of the economics of the project — the costs and the benefits.

"If necessary, go through a rejustification and refunding of the project. Are the powers that be willing to fund it?

"Once you have a good understanding of the costs and benefits and you have a strong sponsor, then you need a sound project plan. That's usually where things have gone wrong in the past. You need detailed estimates of the effort required and clearly defined responsibilities as to who's going to do what. There needs to be full and active participation from all of the key members of the project team.

"You have to track the project very closely, stay on top of the costs and timing of each milestone and stay in close communications with your project sponsor. When you do those things, usually your project gets back under control.

"Of course, if you do those things on the front end, you won't have out-of-control projects."



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Just how do you spell 're-engineering?'

By Garry Ray

You won't find "re-engineering" listed in the Oxford English Dictionary, but Gemini Consulting, Inc. in Morristown, N.J., claims the vaunted reference book is a core component of its Construct re-engineering methodology.

No, the last word on words is not embedded in the consultancy's new BusinessWorks re-engineering software, announced last week. The dictionary is employed by Gemini consultants to help corporate executives craft a "corporate glossary" for the entire company. "If you don't have a common language [to discuss a re-engineering project], you're wasting a lot of time," said Gemini Vice President Steven Patterson.

Having agreed on the company's common vocabulary, the executives next use Gemini's BusinessWorks software to define their fundamental business purpose and overall business objectives.

Then the executives create a companywide "work reference model" (WRM) and "object reference model" (ORM) in BusinessWorks.

To develop the WRM — which includes all of the activities supporting the business purpose and objectives — they add as many as 50 phrases in verb/noun form. Patterson said the WRM might include such fundamental processes as "sell products," "fulfill orders" and "contact customers."

> **"If you don't have a common language ... you're wasting a lot of time."**
> *— Steven Patterson, Vice President, Gemini Consulting*

"The only thing we look at is what is being done and why it's being done," Patterson explained.

Because the WRM actually is a representation of the company's business transactions and business rules, Patterson added, "it is important that the terminology be relevant, consistent, accurate and can be defended."

Software dictionary

The terms are then transferred to the ORM portion of Construct. Nouns created in the previous step — such as "product" and "customer" — represent data elements in the ORM and are used to create a source data dictionary for the entire company.

Executives can get an overview of all records, data, transaction types and objects used within the company because these data elements and processes have been captured and organized in the BusinessWorks software.

The end result, Patterson said, is a set of transaction models and data models that can be used throughout the organization. "We're trying to boil all of the activity down to one set of code and processes that can be used across the company," he said.

Analysts said the construct methodology and BusinessWorks software provide more than analysis and prototyping of business processes.

"They've delivered an environment that allows business and software managers to get in a room and understand each other," said John Ryner, vice president of Patricia Seybold Group in Boston.

BusinessWorks, which was jointly developed by Gemini and ParcPlace Systems, Inc. in Sunnyvale, Calif., is an extension of the ParcPlace VisualWorks development environment, company officials said. It is available in conjunction with Gemini consulting services and is not sold separately.

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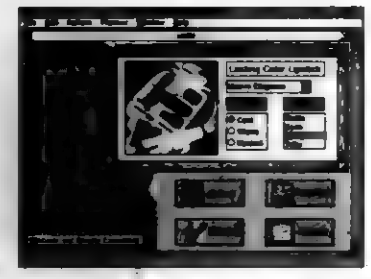

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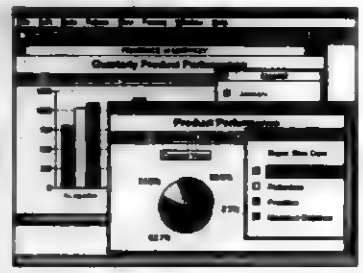

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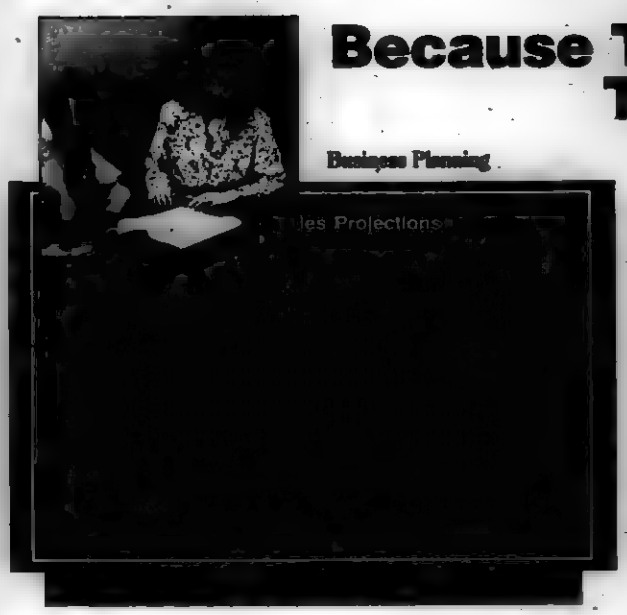

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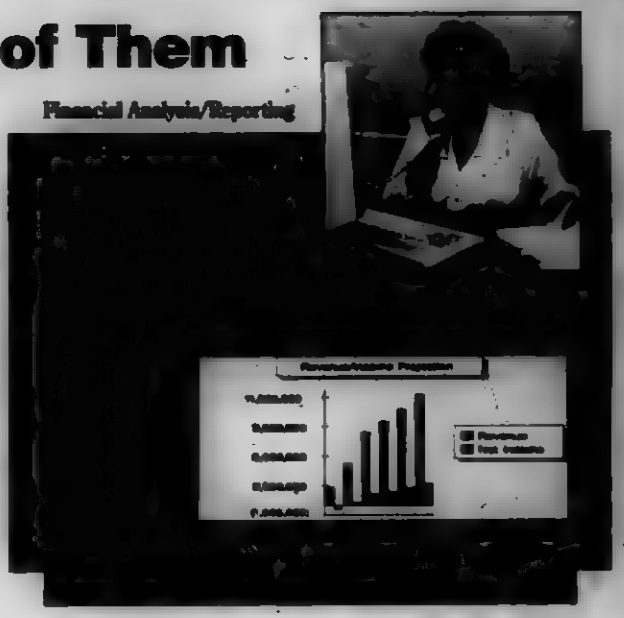

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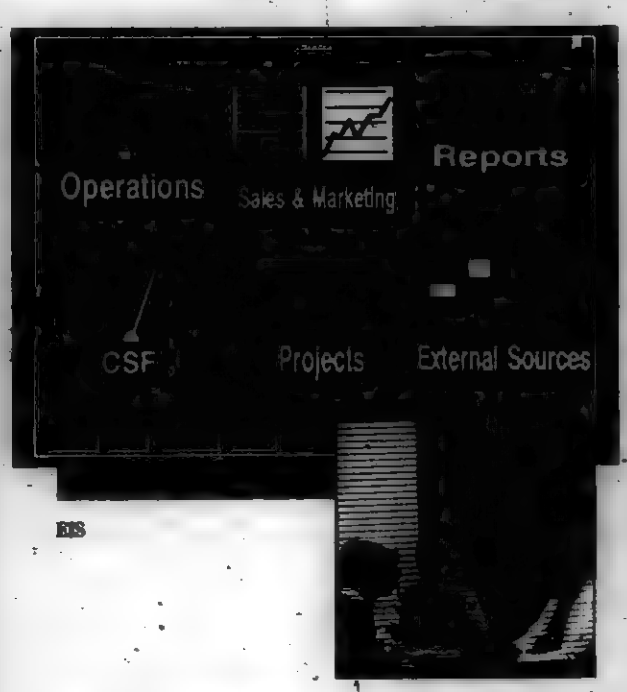

The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

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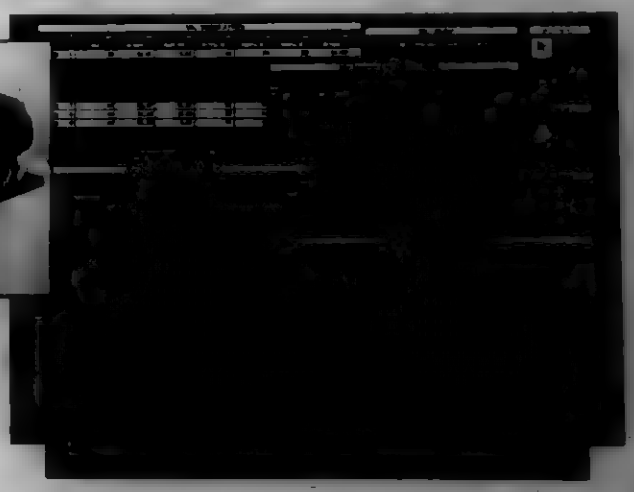

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Application development tools

BKS Software, Inc. has introduced Version 2.0 of Poet, an object-oriented database system for C++ application development.

Enhanced capabilities in object locking, event handling and transaction support have been added. According to the company, Poet 2.0 increases user productivity by removing the translation needed when shifting data between file-oriented database systems and object-oriented applications based on the relational model. Code is reusable, extendable and maintainable because applications stay object-oriented.

Prices for Poet 2.0 start at $2,700.

▶*BKS Software*
Suite 2200
1 Kendall Square
Cambridge, Mass. 02139
(617) 621-7047

Tritus, Inc. has announced Version 1.2 of Tritus SPF, a style editor that supports OS/2 and DOS.

The product is a PC version of IBM's mainframe-based ISPF/PDF 3.3. According to the company, mainframe users can work with the same keystrokes and commands found on the mainframe editor while using the PC.

Features for Tritus SPF include modifiable panels, custom fonts, edit scroll fields, multiple logical terminals and a complete keyboard mapping ability, among others. DOS or OS/2 and a minimum of 2M bytes of memory are required.

Tritus SPF 1.2 costs $345.

▶*Tritus*
Suite 120
6034 W. Courtyard Drive
Austin, Texas 78730
(512) 794-5800

XVT Software, Inc. has announced Release 1.0 of the XVT-Design++, a software package that provides a complete graphical user interface (GUI) tool for creating C++ applications.

According to the company, the package comprises two components: a C++ application framework with graphical user objects and an interactive design tool for user interfaces that incorporates a C++ code fragment editor. The XVT++ Application Framework and the XVT Portability Toolkit are included.

The XVT-Design++ costs $1,395 for Intel Corp.'s 1486 and similar systems and $3,095 for workstations.

▶*XVT Software*
4900 Pearl East Circle
Boulder, Colo. 80308
(303) 443-4223

Pure Software, Inc. has announced Purify 2, an error detection tool.

According to the company, the product was designed to improve software reliability by getting rid of runtime memory errors, memory leaks and memory access errors.

Purify 2 detects runtime errors in C and C++ Unix applications. An incremental linker for rapid turnaround and mail mode for remote error reporting are included.

Purify 2 costs $4,000.

▶*Pure Software*
1309 S. Mary Ave.
Sunnyvale, Calif. 94087
(408) 720-10000

Silicon Valley Software has introduced EasyDBG, a visual, interactive debugger.

The product was designed for the company's SVS ANSI C, 386/486 SVS Fortran-77 and SVS Pascal language systems.

Features include a pull-down menued interface, single-key command operations and extensive on-line Help. Users can also customize the EasyDBG interface.

The product's full-screen display simultaneously shows variables, source and optionally disassembled object code while the application's output is sustained on a separate virtual screen, the company said.

EasyDBG runs as a true 32-bit application and is DOS protected-mode interfaced for Microsoft Corp.'s Windows, DOS and OS/2.

EasyDBG costs $195.

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RETHINKING RE-ENGINEERING

The idea is still hot, but companies are discovering it's tricky – and risky – to rip up business processes. High failure rates give rise to a new, more cautious trend: 'Re-engineering Lite.'

COMPUTERWORLD SPECIAL REPORT

Nick Nelson

▲ **Elf Atochem's Robert Rubin:** *His company's recent projects aren't huge but still have big impact*

By Rosemary Cafasso

When consultant Michael Hammer challenged businesses three years ago to reinvent themselves, he might as well have set a lit match to a haystack.

Interest in business process re-engineering and its variants roared across industry. Notable early successes, including Ford Motor Co. and Hallmark Co., only fanned the flames, as did articles in *BusinessWeek* and other publications.

Today, observes George Sekely, president of CSX Technology, Inc., the information systems arm of transportation giant CSX Corp., re-engineering remains "this season's Holy Grail."

Indeed, several recent polls show that 70% or more of large U.S. companies claim to be re-engineering. The market has also attracted hundreds of experts for hire, ranging from giants such as Andersen Consulting to tiny, one-person consultancies.

Despite broad interest, the original concept — wholesale and widespread detonation and reinventing of business processes — has yet to become the success many had expected.

Computerworld interviews with nearly two dozen top IS executives and consultants, plus an exclusive survey of the nation's leading technology users (see charts beginning on facing page), reveal that re-engineering still has wide appeal but is much harder to implement than many expect.

Early fruits

The poll of IS executives at *Computerworld Premier 100* companies found that nearly half of the organizations re-engineering say they are enjoying greater productivity, lower expenses, higher profitability or other benefits.

But many are starting small or scaling back projects, consultants say, after encountering the huge challenges that characterize full-blown re-engineering. Only one in four firms involved in re-engineering projects is tackling total, large-scale redesign, our survey found.

True, a half-dozen companies polled reported megaprojects with budgets exceeding $100 million. But most respondents say they are doing pilot projects that involve fewer than 30 people and less than $1 million in funding.

"We don't want to re-engineer the whole world in one shot," explains Tom Loane, vice president of information services at Alamo Rent A Car, Inc., where several re-engineering projects are under way.

His thinking is typical of the new, more modest approach, which might be termed "re-engineering lite."

"We do projects in segments," Loane says, "each of which has a deliverable benefit at the end of it." While the projects aren't reinventing Alamo's business, they will substantially boost customer service, Loane says.

The bottom line is that classic, big-bang re-engineering is not shaping up as *the* business strategy for every company. While no one interviewed said the concept is a failure, re-engineering has become an option for a narrower field of companies. One likely reason, consultants say, is that huge projects are very tough.

Goals often unmet

Even re-engineering's biggest boosters say the chances for failure are better than those for success.

CSC Index, Inc., a Cambridge, Mass., consultancy credited, along with Hammer, as the concept's originator and best-known cheerleader, recently said nearly three-fourths of re-engineering projects would fall short of expectations.

In a report co-authored by Hammer and published late last year, CSC Index said almost one-

fourth of 300 re-engineering projects in North America were not meeting their goals. The authors, however, speculated that the failure rate is more likely "on the order of 70%."

Many say the figure is even higher. "I would say it's probably 80% to 90%," says Robert Rubin, vice president at Elf Atochem North America, Inc., a Philadelphia chemical producer, and president-elect of the Society for Information Management.

Mark Klein, a senior vice president at Gateway Management Consulting, estimates that only 5% of re-engineering projects will meet their original goals. "If you are talking about the 80% reductions and tenfold increases," he adds, "even 5% may be generous."

CSC Index uses a narrow definition of failure that includes any project "either completely abandoned or changed for something more incremental," says Bradford Power, a CSC Index consultant who directs Index Quantum, an advisory service on re-engineering.

Despite that tough standard, there's general agreement that the number of bona fide re-engineering successes to date is relatively small. Power estimates the figure is "somewhere in the couple of dozen to 50 range."

What's more, CSC Index says the number of people tackling re-engineering is probably overstated. In late 1992, CSC Index published a poll showing that 72% of 407 respondents had a "major and formal process improvement" under way.

But CSC Index Vice President Steven Stanton calls the figure a "garbage" number. "I am talking about really big and fast change," he says. "Most organizations feel the need, but I don't think 70% are doing it."

What's the problem?

While reasons differ from firm to firm, consultants say many big re-engineering efforts fall short because the concept is so hard to implement. Experts say the biggest challenges include the following:

Corporate resistance. Experts cite a formidable array of "soft" issues as the biggest roadblock to re-engineering success.

Among other things, the endeavor demands executive-level commitment, ongoing involvement by high-level personnel, highly effective communication and the courage to face tremendous change in work habits. Companies must also accept a new definition of corporate culture, often preempting one that has been in place for decades or longer.

"People are talking a good story," says Roger Burlton, national director of information technology at SRI Strategic Resources, Inc., a consultancy in Bernaby, British Columbia. "But when I see them at conferences, I often see issues like internal politics, hierarchies and incredible issues on change management. This is scaring the heck out of people."

Unrealistic expectations. More fundamentally, IS managers and consultants say high hopes can also be a project killer. "[If] you think there

Re-engineering, *page 104*

Buzzword buzzings

"[Re-engineering] is a 80,000-ft word, and it doesn't have a good definition. We've done some things . . . before the word re-engineering came out that were, in essence, re-engineering." —*Robert Hecht, vice president of investment systems, Prudential Investment Corp.*

"Re-engineering is for [companies] that have concluded that evolution won't get them there—whether it is digging out of a ditch or getting to the next mountain. Either way, they need a quantum leap." —*Rudy Puryear, managing partner, Andersen Consulting*

"One way to judge if you are re-engineering: The first time you bring it up, if no one screams, 'Are you crazy?' then it is not a re-engineering project." —*Robert Rubin, vice president of information services, Elf Atochem North America, Inc.*

"Pick up a consultants directory and try to find a firm that doesn't say they work with re-engineering. Everybody wants to apply it to what they are doing . . . to seem in tune with the times." —*Mark Klein, senior vice president, Gateway Management Consulting*

"It is absolutely necessary that we continually improve. Don't make a big deal out of it." —*George Sekely, president, CSX Technology*

"If you do not have a snake oil to sell, you will have a tough time making a buck. If every solution for the world of information systems was implemented that was going to save us $50 million, we'd only be spending about a buck on IS today." —*Tom Loane, vice president, information services, Alamo Rent A Car, Inc.*

"There is always a current seduction, and everyone wants to get on the bandwagon." —*Erwin Martinez, principal, CSC Partners*

"This is the CASE of the '90s." —*Roger Burlton, national director of information technology, SRI Strategic Resources, Inc.*

"A lot of what is being cast as re-engineering would have been called operations improvement two years ago." —*John Demetra, principal, Deloitte & Touche*

Modest projects predominate

Most say they are re-engineering

Based on the classic definition, are you re-engineering any part of your business?

Percent of respondents (Base: 100)

YES: 72%	NO: 28%

but only one in four is attempting a total redesign

Level of re-engineering

Number of respondents (Base: 72)

1. Simplification: remove steps from a business process	4
2. Simplification/improvement	5
3. Improvement: add new technology and remove steps	22
4. Improvement/Total redesign	15
5. Total redesign: new process, new technology, new way to accomplish goal	24
6. Don't know	2

Half choose smaller scale projects

How would you describe the scope of your project?

Number of respondents (Base: 72)

Single process in department	1
Departmental	10
Divisional	23
Enterprisewide	34
Other	3
Don't know	1

with modest funding

Cost of project?

Number of respondents (Base: 72)

Less than $300,000	20
$500,000-$1M	8
$1M-$5M	10
$5M-$10M	8
$10M-$50M	10
$50M-$100M	8
More than $100M	6
Other	2

and staffing

How many people are involved in implementing the project?

Number of respondents (Base: 72)

Fewer than 10	12
11-30	29
31-50	8
51 or more	20
Don't know	3

Methodology

Computerworld recently polled 100 of the nation's most effective technology users to get an unbiased look at what they were really doing in the way of re-engineering. Top-ranking IS executives from the 1992 *Computerworld Premier 100* were surveyed by telephone by First Market Research Corp. in Austin, Texas, between Feb. 15 and March 1, 1993.

PAYOFFS TANTALIZE BUT TOUGH TO NAIL DOWN

IS THE PROJECT MEETING YOUR EXPECTATIONS?

NUMBER OF RESPONDENTS (BASE: 72)

Yes	56
No	4
Don't know	22

PLEASE SPECIFY BENEFITS:

NUMBER OF RESPONSES (BASE: 123)

Productivity boosts	27
Overall expenses reduced	27
Profit boosts	22
Staff reduction	21
Revenue boost	14
Market share increases	12

CAN YOU CURRENTLY MEASURE BENEFITS FROM THIS PROJECT?

NUMBER OF RESPONDENTS (BASE: 72)

Yes	45
No	25
Don't know	2

WHO MEASURES THE BENEFITS?

NUMBER OF RESPONDENTS (BASE: 72) MULTIPLE RESPONSES ALLOWED

User department executive	31
Corporate officer	30
IS executive	11
Other	11

Re-engineering

CONTINUED FROM PAGE 103

are some silver bullets out there, then you will find yourself disappointed with results," says John Demetra, a principal at Deloitte & Touche. "Some people have taken a few examples as gospel and feel those results are available in every situation."

Hammer, president of Hammer and Co. in Cambridge, Mass., says re-engineering is more like a game of chess than roulette: You lose not because of bad luck but because you don't know the rules. Many firms don't understand everything involved in a "real" re-engineering project, Hammer says.

That's what happened at one consumer goods company that recently aborted a re-engineering project. According to the firm's chief information officer, who requested anonymity, the company did not do its homework. One major mistake, the executive says, was failure to include all 50 profit centers in an evaluation of the best administration system.

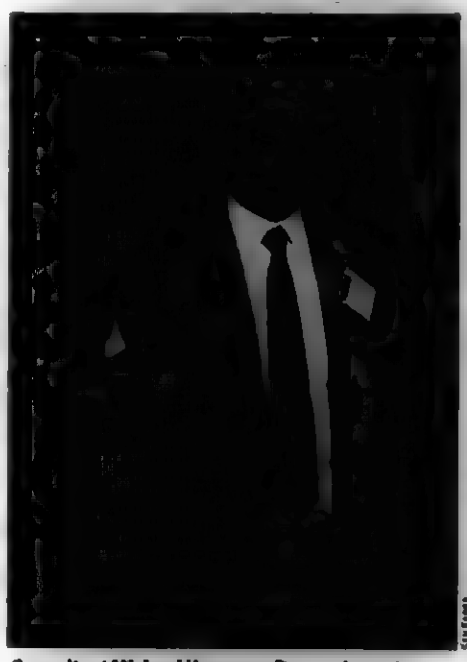
Instead, the company studied the processes of only three or four centers and based changes on this sample group. So when it came time to introduce the new process, some centers simply couldn't cope.

The CIO concedes, "[We] totally underestimated the complexity and diversity of the business. You expect some glitches, but you don't expect to find totally different ways of running the business."

Experts say scores of other companies have fallen into the same trap, making it impossible to effectively manage the broad range of issues inherent in re-engineering.

Quiet de-emphasis. Obviously, no company wants to trumpet its fiascos, so many such failures slip by unnoticed. Failures "are never visible because people gradually phase them out," SRI's Burlton says. "The scope gets whittled away. People end up not fighting the politics and taking a safer route. They don't want to lose their jobs."

Elf Atochem's Rubin says he knows how re-engineering projects can wane, even if successful: Last year, Elf Atochem set out to simplify its spending authorization program and installed a small computer system to automate it. "But since we had taken away a lot of the pain, the impetus to go back and clean it up disappeared," he says. Now the project is back on the priority list.



Consultant Michael Hammer: *Re-engineering not meant for every company*

Not all projects are so lucky, says Sid Diamond, former Black & Decker Corp. CIO turned consultant. "I have seen projects scaled back or extended because of internal politics or resistance to change factors."

Weak corporate backing. Finally, some projects falter because nervous corporate backers pull out at the first sign of difficulty, says Rudy Puryear, managing partner at the information and technology strategy practice of Andersen Consulting in Chicago.

"Everyone is gung-ho; we are going to put all this full-time talent on it, etc., " Puryear says. "Then, the first time they get a blip in earnings, this falls on their priority lists."

Start small

Little wonder that instead of dynamiting existing processes, as Hammer counsels, many companies prefer to take well-aimed sniper shots.

"You go for the small successes at first," Rubin says. He says he views re-engineering as simplifying the organization step by step.

Many are deciding it's more practical for their companies to first try small pilot projects.

For example, Spalding Sports Worldwide, a Chicopee, Mass., maker of sporting equipment, is reshaping key processes in manageable chunks, according to Bard White, CIO.

Step by step, companies move ahead

UCAR Carbon Co., a maker of carbon and graphite products in Clarksville, Tenn., is hoping to "reinvent the company" through a series of re-engineering projects.

"This company is over 100 years old," says Bill Wiemels, vice president of U.S. operations. "The [business] ways were appropriate once, but they are not all appropriate today."

Several projects of varying intensity advance the long-term goal of complete transformation. Some efforts call for a total redesign, while others focus mainly on restructuring management.

UCAR Carbon has already enjoyed some early success. A recent overhaul of ordering procedures, for example, reduced processing time from several days or weeks to as little as a few hours, according to Wiemels.

Now, a single customer representative handles the process from start to finish. Estimated annual savings: $3.2 million.

The company is also restructuring factory operations in hopes of trimming four or five levels of management between plant supervisors and workers. Workers carry more responsibility and handle tasks such as scheduling their own overtime.

They "feel like they are part of the process now," Wiemels says.

Still, Wiemels is the first to acknowledge that there's nothing easy about re-engineering. "You just have to bite the bullet," he says. "You have to determine it is the most important thing. It is tough, and we struggled."

Other examples of re-engineering projects in progress include the following:

Elf Atochem North America, Inc. is re-engineering to simplify operations, according to Robert Rubin, vice president of information services.

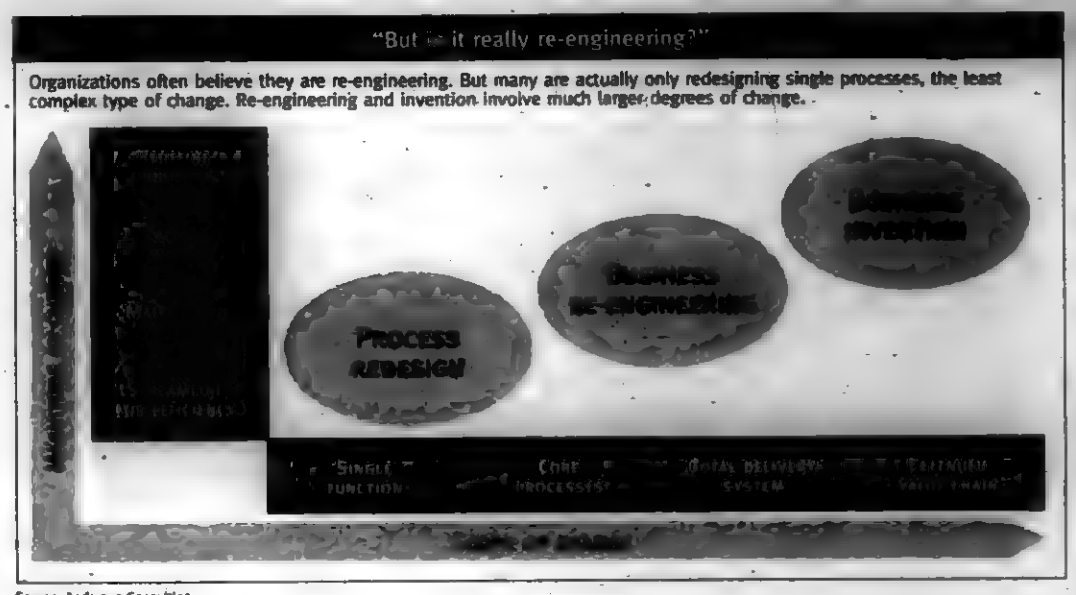
So far, the Philadelphia chemicals producer has redesigned an expense reimbursement program so that sales managers no longer have to sign off on every expense report. Accounting staff members take on more responsibility to manage expense accounts. Salesmen get paid more quickly. Total cost: less than $50,000.

Key Corp. is redesigning loan processing to achieve consistency across the Albany, N.Y., holding company's 10 banks and 847 branches.

The goal, according to Jay Ward, executive vice president at Key, is to improve personal productivity by at least 20% and productivity with customers by 50%. Scheduled completion: mid-1994.

Borden, Inc. The $7 billion New York-based food products giant is restructuring so that several business units can "act as one company," says Demi Lappas, a vice president and chief information officer. Every process, from distribution to marketing, will be affected. Scheduled completion: three to five years, with preliminary results expected in 1993. Lappas would not disclose cost.

—Rosemary Cafasso



Source: Andersen Consulting

"We are trying to transform what's been going on for the last 15 or 20 years, but we are going slowly," White explains. "We can't afford to just go in and upset the apple cart. We are doing it by major departments."

SRI's Burlton adds, "Users may get a 10% gain instead of a 50% gain. That's still good. It's not real re-engineering, but it's a step in the right direction."

Fad or fantastic?

Major changes in scope beg the question: Is re-engineering doomed to fizzle as fad of the year? Expert conclusions differ.

Some observers say the initial smoke is clearing, making way for more realistic change in many companies. Others warn that continued pressures will force companies to pursue a radical approach as their ultimate goal.

Though only one-fourth of companies trying re-engineering are doing total redesigns, Hammer says he's pleased. "It's . . . not discouraging. A couple of years ago, many wouldn't have known what re-engineering was." He notes that the approach may not be appropriate for every company. "I am not saying everyone should be doing it. I never said such a thing."

Hammer predicts that if another

COMPUTERWORLD SPECIAL REPORT

poll were taken next year, "40% would be doing it for real, 50% would still not be doing it but saying they are and 10% [would be] saying they are not."

Not all industry observers are so bullish. Gateway's Klein says recent surveys suggest that "most companies who are likely to be involved are already involved." He says it's doubtful that a new wave of activity will follow.

Yet Erwin Martinez, a principal at CSC Partners, a CSC Index affiliate, argues that many organizations will be forced to expand the scope of re-engineering projects in the next few years.

"A lot of companies have worked themselves, through inaction, to a point . . . where now they have to do something radical," Martinez says. But he agrees not every company needs to reinvent itself. "I think there is a spectrum, from improving the work flow all the way to radical change," he says (see chart above).

For IS, the big challenge now is to distinguish between hype and help. "People tend to go and do things that a lot of other people are doing," notes Robert Hecht, a vice president of investment systems at Prudential Investment Corp. "What we have to do is figure out what's the best of these things that are going on." ■

Joseph Maglitta, senior editor, management, contributed to this report.

Fighting fear of change

Experts and veterans of re-engineering projects say the biggest problem you may face is not mastering the big management principals or implementing new technology; it's probably sitting in the next office.

The human factor — more specifically, near universal dislike of change — drags down most re-engineering projects.

And experts say people are very resourceful when it comes to acting on their fear of the unknown. Their behavior can take the form of passive aggression, such as not bothering to attend an important meeting, or surface as guerrilla warfare, such as publicly proclaiming that a proposed new process has all sorts of flaws and will bomb.

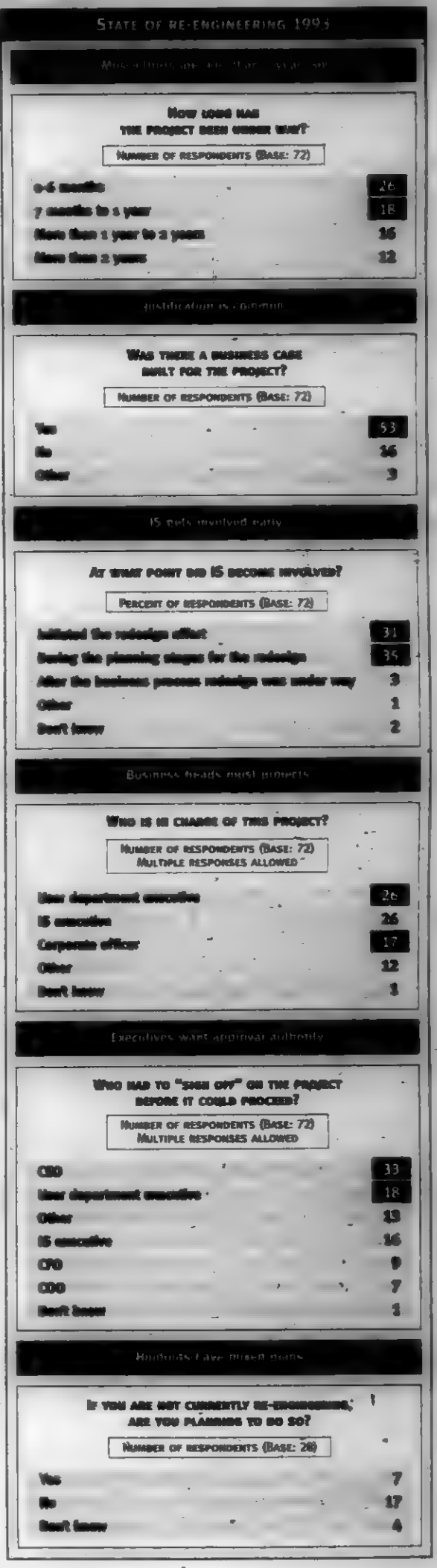
The key, experts add, is to expect these reactions and continually work to manage them.

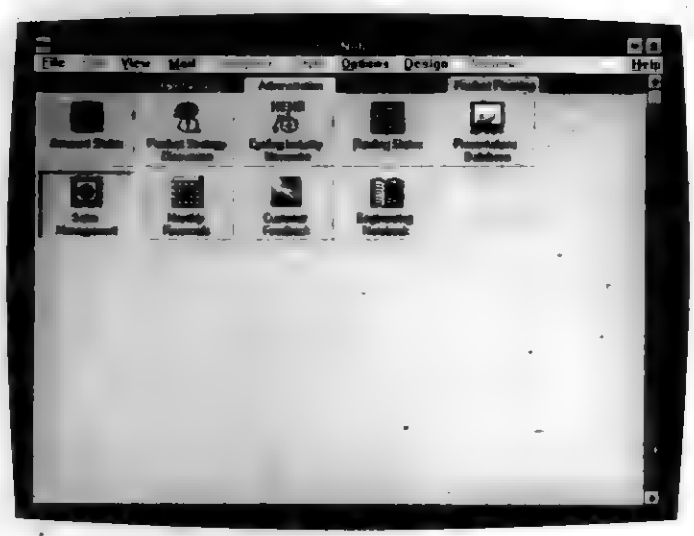
"The really hard part [of re-engineering] is in making an organization change that doesn't want to change," says Steven Stanton, a vice president at CSC Index in Cambridge, Mass.

Here are ideas from veterans and consultants:

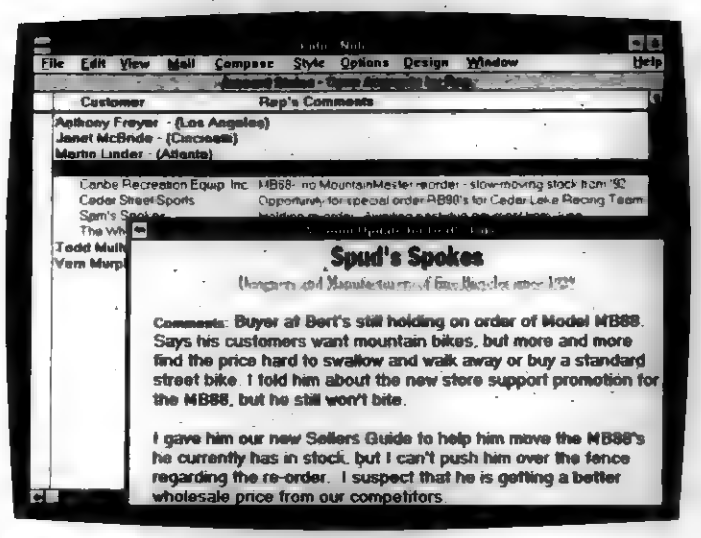
- **Communicate, communicate, communicate.** Try newsletters, videos, informal powwows, etc. The more management talks, the more quickly staff members grow comfortable with change. "If there's a chance people are going to lose their jobs, you can't keep them in the dark about it," says Mark Klein, a senior vice president and managing director at Gateway Management Consulting.
- **Staff re-engineering committees with the best and brightest.** It sends a message through the ranks that the company considers the project crucial.
- **Make sure senior management stays with the project.** "In large part, senior executives make pronouncements and then delegate," said Bradford Power, a principal at CSC Index and director of Index Quantum, a research and advisory service. "In re-engineering, they have to stay involved, and they aren't used to that."

—*Rosemary Cafasso*

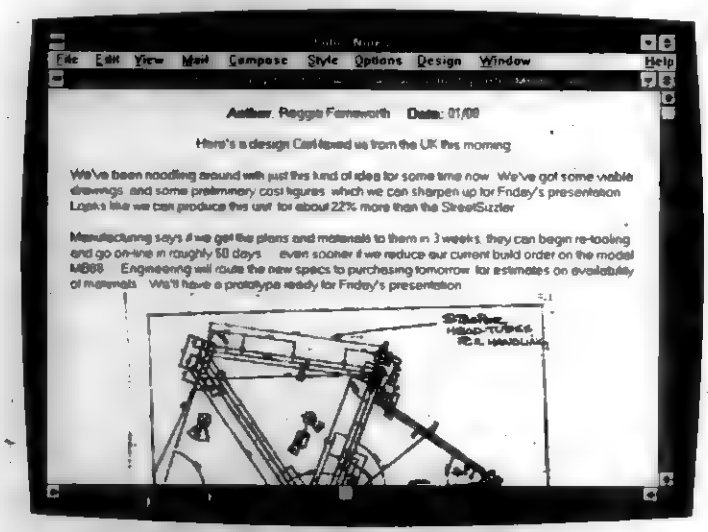




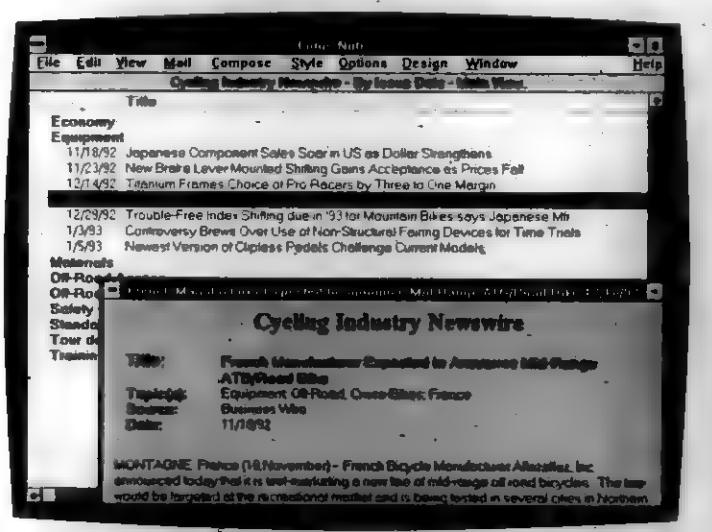
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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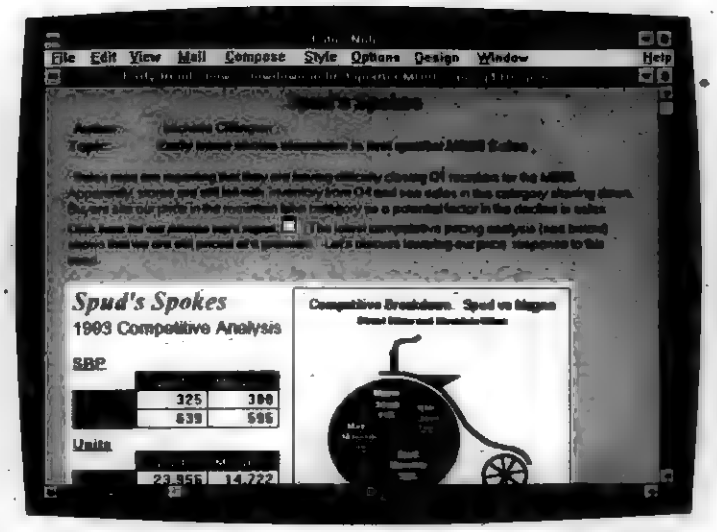
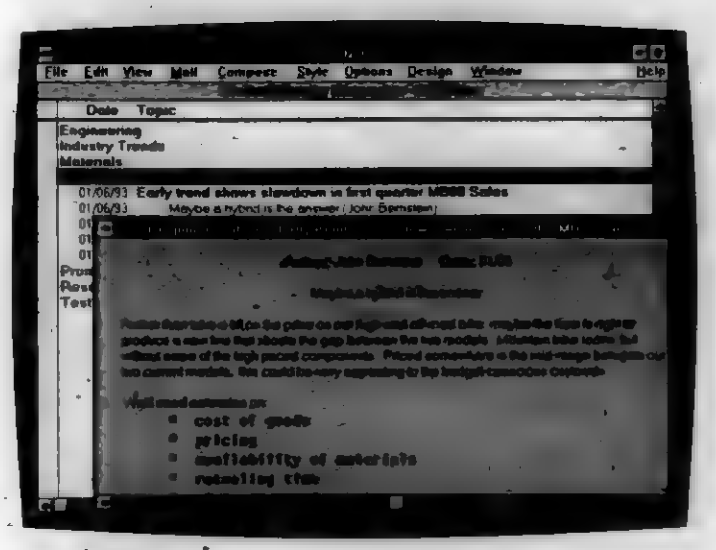
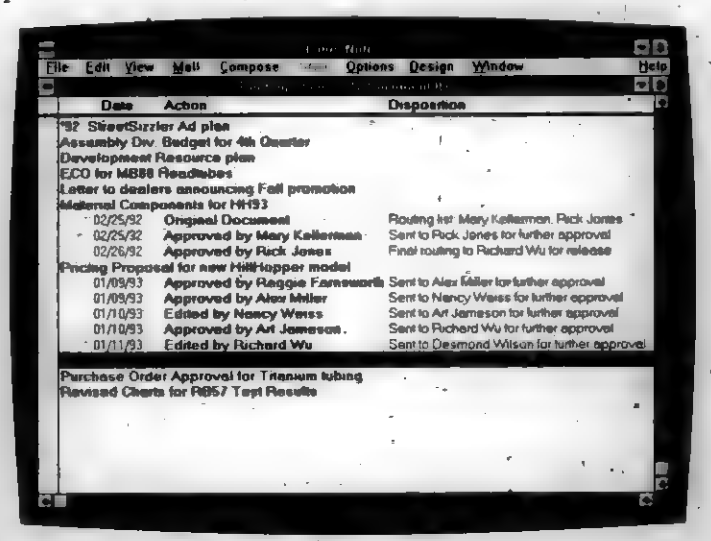


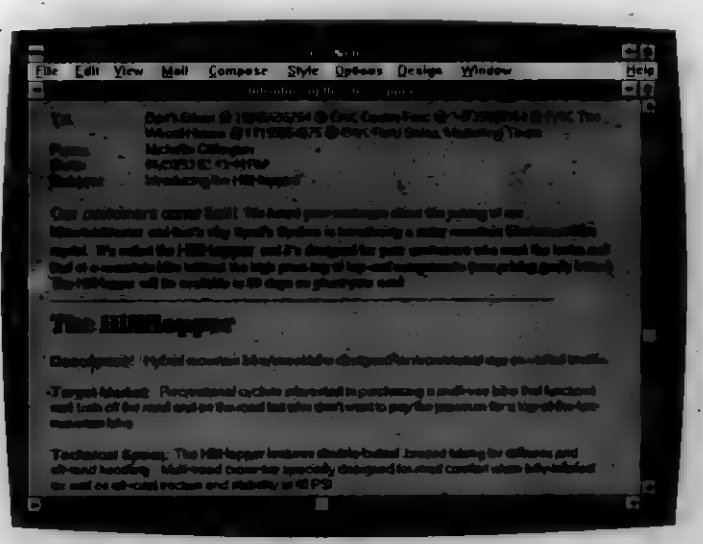
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with
h Michelle shift gears.

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JOB inside

Vendors try to sell you on their latest technology 'vision.' Ever wonder whether a vendor's internal IS staff practices what the company preaches?

By CW staff

You know the vendor pitch: "Downsize *(to our client/server tools, of course)*." "Use networks *(as long as they're ours)*." "Buy open software *(from us, if possible)*." After all, vendors have to make a buck. But what are they doing in their own information systems shops? Are their technology chiefs putting in place the very hardware, software and "solutions" their corporations hype?

IS departments in vendor companies are an interesting breed. While in many ways they are coping with the same issues your shop is — application backlogs, demanding users, doing more with less, rightsizing — they are also dealing with some unique situations.

Vendor IS staffs at companies such as Novell, Inc. and Microsoft Corp. often have the added pressure of acting as guinea pigs for their companies' products. Some, such as Microsoft, deal with users so technical that the users support IS, not the other way around.

We'd like to offer you a glimpse into the IS world at six vendor companies: IBM, Intel Corp., Sun Microsystems, Inc., Microsoft, Novell and Oracle Corp. We'll reveal whether these IS shops practice what their vendors preach and whether their IS chiefs' jobs are as trying — and rewarding — as your own. Read on....

Certain IS shops in vendor companies act as **TEST BEDS** *for the vendor's products. This can be burdensome when trying to perform other IS duties. However, most IS chiefs say this testing has an important consequence: It spares customers from buggy products.*

Microsoft's IS group consists of a bunch of guinea pigs, and they're proud of it, according to David Tagliani, senior manager of information technology group operations. Staff members beta-test Microsoft offerings, as well as software or hardware from other firms.

"We would prefer to be surprised here in IS rather than have the customer be surprised," Tagliani says.

For instance, the IS staff was working with Microsoft's Windows NT several months ago and pinpointed a thorny situation that system professionals at large shops would balk at: NT could not process batch commands, nor did it have processes that could be programmed to run at a certain time without user intervention. Tagliani's group complained, and NT now contains batch functionality.

At Novell, acting as a front-line beta-test site is one of IS' most important jobs, says Gordon Jones, vice president of information services. The IS group supports varied networks, which, Jones acknowledges, adds to the work load. However, such a smorgasbord increases IS' value as an internal test bed for Novell products.

Novell's IS staff has been heavily involved in the upcoming NetWare 4.0 release, he says, giving constant feedback to engineering about any problems. His group is also testing NetWare Loadable Modules in its relational databases, NetWare global messaging and Novell multiprotocol router products.

"We *want* to be a showplace, and we want to

Vendor IS shops, *page 110*

IBM coverage by Johanna Ambrosio, senior editor; Intel coverage by Michael Fitzgerald, senior writer; Microsoft coverage by Christopher Lindquist, correspondent; Novell coverage by Michele Dostert, correspondent; Oracle coverage by Jean S. Bozman, senior West Coast editor; and Sun coverage by Maryfran Johnson, senior editor.

Vendor IS shops

CONTINUED FROM PAGE 109

flush out any problems before our customers see them. We're a good test bed precisely because our environment is so heterogeneous and our users are so knowledgeable," Jones says.

For Oracle's IS group, "part of our whole mode of operation is to act as a test site to prove our software works," says Alan Tottle, vice president of the Network Products Division at the company.

Microsoft's David Tagliani *on beta tests: Keep the surprises in IS*

Tottle says only a small percentage of Oracle's data center floor is used for IS production. "About two-thirds of the floor is filled up with the platforms on which we validate our software," he says. "Each year, the mix of machines will change, depending on what computers are being sold in the marketplace."

The idea is that IS can put software through paces customers can't. For instance, Oracle was working with open systems for its internal setup a long time ago. "We've had OracleMail, a worldwide electronic-mail system, running for four years worldwide. And we put up the Oracle 7 database in full production when it was still in its alpha state. We would never ask a banking customer to put in an alpha version of the database."

But this test bed method is not always foolproof; Oracle has been known to ship buggy software. It has responded by instituting an internal quality assurance program that began in its applications division. Software passes through a number of testing phases before it is put into production.

CLIENT/SERVER *is on everyone's lips today, and the subject is no stranger to IS groups at vendor companies. But these groups are in the spotlight; because certain vendors have made it their business to push client/server, all eyes fall on IS to see if it is turning vendor hype into reality in-house.*

Sun, which preaches distributed open systems to the masses, is in the midst of a rightsizing operation of its own.

The company runs roughly 95% of its $4 billion business on its own workstation and servers and runs more than 300 Unix applications. Its hardware strategy is 100% based on the Scalable Processor Architecture microprocessor.

According to Thanos Triant, director of systems architecture at Sun, all the factory floors, computer-integrated manufacturing-type applications, warehouse distribution and factory test applications run on Unix and Sun workstations. Sun machines also handle sales quotation systems, distribution, cost analysis and decision support.

Today, a single Hitachi Data Systems Corp. mainframe is used for the master production schedule/manufacturing resource planning (MRP) application that supports three Sun factories in California, Massachusetts and Scotland. An Amdahl Corp. mainframe handles some limited development work for the MRP system. General ledger accounting resides on Hewlett-Packard Co. minicomputers running software from The ASK Group, Inc.

Sun says it plans to migrate from both the mainframe and the minicomputer systems in the next two years to a distributed system based on Oracle manufacturing and financial applications.

William Raduchel, chief information officer, counts the transition to the Oracle applications as the toughest challenge facing his IS operation this year. "It will take 15% to 20% of the IS budget this year for the transition," he says. "More than half our budget is spent running the platforms in the current desktop environment, so a lot of short-term projects are going to suffer."

The move to client/server computing has provided Sun with several benefits (see details page 113). It has cut 100 days from the time a customer places an order until the vendor collects payment.

"That's $750 million in cash, which we gained by changing all our business practices," Raduchel notes.

The greatest benefit of Sun's approach is cost-effectiveness, he says. While most firms spend $10,000 to $15,000 per employee per year to put PCs on their desktops, Sun puts a Unix workstation there for $5,000 per employee per year.

"One thing about our operation that surprises people is our willingness to duplicate data and run our desktops like a data center, not a PC network," Raduchel adds. That means individual desktops are dataless, with all application software and user data securely stored on centralized servers.

As recently as five years ago, interest in client/server computing at Intel was almost nonexistent, says Neal Franking, the company's director of corporate information services. That's because the strategy didn't jibe with Intel's image of its business; Franking says Intel saw itself as simply a chip manufacturer.

Today, however, things have changed. The corporate vision is much closer to business use of technology. Thinking has shifted from "What are chips used for?" to "How do PCs affect the metamorphosis of the business process?"

"To do things like just-in-time business requires you to be really streamlined and responsive, which aligns very much with" client/server, Franking says.

Intel has roughly 25,000 PCs based on its own processors, reduced instruction set computing (RISC) workstations, Digital Equipment Corp. VAXs and IBM mainframes in its IS hopper.

Franking estimates that Intel is less than halfway to unplugging its mainframes. Its most significant foray into downsizing comes from a $1.7 million effort in its OEM hardware division in Portland, Ore. Intel's OEM hardware business generates more than $1 billion in annual sales and employs 3,500 people. It has moved off mainframes since a downsizing effort in December 1991.

"For the first six months I was here, I said anybody downsizing was nuts," says Colin Evans, director of IS at the division. "To take out a big mainframe system is a complicated undertaking because it's typically been built up and had a lot bolted onto it over the years."

But Evans was won over by promises of savings and improved customer service. By taking its MRP system off a mainframe and placing it onto networked PCs, Evans says, mainframe chargebacks to corporate may drop from $4 million in 1991 to $1.5 million this year.

On the business side, Intel's new PC MRP system enabled its customers to order directly from the factory, which has reduced Intel's overhead.

But in a shift to move E-mail off a mainframe, Intel's efforts have gone less smoothly. The company has made strides in consolidating some 12 different E-mail systems but still has a ways to go. It has moved 14,000 of its 18,000 knowledge workers onto PC-based E-mail, though much of the messages get routed through mainframe-based E-mail.

"This really tests your infrastructure; you have to be accountable for the entire path, from the local PC to the local hub to the transoceanic link to the switching center," Franking says.

Vendor IS shops, *page 112*

IBM

Message to its customers:
Buy. Through its own products or third-party goods, IBM says it can fit any customer need.

Does IBM practice what it preaches?
IBM's internal systems tend toward big (it says mainframe MIPS are still "growing in the double digits") and primarily Blue.

Business units have mainframes in data centers worldwide, as well as specific equipment, depending on need. The product design laboratories, for example, have RISC System/6000s with simulation software. The manufacturing units have minicomputers and workstations, with linked distributed databases for parts numbers and other information. Marketing and sales are moving into LANs.

IS organizational structure:
IS people who support business units report into the management of the business unit.

Business unit IS has dotted-line reporting responsibility to Gerald Prothro, IBM's vice president of information and telecommunications systems. This group deals with the big picture. It inspects all facilities yearly to check for functional excellence and financial astuteness.

IBM IS has 20,000 worldwide employees and a $4.5 billion annual budget.

Downsizing do's

Here's how to avoid the pitfalls

Downsizing from mainframes to LANs comes with its own risks. Gordon Jones, Novell's vice president of information services, offers this advice:

With the proliferation of LANs at Novell, the IS department says centralized management, control and responsibility for departmental LANs seems to make the most sense for two reasons: Departments want to get back to business, and management is enforcing controls to protect precious data stored on LANs.

To ease backup and security procedures, Jones says, he has consolidated the company's servers. "Though they take up less real estate than a mainframe, our servers contain Novell's real assets: our data. So these servers have to be subject to the same rigorous security, backup and data integrity rules as mainframes."

But Jones stresses that mainframe-level security does *not* mean organizing your LAN IS staff on a mainframe-based model. Instead of separate departments for communications, systems and applications, Jones recommends organizing LAN-based IS staff members into interdisciplinary teams. Problem resolution requires communication.

"We do more work on team building than we do on technical training," Jones says. "Human collaboration is still the key to productivity — in networks, just like anything else."

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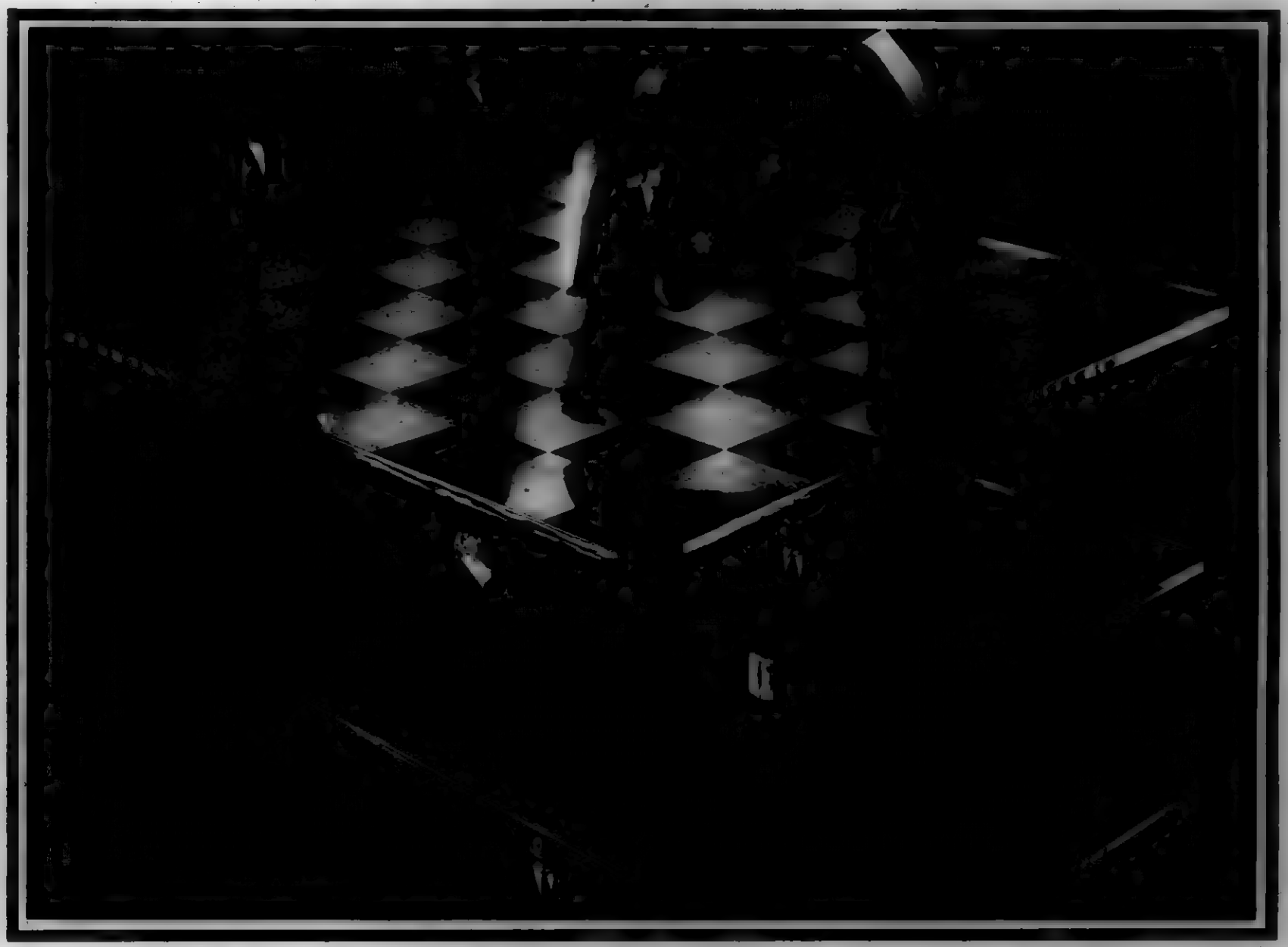

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Vendor IS shops

CONTINUED FROM PAGE 110

As the transition from mainframes picks up speed, networked PCs as a **DOWNSIZING** *approach are in vogue at vendor IS shops.*

At **Microsoft**, the message for customers is to downsize from mainframe applications and move to Windows and networks. The company's IS operations follow that mold but not strictly; Microsoft has certain core business processes on large systems. Specifically, it uses DEC VAXs for accounting and manufacturing, IBM Application System/400s for sales analysis and an IBM Enterprise System/9000 for product testing.

"Nobody is advocating that we simply chuck all that stuff. However, those systems will start to go into a maintenance mode in the next 12 to 18 months," Tagliani says.

Microsoft is in the process of purchasing RISC-based systems from Mips Technologies, Inc. and is looking at DEC's Alpha. "Once Alpha comes out, we'd like to start upgrading the VAX/VMS systems to Open VMS on Alpha, then move to Alpha 'mainframes' running Windows NT," Tagliani notes.

He says that via Alpha, DEC is providing Microsoft with a transition platform to NT. Tagliani says it's important for Microsoft's 350 worldwide IS employees to know what it's like to downsize and say to users, "The water's OK; come on in."

When **Novell** executives tell corporate IS buyers they can run their business on local-area networks, they know what they're talking about. Novell's IS department supports 3,600 employees, who generate almost $1 billion in sales. The company does all its development, marketing and support efforts on Novell NetWare LANs. According to Jones, Novell realizes the same cost savings it pitches to its customers: In 1992, IS costs, including telephone, were only 1.3% of sales.

Microsoft

Message to its customers:
Downsize mainframe applications and move to a Windows-based infrastructure of networks and Windows NT servers.

Does Microsoft practice what it preaches?
Microsoft's infrastructure consists of about 1,000 file servers worldwide, with 150 to 200 running OS/2 1.3, 250 running Xenix and 25 to 30 running NT. The rest run a variety of other operating systems.

All Microsoft systems are connected via a 30,000-node worldwide network. The company runs its core business processes on large systems — DEC VAXs, IBM AS/400s and an ES/9000 mainframe.

IS organizational structure:
IS is structured to correspond to business units. The company has 350 IS people worldwide.

Intel

Message to its customers:
Improve business performance by linking workers on networks of microprocessor-based computers. This strategy goes hand in hand with client/server.

Does Intel practice what it preaches?
Intel estimates it is less than halfway to unplugging its mainframes and moving into a client/server environment. Intel has some 25,000 PCs based on its own processors but also has RISC workstations, DEC VAXs and IBM mainframes.

IS organizational structure:
IS is structured geographically, with each region having its own site manager. Individual site managers sit in on an IS council, an umbrella organization that decides overall system direction for the company. The IS division reports directly to corporate.

The IS community has been energized by the drive to **OPEN SYSTEMS** *and interoperability in the hopes that it can choose systems based on need and price rather than worrying about equipment working together.*

Oracle promotes interoperable, open systems on heterogeneous corporate networks; the company supports more hardware/software combinations than any other relational database management system vendor. For instance, Oracle 7 can run on more than 80 platforms.

Oracle itself has most of its internal applications, including E-mail and accounting packages, running on Unix, according to Ronald Wohl, senior vice president of applications development. But some internal applications for the company's $1.18 billion business run on a 55-node DEC VAXcluster. Oracle used VAXs as its primary development platform from 1977 to 1992, when it shifted to Sun's Unix platform. Wohl says the move from VAXs to open systems has been easy. "The database and applications are written in a portable fashion, so they run essentially unchanged across environments."

But Tottle has one Unix caveat: The systems Oracle is adopting "don't have the tool sets more mature products have," such as performance monitors, that enable mainframe data centers to fine-tune their operations.

IS chiefs in vendor companies say they are under the same kinds of pressures as their colleagues in user companies — they want to cut costs but not affect the quality of processing or service. **CONSOLIDATION** *and* **OUTSOURCING** *are integral to their plans.*

Like many of its customers, **IBM** is discovering the efficiencies of megacenters populated by the largest and most powerful mainframes available, says Gerald Prothro, vice president of information and telecommunications systems.

Executives everywhere will recognize his mantra: "We want to save money, be more efficient and handle more volume."

Prothro's group has established a consolidation mandate. "So, if we find a region with 15 separate glass-house environments, that is clearly deleterious," he says.

Beginning in 1988, IBM began consolidating its data centers worldwide and, within the past year, began moving data center operations under the purview of IBM's outsourcing company, Integrated Systems Solutions Corp. (ISSC).

Here in the U.S., IBM has moved all the marketing and sales data centers to ISSC and is working to do the same for the manufacturing and distribution units. So far, Prothro says, the program is working just fine. "We have been able to keep costs flat, with the total MIPS delivered up between 15% and 22%."

IBM will also export this consolidation and outsourcing plan overseas. IBM Europe is now consolidating more than 30 data centers down to eight or nine; IBM Japan had nine such sites and will cut those to four by the end of 1993.

Oracle's idea of consolidation is cramming more millions of instructions per second into the same 13,000-sq-ft computer room space without expanding the computer room itself. Even now, the data center (a total of 22,000 sq ft in size) is small in comparison with other Fortune 500 companies' facilities, in which 50,000 sq ft or more is the norm.

"We have lots of small machines now, and we're evolving into having fewer, larger machines. Sooner or later, we'd like to start on the path of having dark data centers," automating data center functions and reducing staff, Tottle says.

To that end, Oracle is planning to install automated tape libraries and optical disc drives to reduce the need for human operators to place IBM 3480-type tape cartridges in tape drives for backups and off-site archiving.

Novell

Message to its customers:
You can run your business on LANs.

Does Novell practice what it preaches?
Novell's IS department supports 3,600 employees, who generate almost $1 billion dollars in sales. The company does all its development, marketing and support efforts on NetWare LANs.

With seven mergers and acquisitions in 10 years, the company inherited myriad PCs running DOS, Windows and OS/2, Apple Computer, Inc. Macintoshes, Unix boxes and Next, Inc. workstations. It has three DEC VAXs. The IS group supports all applications on NetWare.

IS organizational structure:
The organization is basically a hierarchical, centralized structure headed up by a vice president of IS. The group has 113 people. IS costs were nearly $1 billion in 1992.

Oracle

Message to its customers:
Portable, open systems, most notably Unix-based ones.

Does Oracle practice what it preaches?
Oracle claims it runs its $1.18 billion global business on its own software on a variety of hardware. Its internal applications, including E-mail and accounting, run on Unix.

But a tour of the data center showed that some internal applications run on the DEC VAXcluster.

The data center contains Sun servers, HP 9000s, Tandem Computers, Inc. processors, an Amdahl mainframe, an IBM AS/400, some Unisys Corp. Unix machines, an IBM 4381, older Wang Laboratories, Inc. VS minicomputers and two new NCube 2 supercomputers.

IS organizational structure:
The vice presidents of its two primary IS groups report directly to Oracle CEO Lawrence J. Ellison.

What would an IS manager's life be without **USERS***? For vendor IS chiefs, the problem isn't that users know too little but that they know too much — a bummer as well as a boon.*

Microsoft's users play an important, albeit unusual, role in its systems department's life: They provide IS with technical support. While IS concentrates on keeping the systems environment running, technical details are often left to users, who are experts on the Microsoft software on which the systems run.

"We use our own Microsoft [non-IS] people to get assistance. If we have a LAN Manager problem, we go to LAN Manager people," Tagliani says.

The user/IS information flow doesn't stop at support. "It's common for the young, excited group of [non-IS] developers to come up with their own solutions" to systems problems, Tagliani says. And IS wants to make the most of this knowledge. "What we ask is that if they have a way of doing things that's better than the way we have provided, by all means let us know," he says.

For some shops, however, savvy users are to be avoided. Though all of Novell's 1,000 production servers are connected, Jones maintains a "firewall" between production servers and the engineering networks that Novell programmers are busily crashing, fixing and rebuilding.

"I mostly turn a blind eye to engineer-

ing. I don't want to know what crazy things they're doing over there," he says. "All businesses isolate their development environment from their production environment; when your business is networking, you have to be doubly careful."

With all the cutting-edge technologies and advanced research, it's hard to believe that **APPLICATION DEVELOPMENT** *gives vendor IS staff members fits.*

Yes, **IBM** — even with its virtually unlimited access to the best techno-goodies the computer industry has to offer — has an applications backlog. Although Prothro declines to specify what that is, he says IBM is addressing it in several ways.

On the drawing board is a plan to distribute the power of the workstation so individuals are at the center of the compute environment and have access to all its pieces.

Among the applications available to the user would be what Prothro calls "enablement software," which would turn end users into programmers who save IS time by building their own applications.

IBM has also changed its applications design methodology. Instead of the old way of sequentially developing code and testing it, IBM is using multidisciplinary teams made up of IS and users. "We structure them around the user problem being solved, and we interactively test and simulate," Prothro says. "That way, a user doesn't sit there with nothing, and satisfaction goes up."

The IS staff at **Novell** is trying to cut back on applications development primarily by using off-the-shelf packages and farming out development work.

If it can't find a commercial product, Novell IS staff members will do small, front-end programming tasks, but they usually contract out major projects. "It helps us handle the peaks and valleys of application demand," Jones says, "and gets us expertise in new technologies such as object-oriented programming."

Jones says he wants to keep Novell engineers busy adding value to NetWare, not sitting in IS reinventing the wheel.

Sun, for its part, has some internal development rules so IS doesn't get stuck with runaway development projects.

One credo is to recover the cost of a software project within months. IS also insists that the same version of Solaris development tools is used companywide to ensure high code reusability.

"One of my rules is that no project is allowed to take more than one year, 10 people and $1 million to complete," Raduchel says.

One example of an application developed this way is Sun's internal SO Tool. It took one year, six staff members and $750,000 to build. •

Intel's Neal Franking: *Firm is less than halfway to unplugging its mainframes*

Sun

Message to its customers:
Distributed, Unix-based client/server systems that adhere to open, standard technologies.

Does Sun practice what it preaches?
Sun has a 22,000-node TCP/IP network controlled by the company's own distributed network management environment. Sun servers in local offices handle all database queries. New systems are built around distributed copies of the main database. Sun does have mainframes but says they are just another resource on the network.

IS organizational structure:
Sun has a 1,000-member centralized IS organization. Its IS budget is roughly $200 million.

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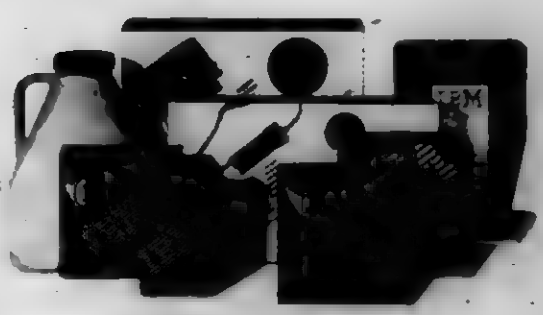

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The escape from outsourcing

■ Last week, Dana Crenshaw, a programmer/analyst at an organization in Georgia, described the initial shock of learning that his organization was contemplating outsourcing and the experience of undergoing an efficiency audit. In the second part of his tale, Crenshaw and his colleagues await the recommendations of the outside consultants who conducted the audit.

Tuesday, Sept. 29, 1992
We received word today that the results of the department audit conducted by the consultants will not be discussed at the executive meeting until November because the project leader is behind schedule. In the meantime, why live in uncertainty? Some of us are updating our resumes, just to be safe.

On the other hand, by jumping ship prematurely, we risk missing out on an opportunity that could possibly accelerate our careers. I think the problem lies in unfamiliarity with outsourcing companies.

Thursday, Oct. 22, 1992
We found out today that we may not know until January. The lateness of the project can be attributed to many factors. For instance, about halfway through the interviews, the project manager decided to talk to everyone on staff instead of just a sampling of people. These additional interviews slowed the process.

By now, though, we have resolved not to worry about what will happen and concentrate on our work. Our boss commended us for our patience and continued level of production. This was very much appreciated.

Monday, Dec. 14, 1992
Today we were all given a briefing on what to expect as a result of the audit. Recommendations will be presented for action at February's meeting. Recommendations to be made include filling vacant positions such as an executive director of IS and quality assurance professional (a new position). The future of IS hinges on these positions being approved.

Monday, Dec. 14
Even though we have a lot of changes to make, one of the changes will not be outsourcing. The audit report said that with outsourcing, we would lose both money and control of the IS department.

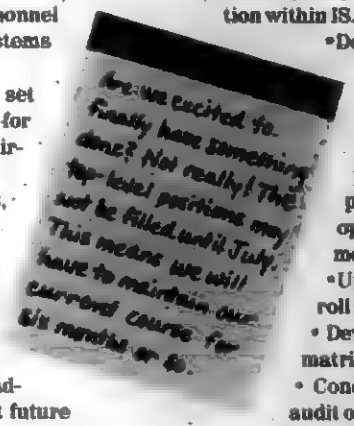
The audit report was not short on problem areas. In addition to filling the executive director post, the following problem areas were brought up:

- Technology decisions are not organized or controlled.
- There is no formal systems development methodology for developing applications.
- End-user requirements change during development and are not always included.
- Financial, personnel and payroll systems are outdated.
- There are no set standards for screening and hiring personnel.
- Personnel skills, career paths and performance expectations are not defined clearly.
- Investment in training is not adequate to support future requirements.
- Quality control is inadequate.
- We lack disaster recovery plans.

Even though we have a lot of changes to make, one of the changes will *not* be outsourcing. The audit report said that with outsourcing, we would lose both money and control of the IS department.

So for now we are "safe."

Are we excited to finally have something done? Not really! The top-level positions may not be filled until July. This means we will have to maintain our current course for six months or so.



Friday, Feb. 12, 1993
Here ends this chapter in "The Life and Times of IS."

Today, the following recommendations (as a result of the problems outlined in the audit report) were approved:

- Hire a full-time executive director of IS.
- Define a quality assurance function within IS.
- Develop an IS strategy and technology plan.
- Select and implement an application development methodology.
- Upgrade the payroll system.
- Develop an IS skills matrix.
- Conduct an internal audit of IS.
- Adopt an IS security policy.

The most significant of the approvals is the hiring of an executive director. We don't know when they plan to fill the position, but the fact that they will indeed fill it is enough for us to believe that brighter days are ahead. Needless to say, we are glad this issue has finally been brought to a close.

Once the director is hired, I expect the pace to pick up tremendously. But for now we all are grateful that we still have a place to call home.

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TheExperts

Production control: Racing the clock for project delivery

career UP

By Alice Bredin

Ten people in New Jersey make sure local residents and businesses can get 411 directory assistance and 611 emergency phone service whenever they need it. Every month these same 10 people process all the monthly financial information for one of the largest companies in the state and ensure its accuracy under deadline.

These linchpins are members of the production control department at Bell Atlantic Information Systems in Madison, N.J. The 24-hour operation at New Jersey Bell schedules and maintains jobs and runs real-time systems such as 411.

Production control departments are in charge of planning, scheduling, running and distributing computer jobs within a company. In this department, professionals work primarily on mainframes.

By all counts, this is a career that involves pressure because the nature of running jobs is deadlines. However, most people also say that the hours, barring problems, are reasonable, and the variety of work makes it interesting.

"There is pressure involved because we're doing important projects that people inside and outside Bell really depend on," says Eric Muse, manager of applications maintenance control at Bell Atlantic.

Step by step

Joe Gerardo, production manager of operations at Thompson Financial Services, Inc., a financial publishing firm in New York, says he's enjoyed production control at all levels; he has worked his way up the career ladder from operator to production manager.

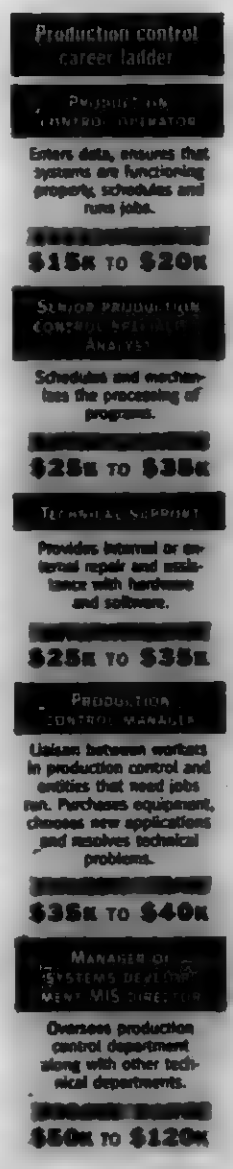
Like Gerardo, most production managers have worked their way up the ladder. Operators' jobs are most often obtained right out of college, and promotions to analyst or technician usually precede a manager's job.

Production control operators enter data, ensure that systems are functioning properly and run jobs. At the next level, analysts or senior production control employees determine when projects will run, implement new applications and schedule jobs.

Production control managers are the liaisons between workers in production control and entities that need to run jobs. They also purchase equipment, choose new applications and resolve deadline and technical problems.

Shelly Satterfield is production control manager at Dittler Advanced Data Systems, the Oakwood, Ga., data division of Dittler Brothers, Inc., an Atlanta printing house. She started as a book binder with some computer knowledge. She then worked in data entry and, over a six-year period, was promoted to manager without having a college education.

After manager, the next step is director of operations. In this job, responsibility is usually divided between production control and other departments, including security and disaster recovery.



During the last few years, production control management has been moved out of computer rooms and into the corporate environment. Managers are now able to work with the corporate entities that need production control services.

Uncertain future

One potential downside of production control is that the IS industry is moving away from mainframes. Therefore, a department running production jobs may no longer be necessary.

"If you have departments that are getting a turnaround in information because they can run something from their desk, there may not be a need for us," Muse says.

Walt Thyer, vice president of the Association for Computer Operations Management, Inc., an Orange, Calif.-based association of computer operations managers, says this is because computing power is moving to the desktop, as well as downsizing and consolidation. But, Thyer does not see this trend as ending production control jobs.

Thyer says production control employees possess valuable technical skills that they can parlay into a new position, helping users with backup and disaster recovery.

Bredin is a free-lance writer based in New York.

FOCUS

Production control coordinator

As production control coordinator at Dittler Advanced Data Systems, Shelly Satterfield talks to just about everyone in the company. Her job is to make sure Dittler's print jobs are running smoothly.

Every day at 8:30 a.m. and 4:30 p.m., she meets with data personnel and sales representatives to discuss job progress and get updates on new business.

In between, Satterfield walks to the proof room or data center to answer technical questions and to check on the status of various projects.

"It's a great job for me because I like organizing things my way, talking to people and helping people," Satterfield explains. "But I also have to be patient and explain to reps why they cannot always get jobs completed by the deadline they want." —*Alice Bredin*

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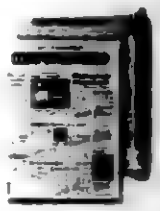

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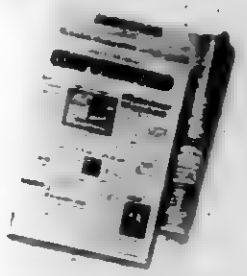

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Requirements: a Bachelor's degree in Computer Science or equivalent experience. A minimum of 5 years' experience with software system administration, preferably in a university environment required. Experience with UNIX and C a necessity. Experience with ULTRIX, HP/UX, and/or AIX preferred.

Interested candidates should submit two copies of both cover letter and resume referencing **Job No. A93-019** to: **James H. McCarthy, MIT Personnel Office, Bldg. E19-239, 77 Mass. Avenue, Cambridge, MA 02139-4307.**

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- Manages a staff of technical and support personnel by hiring, training, setting work priorities for supervising, and evaluating personnel. Monitors activities in all areas to ensure that all activities are conducted in a professional manner.
- Performs project management by providing needs analysis and systems development planning services to faculty and administrators interested in procurement or construction of computer software systems.

Qualified Candidate:

- Should possess a Masters degree in appropriate discipline and have extensive experience in supervision of technically oriented personnel, in planning and management of information processing services and in the development of subordinate managers.

Please send a letter of application with a resume and the names, addresses, and telephone numbers of three references to: Ms. Carla Newman, Secretary to the Search Committee, Office of Information Technology, James Madison University, Harrisonburg, Virginia 22807. Phone: (703) 568-6896 Internet: OIT_CARLA@VAXT.ACS.JMU.EDU

Review of applications will begin immediately and will continue until suitable applicants are identified. Preference will be given to applications received before April 30, 1993.

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- **MANAGER - Software Information Development** - Responsible for development and maintenance of internal and external software product documentation. Manage a team of 8-10 software engineers working on numerous products. Requires BS/MS degree plus 5-7 years of software development, test or technical writing experience. Prior online documentation experience at a management level is a plus.

- **SOFTWARE ENGINEERS** - Responsible for development of UNIX and/or mainframe tools to support a new UNIX based software configuration management system. Requires BS/MS degree and 5-7 years software engineering experience in a UNIX and/or mainframe environment using high level languages. Knowledge of product build/packaging under SMP/E is an advantage.

- **SOFTWARE DOCUMENTATION SPECIALISTS** Responsible for developing software product documentation and internal specifications. Will participate as integral member of product development team through lifecycle of product. Must have technical expertise as well as proven writing skills. Test or code development experience or training, in addition to writing, preferred. Requires BS/MS degree and 5-7 years of software experience. Openings for mainframe products, UNIX-based products and Novell network products. Knowledge of Interleaf publishing software and designing for online is an advantage.

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- **SOFTWARE TEST ENGINEERS** - Responsible for the design, development and execution of software test programs and procedures applying knowledge of IBM MVS and VM operating systems. Position requires a BS/MS in computer science or engineering and 5 years experience in several of the following areas: MVS, VM, JCL, REXX, SAS, 370 Assembler, SMP/E, C, OPS/MVS, and test automation.

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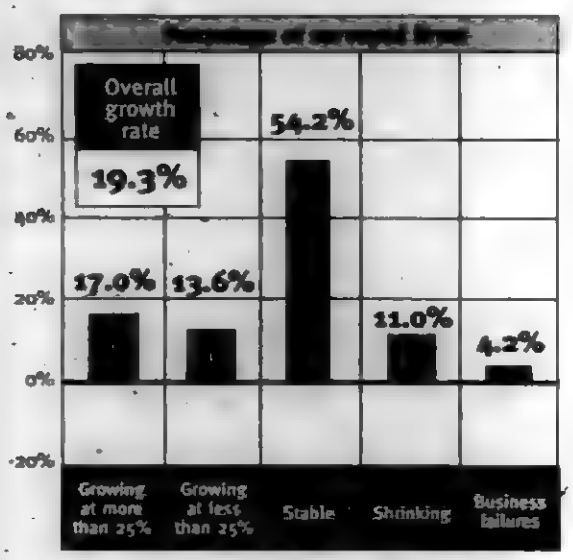

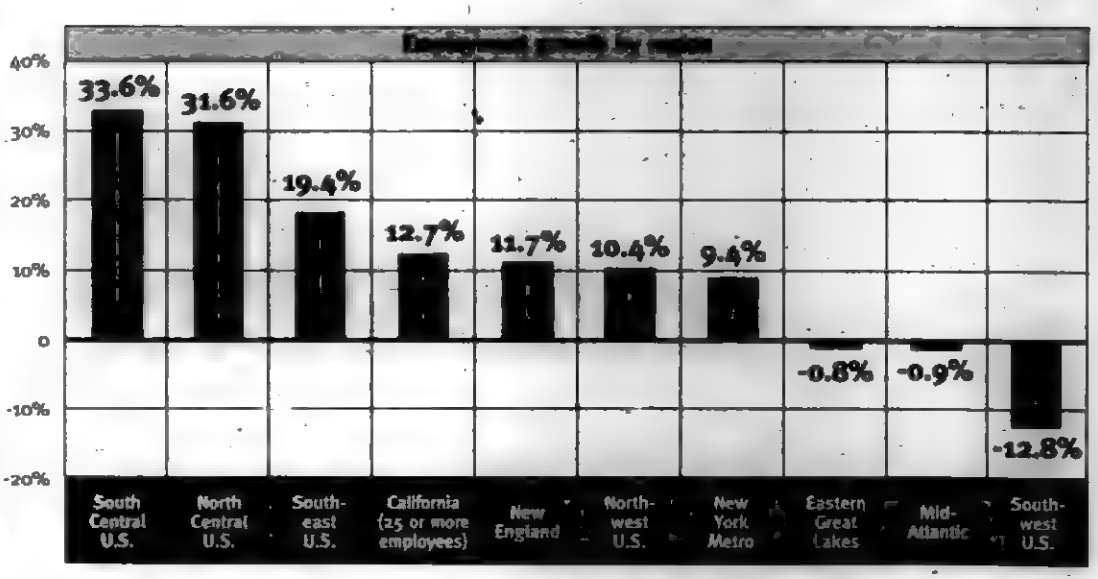

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Hogan SYSTEMS

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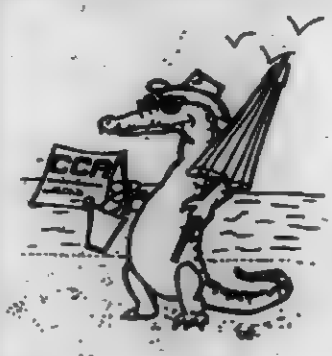

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Software upgrades can be simplified

playing it SAFE

By Daniel Lyons

Upgrading PC software across an organization can be tricky business. If certain compatibilities are not met, formatting features such as fonts and margins could be different or not show up at all. Even worse, documents created in an earlier version may be unreadable.

Experts say there are questions you should ask yourself and your vendor beforehand to smooth the transition.

Does the new software version offer complete backward compatibility with the old version?

"Most companies are very scrupulous about backward compatibility, but some are not as scrupulous," says Jeffrey Tarter, editor and publisher of "Softletter," a software industry newsletter based in Cambridge, Mass. Even major software vendors can pose difficult compatibility issues for you.

In the old DOS days, providing compatibility with previous versions wasn't so difficult. In the graphical user interface world, however, "the problems are becoming more prevalent," Tarter says. "There are some very complex issues of display on the screen and on paper."

In the past, when you opened a database file or spreadsheet file, you didn't have to worry about display options; you just had to get the data right. Now there are fonts, screen positions, kerning and other variables coming into the documents.

Incompatibilities are application-dependent and random. Simple things such as margins, font types and other formatting features are all subject to change. In some instances, loading new applications can even alter config.sys files.

To avoid problems, it's wise to test an upgrade with a few users before deploying it across the company.

How can you ensure that all employees are using the same version of the program?

This is not easy to accomplish, and in some companies it's a nightmare. "More and more people are sharing data in networked environments, and yet you have cases where there are half a dozen versions of the same product floating around. It can be a real mess," Tarter says.

It's important to have a plan to make the new version available to all users as quickly as possible. You might consider using asset-management software to identify which versions are where on a network. Once this is done, set up goals for software standards and then upgrade.

Of course, some users won't want to give up a version they're using. The best information systems can do is make recommendations. "At our company, Quattro Pro is the preferred spreadsheet, but some people are still using Lotus 1-2-3," says Sheldon Laube, national director of information and technology at Price Waterhouse in Menlo Park, Calif. "We don't have software police."

Is there any way to get the upgrade to all users quickly and painlessly?

Vendors are looking for ways to make the deployment of upgrades less onerous. One way to lessen the burden is through software configuration management tools. Products such as Software Update and Distribution System from Boston-based Frye Computer Systems, Inc. let network managers deploy an upgrade across a network as well as upgrade all data files.

How do I justify making an upgrade?

Sometimes a single feature may be important enough to warrant a change. For example, Robert Aberg, a senior development engineer at Allied Signal Aerospace Co. in Phoenix, says his department moved to Microsoft Corp.'s Excel 3.0 because of its plotting feature. But the department balked at Excel 4.0. "We just didn't see any reason," he says.

Evaluating each new feature of each new upgrade of each new product can be a full-time job. One way to avoid it is to form long-term licensing agreements with vendors — and then automatically get every upgrade.

"We have 35,000 PCs, and trying to keep track of which machine has which version and then pay for it — it's craziness," Laube says. "You can't afford to try to figure it out."

Lyons is a free-lance writer in Ann Arbor, Mich.

Legal issues

In the past, software customers tended to strike one-time deals with software vendors. Today, customers typically form long-term relationships with vendors, says Jeffrey Ritter, a lawyer in Columbus, Ohio, and an advisor to the American Bar Association on software sales and licensing issues.

In the original license agreement, companies should include stipulations about upgrades for bug fixes as well as new features, Ritter says. Here are a few more of his tips:

▶ Documentation. Make sure the original license agreement requires the vendor to provide corrected documentation to go with any bug fixes that ship after the original product.

▶ Source code. If you negotiate to have source code held by an escrow agent, make sure that extends to source code for upgrades, too.

▶ Warranties. Make sure that all warranties and assurances regarding the original product also apply to any future upgrades.

▶ Customization. Define whether a particular upgrade is a general one or one that is specific to a customer's demands. Some vendors and customers have squabbled over ownership rights on work done to meet an individual customer's needs. — *Daniel Lyons*

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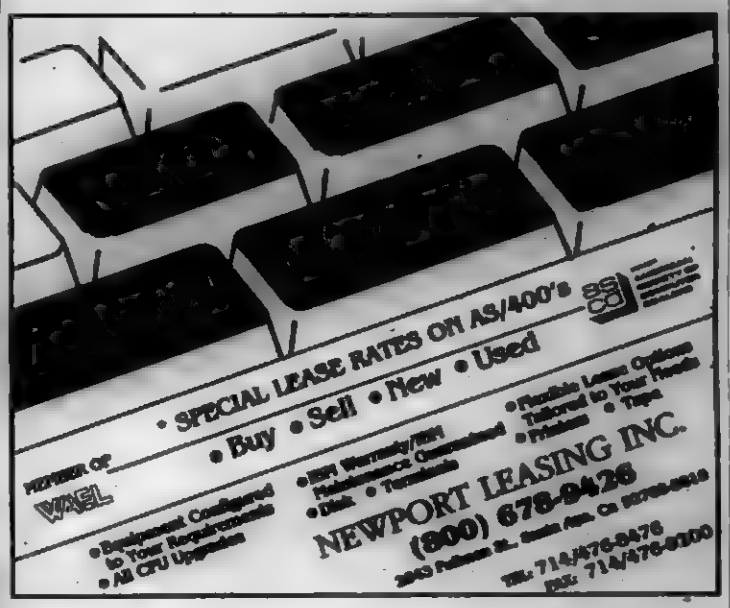

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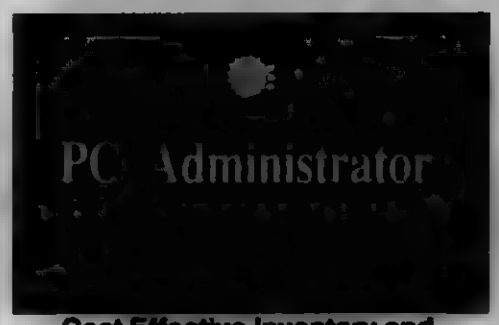

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Novell Inc.	15.8	Gateway Communications	-7.9

Dollar

Matsushita Electronics	7.75	Computrends Corp.	-9.38
Dell Computer Corp.	5.75	Brooktrout Technology	-6.25
Compaq Computer Corp.	5.63	Altos Corp. (H)	-3.75
Novell Inc.	4.75	Lexent Corp.	-3.50
Microsoft Corp.	4.25	Powersoft (H)	-3.25
Kendall Square Research	4.13	Southwestern Bell Corp.	-3.13
Motorola Inc.	3.75	Bellsouth Corp. (H)	-2.88
Struct. Dynamics Research	3.75	Bell Atlantic Corp.	-2.63

Mini forecast: Partly sunny

Despite the rumored demise of the mainframe and minicomputer, there are some good bets in the high-end hardware market.

A recent report by analysts John Jones Jr. and Theresa Liu at Salomon Brothers, Inc. recommends the purchase of four stocks in that sector: Pyramid Technology Corp. (PYRD), Stratus Computer, Inc. (SRA), Tandem Computers, Inc. (TDM) and Hewlett-Packard Co. (HWP). Other companies in the sector carry Hold ratings.

Jones and Liu were generally cautious regarding near-term market conditions for big-ticket hardware items. Currency exchange rates will have a negative impact on near-term revenue throughout the sector, and results in the most recent quarter, while slightly improved, still show the effects of the lagging worldwide economy, they said.

Also, according to the Salomon Brothers report, gross margins continue a downward trend as a result of competitive pressure and price cutting. Pyramid and Amdahl Corp. (AMH) are exceptions to that rule because of new product cycles that are just getting under way.

Stratus and Tandem are beneficiaries of Digital Equipment Corp.'s (DEC) cutback on research and development in fault-tolerant computing. The high cost of entry into that field shields Stratus and Tandem from some competition.

Although HP is classed with other minicomputer and mainframe stocks, the company's prospects are buoyed by strong product lines in smaller systems. HP's workstation sales grew more than 9% in 1992, and the company continues to fare well in the desktop and network printer markets.

—Derek Slater

Salomon on hardware

CURRENT INVESTMENT RECOMMENDATIONS FROM SALOMON BROTHERS, INC. FOR SELECTED HARDWARE COMPANIES:

Amdahl Corp.	8	Hold
Cray Computer Corp.	4	Hold
Digital Equipment Corp.	45 7/8	Hold
Pyramid Technology Corp.	15 1/4	Buy
Sequent Computer Systems, Inc.	20	Hold
Stratus Computer, Inc.	34	Buy
Tandem Computers, Inc.	13 5/8	Buy

CW Chart: Michael Siggins

Exch	52-Week Range			Mar 12 3pm	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT						
OTC	34.63	9.63	3 COM Corp.	32.25	0.75	2.4
NYS	76.63	56.25	American Info Techs Corp.	72.75	-2.13	-2.8
NYS	59.13	37.75	AT&T (H)	57.00	0.00	0.0
OTC	3.56	0.75	Artel Communication Corp. (H)	3.00	-0.25	-7.7
OTC	24.50	10.25	Banyan Systems Inc.	20.25	1.50	8.0
NYS	56.75	40.25	Bell Atlantic Corp.	52.50	-2.63	-4.8
NYS	57.50	43.38	Bellsouth Corp. (H)	53.75	-2.88	-5.1
NYS	6.75	3.63	Bolt, Beranek & Newman	4.88	0.38	8.3
OTC	18.50	10.00	Brooktrout Technology	13.00	-4.25	-24.6
NYS	92.25	42.13	Cabletron Systems	87.38	2.13	2.5
OTC	34.50	17.75	Chipcom Corp.	30.25	0.00	0.0
OTC	94.75	33.00	Cisco Systems Inc.	93.63	0.38	0.4
OTC	26.50	5.50	Compression Labs Inc.	12.75	0.00	0.0
OTC	6.06	0.88	Data Switch Corp. (H)	6.06	0.56	16.7
NYS	22.25	13.75	Digital Comm. Assoc.	19.38	-0.13	-0.6
OTC	14.75	7.00	Digital Systems Int'l Inc.	7.25	-0.63	-7.9
OTC	29.50	4.00	DSC Communications (H)	28.25	1.25	4.6
OTC	9.50	4.75	Fibronics Int'l Inc.	8.13	-0.25	-3.0
OTC	37.50	10.50	Frenet Corp.	11.25	-0.50	-4.3
OTC	4.38	1.50	Gandalf Technologies Inc.	3.38	0.06	1.9
OTC	2.06	0.69	Gateway Communications	1.81	-0.16	-7.9
NYS	10.50	2.88	General Datacomm Inds.	8.88	0.25	2.9
ASE	4.63	2.00	Go Video	2.56	0.00	0.0
NYS	37.75	28.88	GTE Corp.	36.38	0.25	0.7
NYS	78.50	62.50	ITT Corp. (H)	78.00	-0.25	-0.3
OTC	43.38	29.50	MCI Communications Corp.	42.38	0.88	2.1
OTC	13.50	2.25	Microcom Inc.	4.50	-0.50	-10.0
OTC	24.25	8.00	Netrix Corp.	9.00	-0.25	-2.7
OTC	19.00	9.63	Network Computing Devices	15.75	0.75	5.0
NYS	16.00	8.13	Network Equipment Tech.	8.63	-0.13	-1.4
OTC	23.25	8.00	Network General	14.50	-0.88	-5.7
OTC	15.75	8.50	Network Systems Corp.	11.38	0.13	1.1
OTC	59.25	13.63	Newbridge Networks Corp. (H)	58.38	1.63	2.9
NYS	48.00	30.50	Northern Telecom Ltd.	43.75	-1.25	-2.8
OTC	34.75	22.50	Novell Inc.	34.75	4.75	15.8
NYS	92.50	69.13	Nynex Corp. (H)	87.88	-3.75	-4.1
OTC	36.00	14.50	Octel Communications Corp.	27.25	-1.50	-5.2
OTC	8.00	3.38	Penril Data Comm Networks	4.63	-0.13	-2.6
OTC	47.25	10.25	Picturetel Corp.	23.00	-1.50	-6.1
OTC	16.25	7.00	Proteon Inc.	7.75	0.00	0.0
NYS	30.38	10.16	Scientific Atlanta Inc.	22.50	-0.50	-2.2
NYS	75.63	56.63	Southwestern Bell Corp	72.00	-3.13	-4.2
NYS	31.13	20.75	Sprint Corp. (H)	30.00	0.88	3.0
OTC	27.00	8.75	Standard Microsystems Corp	19.50	-0.75	-3.7
OTC	18.00	6.88	Stratacom Inc.	14.75	-0.38	-2.5
OTC	95.50	18.75	Synoptics Communications	91.13	2.38	2.7
OTC	7.13	6.25	Telebit Corp.	5.13	0.13	2.5
OTC	9.38	2.13	Telematics Int'l Inc.	7.88	-0.13	-1.6
OTC	25.50	13.38	US Robotics	20.00	0.00	0.0
NYS	43.88	32.88	U S West Inc.	40.75	-1.38	-3.3
OTC	46.00	12.00	Wellfleet Communications	40.75	0.75	1.9
OTC	22.00	7.00	Xircom	9.00	0.50	5.9
COMPUTER SYSTEMS						
OTC	7.50	3.00	Advanced Logic Research	3.13	-0.13	-3.8
OTC	65.25	41.50	Apple Computer Inc.	56.50	1.00	1.8
OTC	24.25	11.25	ASI Research Inc.	14.63	-0.13	-0.8
NYS	16.25	4.75	Commodore Int'l (L)	5.00	-0.38	-7.0
NYS	58.50	22.25	Compaq Computer Corp.	50.63	5.63	12.5
OTC	49.88	15.00	Dell Computer Corp.	36.88	5.75	18.5
NYS	86.00	50.25	Hewlett Packard Co.	77.13	-0.38	-0.5
NYS	33.00	14.13	Silicon Graphics	30.88	0.88	2.9
OTC	41.00	22.50	Sun Microsystems Inc.	32.63	-2.50	-7.1
NYS	32.13	22.25	Tandy Corp.	26.38	0.25	1.0
NYS	9.75	5.00	Zenith Electronics	7.25	-0.25	-3.3
OTC	16.75	2.75	Zeos International Ltd.	5.13	0.25	5.1
APPLICATIONS SOFTWARE						
ASE	18.38	6.63	Ampahl Corp.	7.88	-0.25	-3.1
NYS	14.63	6.75	Conver Computer	5.88	0.13	2.2
OTC	6.50	1.88	Cray Computer	4.38	0.38	9.4
NYS	65.00	19.00	Cray Research Inc.	28.25	-0.25	-0.9
NYS	13.88	7.13	Data General Corp. (H)	13.38	-0.13	-0.9
NYS	59.88	30.38	Digital Equipment Corp.	46.13	-0.63	-1.3
NYS	38.63	26.63	Harris Corp.	35.00	-0.63	-1.8
NYS	100.38	45.88	IBM	55.00	-0.88	-1.6
OTC	20.50	5.50	Kendall Square Research	20.50	4.13	25.2
NYS	110.00	83.00	Matsushita Electronics	96.50	7.75	8.8
OTC	17.00	6.00	Pyramid Technology	15.75	0.00	0.0
OTC	24.00	11.13	Sequent Computer Sys.	18.63	-0.88	-4.5
OTC	16.38	1.38	Sequoia Systems Inc.	2.31	-0.13	-5.1
NYS	51.50	29.50	Stratus Computer Inc.	34.25	0.75	2.2
NYS	16.88	9.88	Tandem Computers Inc.	13.25	0.13	1.0
NYS	13.88	7.75	Unisys Corp. (H)	13.50	0.00	0.0
ASE	6.38	0.06	Wang Labs Inc. (B)	1.00	0.19	23.0
SYSTEMS SOFTWARE						
OTC	56.50	25.25	Adobe Systems Inc.	45.50	0.38	0.8
OTC	28.75	10.25	Aldus Corp.	18.38	-1.88	-9.3
OTC	18.75	5.63	American Software Inc. (L)	6.38	-0.25	-3.8
OTC	28.00	9.75	Ask Computer Systems (H)	25.50	-0.63	-2.4
OTC	56.50	27.75	Autodesk Inc.	45.75	0.00	0.0
OTC	26.25	3.50	Bachman Info. Systems	4.06	0.06	1.6
OTC	43.00	34.00	BGS Systems Inc.	41.00	2.00	5.1
OTC	84.13	37.25	BMC Software Inc.	54.25	-1.75	-3.1
OTC	28.75	17.00	Boole & Babbage	25.75	0.50	2.0
OTC	71.50	17.50	Borland Int'l Inc.	22.75	-0.25	-1.1
OTC	8.88	3.00	CE Software	3.75	0.00	0.0
ASE	35.00	9.38	Cheyenne Software Inc.	30.50	-1.25	-3.9
OTC	19.50	8.75	ChipSoft	13.38	-1.13	-7.8
OTC	9.88	5.63	Cognos Inc.	6.75	0.00	0.0
NYS	27.38	10.88	Computer Associates	24.88	-0.13	-0.5
NYS	12.38	4.00	Computervision Corp.	5.63	0.25	4.7
OTC	18.50	6.75	Comshare Inc.	9.00	-0.75	-7.7
OTC	17.25	10.75	Copel Corp.	14.25	0.25	1.8
OTC	43.00	6.00	Easel Corp.	9.63	0.50	5.5
OTC	25.25	12.00	4th Dimension	20.25	0.00	0.0
OTC	26.50	11.00	Frame Technology	12.13	-1.88	-13.4
OTC	22.25	12.50	Group I Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta	27.00	-0.50	-1.8
OTC	8.75	3.50	Hogan Systems Inc.	7.25	-0.38	-4.9
OTC	25.75	12.25	HMS	16.25	-0.75	-4.4
OTC	34.75	18.50	Information Resources	30.75	1.38	4.7
OTC	42.00	12.13	Informix Corp.	33.50	-1.00	-2.9
OTC	21.25	11.00	Intergraph Corp.	12.25	-0.25	-2.0
OTC	13.63	7.75	Interleaf Inc.	10.00	0.25	2.6
OTC	18.25	7.00	Intersolv Inc.	8.90	0.25	3.0
OTC	19.25	9.50	Knowledgeware Inc.	10.13	-0.38	-3.6
OTC	54.75	28.75	Legent Corp.	42.25	-3.50	-7.7
OTC	38.50	14.75	Lotus Development	26.50	-0.50	-1.9
OTC	23.00	15.50	MathSoft	18.25	-1.25	-6.4
OTC	23.25	5.50	McAfee Associates (L)	7.75	-0.50	-6.1
OTC	8.38	1.88	Meca Software	7.63	0.13	1.7
OTC	20.00	5.25	Mentor Graphics	9.38	-0.13	-1.3
OTC	46.00	17.25	Micro Focus	33.25	-0.13	-0.4
OTC	20.50	6.50	Micrografx Inc.	8.00	0.25	3.2
OTC	95.00	65.50	Microsoft Corp.	88.00	4.25	5.1
OTC	36.38	12.00	Oracle Corp.	34.38	0.13	0.4
OTC	31.88	13.13	Parametric Technology	29.38	0.38	1.3
OTC	40.50	22.50	Peoplesoft	30.13	-0.38	-1.2
OTC	11.00	3.50	Phoenix Technologies	4.75	-0.25	-5.0
OTC	40.00	29.75	Powersoft (H)	33.25	-3.25	-8.9
OTC	25.00	11.25	Platinum Technology	15.75	-1.25	-7.4
OTC	61.50	29.00	Progress Software Corp.	46.75	-1.25	-2.6
OTC	21.00	2.94	Quarterdeck Office Sys.	4.00	0.94	30.6
OTC	26.50	11.75	Rainbow Technologies Inc.	20.75	-0.25	-1.2
OTC	22.50	4.00	Rasterops	7.50	0.00	0.0
OTC	15.50	3.63	Ross Systems	12.63	-0.13	-1.0
OTC	27.25	8.50	Sapiens USA Inc.	23.25	-1.00	-4.1
OTC	26.25	6.75	Software Publishing Corp.	12.88	-0.88	-6.4
OTC	9.13	2.00	Software Toolworks Inc.	7.75	-0.56	-6.8
OTC	5.25	0.75	Spinnaker Software	2.06	-0.06	-2.9
OTC	15.00	3.25	State of the Art	12.00	0.25	2.1
NYS	23.63	13.75	Sterling Software Inc.	23.25	2.25	10.7
OTC	21.25	8.00	Struct Dynamics Research	17.75	3.75	26.8
OTC	62.25	23.00	Sybase Inc.	59.25	0.75	1.3
OTC	48.75	5.88	Symantec Corp.	11.88	0.88	8.0
NYS	33.50	5.25	Systems Center Inc.	8.75	-0.50	-5.4
OTC	25.50	10.00	System Software Assoc.	13.00	0.25	2.0
OTC	10.13	2.50	Tenzec Corp.	4.50	-0.38	-7.7
OTC	22.75	9.13	ViewLogic Systems	19.25	1.25	6.9
OTC	23.75	8.13	Walker Interactive Systems	9.38	-0.63	-6.3
OTC	4.38	1.38	Wordstar	2.31	0.00	0.0
SEMICONDUCTORS						
NYS	24.25	7.38	Advanced Micro Devices (H)	23.50	0.00	0.0
NYS	18.75	8.88	Analog Devices Inc.	18.75	0.88	4.9
OTC	20.13	7.63	Atmel Corp.	18.75	0.25	1.4
OTC	12.63	3.13	Chips and Technologies (L)	3.56	0.19	5.6
OTC	39.75	16.25	Cirrus Logic	28.50	2.75	10.7
NYS	16.75	7.38	Cypress Semiconductor Corp	11.25	0.50	4.7
NYS	16.13	7.00	Dallas Semiconductor	15.25	0.38	2.5
OTC	121.25	46.50	Intel Corp. (H)	117.75	0.13	0.1
NYS	13.88	4.88	LSI Logic Corp. (H)	13.88	1.38	11.0
NYS	27.75	12.88	Micron Technology (H)	27.75	1.88	7.2
NYS	64.75	36.88	Motorola Inc.	64.75	3.75	6.1
NYS	14.13	8.25	National Semiconductor	13.25	1.88	16.5
OTC	21.25	8.25	Sierra Semiconductor	13.50	0.25	1.9
OTC	38.50	22.25	SynOptics	29.00	-2.13	-6.8
NYS	61.38	31.50	Texas Instruments (H)	61.38	2.25	3.8
OTC	10.00	6.00	VLSI Technology	7.13	0.00	0.0
OTC	7.63	2.13	Weitek	7.00	0.00	0.0
ASE	9.63	3.50	Western Digital Corp.	8.13	-0.38	-4.4
OTC	37.25	14.50	Xilinx (H)	36.13	-0.13	-0.3
OTC	27.84	12.50	Zilog Inc.	24.00	-1.13	-4.5
PERIPHERAL AND STORAGE SYSTEMS						
OTC	28.75	10.38	American Power Conversion	27.25	1.38	5.3
OTC	20.17	13.67	Banctec Inc.	(s) 17.50	0.50	2.9
OTC	20.75	9.25	Cambex Corp.	11.63	0.13	1.1
ASE	18.38	6.75	Cognitronics Corp.	9.13	-5.38	-37.1
NYS	25.50	16.13	Conner Peripherals	17.63	-0.38	-2.1
OTC	38.50	19.75	Creative Technologies Inc.	31.25	-0.25	-0.8
OTC	30.75	14.25	Data-Race Inc.	22.50	1.50	7.1
ASE	19.63	6.75	Dataram Corp.	8.50	0.25	3.0
NYS	28.75	7.25	EMC Corp.	25.63	0.75	3.0
OTC	10.50	5.38	Emulex Corp.	7.13	0.50	7.5
OTC	19.00	13.25	Evans & Sutherland	14.00	0.00	0.0
OTC	39.25	12.00	Exabyte	13.75	0.63	4.8
OTC	26.00	7.09	Intelligent Info. Systems	21.25	-1.00	-4.5
OTC	9.25	3.88	Iomega Corp. (L)	4.38	-0.25	-5.4
OTC	34.75	5.75	IPL Systems Inc.	6.75	0.00	0.0
OTC	24.00	10.75	Komag Inc. (H)	22.00	-1.25	-5.4
OTC	19.63	7.00	Maxtor Corp. (L)	7.13	-0.38	-5.0
OTC	12.38	7.13	Micropolis Corp.	7.75	-0.50	-6.1
NYS	109.75	85.50	3M Corp	108.50	1.25	1.2
OTC	7.75	4.00	Printronix Inc.	6.88	0.00	0.0
NYS	17.13	6.88	QMS Inc.	15.00	-0.25	-1.6
OTC	17.88	12.13	Quantum Corp.	15.00	-0.38	-2.4
OTC	17.75	3.75	Radius Inc.	5.25	0.50	10.5
NYS	16.25	7.50	Recognition Equipment	13.38	0.50	3.9
OTC	13.88	5.50	Rexon Inc. (L)	6.00	0.00	0.0
OTC	22.38	12.00	Seagate Technology	16.75	0.38	2.3
NYS	72.50	18.00	Storage Technology	25.38	1.13	4.6
NYS	25.50	16.88	Tektronix Inc.	25.50	0.88	3.6
NYS	88.88	66.75	Xerox Corp.	82.75	-0.38	-0.5
SERVICES						
OTC	23.50	12.76	American Mgmt. Systems	22.13	1.75	8.6
NYS	5.38	3.00	Amacomp Inc.	3.75	0.00	0.0
OTC	35.75	16.00	Analysts Int'l	30.75	-1.50	-4.7
NYS	56.13	38.75	Auto Data Processing (H)	54.13	-0.50	0.9
NYS	17.25	9.41	Ceridian Corp.	16.88	0.13	0.8
NYS	17.38	12.50	Comdisco Inc	15.88	-1.13	-6.6
OTC	13.00	6.75	Computer Horizons	11.00	0.75	7.3
NYS	88.50	57.00	Computer Sciences	75.88	1.38	1.8
NYS	9.75	7.00	Computer Task Group	7.75	-0.38	-4.6
NYS	40.50	22.00	Comsat Inc.	30.38	0.63	2.1
OTC	18.50	6.00	Corporate Software	12.00	0.00	0.0
OTC	30.75	7.63	Egghead Discount Software	7.88	-0.13	-1.6
NYS	35.88	25.25	General Motors E (EDS)	31.13	0.75	2.5
OTC	25.50	9.25	Inacom Corp.	20.75	0.13	0.6
OTC	23.50	6.25	Intelligent Electronics	14.63	-0.25	-1.7
OTC	14.38	6.63	Medisel	10.75	0.13	1.2
OTC	15.75	9.75	Micrognd Inc.	13.00	-0.25	-1.9
OTC	40.00	21.66	Paychex	38.75	-0.25	-0.6
NYS	84.88	59.75	Policy Management Sys. (H)	84.13	0.00	0.0
NYS	35.38	16.81	Reynolds and Reynolds (H)	33.63	-1.38	-3.9
OTC	31.75	22.00	SEI Corp.	29.25	-0.25	-0.8
OTC	24.38	16.88	Shared Medical Systems	22.00	0.38	1.7
OTC	14.38	5.75	SHL Systemhouse	10.38	1.25	13.7
OTC	29.25	18.25	Software Spectrum Inc.	24.00	-0.38	-1.5
OTC	33.75	20.75	Sungard Data Systems (H)	32.50	0.25	0.8
NYS	2.75	1.13	Ultimate Corp.	2.63	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
Note: Banctec completed a 3-for-2 stock split.

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In Brief

Dell posts gains

Showing little impact from persisting PC pricing pressures, **Dell Computer Corp.** last week posted fiscal fourth-quarter earnings of $31.3 million, a 109% increase from the year-earlier period. Revenue rose 117% to $620 million in the period ended Jan. 31. For the year, the Austin, Texas, company posted profits of $102 million on revenue of $2 billion, up 100% and 126%, respectively, from fiscal 1992.

Gateway on the rise

Mail-order PC house **Gateway 2000** reported calendar 1992 profits of $106 million, up 77% from the year-earlier period. Revenue for the year exceeded $1.1 billion, up 76% from 1991. The privately held North Sioux City, S.D., company said it shipped about 437,000 units last year, up 75% from 1991.

Olivetti buys into EO

Ing. C. Olivetti & Co. purchased a minority stake in **EO Corp.** The Milan, Italy, firm will get a seat on EO's board and will co-market the Mountain View, Calif., firm's personal communicator in Europe. Olivetti joins AT&T, Matsushita Ltd. and Marubeni as EO's marketing and financial allies.

SHORT TAKES Internetworking vendor **David Systems, Inc.** in Sunnyvale, Calif., filed an initial public offering (IPO) of 2.5 million shares, which are expected to sell for between $7 and $8.50 a share. . . . Real-time software developer **Wind River Systems, Inc.** in Alameda, Calif., registered an IPO of 1.9 million shares, which are expected to sell for between $8 and $10 a share. . . . **Trinzic Corp.** in Palo Alto, Calif., has agreed to acquire **Channel Computer, Inc.**, a Portsmouth, N.H., developer of client/server applications, for about $6.5 million.

Time ripe for software start-up

Emprise Technologies focuses on distributed systems management

By Johanna Ambrosio
BRIDGEVILLE, PA.

■ Timing is everything in starting a business, and a start-up focusing on distributed systems management may be in the right place at the right time, users and industry watchers said.

Emprise Technologies, Inc., established by Glen Chatfield, a Duquesne Systems, Inc. founder, and Neal Pollon, a Legent Corp. cofounder, is working on a series of products designed to simplify tasks such as backup and security in a distributed environment.

Key to the strategy is building bridges — or acquiring products — that link systems software on mainframes to their counterparts on PCs and local-area networks.

Although companies such as Legent and Computer Associates International, Inc. are targeting distributed systems management, analysts said the market is wide open. Users who are distributing their processing are clamoring for more robust systems management tools.

Best of both worlds

"When you're running distributed systems from many locations, there are some tools that you're used to in the mainframe that you don't have in the other environments," said Jerry Laflen, vice president of computer operations at Farm Home Loan in Nevada, Mo., and a charter Emprise customer. "I guess we want the benefits of distributed computing but with the central administration of the mainframe."

That is exactly the set of issues, which Emprise is calling "intersystems management," that the company will target, said Gregory Cotiochia, vice president of operations.

The approach differs from that of mainframe vendors targeting the market. "Mainframe software companies are generally extending their software to work on other platforms like PC or Unix," Cotiochia said. "But most users already have these products in place on other platforms, so they want interaction between the environments, not a replacement product."

Emprise will bring out its distributed systems management product set during the next 12 months, Cotiochia said. This will include alliances with "key LAN software vendors," he added, declining to elaborate.

Software allies

In the interim, the company has acquired four software packages from other small vendors to help bring in revenue as it builds and acquires its key software. Among the packages Emprise is selling is Intersend, a file-transfer utility formerly called Beamit, acquired from Soto Systems in Branson, Mo.

Another package is CICS Automated Table Systems, acquired from user American International Group, Inc. in New York, which developed the package. It automates the procedures for changing CICS applications. All told, Emprise has about 100 customers for the four acquired packages.

Igor Steamark, a program director at Gartner Group, Inc., said Emprise "looks promising. We're waiting to see how well they'll deliver. This company is representative of companies we'll be seeing over the next year or two. As refugees from larger companies, they have the experience, the money, the contacts and the knowledge to succeed."

Nevertheless, Emprise might be ahead of some large users for distributed systems management products. Jerry Cavanaugh, manager of the information technology department at British Aerospace in Sterling, Va., and an Intersend user, said, "Right now, distributed systems management is not a hot button for us or for our business. We're using Intersend for batch file transfers, and it works just fine; but that's about all we need for now."

At a glance

Emprise, founded in Nov. 1992, has 20 employees; that number will probably grow to 40 by year's end. The company only recently announced itself to the industry because it spent the past few months building a global distribution network and acquiring products. Emprise was funded with money from its principals. The goal is to become a $3 million to $5 million company by December, eventually growing to perhaps the $100 million to $200 million range.

Integration focus paying off for restructured Bull

By Melinda-Carol Ballou
BILLERICA, MASS.

Although it is still swimming in red ink, Groupe Bull is starting to reap dividends from its tighter focus on open systems and integration services.

The company's 1992 consolidated financials, released earlier this month, show reduced operating deficits, although heavy restructuring charges kept Bull mired in losses.

There was a silver lining, however. "We cut our operating margin loss in half [to $121 million]," said Axel Leblois, president and chief executive officer of Bull HN Information Systems, Inc., the U.S. subsidiary of Groupe Bull.

Leblois said Bull's U.S. business is profitable, although he declined to give figures. He attributed U.S. profitability to a 2-year-old business unit structure, which gives individual groups profit-and-loss responsibilities and a focus on services, including systems integration.

Getting worse ...

	1991	1992
Revenue	$5.93B	$5.7B
Operating margin	$(205M)	$(121M)
Write-downs	$119M	$462M
Net loss	$(585M)	$(892M)

Source: Bull HN Information Systems, Inc.

Groupe Bull's systems-integration focus — pinned heavily on helping companies migrate from proprietary to open systems — contributed to $650 million worth of revenue for professional services in 1992, or 11% of corporate revenue, according to Bonnie Digrius, a program director at Gartner Group, Inc., a market research firm in Stamford, Conn. "They're successfully making the transition to [systems integration]," she said.

Bull closed a $500,000 services deal with American Airlines last year, for example.

But while Groupe Bull is the No. 4 player in Europe for services, it is not among the Top 10 service providers in the U.S. and must "shore up its presence in what is an exceptionally aggressive market" in this country, Digrius said.

Although systems integration business climbed, total company revenue decreased (see chart). The decline was attributed to monetary fluctuations and the recession, the firm said.

Bull is losing Steve Gardner, the president of the Integris systems integration division, who will be filling a vice presidential spot at Data General Corp.

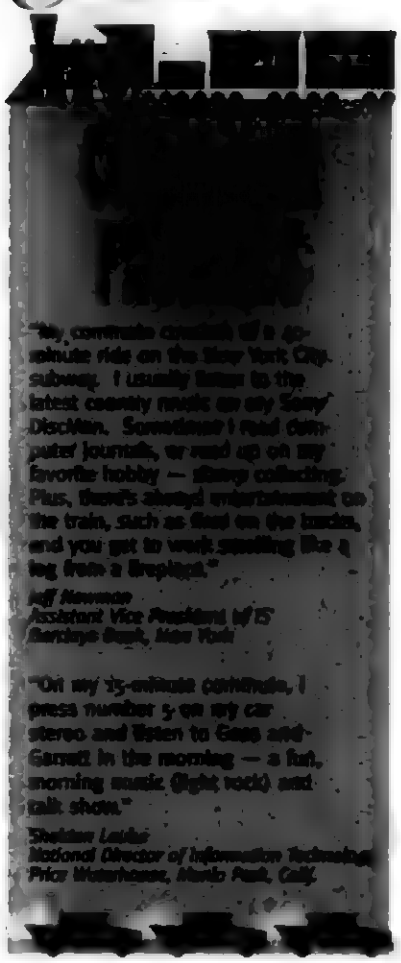
Industry analysts were positive in their assessment of the company's progress in cutting back on losses. "Whenever you start getting closer to black ink rather than red ink it's a good sign. They must be doing some things more efficiently, but they have a ways to go still," Digrius said.

Wysiwyg

Great Names

JIM CARRIER

Director of computer technical services, who's also involved with efforts to install a global wide-area network at Fisher-Price, Inc.



"My commute consists of a 40-minute ride on the New York City subway. I usually listen to the latest country music on my Sony Discman. Sometimes I read computer journals, or read up on my favorite hobby — stamp collecting. Plus, there's always entertainment on the train, such as food on the floors, and you get to work smelling like a log from a fireplace."

Jeff Newman
Assistant Vice President of IS
Barclays Bank, New York

"On my 25-minute commute, I press number 5 on my car stereo and listen to Ease and Garrett in the morning — a fun, morning music (light rock) and talk show."

Sheldon Laube
National Director of Information Technology
Price Waterhouse, Menlo Park, Calif.

WANTED: OVERACHIEVERS

IBM has hired not one but two major headhunting firms to find a new CEO, according to Sam Albert, industry observer-at-large. The "unusual" move means that IBM's next leader "will definitely hail from beyond the computer industry as well." Albert declined to speculate on who the job might go to but said the CEO-to-be will have specific traits:

Age: Early 50s

Experience: Leading conglomerates

Style: Risk-taking overachiever

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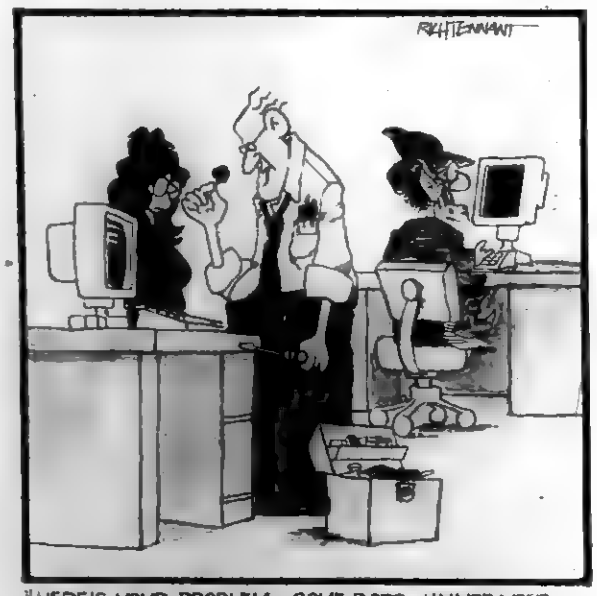
The Fifth Wave *by* Rich Tennant



"HERE'S YOUR PROBLEM. SOME BOZO JAMMED YOUR KEYBOARD WITH A FOUR-LEAF CLOVER."

Inside Lines

End run

Sybase is expected to announce this week that it has found a way around Oracle's refusal to sell it an Oracle 7 license for the enhancement of Sybase's SQR report writer product. Sybase has struck a deal with Management Information Technology, a Long Beach, Calif., Oracle independent software vendor since 1985, to port the SQR product to Oracle 7. Sybase acquired the SQR report writer last year. It works with a variety of relational databases from Sybase, Oracle, Informix and IBM's DB2. SQR is already compatible with the Oracle Version 6.0 relational database.

Spit and polish

DEC is working overtime to beef up its image. Sources said President and CEO Robert Palmer presided recently over a 70-person meeting that had an important mandate: to determine the colors on the official company logo and to decide whether the "i" in "Digital" ought to retain its current squared edges or be softened to an oval shape. At the same time, more personnel cuts are likely to begin moving forward later this month, sources said.

Going west

Hitachi will today announce its entry into the U.S. E-mail market with LAN E-mail integration software. The company expects to ship directory synchronization software based on the Simple Mail Transfer Protocol in the third quarter and said it is "absolutely committed to X.500 long term." Hitachi's Computer Products unit will also demonstrate at UniForum an X.400-based network management software package on top of a Hitachi workstation built with code borrowed from Retix.

Muscling in

Controversy continues to swirl around Lexcel's Lance+, an integrated SNMP-based network management system that Lexcel officially stopped developing in January. Both Hewlett-Packard and Sun consider the Lexcel user base, which has been estimated at 250 sites, to be full of prime potential customers. HP is offering Lance+ users 35% off OpenView Network Node Manager's list price, while Sun announced last week a free upgrade from Lance+ to SunNet Manager. Meanwhile, Lexcel says it hopes to continue supporting and enhancing Lance+ through a partnership to be announced shortly.

Death reports are premature

Who says ISDN is dead? Following recent announcements of ISDN support by luminaries such as Sun and Eicon, DEC will announce Pathworks support for ISDN this week. Pathworks is DEC's strategy for integrating various desktop environments with various network operating systems, all on a VAX.

That was no technical difficulty that caused the TV screen to go blank last week during the Interactive Information Network's (IIN) broadcast of IBM's consultants' meeting in Orlando, Fla. At IBM's behest, IIN agreed to pull the plug once IBM outsourcing President Sam Palmisano came to the podium to give a presentation on IBM's ISSC outsourcing subsidiary. IIN also blacked out a talk by IBM France President Pierre Hessler. The airwaves came alive again during a question-and-answer period, in which Palmisano described a lean, spartan ISSC operation. Marty Clague, an IBM consultant as well as a software and services general manager, by the way, all but confirmed that IBM's various consulting and services groups are competing with one another. Responding tongue in cheek to a questioner seeking delineation of the groups, Clague said the answer would depend on who's giving it. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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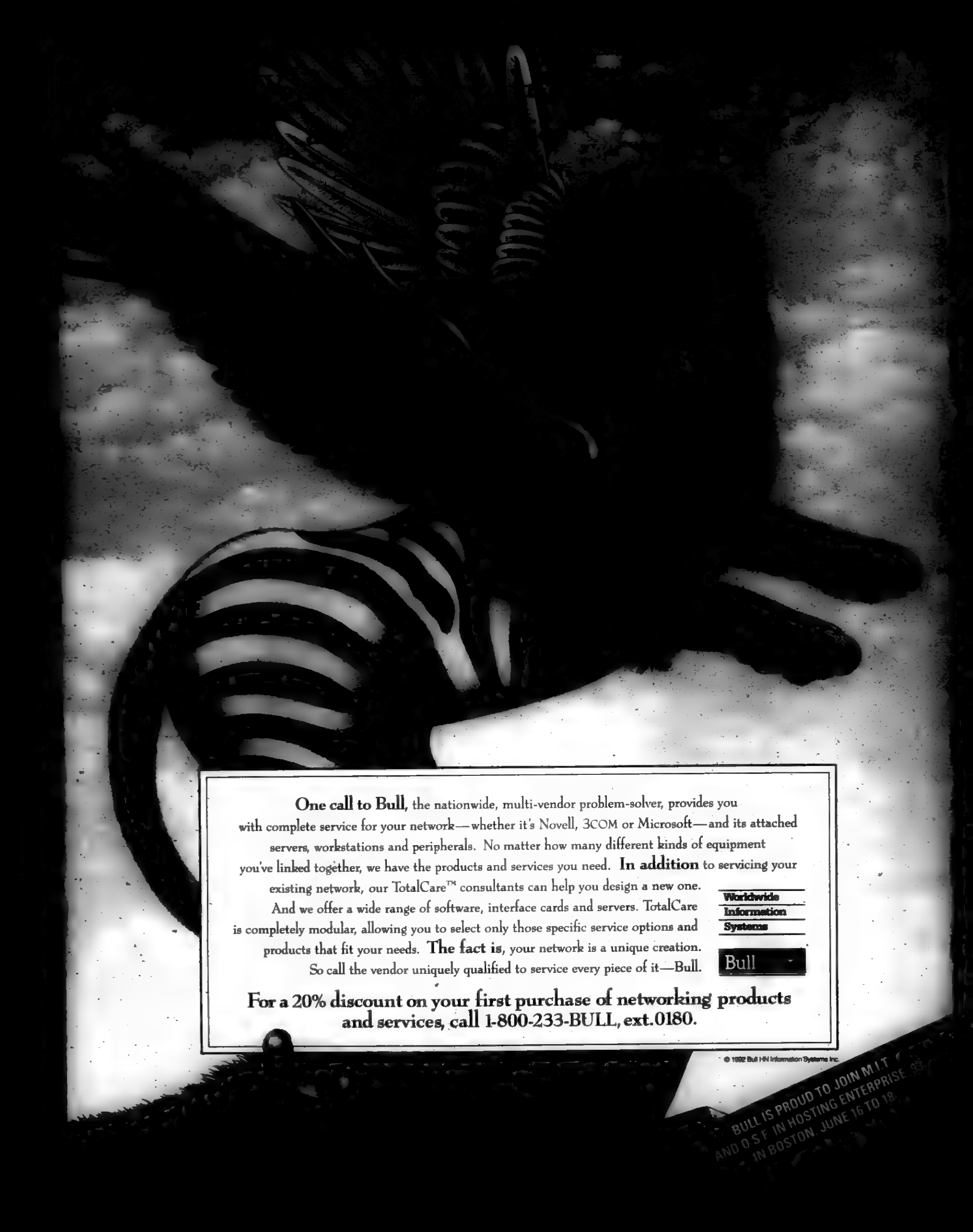
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The Newspaper of Information Systems Management
March 22, 1993, Vol. 27, No. 12, 108 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Inside

CHIPS
Intel's Pentium debuts today and should appear in systems by the middle of May. The chip, which faces a tough battle against RISC microprocessors, will allow systems vendors to deliver powerful platforms for downsizing host-based applications to client/server networks. *Page 2*

CLIENT/SERVER
Users like the ease of use of Oracle's new integrated client/server tool kit but are still waiting for precise pricing and packaging data. *Page 4*

DISASTER RECOVERY
The recent East Coast blizzard closes a data center responsible for handling transactions at 5,000 automated teller machines nationwide. *Page 6*

MANAGEMENT
Business analysts trained in operations research can be a secret weapon in a CIO's quest for bottom-line results. Experts say IS executives must learn to exploit the talents of these mathematical wizards. *Page 63*

IBM tries user-based host pricing

Decision-support software tapped first

By Johanna Ambrosio
SAN FRANCISCO

IBM last week revealed its first attempt at user-based pricing for a mainframe application. If this trial meets with user acceptance, IBM may use the model for other mainframe applications, executives said.

Although different parts of IBM are trying various software pricing models, last week's disclosure marked the company's first public admission that user-based pricing could become more widespread for IBM mainframe software.

Users said they welcome the change of heart. George Sekely, president of CSX Technology, Inc. in Jacksonville, Fla., said, "IBM is starting to act more like a PC software company. If the price is sufficiently low, wonderful. It allows us

IBM, *page 12*

Unix rivals unite

By Marytran Johnson
SAN FRANCISCO

The endorsement last week of a single "Unix dashboard" by six of the industry's powerhouses could produce a common set of standards by mid-1994 that would enable users to build open systems architectures without worrying about whose technologies they are using.

However, the stunning show of unity at UniForum 1993, ostensibly aimed at easing customer frustrations with the Unix industry, had a more pressing motivation: to ward off the evil eye of Microsoft Corp.'s Windows NT 32-bit operating system.

Agreeing to deliver a Common Open Software Environment — dubbed "Cozy" — across their Unix platforms were IBM, Hewlett-Packard Co., Sun Microsystems, Inc., Unix System Laboratories, Inc., The Santa Cruz Operation and Univel, Inc., a subsidiary of Novell, Inc.

In addition to offering users the same look and feel across heterogeneous desktop systems, the vendors also pledged to adhere to a consistent set of desktop application programming interfaces, common networking products and a variety of existing and emerging standards in graphics, multimedia and object technology (see story page 14).

Five years of pitched battle among the Unix camps, however, has left users unwilling to jump for joy at the first signs of cooperation or common sense. Cozy, they pointed out, is one of many efforts undertaken since the late 1980s aimed at Unix unification.

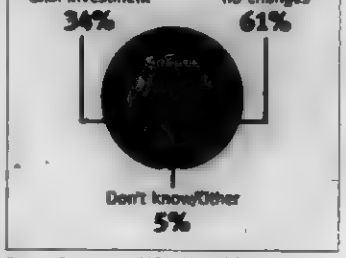
"It sure sounds like a good thing,

Unix, *page 14*

Lukewarm

Only about one-third of respondents said the common set of open systems interfaces would cause them to invest more heavily in Unix

HOW WILL THIS ANNOUNCEMENT AFFECT YOUR INVESTMENT IN UNIX?



Source: Computerworld Database Division

Wireless intrigues IS executives, but technical obstacles stunt use

By Joanie M. Wexler
NEW YORK

Despite their zeal for the "virtual corporation," many firms are ruefully acknowledging that the technology that will eventually let employees carry their offices around with them in an integrated computer/communications device is still in its infancy.

Stumbling blocks to implementing the virtual corporation today, they said, include security, bandwidth, convenience and concerns about the safety of today's wireless networking schemes.

Information systems and networking professionals from all walks of corporate life attended a conference here last week sponsored by Boston-based consultancy The Yankee Group and *Computerworld*. They indicated they are hungry for wireless networking and discussed innovative applications they are already planning or testing. But most said they would wait for the resolution of these outstanding issues before implementing wide-scale deployment.

For example, Stephen R. Schoenfeld, managing director at Lehman Brothers, told attendees that he is testing wireless electronic mail and local-area networking on trading floors to help

Wireless, *page 8*

Portable offices

While companies are anxious to untether employees, unresolved issues with wireless technology will prevent an explosion in the virtual office for at least two years

Projected number of U.S. users

Cellular (voice and data)	13M	16M	19M
Personal communications systems (voice)	100,000	500,000	1M
Paging	15.2M	17.2M	19.2M
Wireless packet data services	1.3M	1.7M	2.5M
Mobile computers	23,000	75,000	255,000
Personal digital assistants (voice and data)	2,000	22,000	94,000

Source: The Yankee Group

Chr Chart: Jamal Ganesan

◀ A blend of cellular, personal communications, paging and laptop technologies is creating a new breed of employee: the mobile professional. However, in 1992, only half a million of some 36.5 million mobile devices in use were data-oriented.

Multiprocessing

Hyatt ups open systems

By Mark Halper
CHICAGO

Hyatt Hotels Corp. will soon select a multiuser Unix server to handle a quantum leap in reservation volume that will kick in as the hotel expands its central booking process and enters the reservation outsourcing business.

Gordon Kerr, senior vice president of MIS, said Hyatt will decide by mid-May whether to transfer its Spirit reservation system to Pyramid Technology Corp.'s MIServer ES, the Hewlett-Packard Co. Corporate Business System or NCR Corp.'s 3550.

The company currently runs Spirit on a 12-processor version of AT&T's Pyramid-made 7000 over an Informix Corp. data-

Hyatt's Gordon Kerr *seeks more MIPS*

base, but two pending business changes will push the 7000 beyond its limits.

Hoping to capitalize on a void left by the collapse of the AMR Corp.-led Confirm reservation project, Hyatt is seeking customers in the lodging industry, Kerr said.

However, Hyatt's

Hyatt, *page 16*

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Intel Systems

▲The television of the not-so-distant future could be a couch potato's dream come true: a voice-controlled appliance with the smarts of a PC and the audiovisual quality of a movie screen. Page 39.

UNIFORUM

IS professionals struggling with the move to open systems computing met at **UniForum 1993** last week to discuss how to compensate for shortcomings in systems management, security and other areas. *Page 14.* **Lotus** tells customers that **Notes for Unix** has been delayed until the second half of 1993. *Page 15.* **IBM**'s new **Unix** relational database, announced last week, gives users a unique stepping-off point for re-engineering mainframe applications for client/server systems, but analysts said it still doesn't match rival products. *Page 12*

PC SOFTWARE

Microsoft's Hermes system management technology is turning heads at recent demonstrations. The **Windows NT**-based server software allows managers to perform custom installations across a network and maintain detailed inventories of PC software. *Page 37.* **WordPerfect** will today announce the first major upgrade to its flagship DOS word processor in three years. *Page 10*

CW GUIDE

When 'server' means 'file server,' memory, storage and speed are paramount. When you're looking for a machine to do heavy-duty database serving, the purchase checklist changes to scalability, bottleneck handling, reliability and manageability. Users evaluate the market-leading RISC servers from **DEC, DG, IBM, HP** and **Sun**. *Page 67*

VIEWPOINT

Work-flow tools can do a lot to make processes more efficient and more adaptable, says columnist **Esther Dyson**, but they can't accomplish much if the people using them don't really understand them or the way work is accomplished. *Page 33*

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Pentium roars to starting gate

Intel chip faces battle to achieve server dominance

By Michael Fitzgerald
SANTA CLARA, CALIF.

■ Intel Corp. rules the desktop, but it has yet to prove itself in the high-end server market, where systems ranging from high-end reduced instruction set computing (RISC)-based workstations to traditional mainframes are potential competitors.

Intel hopes to squelch the competition with Pentium, its next-generation microprocessor, for which it will announce technical details today. Intel officials said systems vendors will be able to ship limited numbers of Pentium systems starting May 17.

"We're starting the whole downsizing/rightsizing thing, and it's a battle of RISC vs. Pentium," said Louis Gutentag, information systems director at Milbank, Tweed, Hadley & McCloy, a New York law firm that has its back-office applications on an IBM mainframe. "I can buy RISC systems today and solve my problem, but we'll need Intel systems for things like document management. I'm trying to avoid running a dual platform shop" after downsizing, he said.

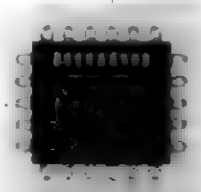
Gutentag, who as a member of Intel's Corporate Advisory Board has seen a demonstration of Pentium-based systems, said the chip's speed was impressive.

Intel is billing Pentium, designed with RISC-like features such as a superscalar architecture to greatly improve processing speed, as a CPU that will let users bring large systems applications into a client/server desktop environment. It also has mainframe-type features.

However, performance marks its long suit: The 66-MHz version of Pentium will run up to 70% faster than current top-of-the-line Intel systems.

"You can now put a two- or four-processor Pentium system together, and in terms of computing power you're equal to the largest ES/9000," said Virgil Hornstein, director of North American systems product marketing at Compaq Computer Corp. Compaq will move its Tri-Flex server architecture down from the SystemPro XL to ProSignia and DeskPro/M products in order to take advantage of Pentium, Hornstein said.

Intel officials and users agreed, however, that it will take time for the software vendors to catch up to the new capabilities of Pentium. Pentium was designed to work well in a multiple processor system environment, but little software is currently available to take advantage of these types of systems.



Faster chip
The Pentium Pipelined Floating Point Unit can run floating point-intensive applications five to 10 times faster than the 1486 CPU, with which it is compatible. Pentium users will find enormous performance boosts in applications such as financial analysis, engineering simulation, modeling and spreadsheets.

Intel's Curt Nichols, marketing director for Pentium, said Intel recognizes that downsizing mission-critical applications "requires advanced operating systems, and we're not developing Pentium in a vacuum." He pointed to The Santa Cruz Operation's SCO Unix, Microsoft Corp.'s Windows NT, Next, Inc.'s NextStep and IBM's OS/2 2.1 as operating systems that will be optimized for Pentium.

Current software, however, will have to be recompiled to realize Pentium's full performance benefits. Pentium-optimized applications, when they appear, will also run on existing Intel platforms.

"I expect we'll use some Pentium desktops for our mapping applications, but we'll primarily use them as servers," said John Miller, director of office systems technology at GTE Telephone Operations in Irving, Texas, and another member of the advisory board.

Intel will also announce today its Peripheral Component Interface chip set for Pentium. This is a local bus designed to allow users to link hard drives, graphics and other peripherals directly to the processor and should further enhance Pentium system performance if vendors adopt it.

DEC names second source for Alpha

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. further legitimized its Alpha AXP strategy last week when it announced a deal with Mitsubishi Electric Corp. to act as a long-awaited second source for the Alpha chip.

Although user reaction to the announcement was generally positive, five out of 21 users reached for comment by *Computerworld* last week said such an agreement would be stronger if DEC had signed on a well-known U.S. chip maker.

"Personally, the main reason I care about this is that it may strengthen Alpha's position in the marketplace," said John Osudar, a computer scientist at Argonne National Laboratory in Argonne, Ill.

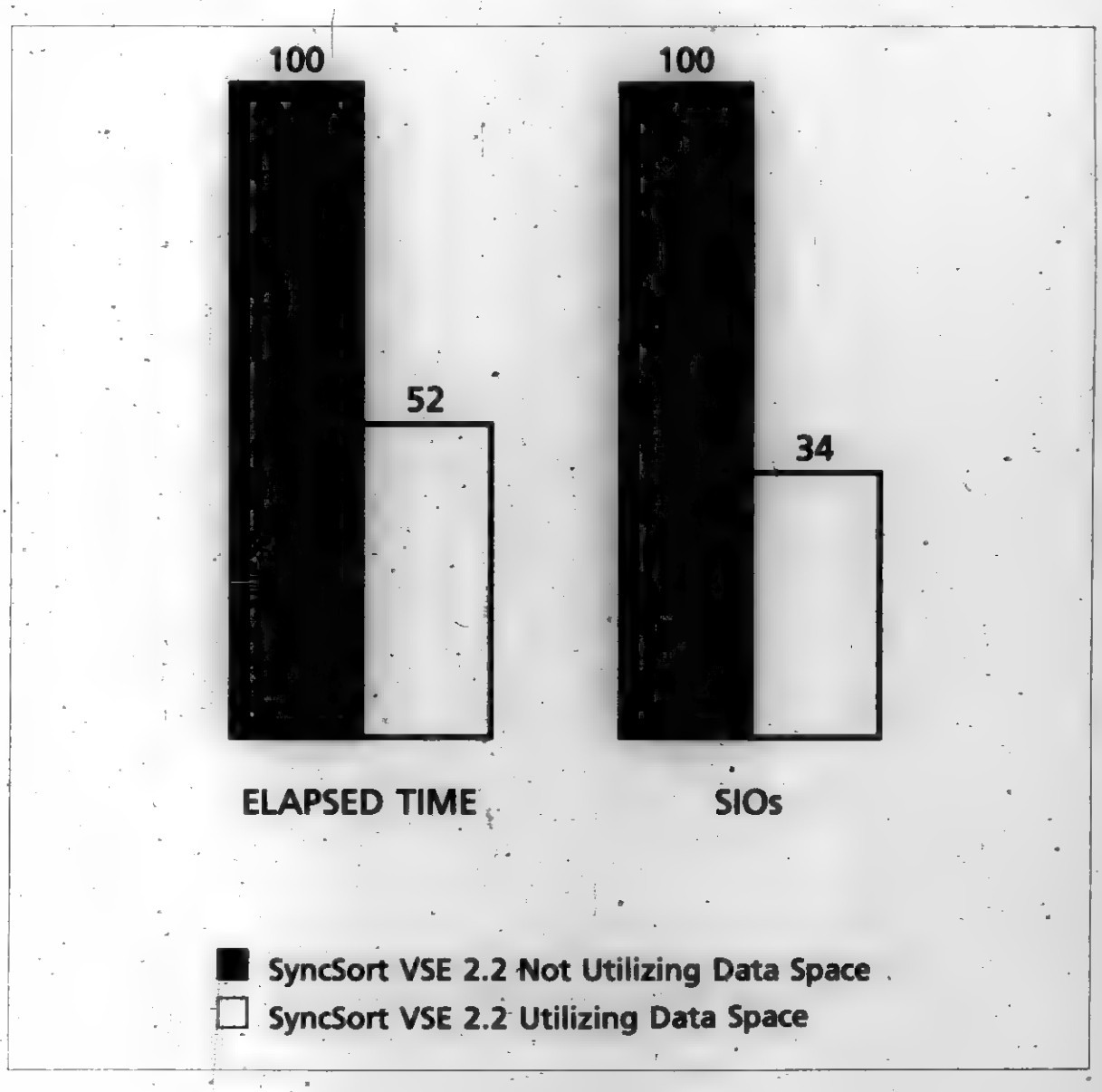
"While any second source is good, a household name would have been better," added Bill Mayhew, chairman of the Digital Equipment Computer Users Society.

Mitsubishi will begin producing the chips in the 1994 time frame built around DEC designs, and it will produce chips based on its own designs thereafter, according to DEC officials.

Industry analysts were upbeat about the development.

"Mitsubishi is not a proven force in the 32-bit processor market, but they are a capable semiconductor manufacturer and should not have any trouble producing the DEC-designed chips, particularly given a time frame of almost two years," said Michael Slater, editor of the "Microprocessor Report," which is published in Sebastopol, Calif.

SyncSort VSE Exploits VSE/ESA Data Space Today.



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Client/server tools

Oracle wins kudos, hears concerns

By Jean S. Bozman
SAN FRANCISCO

At biocastal rollouts last week, users lauded Oracle Corp.'s graphical client/server tools for their projected ease of use. But as comprehensive as the 14 integrated tools are, users noticed one key ingredient was missing: prices.

That is because Oracle has yet to publish prices for the Cooperative Development Environment (CDE). Oracle executives later told *Computerworld* the firm would provide a price list before the tool set ships in June. "We'll have that established in the next month or two," said Jerry Baker, senior vice president of Oracle's Product Line Division.

CDE prices are still under discussion. "We are completely revamping the pricing structure of the tools," said Farzad Dibachi, senior director of CDE product marketing.

Dibachi said thebundled CDE tools would be priced at approximately $20,000 but that prices would vary according to platform. In contrast, he said, current character-based Oracle computer-aided software engineering (CASE) tools alone are priced at $18,000. However, a Microsoft Corp. Windows version of CDE will be priced much lower than $20,000, he said, and runtime versions of the CDE tools will be priced at several hundred dollars.

Even before CDE ships in June, users can buy the current crop of Oracle tools and then upgrade to CDE tools at no cost, provided they have paid a maintenance fee, Dibachi said. Baker said users will have the option of buying a single, bundled package of CDE tools or an assortment of separate modules, such as the Oracle's Browser and CASE tools.

Oracle CEO Lawrence Ellison

By July, Oracle users will have three ways to access data stored in IBM's DB2 database:
- Oracle's SQLConnect gateway links Oracle servers to DB2.
- New "transactional triggers" allow CDE tools to directly address DB2.
- Microsoft's Open Database Connectivity application programming interface links Oracle clients with the DB2 server.

In the absence of a price list, users and analysts guessed last week that a fully equipped developers' tool kit would cost $20,000 to $30,000. That is comparable to the cost of an integrated CASE tool set, said Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. But the price is considerably more than the cost of Windows tools from Gupta Corp. and Powersoft Corp., which are installed at many Oracle sites.

Some users said they are very interested in seeing a final price list. "The tool set was received very positively, but I'm concerned that it could easily cost $30,000 to completely outfit a developer's workstation, including the CASE tools," said Warren Capps, director of Oracle systems and training at federal contractor STR Corp. in Reston, Va., who attended a Washington, D.C.-area briefing. "That's as much as the cost of hiring a programmer."

Early CDE user Garrett Suhm, a project leader at Westinghouse Savannah River Co. in Aiken, S.C., said he prefers flexible pricing for runtime versions because "we don't want 100 boxes of tools to come here. We want one box, and we'll deploy it on the Novell server."

The high degree of integration among CDE tools is expected to boost productivity. CDE applications can be developed once, then deployed on many platforms whether they host character-based or graphical user interface screens [CW, March 15]. The integration of the forms and report writer tools will save time formerly spent capturing and displaying answers to SQL queries, users said.

Key ingredient

Access to multiple databases scattered throughout large organizations is expected to be a key selling point. Oracle users will be able to build applications that run directly against IBM's DB2 and SQL/DS relational databases, said Dennis Moore, product marketing manager for CDE. Future versions will address more database engines.

Oracle Chief Executive Officer Lawrence Ellison told the audience at the New York unveiling of CDE that programmer productivity is a major benefit of the integrated tool set. "CDE is designed to get you away from having to write lines of code," Ellison said.

Users agreed. "CDE cuts application development to a matter of days," said James Bennett, vice president of the technology division for CDE beta-test site First National Bank of Chicago, which has developed Oracle applications that run against IBM's DB2. "It's an impresaive product."

Senior editor Michael Vizard contributed to this story.

Novell cuts tags, adds function to desktop Unix

By Michele Dostert
SAN JOSE, CALIF.

Novell, Inc.'s Univel desktop Unix subsidiary fired another salvo in the 32-bit PC operating system wars last week by slashing the price and boosting the application base of its UnixWare personal and application server products.

Univel dropped the price of its UnixWare Personal Edition to $249, a 50% cut. It also slashed prices on the UnixWare Application Server (48%) and Software Development Kit (40%) to $1,290 and $599, respectively.

The price cuts make UnixWare competitive with IBM's OS/2 2.0, which is priced from $195 to $270. Microsoft Corp. has not yet announced pricing for Windows NT.

Univel also expanded UnixWare Personal Edition's ability to run DOS and Windows applications. UnixWare already comes bundled with Novell's DR DOS 6.0 to let users run DOS applications. Now, any PC with Windows can use UnixWare's new Windows Merge capability to support Windows 3.0 and 3.1.

"Adding Windows support means UnixWare now has a very broad application base; it can run familiar DOS and Windows packages as well as complex, powerful Unix [System V, Release 4] applications," said Stan Schatt, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

UnixWare can now partition a user's disk into UnixWare, DR DOS 6.0 and Windows partitions. The user can then install any DOS, Windows or Unix application.

Jeff Byrne, Univel's product marketing manager, said that with these partitions in place, most Windows functions run natively, using the Intel Corp. chip instruction set; the Windows graphical interface is automatically mapped over to an X Window System interface.

NT moves to next test phase

By Christopher Lindquist
REDMOND, WASH.

Microsoft Corp. has begun rolling out the second beta-test release of Windows NT, and testers are anxiously awaiting what they hope will be a near production-ready version of the operating system that fixes many of the flaws in the previous release.

Several beta-test users contacted had not received their copy of the new beta-test release as of last week but said they are eager to see if it meets their expectations. And at least one waiting tester said his company planned on moving the second beta-test version into some production situations as it became feasible.

That user, Doug Farmer, lead for local-area network administration and systems integration in information services at Chevron Canada Ltd. in Vancouver, British Columbia, said his company is part of the Advanced Server beta-test program. He said the demonstrations it has seen of the Advanced Server component has left staff members "pretty excited."

NT Advanced Server includes a variety of features for larger networks, including LAN Manager for Windows NT, built-in fault tolerance and centralized network administration.

Farmer described his organization as a "fairly big LAN Manager shop" and said the tight link between operating system and the basic layers of networking should make life easier. "Those lower layers are now invisible, so you don't get all hot and heavy about them," he said.

Other users were quick to tick off several items they said they hope to see improved in the latest release:
- Better support for DOS and 16-bit Windows applications.
- Increased overall performance.
- Enhanced Transmission Control Protocol/Internet Protocol connectivity.
- Increased support for Systems Network Architecture connectivity.
- Improved support for Novell, Inc.'s NetWare.

Realistic benchmarking

Microsoft has claimed that all of these issues are being addressed in the new release. Indeed, the company has said that the Beta 2 release is sufficiently tuned for realistic benchmarking to be performed on it, something it said should not be done with the earlier beta-test copy.

DOS and Windows 16-bit support in the first beta-test version was known to be unstable, a fact Microsoft had acknowledged to users before it shipped.

"[DOS and 16-bit Windows] support is there, but it's not real solid" in the October beta-test release, said Louis Kahn, network administrator at the Centers for Disease Control in Atlanta.

Kahn said he hopes support improves to the point that he can put Windows NT on user desktops. "We're hoping that it will be a nice, smooth transition between Windows 3.1 and Windows NT," he said.

Developers have at least one more hurdle in their move from the first to the second beta-test release, however. The new one also includes a new executable format — one that will require developers to recompile their Windows NT applications.

While this will no doubt cause some concern among developers and users as they attempt to get all their software up to speed, David Thatcher, Microsoft's group product manager for Windows NT, said developers are forewarned.

"The product that we're shipping now is supposed to be as close as we can get to the final," Thatcher said. This will be the final version of the executable, so it should not cause problems when Windows NT actually ships, he added.

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IBM LASERPRINTERS PAGE WIDE

News Shorts

First Mac clone debuts

NuTek USA, a small Silicon Valley start-up, has begun selling a PC that the firm claims nearly duplicates the functionality of the **Apple Computer, Inc.** Macintosh. The $2,996 Duet computer is a "workalike" machine that NuTek will target at mixed Macintosh and IBM environments, according to President Benjamin Chou. The company will also sell circuit boards that manufacturers can install on IBM-compatible machines that will allow them to run Macintosh software, he added. Apple officials vowed to aggressively defend their property rights if they are impugned.

PowerBook said to get pen input

Apple has slated an autumn introduction of a version of its PowerBook portable that can use a pen as well as a keyboard to enter and manipulate data, according to a published report. **Grid Systems Corp.** and **NEC Corp.** currently sell machines that employ both pens and keyboards. Apple is delaying its introduction while waiting for the pen market to grow. The systems are expected to be priced between $2,100 to $4,000, depending on configuration.

CompuAdd abandons retailing

CompuAdd Computer Corp. said it would abandon the retail channel in favor of its direct marketing arm. The Austin, Texas, PC maker has 110 stores that sell CompuAdd systems and a variety of peripherals and software. The $525 million company scaled back its plans to expand to 200 stores last year and will close all of its retail stores by year's end.

Next president resigns

Next, Inc. last week announced the departure of Peter van Cuylenburg, president and second-in-command. Next officials said van Cuylenburg's exit was related to the downsizing of the firm, which last month scrapped its hardware business in favor of pushing its NextStep operating system. At least a half-dozen high-level executives have departed the Redwood City, Calif., company in the past year.

JWP leaves PCs behind

JWP, Inc. is on its way out of the information services business. The Rye Brook, N.Y., firm, which doubled its revenue to roughly $2 billion with its August 1991 purchase of PC distributor **Businessland, Inc.**, late last week put its $1.7 billion PC services unit on the block. JWP cited the extreme volatility in the PC market and a need to refocus on its original core business, mechanical and electrical services, as its reasons.

SHORT TAKES **Microsoft Corp.** Chairman Bill Gates will reportedly unveil MS-DOS 6.0 at a user group meeting in San Francisco on March 30. The updated version of DOS includes enhancements such as integral data compression and improved memory optimizers.... In a cost-saving victory for U.S. computer makers, the Department of Commerce declined to maintain an 87% import tariff on South Korean dynamic random-access memory chips.... **Digital Equipment Corp.** unhooked the X.400-based electronic-mail portion of its TeamLinks for Windows office automation software and is selling it separately for $49 per user.... **Compaq Computer Corp.** Senior Vice President H. Douglas Johns resigned unexpectedly last week to pursue "family and personal business interests." Compaq President Eckhard Pfeiffer will assume Johns' role until a successor is found.... **Hewlett-Packard Co.** announced a 42M-byte version of its Kittyhawk 1.3-in. hard disk, priced at $499.

News shorts, *page 16*

Disaster recovery

ATMs frozen by blizzard

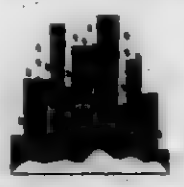
By Kim S. Nash
CLIFTON, N.J.

Heavy snows from the blizzard that recently blanketed the East Coast caused the roof of Electronic Data Systems Corp.'s data center here to cave in on March 13, leaving customers of 5,000 automated teller machines (ATM) without electronic access to their bank accounts for several days.

The 13 ATM networks that shut down are not expected to be up until later this week, when EDS moves a large installation of fault-tolerant Tandem Computers, Inc. machines to a new data center that it has leased from AT&T in Rochelle Park, N.J. Until then, bank-card holders must find an ATM on one of 18 other networks that EDS signed up to do substitute processing.

Downed networks include four owned by EDS: MPACT in Texas, Instant Teller in California, Easy Answer in Illinois and Exchange, which operates in the U.S. and internationally. Others include Money, AFFN and TX.

EDS declined to say whether it has a disaster recovery plan to cover the Tandem installation. The company does have a contract with Comdisco Disaster Recovery Services, Inc. in Rosemont, Ill., for IBM computers at the data center that are peripheral to the ATM network. After the disaster, Comdisco offered EDS use of IBM computers and networks at two sites in Northern New Jersey and made a Tandem site in Illinois available, even though the latter was not part of the contract.



However, EDS opted to go its own way, partially because one of the backup locations offered by Comdisco was already crowded with firms knocked out of their usual digs by the World Trade Center bombing. Looking for a new site close to the original data center "cost us only half a day to a day" of recovery time, said Jon Senderling, an EDS spokesman.

Local authorities prevented EDS employees from recovering equipment from the collapsed data center until late last week, so the company gathered extra machines from various EDS sites across the U.S. Meanwhile, EDS arranged for temporary ATM help from 18 other networks, gradually giving bank-card users access to their accounts through alternate ATMs. By late last week, 95% of the affected customers had some kind of access, Senderling said.

The system should return to normal later this week, according to a source inside an EDS operations center in Southern California, although Senderling would not confirm that target.

Although the ATM outage has been inconvenient for bank customers, EDS anticipates no problems with data loss or damage, Senderling said, because it did a controlled shutdown before evacuating the mangled data center. "All our account data is intact," he said.

Mid-Atlantic correspondent Thomas Hoffman contributed to this report.

Mellon Bank to sell off IS services

Accounting Services, Data-Link, Datacenter up for grabs

By Nell Margolis
PITTSBURGH

Mellon Bank Corp., which has spent the last year denying it is exiting the outsourcing business, last week took a major step toward turning the rumors into fact.

A spokeswoman at the bank confirmed that investment banker Goldman, Sachs & Co. has been hired to help Mellon sell a hefty chunk of its information systems division. The three business units on the block — Mellon Accounting Services, Data-Link and Datacenter — provide outsourcing services to trusts businesses, financial institutions and mortgage banking operations.

Still in the stable: commercial (nonbanking and finance) outsourcing. That unit is responsible for servicing Mellon's largest outsourcing contract, a multiyear deal with National Steel Corp.

The bank is also hanging on to a raft of hardware and telecommunications resources that now serve, among others, the three units on their way out. Computer services tie-ins with Mellon, the spokeswoman said, are not an explicit part of the offers for sale; whether they become so, she said, will depend on the eventual buyers and the deals they negotiate.

As of press time, no formal negotiations were afoot, according to Mellon. Speculation as to who might line up for a slice of Mellon IS went into high gear days before last week's formal announcement and continued to mass around Milwaukee-based M&I Data Services, Inc. The IS arm of banking software and services purveyor Marshall & Ilsley Corp., M&I Data Services is widely regarded as a premier-quality niche player. Its software strengths could be wed to Mellon IS' estimated 750-bank customer base with minimal pain and intriguing profit potential, said George DiNardo, formerly Mellon's highest ranked IS executive and now a consultant at Coopers & Lybrand. Both Mellon and M&I Data Services declined to comment.

Mellon at a glance

IS budget: $208.5 million
IS staff: 1,500
Processor value: $63 million
Number of PCs and terminals: 20,000

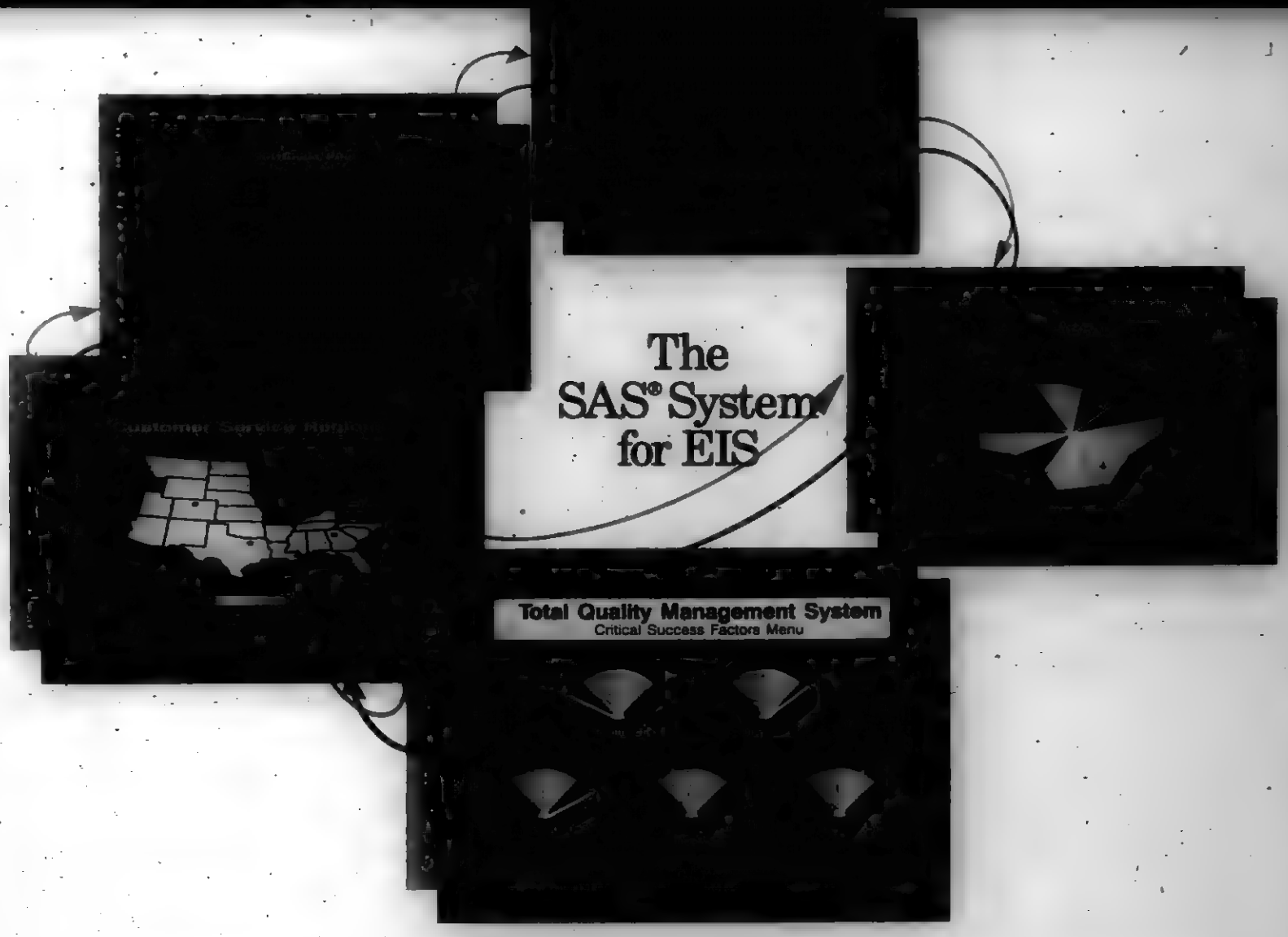
Source: *Computerworld Premier 100*

According to the Mellon spokeswoman, the sell-off is no sellout of either outsourcing or IS; rather, it is an effort to further hone an already sharpened focus on core activities and fee-based businesses with robust growth curves.

Taken together, the three units contributed roughly 5% of Mellon's overall $2.1 billion revenue last year. "According to New Orleans-based banking analyst M. Arthur Gillis, they kicked in closer to 45% of Mellon IS' 1992 revenue.

However well it may serve the bank's bottom line, Gillis said, a for-sale sign in that large a piece of Mellon IS turf also signals a major distancing of the bank from its once sought-after identity as a technology services provider.

Mellon, several analysts noted, was into outsourcing well before the bandwagon took off in the late 1980s. Moreover, Gillis said, its tactic of eschewing megadeals for a large quantity of modest but solid service contracts added up to a sizable revenue base. "Some 750 banks as outsourcing clients is nothing to sneeze at," Gillis said. "Systematics [a banking software and services house based in Little Rock, Ark.] has about 1,100, and they're considered a giant."



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Enterprise computing

Mac servers to finally debut

By James Daly
HANNOVER, GERMANY

Apple Computer, Inc. will this week launch its biggest push yet for the corporate market when it introduces its first true dedicated Macintosh servers.

The Workgroup Server 60, Workgroup Server 80 and Workgroup Server 95 will be unveiled Thursday at the CeBIT Computer Fair here. It will immediately target workgroups that range from five to 200 workers.

Analysts said the absence of a server has hurt Apple's corporate sales. Although Apple's high-end Quadra Macintosh certainly had the power to work as a server, Apple never positioned it as such and hence added on a lot of the gadgets and functionality expected in a more general-purpose machine.

Apple hopes to use the Macintosh's reputation for ease of use to sell the workgroup servers to businesses entwined in the challenges of creating a client/server architecture.

The client/server strategy has proved attractive to large information systems shops because it unifies all computing services, but building and managing such a setup has proved tricky. "You can't belittle Apple's ease-of-use argument, especially when dealing with client/server," said Jim Groff, senior director of Apple's Enterprise Systems Division.

Analysts said they believe simplifying the aggravating job of server setup and administration could save big money. A cost/benefit analysis issued in January by Gartner Group, Inc.'s Consulting Services in Stamford, Conn., said the life-cycle cost of maintaining a Macintosh for five years is $4,000 less than a PC running Microsoft Corp.'s Windows and nearly $10,000 lower than a DOS system.

"The primary reasons for the Macintosh cost advantage were its superior ease of installation, use and learning as well as its transparent networking," the report states.

Those are administrative issues that users can relate to. "When I think of running a Unix server, I think of seven systems programmers constantly running around trying to keep the thing going," said Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "So if Apple can provide a plug-and-play box in which we can do a lot of nifty things without a lot of fuss, it could change our lives significantly."

But questions remain about how well the servers will work using software to connect them to Novell, Inc.'s NetWare, which accounts for more than 70% of the market. "That's the big question: How well it will work with Novell," Comnes said. "It just had better work well."

Apple's lateness in addressing the server market could hurt its cause — but the damage may not be irreversible, analysts said.

"The PowerBook was very late to the portable computer market, but it did such a good job in terms of ergonomics and performance that it took off like a rocket," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif.

Insiders also said they expect Apple to ultimately introduce workgroup servers targeted for specific tasks. The company has already begun to go down that road with the Workgroup Server 95, which will have an optional configuration designed specifically for a database environment. "Apple owns the whole ball of wax, from the operating system to the hardware, so it would be very easy to do," Hartsook said.

Apple will simultaneously introduce two new versions of its AppleShare software for high-performance file-and-print services. The vendor will also reach out to the DOS and Windows environments with the introduction of AppleTalk Connection for DOS and Windows, which will let PC users access files stored on the new servers as well as other AppleShare servers.

Servers up

Apple's new servers run the gamut

	Workgroup Server 60	Workgroup Server 80	Workgroup Server 95
Chip	20-MHz 68040	33-MHz 68040	33-MHz 68040
RAM	8M to 68M bytes	8M to 136M bytes	16M to 256M bytes
Hard drive	230M- or 500M-byte	500M- or 1G-byte	230M-, 500M- or 1G-byte
Ship date	Summer	Summer	April
Starting price	$3,079	$6,399	$7,589

Source: Apple Computer, Inc. CW Chart: Michael Siggins

Apple picking

Oracle Corp. is one of several major relational database management system vendors that will soon announce support and products for the new Apple servers.

Wireless

CONTINUED FROM PAGE 1

Lehman Brothers increase its 250 million to 350 million daily trades to 1 billion.

A pen computing/wireless combination replaces a complicated series of phone calls and paper-passing procedures in place today for executing trades, he explained, and eliminates several time-consuming and error-prone steps.

Schoenfeld said that while the small pilot has trimmed trade-execution time from 90 seconds — "a lifetime in our business" — to about five, "we're not 100% sure about security. It's too early to tell if an outsider could pick off our data."

Mike McKenna, vice president at Citibank NA, agreed: "Security is nonexistent today" for wireless networking, which "doesn't cut it for a financial services firm processing 17 different credit cards and more than 30 million accounts." Also, he said, while great strides have been made with wireless hardware, "software [application] integration with the hardware" is in an embryonic stage.

The availability of bandwidth to support applications that hum along on high-speed wired LANs is also an unknown — and one that will persist until the Federal Communications Commission and Congress determine how they will allocate wireless spectrum. In fact, Schoenfeld said, Lehman Brothers has not yet determined whether there will be sufficient bandwidth for sending groundswells of trading traffic at peak periods to its multiple brokerage houses simultaneously.

Less work

Cellular giant McCaw Cellular estimated that members of today's work force invest a month more per year in their jobs than workers in 1970 did. However, the generation entering the work force today is not of the 70-hour-a-week mind-set, according to Metropolitan Property and Casualty President Daniel J. Cavanagh, who views mobile and wireless technologies as a possible solution. He sees real-time voice and data interaction among employees such as claims adjusters as a way of combining several tasks in one on-line effort, which could keep employees from piles of after-hours paperwork and thus shorten the workday.

"It would not be fair for firms to have to queue up" and for some to receive information later than others, Schoenfeld said.

Health concerns

Holding back other users, such as Raymond S. Perry, chief information officer at Avon Products, Inc., in Rye, N.Y., are concerns about the safety and convenience of cellular products. The controversy surrounding whether cellular technology causes health problems "must be resolved before I give the technology to half a million salespeople," he said.

Also, "there are too many cellular black holes" where transmission gets disrupted for that technology to be viable, he said. "There is even a major Bell operating company that can't access its own cellular network from its own parking lot!"

On the other hand, Avon sees wireless as a way to reduce the cost of client/server computing. "Client/server is costing as much [as host-centric computing] because your spend all your time installing cable and maintaining the network," Perry said.

Meanwhile, Perry has outfitted 20,000 of his half-million worldwide sales reps with a handheld wired terminal that allows them to place orders on-line 24 hours a day; the device costs less than $100. He said the move has reduced the cost of an Avon order by about $1 — a significant amount considering that most orders generally total well under $20.

Perry said adding a wireless component to the terminal could enable Avon to slash printing costs by putting the half-million manuals it prints biweekly on-line.

For now, though, bandwidth, safety, convenience and other concerns are likely to plague users. Even Jim Barksdale, president of McCaw Cellular Communications, Inc., who described the virtual enterprise concept as "making people as effective outside of the office as they are inside," said he "wouldn't purport that such a capability is available today."

'And another thing. . .'

At last week's conference on wireless and mobile computing, The Hertz Corp., The Ryland Group, Inc., Marriott Corp., United Parcel Service, Inc. and other large companies expressed additional concerns about wireless technology:

- How do you coordinate billing when voice and data are being handed off among up to 60 cellular carriers nationwide? In UPS' case, the 50,000-truck company had the clout to get carriers to form one billing consortium to handle it. But that is not a likely scenario for the average company going wireless.
- There is still confusion among technology alternatives, and it was "like pulling teeth" to get vendors to help David Merritt, project leader at Hertz, grasp the technologies. "I still don't know that I have," he said.
- There are no internetwork service interoperability standards today; most users are closed in to one proprietary system. In addition, users are limited in their terminal equipment choices by the type of wireless network service they deploy.
- Battery life for portables is still restrictive, and it is illegal to use cellular technology on airplanes (though it reportedly works just fine).

—*Joanie M. Wexler*

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Local-area networking

DEC, Novell plan NetWare on Alpha

By Michele Dostert
BOSTON

Digital Equipment Corp. and Novell, Inc. plan to build a version of Novell's NetWare 4.0 local-area network operating system that will run natively on DEC's new line of servers based on the Alpha AXP 64-bit reduced instruction set computing (RISC) chip.

The NetWare for Alpha software developer's kits will ship by the end of the year, with actual products scheduled to be released in 1994. NetWare for Alpha will be sold both through Novell's reseller channel and directly by DEC's sales force.

DEC will face stiff competition in the NetWare-on-RISC market. The Novell/DEC agreement is similar to NetWare 4.0-on-RISC deals Novell has previously announced with Hewlett-Packard Co. and Sun Microsystems Computer Corp. for their Precision Architecture-RISC (PA-RISC) and Scalable Processor Architecture servers. HP's PA-RISC implementation is due out by the end of 1993.

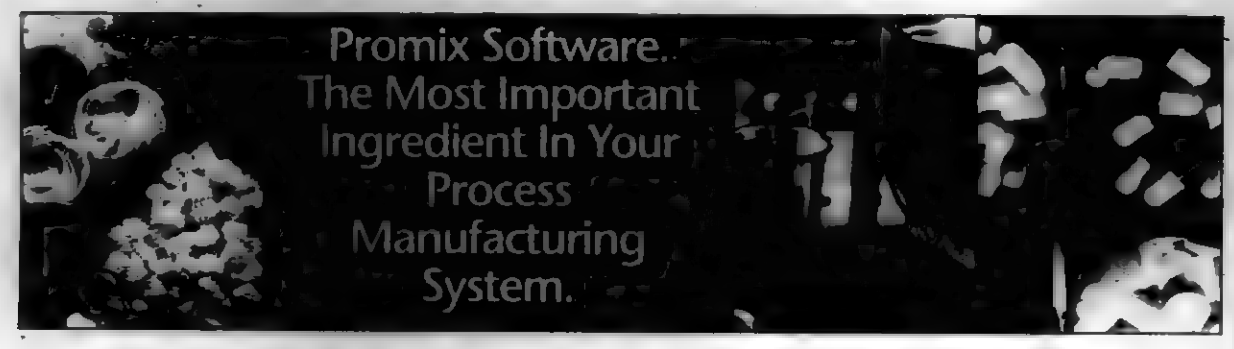
One analyst pointed out that limitations of the NetWare operating system will prevent it from taking full advantage of the Alpha chip. "NetWare 4.0 addresses data in 32-bit chunks, not 64; Novell does not support the symmetric multiprocessing capabilities that are one of Alpha's main strengths, and it doesn't support the cluster architecture that lets Alpha scale so nicely," said Frank Dzubek, president of Communications Network Architects, Inc., a Washington, D.C., research firm.

On the fence

DEC users were divided on the new offering. "It's nice, but it's just a way for DEC to sell more Alpha boxes, and if it doesn't price those boxes very competitively, it won't even do that," said Bob Melford, a network symposium representative of the Digital Equipment Computer Users Society. "DEC would help their users more by teaching VMS to speak NetWare fluently — and natively."

"I think it's a great idea," countered Stephen Tihor, a research scientist at New York University who uses both Alpha boxes and NetWare. "Our Intel servers are running out of steam. I love these Alpha boxes, and I think you'll probably get some great I/O out of them as NetWare servers."

With automation, Process Manufacturing has become a patchwork quilt of software programs, each designed to pay attention to a specific part of the process. Few can deliver an integrated information solution that pays attention to the whole process.



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WordPerfect previews upgrades for DOS

By Michael Vizard
OREM, UTAH

WordPerfect Corp. will preview today the first major upgrade in 3½ years to its word processing software package. The new release will add what-you-see-is-what-you-get editing capabilities to the industry's most widely used PC word processing package.

WordPerfect 6.0 will also allow users to work in three different modes: a standard text mode, a graphics mode or a full-page mode. "The graphics mode is probably a little faster than the page mode because you don't see all the headers that you would see in the page mode," a company spokesman said.

The company will ship versions for Microsoft Corp.'s Windows and IBM's OS/2 by year's end, a spokesman said.

Other new features will include the ability to work with nine documents simultaneously. The current package allows users to work with only two documents at the same time. Version 6.0 will have fax capabilities and support for an UNDO command and will provide the ability to embed sound in documents.

WordPerfect 6.0, which is in beta testing, is slated to arrive this spring, shortly after WordPerfect delivers Version 5.2 of WordPerfect for DOS and OS/2. Version 5.2 is already available on Windows.

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IBM takes on Unix RDBMSs

DB2/6000 to aid re-engineering from legacy mainframes to client/server

By Jean S. Bozman
SAN FRANCISCO

While IBM's Unix relational database for the IBM RISC System/6000 lacks some of the features of its database competitors, it gives IBM users a stepping-off point for migrating mainframe applications to open client/server applications, analysts said.

For longtime IBM shops, DB2/6000 provides a development database for the re-engineering of legacy applications. "It's not a heart-stopping, raise-the-flag kind of database," said Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. But combined with IBM's new Distributed Database Connection Services/6000 (DDCS/6000) database query system, it can extract key data from IBM's DB2 mainframe database.

"It's a very low-cost, high-performance gateway to open systems," DePalma said. "This gives companies looking to replace their mainframes gradually a way out."

Source: International Data Corp.

David McGoveran, president of Alternative Technologies, agreed that DB2/6000 will appeal most to IBM users. "Even if the true Blue shop is disappearing, the people who ran those shops are not," he said. "Those people like to have a solution that lets them downsize without going away from IBM."

Lacking features

By comparison, DB2/6000 lacks triggers and stored procedures — two keys to event-driven, rules-based computing on database servers. However, IBM said stored procedures can be created by writing custom code. DB2/6000 also lacks binary large object (Blob) support for multimedia applications.

Technical differences between DB2/6000 and its Unix database competitors stem from its status as a first release, analysts said. Databases from Oracle Corp., Sybase, Inc., Informix Software, Inc., and The ASK Group, Inc. virtually matched on feature checklists last year.

Janet R. Perna, director of database technology at IBM Canada Ltd.'s Toronto software laboratory, directed development of the DB2/6000 database. She said her design goals were compatibility with IBM's DB2 relational database and speed. "We're prepared today to be competitive in terms of performance," she said.

But a number of new features will be released in the next 18 months. Among them: support for Blobs, variable-length fields, user-defined functions and user-defined data types and triggers, she said. DB2/6000 already has a cost-based optimizer and declarative referential integrity, which some rivals lack.

In announcing DB2/6000, IBM struck a number of technical partnerships with many of the major database vendors. Most of them have already agreed to support IBM's Distributed Relational Database Architecture standard, which will allow multiple databases to interoperate in distributed networks.

Late last week, Sybase and IBM disclosed a joint product development, marketing and support agreement.

IBM tries per-user pricing

CONTINUED FROM PAGE 1

to get into more applications."

The pricing announcement came as a relatively low-profile part of last week's barrage of database and information Warehouse products (see story at right). In essence, IBM said, two of the three components of Version 3.2 of its mainframe Application Solution (AS) decision support software now include a per-user pricing option. Or users can choose the traditional tiered approach.

Prior to last week, each of the three mainframe AS pieces were priced according to the size — or tier — of the machine they ran on. Now the so-called "client" portion — a graphical user interface for terminals that actually runs on the host — and the business tools component, which includes statistics, project management, business modeling and other features, have a per-user price tag as well.

To keep track of how many users are on these modules, information systems shops would need to install another IBM software package: Software License Monitor, a free host-based package introduced in November 1992 to track the number of people using a mainframe application.

The third AS piece — the "server," which contains reporting, charting and other functions — still maintains the traditional tiered pricing approach, according to Shaun Jones, a market planner at IBM's Programming Systems laboratory in Warwick, England.

"This is the essential part of the system, and it is accessed by a lot of people. It would quickly get to the point where it is less expensive to pay the tiered price rather than the per-user price, so we thought it best to keep it on tiered pricing," he said.

Savings plan

An IBM-provided example of the savings that can be realized with the new per-user pricing plan: A shop with a Group 70 processor with 200 end users, 10 of whom are using the optional statistics and project management portion, would pay a total of $6,116 per month vs. the old total of $6,640.

Jones acknowledged that the per-user pricing move was made in part to compete with PC packages. "If our product is outrageously priced, no one's going to buy it, regardless of the function," Jones said.

He added that the new model will allow customers to pilot AS and grow from a small number of users to a larger number without paying a heavy financial penalty.

Tom Aser, vice president of sales and marketing at IBM's Programming Systems headquarters in Somers, N.Y., said the model might spread to other IBM packages. "If this is successful, there might be other products we might consider." They would probably have "similar characteristics" to AS, he said. He pointed to applications such as OfficeVision, where there is a buildup of end users over time.

"As utilization goes up, customers can make a decision whether to shift to [processor] group pricing or stay with per-user, whichever is most attractive," Aser said.

Another AS innovation that was implemented last year — breaking the host package into smaller pieces with functions that users can pick and choose — might also become more common, Azer said.

Stamp of approval

Most industry observers were upbeat about IBM changing its host software pricing and packaging structure.

"It's a very, very sane approach to things," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "It should satisfy the comments of a large population of users, and it should actually reduce software costs."

This flexibility will be increasingly important, Dzubeck said, as the price of mainframe-class hardware drops. "If the mainframe costs $100,000, how can you pay $150,000 for a piece of software?"

Still, there is at least one flaw in the plan. Bill McNee, a vice president at Gartner Group, Inc. in Stamford, Conn., said, "IBM is providing different license managers on different platforms. The difficulty is in managing them all."

For example, McNee said, IBM has licensed Gradient Technologies, Inc.'s NetLS license manager for the RISC System/6000 platform. "I suggest IBM will most likely drop its proprietary solutions and adopt industry standards like NetLS for the mainframe," In about two years, McNee added, IBM will likely provide a metering approach.

Database doings

Among IBM's announcements last week were the following:

- **DB2/6000**, a relational database management system for the RISC System/6000, and Distributed Database Connection Services/6000, which allows customers to develop applications that access and update host databases from DOS, Windows, OS/2 and AIX workstations (see story above). Initial customer shipments of both products is slated for late July; general availability will be announced at a later time, IBM said.

Some 18 third-party vendors also announced packages that work with the new AIX database. Pricing for DB2/6000 ranges from $2,000 to $149,400, depending on the machine. For DDCS/6000, pricing ranges from $1,150 to $24,800.

- Version 2.1 of DB2 for the mainframe, which allows customers to distribute and update host-based data in multiple sites and improves query-processing time by up to 20%, IBM said. It is slated to ship by June; pricing ranges from $664 to $11,630, depending on the processor.
- A decision support initiative. IBM will work with third-party vendors, including Comshare, Inc., to bring together different decision support products in a common framework. IBM also announced Query/6000, a query-generation package for the RS/6000, and a new version of Query Management Facility VSE/ESA, which sports an improved end-user interface. Pricing was not available at press time. Pricing for Query/6000 depends on the number of users; for example, up to two costs $700, and more than 128 costs $30,000.
- Data Propagator Version 2.1, which allows bidirectional updating between IMS and DB2 databases. First customer shipments are due by late September; pricing and general availability have not been set.
- IMS/ESA Version 4, slated for late May. Enhancements include improved database availability, IBM said. Pricing ranges from $3,570 to $8,630, depending on the processor.
- Information Warehouse architecture specifications will be published next month.

—*Johanna Ambrosio*

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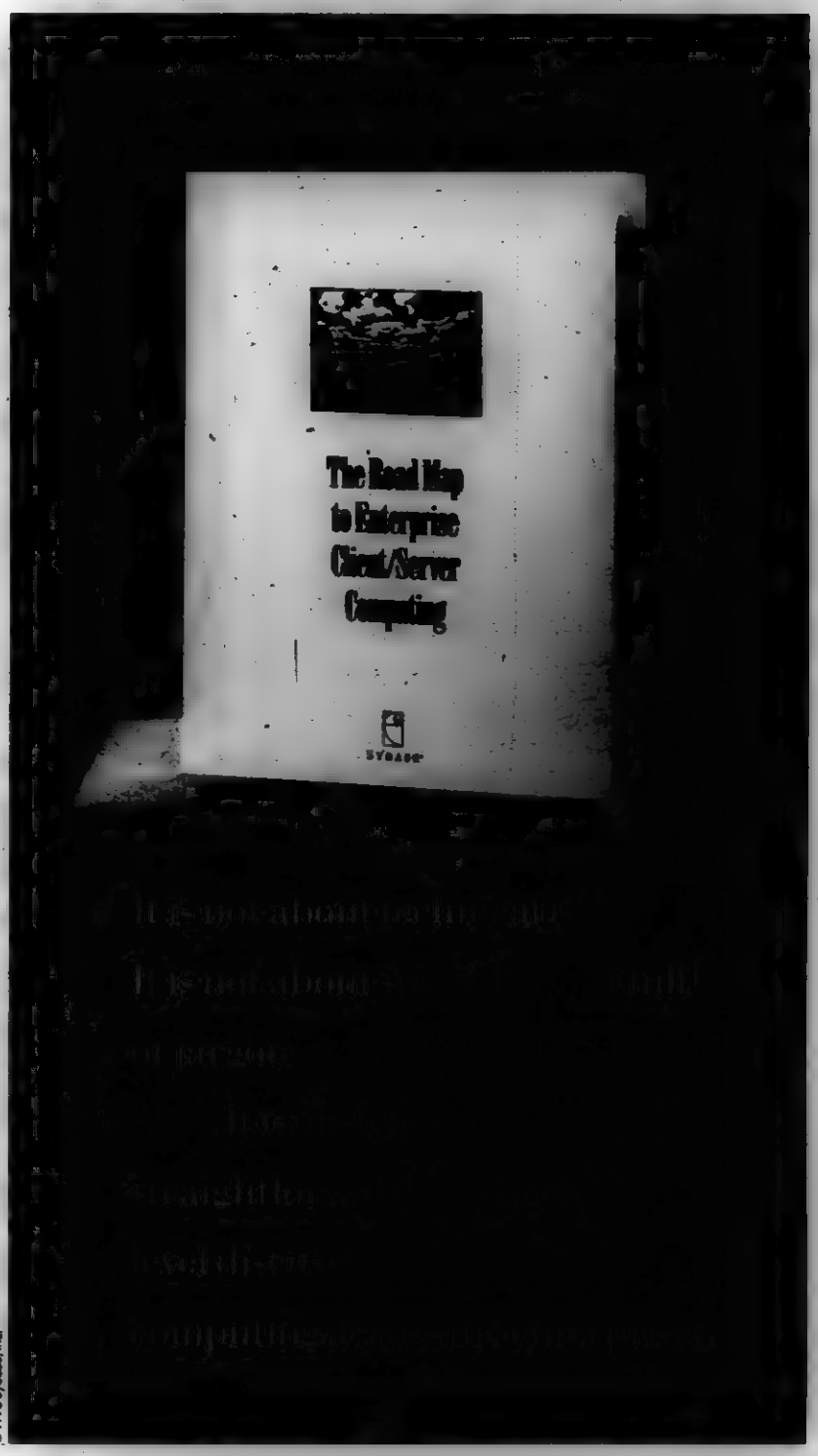

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Heat is on for client/server migration

By Maryfran Johnson
SAN FRANCISCO

■ Shortcomings in systems and network management, security and training are keeping information systems executives awake at night as they contemplate their shops' inevitable migration to open client/server computing.

Solving those and other pressing problems occupied more than 100 managers from companies such as Shell Oil Co., Hyatt Hotels Corp., US West and JC Penney Co. at last week's first UniForum Technology Managers Conference here. On topics ranging from the high cost of retraining Cobol programmers to the gaps in industrial-strength software for Unix, the managers swapped war stories and heard advice from both peers and consultants.

"The big problems are not solved yet — things like configuration management, security or version control," said Judith Hurwitz, the conference organizer and president of Hurwitz Consulting Group in Newton, Mass.

Network topologies, for example, can cause major problems when one PC crashes and brings down the rest of the business "like a string of Christmas lights," said Gail Leveseque, manager of special projects at Monadnock Paper Mills, Inc. in Bennington, N.H.

Monadnock Paper, the oldest continuously operating paper mill in the country, is migrating from customized software on proprietary Wang Laboratories, Inc. machines to open systems running packaged applications.

End users are playing a far more pivotal role in evolving client/server systems, she said, echoing the comments of other executives at the conference. The IS division at Monadnock is coping with a kind of role reversal as users help determine the business needs that will drive system purchases in the future.

Training essential

Personnel retraining and skill shifts were raised as sometimes overlooked costs in conversions.

"What I can guarantee doesn't work is sending your people off to a two-week class and then putting them onto new tools," said Ken Richmond, one of the conference speakers and senior technical lead at Charles Schwab & Co. in San Francisco. Instead, Richmond recommended more realistic expectations for a longer skill ramp-up time, plus better management at the top technical levels.

Some of the issues concerning open software development include difficulties moving applications from development to production platforms, a proliferation of tools offering only point solutions and the questionable expense of tools that do not become reusable assets.

At US West in Denver, for example, the telecommunications firm is standardizing on Hewlett-Packard Co.'s SoftBench computer-aided software engineering (CASE) tool framework, hoping to broaden its selection of "plug-and-play" tools from a variety of vendors rather than settling on one integrated CASE tool set. "We are in the driver's seat, selecting tools based on our needs, not the vendor's needs," said Terry Simmons, senior member of the technical staff at US West.

At American National Can Co., the route to open systems is leading the company toward a heterogeneous database architecture as it tries to reduce IS costs, halt its mainframe growth and give users more useful, transparent access to data.

The $4.5 billion multinational operates a complex network that serves more than 1,000 users on everything from 3270 terminals and HP Unix workstations to an Amdahl Corp. 5890-300E mainframe.

"There are a lot of products that do part of the job, and none that do it all," said Donald Brungard, vice president of MIS at American National Can.

Reality check

Top client/server challenges:

1. Lack of development and debugging tools.
2. Gaps in programmer skills and high retraining costs.
3. Incomplete methodology for defining architecture and application design.
4. Cost-justifying and budgeting.
5. Lack of available software for distributed systems and network management.
6. Integrating with legacy systems.
7. Personnel issues.

Source: Survey of 140 users at UniForum Technology Managers Conference

Unix rivals unite

CONTINUED FROM PAGE 1

but we'll see," said Terry Barrett, district manager of Unix computing environments at Bell Communications Research in Piscataway, N.J.

Mark Schmidt, vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark., said he sees the move as a positive — if somewhat overdue — one for the Unix industry.

"I think we got a wake-up call from our users and our software developers," said Ed Zander, president of SunSoft, Inc., a Sun Microsystems, Inc. software subsidiary that will now sell and support the Open Software Foundation's OSF/Motif.

"'Let's stop NT before anyone starts sipping the Kool-Aid. This is 75% of the Unix industry united," said Sun President Scott McNealy.

Some Sun users said they were concerned about moving to a new interface. "My users won't like it," noted Joe Tankersley, research scientist at Amoco Production Research in Tulsa, Okla. "But if the tools are customizable to the point we need them to be — we're an expert shop — we should be fine."

Sun's Scott McNealy: *'This is 75% of the Unix industry united'*

Notably absent from the party was Digital Equipment Corp., which has committed to running Windows NT as well as DEC/OSF/1 Unix and OpenVMS on its new Alpha machines. DEC officials were clearly miffed at the last-minute invitation they received just a few days before the announcement, and they said much of their "Unified Unix" strategy is already "fully compatible" with what the group is proposing.

"The more they actually follow up on this, the better off the Unix industry is going to be. We're not against them," said Bill Demmer, vice president of the computer systems group at DEC.

Mindful of Windows NT's expected impact on the desktop, some analysts said this effort may prove too little, too late for the fractured Unix industry — a suggestion rejected by IBM's Bill Filip, general manager of advanced workstations and systems. "We'd love to have Microsoft join us; then we could name our desktop APIs 'Win-Win,'" he quipped.

All the interfaces and technologies adopted under this effort will be turned over to the X/Open Co., a standards body that will brand and certify the products and then publish the full specifications.

"This is a long overdue triumph of the obvious," said Nina Lytton, an analyst and editor of the "Open Systems Advisor" newsletter. "Dawn has broken on marble heads."

Stressing that they are not a consortium or any kind of formal organization, the six companies plan to hold a developers' conference in October.

Products conforming to COSE are expected to ship in the first half of next year.

Analysts cautioned users that vendors are promising to support competing technologies — such as the OSF's Distributed Computing Environment and Sun's Open Network Computing-Plus — but not to make them interoperate.

"We don't think the decision to support three standards does anything to unify the Unix community at large; it just gets into a pick-and-choose options menu," noted Terry Smith, vice president of information systems at First Boston Corp. in New York.

Senior editor Elisabeth Horwitt contributed to this report.

Copy, but carefully?

COSE spans six areas of technology: desktop, graphics, multimedia, networking, systems management, and object management.

Desktop: The Common Desktop Environment specification — to be published in June — will incorporate elements from HP's Visual User Environment, IBM's Common User Access model and Workplace Shell, SunSoft's OpenLook and Desk-Set productivity tools, USL's Unix System V Release 4.2 Desktop Manager, the OSF's Motif tool kit and window manager (with modifications to support users familiar with OpenLook applications), and SunSoft's ToolTalk interapplication messaging facility.

The desktop environment will unite servers in a range of client/server platforms, providing a common look-and-feel "Unix dashboard" of capabilities such as electronic mail, text editing, productivity tools, window management, graphical object/file management and other features.

Networking: All six companies will sell, deliver and support the OSF's Distributed Computing Environment, SunSoft's ONC+, Tivoli and Merrill/Data's Net-Ware Data client networking products. Pricing and availability will be set later.

Graphics: All companies will support a set of graphics facilities from the MIT X Consortium.

Multimedia: The companies will submit a joint specification for the Interactive Multimedia Association's request for technology.

Object Technology: The companies will work together to accelerate development and delivery of object-based technology from the Object Management Group and will support the Common Object Request Broker standard for distributed object management.

Systems Management: The companies will form a working group to push acceptance of industry specifications. Initial focus will be on areas of user and group management; software installation and distribution management; software licensing management; storage management; and distributed file system management.

Lotus teases Notes for Unix

By Michael Vizard
SAN FRANCISCO

Lotus Development Corp. tantalized prospective customers last week at UniForum with a demonstration of Notes 3.0 running on Unix, while at the same time telling them that Notes will not arrive on Unix until at least midyear.

Lotus had originally promised to deliver a Unix version of Notes shortly after it delivers Version 3.0 on OS/2, which is scheduled to ship on April 1. Notes 3.0 debuts on Wednesday.

The delayed delivery of Notes on Unix was attributed to Lotus' efforts to debug the OS/2 version of Notes 3.0 before putting the product into beta testing on Unix, according to Terry Rogers, vice president of the Communications Products Division at Lotus.

Lotus' rollout schedule for Notes on Unix platforms could have a negative impact on a number of sites, including those looking to adopt multiprocessor servers for the groupware product, sites that do not wish to adopt OS/2 platforms simply to run Notes and government agencies that are required to run Unix, said David Marshak, an industry analyst at the Patricia Seybold Group in Boston.

"There is no competitive product to Notes, so I don't think Lotus will lose any customers over this, but it will delay the delivery of large-scale Notes applications," Marshak said.

"In general, Notes 3.0 is late," said Priscilla Emery, a vice president at New Science Associates, Inc. in Westport, Conn. "With Notes 3.0 and Unix support, customers are looking at Notes as an enterprisewide collaborative environment. It's not just a workgroup novelty anymore."

The major components of Notes 3.0 that will arrive next month include support for Apple Computer, Inc. Macintosh clients, a text-retrieval engine based on technology supplied by Verity, Inc., support for a broad range of network protocols, an enhanced Microsoft Corp. Windows interface, a hierarchical naming service, a richer set of application development tools, support for basic workflow and version control functions and an enhanced mail-routing capability.

The Unix version of Notes is scheduled to go into beta testing next month. The first operating systems supported will be Sun Microsystems, Inc.'s Solaris, followed by The Santa Cruz Operation's SCO Unix, Hewlett-Packard Co.'s HP/UX and IBM's AIX, said Tony Parham, product manager for Unix products at Lotus.

Above and Beyond

Coinciding with the rollout of Lotus' Notes 3.0., Beyond, Inc. will introduce two new electronic-mail products that work with Notes.

Beyond Notes Connection [CW, Oct. 12, 1992] is a lower cost method for Beyond Mail users to participate in Notes database discussions because it does not require a Notes license. Scheduled to ship next month, it will cost $995 for an installation supporting 50 to 100 users. Notes lists for $495 per node.

For Notes users, the company will ship a version of Beyond Mail for Windows that can be used as an alternate mail option from within Notes. Because Beyond Mail works with Novell, Inc.'s NetWare Global Message Handling Service and Banyan Systems, Inc.'s Vines, this gives Notes users, for example, access to the Vines StreetTalk directory. —*Lynda Radosevich*

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News Shorts

Privacy group hails BBS ruling

The Electronic Frontier Foundation, based in Washington, D.C., hailed a March 12 court ruling in the case of Steve Jackson Games v. the U.S. Secret Service as a victory for the constitutional rights of electronic publishers and computer bulletin boards. A federal judge in Austin, Texas, ruled that the bulletin board operator's First Amendment and privacy rights were violated when the Secret Service seized his system as part of a hacker investigation.

Adaptive reabsorbed by parent NET

Following an agreement to merge earlier this month, broadband switch company Adaptive Corp. and its parent Network Equipment Technologies, Inc. (NET) detailed reorganization plans last week. Adaptive, which will focus on Asynchronous Transfer Mode and frame-relay switching products, will become one of three NET divisions. They include the T1 multiplexer-oriented Network Systems Division and a newly formed Transmission Products Division, which will assume responsibility for Adaptive's Sonet Transmission Manager and SPX statistical multiplexer.

HP chooses Unix mini manager

After a protracted search, Hewlett-Packard Co. last week filled the job of general manager for its Unix minicomputer operations, known as the General Systems Division. The firm tapped Carol Mills, who had been general manager of HP's client/server group. As head of HP 9000 operations effective April 15, Mills takes over a division that is growing at a roughly 40% clip and that is believed to now account for more than half of HP's minicomputer sales. Mills replaces Bernard Guidon, who will serve as European marketing manager for all HP minicomputers and workstations.

Andersen reveals financial details

Andersen Consulting is loosening up on information. The firm last week held a daylong briefing, the first of its kind for the Chicago-based consultancy. While Andersen remains mum about its earnings, it recently published an annual report indicating that its firmwide revenue for 1992 was $2.72 billion, up 16% from 1991. Significantly, Andersen claims 40% of its business last year was related to the design, development and support of client/server systems. Andersen officials said last week they expect to reach nearly $2 billion in client/server-related business this year.

Hitachi boosts mainframe line

Hitachi Data Systems Corp. announced it will ship 13 new models of its IBM-compatible GX mainframe line by year's end. This brings the total GX lineup to 26 mainframes, including a 390 million-instructions-per-second, eight-processor machine. However, HDS did not provide final prices or say when it would ship new IBM Enterprise System/9000 features.

SHORT TAKES Digital Equipment Corp. announced Pathworks ISDN (DOS), which is said to enable PCs connected to DEC Pathworks servers to communicate over Integrated Services Digital Network Basic Rate Interface connections.... AT&T last week said it will extend its frame-relay service to Canada and nine European countries in July, bringing its European coverage to 16 countries.... The ASK Group, Inc.'s Man-Man/X manufacturing program has been ported to the HP 3000 with PeopleSoft, Inc.'s financial and asset management software due to follow later this year.... PeopleSoft also plans to introduce versions of its financial and human resource packages for IBM's DB2 AIX/6000 and DB2 OS/2 databases, which were announced in January.

Hyatt ups open systems

CONTINUED FROM PAGE 1

most immediate need for more computing power stems from a pending change in its internal reservation process that will more than double the number of annual reservations handled by central computing operations from roughly 2.5 million to 6 million, according to Kerr.

Hyatt will soon tie into the system the reservations that its 105 U.S. hotels book directly. Hyatt will also add direct bookings from about 10 of its 64 overseas hotels, Kerr said. Hyatt's Transmission Control Protocol/Internet Protocol network runs over fractional T1 lines in the U.S. and through X.25 dial-in lines from the overseas hotels.

The direct reservations are handled by smaller AT&T 7000 servers at each hotel. Hyatt has used the central system for toll-free phone and travel agent bookings and will continue to use it for those functions.

Many of the hotel-direct bookings are for groups rather than individuals, so the 140% increase in reservation volume will not translate into a 140% increase in processing activity because each group is processed much like an individual would be, Kerr said.

Processor predicament

Still, the change will increase processing demands by 50% to 100% — enough to merit a new system. And while the company is leaning toward a 24-processor Pyramid system, it has not yet made its final choice, Kerr said.

Kerr noted that benchmark comparisons by the Transaction Processing Performance Council show little meaningful difference between Pyramid and HP machines but a wide gulf between those two and the less powerful NCR 3550.

All things being equal, Kerr said, it would make good business sense for Hyatt to buy a Pyramid machine because Pyramid has a proven performance record at Hyatt with the AT&T 7000.

Similarly, he noted that HP lacks experience in symmetric multiprocessing (SMP). HP has been in that business since late 1991, while Pyramid has practiced SMP for years.

HP Computer Systems Organization Vice President Wim Roelandts pointed out that HP's system runs on four processors, while Pyramid's requires 24. When transaction processing machines shift into batch jobs, they switch to a uniprocessor mode, in which case the stronger HP processors would vastly outperform the Pyramid processors, he noted.

"One pony is worse than one big horse," Roelandts said.

Kerr agreed with that assessment but said Hyatt "does not have that many batch operations."

Hardware equation

And while both Pyramid and HP outperform the NCR machine, Kerr claimed that NCR — an AT&T subsidiary — is still in the running because remaining with the same supplier affords Hyatt business continuity.

Another factor is system availability. Kerr said Hyatt will start adding hotel-direct bookings to the system on May 1 and hopes to make its hardware decision by May 15, if not sooner.

"If someone says, 'You can have it in October,' then they're out of the question," Kerr said.

Room service

The collapse of the Confirm reservation project, which was to have provided systems and processing to the travel industry, has opened up possibilities for Hyatt to market its in-house-developed system to other lodging concerns, noted Gordon Kerr, Hyatt's senior vice president of MIS.

Hyatt is talking with prospects whom Kerr declined to identify. "Confirm tied the industry up for a long time," he observed.

The Confirm development consortium, known as Intrico and headed by AMR, fell apart last summer amid charges that AMR had deceived partners Hilton Hotels, Marriott Corp. and Budget Rent A Car Corp. into continuing to invest in a troubled operation (CW, Oct. 12, 1992).

Hyatt plans to offer outsourcing on its own or through a third party and is also trying to license its software to hotels that would make their own processing arrangements, Kerr said.

Hyatt may work with a third party to overcome concerns among hotels worried about relying on a competitor to supply information technology.

Kerr said the lodging industry will eventually come around. "Does it make sense for 10 hotels to each run a different reservation system? I don't think so," he observed.

—Mark Halper

Mead Data shuns host for Unix system

By Mark Halper
DAYTON, OHIO

Likening the challenge to "changing spark plugs on a truck going down the road at 60 miles per hour," Mead Data Central, Inc. last week said it is migrating its computer operations from a mainframe environment to Unix platforms provided by three vendors.

Mead Data, which markets the Lexis and Nexis legal and news information services, is shifting to Hewlett-Packard Co., Sun Microsystems, Inc. and NCR Corp. gear. It had been using IBM, Hitachi Data Systems Corp. and Amdahl Corp. iron.

The massive undertaking entails moving some 2T bytes of information off eight mainframes, said Claymon Cipione, Mead Data's vice president of production, development and operations.

The company is making the switch to cut costs and decentralize computing operations, Cipione said. "Glass houses are like things that glow in the dark," he said. "Tornados find them; airplanes crash into them."

He declined to quantify estimated savings.

Cipione said the cutover will affect all of Mead Data's operations, including its fabrication unit, which puts the data the company gathers "from almost every vehicle known short of word of mouth" into Mead Data format.

The company's electronic sources include news wires, the Internet, magnetic tapes and paper scanners.

Mead Data has already taken delivery of an HP 9000 Corporate Business System, HP's mainframe-class symmetrical multiprocessing minicomputer, and is believed to be negotiating the purchase of two additional Corporate Business Systems to provide redundancy.

The company has also purchased Sun 690s and NCR 3445, 3450 and 3550 boxes, Cipione said.

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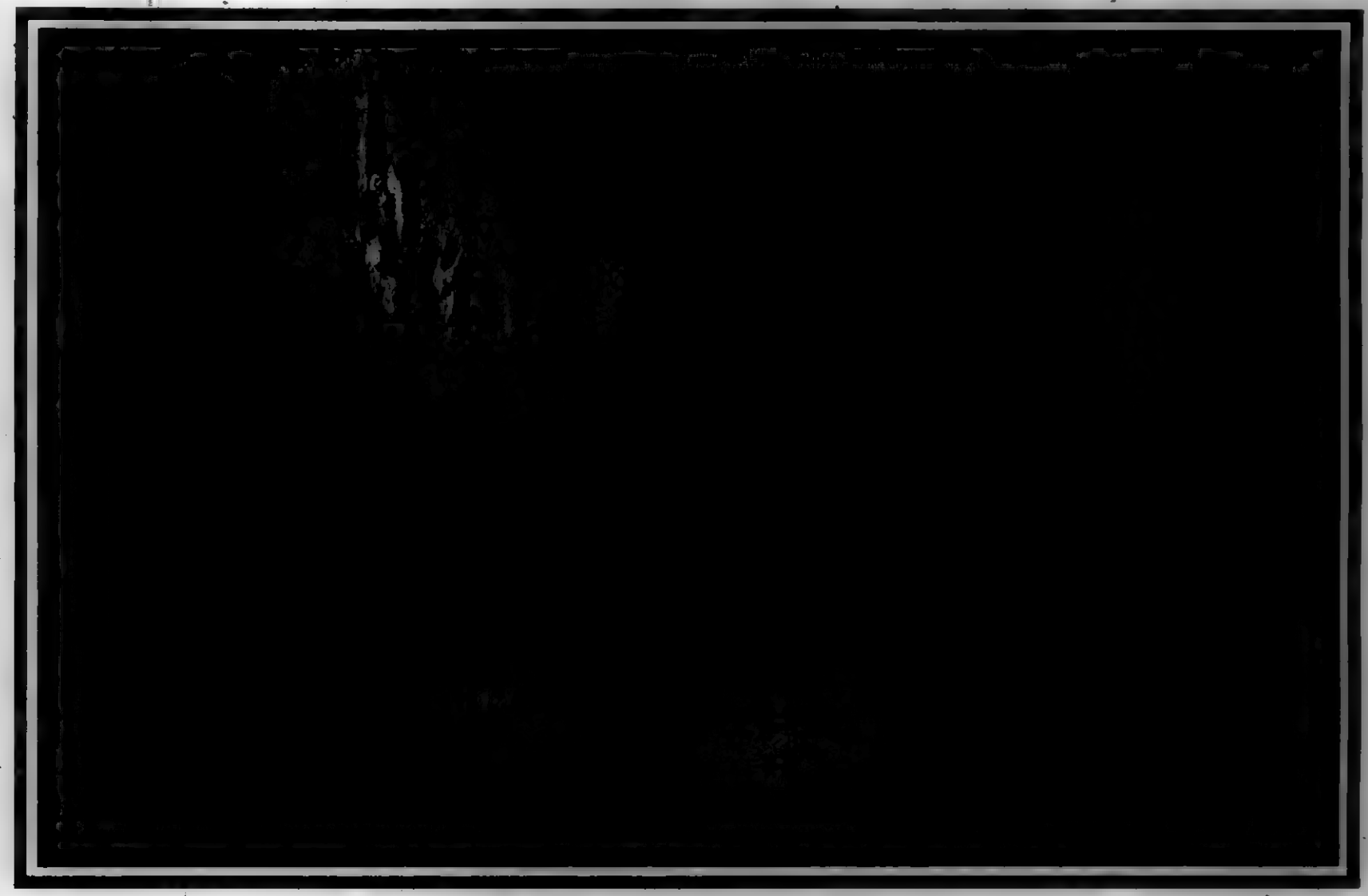

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WilTel to offer ATM-based net service

Public channel-extension network aimed at firms consolidating data centers

By Joanie M. Wexler
THE WOODLANDS, TEXAS

Long-distance telecommunications carrier WilTel plans to announce today what analysts said is the first application-driven Asynchronous Transfer Mode (ATM) offering: a public channel-extension network service.

WilTel said the service is aimed at companies consolidating data centers and needing high-speed connectivity between distributed, high-performance peripherals and centralized hosts.

However, some users immersed in data center consolidation, such as WilTel customer Atlantic-Richfield Co. (Arco) in Los Angeles, said they do not need more bandwidth.

John F. Coman, Arco's manager of networks and information services, said, "If you do data center consolidation, you need less channel extension afterwards." One reason for this, he said, is that "everyone is getting away from high-speed printers because there is a tremendous drive to reduce paper."

Companies that do wish to extend the lightning-fast speeds of point-to-point channel network jaunts over wide geographic areas will require broadband networks, however. WilTel's channel-extension service will initially roll out over a T3 (45M bit/sec.) network this month and shift to a full-blown ATM-based offering in the fourth quarter.

ATM is an emerging technology that can eventually take users into gigabit networking. It suits the intermittent nature of channel traffic because users pay for network services only when they use them.

Joining in

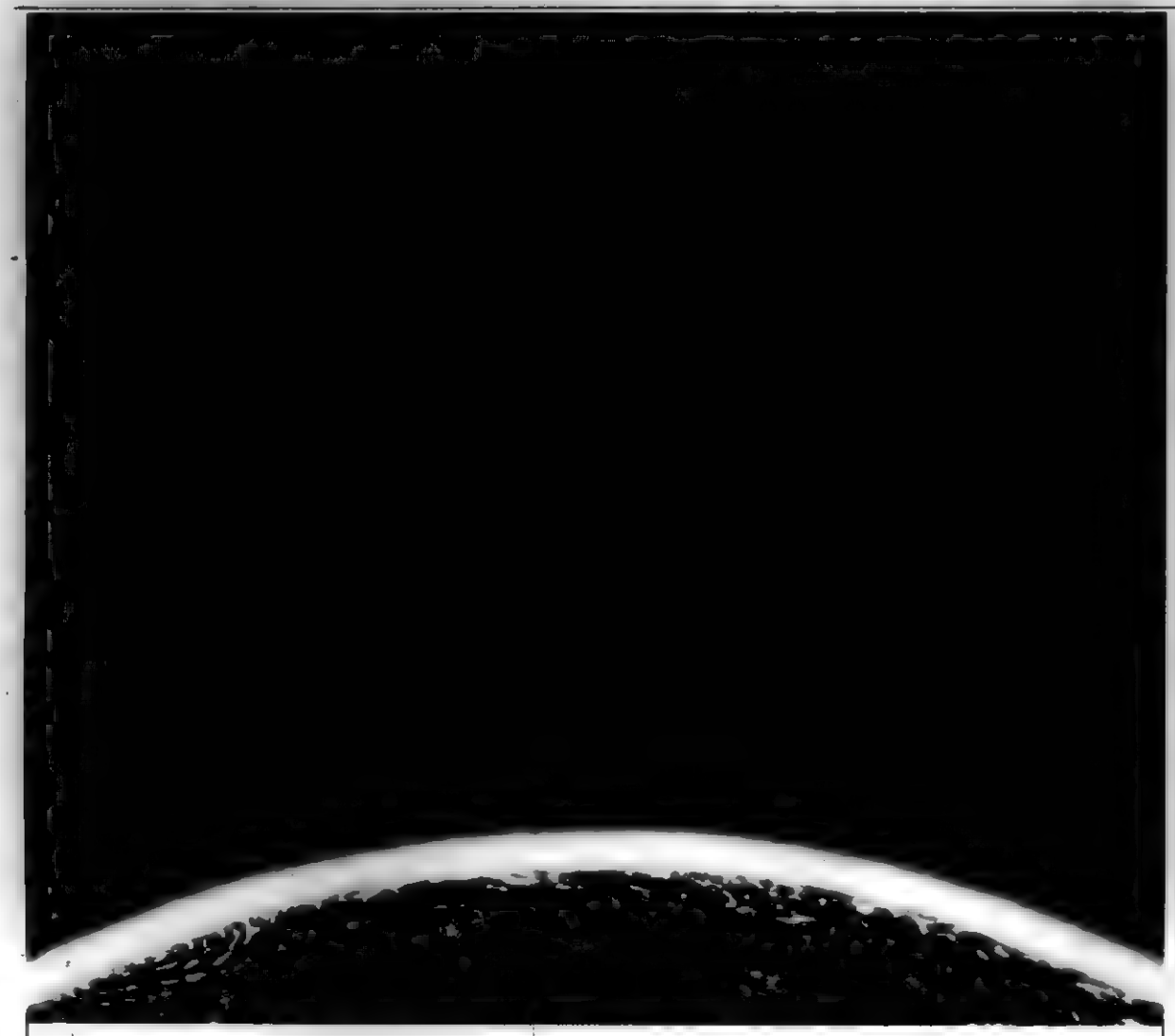
AT&T and Sprint Corp. have announced they will have ATM networks in place this year, though they have not defined what kinds of services will be available. MCI Communications Corp. identified channel extension as a targeted application with its switched T3 service, though it offers no end-to-end channel-extension service yet.

WilTel is building its network on equipment from channel market leaders Computer Network Technology Corp. and Network Systems Corp. so users of these vendors' products can blend their private and public channel networks, said Bill Wilson, WilTel's vice president of strategic planning.

The point of a public service is to give users high-speed channel networks without their having to make hefty capital investments (for example, Computer Network Technology equipment runs from $30,000 to $100,000-plus at each end) and to spare them from the higher costs of buying other devices and communications links piecemeal, he said.

Wilson would not provide specific WilTel pricing structures other than to state that monthly costs could range from $15,000 for a "very simple, single-link, point-to-point connection" to $200,000.

However, Berge Ayvazian, a senior vice president at The Yankee Group, a Boston consulting firm, said WilTel's aggregate purchasing volume will allow it to package channel-extension gear "more economically than any individual customer. Users would probably pay 10% to 20% more" for equipment if they were building a private channel network.



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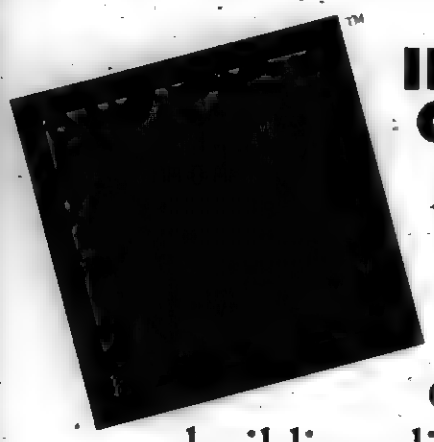

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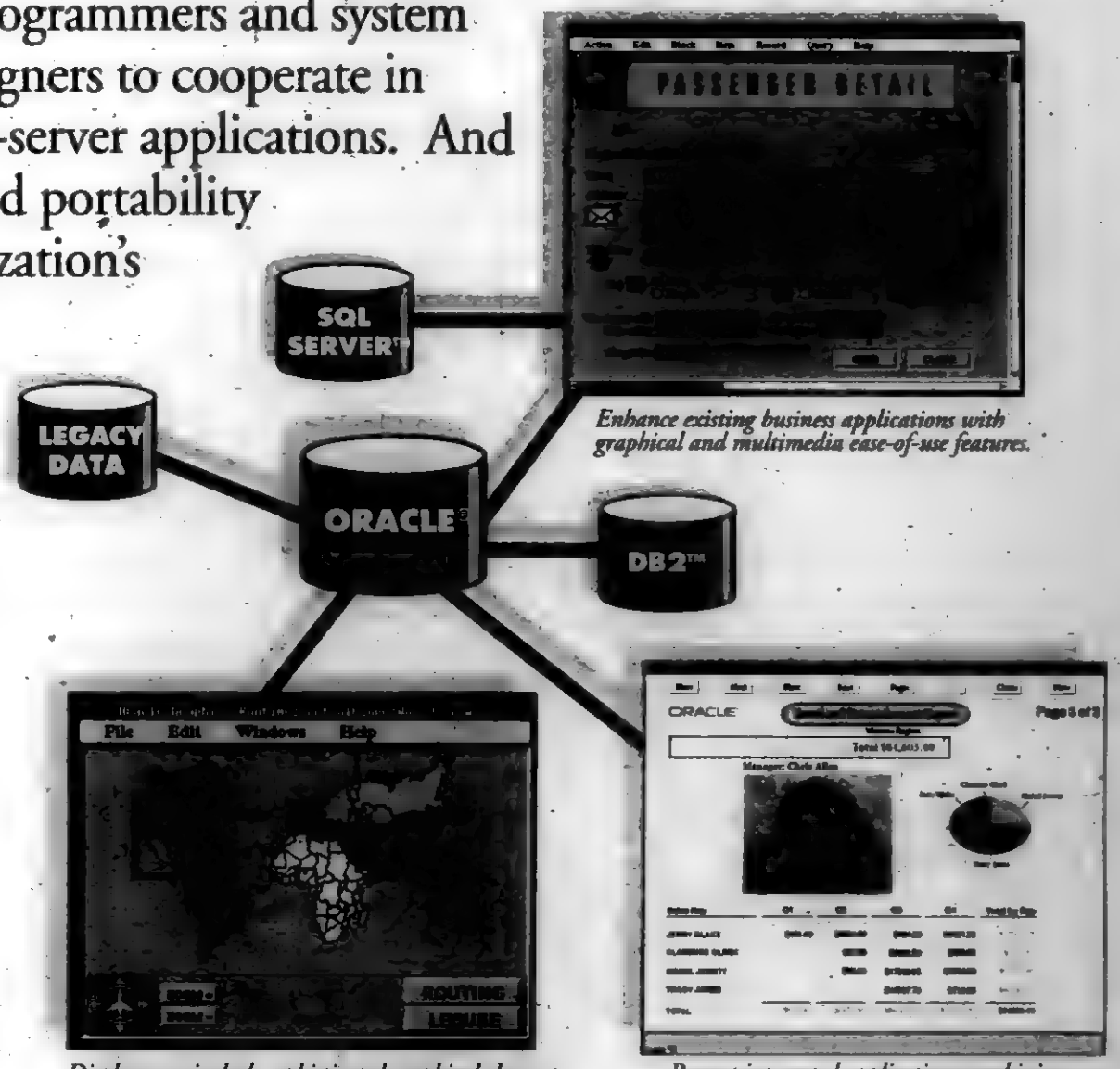

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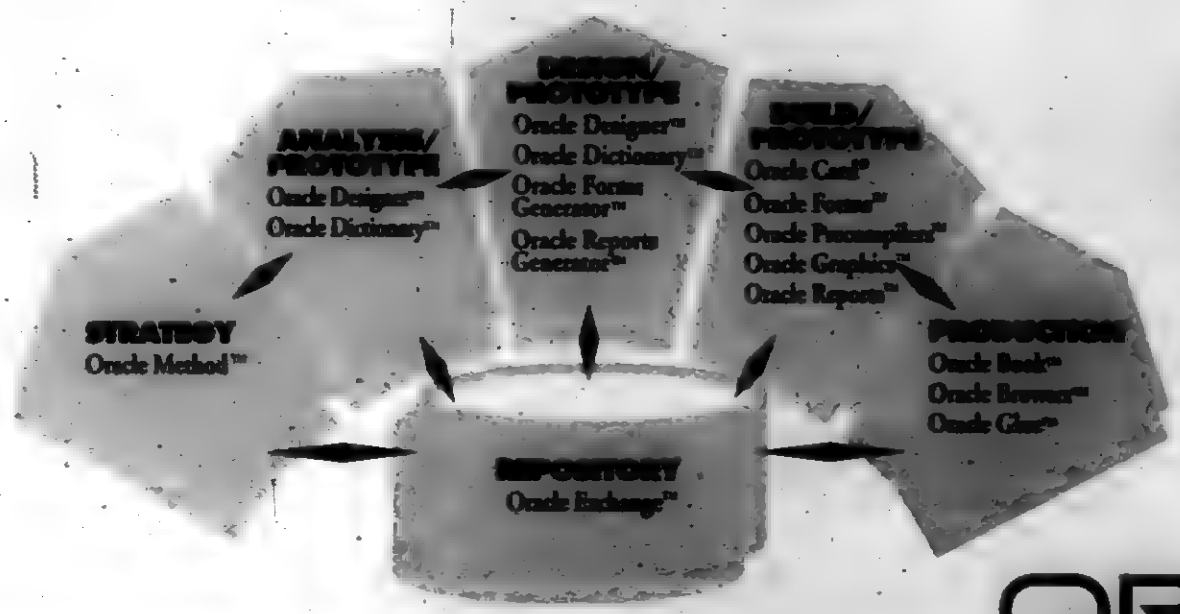

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Wide-area networking

SNMP to manage long lines

By Elisabeth Horwitt

Leading carriers are finally climbing off their proprietary or Open Systems Interconnect-based network management platforms and offering to make their broadband services manageable by Simple Network Management Protocol (SNMP).

This will be a real boon to users who increasingly want one SNMP-based system to manage an end-to-end, local-area network-to-LAN connection — including the carrier "cloud" in the middle, according to Iain Stevenson, senior consultant at London-based research company Ovum Ltd.

Next week BT is expected to announce that it will provide SNMP manageability for its Global Network Services (GNS) by year's end. This will "enable users on the LAN end to see the status of [BT's] LAN Interconnect Service: whether a circuit is up or down, as well as traffic levels," said Keith Willetts, group development executive for BT's managed communications services.

BT's announcement closely follows a similar introduction by MCI Communications Corp.

Schindler Informatik AG is one company looking for an SNMP management system for a global installation of LANs that it is in the process of connecting via Integrated Services Digital Network, according to Ed Hodgson, manager of computing and communications at the Swiss elevator company. A direct tie-in to the carrier via SNMP would be useful if it supplied real-time information about a network failure and what the carrier is doing about it, Hodgson said.

BT is also expected next week to announce alliances with Hewlett-Packard Co. and Sun Microsystems, Inc.'s SunConnect unit to "tightly integrate" BT's Concert network management system with the two vendors' SNMP-based network management systems.

The companies will link and synchronize Concert's database with those of the SNMP systems, with the goal of giving SunNet Manager and OpenView users fuller management of BT's GNS, Willetts said.

This second phase of BT's SNMP support is scheduled to deliver the following functions by its first-quarter 1994 rollout: on-line, on-demand provisioning of bandwidth on BT circuits; two-way alert exchange between user and carrier; on-line access to carrier billing information; and on-line ordering of BT services.

At the recent Interop '93 Spring show, MCI introduced a management information base that will enable SNMP systems to monitor circuits on MCI's HyperStream family of broadband services. MCI also announced HyperScope, a SunNet Manager-based turnkey system for managing HyperStream frame-relay services both here and overseas. The system is available now for $965 per month.

MCI will support SNMP management of HyperStream Switched Multimegabit Data Service by summer, the company said. Sprint Corp. plans to provide general availability of SNMP-based management of its frame-relay service by year's end, a company spokesman said. It is looking at expanding SNMP management capabilities to its X.25, private-line and ATM services as well.

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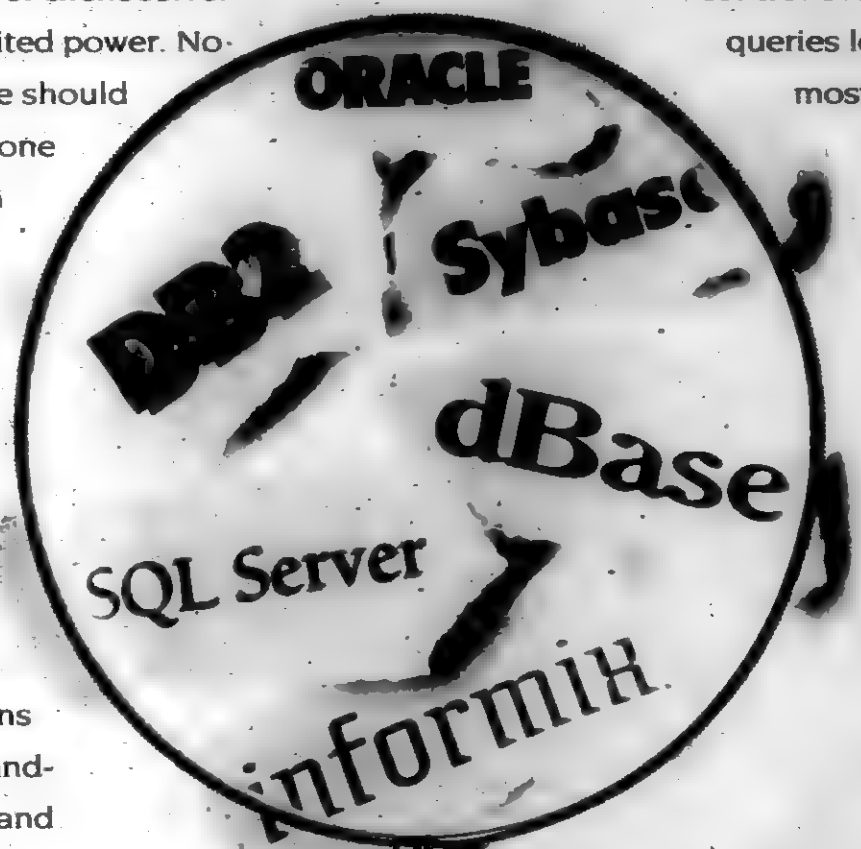

Israel Littman, manager of management analysis for Con Edison's Central Engineering Department, used ObjectView to develop a management/engineering information system. The application, which accesses budget, resource, project and performance data, helps managers immediately identify exceptions before they turn into major problems.

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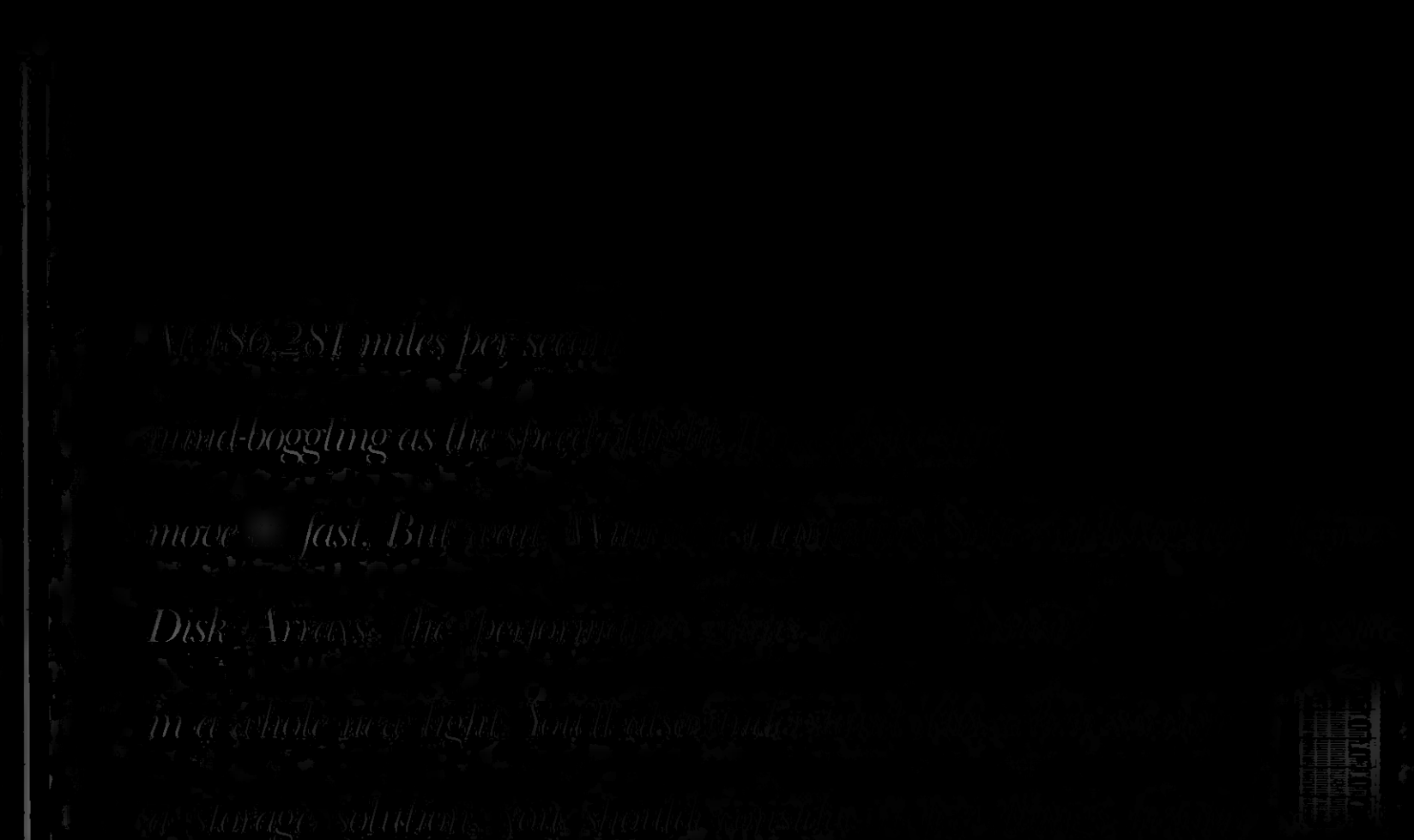

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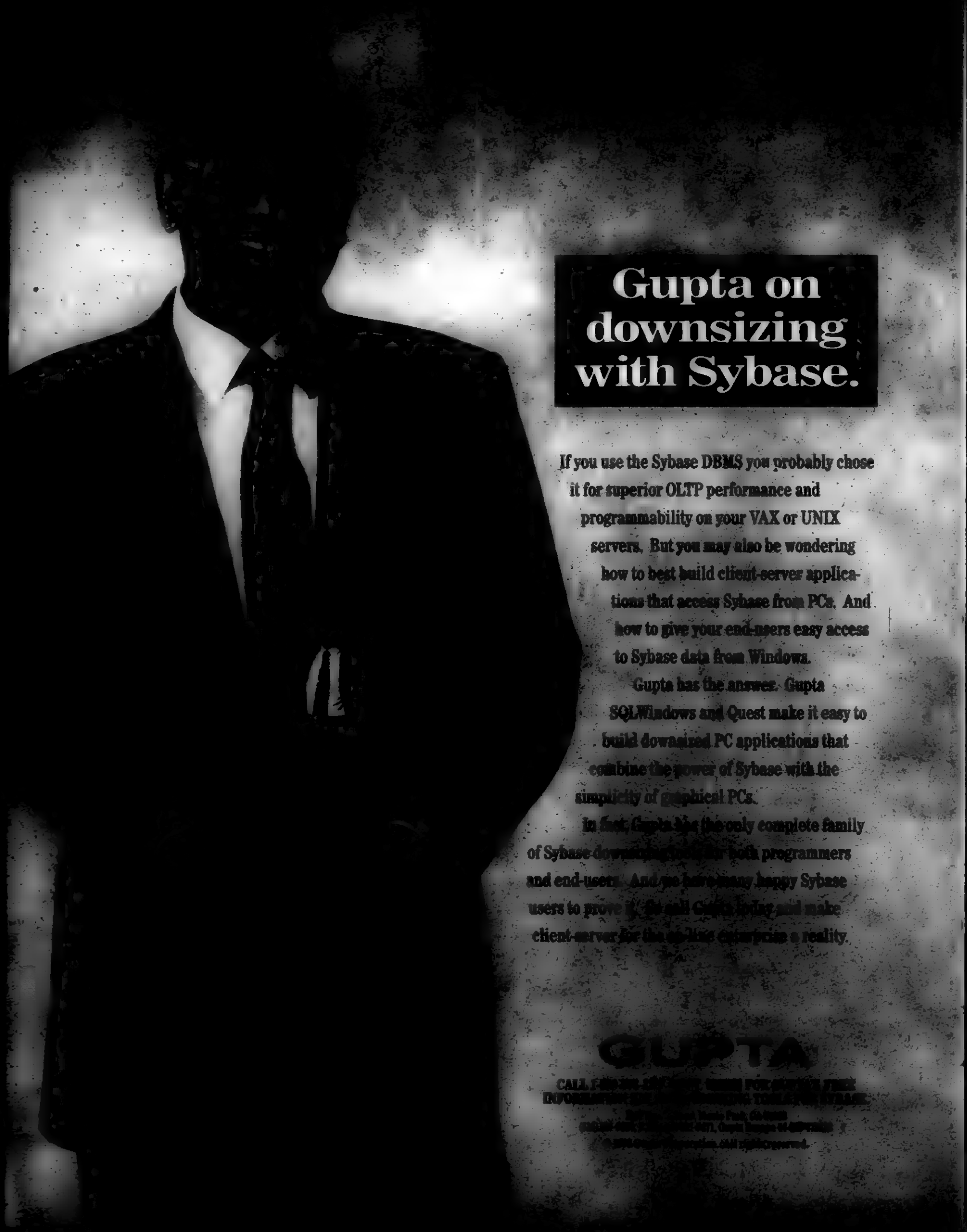
Gupta on downsizing with Sybase.
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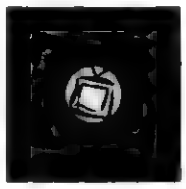
It's TV time

HDTV may be on hold, but a personal movie theater box is still in the offing

By Kim S. Nash

The television of the not-so-distant future promises more than a technopolitical battle over HDTV.

Picture a voice-controlled appliance with a PC's smarts and the audiovisual quality of a movie screen whose information and entertainment broadcasts you tailor.



Now picture it in time for Christmas.

The Federal Communications Commission's February decision to delay choosing a standard for high-definition television (HDTV) from among the four submitted last year opened a window of opportunity for computer and cable companies to beat HDTV players to market with advanced digital TV technologies.

Ditching current analog TV broadcasts for digital transmissions — and installing supporting technologies such as fiber-optic networks — will happen in stages and not without struggles. But once it arrives, digital technology will lay the groundwork for interactive, whizbang television and true multimedia PC applications.

Superappliance

PC and TV technologies will converge, resulting in a single, super household appliance that handles all functions now performed by the separate boxes — and more. "Your TV is likely to have an Apple or IBM logo on it five years from now," said Nicholas Negroponte, director of MIT's Media Laboratory in Cambridge, Mass.

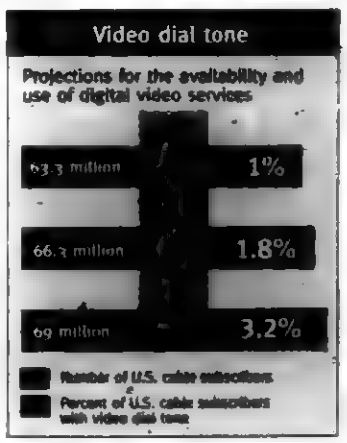
Marrying PCs and TVs will require something old, something new and something Blue, if IBM has anything to say about it. Existing technologies such as digital communications networks and fiber-optic cable will have to work with tools still in development, including heavy-duty data compression systems. IBM maintains that mainframes are perfect as servers for compressed images as well as full-motion video.

It has been widely speculated that IBM is working with media giant Time Warner, Inc. to develop a multimedia TV system for home consumers, but neither company would comment on the rumored project.

Digitization of TV broadcasts will enable intelligent "video dial tone" systems, said Larry Vanston, president of Technology Futures, Inc., a research firm in Austin, Texas, that specializes in new media technologies. Such systems go beyond today's pay-per-view scheme, where a viewer calls his cable company to sign up for a movie that the company has scheduled to broadcast on one of its for-fee channels.

Personal channels

In video dial tone, a viewer uses a remote control to program his digital TV (or, in the interim, a digital converter box) to capture and download one of a large selection of movies to his personal channel. When the show ends, the viewer can download information from a shopping network to do the grocery shopping or order Chinese take-out from the corner restaurant.



Source: Technology Futures, Inc.

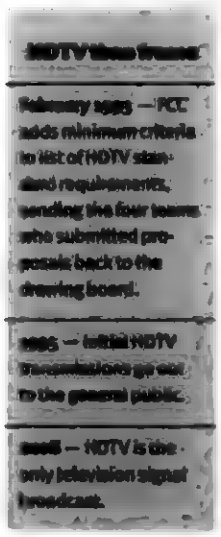
This sort of "information on demand" is not that far off. About 200,000 digital satellite receivers from Hughes Network Systems are projected to hit retail stores by December, with initial digital transmissions — largely entertainment — scheduled for broadcast in early 1994.

It's too soon to estimate what this couch potato nirvana will ultimately cost the average viewer. But experts bet that we will share in the cost of outfitting cable companies with fiber-optic networks and other equipment, a task estimated at $5 billion to $15 billion.

Moreover, for all this to come into focus, cable, computer and TV companies will have to cooperate.

Fat chance, said skeptics such as Dwight Allen, senior manager for the telecommunications and electronic services industry program at Deloitte & Touche's Washington, D.C., office.

Negroponte agreed. "The entertainment market is just huge," he said, adding that home entertainment companies are pushing harder than business-oriented computer companies to get digital technology devices onto store shelves. Consider that the electronic book publishing industry pulled down $100 billion in worldwide revenue last year and that video movie rentals totaled $12 billion in the U.S. alone.



Little guidance

Meanwhile, governmental efforts to guide the development of TV technologies before private companies fly off in their own directions has been slow going, at best, Allen said.

The FCC, for example, has been making noise about choosing an HDTV standard for some time, and still no decision has been made. Plus, an already slow-moving FCC was made slower by the recent White House administration changeover.

By the time the FCC even looks at the HDTV submissions again, there will be digital products on the market, Negroponte noted. "Nobody's daydreaming in this area," he said.

Even so, intra-industry battles could slow progress. Both cable and phone companies are vying for future consumer business by laying down fiber-optic backbones.

Right now, phone companies supply individual, low-bandwidth channels to each home. Cable companies, by contrast, control a smaller number of higher bandwidth channels shared by many homes in a given geographical region.

To achieve the digital vision, cable companies want to use data compression and fiber optics to bring separate channels to homes via large multiplexers. Phone companies want to find a way to add more bandwidth to each of their individual lines.

Computer vendors will shape the digital evolution, but not for a few years, Negroponte concluded. Rather, PC software and hardware makers such as Microsoft Corp. and Apple Computer, Inc. will gradually increase the capabilities of multimedia machines, which will become the de facto TVs of the future.

"The entertainers will have to come around eventually and work with computer companies if they really want advanced technology in their products," Negroponte said.

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Thanks, Microsoft

As I sit writing this editorial on the big Unix collaborative announcement of last week, it seems appropriate that I chose a yellow underliner to highlight certain selections of my notes. That's because you can't help feeling a little jaundiced when yet another group of vendors has banded together to "do the right thing" for users.

Even the most jaded observer, however, has to be excited about the first real prospect of unifying the many diverse flavors of Unix into a blend of greater consistency. The result for customers, if all goes according to promise, would be a tremendous increase in the compatibility of Unix software across disparate hardware platforms. No, not one Unix, but at least a common set of application interfaces. And that is truly good news.

One vendor in the Unix unification group, Sun, has an excellent track record of making development alliances work, given its experience working with AT&T in the Unix International group. That group was successful because it carefully defined its goals and limited its size — characteristics of the current group of collaborators.

With all the potential benefit for customers from this confederation, the motives for its organization shouldn't really matter. But they do matter and, to that end, Unix aficionados ought to sit down and write a thank you letter to Bill Gates and Microsoft.

Thank them for being big. Thank them for being aggressive. Thank them for being hated. Thank them for being the IBM of the 1990s. And thank them for scaring the pants off a group of vendors that otherwise might not have joined ranks to, in their words, respond "to increased customer demand for consistent technologies across multiple platforms."

Be glad that the Federal Trade Commission didn't issue the harsh sanctions against Microsoft that some members of the new Unix consortium so ardently sought. The investigation alone should be enough to force Microsoft to stay within the boundaries of competitive fair play, as painstakingly defined in the voluminous U.S. antitrust laws.

But there are no laws against playing hard. In a free market, hardball only forces others to elevate their own performance. That's what's happening here.

If the Unix group delivers as promised, the pressure will be on Microsoft to deliver a version of its Windows NT operating system that similarly answers the customer requirement for cross-platform compatibility. And with some 2 million copies of another NT competitor, namely OS/2, already in users' hands, Microsoft will have no choice: It must make NT all it's been cracked up to be.

Bill Laberis

Bill Laberis, *Editor in chief*

IS must meet business needs

The Feb. 15 issue contains two pieces touching on the place of information systems in the organization.

Rick Marshall's Viewpoint article "Don't let IS become your CEO's ball and chain" offers a view of IS as a cost of doing business. In his In Depth article "Performance anxiety," Dan Allen discusses the need to audit and analyze IS performance, with attention to structure, discipline and control.

While these perspectives are very important, they overlook the most significant factor influencing the IS department — the contribution to the mission of the organization.

Sophisticated systems, cost savings, thorough outsourcing and high scores against industry benchmarks make for good conversation in the IS clubhouse. Yet, IS is a service unit just like personnel, purchasing, accounting and a variety of other departments. And, just like those other departments, the importance of IS comes from what it does for the success of the organization.

Mr. Allen teases us with an opening dialog that ends with no response to a crucial organizational need.

That single response, or its absence, says more about IS than the sum of all the audits, analyses and cost reductions.

Computerworld could do its readers a great service by increasing attention to this less quantifiable area.

Forrest E. Stanley
Bakersfield, Calif.

Pass or fail

Regarding Paul Gillin's commentary "OS/2 — no jokes" (CW, Feb. 15), I wish to thank Mr. Gillin for letting us know that OS/2 "requires that the user understand concepts such as what a DLL file does or the difference between startable and installable partitions."

Upon learning this, I immediately told my 16-year-old daughter that she would have to stop using OS/2 until she learned all about DLLs and installable partitions.

If Paul Gillin says it's "required" then, by gosh, it's required. I shudder at the thought of all those OS/2 users out there like my daughter who are proceeding ahead with no knowledge of these critical concepts.

Anyway, thanks to Mr. Gillin, no one in my household will use OS/2 until he can pass a rigorous OS/2 test.

William Keegan
Bedford, N.H.

Forgot ODBMS

Scott Koehler's commentary "The scoop on OOP" (CW, Feb. 8) provided a brief and thoughtful overview of two of the three main areas of object technology: tools and languages.

I was, however, quite surprised to see that he omitted any discussion of object database management systems (ODBMS) — the third leg supporting any object-oriented application development platform.

Object technology is about more than just graphical user interfaces (GUI) and languages. It's a new way to build applications that requires retooling not only the GUI and language but also the database management system underneath it.

I suppose he'd reply: "OOPS, well two out of three ain't bad."

David A. Kellogg
Menlo Park, Calif.

Playing favorites

I am starting to feel that *Computerworld* has been placed on Microsoft's payroll or has become naive enough to believe Bill Gates' lies. Michael Vizard's article "Client/server caveats" (CW, Feb. 15) was not much more than a plug for Windows NT.

He criticizes OS/2 for being too large and unwieldy. Yet, if Vizard had used OS/2, he would readily recognize how easy and intuitive it is to use. More importantly, Windows NT is much larger and unwieldy.

I guess that IBM bashing and biased reporting are now accepted and popular at the *Computerworld Star*. Hope to read the "Windows NT interfaces with aliens" article next issue.

James Villela
Torrance, Calif.

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The IS spouse strikes again

Alice Lesch Kelly

When my husband and I decided to buy a house, we were both filled with excitement thinking of the many home improvements we could make.

"We can paint the dining room pale blue and buy an oriental rug!" I said. "We can rip down all the kitchen cabinets and replace them with a new set of oak cabinets!"

"And we can wire the entire house with coaxial cable, buy a few more PCs and some LAN software and E-mail each other from room to room!" Dave said. "Just think of how it will add to the house's resale value!"

Uh oh. The IS spouse strikes again.

Dave and I both have big plans for this house, but I'm afraid we may be at odds. Take the spare bedroom. I think it would be nice as a den. We could put up some bookshelves, have a comfortable reading chair and maybe even buy an antique desk. And a window seat would look wonderful.

But Dave has other ideas.

"This," Dave said when he saw the spare bedroom, "will be the systems room."

I can envision the compromise: an antique desk hidden by a PC and a scanner, bookshelves sagging under the weight of too many copies of Borland C++ documentation and an easy chair surrounded by the many computer publications that our poor mail carrier lugs to our front door each day. And the window seat would be a perfect place for the laser printer.

Peter Steiner

To the penny

Of course, there are some advantages to having an IS spouse while buying and decorating a house.

For example, when it came time to negotiate, Dave was able to use his many spreadsheet programs to figure out exactly — and I mean exactly — how much everything would cost us.

"If the bank lowers its interest rate tomorrow by .125%, we can save $6.53 a month," Dave reported to me one day. "That may not sound like much, but over the course of the loan, that would add up to the price of, say, a 486 notebook computer."

And when I started talking about a decorating plan, Dave set out to find the perfect CAD software package.

"We'll be able to take photos of each room, scan them into the PC and then decorate on-line!" Dave said. "We can move the couch here and the china closet there without any backbreaking labor. It'll be a cinch."

OK. I can be flexible. I can go along with the idea of computerized furniture arrangements. And it may be nice to have a printout of our anticipated household expenses from now until the year 2023.

But do we really need a LAN?

Dave thinks it's a great idea — and he said it won't take up much space at all.

"We can put the server in the linen closet," he said. "Then as the little ones come along, we can add dumb terminals."

Kelly is a *Computerworld* copy editor.

Tools won't help if you don't know what you're doing

OPEN MIND *by* Esther Dyson

Many organizations are building "work flow" systems these days. Not all of them understand, or will reap, some of the most important benefits that true work-flow can provide.

In principle, a work-flow system is any system that includes people interacting through a computer to complete a task.

Real work-flow systems won't just happen because the tools exist to create them. Good tools don't create good systems.

Ostensibly, the basic reason for work-flow systems is to automate routine work. But if you use that definition and that reasoning, what you'll get is something that could be a standard multiuser mainframe application — a system that speeds up and streamlines tasks rather than recasting the work process. You'll get a conventionally rigid, application-oriented system that is impossible to understand in terms of work flow — and also impossible to modify.

The current range of tools provides the proper abstractions and concepts — a person, a task, a routing list, an approval cycle — for development of flexible, process-oriented systems. Indeed, the benefit of the new work-flow tools isn't so much that they automate processes but that they make them understandable. These tools are for communication as well as design. People other than the original developer can change such a system easily because the structure and sequence of the work processes are visible.

Thus, aside from power and the ability to handle sheer volume, the mark of a good work-flow system is flexibility, both in design and operation. It should be easy for users both to build a work-flow system and to define ways to handle exceptions and change the work flow in response to changing conditions ("exceptions" that become permanent).

After all, if you read current management literature, you know that the most valuable capability IS can offer a company is not cost efficiency but the ability to change quickly, to re-engineer itself and to learn. In a service-oriented world that's moving ever faster, a company that can change its processes as well as its products has a powerful competitive advantage.

To illustrate, first think of the software video cliche of the 1990s: Five yuppies sit around a table. One says, "What if we changed this figure here?" And the graph on the screen magically redraws itself.

The video of the '90s? A racially mixed, casually dressed group is discussing a merger. "Now that we've acquired Wondercorp, we have to link it into our customer-support process. When a message comes in, it should go to support first, then to the Wondercorp Quality Control team. ..." The work-flow chart on-screen automatically redraws itself (and the work-flow code is also automatically updated).

In the end, work flow is a thinking and designing aid as much as it is a system for automating work. But real work-flow systems — flexible, '90s-era work-flow systems — won't just happen because the tools exist to create them.

Good tools don't create good systems. Only you can do that, by taking advantage of a tool's ability to model and design a business process and by making it your business to understand what people are really doing in their jobs.

Dyson is editor of two newsletters: "Release 1.0," about emerging software technologies, and "Rel-EAST," about emerging computer markets in Eastern Europe.

They tell you they need imaging. You tell them they need Wang. Here's what happens next.

They say: "Wang is finished."

You say: "Guess again. They're putting a ton of money into their imaging group. They're shipping products. And the word is, there's a lot more coming."

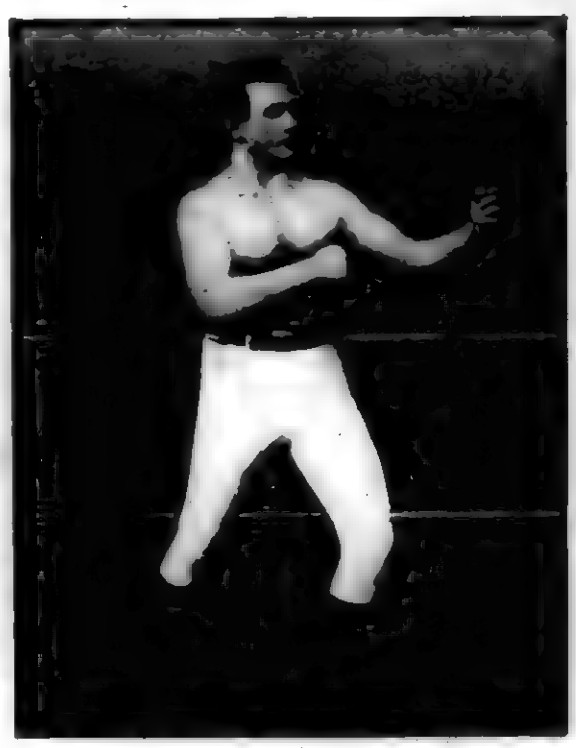
They say: "Yeah—Proprietary platform stuff, right?"

You say: "Wrong. PC- and UNIX-based stuff. Windows. NetWare. *Open* stuff."

They say: "Well . . . So what? They can't image-enable *our* system, anyway. We've got multiple platforms, multiple languages, *all kinds* of networks . . ."

You say: "Wang can image-enable any environment. IBM. DEC. UNIX. Windows. Anybody."

They say (after a pause): "No kidding?"



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Charles Babcock

The Next direction

Yogi Berra once said, "When you come to the fork in the road, take it." Next, Inc. in Redwood City, Calif., came to a fork in the road last month. Fortunately, it knew which direction its customers wanted to take.

Next has dropped its line of elegant black boxes. It is selling its automated factory in Fremont, Calif., and is focused on its customers' interest: the NextStep object-oriented software environment. By May 25, NextStep will be available on standard Intel 1486 hardware.

IBM and Apple through their Taligent unit and Microsoft with its Cairo project are all at work on something similar, but deliverable systems are a year or more away. With four years' experience in building and supporting an object-oriented application development system and a price tag ($2,800) that puts NextStep in a different league from the few existing products of this type, Next has the lead — if it can find the means to exploit it. Next's management ranks have been thinned by resignations and layoffs, and last week President Peter van Cuylenburg announced his departure.

The object-oriented approach brings the concepts of reusable components and modular structure to the development of software applications. It also brings the potential for large-scale efficiencies.

Capers Jones at Software Productivity Research says we won't realize truly dramatic savings in software development costs until we adopt more of the principles of object orientation. In a study of 50 programming languages, he found that a function point requires 128 statements in a C program, 108 in Cobol and only 28 in an object-oriented language. In addition, those 28 statements are easier to maintain and reuse than their third-generation counterparts.

Uphill battle

But it's not necessarily easy adopting the object-oriented approach. Programmers and analysts must give up their business process models and flowcharts to think in terms of object behavior analysis. And payback for the initial effort is slow. Much of what passes for object-oriented programming these days is the use of SmallTalk or C++ to add isolated objects to procedural programs.

Building applications in an integrated, object-oriented environment produces components that can be revised, upgraded and reassembled into new systems. Object-based systems are easier to maintain than procedural systems because an object can be documented and revised without disrupting other objects. And the more times an object is used, the greater the return on its development.

NextStep is an operating system that contains closely integrated object and database tools. It is based on the Mach operating system, in which processes communicate by message-passing in a vein similar to the way objects communicate with one another. Mach also runs a large chunk of Berkeley Unix as a server, giving it characteristics of Unix as well as its own unique profile. (Taligent's Pink is also based on Mach.)

In addition, Next has extended the conventions of the GUI. At Next's unnaturally quiet headquarters, product manager Rick Jackson illustrated how a user could tap a file directory on a remote machine and then drag and drop its name to a "shelf" at the top of the window, where it becomes an icon, available to the application.

When Next confronted the fork in the road, it knew which way to go. That way is still less traveled, but it is clearly the direction that much of application development will have to take. The remaining Next staff members have a chance to lead the caravan.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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Hermes debuts at Windows Summit

By Christopher Lindquist

■ Microsoft Corp. has had Hermes flying around the country recently, and the Windows NT-based systems management technology has been turning a few heads.

"Hermes is sort of the bride and groom dolls on top of the wedding cake, and the cake is Windows NT," said Bill Higgs, vice president of software research at Computer Intelligence/Infocorp in Santa Clara, Calif. "This is supposed to be the software that demonstrates the value of NT in the networked world."

Higgs said Hermes technology will create some of the "reassurance" products that Microsoft will use to help convince information systems managers that it is serious about playing in mission-critical markets.

Indeed, Microsoft has recently been quoting figures that puts the cost of installing software on 2,000 PCs at around $5 million per year. Hermes, according to Microsoft, is the code name for a collection of technologies intended to ease the installation and support of software on a network, thereby lowering costs.

While Hermes has had its name bandied about for some time, two weeks ago marked the first public demonstrations of the technology, including demonstrations at the Windows Summit in Carlsbad, Calif., Microsoft Tech-Ed in Orlando, Fla., and Interop '93 Spring in Washington, D.C.

Among the goals set for Hermes are the centralized distribution and support of software, remote monitoring and control of nodes and hardware configuration management. Demonstrations of the product have included "drag-and-drop" installation of software across a network.

For example, a systems manager could have Hermes technology identify all of the 386- and 486-based PCs with more than 40M bytes of free disk space on a network. He could then have Hermes install a new software package on each of those PCs, and even have Hermes configure the software according to the hardware requirements of the machine, such as installing the proper device drivers for different video adapters.

Such installations are accomplished through a variety of means, not the least of which are scripts that describe how the software is to be installed on each machine. The systems manager can write these scripts, or they can be supplied by third-party software vendors.

Hermes would also support a licensing application programming interface (API) that would inform users if they were attempting to run, say, the 101st copy on a license that only called for 100 copies and would prevent the program from executing. Systems managers could also operate a user node remotely to help determine and fix problems without having to go onsite.

Not alone

There are issues, however. Hermes will not be the only player in the market. IBM, Lotus Development Corp. and Borland International, Inc. are reportedly working on products in the same vein as Hermes, and Computer Associates International, Inc. is positioning its Unicenter products as a competitor. Indeed, IBM already has its Configuration, Installation and Distribution Services product for software distribution, though it is currently restricted to installing software on OS/2 machines.

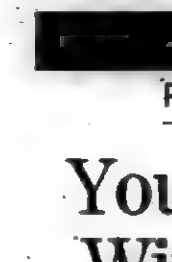
Some customers and vendors may also be wary of the power Microsoft could wield if it has access to all the information Hermes ■ promising to collect, said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash. While the licensing API sounds good, "Do you really want Big Brother on a network shutting you down because you have 101 licenses instead of the 100 you paid for?" Berst said, noting that some customers might prefer quarterly checks on licenses rather than Hermes' instantaneous reporting.

One user who said he had seen an early version of Hermes being tested indicated that there could be some problems with network traffic if systems managers are not careful. For example, he said a forced installation of a new application distributed to 500 people who all logged on around 9:00 in the morning could cause significant traffic problems. However, Hermes "looks like its going to be real, real good" overall, he said.

Microsoft is quick to say that Hermes is not a product in and of itself. Hermes technology, due by year's end, may be marketed in a variety of ways, including systems aimed at smaller local-area networks and others intended for large-scale wide-area networks. Hermes will also include support for several platforms, including Windows, Windows NT, DOS and the Apple Computer, Inc. Macintosh. Hermes itself will require a Windows NT server.

Hard to handle

Sources indicate that Hermes is coming along well and should make its year-end ship date. However, of three recent demonstrations, only one, at Interop, was actually Hermes. The others were Visual Basic mock-ups. The reason: It is difficult to carry around a large LAN for demonstration purposes, and Hermes is still not ready for prime time, according to Dave Berry, Microsoft product manager for systems management services. "If you hold its hand, it kind of works now," he said.



Paul Gillin

Your turn, Windows

Having given OS/2 its lumps a few columns ago, I'm not happy to share my advice on how to get the most out of Windows 3.1. First, let me say how much I like Microsoft and that I think Windows is a great product and how Microsoft should never, EVER stop sending me free software because I like it so much.

Windows 3.1 is much better than Windows 3.0 because it has gotten rid of the annoying and frequent Unrecoverable Application Errors and replaced them with annoying and frequent General Protection Faults (GPF). This is a much easier error message to pronounce.

Gillin, *page 38*

Multimedia technology

Asymetrix tightens links in Windows graphics tool

By Michael Vizard
BELLEVUE, WASH.

As presenters move to adopt multimedia technology in a never-ending quest to add more pizzazz to lifeless data, users are discovering that existing presentation graphics packages leave a lot to be desired when it comes to handling audio and video.

To address this problem, Asymetrix Corp. has launched a presentation graphics package for Microsoft Corp.'s Windows that was designed to handle multimedia elements from the ground up.

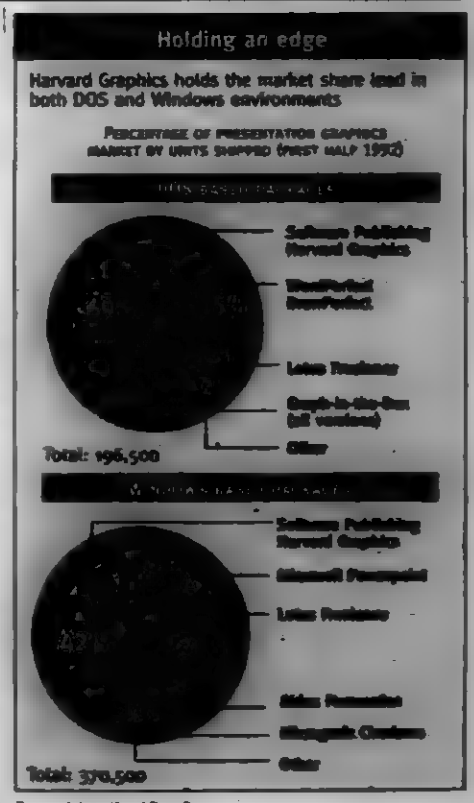
Offered at an introductory price of $99 until July, Compel 1.0 includes a hyperlinking facility that lets users link supporting data to any item in the presentation simply by clicking on the mouse.

And while other presentation graphics packages are capable of supporting multimedia objects, Compel's facilities for creating and managing these objects will set it apart from existing offerings, according to Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash.

"Compel handles housekeeping issues better. It provides pointers and subdirectories that automatically link files all over the disk. The triggers and sequencing of objects are well-handled," Berst said.

In addition, Compel, which will be priced at $295 after July, supports on-the-fly compression and provides a facility that will automatically distribute a presenta-

Asymetrix, *page 38*



Source: International Data Corp.

Notebooks

NEC Technologies rebounds with versatile Versa notebook

By Michael Fitzgerald

NORWOOD, MASS.

■ NEC Technologies, Inc. has at least temporarily regained momentum in the notebook market thanks to its new Versa notebook, analysts and users said. The new family boasts a local-bus graphics scheme, and everything but the processor is upgradable.

The Versa will use the 20-MHz and 25-MHz versions of Intel Corp.'s 14988L processor, and the 33-MHz version when it is available. Versa has a user-upgradable hard disk and random-access memory, a reversible, user-upgradable screen (from monochrome to color or to pen-capable), a floppy drive that can be replaced with a battery for extra battery life and two Personal Computer Memory Card International Association (PCMCIA) Type II slots. The monochrome version weighs 6.1 pounds, while the color version weighs 6.8 pounds.

> "Right now, the Versa is the notebook I would tell users to go buy."
>
> — *Jeffery Henning, BIS Strategic Decisions*

Users said the Versa looked interesting to them.

"We were looking for versatility," said David Pinkard, senior network technical specialist at Mallinckrodt Medical, Inc. in St. Louis. Mallinckrodt will probably buy several hundred Versas this year. "The big thing we saw with the Versa was the ability to do a lot of upgrading. We're facing the problem of how long you write off an asset; micros become obsolete in two years, but we're writing them off over five years, so anything we can do to protect our investment is a help to us."

Pinkard cited the ability to upgrade memory and the PCMCIA slots as two features that were of particular importance.

Analysts praised NEC for its design efforts, which synthesize a number of features that other notebook vendors have offered, such as upgradable screens, upgradable hard drives and the removable floppy drive.

"Right now, the Versa is the notebook I would tell users to go buy," said Jeffery Henning, an analyst at BIS Strategic Decisions in Norwood, Mass. "It makes a lot of sense for companies because it is so configurable. You know you can have it for the next five years and it'll last."

Henning also cited NEC's "elegant" design.

Still, some analysts said NEC's clever design will not set it apart in the market for long and may not draw customers to it.

"The issue for them is getting onto corporate short lists. They don't have the best pricing and volume in the channel. The features don't give them a major leg up because in the market it comes down to marketing battles," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Even some NEC users, while they liked the product, said other notebooks continue to top their buy lists.

"There still isn't anything out there with a screen as good as the IBM Thinkpad 700C," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co., which uses both NEC notebooks and the IBM Thinkpad line.

Nelson said the Versa's active-matrix color screen, at 9.45 in., simply did not match IBM's 10.4-in. screen.

Versa pricing ranges from $2,659 at the low end to $4,539 for a high-end, active-matrix color version with a 180M-byte hard drive. All versions except the pen-capable models are now available, although NEC does not expect to begin volume shipments until next month.

Asymetrix tightens links

CONTINUED FROM PAGE 37

tion across multiple floppy disks, he said. The latter capability is useful for creating presentations that are then displayed on another PC.

"To add video and audio to other presentation graphics packages is very difficult. You have to write a lot of scripts. Compel accomplishes this with just one mouse click," said Mark Hopper, director of sales at AuraVision, Inc., a manufacturer of video chips in Fremont, Calif. Before moving to Compel, Hopper said, he previously used Powerpoint from Microsoft and Harvard Graphics from Software Publishing Corp.

Along with Lotus Development Corp., Microsoft and Software Publishing are the dominant players in the presentation graphics market.

Heat is on

According to Berst, Software Publishing has been under significant pressure from both Microsoft and Lotus, which bundle their presentation graphics packages with suites of Windows applications.

In particular, Microsoft has benefited the most from bundling Powerpoint with Microsoft Office.

"Microsoft Office has been so successful and has given Powerpoint momentum. It's a de facto standard at a lot of sites," Berst said. According to International Data Corp. (IDC), Powerpoint has a 23% share of the market.

"The percentage of Microsoft Office users who don't use Powerpoint is now down to 20%," noted Cathy Harris, a Powerpoint product manager.

"One of the first applications to move to Windows are presentation graphics packages, and I'm not sure Software Publishing will be able to keep up with the suites," Berst said.

Top player

According to International Data Corp., Software Publishing is the dominant player in the DOS market, with a 69% share as of the second quarter of 1992, while maintaining a 42% share in the Windows market. IDC estimated that 370,500 presentation graphics packages for Windows were shipped in the first half of last year, compared with 196,500 packages for DOS systems.

To counter Microsoft and Software Publishing, Lotus has been focusing on pushing its SmartSuite set of applications, which is expected to boost sales of presentation graphics. Lotus has a 20% share of the Windows market, according to IDC.

Lotus also delivered Version 2.0 of Freelance Graphics for Windows, which provides support for some multimedia capabilities and a range of enhancements designed to make the product easier to use.

Also making a play in this market is WordPerfect Corp., which plans to deliver WordPerfect Presentations 2.0 this summer. Like Freelance Graphics, WordPerfect Presentations is priced at $495. Harvard Graphics is priced at $595, and PowerPoint is priced at $495.

Gillin

CONTINUED FROM PAGE 37

GPFs won't cause your system to crash more than eight or 10 times day, so please don't worry about them. Windows is a perfectly stable operating system shell as long as you don't do something stupid that violates system integrity, like starting two applications at once or attaching to a network. If you do make such a bonehead mistake, Windows 3.1 has loads of very nice auditing features that help you diagnose why you just lost last month's entire accounts receivable file.

Danger zone

One is an attractive blue screen that pops up just before your system crashes and tells you that Windows has become unstable and must sit down and think about things for a while. This kind of advance warning is enormously helpful in giving you time to choose which brand of razor blade with which to slit your wrists after your morning's work disappears in a cloud of helical molecules. You can either wait an hour until Windows has had a couple of drinks and settles down or just turn off your computer and get it over with quickly. Helpful hint: Save time.

> Windows 3.1 has made people with 60M-byte disk drives and 4M bytes of memory feel like real wimps.

Windows also has a much nicer developer's interface, which has enabled third parties to write software that does things such as make your icons squeal like a pig when you drag them across the screen. In the computer industry, this is called "multimedia" and is supposed to increase your productivity dramatically.

But the best thing about Windows 3.1 is that it has made people with 60M-byte disk drives and 4M bytes of memory feel like real wimps. You can use Windows with less than 4M bytes of memory but only use the clock and maybe the calculator (though you shouldn't use the memory key on the calculator).

The reason Windows needs so much disk space is because it has something called a "swap file" that it uses for virtual memory, which is an operating system's way of treating the hard disk like a cat treats a litter box. Windows leaves little droppings of "data doo-doo" in the swap file that it can't fit into memory to the point that the swap file grows to Orson Wellesian proportions and threatens to send out for pizza.

There is a way to deal with this: Buy a bigger disk drive. The current rage is the attractively named "scuzzy" interface. This allows you to chain disks together when you run out of storage space until eventually you have a little chain of disk drives stretching out your door.

You will need this disk storage because Windows applications have gotten quite big and complex as well. I suspect they're getting payoffs from the scuzzy disk drive makers to do this. One reason is that many applications now support Windows TrueType fonts. There are many such fonts out there — so many it is now possible to write very long memos in which no two letters look the same.

The best thing about Windows is that it is an accepted industry standard. Microsoft claims to have shipped approximately 1.6×10^{12} copies of Windows in the last 12 months, and software developers are flocking to convert their tightly coded little DOS applications into blobular graphical applications in hopes of selling them all over again to the same customers. This is an exciting development for the entire computer industry — especially the scuzzy disk makers.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

[redacted]

Software application packages

Alpha Software Corp. has announced Report Styler, a Microsoft Corp. Windows-based desktop publishing tool.

Report Styler has the ability to emphasize key points and clarify data for existing reports. A five-step method is employed that starts with software application packages to create the report. Then the method saves the report to a text file and imports the file into the Report Styler.

Report Styler costs $199.

▶*Alpha Software*
168 Middlesex Turnpike
Burlington, Mass. 01803
(617) 229-2924

Welcom Software Technology has released Texim Project 2.0, a Microsoft Corp. Windows-based project management system.

Features include the ability to perform trend analysis through performance profiles, risk management by statistical analysis and resource management from the cost side of a project.

A single-user version costs $1,295. Network prices start at $1,595.

▶*Welcom Software Technology*
Suite 275
15995 N. Bakers Landing
Houston, Texas 77079
(713) 558-0514

Microsoft Corp. has started shipping the CD-ROM version of Microsoft Office for Windows.

The product is a suite of business applications for Windows that bundles Microsoft Word Version 2.0, Version 3.0 of the Microsoft PowerPoint presentation graphics program, the Microsoft Mail Workstation License Version 3.0 and Microsoft's Excel Version 4.0. On-line documentation and an integrated installation program are included.

Microsoft Office for Windows on CD-ROM costs $750.

▶*Microsoft*
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Utilities

Intex Solutions, Inc. has announced a new version of Rescue Plus.

Designed for Lotus Development Corp.'s 1-2-3 and Symphony spreadsheets, the file recovery utility restores erased, corrupted, lost or damaged files on floppy or hard disks.

The product is not confined by any limitations of file or hard disk size. It returns forgotten Lotus passwords and works with .WK3 files. Two file formats of Lotus' 1-2-3 spreadsheets are supported.

Rescue Plus I costs $129.95, and Rescue Plus II costs $149.95.

▶*Intex Solutions*
35 Highland Circle
Needham, Mass. 02194
(617) 449-6222

Peripherals

Identity Systems Technology, Inc. has announced it will be bundling its standard and infrared mouse and trackball products with Micrografx, Inc.'s Windows Draw Limited Edition software. The purchase of the Identity three-button serial mouse, infrared mouse or serial trackball includes the software for free.

The serial mouse costs $59, the infrared mouse costs $79, and the trackball is priced at $69.

▶*Identity Systems Technology*
1347 Exchange Drive
Richardson, Texas 75081
(214) 235-3330

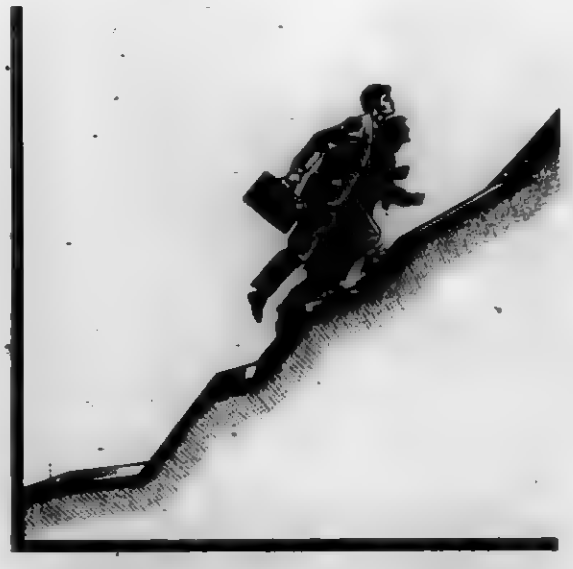
Systems

Diamond Technologies, Inc. has released the DT486 DLC-40, a 486-based PC.

Basic configuration for the DT486 DLC-40 provides a Super VGA color card and Super VGA monitor, an 80M-byte hard drive, 1.2M- and 1.44M-byte floppy drives and 4M bytes of memory, upgradable to 32M bytes on the motherboard. A serial mouse, MS-DOS 5.0 and a 101-key enhanced keyboard are also included.

The basic configuration price for the DT486 DLC-40 is $1,299.

▶*Diamond Technologies*
17165 Gillete Ave.
Irvine, Calif. 92714
(714) 252-1006



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[redacted]

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GIS popularity growing

Applications help uncover geography-based solutions

By Maryfran Johnson
BOSTON

■ Serious interest in geographic information systems (GIS) is stirring in the business community as more companies turn to this technology to choose new retail site locations, optimize distribution routes or analyze the demographics of their target audiences.

Such interests were the focal point for nearly 2,000 in attendance at the recent GIS in Business '93 conference. Companies such as Levi Strauss & Co., Arby's, Inc., Consolidated Rail Corp., Federal Express Corp. and Wisconsin Power & Light Co. came to talk about their experiences using GIS to integrate mapping, graphics and spatial data with traditional business data such as spreadsheets and statistics.

Products such as Arc/Info *simplify complex mapping*

"Business interest is much higher now," said Hal Reid, vice president of development research at Arby's in Miami Beach. Yet it is often marketing, planning or operations divisions rather than IS departments that seem more attuned to what GIS can offer, he added.

"The major client for MIS is usually accounting and payroll, which is the static side of the business. They don't seem connected to GIS at all," Reid noted. He has two urban geographers using PC-based GIS applications for strategic development planning, franchise administration and demographics analysis. The results, he added, have been reduced costs and increased capabilities in managing Arby's franchise territories.

At Walgreen Co. in Deerfield, Ill., the drugstore chain is using GIS applications running on a trio of Intel Corp. I486-based PCs for planning and site development work. But like Arby's, it operates apart from the information systems group. "MIS people don't embrace this stuff very much," said Joseph Mercurio, director of planning and research at Walgreen.

Growing market

Even without marked IS enthusiasm yet, the market for GIS has grown to about $2 billion annually and is projected to scale up substantially during the next five years because of plummeting hardware costs and easier to use desktop software. Today, however, analysts note that GIS is perceived as an intriguing technology with no obvious role to play in mainstream data processing.

GIS enthusiasts argue that the scenario will change as companies recognize the importance of visualizing information in more accurate, flexible ways that incorporate maps with various data types. "People want to understand their customers and their coverages better,"

GIS, *page 42*

MapInfo establishes map-to-database link

Looking to unlock the reams of data stored in relational databases, MapInfo Corp. has added a SQL module to its mapping software for Microsoft Corp.'s Windows.

Designed to allow users to link data to a specific geographic area, MapInfo for Windows is based on a local database that resides on the PC. Data is imported to the MapInfo database and then displayed using maps that are created with the MapBasic programming language.

The addition of a SQL interface will for the first time let MapInfo users access remote data sources rather than just local file formats such as Lotus Development Corp.'s 1-2-3 or Microsoft's Excel spreadsheet, said MapInfo Chief Executive Officer Brian Owen.

"The SQL interface will allow mapping software to access data across the enterprise," Owen said.

Database formats supported by the SQL DataLink module for MapInfo include Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, IBM's DB2, The ASK Group, Inc.'s Ingres, Borland International, Inc.'s Paradox, Gupta Corp.'s SQLBase Server, Microsoft's SQL Server and Novell, Inc.'s NetWare SQL. SQL DataLink is based on SQL drivers supplied by Pioneer Software in Raleigh, N.C.

Organizations currently making use of MapInfo, which company officials said has an installed base of 40,000 licenses, include telecommunications companies, retail firms and health care institutions.

"Any time you have remote assets that need monitoring, MapInfo can be used to monitor them," Owen said.

MapInfo also released a maintenance upgrade of MapInfo for Windows and its MapBasic programming language.

MapInfo 2.1 is priced at $995, while MapBasic is priced at $795. The SQL DataLink module is priced at $595. MapInfo will be priced at $1,295 as of May 1.

Moving to NetWare 4.0

Planning critical to upgrade success

By Michele Dostert

In many departments, local-area networks have sprung up on an ad hoc basis, with little advance planning. Servers, applications, data and users were added haphazardly — wherever they fit — and did not reflect the structure of the department they served. Often, work flow was engineered to fit the LAN's illogical structure instead of the LAN's being re-engineered to fit a logical work-flow structure.

Novell, Inc.'s new NetWare 4.0 LAN operating system, which has a logical, global directory service instead of the physical, server-specific bindery scheme used in earlier NetWare versions, was designed to change all that. But beta-test users stressed that in order to reap the full benefit of NetWare 4.0's directory, management and data compression features, considerable time must be invested in pre-upgrade planning.

"You need to use some low-tech tools first — paper, pencil, flow charts and mental effort — before you upgrade," said Sam Calderone, a systems specialist at Texaco Chemical Co. in Bellaire, Texas.

Do it right the first time

Early Version 4.0 users said the first step in planning an upgrade should be to inventory and review the data and applications on the LAN's servers, then decide how they should logically be grouped and stored. While it is not necessary to off-load and reload data when upgrading servers to NetWare 4.0, beta-test users recommended doing so.

"First, off-loading and reloading your data lets you take full advantage of 4.0's new volume management and data compression features," said John Miller, a network manager at HealthCare Co. in Downers Grove, Ill. "Second, if you're going to upgrade, do it right. Take the time to impose a logical structure on data that may now be illogically distributed."

Beta-test users urged others to study NetWare 4.0's directory structure and syntax. Its distributed directory requires network managers to view the network from a logical, rather than a server-centric, perspective. The user must also learn a whole new hierarchical syntax composed of trees, roots, branches, leaves, containers, objects and contexts. "It's not difficult once you understand the concept, but it's completely different from how NetWare 2.x and 3.x work," Miller said.

Novell recommended that network managers analyze their corporate work flow. After data grouping and server names have been decided, managers should next design logical groups of users who need similar access. Then they should study users' requirements to determine which groups each user should belong to. Once added to these groups, users will "inherit" rights common to that group, unless the manager uses the inheritance filter to limit rights.

A matter of rights

In earlier NetWare versions, each server had its own physical bindery, a flat file of users and rights for that server. NetWare 4.0's Directory Service, in contrast, generates a single, logical, hierarchical directory that is replicated across all servers in the network. Users logging on from anywhere in the network can thus see and access any server, device, application or data to which they have rights.

"You don't have to plan first; you could just upgrade the server and make every user his own group or just add him to groups you're thinking up on the fly," said David Eckert, a member of Westinghouse Electric Corp.'s Advanced Technology Group. "But if you do it that way, you'll end up with a huge mess, and it will be your own fault, not Novell's."

Once the first server has been upgraded and all network servers, devices, groups and users have been organized into its directory, other servers can be upgraded quickly. Network managers must simply off-load the data, upgrade the operating systems, reload the data and bring the server on-line; the NetWare Directory Service will automatically replicate the directory on each new server.

"You can easily upgrade a 10-server net in a weekend if you've done your homework first," Miller said.

Product claims easy document management

By Melinda-Carol Ballou
DI BLIN, OHIO

Information Dimensions, Inc. announced a new graphical document management product built on its Basisplus document database.

Designed for document-intensive workgroups in the aerospace, telecommunications, pharmaceutical, legal and government markets, DocWorks manages mixed object data and compound documents through the Basisplus engine but is much easier to use, company officials said.

"After we acquired Zylab [Corp.], we took their desktop expertise and ease of use and brought it to Basisplus by combining the technology of Zyindex," said Bruce Duffy, a vice president at Information Dimensions.

DocWorks also launches applications so users are able to view and edit images, graphics, spreadsheets or computer-aided design drawings. Through DocWorks' hyperlinks, users can access all components of compound documents.

Users' choice

While most document management products fix an arbitrary number of document attributes through which users can access documents, DocWorks lets users choose the number and type of fields to associate with them, officials added.

The initial release, DocWorks 1.0, will support PCs running Microsoft Corp.'s Windows off of Unix and VMS-based servers. It supports Transmission Control Protocol/Internet Protocol and DECnet networks using Novell, Inc.'s LAN WorkPlace, Sun Microsystems, Inc.'s PC-NFS, Hewlett-Packard Co.'s ARPA Services and Digital Equipment Corp.'s Pathworks.

DocWorks is slated to ship in May. Pricing begins at $9,000 for a 20-seat license.

Gigatrend ships automatic tape changer

Gigatrend, Inc. is shipping a robotic device said to automatically change data cassettes contained in a desktop backup server.

Called Autochanger, it works with Gigatrend's network backup hardware and software and lets network managers store up to 60G bytes of network data at 50M byte/min. without being present to change tapes, Gigatrend said.

The device can be linked to a network file server or a tape station on a network. Unlike tape libraries, Gigatrend said, the Autochanger lets managers access specific files quickly — in less than two minutes — with file access software that can search for data randomly rather than in the sequence in which it was stored.

In addition to changing the tapes, the Autochanger software can manage the backup process, detecting errors such as improperly loaded cassettes and notifying the manager prior to the beginning of an unattended backup, the company said.

Pricing for the Autochanger begins at $11,550.

▶*Gigatrend*
2234 Rutherford Road
P.O. Box 4296
Carlsbad, Calif. 92008
(619) 931-9122

Workstations

Integrix, Inc. has announced the 50-MHz SS2+ Basic System (SS2+B) workstation.

The product is a Scalable Processor Architecture (SPARC) workstation that was designed for commercial and technical applications.

Features for the SS2+B include improvements in integer and floating-point performance.

In addition, the product operates with SunSoft, Inc.'s Solaris operating system, the company said.

Consisting of a 50-MHz system board, integrated Ethernet and Small Computer Systems Interface disk controllers and three S Bus expansion slots, the SS2+B also offers external connections that are identical to Sun Microsystems, Inc.'s SPARCstation 2, the company reported.

The SS2+B costs $2,995.

▶*Integrix*
1200 Lawrence Drive, #150
Newbury Park, Calif. 91320
(805) 375-1055

Unix

Wyse Technology, Inc. has introduced the Series 7000i Model 760MP, a True Symmetric Multiprocessing platform.

The product is a Unix-based multiuser system and network database server that can support more than 250 active users.

Scalable to five Intel Corp. 66-MHz i486DX2 processors, the Series 7000i Model 760MP exceeds 200 million instructions per second via the extension of CPU scalability, maximized bus throughput, disk and peripheral performance, a new system board design and advanced diagnostics, the company reported.

Users can boot the system remotely through an internal modem.

Prices start at $19,995.

▶*Wyse Technology*
3471 N. First St.
San Jose, Calif. 95134
(408) 473-1200

E-mail

WordPerfect Corp. has introduced WordPerfect Office 3.1 for Unix.

The product is an electronic-mail, personal calendaring and group scheduling package designed for Hewlett-Packard Co.'s 9000 Series 700/800 and IBM's AIX RISC System/6000, according to the company.

WordPerfect Office 3.1 enables users to communicate with others who are using a variety of platforms, including Microsoft Corp.'s Windows, Apple Computer, Inc.'s Macintosh, Digital Equipment Corp.'s VAX/VMS and DOS.

Message retraction, message tracking, encryption and optional automatic deletion, password protection and security notices are included.

A five-station package costs $495.

▶*WordPerfect*
1555 N. Technology Way
Orem, Utah 84057
(801) 225-5000

Workgroup software applications

Mergent International, Inc. has announced the Single Sign-On facility.

The product works in conjunction with the company's PC/Data Access Control System for Windows. Single Sign-On offers centrally managed, single-password sign-on to workstations, host connections and networks, the company reported.

Password expiration is managed automatically. Single Sign-On creates a proprietary recognition string of learned passwords and identifications.

Single Sign-On is available for corporate licenses only. A minimum of 25 units costs $6,500.

▶*Mergent International*
70 Inwood Road
Rocky Hill, Conn. 06067
(203) 257-4223

Local-area network hardware

Digital Equipment Corp. has introduced the DEC EtherWorks 3 Turbo network interface cards.

Created for users of AT- and Extended Industry Standard Architecture-compatible PCs and servers, the interface cards were designed to access remote printers, data files and other services across all major local-area network operating systems, according to the company.

Full client/server compatibility is provided with the following: DEC's Pathworks network operating system and Microsoft Corp.'s LAN Manager Network Device Interface Specification Version 2.0, The Santa Cruz Operation's SCO Unix, Novell, Inc.'s NetWare's Open Data-Link Interface v3.11 server and client and Banyan Systems, Inc.'s Vines protocol.

The network interface cards are available in three versions, with prices ranging from $155 to $185.

▶*DEC,*
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

GIS popularity

CONTINUED FROM PAGE 41

said Kathy Hale, an analyst at Dataquest, Inc. in San Jose, Calif.

Vendors such as Digital Equipment Corp., which has at least 50 software company partners in GIS, anticipate healthy growth in real estate and retail, said Dave Donelan, a GIS product manager at DEC. Environmental monitoring to meet government regulations is another hot area for businesses taking an interest in GIS, Donelan noted.

Today, most GIS applications run on distributed Unix-based workstations or PCs, and there are relatively inexpensive mapping and data sources available on CD-ROMs.

The Environmental Systems Research Institute in Redlands, Calif. — the granddaddy of all GISs — is moving into business markets with its new ArcView, a desktop mapping and GIS product. ArcView integrates map data, spreadsheets, business graphics, multimedia, large relational databases and word processing in a single desktop environment.

In the past, GIS technology has typically been used by local governments, federal agencies and utilities — places that could afford the system costs involved with proprietary midrange platforms and the staggering expense of data gathering.

Today, most GIS applications run on distributed Unix-based workstations or PCs, and there are relatively inexpensive mapping and data sources available on CD-ROMs from dozens of vendors, including the U.S. government's Topographically Integrated Geographic Encoding and Referencing, or Tiger, street-level maps.

Anticipating change

Levi Strauss took its plunge into GIS in the mid-1980s by integrating geodemographic analysis, mapping and internal shipment data with marketing analyses. Its first application was a distribution analysis and tracking system that made it possible to "anticipate change rather than just react to it," according to P. J. Santoro, a target marketing specialist at Levi Strauss.

The jeans maker is now developing GIS applications to help determine what merchandise mix is best for stores in particular trading areas, and it is integrating video images of its store displays into analysis and querying capabilities.

Scott McNealy, president of Sun Microsystems, Inc. and one of the keynote speakers at the conference, said Sun's internal use of GIS applications enables the $4 billion vendor to track its resellers and manage an estimated 4 million square feet of leased property worldwide.

"We believe GIS is a technology, not just a market," McNealy said.

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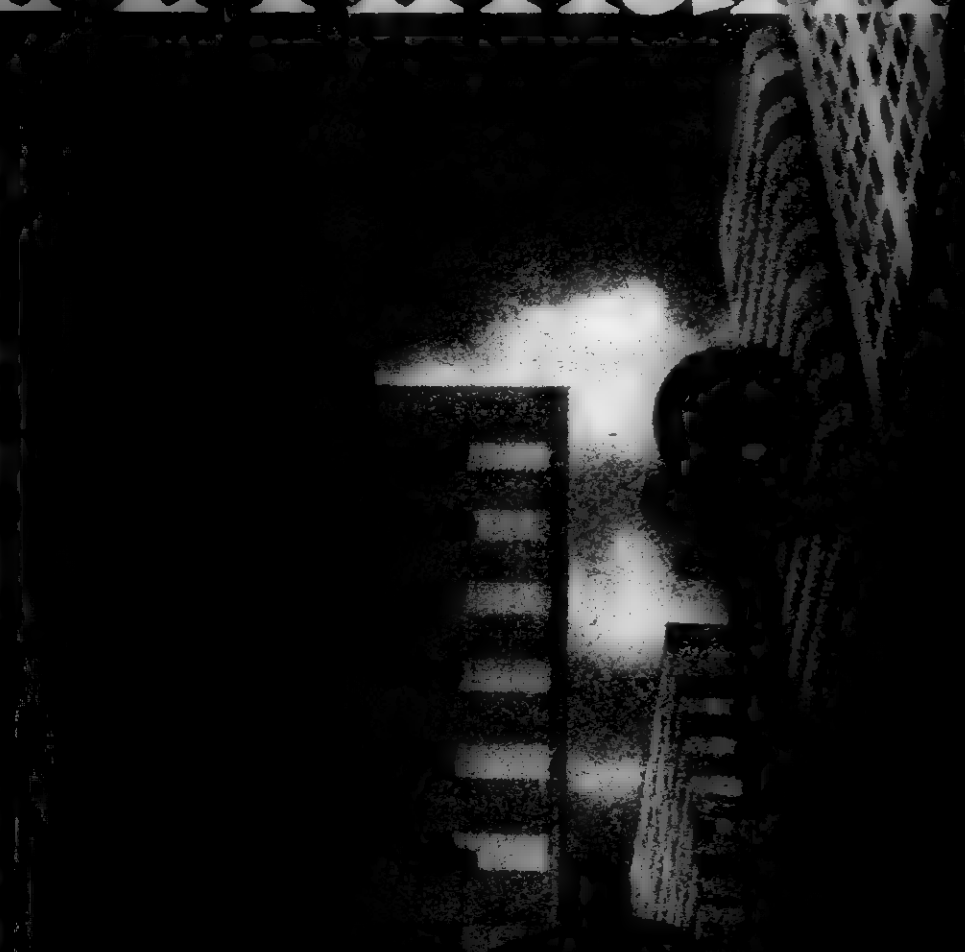
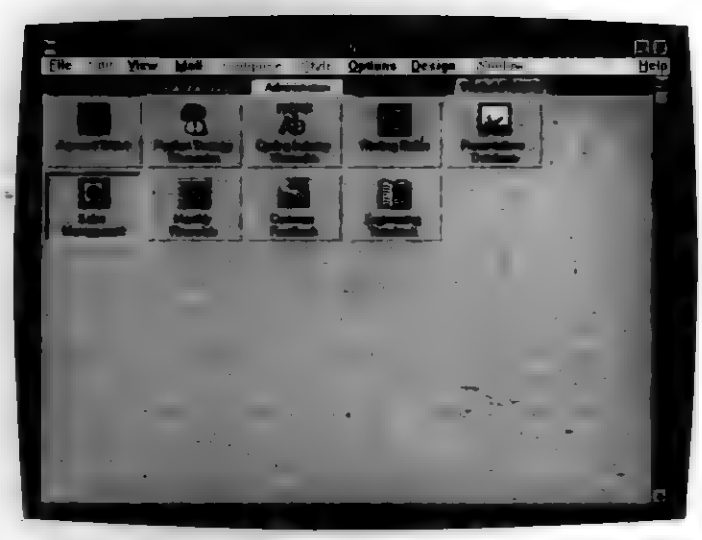
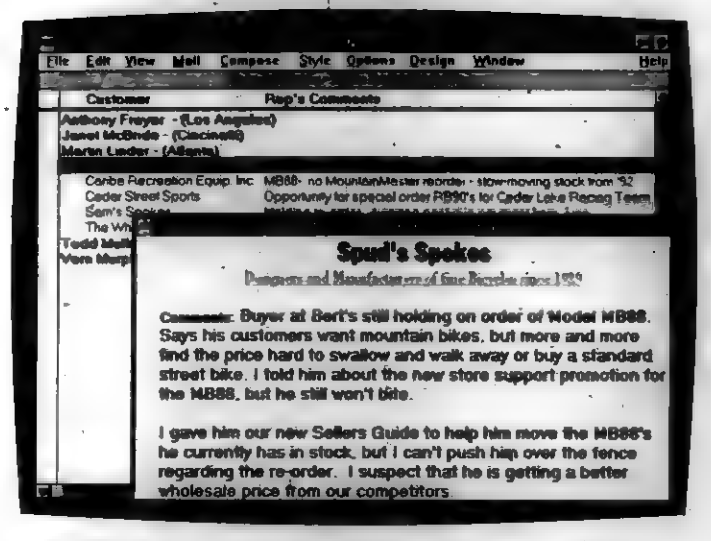
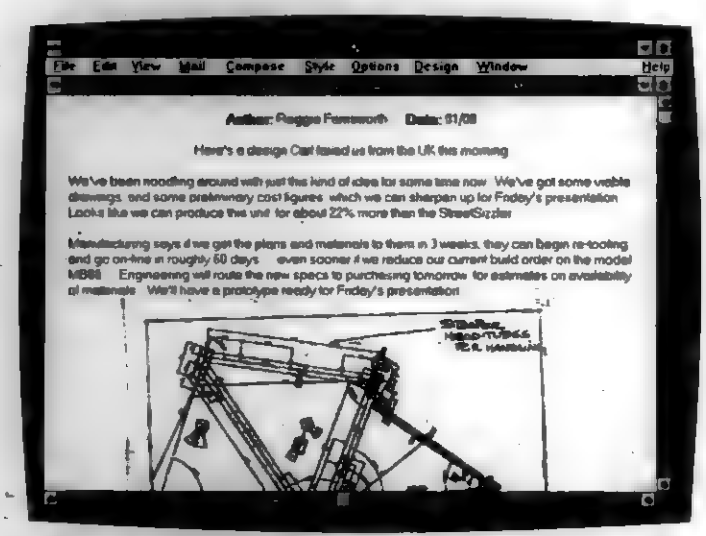




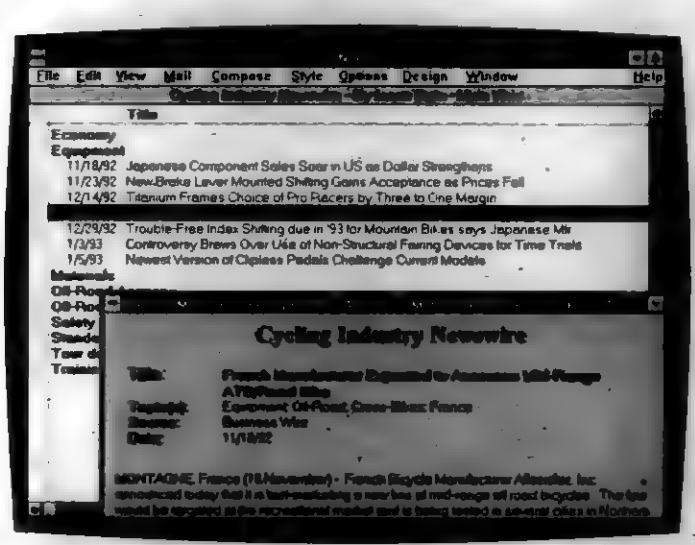
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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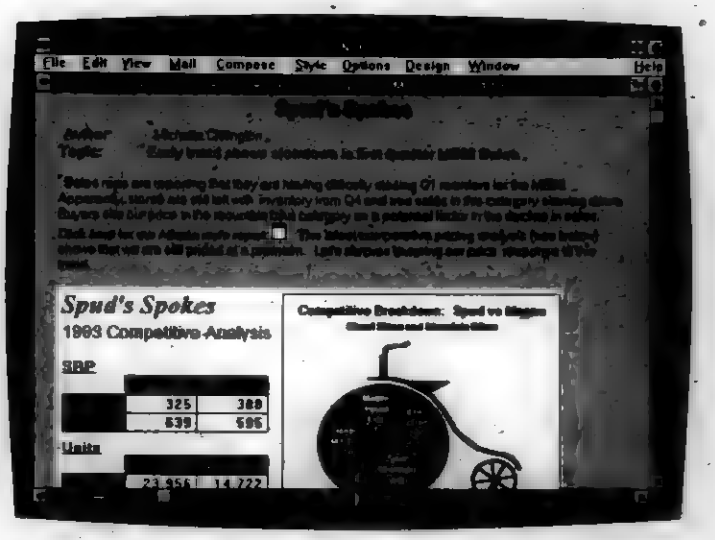
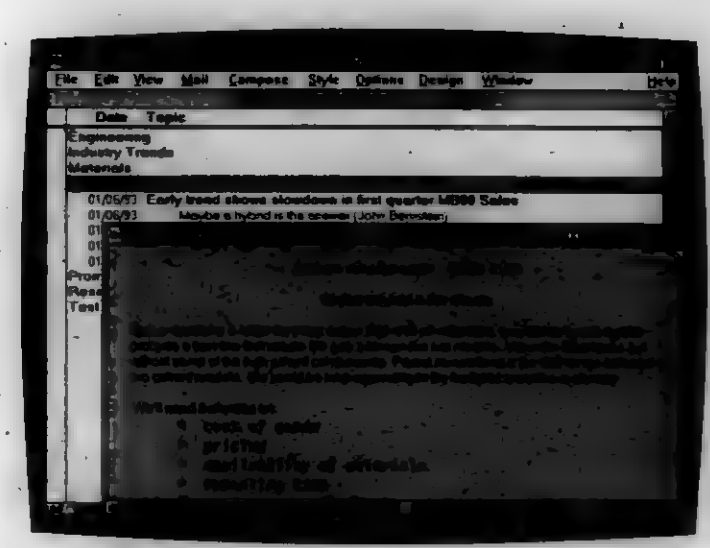
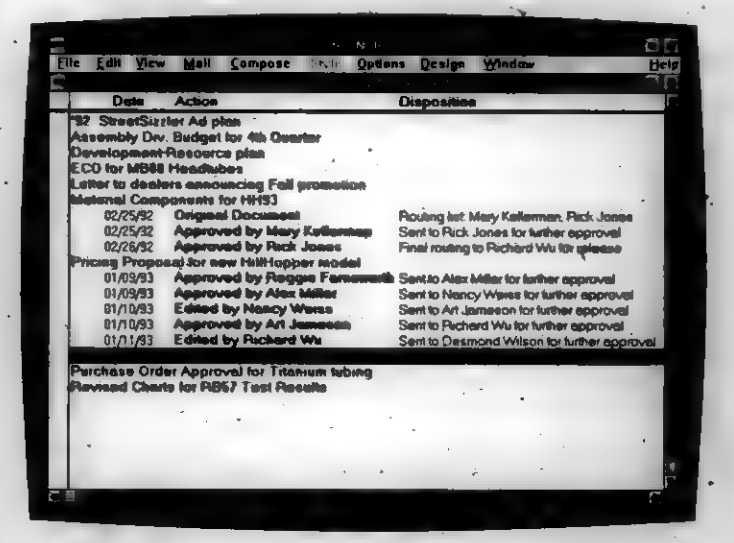
In Canada, call 1-800-GO-LOTUS. ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA



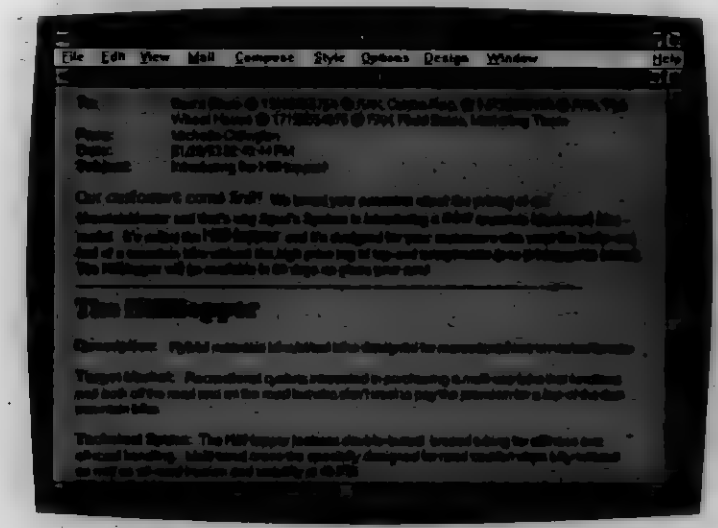
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

effortlessly people use Notes to respond and move the project forward.

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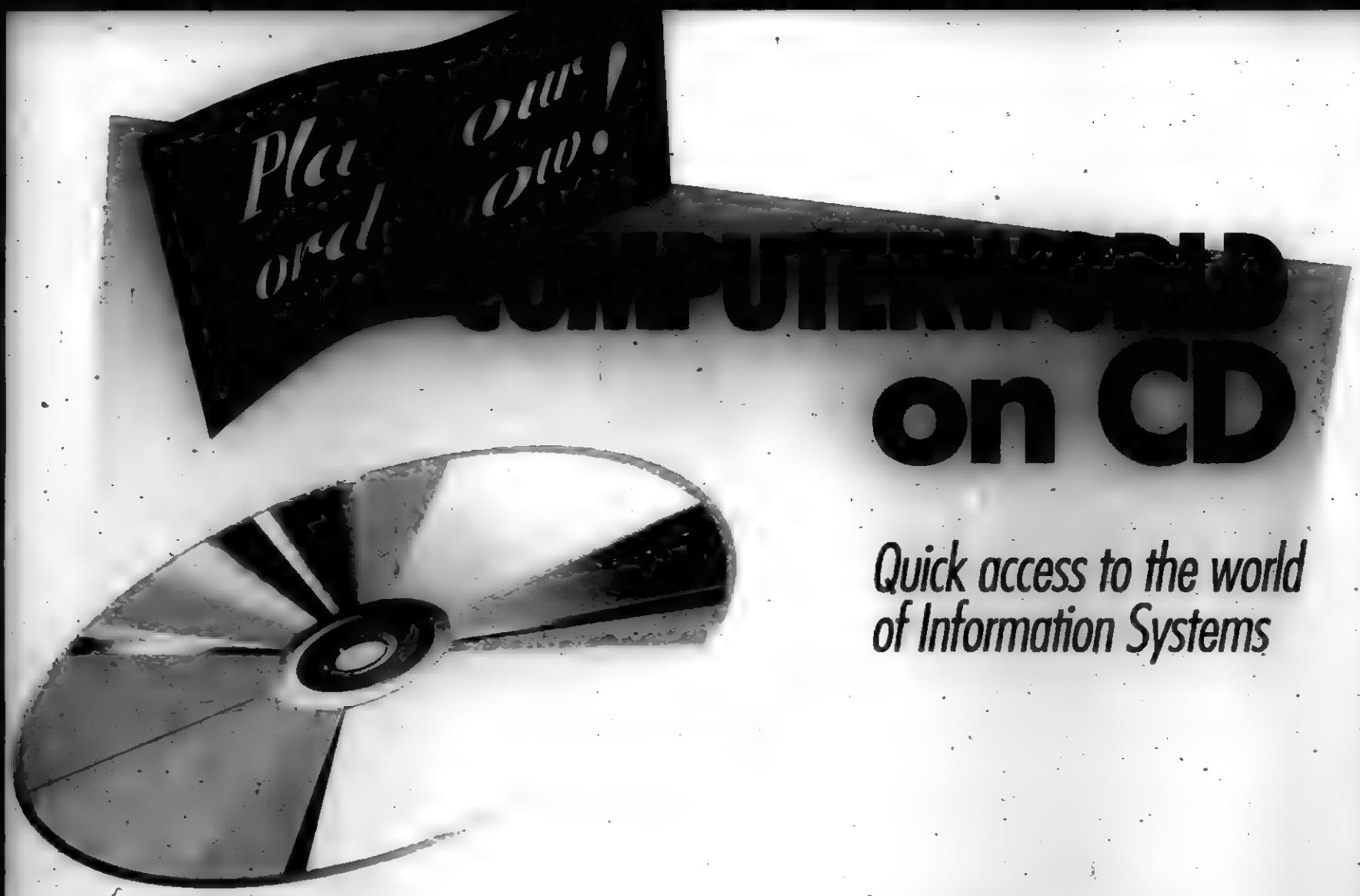

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LAN switch gains foothold

Hubs used to segment nets rather than increase bandwidth

By Joanie M. Wexler

While the emerging LAN "switching hub" is touted for providing a single user with the bandwidth of a full local-area network, companies today are more likely to use the devices to economically segment networks and unclog tributaries to corporate file servers, users and analysts said.

"The dominant reason people use LAN switches today is as a low-cost bridge or router alternative," said Fred McClimans, a program director at Gartner Group, Inc., a Stamford, Conn., consultancy.

"Most users are creating segments of 10 users or less, then attaching servers to dedicated networks," said Rich Erickson, vice president of sales at New York systems integrator Digital Network Associates, Inc., which sells switching hubs from Kalpana, Inc. and Synernetics, Inc.

The University of Missouri School of Medicine, which uses Kalpana's low-end EtherSwitch, has "no need for 10M bit/sec. to the desktop, though our file servers do," said Ron Neely, microcomputer support specialist.

So the school is using the Santa Clara, Calif., vendor's technology to create a hierarchy of LANs in which traffic, running through SynOptics Communications, Inc. wiring hubs, is internetworked through the Kalpana box (see diagram). This design means a user "is never more than one hop away from a given resource through the EtherSwitch," helping guarantee response time, Neely said.

At Time-Warner Entertainment Co.'s Home Box Office (HBO), a high-end LANplex switch from Synernetics in Billerica, Mass., is functioning as a "concentrator for back-end systems," said Michael Smith, network analyst.

HBO originally bought the equipment to accommodate graphics traffic generated by its creative services department and sent to expensive color printers. However, "we overestimated the bandwidth we needed and discovered [shared] Ethernet serves that purpose for now," Smith said.

So the company moved the LANplex into the data center where the company unstrung an arsenal of IBM RISC System/6000 application servers sharing one 10M bit/sec. Ethernet and gave each server its own 10M bit/sec. network.

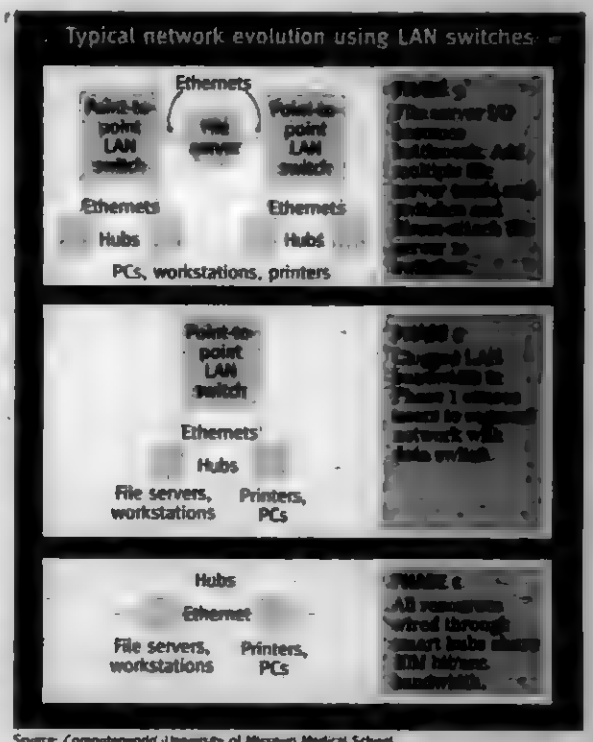
Three options

The Synernetics gear — which 3Com Corp. resells as its 3GH hub — offers users the three-pronged option of dedicating 10M or 100M bit/sec. bandwidth to individual computers or for users to share a 100M bit/sec. Fiber Distributed Data Interface (FDDI) network logically configured inside the switch.

The Synernetics box costs approximately $50,000, Smith explained, and going the full FDDI route when he needed to boost performance a year ago would have meant shelling out roughly $10,000 per workstation adapter card. Per-connection FDDI prices have since dropped to about $4,000.

Smith also estimated that HBO saved approximately $45,000 by not buying a high-end FDDI analyzer because the firm could use existing Ethernet test gear.

In the financial world, the First National Bank of Chicago is using Alantec Corp.'s competing PowerHub switch in its software development environment "so we can separate servers and groups of people from each other to relieve performance pressure on the network," said Joe Cesario, a vice president in the bank's technologies and development group.



Source: Computerworld, University of Missouri Medical School

The bank, like the University of Missouri, dedicates one Ethernet to each of its servers, then uses other Ethernet ports to support groups of developers and smart wiring hubs, Ceasario said. The design revealed that there were file server bottlenecks "that we had never noticed" because of the network's poor performance, he said.

Ark Asset Management Co. in New York is using five Synernetics switches "to give us options for how people access the network," said Paul Cucurullo, MIS manager.

LANplex "allows us to parse out who we want to have faster access" to the network, Cucurullo said. Traders, for example, need higher speeds because they access large chunks of real-time data when performing portfolio analyses, which involve sorting through large amounts of securities from stock exchanges. For basic word processing users, shared Ethernet still does the trick, Cucurullo said.

Per-port switching hub prices

Alantec PowerHub:	$400 to $1,500
Kalpana, Inc. EtherSwitch:	$700 to $900
Synernetics, Inc. LANplex:	$1,500 to $1,700
Bogenhausen-Haas, Inc. DragonSwitch (slated to ship Q2):	$900

Performance boost

For Novell, Inc. NetWare shops looking to build high-performance networks around LAN switches, the University of Missouri's microcomputer support specialist Ron Neely has some advice.

Neely, who uses Kalpana's EtherSwitches, pointed out that when users want to add more cards to their servers to boost server performance, "you need a corresponding port" on a separate switch. The reason, he explained, is that each card in a NetWare file server is required to be attached to a discrete network. That is because NetWare servers do their own internal routing — a function that cannot be disabled.

In other words, if a network administrator installs eight cards in a file server to match disk I/O speeds, "you'll need eight networks and eight Kalpana boxes," he explained. "But it's still cheaper than internetworking with routers and bridges."

The need for separate networks does not exist in the Unix networking world, Neely noted.

— Joanie M. Wexler

Security

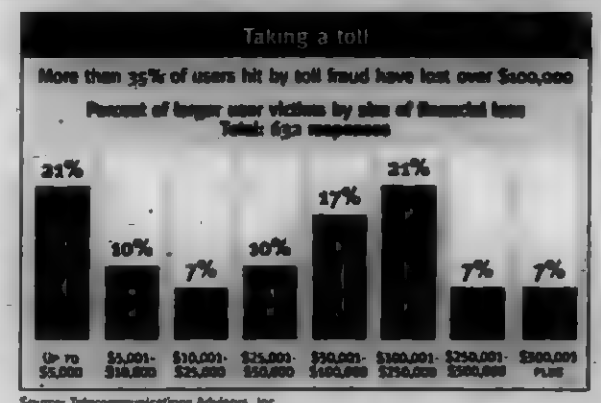
Toll fraud threat growing

By James Daly

The theft of telephone services may be more pervasive than even the most dour security experts believed.

In a recent survey by Telecommunications Advisors, Inc. (TAI), an independent consulting firm in Portland, Ore., a startling 70% of the 632 users polled said they had been the victim of telecommunications toll fraud at least once in the past five years. Many were hit more than once. The median loss per user victim was $90,000.

"The results are foreboding," said John Haugh, chairman of TAI. "Three years ago, 70% of users didn't even know what toll fraud meant. Anyone who thought it would simply go away has to seriously re-examine their position."



Source: Telecommunications Advisors, Inc.

TAI surveyed users at corporate information systems shops with anywhere from 600 to 6,000 extensions each. Most are equipped with nationwide toll-free lines as well as private branch exchanges (PBX) and voice mail systems — the primary entry points for those looking to steal telephone service.

Don Delaney, a senior investigator with the New York State Police,

Toll fraud, *page 49*

Jeffrey N. Fritz

Take FDDI in little bites

To read the literature, you'd think FDDI is a reliable, well-established technology. Want to run Novell over Token Ring through a 100M bit/sec. FDDI ring? No problem. Want to put an SNA environment through an FDDI router? Piece of cake. AppleTalk? Don't even give it a thought.

If you believe everything you read in four-color, glossy brochures, you will soon be convinced that FDDI equipment can handle any current or future protocol with style and aplomb.

I hope you don't believe everything you read.

In the real world

The reality is that FDDI is still an emerging technology and has some major flaws. FDDI vendors seem to be plagued with bug-laden router software and poorly trained technical support staff members.

Even the established market leaders seem to have their share of problems with FDDI — and sometimes the problems are so complex that even the "experts" aren't exactly sure what is going on. The router software you purchased may be shrink-wrapped and look polished, but once established, it may run like beta software.

This leads me to wonder, are FDDI vendors — in their rush to be the first with the latest — pushing software through their development cycles without adequate testing? Are vendors underestimating the wide variety of user environments that their equipment will face in the field? Or, in multiprotocol FDDI, have we finally encountered a technology so complex that it is hard to handle?

To be fair, the basic FDDI architecture is well thought-out and fault-tolerant. FDDI supports primary and secondary counter-rotating rings. If something happens to the primary ring, the secondary ring automatically becomes the primary ring. If both rings break, FDDI equipment will automatically wrap the ring at the break, creating two separate but still functioning rings.

The problem is with the translation of protocols on and off the FDDI ring.

In a multiprotocol environment, major snafus can occur in the routing software. In extreme cases, router software becomes so fouled that it can bring down the entire network.

It is impossible for FDDI vendors to anticipate all the environments in which you might deploy their equipment, so the user must be much more careful.

If you are planning to operate FDDI in a diverse, multiprotocol environment, be prepared for an experience that will try your patience and test the capabilities of your networking staff. The same complexities that plague router vendors will also work against your networking staff.

To preserve at least a little of your sanity, here are some steps that you should take if you are considering deploying FDDI in a diverse network environment:

1. Try to hold off deploying FDDI in a complex, multiprotocol environment. If you can operate with an alternate technology for a while, do so. That will buy time for FDDI technology to shake out and settle down a bit.

2. Test before you deploy. Testing is often a difficult process. It is nearly impossible to set up a comprehensive FDDI test ring unless you can find a way to put all the protocols found in your network on the test ring. If you can't, then your operational network becomes the test ring. Particularly if you are an early user of FDDI, this is very risky business.

3. Let your vendor know that you expect full and aggressive support in fixing any problems you encounter. Like everyone else in these cost-cutting days, FDDI vendor resources are limited. When backbone networks are down, waiting days or weeks for a fix can't be tolerated. The squeaky wheel may get the grease, but that only applies if the vendor has grease to apply to your problem. Some don't.

4. Try to keep in mind that some FDDI vendors behave like kids in a candy shop. They see so many potential dollars that they grab every possible feature and try to shove it as quickly as they can into their products. The difficulty with this candy shop scenario is that you — and not the vendor — will wind up with the FDDI stomachache.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va. He has done extensive work on FDDI networks for his organization.

SNA on LANs gaining ground

APPN products on the way to help users with integration

By Elisabeth Horwitt
WASHINGTON, D.C.

■ The gathering market momentum of IBM's Advanced Peer-to-Peer Networking (APPN) protocol is causing savvy vendors to rethink their product strategies for helping users integrate Systems Network Architecture (SNA) with local-area network installations.

User interest in such products was evident at the APPN/Advanced Program-to-Program Communications Showcase held at the recent Interop '93 Spring show.

Hudson's Bay Co., for example, is evaluating IBM's OS/2 Communications Server and Digital Communications Associates, Inc.'s Select Server products, which took part in the showcase. The products are said to enable PCs to access much of the functionality of APPN without having to run the random-access memory-intensive APPN End Node protocol stack, according to Janusz Szaban, manager of host systems at the Toronto company.

Sync Research, Inc. said its SNAC line of Synchronous Data Link Control (SDLC) to Logical Link Control converters will have the ability by year's end to provide APPN End Node services to DOS PCs running IBM's PU2.1 or Low-Entry Networking (LEN) protocol. While LEN nodes can access APPN resources, they lack APPN End Node capabilities such as automatic registration of themselves and their resources on an APPN Network Node directory.

Szaban said he is also interested in emerging products that are said to convert IBM's SDLC traffic to Logical Link Control 2 (LLC 2) packets, which can pass over a LAN and then to the Quality Logical Link Control protocol, which can be routed over an X.25 or frame-relay backbone. Such a conversion would save Hudson's Bay from having to encapsulate its SNA traffic in Transmission Control Protocol/Internet Protocol (TCP/IP) packets for routing, Szaban said.

Several speakers at Interop warned against using TCP/IP internetworks to handle LAN-to-host SNA traffic, Szaban said.

"They said performance [over such links] is sublevel — that [TCP/IP] is good for casual connections but not for production-strength connections to the host," Szaban said.

Several recent product introductions target the needs of users such as Hudson's Bay:

• **Sync Research** introduced SNAC capability that uses a recently published IBM specification for defining older Application System/400 devices as PU2.1 devices. The devices can then set up sessions with an AS/400 host over a Token Ring LAN and from there over an X.25 or frame-relay link, said Richard Thunen, Sync Research's SNAC product manager.

The firm plans to release a similar connection for Ethernet LANs, he added.

Not top priority

Purchasing data network equipment from a single vendor is regarded as unimportant and should not be a major competitive issue for vendors, according to a Salomon Brothers, Inc. study. Twenty-two of the 50 respondents said one-stop shopping was not very important, while only 10 claimed it was. When asked which vendors offer the best one-stop shopping package, IBM and AT&T took the honors.

• **Elcon Technology Corp.** in Montreal announced InterConnect Server, which is said to allow SDLC devices to communicate over a Token Ring LAN and over a wide-area network, at a price of $3,000 to $5,000. The product targets branch offices that want such connections but cannot afford to pay for both a router and an SDLC-to-LLC2 converter, according to a company spokesman.

The product's support of Point-to-Point Protocol will enable it to interoperate with whatever major router a corporation has on its backbone, the company said. The router portion of the product is said to handle Novell, Inc.'s IPX, TCP/IP and Apple Computer, Inc. AppleTalk protocols.

InterConnect Server is a Novell NetWare Loadable Module that supports LAN-attached PCs running DOS, Windows and OS/2. Support for IBM's OS/2, Microsoft Corp.'s Windows NT and Unix servers is planned.

• **Network Systems, Inc.** in Minneapolis said it is working on an architecture that will be able to route SDLC over LANs and route multiple protocols, including APPN Network Node, by the second half of next year. The product will be able to emulate an IBM 3172 channel-attached controller by the first half of 1993 and encapsulate "unroutable protocols" such as NetBIOS in SNA and TCP/IP backbones by 1995.

• **Jupiter Technology, Inc.** in Waltham, Mass., recently introduced LANWay, which is said to combine SDLC-to-LLC2 conversion with a gateway that puts asynchronous terminal traffic on Token Ring LANs. The series supports up to 32 ports and up to 256 concurrent sessions, at 4M and 16M bit/sec. Pricing starts at $4,500 for a three-port system.

France leads way to ATM

France Telecom is planning to be the first overseas carrier to offer commercial Asynchronous Transfer Mode (ATM) network services, which are due in the second half of 1994, the firm announced recently.

The service will support speeds up to 34M bit/sec. and expand to 455M bit/sec. connections over time, said Yves Parfait, director of broadband networking at France Telecom.

France Telecom's ATM network will be interconnected with ATM-based networks from other European carriers through a referendum signed last November, Parfait said. The carriers include BT, Spain's Telefonica, Germany's Deutsche Telekom and Italy's STET.

The firm is now building an ATM infrastructure and will begin ATM trials mid-year, Parfait said.

Pricing for the ATM service will be based on use plus access charge. Details were not available.

In Brief

FDDI price drop

Ungermann-Bass, Inc. has cut the price of its Fiber Distributed Data Interface (FDDI) concentrator and adapter cards by up to 43%. Cards that attach computers to both of FDDI's rings are now $3,295. Single-attach cards are $1,995 and must be used with an FDDI concentrator, which now costs about $1,750 per port from UB.

Modems cost less

U.S. Robotics, Inc. has reduced prices on its Sportster line of fax and data modems by 42% to 52%.

Cellular in Florida

McCaw Cellular Communications/Cellular One last month launched digital commercial cellular services in Orlando, Fla. It reportedly has more than 1,000 customers.

MCI flies

MCI Communications Corp. has signed a five-year, multimillion-dollar contract with **Morris Air Service** for a dedicated private network linking the airline's Salt Lake City headquarters with all of its domestic sites. The contract also covers MCI Vision and 800 services, which include bill-back services, call volume tracking and other enhanced services previously available only to very large companies.

X.400 over TCP/IP

Messaging gateway vendor **Soft-Switch, Inc.** enhanced its distributed Enterprise Mail Exchange with support for running X.400 mail over Transmission Control Protocol/Internet Protocol networks. The Wayne, Pa., company also upgraded its North American Customer Support Center with around-the-clock support.

Copper and fiber

Northern Telecom, Inc. and start-up **Crescendo Communications, Inc.** in Sunnyvale, Calif., have teamed up to provide concentrators that support 100M bit/sec. network connections over both copper and fiber-optic cabling.

SDLC to Token Ring

Ascom Timeplex is reselling **Sync Research, Inc.**'s devices for converting IBM Synchronous Data Link Control protocols to Token Ring-compatible protocols and Sync Research's frame-relay assemblers/disassemblers. Sync Research also named Ascom Timeplex as its North American third-party service and support organization for its IBM protocol conversion products.

Network management

NetLabs, Inc. has introduced NetLabs/ServiceDesk, a software package.

According to the company, NetLabs/ServiceDesk is an automatic network "help desk" that enables users to track problems from beginning to end, keeping solutions ready for future situations.

Running as an application on the NetLabs/Manager network management platform, user-defined alarms notify the product about device failures and other problem conditions.

NetLabs/ServiceDesk costs $12,000 for four users.

▶ *NetLabs*
4920 El Camino Real
Los Altos, Calif. 94022
(415) 961-9500

AT&T has introduced Accumaster Videoconferencing Management Services.

According to the company, the product was designed for large, multilocation, multinational users and is said to be the first complete videoconferencing network management outsourcing service among AT&T's major competitors.

Installation, network implementation, ongoing management and a variety of professional services including account management and asset management are provided.

▶ Prices start below $40,000.
AT&T
Room 34A59
55 Corporate Drive
Bridgewater, N.J. 08807
(908) 658-2071

Gateways, bridges, routers

Teleglobe, Inc. has introduced the CL 5050, an addition to the company's ConnectLAN line of bridges and routers.

The product is available as either a remote Ethernet bridge (CL 5050B) or as an enhanced remote Ethernet bridge/router (CL 5050E). The CL 5050 incorporates bandwidth optimization techniques that include dial backup, data compression, express queuing and dial-on congestion, offering high-performance, multiprotocol internetworking solutions, the company reported. Support is provided for one Ethernet local-area network connection and two serial connections.

Pricing for the CL 5050 ranges between $3,750 and $5,000.

▶ *Teleglobe*
40 High St.
North Andover, Mass. 01845
(508) 681-0600

Cayman Systems, Inc. has introduced GatorBox EX, a dual Ethernet port router.

The product links Apple Computer, Inc. AppleTalk workgroups with Ethernet backbone networks. GatorBox EX has a 40-MHz Motorola, Inc. MC68030 processor-based platform and was designed for all Ethernet environments, the company reported.

Highlights include support for the company's GatorShare gateway software, Macintosh-based configuration and Telnet-based management; enhanced routing and filtering capabilities; and two Ethernet ports.

GatorBox EX costs $3,495.

▶ *Cayman Systems*
University Park at MIT
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 494-1999

Toll fraud

CONTINUED FROM PAGE 47

said the illegal access and sale of telephone service has turned into a thriving underground business. Skilled hackers typically loop in and out of a firm's PBX to reoriginate calls and prevent line tracing.

They can then resell their means of entry to others, who in turn fill the telephone lines with more illicit traffic. A thriving call/sell operation attracts drug dealers, illegal aliens and organized crime figures.

Users reported attacks on all fronts, including manipulation of their PBX, penetration of voice mail and abuse of both the remote access and maintenance ports.

Who are the culprits? Users said computer hackers and insiders top the rogues' gallery, but some even suspect employees of their long-distance carriers. Such suspicions have already been borne out. Haugh said that about 18 months ago, MCI Communications Corp. helped prosecute and jail a former employee who was transferring telephone access codes to a boyfriend in prison.

Countermeasures include blocking remote ports, eliminating calls to foreign countries, doing a better job of monitoring call records and changing access codes more frequently.

Many security experts now count PBX toll fraud among the most pernicious of corporate security threats. It is easy to understand why. With many companies owning their telecommunications and phone equipment, major carriers said users are responsible and liable for added charges if they are hit.

Some long-distance carriers have begun to adopt a more flexible approach to toll fraud obligations — discounting and even on occasion forgiving such bills, according to Haugh — but forgiveness of debt generally occurs only when users can show they have taken reasonable precautions to protect their systems.

Long-distance carriers are also getting better at contacting customers to alert them about suspicious activity. In 23% of the survey's cases, users first learned of toll fraud from a service company.

Long-distance carriers have also begun to be more helpful in protecting against toll fraud. Last month, for example, MCI announced a broad initiative to help combat toll fraud. The Detect plan includes the monitoring of inbound 800 and outbound international traffic combined with an increased effort to contact customers about suspicious activity. Sprint Corp. and AT&T introduced similar packages last year.

Impact on productivity shown actual size.

1 percent. That's the total increase in corporate productivity since 1980. By contrast, investment in information technology over the same period billowed to almost 50 percent of capital spending.

There is, however, some good news. With the help of Andersen Consulting, organizations of all types have been able to turn these numbers around.

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Spalding tees up client/server

By Rosemary Cafasso
CHICOPEE, MASS.

The process of hitting a baseball has changed little since 1876, but Spalding Sports Worldwide certainly has. Founded by baseball pioneer A. G. Spalding, the company today produces a broad range of sporting equipment, including 1 million golf balls a day. Now it is time for Spalding to reinvent its business processes, according to Bard White, chief information officer.

The technology and business procedures it uses to pump out baseball equipment, golf balls, clubs, basketballs, tennis balls and an assortment of other equipment are now in the midst of a major overhaul.

"We were on the same treadmill as everyone else, with a mainframe and just a zillion terminals hooked in," White said, "and when the machine got slow, you just went out and got a bigger one."

Spalding stopped the treadmill in 1990, when it officially launched a strategy to move from a Hewlett-Packard Co. host-based environment to a client/server architecture using newer HP equipment. At the same time, it is redesigning critical procedures, such as order processing, to more quickly respond to major customers such as Wal-Mart Stores, Inc., Kmart Corp. and Sears, Roebuck and Co.

But both efforts revolve around one key issue: better data management. The client/server migration will eventually result in an information systems framework that includes a host data server, high-powered HP 1486-based servers and IBM PC clones on the desktop. All corporate data will reside on the HP host, where it will be secured and maintained. Applications will run on servers and PCs.

The new business procedures were designed to make better use of inventory data so the company can ship products more quickly.

The strategy grew out of an observation in the late 1980s: PCs will slowly but surely alter the use of information in the company.

"We started to acquire PCs, 10 here and 15 there," White said. "Pretty soon we were up to 400 PCs. We were losing control of corporate data."

Copies of data were being maintained in departments. So, to answer a question as simple as how many customers Spalding had, the company could come up with "four or five answers," White said.

"Marketing counted one way, credit counted another," White said. "We decided we needed a strategy [for IS] to be the official keeper of the data."

In with the new

That set in motion a plan to move applications off the host systems, which at that time were two HP 3000 Model 950s. The company installed a newer HP Model 992/200 at the end of 1992 to function as the corporate data server. Applications are now being developed to run on PCs and servers. White said the company is about 20% client/server, and it should take several years to complete the switch.

Spalding is writing and licensing applications to run on desktops and access corporate data. In some cases, the software is written from scratch. In other cases, the company is licensing desktop software and then writing interfaces to the host databases.

At the same time, procedures are being redesigned to take advantage of corporate data. Order processing, for instance, was completely revamped.

Previously, factory workers would pick stock on a per-order basis. For example, if Wal-Mart requested 1,000 golf balls, 2,000 tennis balls and 500 basketballs, a picker would go to the warehouse and retrieve those items.

Speedy delivery

Today, orders are generated in bulk for a set period of time, such as hourly intervals. Now a picker goes to the warehouse and retrieves all the golf balls requested for several different customers in a given hour.

The end result is faster order turnaround because pickers are not making several trips for each individual order. The company accomplishes this by maintaining current data in the inventory database on the host, White said.

The host databases are updated by servers every 15 minutes. When a package of golf balls is produced, a bar code is immediately printed on it, and the bar-code data is recorded on the server, which then uploads that information to the host.

White said it will be a long time before all departments are using client/server software and maximizing corporate data. Nonetheless, the time needed to pull this off will be worth it, he added. "We can't just rest on the way we used to do things," he said.

On Site

Spalding Sports
Chicopee, Mass.

Challenge: To make better use of corporate data.

Strategy: Move from host-based to client/server architecture; establish host system as data server. Develop new processes and applications that can use corporate data more effectively.

Results: About 20% of operations are client/server. New order-processing techniques make use of inventory database.

Spalding's Bard White: *Migrating to client/server requires better data management*

Jean S. Bozman

Approaching migration

Complexity. Now that client/server applications are a reality, worries about managing the complexity of client/server systems are surfacing among users. But these worries about new computing styles are tempered by the excitement of converting character-based applications into icon-based client/server software.

Several hundred computer professionals who gathered in Philadelphia at the East Coast Oracle Users Conference appeared to welcome the prospect of downsizing aging, monolithic applications that run on mainframes and minicomputers. But many are trying to gauge the pace at which conversion of old systems should take place. Going too fast will cause data management chaos, they said, while going too slowly will leave users way behind the technology curve.

Several practical approaches to client/server migration emerged through user discussions at the conference, including the following:

- **The GUI-first approach:** Many users have started to develop a new generation of client/server applications in stages — converting user screens to a GUI look and feel first, then adapting existing applications to client/server functions over time. Others plan to leave many DOS PCs intact on user desktops and to convert them to Microsoft Windows and client/server functions as needed.
- **The attrition phase-in:** Taking on the entire task at once — as in a wholesale conversion to client/server systems — is viewed by many users as being too expensive. Don't throw the baby out with the bathwater, these users say. Many character-based applications running on hundreds or thousands of dumb terminals at some sites work just fine and have some life left in them. Just phase in client/server systems according to business needs.
- **The no-holds-barred conversion:** This approach takes no prisoners. It accompanies a corporate downsizing plan, which may include the replacement or substitution of an underpowered mainframe with a string of high-powered Unix or PC LAN servers. A development team is detached from regular IS duties to produce a substitute IS system based on relational databases, midrange servers and new client/server application software. Finally, the new system goes into production, and IS managers shut down the aging mainframe.
- **The "show me" strategy, a.k.a. the "I can wait" strategy:** Despite the widespread vendor move to develop and sell client/server products, some users just want to see that it works. These users often monitor the progress of client/server technology by attending conferences but are worried about what some call potential "chaos" in their IS opera-

Bozman, *page 52*

DEC moves to VAX, Alpha mixed clusters

By Melinda-Carol Ballou

In a significant move for its Alpha migration strategy, Digital Equipment Corp. earlier this month released mixed cluster support for VAX and Alpha systems.

The announcement is aimed at users who are eager to test the performance advantages of Alpha by bringing in a few systems gradually, according to analysts and company officials.

The announcement is "probably the most important thing [DEC] could do for their customers this year," said Peter Kastner, a vice president at the Aberdeen Group, a market research firm in Boston.

"It means that those customers can plan to install mixed clusters almost immediately and that their investment in clustering has been protected," he said.

However, users with high availability requirements who run production applications will have to wait until later this year or early next year before layered software ships to support disk volume shadowing and mirroring.

The following types of clustering will be supported:

- Computer Interconnect with a maximum of three DEC 7000/10000s, a total of eight systems and a maximum of two Computer Interconnect controllers and two Star Couplers.
- Digital Storage Systems Interconnect, with a maximum of two DEC 4000 systems on a single bus, can coexist with VAX 4000s, VAX 6000s, VAX 7000s and VAX 10000s but not with MicroVAX 3000s, DEC 7000s/10000s or VAXs using KFQSA controllers.
- Ethernet with up to 12 DEC 3000 satellites and two Ethernet adapters suported within the cluster. DEC 3000, DEC 4000, DEC 7000 and DEC 10000 systems can all act as cluster nodes for the DEC 3000 satellite systems.
- Network Interconnect.
- Mixed Architecture Clusters or Alpha AXP clusters.

The mixed clusters will initially support Fiber Distributed Data Interface (FDDI) via FDDI adapter cards if users have it installed as a network backbone, according to Joe Bates, VMScluster marketing manager at DEC. Direct FDDI support will be available later, he said.

DEC is considering direct support of other non-OpenVMS platforms within the cluster but will base any such decisions on customer demand, Bates added.

Bozman

CONTINUED FROM PAGE 51

tions. Many see database administrators as people who can bring order to client/server by programming the database server to enforce a list of business rules.

Despite initial concerns, many users at the conference said the prospect of shopping for new client/server tools is exhilarating. They can envision aging minicomputer applications being rewritten to run on Unix or PC LAN servers. However, writing client/server programs will clearly require a new mind-set for corporate developers, users said.

The trend toward client/server systems has great momentum, driven by top management's desire to downsize corporations and by IS management's desire to re-engineer applications to run on cheaper platforms. There is no way to hide your head in the sand or pretend you will not participate in the next wave of computing.

The key to making a transition to client/server is realizing there will be a learning curve for programmers, IS managers and even end users. Users should know by now that they must open their appointment books and pencil in the training sessions and conferences they need to attend to improve their client/server skills.

Bozman is *Computerworld*'s West Coast senior editor.

Hospital admits RDBMS

Client/server conversion nears midpoint with patient data system

By Maryfran Johnson
GAINESVILLE, FLA.

■ Building its patient care systems on the backbone of a large database, Shands Hospital at the University of Florida is taking a "low-tech approach" to the high-tech practice of running a health care center.

"We call it low-tech because we swept up all the data we could find in our computer systems and put it in this repository database," said Dr. John Cuddeback, vice president of information services at Shands, the focal point for the University of Florida's College of Medicine.

This approach allows Shands to concentrate on streamlining vast amounts of information without having to replace its paper medical records. Even more importantly, the changes do not demand radical adjustment from users.

In the middle

Nearing the midpoint of a four-year transition to client/server computing, the hospital is building core patient systems and decision support on top of a single Oracle Corp. relational database management system running on an IBM Enterprise System/9000 Model 640, which supports a network of 76 Novell, Inc. servers and more than 2,500 terminals and PCs.

"We have a single production instance of Oracle, used as a data backplane, with everything from clinical data to patient data to cost accounting data to records of how patients move" through the hospital and its multitude of clinics, Cuddeback said. "We're driven by the need to integrate our clinical care, which is what drives the need to integrate the data."

Shands' database is expanding by 7 million laboratory records a year. The growing Oracle clinical database holds about 8G bytes of data, while an older IBM IMS administrative database stores about 35G bytes.

Cuddeback said his vision for Shands' new Hospital Information System (HIS) Version 2 is one that is stripped of technical trappings and eases or eliminates the most miserable aspects of a hospital visit: long waiting hours, lost medical records and misplaced charts.

In the long term, the hospital hopes to wean itself from mainframe dependence, perhaps through the use of multiprocessor "superservers" to consolidate the NetWare servers.

"It's not that we're so happy with the mainframe environment, but we can't quite get where we'd like on another platform yet," said Terry M. Brandt, director of patient systems at Shands. He said he hopes the $4.1 million upgrade last year to the ES/9000 Model 640 is the hospital's last one.

"Our steps are to use Oracle tools on the mainframe, then take the application and make it a client application using the same mainframe server databases during the transition," Brandt explained. "With the application there on the client and the Oracle tools, we're no longer concerned with whether the database is on MVS or a Unix server because we're making generic Oracle calls for data."

By the end of this year, client/server prototypes will be in place for the three most critical applications using the Oracle database: patient registration and tracking, clinic appointment scheduling and the On-Line Outpatient Medical Record (OLMR).

Along with a patient financial management system, those applications make up the core of HIS Version 2, which was launched in June 1991 with the installation of the patient tracking system. The client/server version of HIS Version 2 will roll out during the next two years, replacing 3270 terminals with Microsoft Corp.'s Windows on PCs.

In many ways, the patient tracking application is a mirror of Shands' complexity, Cuddeback noted. It captures data about referring physicians inside and outside the health center and tracks multiple caregivers in multiple roles — in stark contrast to the old system's limitation of indicating only one attending physician.

Shands' Dr. John Cuddeback *says he hopes the new system will shorten patients' long waiting hours and eliminate lost medical records*

ON SITE

Shands Hospital
Gainesville, Fla.

Challenge: To provide easier access to data.

Technology: Oracle database.

Status: First production applications now coming on-line.

Money in the pocket

For a nonprofit hospital the size of Shands — which last year earned $18.5 million in revenue over expenses, serving 22,834 in-patients and more than 200,000 outpatients — coordination of services translates to money saved.

The MVS-based clinic appointment scheduling application will address staff downtime by coordinating separate calendars for several clinics and services.

The OLMR application — a kind of one-stop shopping for hospital data on a patient — has been running for a year. One result of OLMR is that doctors no longer have to keep separate charts on patients. They can tap into a terminal or PC to get up-to-date information.

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DG array performs unattended backup

By Melinda-Carol Ballou

Data General Corp. last week announced a high-performance, fail-safe tape array for a range of Unix systems. It can back up a 30G-byte database overnight without operator attendance, company officials said.

"Any enterprise that needs high-availability disks has also got to look at how they're going to manage their backup," said Larry Hemmerich, DG's vice president and general manager of the Clariion business unit.

Dubbed the Series 4000 Tape Array, the product supports up to seven 4mm digital audio tape cartridges to offer as much as 30G bytes of compressed storage. Data striping is supported so that data is delivered in parallel to the array's multiple drives. This allows the Clariion tape array to function up to six times faster than conventional devices, company officials said. It also provides a 20M byte/sec. Small Computer Systems Interface-2 interface between the host system and the tape array to enhance performance, they said.

To offer greater data reliability, parity information is calculated and distributed in the array's data striping process. In this way, operations do not stop if a tape drive or cartridge fails. The parity data is instead stored on the remaining tapes to make it possible to recover data that would otherwise have been lost, company officials added.

Industry analysts spoke well of the new product.

"The key is their performance — being able to back up in a shorter period of time. This is one of the first ones that I know of [for Unix] that does striping in parity and across so many devices," said Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif.

The product is shipping now for DG's Aviion line and within 90 days for workstations running IBM's AIX, Sun Microsystems, Inc.'s SunOS and Novell, Inc. networks. It is priced at $19,500 with five drives.

[redacted]

Database management

Softworks, Inc. has announced Version 2.0 of Capacity Plus for DB2 (DCP 2.0).

Features for DCP 2.0 include improved compression estimates, improved Custom Compression, a Speed option and disaster recovery capabilities.

The product is compatible with IBM's MVS, MVS/ESA and MVS/XA operating systems.

License fees start at $16,500.

▶*Softworks*
7700 Old Branch Ave.
Clinton, Md. 20735
(301) 856-1892

Software application packages

WorksRight Software, Inc. has announced the Forms Magic software system for IBM's Application System/400.

According to the company, the product was created for designing and printing graphic-based paper forms. Circles, lines, boxes and graphic-based characters are included and can work together in any combination. More than 40 fonts are also available.

Forms Magic costs $199.

▶*WorksRight Software*
986 Madison Ave.
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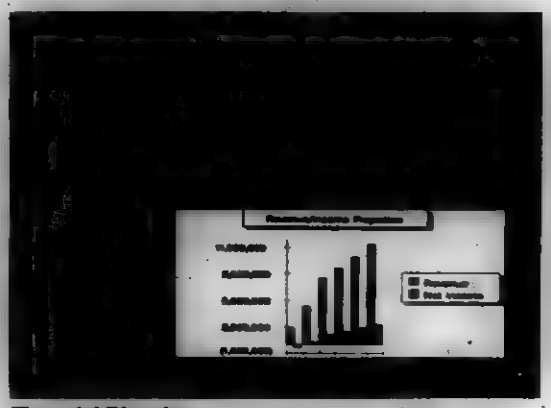
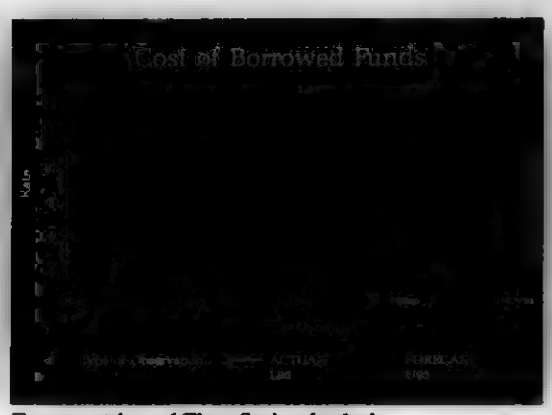
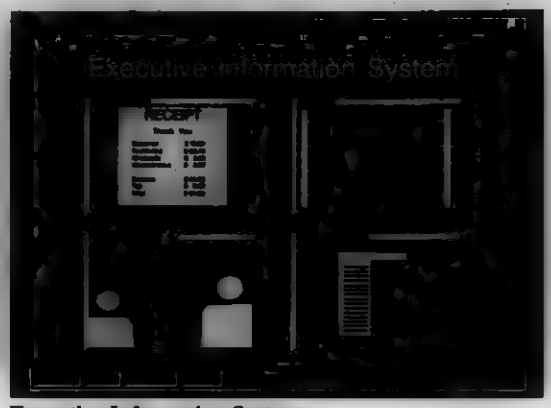


Financial Planning

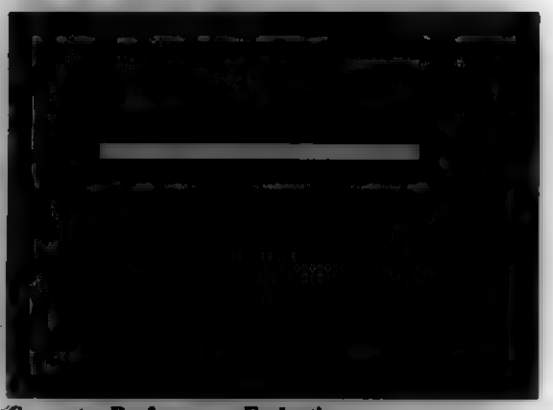


Econometric and Time Series Analysis



Executive Information Systems

Quality Improvement



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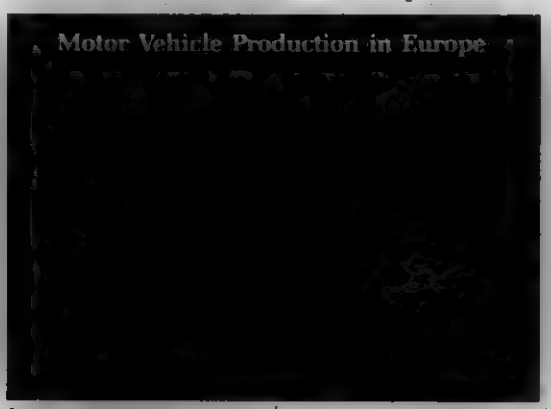
Reporting

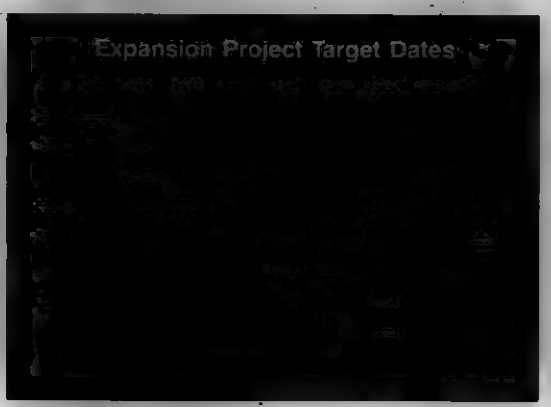
Market Research



Business Graphs

Visualization

Data Analysis



Project Management

Downsizing

Grocer buys into open systems

Associated Grocers uses Unix servers to cut IS costs, boost productivity

ON SITE

Associated Grocers, Inc.
Seattle

Challenge: To control IS costs while positioning the cooperative to take advantage of new information technology.

Technology: Replacing mainframes with networked PCs running Windows and Unix servers running Informix Software's Informix Online.

Goals: Savings on hardware should help cut IS costs from 1% of annual revenue to 0.5%, according to the company.

By Jean S. Bozman
SEATTLE

The grocery business gets by on a razor-thin profit margin. At Associated Grocers, Inc., a $1.2 billion supermarket cooperative, downsizing is being used to keep costs down.

Associated Grocers has a plan to reduce costs through cheaper hardware, but it is still in search of the ideal general-purpose application development tool for open systems.

The firm, a supplier to 350 stores in Oregon, Washington, Alaska and Hawaii, is 18 months into a five-year transition to open systems, said Richard Lester, vice president of information services.

"Cost is a big part of it," Lester said. "But more than anything else, it's the flexibility. Open systems change the cost structure dramatically. We've got to find ways to make better use of computing to take costs out of the pipeline."

Associated Grocers' Richard Lester: *Flexibility is driving force*

Associated Grocers' information systems budget is just under 1% of annual revenue, but Lester would like to halve that percentage. In the process, he plans to re-engineer many of the firm's IBM CICS-based transaction systems, eventually removing the mainframes that host them.

Lower upfront hardware costs, combined with much lower monthly software maintenance costs for small servers than for large mainframes, will have a big impact on the bottom line. At the same time, Associated Grocers expects to gain more productivity in its business by adding new functions to the servers, such as electronic data interchange with suppliers to reduce warehousing of goods.

Until recently, Associated Grocers ran its business on two IBM-compatible Hitachi Data Systems Corp. mainframes. But with the installation of Unix network servers and the shift of application development to desktop PCs, the firm has largely shut down one of the mainframes. "It is there in a standby situation," IS project manager David Okimura said. "It will be fired up if our production system goes down."

As mainframe applications are rewritten for open systems, a swarm of Unix machines have taken on the role of network application servers. So far, these include nine IBM RISC System/6000 machines and two Hewlett-Packard Co. 9000s, most of them stored under desks or in computer room cabinets. A distributed architecture, based on the Open Software Foundation's Distributed Computing Environment standard, links the legacy mainframe systems, the distributed Unix servers and hun-

Grocer, *page 59*

Welcome change

Associated Grocers' programmers are learning to embrace change as they move from Cobol systems to Unix open systems. "The cultural change of going from the comfort of the mainframe environment into a less structured Unix environment is pretty traumatic," said David Okimura, IS project manager.

The brave, new world of client/server computing arrived last June, when support for new development shifted from an IBM-compatible mainframe to desktop Intel Corp. 1486 PCs. Associated Grocers' programmers got client/server training, much of it from software tools vendors. But it is up to programmer/analysts like Dragan Jugnjic and John Elliott to bridge the gap between the predictable world of Cobol and the multilingual world of C, SQL and Microsoft's Visual Basic.

Jugnjic said developing one new warehouse management system required all three: Visual Basic for the development of the PC client's user interface, SQL to link clients to the Informix relational database server and C to extend the functionality of Unix tool sets.

Elliott, who used Visual Basic to create client user screens, said he has no problem manipulating screen objects instead of writing procedural Cobol code. But learning how to do it took several months, he said. The changeover to a new programming style has paid off in productivity: He and his co-workers developed 60 client screens in two weeks.

CASE products focus on basics

By Kim S. Nash
SAN FRANCISCO

Yes, computer-aided software engineering (CASE) is still kicking. No, CASE is not as speedy or inexpensive as newer PC-based, object-oriented tools — but the industry is trying its darnedest to get there.

Feeling heat from the likes of **Powersoft Corp.**, **Borland International, Inc.** and **Microsoft Corp.** (which recently announced souped-up C++ compilers), CASE mainstays, including **Intersolv, Inc.** and **KnowledgeWare, Inc.**, promised that some form of object-oriented technology will be added to their workbenches soon.

Although object-oriented technology got a lot of airtime from CASEWorld vendors, most of the products introduced at the show were less cutting-edge than nuts-and-bolts types of tools, such as project management and training tools — decidedly unglamorous but necessary utilities.

Show highlights included the following:

▶**Digital Equipment Corp.** added products to its Cohésion development framework, including DEC Fuse, a Motif-based workbench running on Alpha AXP systems; Rally OpenVMS AXP, a fourth-generation language; and software configuration management tools.

▶Intersolv unveiled new features for a variety of products. For instance, code generator APS can now create IBM OS/2 and Microsoft Windows interfaces, and a Sybase, Inc. version of LAN Repository for IBM's AIX is due out next month.

▶**Oracle Corp.** announced a video-based CASE training product called the Integrated Education Library, which includes videotapes, curriculum guides, computer-based training modules and textbooks. Pricing was not available for the product, which ships in June.

▶**Applied Business Technology Corp.** (ABT) in New York introduced Project Bridge Modeler, a Windows-based project planning tool that models proposed development tasks and links to Project Workbench, ABT's scheduling tool. It costs $1,950 alone or $5,000 with ABT's Application Development Methodology. It is available now.

▶**Evergreen CASE Tools, Inc.**, based in Redmond, Wash., upgraded front-end, PC-based development tool EasyCASE Professional to support an on-line methodology monitor for developers to consult as they work. It costs $795 and will be available in June, the company said.

▶**Unisys Corp.** previewed The LINC Environment, an integrated suite of tools composed of new and existing modules. Unisys moved its mainframe-based analysis and design tools to the PC and created a utility for maintaining mainframe applications on PCs. It is priced at approximately $10,000 and is slated to be available next month.

▶**Verilog, Inc.**, based in France with an office in Dallas, announced the first module in a line designed to address all phases of object-oriented development. Object Editor is a windowing tool to help developers create reusable software modules. It will cost $8,000 per copy and will be available next month. It supports the following platforms: Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co. 9000 Series 700 and DEC VAXs.

▶**Integrated Computer Solutions, Inc.** in Cambridge, Mass., started shipping ICS Ada Xcessories, a set of products for building Motif-based graphical user interfaces for Ada applications. Priced at $7,615, it supports platforms that run Sun's Solaris operating system.

Better showing

The official tally is not out yet, but CASEWorld attendance was up compared with last year's total of about 6,000, according to Digital Consulting, Inc., the company that puts on the show. However, the numbers are no doubt inflated because Digital Consulting offered free admittance to the product exposition, although not to some of the seminars.

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Grocer moves to open systems

CONTINUED FROM PAGE 57

dreds of IBM-compatible PCs at local stores.

Lester is basing his plans for a plug-and-play, client/server network on the DCE standard, which he said he believes will unify the firm's applications. "DCE has a kind of gravitational force around it," Lester said. "It's kind of like a black hole that's so powerful, it's drawing the vendors to it." Lester sketched out a three-tier architecture based on a presentation layer of Microsoft Corp.'s Windows 3.1 applications, a functional layer of applications running on network servers and a data layer of relational databases stored in servers and legacy data stored in the mainframe.

Tools needed

There is a giant obstacle to creating a plug-and-play open systems network, Lester said: a lack of general-purpose open systems development tools. Associated Grocers' open systems require the creation of custom remote procedure calls to link clients to servers.

"Right now, we're doing everything through brute force," he said, referring to the mixture of tools used to develop links between database servers, legacy data and distributed clients. That means programmers are creating their own middleware for client/server applications, he said.

To create a new open systems architecture, programmers are using Cambridge Technology Group, Inc.'s DCE-compatible tools, the Open Distributed Environment tool set from Open Environment Corp. in Cambridge, Mass., a CTG spin-off. They also use Micro Focus, Inc.'s Micro Focus Cobol and Informix Software, Inc.'s Informix SQL code generator. "The Cambridge tools tie the whole thing together," Lester explained. "They allow you to put things around the network so that you never have to change an application even if those [machines] move around."

That kind of flexibility will prove itself as Associated Grocers' business changes, Lester said. Plug-and-play systems and quick application development will allow the firm to adapt to changing business conditions. A new cross-dock application, for example, will allow groceries to be handed across the loading dock — going directly from the supplier's truck to the store's truck, bypassing Associated Grocers' warehouses. That will help the company reduce costs as it competes with large national rivals such as Minneapolis-based Super Valu Stores, Inc.

Some of Associated Grocers' open-systems applications are ready to go into production. A new post-billing system, which will separate the billing process from grocery-handling on-line transaction systems, is set to roll out to the chain's stores this spring. A new warehouse inventory system went into production one year ago. And some things are better off bought: Associated Grocers bought packaged accounting applications from Lawson Associates, Inc. in St. Paul, Minn., Lester said.

In Brief

Cadre to add Rumbaugh

Cadre Technologies, Inc. said it will include the Rumbaugh object modeling technique in its Teamwork application development tool for C++ and Ada programming. The tool currently supports the Shlaer-Mellor object methodology. Cadre also announced that its Ensemble development tool now runs on several Unix workstations, including IBM's RISC System/6000, Hewlett-Packard Co.'s Apollo 9000 Series 700 and Digital Equipment Corp.'s DECsystem and DECstation lines. Ensemble is a six-module product suite for developing, testing and maintaining C programs.

Gateway products unveiled

Sapiens International Corp., an application development company 10%-owned by IBM, unveiled gateway products between its back-end code generation tools and front-end analysis and design modules from **KnowledgeWare, Inc.** and **Bachman Information Systems, Inc.**

Intersolv enhances tools

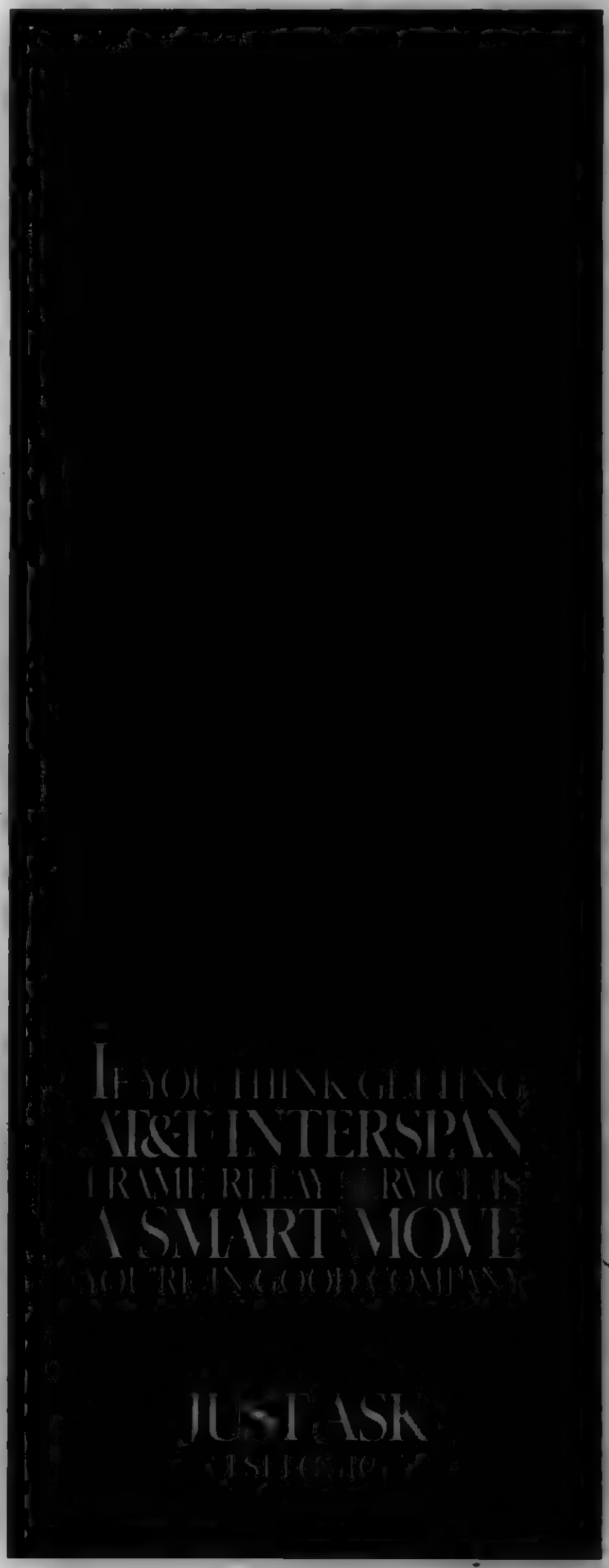
Intersolv, Inc. announced a number of enhancements to its development tools, including the addition of the **James Martin & Co.**'s Information Engineering Methodology to Excelerator II for IBM's OS/2; the generation of Microsoft Corp. Windows and OS/2 client applications from its APS application generator; and a version of the Intersolv LAN Repository for **Sybase, Inc.**'s SQL Server running on the IBM AIX operating system.

CaseSpan updated

InfoSpan Corp., based in Minneapolis, released an updated version of CaseSpan, a repository tool designed to help software programmers migrate from one computer-aided software engineering (CASE) tool to another or pass information among products from different vendors. CaseSpan, which runs on DOS, Windows, OS/2, AIX and SunOS from Sun Microsystems, Inc., supports CASE tools from **KnowledgeWare, Bachman Information Systems, Intersolv, Oracle Corp.** and **Interactive Development Environments, Inc.**

Concurrent licensing

Micro Focus announced that it will begin licensing its Unix software based on concurrent use rather than the combination of machine size and perceived maximum number of users per machine. Under Micro Focus' Unix Concurrent User Licensing, the cost of software is tied to the actual number of users rather than an arbitrary number of perceived users.



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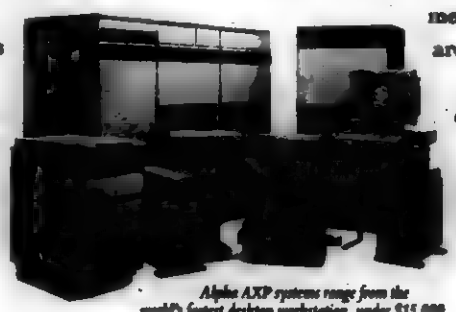

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Cobol compiler helps Unix, Windows coexist

Acucobol, Inc. has taken a big step toward unifying PCs running Microsoft Corp.'s Windows with other platforms. It has provided a runtime version of its Cobol compiler that will allow applications developed on platforms such as Unix or IBM mainframes to be deployed on PCs running Windows.

Acucobol-85 for Windows, currently in beta testing, was designed to leverage the wealth of Cobol programming knowledge at information systems shops without programmers having to recompile applications for a Windows environment.

For example, CF Data Systems, Inc., a Weymouth, Mass., developer of applications for the construction industry, is using a beta-test version of Acucobol-85 for Windows to deploy applications that were developed on Unix systems.

By using Acucobol-85 for Windows, CF Data Systems can allow its programmers to work in the 32-bit preemptive, multitasking Unix environment they prefer, while the applications can be used by users who largely prefer Windows.

"We're a Unix shop, but we're not dumb. Acucobol runtime for Windows lets you redeploy applications without having to go in and rewrite them," said technical director Bill Calahan.

Developers using Acucobol-85 for Windows can customize titles, program icons, place windows and size application screens. In addition, developers can customize it to support any Windows-style features.

Acucobol-85 for Windows costs $225. An Acucobol compiler is priced at $979.

▶ *Acucobol*
Suite 201
7950 Silverton Ave.
San Diego, Calif. 92126
(619) 689-7230

Code libraries

Automation Software Consultants, Inc. has released the Network Basic Library for Novell, Inc.'s NetWare Version 2.0.

The library consists of more than 250 functions designed for writing commercial applications or utility programs for NetWare that require direct access to NetWare services.

The variety of services includes directory and file management, queue management, locking, messages and printing. Almost 50 new functions are introduced in this version, including more NetWare 386-specific features such as file trustees, NetWare 386 rights and encrypted passwords.

Support for Microsoft Corp.'s Quick Basic and Basic is provided.

The product costs $295.

▶ *Automation Software Consultants*
8188 South State Route 48
Maineville, Ohio 45039
(513) 677-0842

Application development tools

Command Technology Corp. has started shipping Version 3.0 of the SPF/PC, a file manager and full-screen text editor.

The product emulates IBM's ISPF/PDF and was designed for users who are making the transition from mainframes to PCs, the company reported.

Version 3.0 of the SPF/PC is compatible with all PC Cobol compilers and provides integration with Micro Focus, Inc.'s Cobol Workbench. Support is provided for count delimited, variable length data records of 32,000 bytes.

The product offers fully mappable keyboard, mouse and color schemes, instant loading of large files and keyboard macros.

SPF/PC Version 3.0 has an introductory price of $199 until May 31. After that the price will be $295.

▶ *Command Technology*
1040 Marina Village Pkwy.
Alameda, Calif. 94501
(510) 521-5900

Watcom has announced Version 9.5 of Watcom C/C++ 32, a multiplatform, 32-bit C/C++ package.

Watcom C/C++ 32 has a high-performance linker that creates executable files in appropriate formats for all supported targets, the company reported. Object code is transported to other industry-standard formats with the product's utilities. The linker performs C++ optimizations, including the elimination of unreferenced virtual functions, and a video debugger uses Novell, Inc.'s NetWare local-area networks and serial and parallel links for cross-platform debugging of applications on remote targets.

Microsoft Corp.'s Windows, Windows NT, Win32s and DOS are supported.

C/C++32 costs $599.

▶ *Watcom*
415 Phillip St.
Waterloo, Ontario
Canada, N2L 3X2
(519) 886-3700

Phar Lap Software, Inc. has introduced Version 5.0 of the 386/DOS-Extender Software Development Kit.

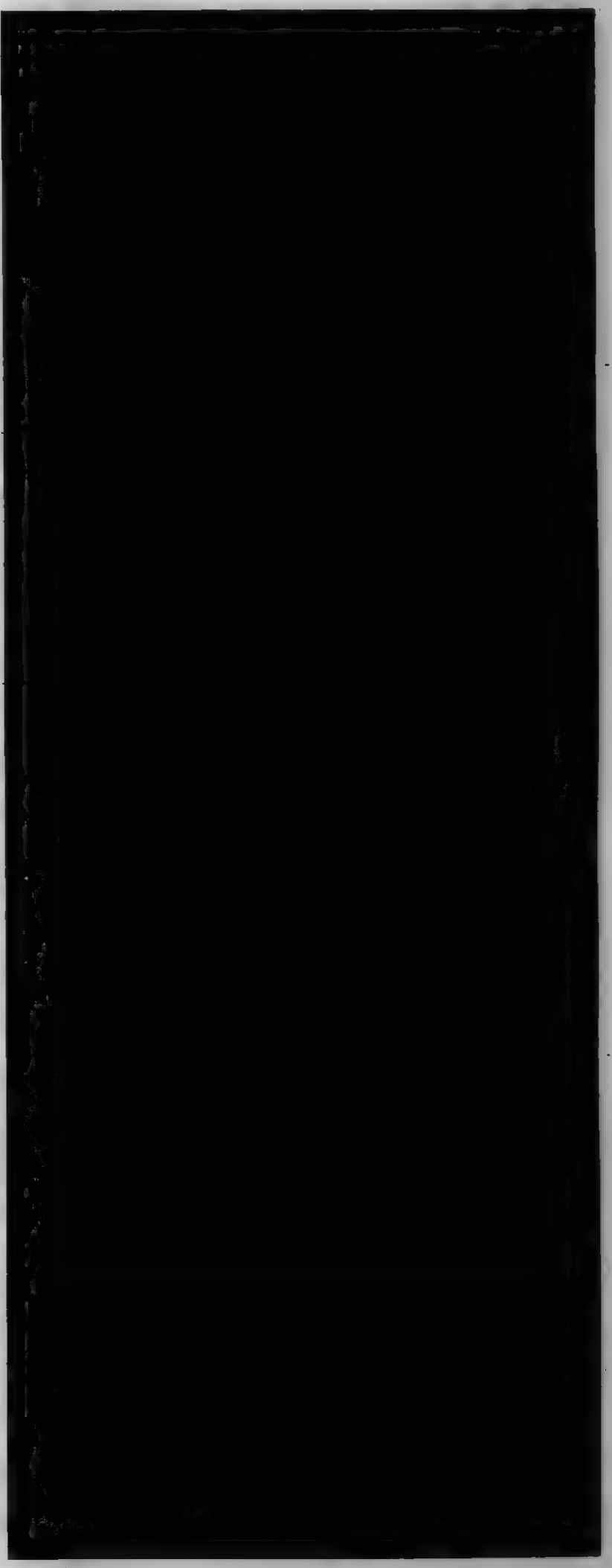
The product was designed for use with Microsoft Corp.'s Windows NT 32-bit C/C++ compiler for 32-bit Extended-DOS development, according to the company.

Users receive the functionality of 16-bit Microsoft C/C++ DOS runtime libraries, including graphics. The 386/DOS-Extender's programs can access up to 4G bytes of all available memory using 32-bit speed and power.

Phar Lap's 386/SRCBug 32-bit source-code debugger is included.

Version 5.0 of the product costs $495.

▶ *Phar Lap Software*
60 Aberdeen Ave.
Cambridge, Mass. 02138
(617) 661-1510



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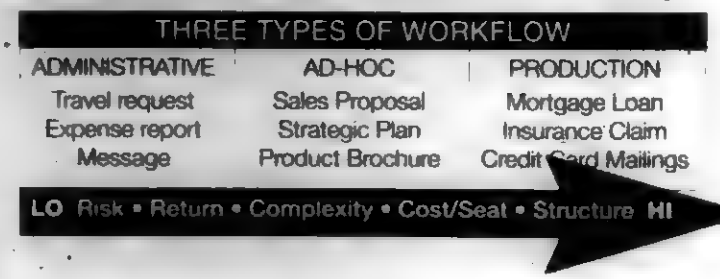

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EFFICIENCY EINSTEINS

Business analysts trained in operations research can be a secret weapon in a CIO's quest for bottom-line results.

By Mitch Betts

Efficiency nuts. Perhaps you've seen one at a cocktail party, explaining that the hostess could disperse that crowd around the popular shrimp dip if she would just divide the dip into three bowls and place them around the room.

As he sketches the improved traffic pattern on the back of a paper napkin, you notice that his favorite word is "optimize" — a surefire sign he has been trained in the little-known fields of "operations research" or "management science."

These folks are driven to solve logistics problems, a trait that may not make them sparkle on the party circuit but may be exactly what today's information systems departments need to deliver more business value.

Experts say smart IS executives will learn to exploit the talents of these mathematical wizards in their quest to boost a company's bottom line.

"If IS departments had more participation from operations research analysts, they would be building much better, richer IS solutions," declares Ron J. Ponder, chief information officer at Sprint Corp. in Kansas City, Mo., and former CIO at Federal Express Corp.

Ponder and others say analysts trained in operations research or management science can turn ordinary information systems into money-saving decision-support systems and are ideally suited to be members of the business process re-engineering team.

"I've always had an operations research department reporting to me, and it's been invaluable. Now I'm building one at Sprint," Ponder says.

Sprint's Ron J. Ponder: *Operations research analysts help build 'richer IS solutions'*

As someone who has a Ph.D. in operations research and who built the legendary package-tracking systems at Fedex, Ponder is a true believer in something that many IS professionals have never even heard of.

Mathematical reasoning

So what is operations research? It's the use of advanced analytical techniques (such as mathematical models) to improve or optimize the performance of an organization. Management science is virtually the same, only its papers have a higher ratio of text to equations. Together, they go by the acronym OR/MS.

In either case, OR/MS analysts just love to solve business problems — and the more complex the puzzle, the more they like it. A classic example is the crew-scheduling problem at United Airlines. How do you plan the itineraries of 8,000 pilots and 17,000 flight attendants when there is an astronomical number of combinations of planes, crews and cities?

The analysts at United came up with a client/server-based scheduling system, called Paragon, that seeks to minimize the amount of paid time that crews spend waiting for flights [CW, May 11, 1992].

The Fortran model even factors in constraints such as union rules and Federal Aviation Administration regulations. It is expected to save the airline at least $1 million a year.

Over the years, some of the best CIOs have had operations research backgrounds. For example, Joseph T. Brophy, the award-winning former CIO at The Travelers Corp., previously worked as an operations research mathematician on the Polaris submarine weapons system.

Operations research got its start in World War II, when the military had to make decisions about allocating scarce resources to various military operations. Since then, the analytic sciences have spread throughout business and government, from designing efficient drive-

Efficiency Einsteins, *page 64*

Efficiency Einsteins

CONTINUED FROM PAGE 63

thru window service for Burger King Corp. to ultra-sophisticated computerized stock trading.

Somewhere along the way, perhaps in the 1970s, the operations research and IS disciplines went on separate tracks.

"The IS profession has had less and less contact with the operations research folks ... and IS lost a powerful intellectual driver," says Peter G. W. Keen, executive director of the International Center for Information Technologies in Washington, D.C.

The split is ironic, considering that one of the first business applications for computers in the 1950s was to solve operations research problems for the petroleum industry. A technique called linear programming was used to figure out how to blend gasoline for the right flash point, the right viscosity and the right octane and in the cheapest possible way.

The 1990s may be an ideal time for the two disciplines to rebuild some bridges, Keen and other observers say. Today's OR/MS professionals are involved in a variety of IS-related fields, including inventory management, electronic data interchange, computer-integrated manufacturing, network management and practical applications of expert systems and neural networks.

Furthermore, each side needs something the other side has. OR/MS analysts need the corporate data to plug into their algorithms, and they need their algorithms plugged into strategic information systems.

Meanwhile, CIOs need to build smart applications that enhance the bottom line and make them heroes with the chief executive officer.

Not people persons

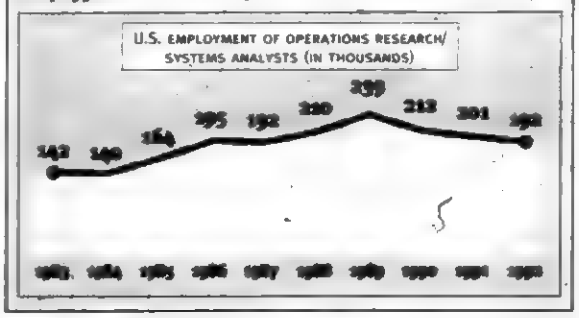
However, Keen says, there are some barriers to collaboration. OR/MS professionals generally lack communication skills and sometimes focus on esoteric mathematics rather than real-world business problems.

"On the other hand, they are very, very bright people. If you can get them away from what I call 'rigor without relevance' and get them onto relevant projects, their rigor is very valuable," Keen says.

Perhaps the biggest barrier is an undercurrent of rivalry between some IS and OR/MS groups as they compete for internal customers, budgets and glory. But failure to cooperate could be suicidal for both professions, experts say.

The recession dip

U.S. employment in operations research and systems analysis rose in the 1980s, but the recession has caused a drop-off in the early 1990s



Source: U.S. Bureau of Labor Statistics — CW Chart: Tom Monahan

At a time when some operations research groups are facing budgets cuts or fading from view altogether, and CIOs are getting fired left and right, it would behoove the two camps to cooperate on some CEO-pleasing "home runs," says consultant Donald B. Brout, president of Quality Technology Decisions, Inc. in New York.

Joseph Brophy *likes to blow his horn for OR/MS*

"Operations research and management science have a lot to offer the CIO," says Brout, who has a background in both management science and IS. "We can all be heroes."

OR/MS analysts can develop a model of the way a business process works now and simulate how it could work more efficiently in the future, he says. Therefore, it makes sense to have an OR/MS analyst on the interdisciplinary team that tackles business process re-engineering projects.

In essence, OR/MS professionals add more value to the IS infrastructure by building "tools that really help decision-makers analyze complex situations," says Andrew B. Whinston, director of the Center for Information Systems Management at the University of Texas at Austin.

Thomas M. Cook, president of American Airlines Decision Technologies, Inc. in Fort Worth, Texas, puts it in even stronger terms. IS departments typically believe their job is done if they deliver accurate and timely information. But Cook says that adding operations research skills to the team can produce *intelligent* systems that actually recommend *solutions* to business problems.

One of the big success stories at Cook's operations research shop is a "yield management" system, which decides how much to overbook and how to set prices for each seat so that a plane is filled up and profits are maximized.

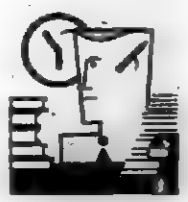
The yield management system, which deals with more than 250 decision variables, accounts for a whopping 5% of American Airlines' revenue. The airline's Sabre reservation system "got a lot of great press, but the value of things like yield management might even dwarf Sabre's benefits," Brout says.

Where to start

So how can the CIO start down the road toward collaboration with mathematicians?

Brout says that if the company already has a group of OR/MS professionals, the IS department can draw on their expertise as internal consultants. Otherwise, he says, the CIO can simply hire a few OR/MS wizards, throw a problem at them and see what happens.

The payback may come surprisingly fast. As one former OR/MS professional put it: "If I couldn't save my employer the equivalent of my own salary in the first month of the year, then I wouldn't feel like I was doing my job."•



Resources

Operations Research Society of America, Baltimore, (410) 528-4146.

The Institute of Management Sciences, Providence, R.I., (401) 274-2525.

OR/MS Today, Atlanta, (404) 431-0867. A bimonthly magazine ($20/year) for operations research and management science professionals, with articles on practical applications.

Hallwecht & Co., Old Greenwich, Conn., (203) 637-5815. Recruiters in the fields of IS, operations research and management science.

Analytic Recruiting, Inc., New York, (212) 687-9163. Recruiters specializing in operations research.

Home runs in management science

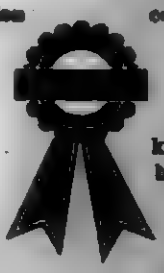
In the last decade, scores of operations research and management science projects have saved companies millions of dollars or have improved government services. Here are some of the "home runs," culled from the book *Excellence in Management Science Practice* (Prentice Hall, 1991).

1981: A computer-aided dispatching system at Chevron USA allowed each dispatcher to handle 400 loads per day, compared with the industry average of 150. Running on an IBM 3033, the system could solve a typical dispatching problem in less than a second. Benefit: Chevron cut transportation costs by 3%.

1982: General Dynamics Corp.'s Data Systems Division developed a model to help it make an IS capacity planning decision. The model showed that computer throughput would be 23% higher if existing tape drives were replaced with drives that were 30% faster.

1982: The Arizona Department of Transportation developed a decision-support system for allocating maintenance funds to the roughest roads while staying within budget. The system has been adopted by Alaska, Colorado, Kansas, Finland and Saudi Arabia.

1984: The New York City Department of Sanitation used several mathematical techniques to improve the deployment of street cleaners, garbage trucks and inspectors, turning the department's embarrassingly poor performance into a national model. Benefits: Then-Mayor Ed Koch said the streets were much cleaner, and refuse collection productivity increased 17%.



1986: Weyerhaeuser Co. developed an interactive computer model that helps lumberjacks cut each log to maximize profits and minimize waste.

The model considers variables such as the log's length, diameter, curvature, taper and knots. Benefit: The company increased profits by $100 million.

1987: General Motors Corp.'s Delco Electronics Division developed a PC-based planning system to identify the best way to ship 300 types of components to 30 assembly plants. Benefit: GM cut logistics costs by 20%, saving $2.9 million a year. —*Mitch Betts*

Executive Track

Newly on board at the IBM Consulting Group in White Plains, N.Y., is **Charles G. Emley Jr.** Most recently a management consulting partner at the Los Angeles office of **Deloitte & Touche's** information technology practice, Emley brings to his new post three decades of experience in the worlds of management consulting and information systems.

At IBM Consulting, where he will hold the title of vice president, he will serve as the North American managing executive for the company's worldwide information technology strategy and planning practice.

Richard Ray has been named vice president and chief financial officer of the **Energy Products Unit** of Dallas-based steel and oil exploration products manufacturing giant **LTV Corp.**

Ray, who formerly served as senior vice president of administration at **Charter Corp.**, succeeds LTV Vice President of Finance and IS **A. Lee Mulkey**, who resigned this year for personal reasons.

At Central Fidelity Banks, Inc. in Richmond, Va., **Jay O. Livingston** has been promoted from corporate executive officer to corporate executive vice president. In his 19 years at the bank, Livingston has served in a variety of managerial capacities; he is currently group manager of statewide bank services and electronic data processing.

John Fallon, former vice president of decisions support at Hartford, Conn.-based **Shawmut Corp.**, is now executive vice president at **Lexington Savings Bank.** At his new post, Fallon reports to his former Shawmut colleague and current Lexington Savings President **Timothy (Ted) Hansbury.**

Glenn Armbruster is the new vice president of materials and logistics management at **Dell Computer Corp.** A 15-year veteran of Digital Equipment Corp., Armbruster headed up DEC's automotive and general/discrete manufacturing industries business unit prior to joining Austin, Texas-based Dell.

In his new capacity he will be responsible for Dell's worldwide logistics, quality, operations information services, business planning and inventory and materials management.

Intelligence Files

Ergo-neglect

The vast majority of corporations have done little to address the ergonomics problems associated with VDT work, according to a survey by The Joyce Institute, a consulting firm based in Seattle.

Only 8% of the companies surveyed had a corporatewide program to redesign VDT jobs to reduce stress, for example, and only 15% had a full-scale VDT ergonomics training program.

The attention given to VDT ergonomics seems to be spotty. For example, although only 8% had addressed the problem of VDT glare on a corporatewide basis, 89% of the companies had addressed it in "some areas."

The good news is that more corporations said they will take action in 1993. The survey found that 57% of the companies plan to work on VDT training and glare issues this year, for example.

Source: The Joyce Institute, Seattle.

GIS in banking

Federal regulations may be a driving force in the adoption of geographic information systems (GIS) in the banking industry.

Under the Financial Institutions Reform, Recovery and Enforcement Act of 1989, regulators are asking for more data that proves that banks and thrifts are meeting the credit needs of their communities.

That means banks must delineate their market areas and provide a breakdown of their loan portfolio per census tract. GIS technology can help banks comply with the regulations by identifying low-income and minority-dominated census tracts and then showing the bank's lending patterns in those areas.

Source: "GIS eases banking's regulatory compliance efforts," by Al Tavakoli, *GIS World*, January/February 1993.

PC buyers' blues

A survey of 1,000 people who recently bought PCs found that they wished they had selected more powerful features at the outset so they could handle future applications.

Some examples follow:

- 62% wanted more expansion slots than they had received.
- 48% felt they should have bought a better quality monitor.
- 47% have found a need to install more random-access memory.
- 39% complained that they had not bought a large enough hard drive.
- 36% desired an additional floppy drive.

Source: Channel Marketing Corp., Dallas.

Calendar

MARCH 28-APRIL 3

Organizational Computing, Coordination and Collaboration Conference. Austin, Texas, March 29-30 — Contact: The University of Texas at Austin (512) 478-4081.

Voice '93 Spring Conference and Exposition. San Diego, March 30-April 1. — Contact: Linda Wilson, Voice Processing Magazine, Houston, Texas (713) 974-6037.

14th Annual IS Performance/Capacity Management Conference. Scottsdale, Ariz., March 30-April 2 — Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

JAD/CASE Conference. Washington, D.C., March 31-April 2 — Contact: ATLIS Performance Resources, Inc., Rockville, Md. (301) 770-3000, ext. 305.

Wireless/PCs Fifth Annual Conference. Washington, D.C., March 31-April 2 — Contact: Telecommunications Reports, Washington, D.C. (202) 842-3022.

Client/server and Distributed Computing: Designing the Application. Washington, D.C., April 1-2 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 4-APRIL 10

Apple Enterprise Computing Conference. San Francisco, April 5-7 — Contact: Apple Enterprise Computing Conference, Mountain View, Calif. (415) 968-8978.

Communications Tokyo '93. Tokyo, April 5-8 — Contact: Ron Atkins, E. J. Krauss & Associates, Inc., Bethesda, Md. (301) 986-4538.

Data Warehouse '93. Washington, D.C., April 5-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 11-APRIL 17

Software Performance Engineering. Santa Fe, N.M., April 13-16 — Contact: L&S Computer Technology, Inc., Austin, Texas (505) 986-3811.

Electronic Data Interchange. San Antonio, April 14-16 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

International Conference and Exhibition on Multichip Modules. Denver, April 14-16 — International Society for Hybrid MicroElectronics, Reston, Va. (703) 471-0066.

Society for Information Management 1993 Institutional Member Conference. Rancho Mirage, Calif., April 14-16 — Contact: Society for Information Management, Chicago, Ill. (312) 644-6610.

APRIL 18-APRIL 24

The Fifth Annual Data Administration Management Association (DAMA) International Symposium. Boston, April 18-21 — Contact: DAMA International Symposium, Boston, Mass. (508) 987-7132.

Supercomm '93. Atlanta, April 19-22 — Contact: Telecommunications Industry Association, Washington, D.C. (202) 457-4912.

Patricia Seybold Group Spring 1993 Conference. Boston, April 18-23 — Contact: Deborah Hay, Patricia Seybold Group, Boston, Mass. (617) 742-5200.

APRIL 25-MAY 1

Xplor International's Vendor Interaction Symposium Information Opportunity Networking (VISION) '93. Denver, April 25-28 — Contact: Xplor International, Palos Verdes, Calif. (310) 373-3633.

The Sollect User Group. Santa Barbara, Calif., April 26-28 — Contact: Sollect Corp., Goleta, Calif. (805) 683-5777.

National Computer Graphics Association (NCGA). Philadelphia, April 26-29 Contact: NCGA, Fairfax, Va. (703) 698-9600.

Distribution/Computer Expo '93 — Exhibit and Seminar. Chicago, April 27-29 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 458-5926.

Incotek '93. Warsaw, April 27-30 — Contact: Global Technologies, Inc., Washington, D.C. (202) 797-3782.

MAY 2-MAY 8

The Workflow Conference on Business Technology. Boston, May 3-5 — Contact: The Workflow Institute, Alameda, Calif. (510) 769-9627.

LotusWorld '93. Boston, May 3-6 — Contact: Daniell & Keefe Associates, Sudbury, Mass. (508) 443-3330.

James Martin World Seminar. Boston, May 3-7 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7080.

DB/Expo '93. San Francisco, May 3-7 — Contact: NDN Enterprises, Inc., Mountain View, Calif. (415) 968-9440.

Dev Con '93. Costa Mesa, Calif., May 4-6 — Contact: Franson, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

The National On-line Meeting. New York, May 4-6 — Contact: Carol Nixon, Learned Information, Inc., Medford, N.J. (609) 654-6266.

Unix Reseller Show and Conference. Dallas, May 4-6 — Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Process for Using Quantitative Data to Manage Information Technology Projects and Activities. San Diego, May 6-7 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

MAY 9-MAY 15

Advanced Topics in DBs. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles (310) 825-1679.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

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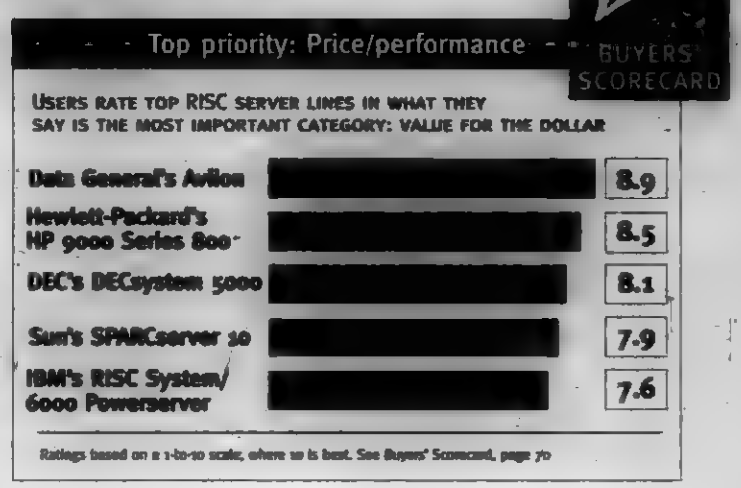

A lot has changed in servers. It's true many machines that fall into this rather large category have gotten faster, more robust and more functional, but no longer do speeds and feeds cut it. The appropriate application server for your business has to do a lot more.

The optimal server for your mission-critical production applications may very well *not* be the one that screamed through benchmark tests. If you're running Oracle over a Transmission Control Protocol/Internet Protocol network, for instance, you will want something different than if you are running Sybase over Novell, Inc.'s NetWare. The optimal server is defined by its use.

In the past, when "server" usually meant "file server," systems managers were mainly concerned with memory, storage and speed. Today, with rampant rightsizing and downsizing, servers are increasingly employed for heavy-duty database serving, running production applications, human resources and inventory. Accordingly, managers are concerned with how the server handles bottlenecks, how large it can scale, how manageable it is and what reliability features it has.

As you can see, we're not talking about $2,000 machines here. Single-processor PCs and workstations top out at 32M bytes — just enough memory to run a production application that isn't going to keep growing, which is unlikely. These machines also tend to lack the reliability, manageability and scalability features that managers seek in a database server, although they are fine for file serving (see story page 71).

This also doesn't tend to include the on-line transaction processing servers such as those from Pyramid Technology Corp., Sequent Computer Systems, Inc. and Tandem Computers, Inc. These machines offer great scalability through multiple processors, but they tend to be architected like a minicomputer; that is, the operating system and database are configured for dumb terminals to send short transactions via a limited number of protocols. Under certain conditions, however, they can do the job (see story page 72).

Database servers need to run a relational database that can support a mix of transaction processing and decision support. This includes superservers, the rather vague category of "multiprocessor servers" (including those from NCR Corp. and Wyse Technology, Inc.) and reduced instruction set computing (RISC) servers designed specifically to handle serious production applications. (For user satisfaction ratings, see Buyers' Scorecard on page 70.)

Strictly speaking, superservers are Intel Corp.-based machines that support multiple processors, have proprietary internal buses and sport high-availability and systems management features (see story page 76). These include IBM's Personal System/2 Model 295, Compaq Computer Corp.'s SystemPro and models from NetFrame Systems, Inc. and Tricord Systems, Inc.

The platform you opt for will likely be based on your systems philosophy and previous experience. In many cases, it can also be determined by whether you're an upsizer or a downsizer. The group you're in tends to determine which track you take. Upsizers tend to opt for Intel-based machines, while downsizers have a pattern of going to RISC (see story page 69).

Of course, not even that rule is firm; there are always exceptions. The Intel and RISC tracks are also merging. Superservers and high-end PCs can run Unix in the form of Novell's UnixWare, Solaris from SunConnect, a division of Sun Microsystems, Inc., and The Santa Cruz Operation's Open Desktop. Likewise, NetWare is likely to soon move onto the RISC platform.

If Microsoft Corp.'s Windows NT proves its worth as a platform, superservers could take a quantum leap forward. Also, multiple high-performance processors are giving both platforms stunning performance, blurring the distinctions in speed (see story page 72).

All of this means the choice of a server will increasingly come down to vendor support, reliability, manageability, price and scalability. It is only then that speed becomes important. For the latest benchmarks on the market-leading servers in each category, refer to our Lab Report charts. •

Alan Radding is a free-lance writer in Newton, Mass.

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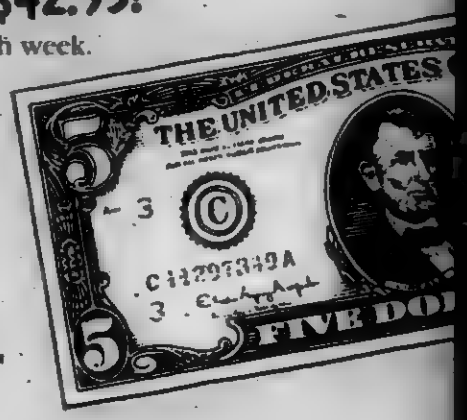

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Servers

Downsizers vs. upsizers

Your orientation determines your need for manageability, support and price

By Alan Radding

The search for a server to run heavy-duty production applications often ends with the purchase of a reduced instruction set computing (RISC)-based machine, a superserver or a multiprocessor machine such as those from NCR Corp. or Wyse Technology, Inc.

While the dark horse in the group has traditionally been the superserver class, these Intel Corp.-based machines are increasingly taking on characteristics usually seen only in the RISC world, such as high-availability features, management capabilities and scalability.

Still, people coming from an information systems orientation seem to shy away from these machines, often opting instead for the more familiar world of the traditional systems vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co. This group is usually downsizing from mainframes and wants to retain that level of control.

"If you are taking a top-down approach, then you have people who are used to high levels of control and support," says Lynn Berg, program director of midrange computing strategies at Gartner Group, Inc.

On the other hand, if the organization is following a "bottoms-up strategy where PCs grew into LANs and now are taking on production applications, it will prefer the PC vendors," Berg continues. These users have never experienced control available in the proprietary host environment.

Management in a PC

Although they don't have the manageability of a mainframe or minicomputer, PC superservers such as Compaq Computer Corp.'s SystemPro, IBM's Personal System/2 Model 295 and models from NetFrame Systems, Inc. and Tricord Systems, Inc. bring inner diagnostics to the PC server.

"These machines generate a lot of information," says Leo Spiegel, executive vice president/chief technology officer at LANsystems, Inc., a New York systems integrator. "It saves you from having to guess where the problem might be."

Superservers basically offer three management features in the form of a plug-in board:

- Provide a full set of statistics on what's happening with the system in real time, in areas such as memory, the drive or the Ethernet card.
- Keep a history of system events.
- Anticipate problems based on statistics and trigger alerts. Some can automatically dial a modem.

Of all the superservers, IBM's offers the most comprehensive set of management features and is the easiest to use. Of course, it is also considered the most complex of the superservers as well.

But while organizations downsizing from a host environment seek as much management capability as they can get, those upsizing from the PC environment take a more laissez-faire approach.

"I'd like to think we'd use management features, but that hasn't been our experience," says Tom Bernhardt, technology specialist at Star Enterprise, a petroleum products refiner in Austin, Texas. The organization uses standard 486-based Extended Industry Standard Architecture servers from Dell Computer Corp. but is shopping for a superserver in preparation for running database applications under Microsoft Corp.'s Windows NT.

The diagnostics on superservers are typically available through a plug-in board. By contrast, the RISC system vendors typically offer this capability through a software layer, says John Turner, major account manager at systems integrator ISYX LAN Systems, Inc. in Rockville, Md. Some people feel the hardware approach makes the machine more in touch with itself, while the software approach is more flexible.

Companies upsizing from PC environments are also intrigued by the fact that they don't have to leave the familiar Novell, Inc. NetWare environment. Hospital Staffing Services, Inc. in Fort Lauderdale, Fla., exemplifies the bottoms-up track. It went through a series of Compaq 386-based servers until it finally jumped to a Tricord server when it acquired another company. Like many upsizing firms, Hospital Staffing Services liked the fact that Tricord ran NetWare v3.11 in native mode.

As yet, NetWare does not run natively on RISC/Unix, although Novell is involved with both HP and Sun Microsystems, Inc. to port to their RISC/Unix platforms. No timetable has been announced.

Unlike high-end PCs, superservers offer high-availability features such as a dual Small Computer Systems Interface controller, mirrored storage (see story page 76) and dedicated I/O processors to reduce I/O bottleneck, says Scott Koegler, manager of IS at Hospital Staffing Services. Superservers still have gaps though, one of which is relational database management system performance.

Brewer's Retail, Inc., a beer distributor in Mississauga, Ontario, that recently downsized from an IBM mainframe, chose Sun 630 MP and 670 MP servers to run a variety of client/server applications built with Uniface Corp.'s Uniface and a Sybase, Inc. database.

RDBMS support

Downsizing organizations tend to opt for the RISC/Unix servers on the basis of their support for the popular networked RDBMS, such as those from Oracle Corp., Sybase, The ASK Group, Inc.'s Ingres Products Division and Informix Corp. These networked databases are basically designed to run on RISC platforms. "When you get to RDBMS performance, people jump to RISC," says Brad Day, principal analyst in the client/server technologies group at Dataquest, Inc. in Framingham, Mass.

Downsizers/Upsizers, page 77

LAB REPORT

RISC SERVERS

	Khomerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
HP 9000/735	189.845	—	41.38	—
IBM RS/6000/220	—	—	—	—
IBM RS/6000/350	92.368	145.75	—	13.890
Silicon Graphics 4D/220 GTX	35.758	24.94	—	12.440

The Khomerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files than Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs

Waiting for NT

Like characters in Samuel Beckett's *Waiting for Godot*, vendors are jockeying for position as they wait for Microsoft's Windows NT. The new operating system promises to have everything users and developers want in an operating system for an application server, plus all the benefits of Unix and PC compatibility. DEC, Tricord, NetFrame and Sequent are already talking about NT servers. But who knows when NT will finally start shipping, exactly what it will be like and how it will perform?

Server shopping list

According to Brad Day, head of the client/server technologies group at Dataquest, Inc. in Framingham, Mass., astute buyers will soon be measuring their application server vendors against the following decision-making criteria:

- **Architecture.** How robust and flexible is it?
- **Operating environment.** Does it run all the operating environments that support current and future application requirements?
- **Upward scalability.** As you add processors or increase I/O, does the system's performance scale well for complex, multiuser needs?
- **Communications.** Does the platform support all necessary LAN protocols as well as WAN connectivity and integration needs to operate efficiently within current LAN installations, as well as move the mission-critical applications off the mainframe?
- **Service and support.** When there are hardware and software problems, can users call on one experienced vendor — a single point of contact — and what level of response time will be guaranteed?
- **Product expansion.** What does the future hold for this product during the next five years that will make users feel comfortable that this architecture will continue to give them technology installation acceptance goals?

LAB REPORT

MULTIPROCESSOR SERVERS

	Khomerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
NCR 3445	53.926	23.75	21.05	25.2
Sun 690MP	43.417	—	32.08	77.690
Wyse 7000/740MP	42.901	—	37.15	—
Alliz 4900	22.850	34.92	23.21	15.74
ALR MultiAccess 5000	12.555	23.47	—	25.280

The Khomerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files than Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs

COMPUTERWORLD BUYERS' SCORECARD

Buyers' Scorecard: DG's Aviion leads the pack in RISC server market

By Derek Slater

Reduced instruction set computing (RISC) servers are offered by an increasing number of vendors. However, the major workstation vendors still hold the lion's share of the RISC server market.

Data General Corp.'s Avion users were most satisfied with their servers. Avion took the highest overall score of 87, well ahead of second-place finisher Hewlett-Packard Co.'s HP 9000 Series 800 servers at 82.

Digital Equipment Corp.'s DECsystem servers placed third with a score of 81. Sun Microsystems, Inc.'s SPARCserver 10 and IBM's RISC System/6000 Powerservers rounded out the survey.

DG's Avion servers include from one to four Motorola, Inc. 88100 processors. As with the other products in the survey, the response base included users of both high- and low-end models.

The Unix-based Aviion workstation and server products play an ever more important role for DG as users move away from the company's proprietary MV minicomputer line. DG's revenue from Aviion products recently surpassed MV systems revenue for the first time.

The DG servers earned the highest score in value for the dollar, and a number of users said price/performance is the Aviion line's greatest strength. Pricing starts at just less than $20,000, while high-end multiprocessor models cost more than $100,000.

RISC servers

Data General's Aviion
SCORE 87

Hewlett-Packard's HP 9000 Series 800
SCORE 82

DEC's DECsystem 5000
SCORE 81

Sun's SPARCserver 10
SCORE 79

IBM's RS 6000 Powerserver
SCORE 77

Users also gave DG's servers top marks for the functionality of their Unix variant operating system, DG-UX. However, the dearth of third-party applications that run under DG-UX proved to be a liability, users said.

HP got an early jump on the RISC market and holds a commanding lead in installed multiuser RISC systems, according to Computer Intelligence/Infocorp. However, Sun currently owns a higher percentage of total RISC systems shipped each quarter.

The 9000 Series 800 servers include a variety of models based on HP's Precision Architecture-RISC processor. The entry-level F10 model, with a 32-MHz processor, costs just over $11,000. At the other end of the line, the 150 model runs at 96 MHz and accommodates 768M bytes of memory.

Respondents gave HP high satisfaction ratings in a number of categories, including value for the dollar and overall speed.

DEC's DECsystem servers are based on Mips Technologies, Inc. RISC processors, with pricing ranging from $13,000 to $53,000. DEC's products scored high in compatibility and quality of service and support but lagged behind in overall speed and value for the dollar.

Sun's SPARCserver 10 line includes four models. These models have either one, two or four SuperSPARC RISC processors from Texas Instruments, Inc.

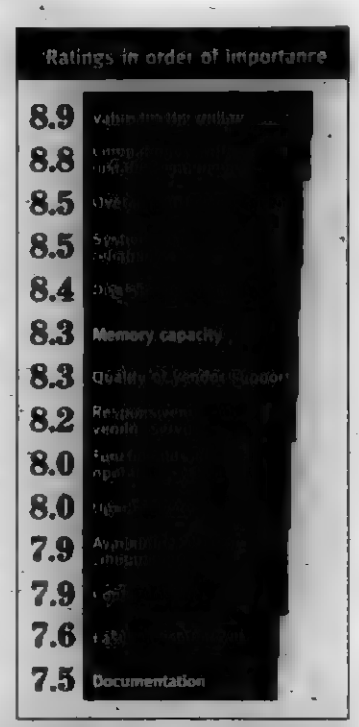
Pricing for the SPARCserver 10s runs from approximately $17,000 to about $55,000, which analysts characterize as relatively high for the performance offered. Users rated the products fairly low in value for the dollar. Sun's product garnered praise for the functionality of its Solaris operating system, but it also earned low ratings in service and support.

Like HP, IBM's RS/6000 line offers a broad range of servers. The low-end model, the Powerserver 220, costs less than $7,000; the high-end Powerserver 970 costs more than $90,000 and has capacities of up to 512M bytes of memory and 20.8G bytes of internal disk space. All models are built around a single IBM Power RISC processor running at clock speeds of 20 MHz to 50 MHz.

Though the line starts at a lower price point than the other products in the survey, IBM users gave their systems a relatively low rating in value for the dollar.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on satisfaction with their RISC-based servers in 15 categories.

All categories were factored into the final scores. The scores for each product in the six most important categories are listed in the charts below. (See the methodology on the following page for a description of the scoring process.)



Vital statistics

Respondents reported the following responsibilities for RISC-based servers:

RESPONSE BASE: 185 USERS

Evaluate or recommend vendors	156
Determine need	149
Set standards for organization	133
Select vendors	131
Buy for user departments	93

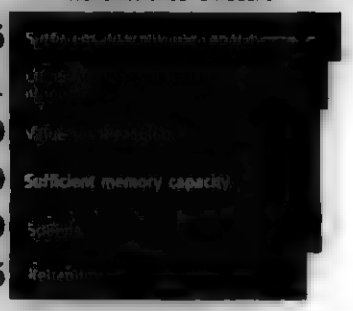
(MULTIPLE RESPONSES ALLOWED)

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.

Data General's Aviion

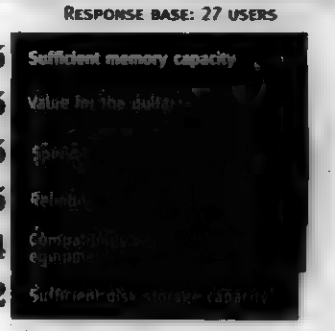
RESPONSE BASE: 20 USERS



Would you buy the product again?

Hewlett-Packard's HP 9000 Series 800

RESPONSE BASE: 27 USERS



Would you buy the product again?

DEC's DECsystem 5000

RESPONSE BASE: 39 USERS

Would you buy the product again?

Downsizers/Upsizers

CONTINUED FROM PAGE 69

Superservers also don't have a long history of proven support. Consulting and systems integration are typically handled by the value-added reseller that makes the sale and does the installation.

In a survey of several hundred client/server system buyers, Dataquest's Day found purchasers insisting that the vendor offer consulting, systems integration and other levels of support (see box page 69).

That explains why RISC vendors DEC and HP showed up well in the study. The multiprocessing machine vendors such as NCR and Wyse also do well here. Such support is typically negotiated and priced separately from the system.

Many levels of support

The support that's available comes in many forms. When Investco Funds Group in Denver left two proprietary Data General Corp. MVS 10000 hosts for the new world of local-area network-based client/server computing, it opted for the NCR 3600 because of the scalability of the system and NCR's high-level support.

"With things changing so fast in this business, you can never know enough, but NCR brought a wealth of resources to us," says David Barrett, vice president of information technology at Investco, a rapidly growing mutual fund company.

Oklahoma City-based Liberty Bancorp went so far as to turn the server vendor into a key player in a three-party alliance involving the bank, the server vendor and its banking software developer. The bank is rearchitecting its entire systems and network infrastructure as it moves from a centralized host to a three-tier client/server strategy, and it has selected HP servers as the middle tier of its strategy.

Something that's potentially misleading about superservers and RISC workstations, for that matter, is that you may end up spending close to low-end mainframe levels on the initial hardware purchase. Despite the use of low-cost PC and RISC technology, when you factor in the cost of sophisticated high-availability components (such as redundant arrays of inexpensive disks storage, mirrored or duplexed storage, other redundant components and multiple processors), these machines are not cheap.

Entry-level prices for stripped-down superservers may range from $12,000 to $20,000, but serious production application servers configured with enough memory and storage typically fall into the $60,000 to $120,000 price range, LANsystems' Spiegel says. A fully configured superserver with multiple processors can cost as much as $750,000 — more than a small mainframe. Depending on configuration and the number of processors, RISC servers can run from the high $20,000s up to $150,000. At the same time, you get 15% to 20% more bang for the buck each year.

Users recommend a minimum of 32M bytes of memory and a gigabyte of storage for starters. For a Compaq SystemPro with 4G bytes of storage, 64M bytes of main memory and a 250-user NetWare license, Midland Life Insurance Co. in Columbus, Ohio, pays about $30,000 and considers it a bargain. •

How low can you go?

With the Intel Corp. 1486 processor, even a standard PC has the power to perform database serving on a small scale. Vendors such as AST Research, Inc., Advanced Logic Research, Inc., Dell Computer Corp., Compaq Computer Corp., IBM and others are turning out well-engineered, powerful, low-cost 486-based PCs that can be adopted for database serving.

When Pentium, the next-generation Intel processor, arrives, it will dramatically increase the processing power of the Intel platform, but it won't do much when the bottleneck is something other than the processing power of the CPU. In fact, it may exacerbate the situation as the superfast processor twiddles its thumbs waiting for data to cross the I/O subsystem.

There are several drawbacks to PCs for anything but entry-level application serving:

- They typically top out in terms of memory and storage where you want your application server to start: at 32M bytes of memory and 1G byte of storage.
- They lack the internal diagnostics of the superservers.
- They lack an internal architecture designed specifically to support high levels of I/O.
- They lack multiprocessing, symmetrical or otherwise.

While PCs have some high-availability features, such as error-correcting memory, they do not support redundancy from the CPU to the disk. But if the database and application is small and there are only a few users (and you can sleep at night without the high-availability features), these machines can work. And when the application invariably grows, it is an easy hop to a PC superserver. —*Alan Radding*

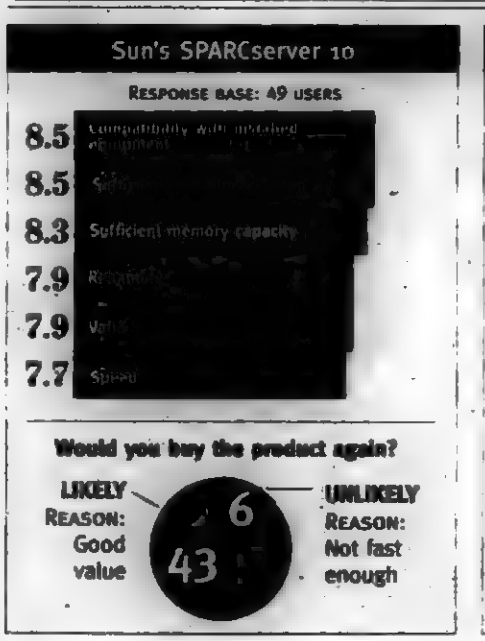
LAB REPORT

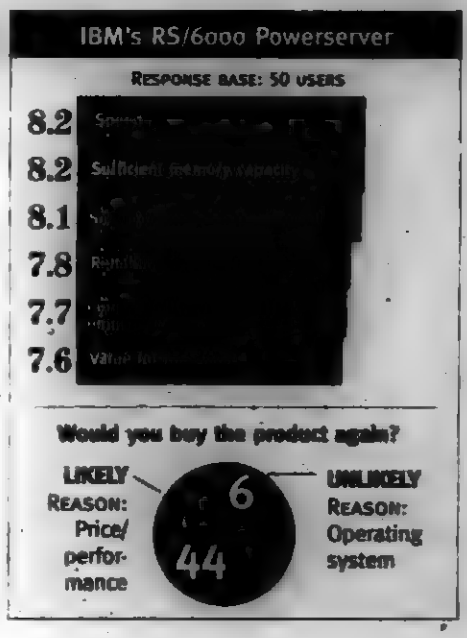
INTEL SERVERS

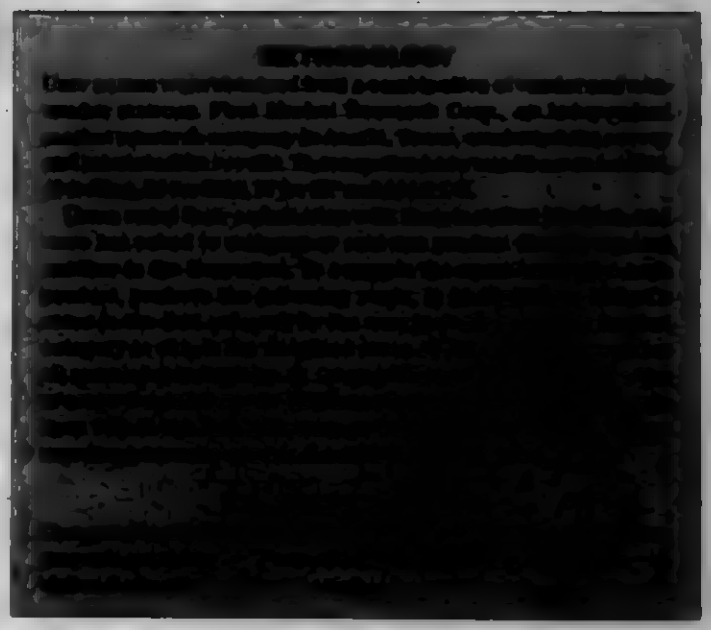
	Khornerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
AT&T StarServer	24,091	29.66	30.82	30,830
Micronics Hy 486/50	22,981	—	28.89	21,510
Compaq SystemPro 486	15,327	20.29	15.71	17,120
Northgate 433EISA	13,469	—	10.38	15,900
ALR VISA	12,385	12.31	9.56	16,620

The Khornerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files than Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs







Scalability and multiple processors

Everyone needs room to grow

By Alan Radding

The hottest thing in the reduced instruction set computing (RISC) world is now infiltrating all servers: symmetrical multiprocessing (SMP).

The reason multiprocessing is so hot is that it plays a direct role in scalability. Managers are hard-pressed to predict what the load will be a few years or even a few months after the system is installed. Instead, they look for scalability — the ability to support lots of disk and memory, add multiple processors and upgrade processors — to expand within the box or move up in a product family without disturbing applications or databases.

The rule of thumb is to pick a vendor where you can start at the beginning or middle of the product line from a capacity standpoint. That leaves you ample room to grow. The big RISC vendors — Hewlett-Packard Co., Sun Microsystems, Inc., Digital Equipment Corp. and IBM — generally offer the greatest scalability. For example, DEC reports 1,000-to-1 scalability for the new Alpha-AXP server line using multiple processors.

Multiprocessing moving

The maximum number of processors available is a major criterion in the purchase of RISC servers. With DEC, Wyse, Sequent and Pyramid, you can go higher still, with Pyramid the highest at 32 processors.

IBM forgoes multiprocessing and instead clusters its machines.

DEC will introduce Alpha with four processors and says it will go to six within a reasonable period.

HP is going from two processors to four with its 9000 line.

Sun already has four processors with its SPARCserver line.

SCO Unix scales to eight processors.

Super difference

The superservers have jumped on the scalability bandwagon, but there's a difference: Not all multiple processing schemes are created equal. For example, asymmetrical multiprocessing (AMP) — which is what superservers such as NetFrame Systems, Inc., Tricord Systems, Inc. and IBM offer — dedicates particular processors to specific functions. This boosts I/O performance (good for file serving), but it doesn't do anything for application serving.

On the other hand, SMP divides work evenly between the processors, which share memory. All processors are fully involved in the processing, so processing power scales almost 100% as new processors are added. For this reason, SMP is very valuable for application serving, but it doesn't do much for file serving.

Part of the problem for the superservers is that Novell, Inc. NetWare doesn't support SMP, although many Unix offerings do.

Expansion alternatives

The superserver vendors are working on advancing their multiprocessing capabilities. For instance, NetFrame recently announced a new family of AMP servers that sport both multiple application processors and multiple I/O processors. A different application running under a different operating system can run concurrently on each application processor. This design will allow an organization to combine file serving and application serving in one box in a balanced way.

In the RISC world, IBM also does not offer SMP. Instead, it provides clustering, which is the ability to couple RISC System/6000s together to boost performance while increasing the high-availability options. This solution has a drawback: It requires more overhead than SMP.

For organizations that expect to grow, scalability is a key consideration. "We looked at Data General's Aviion, but they only offered four processors at the time and were promising eight in a year," explains David Barrett, vice president/information technology at Investco Funds Group in Denver.

With NCR, Barrett gets eight processors with 512M bytes of memory and a 20G-byte disk farm. And, he can scale higher from there. •

Neal Nelson

The reality of RISC

My benchmarking tools have shown for years that for business users, RISC offers little or no advantage over CISC-based machines.

In fact, CISC- and RISC-based network servers are quite similar in areas that are important to business such as network and disk I/O. For many business applications, CISC may be both faster and cheaper, while RISC may be better for engineering and scientific work.

To understand why CISC and RISC deliver similar performance on business applications, let's look at their architectures.

All told, I've found five major differences between CISC and RISC:

• **Chip technology:** RISC machines are supposed to have much faster CPUs than CISC machines. To a certain extent, this speed advantage is an illusion because each RISC instruction is simpler and may perform less "work" than a CISC instruction.

A CISC machine, for example, might require three CPU clock "ticks" to perform one instruction of adding two binary values in memory and leaving the result in memory. At 33 MHz, this would represent 11 MIPS for this machine (33 million cycles per second divided by 3 cycles per instruction equals 11 MIPS).

I know of a RISC machine that had to perform four "instructions" — two loads, one add, one store — totaling 11 clock ticks to do this same task. If this machine were running at 80 MHz (29 MIPS), it would actually perform user tasks more slowly than the 33 MHz (11 MIPS) CISC machine.

As in the children's game, it is the difference between baby steps and giant steps. Two giant steps per second might cover a lot more ground than 10 baby steps per second.

Ultimately, a RISC machine may not offer any benefit to business users by executing less powerful instructions at a faster rate.

• **Floating-point math capability:** RISC evolved from the engineering workstation, where floating-point math is highly valued for scientific calculations such as square root, sine and cosine. CISC evolved from the business market, where floating-point math is less in demand.

Businesspeople want to know the answer to retrieval questions such as "What is the current balance?" and they usually don't ask questions that require floating-point math capability.

Similarities between CISC and RISC machines

- Both use the same disk drive technology at the same speeds (because of the same drives and access times).
- Support chips: Both use the same support chips such as small computer systems interface controllers and Ethernet LAN chips.
- Main memory chips: Virtually all microcomputers (whether CISC or RISC) use the same memory chip technology supplied by a handful of chip manufacturers.
- CPU chips: All use 16- to 32-bit chips; RAM, cache and CPU clocks vary.
- Connectivity: All provide connectivity (via Ethernet, Token Ring, etc.) to other computers.

• **System bus technology:** At one time, the relationship was very clear: CISC machines (represented primarily by PCs) offered a very low-cost, low-performance standard bus. RISC machines (represented primarily by workstations) offered expensive, proprietary, incompatible high-performance buses.

By and large, RISC machines are still offering the same high-cost, proprietary, high-performance buses. On the other hand, CISC now has medium-performance buses, thanks to EISA and Micro Channel Architecture.

When high-performance buses are high-cost and proprietary as well, the benefits are not as significant for business users. Users can find good buses in both CISC- and RISC-based machines.

• **Multiprocessing capability:** For several years, the state of the art in multiprocessing has been driven by the CISC segment. Sequent at the high end and Corollary, Inc. at the low end have both been using Intel chip technology to push the limits in multiprocessing.

For a while, RISC machines didn't offer multiprocessing at all. This was partly because their chips had trouble supporting it and partly because their primary customers (engineers at workstations) didn't want it.

Some RISC vendors are currently offering multiprocessing but in most cases on a much smaller scale than the CISC vendors. A typical RISC multiprocessor will have a maximum of four CPUs.

Multiprocessing is economically sensible because a business user can purchase a machine with a few CPUs installed and add more as processing needs increase.

• **Operating system version or port:** Right now, CISC has performance advantages for NetWare and similar operating systems and RISC has the advantage for Unix. Both of these differences should blur into nothingness during the next few months.

Traditionally, RISC servers have run Unix, while CISC servers ran Novell's NetWare. This is changing. Microport, Inc., Dell, Everex Systems, Novell and Sun now offer Unix Version 4 for CISC machines, and native ports of NetWare are showing up for RISC machines. •

Nelson is owner of Neal Nelson & Associates, a benchmarking firm based in Chicago.

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For distributed client/server applications? ☐ yes ☐ no

How many PCs are connected? _____
Do you use or are you planning to use UNIX with your client/server applications? ☐ yes ☐ no

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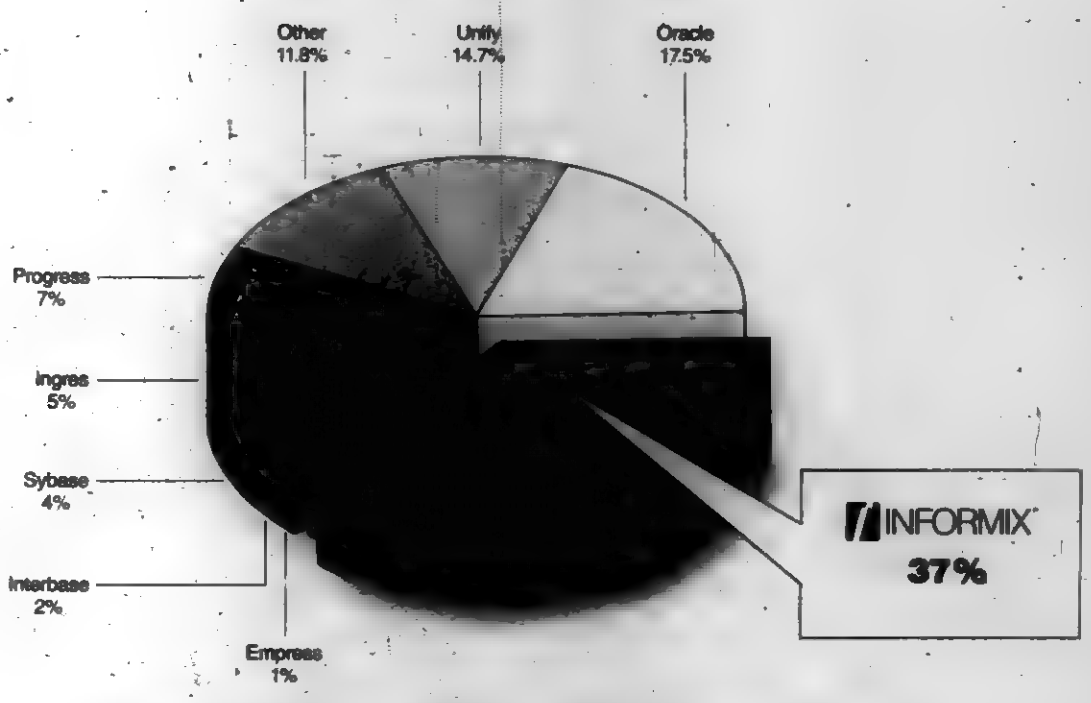

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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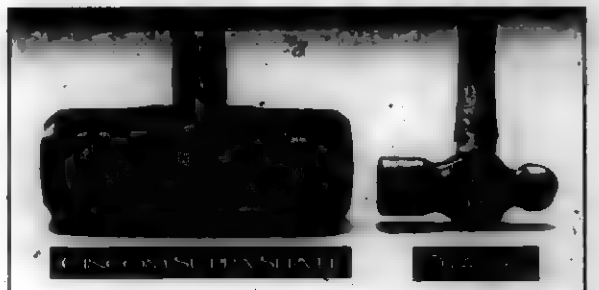

	SUPRA SERVER	ORACLE7
Distributed Multiplatform Scalable Server Technology *(host-based to client/server to server/server)*	Yes	No
Inherently Portable Architecture *(PC LAN, UNIX, Proprietary, Mid-Range and Mainframe, without modification to the application)*	Yes	No
Production Quality Distributed Transaction Management *(Transaction Partners versus Two-Phase Commit)*	Yes	No
Distributed Updatable Join Views	Yes	No
Three Schema Architecture	Yes	No
Cursor Management *(Auto Cursor, Cursor Stability, Fully Scrollable Cursor)*	Yes	No
Support of Multimedia Object Types	Yes	No
Robust Application Life Cycle Development Tool Set	Yes	No

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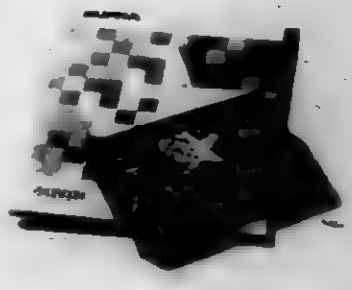

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System reliability

What, me worry?

By Alan Radding

When it comes to reliability, it's not so much *whether* the system will fail; that's bound to happen sometimes. What users are more concerned with — and what vendors work to build into their machines — is how fast you can diagnose and fix the problem.

The fix usually comes in the form of high-availability capabilities such as disk mirroring, disk duplexing, redundant arrays of inexpensive disks support and error-correcting memory (see box).

There was a time when you had to go to Sequent Computer Systems, Inc., Digital Equipment Corp., Hewlett-Packard Co. or Sun Microsystems, Inc. for these features. Now, reduced instruction set computing servers and superservers offer these features.

It was the reliability features that persuaded Robert Curry, associate executive director of information resource management at the Federal Energy Regulatory Commission in Washington, D.C., to use a Tricord Systems, Inc. superserver for a key document-access application.

Tricord, actually, has gone beyond high availability with a new server that uses Novell, Inc.'s NetWare System Fault Tolerance Level III software, which allows one server to mirror another. This level of reliability does not come cheap: It requires two superservers.

High availability sufficient

For most users, however, the basic high-availability features are sufficient. "The vendors know the servers have to be reliable. They engineer them to be extremely reliable," says Lynn Berg, program director of midrange computing strategies at Gartner Group, Inc.

Jerry Whetnall, assistant vice president of corporate systems at Midland Mutual Life Insurance Co. in Columbus, Ohio, reports losing a total of one CPU, about six disk drives and an occasional memory chip among 22 Compaq Computer Corp. SystemPros during three years. "Our downtime over the last year for all our servers came to three to four hours."

There are some reports that superservers require a higher level of maintenance and are not something that the everyday PC guru can handle.

"We needed [a NetFrame engineer] just to install a tape drive, and even then it wasn't easy," reports John Weeden, management information program manager at The Washington State Division of Alcohol and Substance Abuse in Olympia. Rather than rely on a NetFrame Systems, Inc. engineer, the group switched temporarily to a 486-based PC for its Sybase, Inc. SQL Server database, while relegating the NetFrame machine to less critical wide-area network file sharing. •

High-availability features

- **Mirroring:** One controller mirrors data on two sets of disks. This has been standard for years in Unix and is new to superservers.
- **Duplexing:** Multiple controllers mirror data on multiple disks. This is more flexible and faster than mirroring because it can do two reads/writes at the same time.
- **Error-correcting memory:** Memory that automatically looks for parity checking; when it doesn't find it, it notifies the CPU and puts it into memory the right way. This has almost become a given in most systems.
- **Hot disk swapping:** The management system tells you there's a bad disk and allows you to plug in a new one without turning the server off. This is new to superservers and has been offered on PC machines longer.

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Out to get you

Computer security and law enforcement aces give you the lowdown on the biggest threats to corporate security — and what you can do about them

It's

By James Daly

a disturbing paradox. The one-in-a-million chance that a flood will soak their data center prompts conscientious information systems managers to build vaults capable of surviving a nuclear blast.

Yet every day they allow users to insert unscanned floppy disks into their PCs. Or let employees tote around an unencrypted copy of next year's business plan in an easily stolen laptop computer. Or toss old memos filled with passwords and internal information into the dumpster at night.

All over the U.S., security experts claim that corporate America is still largely unprepared for the security challenges of the information age. While most organizations have sunk massive sums of money and time into their computer systems, they don't do as much as they should to protect their investment.

"There's a lot of room for proactive efforts in computer security; I just wish more of it was being done," says Scott Charney, chief of the computer crime unit at the Federal Bureau of Investigation in Washington, D.C.

Computers and communications systems are prime targets for attack by competitors, foreign interests or even disgruntled employees. The goal of complete data security is probably unattainable, but there are still plenty of weak points the average IS manager *can* shore up but hasn't. What are the biggest security risks for corporations these days? Where are the weak points? What should be done to protect critical information? We asked some top security experts:

Daly is a *Computerworld* West Coast correspondent.

PBX toll fraud

Security experts agree that the theft of telephone services is the security-related Achilles' heel of corporate America. In the past several years, toll fraud has grown so fast that U.S. businesses are expected to shell out more than $4 billion for unauthorized, free long-distance calls this year, according to Telecommunications Advisors, Inc., a Portland, Ore., consultancy.

Here's a harsh twist: Because many companies own the equipment the thieves penetrate, long-distance carriers say the companies are liable for the added charges. In other words, if unauthorized calls are discovered on your phone bill — be they for $100 or $100,000 — you are the one who ultimately pays. Not AT&T. Not Sprint. Not MCI.

Don Delaney, a New York State Police senior investigator, says the illegal access and sale of phone service has turned into a thriving underground business. Once in, system crackers resell their means of entry to others; who in turn fill the phone lines with more illicit traffic.

A thriving call/sell operation attracts drug dealers, illegal aliens and organized crime fig-

Security threats, *page 78*

Security threats

CONTINUED FROM PAGE 77

ures, Delaney says, all of whom line up for free calls that are difficult to trace.

Such hackers loop in and out of a firm's private branch exchange (PBX) to re-originate the calls and prevent line tracing. Crimes are often committed over 800 service lines, so the companies also pay for the criminal's operating expenses.

As a result, law enforcement officials say, toll fraud is a problem that is going to worsen. "It's not a matter of *whether* people will be hit but *when*," Delaney says. Last year, he received 150 complaints of toll fraud.

Toll fraud has become so prevalent that firms can buy toll fraud insurance from companies such as The Travelers Corp. in Hartford, Conn.; Warren, N.J.-based Chubb Corp.; National Union Fire Insurance Co. in Pittsburgh; and Aetna Life and Casualty Co. in Hartford, which limits its policy writing to financial institutions. Coverage can be expensive — up to $50,000 for million-dollar policies.

Users say the key to fighting phone fraud is quickly spotting abnormal calling patterns. Last year, Sherry Roggeman, communications coordinator at Empire Southwest Co., a heavy equipment dealership in Phoenix, noticed an unusual amount of telecom activity with Puerto Rico, a place where Empire Southwest does little business.

To Roggeman's dismay, she discovered that someone had gained unauthorized access to the company's PBX through its 800 number and had placed $15,000 worth of long-distance calls. "This is very frightening," says a shocked Roggeman, who has since added a fraud-detection system. "It's scary to think that someone is spending all this time trying to crack my systems."

Many products are already on the market to ease some of this hacker-generated anxiety. Atlanta-based Complementary Solutions, Inc., for instance, makes Telemate FraudFighter, which learns normal telecommunications activity levels and then looks for deviant patterns. Similarly, Xiox Corp. in Burlingame, Calif., offers fraud prevention products that use artificial intelligence features.

Public carriers also sell toll fraud support services. Sprint Corp. now offers Sprintguard, which provides notification of abnormal calling patterns and an insurance plan that limits customer losses. AT&T offers a similar program called Netprotect to relieve customers of liability for international long-distance fraud. On Feb. 2, MCI Communications Corp. joined with a multipronged monitoring and protection initiative called Detect.

Costs for services vary, depending on what you need, how much coverage you want and how many people are covered.

Attorneys are getting in on the PBX toll fraud act, calling for tougher laws. In New York, toll fraud crimes are still handled as misdemeanors. AT&T, in conjunction with others, is working on a proposed bill to make toll fraud a felony.

Experts advise, however, that users not rely on others to prevent toll fraud. "Right now, users are doing very little to protect themselves," says John Haugh, chairman of Telecommunications Advisors. "AT&T handles about 115 million calls a day. AT&T can't look out for you."

Theft of portables

As purchases of easily transportable laptop and notebook computers have soared in the past 18 months, so has their theft. A typical 5-pound laptop can carry a hard disk loaded with sensitive strategic and financial data, as well as long-term marketing and business plans. Laptops also provide a perfect way to steal information from a corporate database by providing all the software needed to dial into the company mainframes.

"In other words, they're a perfect target for thieves," says Steve Purdy, senior associate at New York security services firm Kroll Associates, former Secret Service agent and chairman of the Federal Computer Investigators Committee. "The loss of the hardware is the least of your worries. Think of how much it would be worth to your competitor to have a list of your business contacts or your business plan for next year."

Yet many executives treat these treasure troves of corporate data sloppily. In a recent survey of users of portable computers by International Data Corp. in Framingham, Mass., only 1% of the respondents said they perceive security as a problem of portables, despite numerous high-profile thefts.

Firms are starting to come to grips with the problem, but only after getting burned. According to the IS director at one large chemicals plant: "We finally became aware of just how vulnerable we were when the laptops started disappearing. There's a lot of competitive data on these things, so it's like stealing files out of a filing cabinet."

Some firms have come up with ingenious ways of denying access to information even when a laptop is stolen. At Conde Nast Publications, Inc., an identification chip has been placed in some laptops to verify the user's right to access the company's mainframe. If a laptop is stolen, access to the machine is turned off, and when someone tries to dial up on the stolen laptop, the mainframe sends out a program that erases his hard disk.

Companies such as Shearson Lehman Brothers, Inc., PaineWebber, Inc., Martin Marietta Corp., Grumman Corp. and The Boeing Co. have already instituted stringent portable computer protection policies that include increased awareness programs and rigorous laptop checkout policies.

A good first step to take in portable computer security is to secure the computer physically. Companies such as San Rafael, Calif.-based PC Guardian and Z-Look Mfg. Co. in Redondo Beach, Calif., sell lightweight steel security cables to tightly attach a laptop or notebook to a desk or table.

Step two involves encrypting the data on the portable. "That way, if someone gets hold of the data, they can't do anything with it," Purdy says.

Better yet, "allow people on the road to store information only to their floppy," says Paul Joyal, former director of security at the Senate Intelligence Committee and president of Silver Spring, Md., security firm Integer, Inc. "Then when they're done working, they can just carry the floppy around with them."

Viruses

When last year's Michelangelo virus scare turned out to be a techno-dud, some security managers feared that future warnings about viruses would fall on deaf ears. Like rattlesnakes, computer viruses exist and should be avoided. But they're not lurking behind every rock.

"The [Michelangelo] hype was very exaggerated, but computer viruses are still a very genuine threat," says Sergeant Bob Brown, who works at the Los Angeles County sheriff's office and is a co-founder of the High-Technology Crime Investigation Association, a 400-member organization of law enforcement and security personnel.

Virus concerns should grow as the move toward client/server architectures continues and information becomes more distributed throughout the organization — and hence harder to secure.

The best way to defend against a virus intrusion is to always be aware and recognize any attempt at infection. Experts suggest the following tips to decrease the risk of infection:

- Install a reliable antivirus protection package on your machine, and scan all disks before use. There are many public domain virus detection/prevention packages available on the market.
- Back up all critical data and programs, and periodically inspect backups for data integrity. Great care should be taken to ensure that backups are not infected. The last thing you want to do is reintroduce a virus when disinfecting your system.
- Do not execute programs that are unfamiliar or free applications that sound too good to be true.
- Write-protect original distribution

Nip hackers in the bud

One of the most frustrating aspects of computer crime is that many of the lawbreakers are very young — often high-school age. Sergeant Bob Brown, co-founder of the High-Technology Crime Investigation Association, suggests that if IS managers have the time, they may want to distribute computer ethics rules to local high schools or even volunteer to teach a class on the subject. "Computer security people can get involved at the local level and head off some of the crime before it occurs," Brown says.

Some high schools in the San Francisco Bay area have gotten the word and are beginning to integrate security topics into their computer classes, in much the same way as the Software Publisher's Association conducts its anti-piracy campaign. "If we can nip hackers in the bud — when they're just starting out — half of our problems would already be solved."

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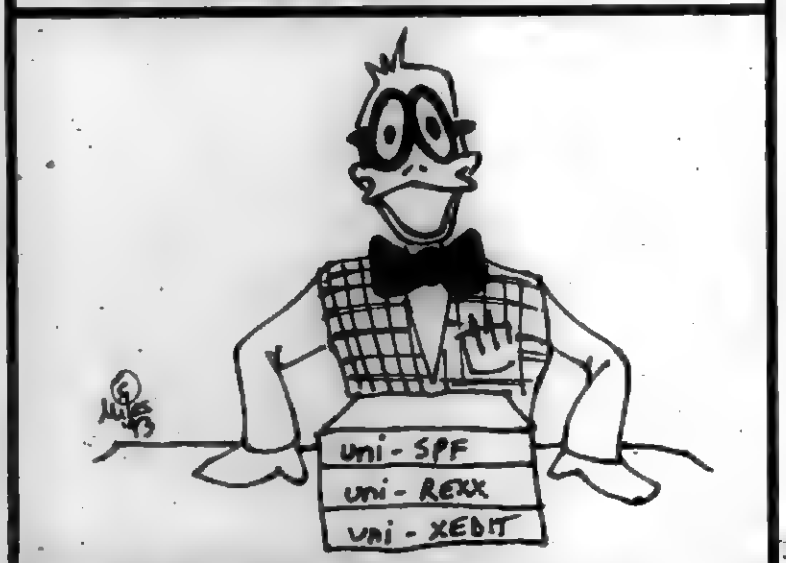

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disks before using them.

• Be on the lookout for symptoms of a virus infection, which include unexpected changes in the time stamps and/or length of files, particularly executable files; programs that take longer than usual to start or perform; programs that attempt to write to write-protected media for no apparent reason; executable files that suddenly vanish or are modified; unexplained decreases in computer memory; or increases in areas marked as "bad sector/clusters" on either hard or floppy disks.

Disgruntled workers

One of the darker sides of the outsourcing and downsizing movement in corporate America is staff cutbacks — often severe ones. Disgruntled workers could represent a serious security threat.

Charles Cresson Wood, a security consultant in Sausalito, Calif., recounts the story of a computer systems manager at a Florida newspaper who was fired and took a position at a competing publication. His original employer soon discovered that its reporters were constantly being scooped on stories for which they thought they had an exclusive. The paper later discovered that the account for the terminated computer systems manager had never been turned off and that he had repeatedly been accessing the old employer's computer to get information about stories in progress.

Wood says that at the time of an employee termination, user IDs and passwords for both computers and networks should be immediately revoked. Companies should remind a departing employee of any signed confidentiality agreements and collect confidential or proprietary information in his possession, Wood says.

"It may sound elementary, but it's surprising how many organizations do a poor job of this, if they do it at all," Wood says. Part of the problem is that in downsized organizations, IS people are shouldering the duties of departed staff members. Oftentimes, security matters take a backseat because harried workers need to deal with day-to-day activities.

According to Wood, one savvy company has written an application that automatically transfers personnel change-of-status information in a DB2 database running on a mainframe into a security-related computer privilege database. The program automatically revokes the privileges of any users who leave the company. Currently, these interconnected systems are rare.

Security managers also need to consider site access control when dealing with angry former workers, hackers or even unsympathetic managers. "Anyone can pop a smoke bomb into a company's air intake; the sensors would read it as a fire, and the sprinklers would go off," says Ian Murphy, a security consultant who serves as president of IAM/Secure Data Systems, Inc. in Gladwyne, Pa. "For 50 cents, anyone can shut a computer system down."

Murphy notes that dumpster diving, in which hackers go through a company's garbage looking for discarded manuals or internal memos that would tell them more about the telephone or computer system, remains an easy way to steal company jewels. "You'd be amazed what you can find in the trash: access codes, passwords, everything," he says. Murphy would know: As a young man, he hacked his way into a phone company computer using data gleaned from several dumpster diving episodes. •

Ignorance isn't bliss

Without a doubt, the single most effective computer security measure an organization can take is to create a well-informed and competent work force. Employees should be made aware of the ways in which they can be tricked into giving away their passwords or access codes by hackers posing as upper management or telephone company personnel.

According to industry watchers, companies must teach employees to be skeptical and to refuse to give out such information until they can double-check the source.

"Before we let a person drive a car, we give them driving lessons. Why shouldn't we tell employees the rules of the road before letting them cruise on the data highways?" says Scott Charney, chief of the computer crime unit at the FBI in Washington, D.C.

He suggests starting with a security awareness week, complete with seminars, slogans and surveys. Follow that up with posters, newsletters and refresher courses.

Great Moments in Hacker History

SEPTEMBER 1970 John Draper, a.k.a. Captain Crunch, discovers that the prize whistle offered in boxes of Cap'n Crunch cereal perfectly duplicates the 2600 frequency of a WATS line, allowing him to make free telephone calls.

1971 Underground activist Abbie Hoffman forms the Youth International Party Line, which includes tips on getting free cable television and phone service.

MID-1970s/EARLY 1980s Teen computer whiz Kevin Mitnik begins making a habit of tapping into data banks and destroying information, altering credit reports of perceived enemies and disconnecting the phones of celebrities. His most famous exploit — electronically breaking into the North American Defense Command in Colorado Springs — helped inspire the 1983 movie *War Games*.

1976 Two self-described hackers, Steve Jobs and Steve Wozniak, form Apple Computer, Inc., creating a multimillion-dollar industry and giving birth to a new generation of hackers.

JULY 1981 Ian Murphy, a 23-year-old who calls himself Captain Zap, gains notoriety when he breaks into systems at the White House, the Pentagon, BellSouth Corp. and TRW and deliberately leaves his resume.

NOVEMBER 1988 Robert Morris Jr., son of the National Security Agency's chief computer scientist, creates the Internet Worm. The program goes haywire and creates an estimated $40 million to $90 million worth of damage before it is stopped.

LATE 1988 A gang of hackers calling itself the Legion of Doom begins to cruise electronic bulletin boards. Gang members reportedly "borrow" phone company technical documents and distribute them on bulletin boards.

1989 Publication of Cliff Stoll's "The Cuckoo's Egg," a best-selling tale of international computer espionage. Stoll, an astronomer at an Internet lab in Berkeley, Calif., recounts how he electronically tracked down German hackers who were breaking into computers at American and European military and defense industry-related sites to steal information for the KGB.

JANUARY 1990 AT&T has a near-catastrophic experience in the form of a nationwide computer systems crash. The Secret Service spearheads Operation Sundevil, which was designed to track down the authors of the AT&T incident. The crash is attributed to information contained in a text file for the BellSouth 911 emergency number, believed to have been stolen by Legion of Doom members.

JANUARY 1990 Craig Neidorff, 19-year-old editor of the electronic magazine *Phrack*, is charged with illegally publishing BellSouth 911 documents, and his computers are confiscated. Charges are later dismissed when it is discovered the documents are publicly available for less than $30.

MARCH 1990 The Secret Service raids the home of Steve Jackson, who published role-playing computer games in Austin, Texas. Agents seize computers they say contain a "handbook of computer crime," which is later discovered to be a role-playing book under development. Jackson is not charged with any crime, but the prolonged disruption and seizure of equipment brought his business close to bankruptcy.

JULY 1990 Several pioneers of the PC industry, including Steve Wozniak, Lotus Development Corp. founder Mitch Kapor and Sun Microsystems, Inc. co-founder John Gilmore, form the Electronic Frontier Foundation (EFF) to protect the First and Fourth Amendment rights in computer technology. The EFF claims Operation Sundevil violates Fourth Amendment protection against illegal search and seizure.

AUGUST 1990 Computer Professionals for Social Responsibility file a Freedom of Information Act request for FBI records on secret monitoring of bulletin boards across the country.

JULY 1992 In New York, five young men are charged with breaking into computer systems at several regional phone companies, large firms such as Martin Marietta, universities and credit-reporting concerns such as TRW, which reportedly had 176 consumer credit reports stolen. The case marks the government's first investigative use of court-authorized wiretaps to obtain conversation and data transmission of hackers.

DECEMBER 1992 Kevin Poulsen, an infamous hacker who once used the computer network alias "Dark Dante," is charged with stealing tasking orders relating to an Air Force military exercise. Poulsen is accused of theft of national information under a section of the federal espionage statute and faces up to 10 years in jail.

—James Daly

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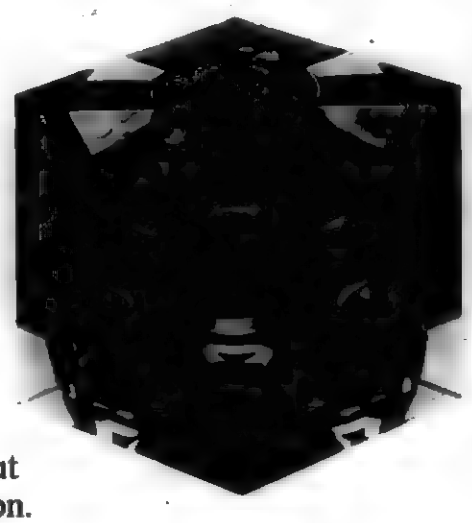

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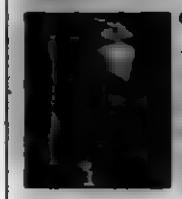
Evolution of IS

Surviving the coming jolts

By Leslie Goff

WILL YOU BE OBSOLETE in the information systems organization of the year 2000? If you're not sure, try asking yourself a few questions: Are you ready to slug the next person who says Cobol programming is dead? Do you still think of networks as "the big three — ABC, NBC and CBS"? Is "the business" a place you keep meaning to visit, like Tahiti?

PREPARING FOR 2000



"It's essential that you get out of your local environment – look around. Look at the companies that are eight years ahead of yours, and you're looking at the year 2000 for your company."

Richard Koeller, Whirlpool Corp.

If you answered "yes" to any of these questions, you might as well answer yes to the first.

Technology may not look radically different in the year 2000 than it does now, but the IS organization will. Those who change with the times will be the best-positioned for the jobs to come, according to IS managers and futurists.

"The new IS professional will be a hybrid, born and raised in the business world but working from a strong base of management and computer skills," says Peter de Jager, an IS consultant and speaker in Brampton, Ontario.

The march out of IS and into the business units will continue, and IS professionals will face job competition from end users who acquire technical skills. The IS organization will be flatter, with less room to move up.

Depending on how aggressively IS reacts to the change, the IS professional "could be displaced to the level of a mere technician," says Joseph Coates, president of Coates and Karret, a futures research firm in Washington, D.C.

Robert Zawacki, a professor of management and international business at the University of Colorado in Colorado Springs, describes the future systems department as "nothing more than a network organization" with responsibility for strategy, standardization and infrastructure issues. Other views differ.

Richard Koeller, vice president of information technology at Whirlpool Corp. in Benton Harbor, Mich., says firms will increasingly value information over technology. "The importance of technology will remain the same, but the importance of information will double," he says.

There is good news for the IS professional who takes on distributed technologies — local- and wide-area networks, telecommunications, PCs, Unix, C++ — and improves "soft" skills. The rising tide of end-user computing and the increased emphasis on information access will create IS jobs dispersed throughout business.

PREPARING FOR 2000

"Read trade books, take night courses, go to trade shows to see new developments. Stay ahead. If you think you're through with your education, you'll be passed by."

Robert Zawacki, University of Colorado

Help desks and customer support organizations will rise in importance. Voice and data networks will continue to merge, opening telecommunications and networking positions. Decision-support systems will proliferate.

"There will be a lot of IS jobs that don't exist today," Koeller says. "There will be changes in how we do the work and what the work is."

"All of our jobs will change," says Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Kansas City, Mo. "Things will evolve from mainframes being the focus to servers being the focus."

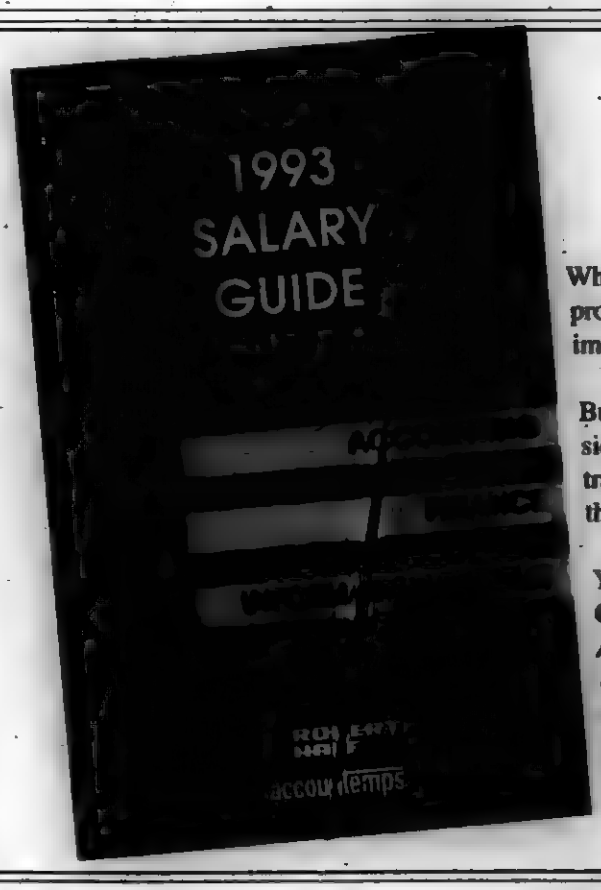
Instead, "business analysts" or "business systems consultants" will be as universal as mainframe programmers were in the 1970s. These IS professionals will be interdisciplinary, with myriad strong technical skills and business sense.

PREPARING FOR 2000

"We'll know a lot more [about the shape of things to come] in the next three years, so now is the critical time to tune in to trade information and the media for information on trends."

Gerald Celente, The Trends Research Institute

Goff is a New York-based freelance writer.



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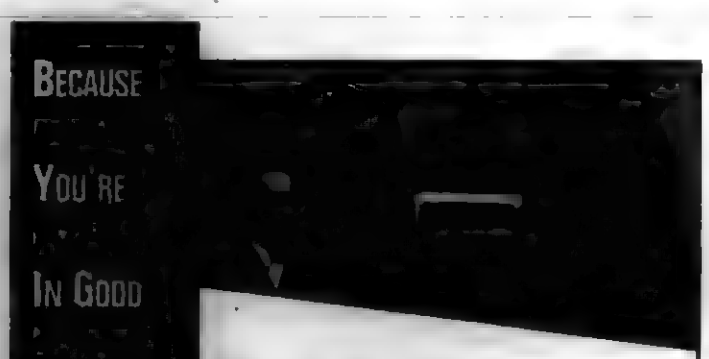

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DB2 Programmer

Working in our Customer Information Systems Department, you will be instrumental in developing our new Customer Information File (CIF) system. This will include designing software to utilize DB2. To qualify, you must have a strong DB2 applications background and experience in designing COBOL applications. In addition, you'll need excellent communication, project management, and leadership skills as well as a commitment to quality and a high degree of creativity. Reference Department CW-AG.

DB2 Systems Programmer

We're looking for an individual to support the maintenance and new releases of QMF and DB2 in our Corporate Data Processing Services Department. This will include supporting performance, tuning and troubleshooting in an on-call capacity. Our ideal candidate will have at least 2 years' DB2 systems programming experience and a Bachelor's degree or equivalent. Strong communication and negotiation skills are also required as is some IMS programming experience. Reference Department CW-SD.

In return for your contributions, you'll enjoy a competitive salary and a variety of benefits. For immediate consideration, please send your resume, indicating the Department code for the position for which you are applying, to SAFECO Corporation, SAFECO Plaza, Personnel T-17, Seattle, WA 98185. You may also FAX your resume to (206) 545-6362. We are an equal opportunity employer committed to hiring a diverse workforce.

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This position requires: Bachelor's degree in Computer Science, Information Systems, or related field, minimum of 5 years experience in information systems design and development; minimum of 2 years experience in the re-engineering of mainframe legacy systems within a diverse CICS/DB2/ADABAS environment incorporating the use of client server technology; minimum of 2 years PC/LAN/WAN experience. Additional experience with DB2, ADABAS, CICS, COBOL, NATURAL, Microsoft Lan Manager, OS/2, and Windows is desirable.

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Designation change

Cast your vote on certification

By Mary Jo Haught

CDP. CCP. CSP. If you don't know what these acronyms mean, it's OK, because soon you won't have to.

They're part of the confusing alphabet soup used in the certification of computer professionals. The acronyms stand for Certified Data Processor, Certified Computer Programmer and Certified Systems Professional.

Now, the nation's largest certifier of information systems professionals and managers is preparing to simplify the process by standardizing titles.

The Institute for the Certification of Computer Professionals (ICCP), a consortium based in Des Plaines, Ill., plans to combine the titles in the hopes of making certification more widespread.

Title wave

An estimated 47,000 IS professionals are certified. Many IS professionals, however, are confused about titles or feel they don't fit into existing title categories.

Starting next January, all IS professionals will be broadly grouped under a single title, which has yet to be chosen. The new title will be representative of those currently certified, as well as those who wish to be in the future.

Once certified, computer professionals may choose from among several specialties including business information systems, communications, office information systems, software engineering, systems programming and systems security. They can be certified for two specialties per test session, along with as many specialty areas as they're willing to prepare for. They can also petition the ICCP to add other specialties to the certification program.

Robert S. Tipton, chairman of the Single Designator Transition Committee, says the organization hopes the new, simplified process will benefit the entire IS profession and help to set new directions. Besides increasing visibility, a single common title raises professional standards by helping members upgrade skills, he says.

In addition, in surveys conducted by the ICCP, 92% of chief information officers indicated that the presence of an ICCP certificate on a candidate's resume influences their hiring decision. Between 57% and 82% of supervisors and CIOs said certification would have some bearing on promotions, salary increases, performance appraisals and consideration for supervisory responsibilities.

In hopes of attracting new interest, the ICCP will also begin offering terminal-based examinations at several sites by year's end.

The 21 member societies of the ICCP — including the Association for Computing Machinery, Association for Information Management, Association for Systems Management, Association for Women in Computing, Black Data Processing Associates and Data Processing Management Association, to name a few — are now trying to determine what the new title designation should be.

If you're interested in suggesting title names, call Tipton at (303) 730-1118, or fax/mail your suggestions using the form at the right.

Haught, a CDP, is a software engineer at MJ Systems in Charlottesville, Va. She is a member of the Data Processing Management Association board of directors.

ICCP Institute for the Certification of Computer Professionals

Single Designator Survey

1. My choice for the new certification title (full words):

2. Reason I support this choice:

3. I currently hold this/these certifications (check all that apply):
   ☐ CCP ☐ CDP ☐ CSP

4. My total professional computing experience (in years):
   ☐ Less than 10 ☐ 10-20 ☐ More than 20

5. I am active in the following ICCP societies:

6. Additional comments:

Please fax completed form by April 1, 1993 to Robert S. Tipton, Chairman, ICCP/Single Designator Transition Committee, at (708) 299-4280 or send c/o ICCP, 2200 E. Devon Ave., Suite 268, Des Plaines, Ill. 60018-4503.

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If you have a career question you've always wanted to ask your boss but didn't have the courage, Tom Loone has your answer. The vice president of IS at Alamo Rent-A-Car, Inc. will be our Fast Track guest adviser in the April 12 issue. If you'd like him to answer your career question, fax it to Kelly Sewell by March 26 at (508) 875-8931.

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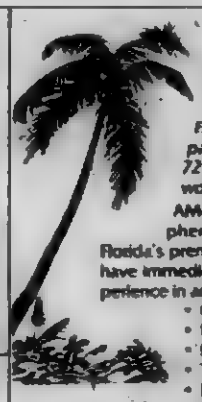
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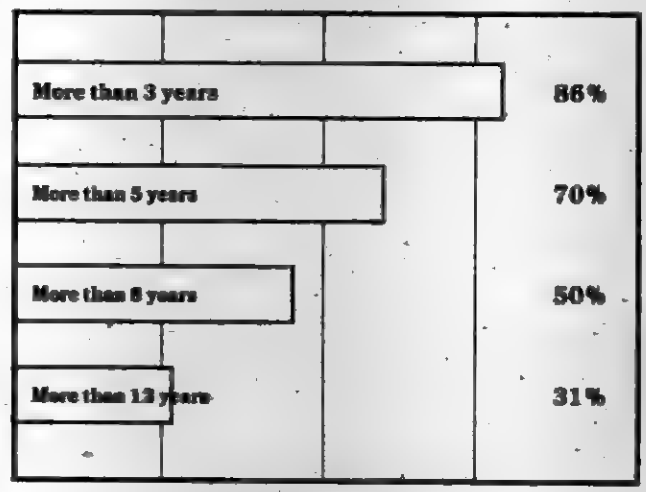

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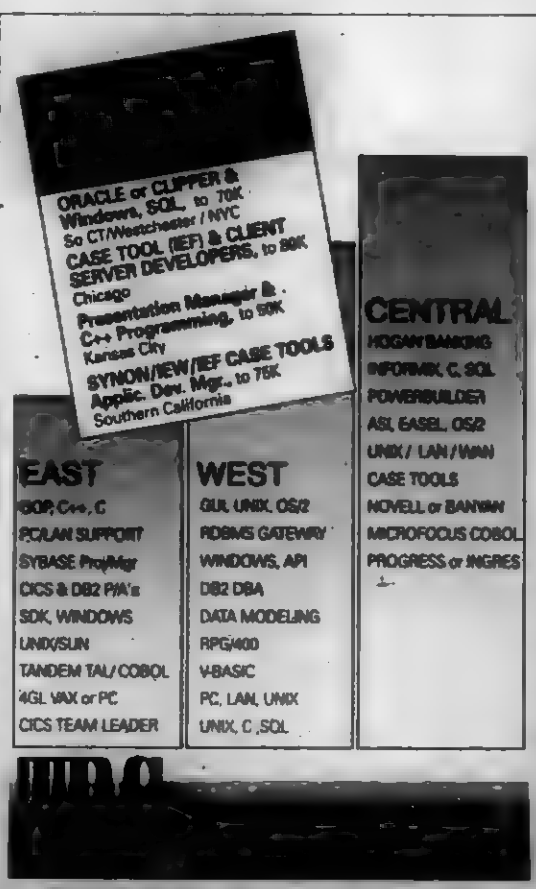

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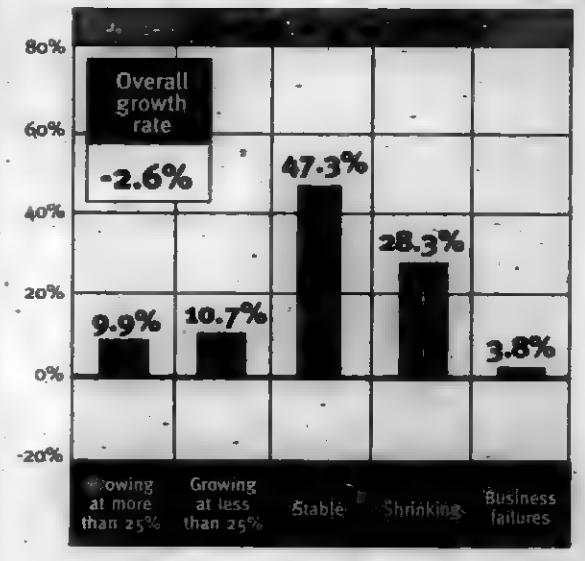

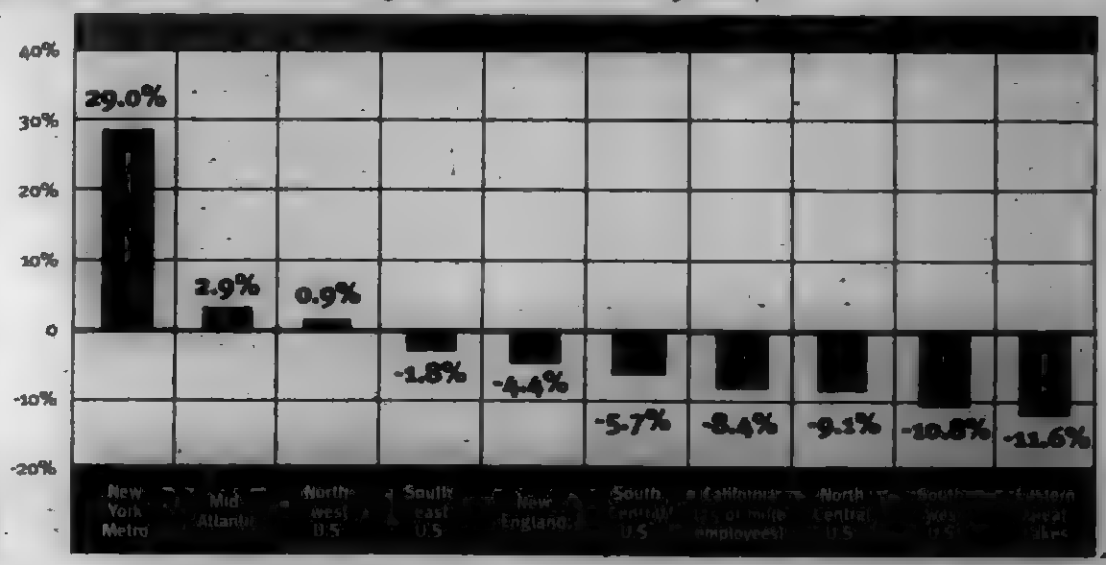

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Marketplace

Software marketing

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By Joe King

SOFTWARE MARKETing is always changing. One of the most popular tactics — upgrades — has heads spinning.

Though keeping up with the latest upgrade may not be harmful to most companies, it has brought to light a few questionable selling practices in the retail channel.

There are actually two types of upgrade practices: the constant release of new upgrades, which hurts the consumer, and the competitive upgrade offer, which hurts the industry and encourages dishonesty.

In the first case, major product upgrades are usually preceded by direct mailers offering a "once in a lifetime" deal for the most recent version — but only if you act now. The catch is, the next release is usually announced two months later. Buyers can avoid losing out by paying attention to the market.

The increase in the number of new releases has added confusion to the practice of competitive upgrades. The competitive upgrade offer is used to woo buyers of one product to a competing product by offering an attractive price. To get the upgrade, resellers often require buyers to prove that they already own a copy of a "full" product.

Proof usually consists of the original disk of a competing product or the first page of the product's manual. Most often, it is the reseller's responsibility to send this proof to the software publisher.

The reason that proof is necessary is that an "upgrade" is actually identical to a full package only in less glitzy packaging. It comes with full documentation and installs just like a new package. The software publishers are actually trying to keep buyers from getting what amounts to a a full package at 50% to 300% off the original price.

However, when resellers were asked what they did with this documentation, store managers replied that it was "kept on file in case the publisher asked for it" — which never happened. Some even admitted to throwing it out or not collecting it at all.

In short, the process of filling out forms and tearing out manual pages of previous versions is a sham. In my experience, retailers and resellers are not required to report anything back to the software publisher.

Onus on retailer

What's wrong is that the burden is left entirely on the shoulders of the retailer to ensure the consumer's honesty. I think the software publishing industry is enabling widespread fraud by making upgrades identical to a full package. To make matters worse, software publishers practically encourage retailers to look the other way by not having some form of upgrade documentation reporting back to them. Why would any savvy consumer pay $395 for a new package when the upgrade is sitting right next to it on the shelf for $99?

The other ethical question raised is which price represents the real value for the software? If the software publisher makes an adequate margin on the upgrade price, the full retail must provide a windfall profit. If the publishers are not making a profit at the upgrade price, their stockholders should be upset. We call the practice "dumping" when the Japanese or Korean companies sell their products to the U.S. at no profit.

If the practice of competitive upgrades is to continue, a reporting requirement that ensures compliance with the upgrade policies must be put into place.

I wonder if my local Lexus dealer would accept the cover page from the owners manual of my 10-year-old Buick in return for 75% off the sticker price?

King is president of Crossroad Partners, a software publisher in Shrewsbury, N.J.

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Todd Herschell, a PC consultant and free-lance writer based in Burbank, Calif.

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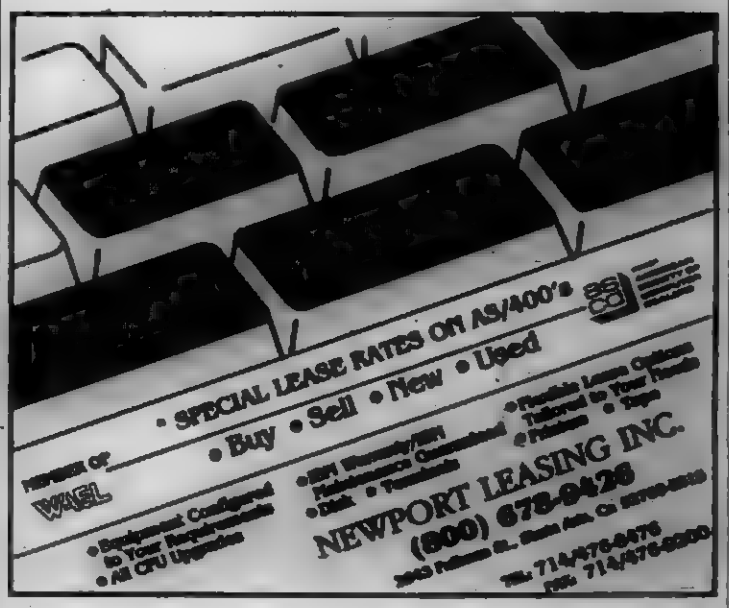
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PS/2 Model 55SX	$875	$750
PS/2 Model 60	$500	$475
ThinkPad 300	$1,550	$1,550
PS/2 Model 95-057	$3,300	$2,700
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Portable III	$400	$450
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LTE-286	$700	$850
DeskPro-486/33I	$1,850	$1,850
Apple Macintosh SE	$650	$625
IICX	$1,650	$1,500
IICI	$2,300	$2,100
IIFX	$2,900	$2,500
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Government	62,291
Utilities, Communications Systems, Transportation Services	58,516
Mining, Construction, Petroleum & Refining	17,618
Manufacturers of Computers & Peripherals	63,550
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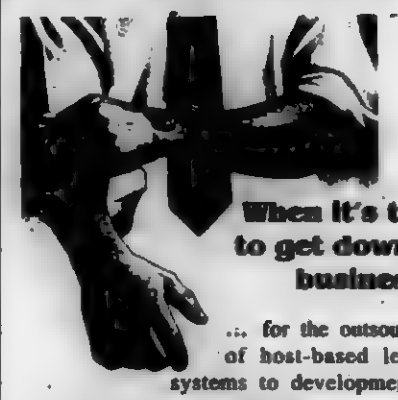

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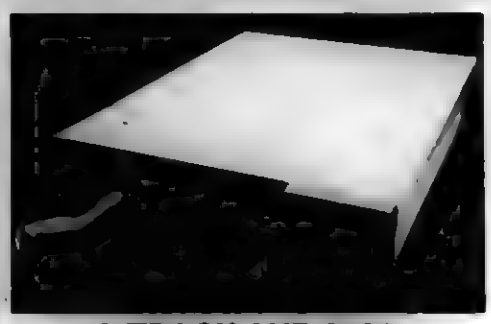

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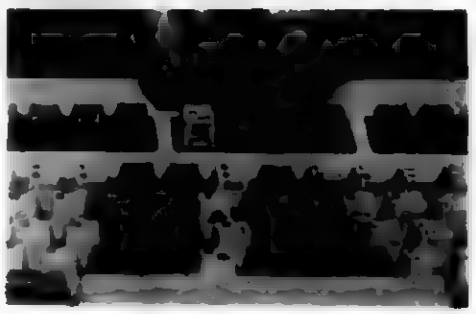

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The Newspaper of IS
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Gainers

Percent

[illegible] Corp.	19.8	Wang Labs Inc. (n)	-50.0
Meca Software	16.0	Cray Computer	-34.3
General Datacomm Ind.	15.3	Western Digital Corp.	-32.3
Maxtor Corp. (L)	14.0	Frame Technology (L)	-29.9
American Software Inc.	13.7	Stratacom Inc.	-23.7
4th Dimension	13.6	Network Computing Devices	-19.0
Exabyte Corp.	13.0	Digital Comm. Assoc.	-18.7
Commodore Int'l	12.5	Proteon Inc.	-17.7

Dollar

American Info Techs Corp.	3.88	Synoptics Communications	-3.38
Micro Focus	3.75	Micron Technology (H)	-4.63
American Power Conversion (H)	3.13	Cisco Systems Inc. (H)	-4.25
Matsushita Electronics	2.75	Texas Instruments (H)	-4.75
4th Dimension	2.75	Frame Technology (L)	-3.63
Maxtor Corp.	2.00	Digital Comm. Assoc.	-3.63
MCI Communications Corp. (H)	2.00	Stratacom Inc.	-3.50
Analog Devices Inc. (H)	1.88	Microsoft Corp.	-3.38

[redacted]

Capital leapfrog

Big-systems vendors no longer dominate the market capitalization charts.

Software colossus Microsoft Corp. (MSPT) and semiconductor firm Intel Corp. (INTL) have both challenged IBM's (IBM) traditional lead in recent months, although IBM's recovery to the mid-50s has widened the gap again.

Internetworking hardware vendors Cisco Systems, Inc. (CSCO) and Cabletron Systems, Inc. (CS) have charged up through the ranks during the past year. Cisco recently surpassed Digital Equipment Corp. (DEC) in market capital by doubling DEC's share price. *—Derek Slater*

Capital fellows

HIGH-TECH COMPANIES WITH THE HIGHEST MARKET CAPITALIZATION

Company	Stock price	Shares outstanding	Market capitalization
IBM	55	570,800	$31.39
Intel Corp.	128 5/8	217,449	$25.80
Microsoft Corp.	87 5/8	275,062	$24.10
Hewlett-Packard Co.	77 1/4	252,000	$19.47
Novell, Inc.	34 3/8	310,858	$10.69
Automatic Data Processing, Inc.	54 1/8	140,007	$7.58
Apple Computer, Inc.	57	121,156	$6.91
Electronic Data Systems Corp.	30 7/8	206,220	$6.37
Cisco Systems, Inc.	95 3/4	64,487	$6.18
Digital Equipment Corp.	46 1/8	129,000	$5.95
Oracle Corp.	36 1/8	142,041	$5.13
Computer Associates International, Inc.	25 1/2	167,278	$4.28
Compaq Computer Corp.	52	81,585	$4.24
Cabletron Systems, Inc.	89 3/8	28,108	$2.51
First Financial Management	85 1/8	57,892	$2.50
Newbridge Networks Corp.	58 3/4	38,803	$2.28
SynOptics Communications, Inc.	92 1/2	22,258	$2.06
Policy Management Systems	85 3/4	23,355	$2.00

Sources: Alex. Brown & Sons, Inc.; Montgomery Securities

Losers

Percent

[illegible] Corp.	19.8	Wang Labs Inc. (n)	-50.0
Meca Software	16.0	Cray Computer	-34.3
General Datacomm Ind.	15.3	Western Digital Corp.	-32.3
Maxtor Corp. (L)	14.0	Frame Technology (L)	-29.9
American Software Inc.	13.7	Stratacom Inc.	-23.7
4th Dimension	13.6	Network Computing Devices	-19.0
Exabyte Corp.	13.0	Digital Comm. Assoc.	-18.7
Commodore Int'l	12.5	Proteon Inc.	-17.7

Dollar

American Info Techs Corp.	3.88	Synoptics Communications	-3.38
Micro Focus	3.75	Micron Technology (H)	-4.63
American Power Conversion (H)	3.13	Cisco Systems Inc. (H)	-4.25
Matsushita Electronics	2.75	Texas Instruments (H)	-4.75
4th Dimension	2.75	Frame Technology (L)	-3.63
Maxtor Corp.	2.00	Digital Comm. Assoc.	-3.63
MCI Communications Corp. (H)	2.00	Stratacom Inc.	-3.50
Analog Devices Inc. (H)	1.88	Microsoft Corp.	-3.38

Exch	52-Week Range			Mar 19 Wk Price	Wk Net Change	Wk Pct Change
SYSTEMS INTEGRATORS AND INFORMATION SERVICES						
OTC	35.13	9.63	3 COM Corp. (H)	32.38	0.13	0.4
NYS	76.63	56.25	American Info Techs Corp.	76.63	3.88	5.3
NYS	59.13	39.75	AT&T	58.63	1.63	2.9
OTC	3.56	0.75	Aztec Communication Corp.	2.81	-0.19	-6.2
OTC	24.50	10.25	Banyan Systems Inc.	17.25	-3.00	-14.8
NYS	56.75	40.25	Bell Atlantic Corp.	53.13	0.63	1.2
NYS	57.50	43.38	Bellsouth Corp.	54.38	0.63	1.2
NYS	6.63	3.63	Bolt, Beranek & Newman	4.88	0.00	0.0
OTC	18.50	10.00	Brookfrout Technology	11.00	-2.00	-15.4
NYS	92.25	42.13	Cabletron Systems	84.00	-3.38	-3.9
OTC	38.50	17.75	Chipcom Corp.	30.00	-0.25	-0.8
OTC	96.50	33.00	Cisco Systems Inc. (H)	89.38	-4.25	-4.5
OTC	26.50	5.50	Compression Labs Inc.	12.63	-0.13	-1.0
OTC	4.63	0.88	Data Switch Corp. (H)	4.38	0.31	7.7
NYS	22.25	13.75	Digital Comm. Assoc.	15.75	-3.63	-18.7
OTC	13.75	7.00	Digital Systems Int'l Inc.	7.50	0.25	3.4
OTC	29.50	4.00	DSC Communications	25.88	-2.38	-8.4
OTC	9.60	4.75	Fibronix Int'l Inc.	7.75	-0.38	-4.6
OTC	37.00	10.50	Fluenet Corp.	11.75	0.50	4.4
OTC	4.38	1.50	Gandalf Technologies Inc.	3.44	0.06	1.9
OTC	2.06	0.69	Gateway Communications	1.56	-0.25	-13.8
NYS	10.50	2.88	General Datacomm Inds.	10.25	1.38	15.5
ASE	4.13	2.00	Gti Video	2.56	0.00	0.0
NYS	37.75	28.88	GTE Corp.	36.13	-0.25	-0.7
NYS	78.63	62.50	ITT Corp. (H)	78.63	0.63	0.8
OTC	44.38	29.50	MCI Communications Corp. (H)	44.38	2.00	4.7
OTC	12.75	2.75	Microcom Inc.	3.88	-0.63	-13.9
OTC	24.25	8.00	Netrix Corp.	8.50	-0.50	-5.6
OTC	19.00	9.63	Network Computing Devices	12.75	-3.00	-19.0
NYS	15.88	7.50	Network Equipment Tech.	7.50	-1.13	-13.0
OTC	23.25	8.00	Network General	13.50	-1.00	-6.9
OTC	15.75	8.50	Network Systems Corp.	10.50	-0.88	-7.7
OTC	60.25	13.63	Newbridge Networks Corp. (H)	55.13	-3.25	-5.6
NYS	48.00	30.50	Northern Telecom Ltd.	43.13	-0.63	-1.4
OTC	35.25	22.50	Novell Inc. (H)	33.00	-1.75	-5.0
NYS	92.50	69.13	Nynex Corp.	88.38	0.50	0.6
OTC	34.75	16.50	Octel Communications Corp.	25.75	-1.50	-5.5
OTC	8.00	3.38	Penril Data Comm Networks	4.44	-0.19	-4.0
OTC	45.75	10.25	Picturetel Corp.	21.88	-1.13	-4.9
OTC	15.75	6.38	Proteon Inc.	6.38	-1.38	-17.7
NYS	30.38	10.16	Scientific Atlanta Inc.	22.00	-0.50	-2.2
NYS	75.63	56.63	Southwestern Bell Corp.	72.63	0.63	0.9
NYS	31.25	20.75	Sprint Corp.	31.25	1.25	4.2
OTC	27.00	8.75	Standard Microsystems Corp.	19.00	-0.50	-2.6
OTC	18.50	6.88	Stratacom Inc.	11.25	-3.50	-23.7
OTC	95.50	18.75	Synoptics Communications	85.75	-5.38	-5.9
OTC	7.13	4.25	Telebit Corp.	4.63	-0.50	-9.8
OTC	9.38	2.13	Telematics Int'l Inc.	7.25	-0.63	-7.9
OTC	25.50	13.38	US Robotics	20.25	0.25	1.3
NYS	43.88	32.88	U S West Inc.	42.25	1.50	3.7
OTC	46.00	12.00	Wellfleet Communications	39.75	-1.00	-2.5
OTC	22.00	7.00	Xircom	8.50	-0.50	-5.6
PCS AND WORKSTATIONS						
OTC	7.50	2.81	Advanced Logic Research	2.81	-0.31	-10.0
OTC	65.25	41.50	Apple Computer Inc.	54.00	-2.50	-4.4
OTC	24.25	11.25	AST Research Inc.	14.00	-0.63	-4.3
NYS	16.25	4.75	Commodore Int'l	5.63	0.63	12.5
NYS	58.50	22.25	Compaq Computer Corp.	48.25	-2.38	-4.7
OTC	49.88	19.00	Dell Computer Corp.	35.38	-1.50	-4.1
NYS	85.00	50.25	Hewlett Packard Co.	73.25	-1.88	-2.4
NYS	33.00	14.13	Silicon Graphics	30.38	-0.50	-1.6
OTC	41.00	22.50	Sun Microsystems Inc.	30.38	-2.25	-6.9
NYS	32.13	22.25	Tandy Corp.	26.38	0.00	0.0
NYS	9.75	5.00	Zenith Electronics	6.63	-0.63	-8.6
OTC	16.75	2.75	Zeos International Ltd.	5.13	0.00	0.0
LARGE SYSTEMS						
ASE	18.38	6.63	Amdahl Corp.	7.88	0.00	0.0
NYS	14.00	4.75	Convex Computer	5.50	-0.38	-6.4
OTC	6.13	1.88	Cray Computer	2.88	-1.50	-34.3
NYS	44.50	19.00	Cray Research Inc.	26.38	-1.88	-6.6
NYS	13.88	7.13	Data General Corp.	12.88	-0.50	-3.7
NYS	59.13	30.38	Digital Equipment Corp.	45.75	-0.38	-0.8
NYS	38.63	26.63	Harris Corp.	37.00	2.00	5.7
NYS	100.38	45.88	IBM	54.25	-0.75	-1.4
OTC	22.00	5.50	Kendall Square Research (H)	18.63	-1.88	-9.1
NYS	110.00	83.00	Matsushita Electronics	98.25	2.75	2.9
OTC	17.00	6.00	Pyramid Technology	15.25	-0.50	-3.2
OTC	24.00	11.13	Sequent Computer Sys.	18.13	-0.50	-2.7
OTC	16.38	1.38	Sequoia Systems Inc.	2.38	0.06	2.7
NYS	49.75	29.50	Stratus Computer Inc.	34.88	0.63	1.8
NYS	16.88	9.88	Tandem Computers Inc.	13.38	0.13	0.9
NYS	13.88	7.75	Unisys Corp.	13.50	0.00	0.0
ASE	6.13	0.06	Wang Labs Inc. (n)	0.50	-0.50	-50.0
SOFTWARE						
OTC	56.50	25.25	Adobe Systems Inc.	43.13	2.38	5.2
OTC	26.50	10.25	Aldus Corp.	17.50	-0.88	-4.8
OTC	18.75	5.63	American Software Inc.	7.25	0.88	13.7
OTC	28.13	9.75	Ask Computer Systems (H)	25.75	0.25	1.0
OTC	56.50	27.75	Autodesk Inc.	43.00	-2.75	-6.0
OTC	25.50	3.50	Bachman Info. Systems	3.88	-0.19	-4.6
OTC	43.00	14.00	BGS Systems Inc.	41.00	0.00	0.0
OTC	84.13	37.25	BMC Software Inc.	51.75	-2.50	-4.6
OTC	28.25	17.00	Boole & Babbage	26.25	0.50	1.9
OTC	71.50	17.50	Borland Int'l Inc.	22.75	0.00	0.0
OTC	8.88	1.00	CE Software	3.44	-0.31	-8.3
ASE	35.00	9.38	Cheyenne Software Inc.	29.25	-1.25	-4.1
OTC	19.50	8.25	ChipSoft	13.00	-0.38	-2.8
OTC	9.75	5.63	Cognos Inc.	6.75	0.00	0.0
NYS	27.38	10.88	Computer Associates	24.13	-0.75	-3.0
NYS	12.38	4.00	Computervision Corp.	5.25	-0.38	-6.7
OTC	18.50	6.75	Comshare Inc.	9.00	0.00	0.0
OTC	17.25	10.75	Corel Corp.	14.75	0.50	3.5
OTC	41.25	6.00	Easel Corp.	10.88	1.25	13.0
OTC	25.25	12.00	4th Dimension	23.00	2.75	13.6
OTC	24.75	7.50	Frame Technology (L)	8.50	-3.63	-29.9
OTC	22.25	12.50	Group 1 Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta	24.25	-2.75	-10.2
OTC	8.75	3.50	Mogan Systems Inc.	7.75	0.00	0.0
OTC	25.75	12.25	IMRS	16.50	0.25	1.5
OTC	34.75	18.50	Information Resources	28.50	-2.25	-7.3
OTC	42.00	22.13	Informix Corp.	32.25	-1.25	-3.7
OTC	19.25	11.00	Intergraph Corp.	12.00	-0.25	-2.0
OTC	13.63	7.75	Interleaf Inc.	9.63	-0.38	-3.8

Exch	52-Week Range			Mar 19 Wk Price	Wk Net Change	Wk Pct Change
OTC	18.25	7.00	Intersolv Inc.	8.00	-0.50	-5.9
OTC	17.75	9.50	Knowledgeware Inc.	9.75	-0.38	-3.7
OTC	54.75	28.75	Legent Corp.	40.50	-1.75	-4.1
OTC	36.75	14.75	Lotus Development	26.00	-0.50	-1.9
OTC	23.00	15.25	MathSoft	15.25	-3.00	-16.4
OTC	23.25	5.50	McAfee Associates	7.50	-0.25	-3.2
OTC	8.88	1.88	Meca Software	8.88	1.25	16.4
OTC	19.00	5.25	Mentor Graphics	10.00	0.63	6.7
OTC	46.00	27.25	Micro Focus	37.00	3.75	11.3
OTC	20.50	6.50	Micrografx Inc.	8.63	0.63	7.8
OTC	95.00	65.50	Microsoft Corp.	84.63	-3.38	-3.8
OTC	36.88	12.00	Oracle Corp. (H)	34.63	0.25	0.7
OTC	31.88	13.13	Parametric Technology	28.50	-0.88	-3.0
OTC	40.50	22.50	Peoplesoft	27.75	-2.38	-7.9
OTC	11.00	3.50	Phoenix Technologies	4.13	-0.63	-13.2
OTC	40.00	29.50	Powersoft (L)	30.50	-2.75	-8.3
OTC	25.00	11.25	Platinum Technology	13.00	-2.75	-17.5
OTC	61.50	29.00	Progress Software Corp.	45.00	-1.75	-3.7
OTC	21.00	2.94	Quarterdeck Office Sys.	3.50	-0.50	-12.5
OTC	26.50	11.75	Rainbow Technologies Inc.	19.50	-1.25	-6.0
OTC	22.25	6.00	Rasterops	6.88	-0.63	-8.3
OTC	15.25	3.63	Ross Systems	13.88	1.25	9.9
OTC	27.25	8.50	Sapiens USA Inc.	21.50	-1.75	-7.5
OTC	25.38	6.75	Software Publishing Corp.	13.13	0.25	1.9
OTC	9.13	2.00	Software Toolworks Inc.	8.13	0.38	4.8
OTC	5.13	0.75	Spinnaker Software	2.25	0.19	9.1
OTC	15.00	3.25	State of the Art	11.25	-0.75	-6.3
NYS	24.50	13.75	Sterling Software Inc. (H)	24.50	1.25	5.4
OTC	20.25	8.00	Struct. Dynamics Research	15.75	-2.00	-11.3
OTC	62.25	21.00	Sybase Inc.	57.50	-1.75	-3.0
OTC	47.50	5.88	Symantec Corp.	11.63	-0.25	-2.1
NYS	13.50	5.25	Systems Center Inc.	8.75	0.00	0.0
OTC	29.50	10.00	System Software Assoc.	14.50	1.50	11.5
OTC	9.63	2.50	Tivoli Corp.	4.63	0.13	2.8
OTC	22.75	9.13	Viewlogic Systems	16.88	-2.38	-12.3
OTC	23.75	8.13	Wallen Interactive Systems	9.00	-0.38	-4.0
OTC	4.31	1.38	Wonderstar	2.50	0.19	8.1
SEMICONDUCTORS						
NYS	24.50	7.38	Advanced Micro Devices (H)	23.00	-0.50	-2.1
NYS	20.63	9.00	Analog Devices Inc. (H)	20.63	1.88	10.0
OTC	20.13	7.63	Atmel Corp.	17.38	-1.38	-7.3
OTC	11.75	3.13	Chips and Technologies	4.00	0.44	12.3
OTC	39.75	16.25	Cirrus Logic	25.13	-3.38	-11.8
NYS	15.75	7.38	Cypress Semiconductor Corp.	10.63	-0.63	-5.6
NYS	16.13	7.00	Dallas Semiconductor	14.25	-1.00	-6.6
OTC	121.25	46.50	Intel Corp.	115.00	-2.25	-2.3
NYS	14.13	4.88	LSI Logic Corp. (H)	12.63	-1.25	-9.0
NYS	28.50	12.88	Micron Technology (H)	23.13	-4.63	-16.7
NYS	66.50	36.44	Motorola Inc. (H)	63.25	-1.50	-2.3
NYS	14.13	8.25	National Semiconductor	13.00	-0.25	-1.9
OTC	21.25	8.25	Sierra Semiconductor	12.75	-0.75	-5.6
OTC	38.50	22.25	SynOptics	27.13	-1.88	-6.5
NYS	63.38	31.50	Texas Instruments (H)	57.13	-4.25	-6.9
OTC	9.88	6.00	VLSI Technology	6.88	-0.25	-3.5
OTC	7.63	2.13	Weitek	6.88	-0.13	-1.8
ASE	9.63	3.50	Western Digital Corp.	5.50	-2.63	-32.3
OTC	37.50	14.50	Xilinx (H)	33.25	-2.88	-8.0
OTC	27.84	12.50	Zilog Inc.	23.75	-0.25	-1.0
PERIPHERALS AND SUBSYSTEMS						
OTC	31.00	10.38	American Power Conversion (H)	30.38	3.13	11.5
OTC	20.16	13.66	Banctec Inc. (s) (L)	16.88	-0.63	-3.6
OTC	20.75	9.25	Cambex Corp.	11.50	-0.13	-1.1
ASE	18.38	7.25	Cognitronics Corp.	7.88	-1.25	-13.7
NYS	35.50	16.13	Conner Peripherals	16.38	-1.25	-7.1
OTC	38.50	10.75	Creative Technologies Inc.	13.00	1.75	5.6
OTC	30.75	14.25	Data Race Inc.	21.50	-1.00	-4.4
ASE	19.63	4.75	Datapoint Corp.	9.00	0.50	5.9
NYS	28.75	7.25	EMC Corp.	24.25	-1.38	-5.4
OTC	10.50	5.38	Emulex Corp.	6.88	-0.25	-3.5
OTC	19.00	13.25	Evans & Sutherland	16.50	0.50	3.1
OTC	39.25	12.00	Exabyte	15.00	1.25	9.1
OTC	26.00	7.09	Intelligent Info. Systems	21.50	0.25	1.2
OTC	8.88	3.88	Iomega Corp.	4.75	0.38	8.6
OTC	34.75	5.75	IPL Systems Inc.	6.75	0.00	0.0
OTC	24.00	10.75	Komag Inc.	20.25	-1.75	-8.0
OTC	19.63	6.88	Maxtor Corp. (L)	8.13	1.00	14.0
OTC	12.38	6.88	Micropolis Corp.	6.88	-0.88	-11.3
NYS	109.88	85.50	3M Corp (H)	109.75	1.25	1.2
OTC	7.75	4.00	Printronix Inc.	7.25	0.38	5.5
NYS	17.13	6.88	QMS Inc.	15.00	0.00	0.0
OTC	17.88	12.13	Quantum Corp.	13.50	-1.50	-10.0
OTC	12.75	3.75	Radius Inc.	4.88	-0.38	-7.1
NYS	16.25	7.50	Recognition Equipment	12.63	-0.75	-5.6
OTC	13.88	5.50	Rexon Inc.	6.63	0.63	10.4
OTC	22.38	12.00	Seagate Technology	15.00	-1.75	-10.4
NYS	68.75	18.00	Storage Technology	25.00	-0.38	-1.5
NYS	25.75	16.88	Tektronix Inc. (H)	25.75	0.25	1.0
NYS	88.88	68.75	Xerox Corp.	82.13	-0.63	-0.8
SERVICES						
OTC	23.50	12.16	American Mgmt. Systems	22.63	0.50	2.3
NYS	5.38	3.00	Analogic Inc.	4.00	0.25	6.7
OTC	35.75	16.00	Analysts Int'l	29.25	-1.50	-4.9
NYS	56.13	38.75	Auto Data Processing	52.13	-2.00	-3.7
NYS	17.25	9.41	Cedidam Corp.	15.38	0.50	3.4
NYS	17.38	12.50	Comdisco Inc.	16.63	0.75	4.7
OTC	13.00	6.75	Computer Horizons	10.63	-0.38	-3.4
NYS	80.50	57.00	Computer Sciences	75.00	-0.88	-1.2
NYS	9.75	7.00	Computer Task Group	7.50	-0.25	-3.2
NYS	40.50	22.00	CompUSA Inc.	29.50	-0.88	-2.9
OTC	18.50	6.00	Corporate Software	11.75	-0.25	-2.1
OTC	30.75	7.63	Egghead Discount Software	8.25	0.38	4.8
NYS	35.88	25.25	General Motors E (EDS)	30.75	-0.38	-1.2
OTC	25.50	9.25	Inacom Corp.	19.25	-1.50	-7.2
OTC	22.25	6.25	Intelligent Electronics	14.38	-0.25	-1.7
OTC	14.38	6.83	Medisel	12.00	1.25	11.6
OTC	13.50	5.75	Microage Inc.	12.75	-0.25	-1.9
OTC	42.00	21.66	Paychex (H)	40.00	1.25	3.2
NYS	86.88	59.75	Policy Management Sys. (H)	85.00	0.88	1.0
NYS	35.38	16.81	Reynolds and Reynolds	33.88	0.25	0.7
OTC	31.75	22.00	SEI Corp.	29.25	0.00	0.0
OTC	24.38	16.88	Shared Medical Systems	21.63	-0.38	-1.7
OTC	14.38	5.75	SHL Systemhouse	10.13	-0.25	-2.4
OTC	29.25	18.25	Software Spectrum Inc.	24.25	0.25	1.0
OTC	33.75	20.75	Sungard Data Systems	32.63	0.13	0.4
NYS	3.63	1.13	Ultimate Corp.	3.13	0.50	19.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Software sales soar

Despite raging price promotions, North American sales of PC applications reached $1.71 billion in the fourth quarter of last year, up 9.6% from 1991, according to the **Software Publishers Association.** Sales in 1992 totaled $5.75 billion, a healthy 14% increase from a year earlier. DOS sales continued to drop in the fourth quarter, while Microsoft Corp. Windows applications grew 64% to $639 million. Apple Computer, Inc. Macintosh applications rose 16% to $277 million.

Adobe results up

Adobe Systems, Inc. earned $15.4 million in the first quarter ended Feb. 26, a 14% increase from the comparable period last year. Earnings were boosted by $3.9 million from the sale of stock. Revenue climbed 10% to $68.5 million, the Mountain View, Calif., software developer said.

SHORT TAKES **Sun Microsystems, Inc.** is developing wireless communications technology with a private Russian company, Elvis + Ltd. Sun also purchased a 10% interest in the firm. . . . **Control Data Systems, Inc.** in Arden Hills, Minn., has agreed to buy **Evernet Systems, Inc.**, a $40 million network systems integrator based in Los Angeles. The transaction is expected to be finalized in May. . . . **Wall Data, Inc.**, a Redmond, Wash., software vendor, has floated an initial public offering (IPO) of 2.8 million shares, priced at $20 a share. . . . **Dialogic Corp.**, a Parsippany, N.J., developer of call processing systems, registered an IPO of $2.5 million that is expected to fetch between $10 and $12 a share . . . . **NetWorth, Inc.** in Dallas said it expects to break even in the fiscal third quarter that will end March 31, below earlier expectations.

Wang unveils reorganization

By Melinda-Carol Ballou
LOWELL, MASS.

■ Leaving behind its minicomputer legacy, Wang Laboratories, Inc. filed a reorganization plan last week that reiterates a sharpened focus on software and network integration services.

The plan, developed in conjunction with key creditors, is slated to be heard by a bankruptcy court judge within three months, company officials said. The plan is expected to bring the company back to profitability by 1994 as a $1.2 billion enterprise, noted Joe Tucci, Wang's president and chief executive officer.

Wang lost $357 million in 1992, on revenue of 1.9 billion. During the first six months of fiscal '93, Wang had revenue of $711 million, with a net loss of $66 million.

The reorganized company has been divided into five geographic business units, with horizontal product units focusing on software (imaging, office and computer-aided software engineering tools) and network and systems integration, as well as the vestigial VS group. The business units will be responsible for their own profit and loss.

As a result of the new organization, Wang will lay off approximately 3,000 employees, mainly in the VS development and manufacturing groups, the direct sales force and corporate support, officials said.

Wang will not develop future versions of its VS line, though it will continue to service existing platforms.

Tough competition

The software and services road Wang is following will not be an entirely smooth one. Nearly all the other once-proprietary hardware vendors — Digital Equipment Corp., Groupe Bull, Unisys Corp. and IBM — are seeking to gain revenue through systems integration services, and the competition is fierce.

Analysts questioned whether Wang will be able to deliver on all of its products and services to customers as it downsizes.

"There are a lot of questions, and you cannot predict exactly how it will go," said Jim Brennan a senior director at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

A revitalized Wang is betting on deals such as an alliance inked recently with Hewlett-Packard Co. The two companies will jointly market Wang's software products on HP 9000 platforms. This will provide yet another migration platform for VS customers, adding to IBM's Application System/400 and RISC System/6000 and PC local-area network environments previously available to Wang's installed base.

The strategy has merit, other industry analysts said.

"I think it will work and will stabilize the installed base," said Chris Christiansen, a director at International Data Corp., a market research firm in Framingham, Mass. "The false prophets were proven wrong on Wang. They are not going out of business and being broken up; there is still a fundamental value there."

Fresh start?

Salient details of Wang's reorganization plan as approved by a creditors committee:

- Business groups formed to focus on software and network integration services and five geographic regions; head count cut from 9,300 to 6,200.
- Ownership of the firm will be transferred to certain classes of creditors. New stock will be issued.
- Shareholders of Class B and Class C stock will get seven-year warrants to purchase 20% of stock in the new company.
- New board will be elected pursuant to the plan's acceptance by bankruptcy court.

Unisys banks on services

By Thomas Hoffman
BLUE BELL, PA.

After five consecutive profitable quarters, Unisys Corp. is counting on professional services to keep its momentum up.

The professional services push will emphasize systems integration, outsourcing and other information services such as business process re-engineering, said Victor E. Millar, president of Unisys Worldwide Professional Services.

The vendor's plan of attack will be concentrated on the four major vertical markets that last year brought Unisys 80% of its overall revenue: public sector, financial services, airlines and telecommunications.

Millar predicted Unisys would attain 12% to 15% revenue growth in professional services this year.

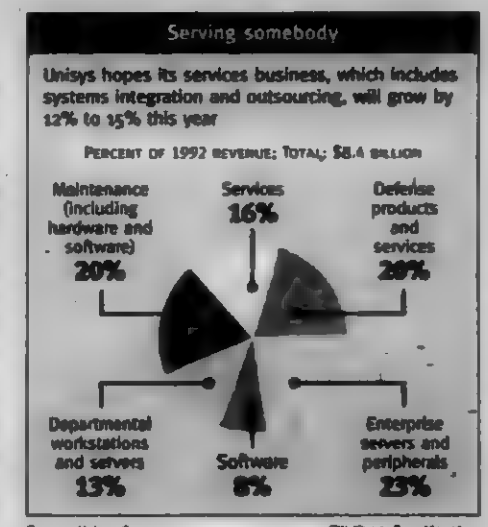
In addition, Unisys plans to provide expanded services such as business process re-engineering and information research such as market, competitive and technology analysis for customers.

Unisys' plans also offer benchmarking services, which would enable clients to compare how other organizations have successfully handled specific departmental tasks.

Some analysts said they like the vendor's chances of success, especially with a 60,000-customer installed base.

"I think they have a fighting chance because of their big customer base, but they are getting a little bit of a late start," noted William J. Milton Jr., a financial analyst at Brown Brothers Harriman & Co. in New York.

Others were not so sure. Fred Joy, a senior analyst at Meta Group, Inc. in Westport, Conn., said he does not think Unisys can compete globally with industry heavyweights such as Electronic Data Systems Corp. but that Unisys can succeed by focusing on its four primary lines of business.



Even outlook

Unisys expects 1993 revenue to be flat, compared with 1992's $8.4 billion, primarily because of weak sales in Europe and Japan. However, the company's continued cost-cutting initiatives should aid profitability.

Unisys already brings some experience to the table in systems integration and outsourcing. For example, last year, Unisys landed two impressive deals here in the U.S. — a $45 million outsourcing deal in January with Subaru of America, Inc. and a 10-year, $56 million outsourcing pact with California Republic Bank, announced in September (CW, Oct. 5, 1992).

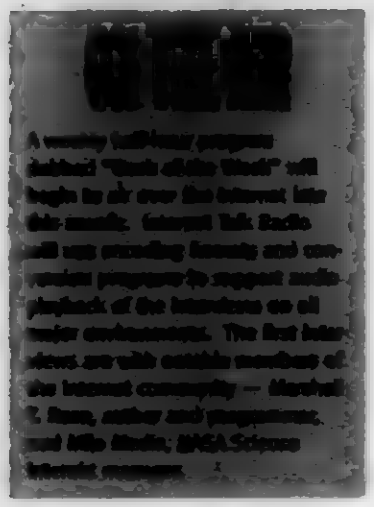
Last year, Unisys snared more than $100 million in outsourcing contracts, according to Dewaine L. Osman, Unisys' vice president of corporate planning.

Unisys customers said they welcome the services-oriented approach. "I think they have a very bright future in professional services. Unisys has downsized to the point where they're ready to face the future, and professional services is a good addition," said Pamela Ackley, software manager at Carlton Computer Support Services, Inc. in Beltsville, Md.

Wysiwyg

Great Names

THOMAS PASCAL FARHAM
Lead programmer analyst, TransAmerica Occidental Life Insurance Co., Los Angeles



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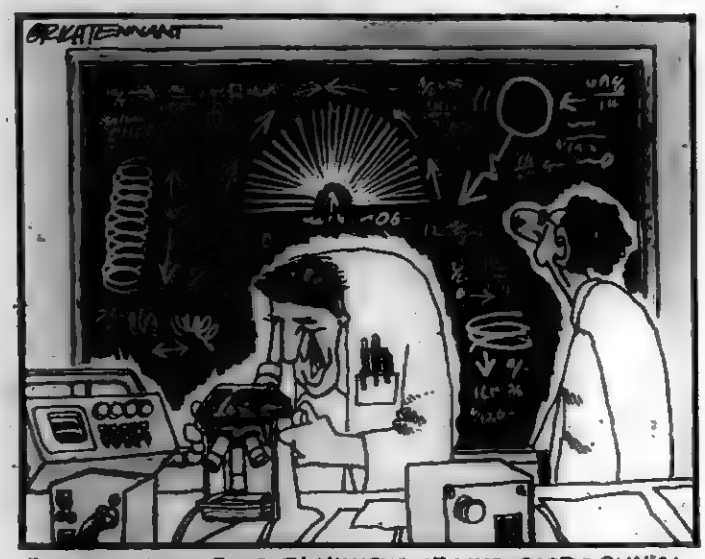
HIGH-TECH MOUSETRAP

The lads at Rentokil's Pest Control Service in the UK have invented a better mousetrap, and they expect the world to beat a path to their door. The poison-free Mouse Alert system consists of two infrared beams and a radio transmitter. When a mouse enters the trap and breaks both beams (there are two to prevent false alarms), the transmitter signals the controller to shut the trap doors. The controller, which can serve over 200 traps, automatically dials the phone number of a pest-control technician, who then removes the mouse "for humane disposal" off-site and resets the trap. The market: food, drug and electronics companies that fear contamination from even a single mouse.

Source: Rentokil Ltd., West Sussex, England

The Fifth Wave *by* Rich Tennant



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Inside Lines

An interface for all seasons

Microsoft is planning to broaden its Open Database Connectivity (ODBC) vendor-neutral programming interface for database connectivity among PC, minicomputer and mainframe systems. Microsoft is reportedly funding Rochester Software Connection, Inc. to develop software that will allow Microsoft to implement ODBC on IBM's AS/400 minicomputers. The product, currently in alpha testing, would allow desktop devices running Microsoft's Windows to access the AS/400 database. Microsoft is expected to begin shipping the product this fall, upon the release of its Access Version 1.2 software.

Doing it their way

Sun is moving ahead with migrating its manufacturing operations to a client/server scheme [CW, March 15]. The company has quietly hired Computer Sciences Corp. (CSC), under a $27 million outsourcing contract, to operate its mainframe-based manufacturing software at a San Diego data center while it develops a client/server version of MRP-II with Oracle to run on Sun hardware. CSC will assist in the implementation and is discussing a strategic alliance with Sun to jointly market the system once the in-house job is complete. Sun has an option to cancel the 89-month outsourcing contract whenever it thinks the client/server system is ready.

More to come

Cisco Systems says the first draft of Advanced Peer-to-Peer Internetworking (APPI), scheduled for release in June, will not be able to interact with IBM's APPN Network Node. The primary reason: Cisco Systems and the APPI Forum do not want to mess with any technology that involves IBM patents. However, the forum is working on a connection between APPI and APPN Network Nodes, aware that many users will want to combine the two types of installations. APPN is gaining ground with IBM shops that want a more dynamic, flexible way to configure and administer their Systems Network Architecture networks, while APPI promises equivalent functions over a TCP/IP backbone.

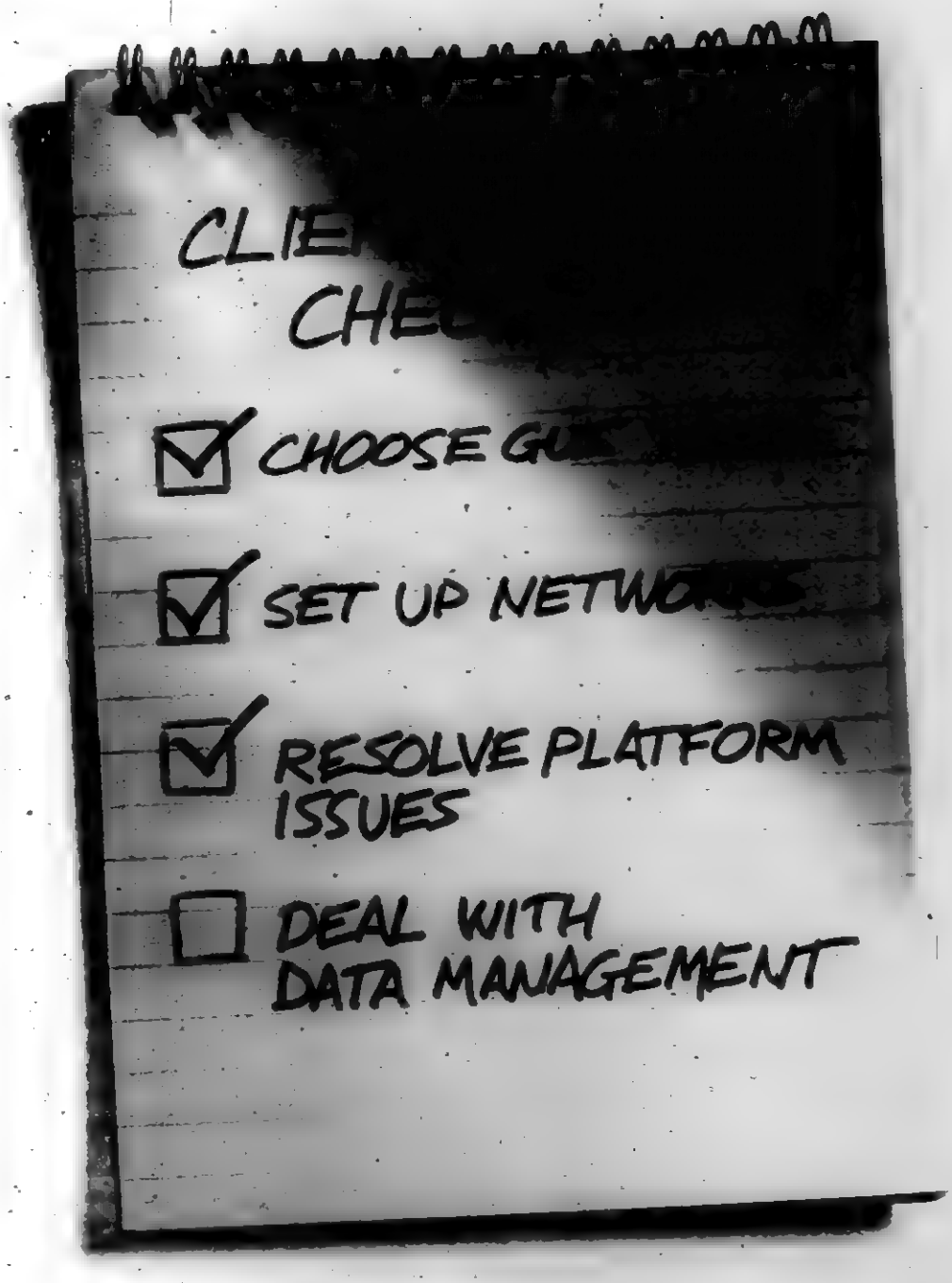
Dell on wheels

Dell is readying a replacement for its 8E line of high-end servers, according to sources. The coming product takes the cabinet of Dell's defunct multiprocessor system, keeps the drive bays and puts in Intel's Pentium chip and the Peripheral Component Interface local bus (see story page 2). The cabinet, which was designed with wheels to make it easier to move around, "looks like R2-D2," one source said. Dell had targeted this product for a mid-April release with a 486 processor in it, but sources said the date may have slipped.

Making a new CASE

Now that KnowledgeWare is part of HP's Unix-based SoftBench application development framework, the Atlanta-based company has to step up plans to roll out Unix products that have been promised for more than a year. A Unix code generator is due late this year, according to a product representative. Meanwhile, ADW, the company's CASE workbench, will support SQL by late summer, with full-fledged support for Oracle and Sybase databases by late 1993, the representative added.

The humor highlight of the Unix unity press conference at Uni-Forum last week was Microsoft's Scott McNealy, who finally said the "M" word in public. That's M for Motif, the GUI from the Open Software Foundation that Sun has fought against for years with its own OpenLook GUI. McNealy was called to the stage to say: "I really love the concept of Motif." At first he blurted out "SPARC" and then "marriage," but he finally got it out. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8566.



The One You Haven't Done Could Be Your Undoing.

As you move to client/server computing, you'll undoubtedly spend countless hours evaluating GUI tools, sorting through network solutions and resolving platform issues. But past experience will tell you that managing your data is just as important. In fact, it's key to delivering information to your users when and where they need it–and making sure it's the right information.

To help you address the issue of data management in a distributed environment, we've developed a useful guide that's yours free. For your personal copy, return this coupon or phone us at **1-800-BACHMAN. In Canada, call 1-800-445-0854.**

Successfully implementing client/server computing isn't easy. But if data management is high on your list, you'll be well on your way to getting the job done.

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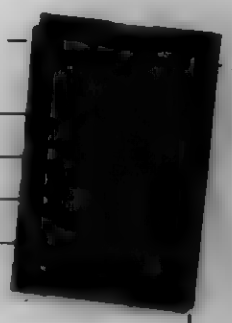

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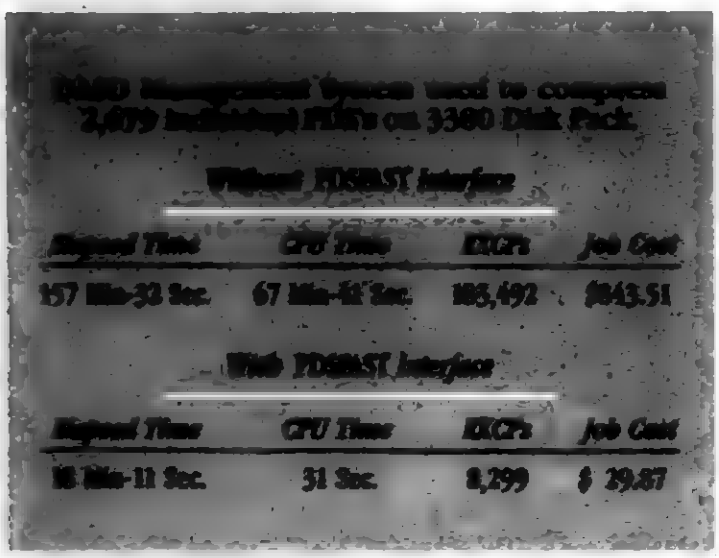

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COMPUTERWORLD

Inside

IBM'S NEW LEADERSHIP
Louis V. Gerstner Jr. may know more about information systems than most people think, judging by some innovative projects undertaken at **American Express** and **RJR Nabisco** during his tenures there. *Page 15.* Gerstner is not the first outsider to take over an ailing computer company. Others who tried have had mixed success. *Page 14*

'INSOURCING'
Pepsico consolidates three IS operations instead of outsourcing, hoping to gain economies of scale without losing control. *Page 1*

PC OPERATING SYSTEMS
MS-DOS 6.0 gets a lukewarm reception from corporate IS while Novell provides a preview of coming initiatives with its DOS 7.0. *Page 4*

CHANGE AT NCR
Gilbert P. Williamson retires as NCR chairman. His successor, **AT&T**'s Jerre L. Stead, has a reputation for cost-cutting. *Page 2*

Users cheer fresh start

By Johanna Ambrosio
ARMONK, N.Y.

The first outsider to be named an IBM chairman and chief executive officer — Louis V. Gerstner Jr., formerly chairman of RJR Nabisco, Inc. — is a welcome sign of IBM's new start, according to many information systems executives interviewed last week.

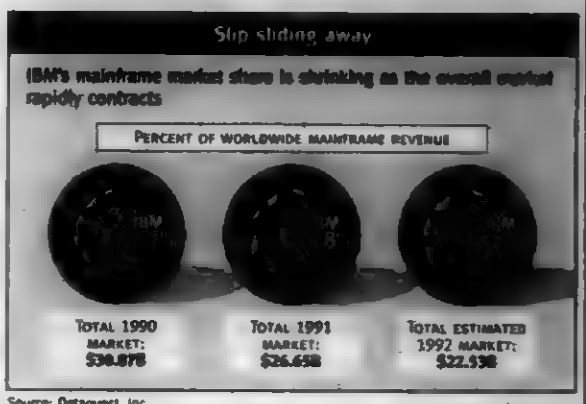
IBM STARTING OVER

"The company needs a fresh direction," said Don Churchill, chief information officer of Walgreen Co. in Deerfield, Ill.

James Matsey, corporate director at Reynolds Metals Co. in Richmond, Va., agreed. "It will be an exciting tenure. This guy is going to look at things from a marketing standpoint. It is a refreshing change."

Gerstner will officially take the reins at IBM this Thursday. His appointment was announced last Friday during a hastily convened press conference at a New York hotel, during which John Akers passed the baton. Akers has led IBM since 1986; his plans were not announced.

Not everyone was completely sold on the idea of a computer-industry outsider leading a company as steeped in technology as IBM. RJR Nabisco's primary holdings are in food companies — including the makers of Oreo cookies and Ritz crackers — and tobacco products such as Camel and Winston cigarettes.



Source: Dataquest, Inc.

A recent *Computerworld* survey of 100 users who do most of their business with IBM found that 51% believe the company's new CEO should have a technology background [CW, March 8].

"You need to know enough [about technology] yourself so you're not snowed," said Dom Tiano, IS director at the Mercer Medical Center in Trenton, N.J. "He doesn't have to be able to install a local-area network, but he needs to understand the general implications of technology."

Most customers said they view the an-

IBM, *page 14*

Demand forces PC paucity

By Michael Fitzgerald

Overwhelming user demand has outpaced the supply of PC products to the point where many resellers and industry officials predict the shortage will continue through the first half of the year. Most vendors blame a lack of components for the shortfalls.

The supply shortages are widespread:

- The IBM PC Co. has acknowledged delays of up to two months with its Personal System/ValuePoint and PS/2 families, and it has a $1 billion backlog for its popular ThinkPad 700 line of notebooks.
- Apple Computer, Inc. has had similar delays with its Quadra servers and PowerBook notebooks.
- Compaq Computer Corp. has cut delivery times for products to a month in general, but continues to suffer shortages, particularly with its DeskPro/I family.
- AST Research, Inc. acknowledged a six- to eight-week backlog for its notebooks and its Bravo line. Gateway 2000 Ltd. acknowledged shortages as well.

PC paucity, *page 16*

Sabre eyes downsizing

By Mark Halper
DALLAS

Mainframe computing's most sacred cow is no longer safe from open systems.

AMR Corp. revealed last week that it will soon cut a sliver of the world's largest transaction processing system over to Unix and that more migration could follow if big iron pricing does not decline.

Max Hopper, senior vice president of information systems, said AMR this fall will switch the cargo-routing portion of its giant airline reservation operation to an IBM RISC System/6000 running an Oracle Corp. database. Behind the move is AMR's need to find less costly alternatives to its mainframe Transaction Processing Facility systems.

Hopper said it could be two to three years before AMR decides whether to migrate other portions

Sabre, *page 10*

System slices

- **Passenger service system:** 7 IBM 3090s, 1.7T bytes of storage.
- **Fare pricing complex:** 4 IBM 3090s, 374G bytes of storage.
- **Flight operating system:** 1 IBM 3090, 242G bytes of storage.
- **A variety of systems** make up 29 off-line mainframes. Twenty of these are DEC VAXs; the remainder are IBM machines, except for one Amdahl machine. Total storage capacity on these is 2,338G bytes.

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Past failures temper hopes for Unix unity

Vendors urged to abandon politics, differing agendas

By Maryfran Johnson

With a long trail of fractured fairy tales behind them, the six computer companies vowing to create a common desktop environment for Unix have much to prove in the coming months, users and analysts agreed last week.

"I've become extremely pragmatic," said Mark Factor, MIS director at the Boston-based Au Bon Pain chain of French bakery cafes. "Conceptually, it's nice that people get together, but the question is, what's it going to mean to me?"

By the end of April, the answer to that question will be a bit more detailed as IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and Unix System Laboratories, Inc. spell out exactly who is doing what in their joint development work on the Common Open Systems Environment desktop. The COSE effort will extend beyond the desktop to include common networking, graphics, multimedia, object technology and systems management.

Univel, the Novell, Inc. subsidiary, and The Santa Cruz Operation are also involved in this "cozy" effort, but the actual development work

Unix, *page 8*

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broadband needs are becoming much
more than a drop in the bucket.

PC SOFTWARE

Lotus introduces Release 3.0 of Notes with first shipments scheduled for late next month. The new version will support a Windows server for small office settings. *Page 6.* Support for spreadsheet version control is expected in the next version of **1-2-3 for Windows**, along with improved information sharing in workgroups. *Page 6.* **Microsoft** outlines plans to enhance its Access database and improve integration between it and **FoxPro**. *Page 6*

NETWORKING

AT&T sanctions collaborative desktop videoconferencing with a new product family. While interested, most users say they will likely wait for prices to drop. *Page 2.* The first wireless adapter for **PCMCIA notebooks** may answer some mobile computing needs, but low data transfer rates and high costs may initially limit the technology's appeal. *Page 16.* If you think it's tough getting a dial-tone in some countries, try to connect LANs 'over there' and you'll see why some managers are scratching their heads over implementing global networks. *Page 71*

MANAGEMENT

It's hard being a counterrevolutionary, but many IS managers find themselves in this role as they take over fragmented departmental LANs. *Page 89.* Three organizations prove you *can* align IS and business for spectacular results. **McGraw-Hill** succeeded in creating a new market, **Chase Manhattan Bank** enlightened decision-makers, and **Boston College** put key information at users' fingertips. *Page 99*

VIEWPOINT

Microsoft may find that cracking the corporate IS market is tougher than it expects, says columnist **John Gantz.** Selling client/server to IS managers is a long way from selling DOS and spreadsheets to the masses. *Page 33*

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Pepsico firms choose 'insourcing'

Combined IS operation to shift from iron to client/server

By Nell Margolis
DALLAS

An agreement signed earlier this month gives three major divisions of Pepsico, Inc. the benefits of outsourcing without leaving the fold.

Under the agreement, all data processing for Pepsico Food Systems (PFS), Taco Bell in Irvine, Calif., and KFC (formerly Col. Sanders' Kentucky Fried Chicken) in Louisville, Ky., will be provided by a newly established Restaurant Data Center. Approximately 20 information systems employees from the combined IS ranks of the three client firms will move to Dallas in the next nine months to staff the center, a PFS spokeswoman said. Layoffs or job phaseouts are not part of the scenario, she said.

> The IS department has shifted its focus from mainframes to client/server almost overnight.

Some nine months in the making, the "insourcing" deal is the brainchild of the divisions' respective IS heads, who started hatching plans during informal meetings, sold it upward and "were lucky enough to get a lot of support" from Pepsico Chief Information Officer Alan Deering and data processing head John Di Chiara, Taco Bell IS Vice President Susan Cramm said last week. Di Chiara, a 10-year Pepsico veteran who headed the project's benefit analysis team, will serve as the center's senior director.

Initially, Jerry Gregoire, PFS' vice president of IS, Cramm and KFC IS Vice President Ken Harris were targeting productivity boosts as well as economy of scale, they said. All three, Harris said, were running IBM mainframe-centric shops that devoted large chunks of time to similar data processing tasks. KFC's IS crew devotes an estimated 20% to 30% of its resources to host-based data processing, Harris said; nonstrategic tasks can wolf down 70% of IS clout at Taco Bell, according to Cramm.

"If we hadn't consolidated into the Restaurant Data Center, we would have outsourced," Cramm said. KFC, too, was eyeing that alternative, Harris said, "but our overwhelming preference was to 'insource.' "

"Mainframe operations are critical," Cramm noted. "But can I leverage them to sell more tacos? Uh-uh." Offloading them to the center will allow the firms' internal IS teams to focus on strategic initiatives, Harris said.

In its first implementation, the center will serve 150 million instructions per second (MIPS) of IBM mainframe-based processing to its three founders. That makes it Pepsico's second-mightiest data center, surpassed only by Frito-Lay, Inc.'s. Moreover, the spokeswoman said, extending the center's services to the remaining Pepsico divisions — Pizza Hut and Hot 'n' Now — is not out of the question.

Unanticipated benefits of the new arrangement are already sprouting. "Probably the most exciting is the way [the center scenario] has shifted the focus of our whole [IS] organization to client/server, virtually overnight," Cramm said. The mainframe data processing work load, she explained, has given IS staff members both a reason and an excuse for dragging their heels on a proposed segue onto the desktop by piling up tasks and providing a safe, traditional way of attacking them.

With both the data processing duties and the mainframe safety net stripped away, the Taco Bell staff is embracing the prospect of life on a local-area network, Cramm said. "Let's face it: I could've held client/server training sessions for a year, and it wouldn't have had the impact of 'Hey, folks, this box is outta here.' "

DEC's results continue on upward course

By Melinda-Carol Ballou

Digital Equipment Corp.'s fiscal quarter will end this week with layoffs totaling approximately 3,500 and an expected decrease in losses when compared with the same period a year ago, according to internal sources. Some industry analysts estimate that DEC may even become profitable by the end of the company's fiscal year in July.

Cutbacks in personnel encompassed manufacturing, field sales and services, as well as marketing and software engineering units, sources said. Decisions about the fate of many DEC products are still being made.

Robert Palmer, DEC's chief executive officer, said last week that the company is reducing the rate at which it is losing money and will move away from vertical software products, focusing on integrated and workgroup solutions.

"Our first order of business is to get into the black as soon as possible," he said. "We have 40% less [physical] space and will have reduced [head count] by more than 35,000 people by the end of the year."

The final targeted head count is 80,000 to 90,000, he said, compared with approximately 114,000 when Palmer was appointed.

But just getting into the black will not be enough for DEC, analysts said.

"Once products have been dropped, a game plan must be put in place . . . having profitability as a focus may be OK if after that happens someone takes an outward look again to determine 'how can we grow?' " said Lynn Berg, a director at Gartner Group, Inc., a market research firm in Stamford, Conn.

Corrections

- Novell, Inc.'s IS costs were erroneously listed in the March 15 issue. IS costs were 1.3% of $1 billion in sales in fiscal 1992.
- The average use of PCs for development is about 20%. The number was incorrectly cited in the March 8 issue.
- The price of Autodesk, Inc.'s AutoCAD Release 12 for Windows was incorrectly reported in the March 1 issue. The suggested retail price is $8,750.
- Proceeds from Powersoft Corp.'s initial public stock offering were overstated in the Feb. 8 issue. Powersoft earned less than $37 million through the offering.

Face-to-face on the desktop

AT&T readies Personal Video System, but users say cost too high

By Joanie M. Wexler
NEW YORK

In the wake of an AT&T move last week sanctioning desktop videoconferencing, users intrigued by the technology said it must drop in price before they can justify the cost of viewing a colleague in a 3-in. by 3-in. window on their computer screens.

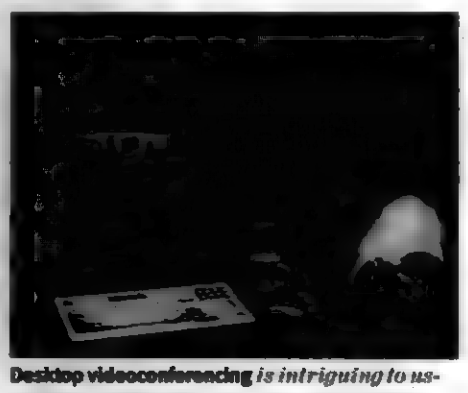
AT&T said it will ship this fall the initial model of its Personal Video System that allows distant users to team up on computer-based projects — such as collectively revising an engineering diagram or conferring on a medical image — via their 386- or 486-based PCs while they communicate visually in a separate PC window. The system is $6,995 per desktop for four users (about $28,000 total), not including network service charges.

"The price sounds a little high, considering electronic mail and voice mail are doing the trick for us today," said Edward Kelly, director of data operations at Colonial Penn Insurance Co., an AT&T network services customer in Valley Forge, Pa. "But if [the video system] got down to prices compatible with what you pay for software packages — say, $5,000 for a 20-user pack — then it would get appealing."

Just learning to crawl

The concept of video-based collaborative computing — introduced nearly two years ago by VideoTelecom Corp. in Austin, Texas, for "room"-based videoconferences on large screens — is in its infancy. However, it builds on the team-oriented benefits of successful groupware packages, such as Lotus Development Corp.'s Notes, by adding the real-time and full-motion video components.

The AT&T desktop system "sounds like 'Notes gone visual,'" said Phillip Evans, director of telecommunications at Perot Systems Corp. He predicted, however, that the appeal of AT&T's offering and others (see story at right) "will depend on the application. While most people admit that the body language of a visual component aids communication, how do you quantify that?"



Desktop videoconferencing *is intriguing to users, but gauging its payback will be difficult*

For example, Newtrend, a developer of financial services applications in Orlando, Fla., sees the potential for desktop collaboration between development organizations in Irving, Texas, and Maitlin, Fla. However, today, "it's cheaper to E-mail and call. How often do you really need to see the person and work with a document together?" wondered Keith Thompson, manager of business data processing.

The benefit of collectively performing work in real time rather than sequentially passing code, documents or diagrams from worker to worker "would be a hard benefit to justify in terms of $28,000," he said.

However, John Hamilton, telecommunications supervisor at Midwest Power Systems in Des Moines, Iowa, said he sees value if the price is right. He is implementing VideoTelecom's "mediaconferencing" on the big screen so that programmers and far-flung application support staff can jointly develop mainframe applications. "We justified the video in travel payback," he said. "An extra $3,000 for the collaborative part isn't a big deal."

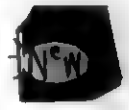
Still, Ken Krechmer, principal at Action Consulting in Palo Alto, Calif., said: "My sense is that audio graphics conferencing, where I use the telephone in conjunction with a common white board, provides more than 90% of the functionality [of a personal videoconference system] for less than 25% of the cost."

Krechmer said he doubts that "talking heads, particularly smaller than three inches square, provide much useful information to conference attendees."

However, he deemed the technology more valuable in "power" meetings where political, managerial or negotiation-oriented discussions are going on than in technical meetings where a team is tackling a specific task.

The reason, he said, is that in a technical meeting, most people do more than just view the presenter; they look at the white board most of the time, converse with the colleague sitting next to them and otherwise generally size up group opinion.

To that end, a start-up called WorkSpace, Inc. in San Francisco is reportedly developing software to allow participants to determine who is speaking other than the individual on camera, who has a hand up to ask a question and other relevant activities that go on during a meeting, Krechmer said.



The $6,995-per-desktop Personal Video System Model 70 is the first in a new AT&T family of products and services called Visual Solutions. The desktop system is based on worldwide video and audio compression standards, although initial offerings must be used with an AT&T PBX or with digital network services based on AT&T switching platforms.

Today's landscape

AT&T's 386 or 1486 AT-bus-based system running under Microsoft Corp.'s Windows requires an AT&T "video-ready" Integrated Services Digital Network (ISDN) voice terminal, AT&T/NCR Corp.'s TeleMedia Connection hardware/software package, a video camera, an AT&T Definity private branch exchange (PBX) or digital services that are based on AT&T switching equipment.

The traditional "big screen" videoconferencing vendors are all breaking into the desktop business as well. Unlike the AT&T offering, however, options from Compression Labs, Inc., PictureTel Corp. and VideoTelecom Corp. are relatively independent from network switches and service offerings. Their general desktop plans are as follows:

- **Compression Labs** in San Jose, Calif.: Plans to release an AT-bus system running under Windows by year's end, followed by IBM's Micro Channel Architecture-based and then workstation platform-based systems. Cameo currently works with ISDN services, though the company plans to roll out an interface to switched 56K bit/sec. services in the second quarter.

Compression Labs began shipping the Cameo Personal Video System last September for midrange and high-end Apple Computer, Inc. Macintoshes. It costs about $4,300, not including the Macintosh. Cameo is not a "true" collaborative package in that users do not share files and screens in real time.

- **PictureTel** in Danvers, Mass.: Plans to ship an AT bus- and Windows-based fully collaborative system in the second half of this year. The vendor intends to sell components only — not the PC. Pricing is not yet available.
- **VideoTelecom** in Austin, Texas: Plans to ship the collaborative DeskMax Intel 1486-based turnkey system in the third quarter of this year. It will cost $14,950, including the PC, which users can also use for other tasks. Vendor does not intend initially to sell a "bag of parts" for users who already have PCs. Will interface with ISDN or switched 56K bit/sec. network services.

NCR top posts see changing of guard

By Thomas Hoffman
DAYTON, OHIO

NCR Corp. announced that Gilbert P. Williamson, chairman and chief executive officer of the wholly owned AT&T subsidiary, will retire May 1 after more than 30 years at NCR.

Succeeding Williamson will be Jerre L. Stead, the former chairman and CEO of Square D Co., who joined AT&T 18 months ago to oversee its Global Business Communications Systems (GBCS) division. Stead moved quickly to reduce its expenses by more than $100 million.

The $4 billion business unit, which produces private branch exchanges and other digital switching systems, was losing hundreds of millions of dollars before Stead took over.

His cost-cutting efforts, employee-reward directives and approaches to developing departmental teams enabled the division to hit profitability by the third quarter of 1992.

Improving NCR's profitability "was real high on [AT&T Chairman Robert Allen's] mind," Stead said. NCR posted a $288 million operating income last year.

Stead and analysts said the change in leadership reflects a strategic shift by NCR to place more focus on integrating AT&T's communications savvy with the $7.1 billion (in 1992 revenue) subsidiary's computing capabilities in a bid to foster further development in areas such as multimedia.

Williamson, who analysts said reaped several million dollars from the September 1991 AT&T/NCR merger, was contacted in January by a head-hunting firm seeking a replacement for IBM chairman John Akers. Williamson was not interested in the position.

Neither AT&T nor NCR has any immediate plans to introduce a separate multimedia business unit, but Stead said joint research will eventually produce additional integrated voice and data processing technologies (see story above).

One financial analyst noted the significance of replacing a longtime NCR executive with an outsider. "It's almost akin to how Apple brought in [John] Sculley from Pepsi. This is an AT&T directive that could signal a whole philosophy change," said Joseph Payne, senior vice president at Kemper Securities in Chicago.

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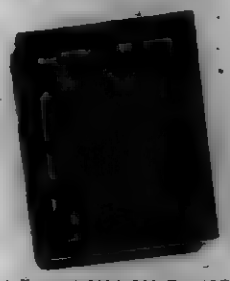

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Vendors face off

Duo of DOS updates debuts

By Christopher Lindquist

For a dying operating system, DOS is still kicking pretty hard these days with both Microsoft Corp. and Novell, Inc. fighting to see who gets to hold the wake.

Both vendors unveiled their latest DOS updates last week, each of which faces hurdles in getting users to switch from current versions. Some users contacted were considerably less excited about moving en masse to Microsoft's MS-DOS 6.0 or Novell's DOS 7.0 than they were about previous DOS updates.

Possibly more important to the vendors is the disposition of the DOS market down the road. Although Novell's DOS — the former DR DOS — holds a miniscule market share, it is key in Novell's strategy to challenge Microsoft in the operating system arena. Hence, Microsoft has extra incentive to beat back any Novell DOS gains.

"You'll start to see us working with the Univel folks," said Toby Corey, director of marketing in the desktop systems group at Novell. Corey said Novell sees an opportunity to leverage its NetWare market by making its DOS as easily networked as possible. In addition, there is the potential to win market share through option bundling and aggressive pricing.

Bells and whistles

Microsoft's MS-DOS 6.0 includes data compression and disk caching, backup and virus protection utilities, a means of linking and transferring files between desktop and portable computers, a disk defragmenter and easier to use memory management features.

Microsoft's next major version of DOS, MS-DOS 7.0, is due later next year and will reportedly include 32-bit internals and multitasking.

As of this summer, however, Novell DOS 7.0 will have preemptive multitasking as well as NetWare client support, a Simple Network Management Protocol-based management agent and a DOS Protected Mode Services interface that will allow device drivers and resident programs to run in extended memory.

Yet some users said their systems are running fine under previous versions.

"Our game plan right now is for our installed base to use [MS-DOS] 5.0 and for our new purchasers to use [MS-DOS] 6.0," said Victor Mutnik, corporate vice president of New York Life Insurance Co. He said he cannot cost-justify moving to MS-DOS 6.0 simply to take advantage of disk compression features.

Not so at Amway Corp., where Tom Reck, manager of business automation, said the data compression utility in MS-DOS 6.0 will give him more disk space in older PCs while bypassing third-party products. "I won't have to upgrade those hard disk drives," he said.

Meanwhile, Novell DOS 7.0 faces another challenge. "I would just worry too much about maintenance and compatibility [issues] and whether Microsoft will do something down the line that [Novell] DOS won't track. I just won't risk it," said Vincent Fusco, senior program analyst at Young and Rubicam, Inc. in New York.

West Coast correspondent Michele Dostert contributed to this report.

Windows NT on RISC may be risky

DOS, 16-bit Windows applications to run faster on X86 platforms

By Christopher Lindquist

Users moving to Microsoft Corp.'s Windows NT who still need to run critical DOS or 16-bit Windows applications may not want to take the RISC.

That is according to Microsoft and analysts who responded to questions about Windows NT's ability to run such applications on reduced instruction set computing (RISC) platforms such as Digital Equipment Corp.'s Alpha and Mips Technologies, Inc.'s R4000. Most Fortune 1,000 firms have millions of dollars invested in 16-bit applications.

"If a customer is going to run mostly DOS or Windows 16-bit applications, then sticking to any type of X86 platform is likely to give you better performance," said Rich Barth, product manager for Windows NT.

This is because an extra layer of instruction set emulation has to take place on RISC systems 16-bit programs in order to work. As a result, Barth said, users could expect roughly 386SX performance for DOS and Windows 16-bit software running under Windows NT on a 50-MHz Mips' R4000 processor.

Reports from inside Microsoft indicate that Windows NT designer David Cutler is a RISC man. The VMS architect and former DEC employee reportedly uses a Mips R4000-based machine for his Windows NT development.

Whether that will be important to users depends on who you talk to. "I don't think DOS compatibility is going to be that big an issue for NT," said Jesse Berst, publisher of "Windows Watcher" in Redmond, Wash. He predicted NT will be used primarily for 32-bit applications.

Other analysts disagreed.

"If they could seamlessly do the integration, they'd be pushing it as an integration platform," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. "What's out there is what we call an installed base. It's a legacy issue. It's going to be a big problem."

Senior editor Maryfran Johnson contributed to this report.

Apple to beef up customer support

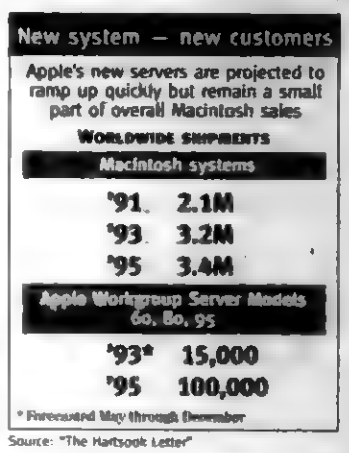
By James Daly

Apple Computer, Inc. will continue its effort to woo corporate users building client/server setups when it unveils a suite of support programs at next week's Apple Enterprise Computing Conference in San Francisco, sources familiar with the company's plans said.

Apple's Support Professionals Architecture is the company's boldest step yet to provide the kind of industrial-strength support infrastructure that user groups like MacIS have been clamoring about for years.

"This is a big one," said one user who has seen the company's plans. "Anyone who finds themselves supporting 1,000 or more machines knows it can be quite challenging. This is a good start for a very complex problem."

Apple's new program will be a multitiered affair, offering options such as on-site support personnel, personalized training, televised briefing for remote sites, an on-line CD support database and configuration management utilities. Apple will also offer seven-day, 24-hour technical support for its recently introduced servers.



Telephone support for most multiple-site corporations will be coordinated by Apple's new technical support center in Austin, Texas. The average package for a large organization with several hundred machines should run about $5,000 a year, sources said.

Morris Taradalsky, head of Apple's Enterprise Systems Division, has stated that customer support will be "crucial" in Apple's ability to play a larger role in corporate system-wide design. Although Apple already has a series of support offerings, users have criticized the company's efforts in this area in the past as being weak and not targeted toward complex corporatewide problems.

"It used to be that when you had a Mac problem you just didn't know who at Apple to call; it was very frustrating," said James Yip, manager of technical services at Ernst & Young in Toronto. Yip has since signed on to Apple's Applecare Expert program and reports good results.

Insiders said the shift in the importance Apple attaches to customer support can be attributed to Dan Byrne, who last year became vice president of Apple's Customer Support Division. "For years, Apple had used this shotgun, half-baked approach to customer support," another Apple user said. "But Byrne has changed that. He's recognized the fact that customer support should always be a continuum."

WordPerfect bundles spreadsheet

By Michael Vizard
PROVO, UTAH

WordPerfect Corp. said last week it will integrate its PlanPerfect spreadsheet into Version 6.0 of its WordPerfect word processor for DOS, due sometime in June or July.

The move was designed to counter the growing influence of bundled suites of software that Microsoft Corp. and Lotus Development Corp. offer. Suites currently account for as much as 40% of the spreadsheet and word processing units sold.

While the spreadsheet functions included in the upcoming version of WordPerfect are not as robust as offerings from Lotus and Microsoft, the spreadsheet capabilities will be enough to satisfy most average users, said Dan Lunt, WordPerfect's vice president of sales.

In addition to no longer offering PlanPerfect as a separate product, WordPerfect will enhance its abilities to compete against suites by expanding its joint marketing efforts with Borland International, Inc. in the next several weeks, Lunt said. Until recently, these efforts have been less than successful, he added.

While introducing WordPerfect 6.0, company officials stressed their commitment to offering upgrades to the 11 million users of WordPerfect in the DOS market. Version 6.0 of WordPerfect for Windows and OS/2 will not arrive until year's end.

"Both the DOS versions and Windows versions of WordPerfect have their place," said Gordon McComb, a San Diego writer who is beta-testing WordPerfect 6.0. "For people who went to Windows to get a WYSIWYG editor, 6.0 is a very serious product that now offers the same capabilities without the overhead of Windows."

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IBM

News Shorts

Olsen backs start-up

Digital Equipment Corp. founder and former Chief Executive Officer Kenneth H. Olsen is backing a new company, industry sources said. Dubbed the Modular Group and financed with $1.44 million in venture capital, some of which came from Olsen, the company was founded by ex-DEC employees and will act as an umbrella to high-tech start-ups. These include **Modular Computer Technologies, Inc.**, which is manufacturing a midrange server that will target DOS and Microsoft Corp. Windows environments.

Apple to license chip

In another signal that **Apple Computer, Inc.** is opening its proprietary Macintosh design, the company last week announced that it would license the ARM microprocessor that is at the heart of the upcoming Newton personal digital assistant to **Sharp Electronics Corp.** Apple also continued to pave the way for Newton's midyear introduction by stating that **Motorola, Inc.**, **Siemens AG** and **Kyushu Matsushita Electric** would make products based on software for the Newton, while Silicon Valley chipmakers **Cirrus Logic** and **LSI Logic** would produce custom chips to be used by Newton licensees.

Netwise offers host link

Netwise, Inc., a vendor of remote procedure call (RPC)-based networking products, has spent the last 18 months developing TransAccess, an RPC-based product line that is said to connect legacy **IBM** mainframe applications with popular client/server application environments such as **Oracle Corp.**'s SQL Forms, **Powersoft Corp.**'s PowerBuilder and **Microsoft**'s Visual Basic. Developers can then more easily write applications that can directly query nonrelational mainframe databases rather than downloading masses of data. The Unix version is available now and is priced at $75,000 to $125,000.

Retix quarterly financial outlook down

Retix in Santa Monica, Calif., said it expects its financials to fall below analysts' expectations for its fiscal quarter ending April 3 — dropping as much as 15% compared with the same quarter last year. Retix also said a class-action suit alleging securities violations between Feb. 17 and March 23 has been filed.

SHORT TAKES **Reach Software Corp.** has begun commercial shipments of its electronic-mail-enabled work-flow management software.... **Systems Strategies, Inc.** announced Express Integrated Desktop, which is said to provide Unix systems with a variety of terminal-to-host connections.... **The Chase Manhattan Bank NA** has awarded **Unisys Corp.** a multiyear contract to provide Chase's Lake Success, N.Y., facility with image-based check processing and disaster recovery services.... **IBM** announced the formation of a tiny business unit, **The Interran Resource Group** in Washington, D.C., to focus on the information systems needs of trade associations, unions and other nonprofit groups.... **Unify Corp.** in Sacramento, Calif., said its founder and chief technology officer, Nico Nierenberg, has left.... **Electronic Data Systems Corp.** scored its first sale of its Strategic Banking System to a bank that was not in on the system's development — **U.S. Bancorp** in Portland, Ore.... **Apple** announced AppleSearch, a search-and-retrieval device aimed at giving Macintosh users easy access to unstructured text.... **Software 2000, Inc.**'s President, Doug MacIntyre, has resigned from the company effective immediately to start a consulting firm focused on quality initiatives in high-tech companies.

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Notes Release 3.0

Lotus serves Notes on Windows

By Michael Vizard
NEW YORK

Lotus Development Corp. last week made its long-awaited announcement of Notes Release 3.0 and included a surprise: a version of the Notes server for Microsoft Corp.'s Windows.

Intended to give small workgroups a server of their own, Lotus' Notes Server for Windows is a full-function Notes implementation that can support up to 10 clients from a central PC running Windows, said Ray Ozzie, president of Iris Associates, a Westford, Mass.-based spin-off of Lotus that is responsible for developing Notes.

Users in small or remote offices can reduce phone traffic by maintaining a local Notes server that can update itself from a central Notes server.

"I'm not sure it was intended for this, but I use the server version for Windows to take work home from the office," said Danny Hayes, president of Hayes Computer Systems, Inc. in Tallahassee, Fla., which is serving as a beta-test site for the Windows server. Hayes said the server version, while taking up more memory, provides a more complete Notes implementation than Windows client software.

In the meantime, Lotus' delivery of Notes, which was originally planned for this month, keeps sliding. The company said it now plans to deliver Notes 3.0 late next month on Windows and OS/2 servers. These servers will support both Windows and Apple Computer, Inc. Macintosh clients.

Shortly after the April delivery, Lotus will add support for OS/2 clients. Notes server implementations for Novell, Inc.'s NetWare and Unix will soon follow.

Included in Notes 3.0 is a new user interface, additional application development and network administrative tools, a full text search engine developed by Verity, Inc. in Mountain View, Calif., a document version tracking facility, a hierarchical naming service, a fax gateway, Novell's IPX/SPX, Transmission Control Protocol/Internet Protocol and Lotus CC:Mail transports, a database lookup facility and partial replication services.

Lotus will add a scheduling and calendaring facility to Notes sometime this year using technology in CC:Mail, according to Lotus Chief Technology Officer John Landry.

He also said the company will enhance its support for accessing SQL databases through Notes by providing the ability to initiate joins on relational database management systems from within a Notes client.

Notes servers and client software packages are priced at $495. A Notes starter kit, which includes a Windows server and two Windows clients, is priced at $995.

Version control

Lotus this week will demonstrate versioning capabilities in 1-2-3 for Windows Version 4.0. Due out this summer, it will let users share spreadsheets across workgroups more easily.

Microsoft currently has a version control feature called Scenario Manager in Excel, but Lotus plans to deliver support in Version 4.0 for multiple versions, allowing users to track and create multiple versions of cells, spreadsheet files and spreadsheets that are attached to Lotus' Notes, said Nina Primm McIntyre, Lotus' director of spreadsheet product management.

FoxPro, Access to share features, keep identities

By Jean S. Bozman
REDMOND, WASH.

Microsoft Corp. said last week that it will boost its 5-month-old Access desktop database with a souped-up database engine, a speedy query optimizer and more user-friendly features during the next two years.

The first upgrades could come in June, when Access Version 1.1 is expected to debut. Several key technology pieces are being imported to the homegrown Microsoft Access database from FoxPro, the Xbase product Microsoft acquired when it bought Fox Software, Inc. last year.

Corporate users of both products have complained that Access is not easy enough for many end users to operate. Users and analysts said it is not fast enough to handle many memory-intensive database tasks. But users said they like the idea that Access can tap into a rich array of remote relational databases such as IBM's DB2, Oracle Corp.'s Oracle 7 and Sybase, Inc.'s SQL Server — something FoxPro cannot do directly.

Microsoft said it will provide a more seamless migration path between Access and the FoxPro Xbase environment for corporate developers. "We're selling both products to the same corporate accounts," said Richard McAniff, general manager of the Fox business unit. "As we move further on, we won't try to duplicate functionality. We want to make it fairly seamless."

Microsoft users and analysts said the two products will start to present a common "look-and-feel" by 1994.

"I want the report writer and the form tools of Access and the Xbase compatibility and the ISAM engine of FoxPro," said Bob Osterman, director of information systems at Air France in New York. He said he likes FoxPro but uses Microsoft's Visual Basic to build corporate client/server applications.

Industry analysts and many users said Access is not yet robust enough to handle mission-critical applications. Chris Le Tocq, a senior analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., said the upper limit of 128M bytes for an Access database is much too low, and it still has bugs that must be fixed in the next release [CW, Jan. 25].

A more affable Access

Access 1.1, scheduled to be announced midyear, will be more user-friendly, Microsoft said. "The assumption we made was that most people who purchased Access would have some experience with other database products," said Dawn Trudeau, manager of the Access business unit. "We have since learned that many had no previous database experience." She said Access will get more "wizards" to guide novice end users.

Many IS managers said they prefer FoxPro to Access but want connectivity to relational databases.

"What you need from FoxPro is the ability to embed SQL commands, so you can grab the data that is necessary from database servers around the world," said Jay Davis, technical services manager at The Chase Manhattan Bank NA's Chase National Corporate Services center in Miami.

HP product delays try user patience

By Mark Halper
PALO ALTO, CALIF.

The Hewlett-Packard Co. juggernaut has hit a few potholes while rolling down the mainframe downsizing road: A spate of product and ordering delays have in some cases forced users to switch vendors.

Shipment slowdowns are affecting a swath of product types ranging from minicomputers to workstations to disk drives. HP has outgrown its infrastructure while racking up impressive downsizing wins such as those landed with The Boeing Co. and Mead Data Central, Inc.

Delays in various product lines have been ongoing since the beginning of the year. Users said HP has attributed some of the delays to chip problems, and they also noted that HP's ordering process has bogged down in part because its order forms are confusing.

HP apparently has solutions in the works, as it readies a new electronic ordering process code-named Conquest. An HP spokesman last week declined to comment on the pending changes.

Initial troubles

Problems came to light last fall when HP delayed shipping until December a series of mainframe-class minicomputers it introduced in May 1992.

At that time, HP kept mum about the delays, but Vice President Wim Roelandts revealed two weeks ago that a faulty memory management chip held up shipments.

Users were patient with that round because HP was relatively new at the kind of sophisticated multiprocessing technology used for the high-end boxes and because the company provided smaller models to tide them over.

What users said they now find disconcerting is a stretch in lead times across various product lines. Customers accustomed to four- to six-week deliveries said they are now getting quotes of eight to 10 weeks.

The spokesman downplayed reports of the product delays, noting that "everything is sitting at six to eight weeks," except for the HP 9000 Model 715 workstation. He also said delays in one product area — memory — are industrywide.

Jane Copeland, president of Holland House, Inc., a software company in Austin, Texas, and head of the advocacy committee for the HP user group Interex, said HP told her company that "a problem with the main chip" recently caused it to delay delivery of two HP 9000 Model 715 workstations to Holland House.

Jumping ship

Whatever the problem, a major law firm, which asked not to be identified, recently canceled an order for an HP 9000 Model G50 after HP continually postponed delivery dates. The firm turned instead to IBM for a RISC System/6000 Model 580.

"Hewlett-Packard had a golden opportunity, but they couldn't deliver," the firm's information systems director said.

Another loss occurred at Hughes Electronics Space and Communications Division, where Chief Information Officer Gary Osborn said he recently installed two Sun Microsystems, Inc. servers in a Unix scheme that had been purely HP. In his case, his HP sales representatives had quit, and "HP wasn't around to service the contract."

Shipment delays are also beginning to wear thin at a leading oil and gas exploration company, which also asked not to be identified.

Delivery of an HP 9000 Model 850 has slipped to nine to 10 weeks, a project director said.

"We have longer delays than we would like for an operation like this," the director said, noting that his company's IS chief had scheduled a meeting with HP for an explanation.

The situation at Acustar's Electrical — a Chrysler Corp. subsidiary that uses HP 9000s to support eight manufacturing plants — is also getting a little testy. "The lead times are extending to three months on disk drives," said Dave Brolsma, IS manager, noting the company has placed an order for a 1.3G-byte drive.

Past failures temper hopes for Unix unity

CONTINUED FROM COVER 1

will be done by the four founders.

"So many people have come up with these things and failed," acknowledged Gary Eichhorn, general manager of HP's workstation systems group. "We are going to underpromise and overdeliver on these commitments. There is no way it's not going to work."

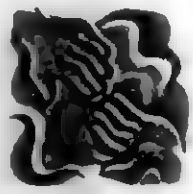
That kind of confidence stems partly from the fact that all of the technologies to be integrated into COSE are reasonably mature products. Among them are the Open Software Foundation's Motif graphical user interface, Sun's Tooltalk and DeskSet tools and HP's Visual User Environment (VUE).

"This is an integration job of stuff that's been running for years," Eichhorn stressed. "It's not rocket science."

Pressure felt

The genesis of COSE came from the confluence of three compelling forces: irate Unix customers, frustrated software vendors and the competitive pressure from Microsoft Corp.'s upcoming release of its Windows NT operating system. Yet even if the group pulls off this creation of a common "Unix dashboard," the sales job involved in persuading users to run Unix instead of DOS or Windows NT on their desktops remains formidable.

"I'm really going to have to be shown that this one is going to work," said Pat Thomas, MIS director at Hickory White Furniture Co. in High Point, N.C., which has been migrating to client/server systems based on Sun and SCO Unix. "I'm trying to give them the benefit of the doubt, and I hope they set a precedent so that other consortia and standards groups can begin to relax their jealousies."



Broken promises

In 1989, HP, IBM and DEC promised that by the following year they would all be running the Open Software Foundation's OSF/1 Unix operating system on their machines — giving users one common, cross-platform Unix environment. Yet only DEC wholeheartedly adopted the OSF/1 kernel, while IBM and HP kept their own Unix variants and added pieces of OSF/1. Meanwhile, more than 20 Unix variants populated the market, most of them based on AT&T/USL's System V Unix and none completely compatible with the others.

> "There is no way it's not going to work."
>
> — *Gary Eichhorn, HP general manager, workstation systems*

"We're big users of Unix where we have someone very technical nearby, but we have not migrated our stores off of DOS," Factor said. "I know that day will come, but until someone opens up my mind otherwise, [the DOS migration] is going to be OS/2 or NT. Those platforms have come from a desktop mentality, whereas Unix hasn't."

Project teams at IBM, HP, Sun and USL are still hashing out the division of labor on tasks such as the integration of Sun's Tooltalk with HP's VUE. The finished product will be a specification submitted to the X/Open Co. in June for approval and publication. Then the vendors plan to build identical common implementations of the COSE desktop, taking care that any additional features added above it do not "break" the specification by altering it.

At Kash n' Karry Food Stores, Inc. in Tampa, Fla., the COSE agreement was viewed as a wonderful outbreak of common sense. "I'm absolutely ecstatic that they're putting their reputations on the line and saying they're going to do it," said James Stikeleather, director of systems development. "By taking the best-of-breed from each and coming up with a common set of standards everybody can work with, they've created the best of all possible worlds."

One issue to watch as COSE becomes a reality, analysts said, is how the vendors handle cross-platform licensing — one of many as-yet-unsettled areas in the COSE effort.

Users are also keenly aware of the catalyst role played by Windows NT.

"Bill Gates may succeed in achieving what the marketplace hasn't achieved in a long time: getting a unified Unix platform that looks the same to everybody," said Sam Malek, manager of technology support at Salomon, Inc., one of the largest Wall Street users of Unix workstations.

"If this works, we could wind up with two major standards: Unix and NT," Malek said.

A look back

Past attempts at Unix unity paint a sorry-looking picture:

1987/1988: AT&T and Sun pair up to create the standard Unix. The move splits the industry into two warring camps: HP, IBM and DEC with the OSF, and AT&T/Sun with Unix International, Inc.

1990: OSF and Unix International hold unity talks to marry the two rival camps. But the talks unravel by April, with both sides citing "irreconcilable differences."

1991: The Advanced Computing Environment (ACE) forms in April, led by DEC, Microsoft and Compaq, achieving more than 200 members at its peak. The plan is to unify Unix and Microsoft's Windows NT on common platforms, establishing a desktop alternative to Sun and delivering shrink-wrapped Unix software for Intel and reduced instruction set computing hardware. Within a year, ACE quietly dies, the victim of mismatched partners with conflicting interests.

COSE aims at net systems management

By Elisabeth Horwitt

The Common Open Software Environment (COSE) alliance will shortly start work on a common distributed Unix systems management environment that is likely to be more quickly available and far more widely supported than the Open Software Foundation's (OSF) Distributed Management Environment (DME).

While it has yet to define its goals, the COSE working group is tentatively committed to coming up with a common systems management framework, which is likely to include many, but not necessarily all, elements of the existing DME framework.

The group also said last week it plans to either develop new applications or push for industrywide adoption of existing products in the following areas: software distribution and installation, storage management, group and user management, print spooling and distributed file system management.

In areas where COSE and OSF applications overlap, "I'm not sure [the DME applications] will win," said Kurt Friedrich, general manager of Hewlett-Packard Co.'s Open Systems Software Division. "We'll need to negotiate."

"I've talked with some other COSE members. We don't want an architecture for the future but a framework and products that are available everywhere now," said Sun Microsystems, Inc. spokesman Dave Taber. "The idea is let's close some of these gaps up front."

For HP, however, time to market takes a back seat to "developing a good design that will last a long time," Friedrich said. "I don't want a mongrel set of random offerings that will keep us from a long-term solution."

Welcome effort

The COSE effort is welcome to information systems managers who have been creating their own distributed Unix management systems rather than waiting for DME to come around.

Wells Fargo & Co.'s Wholesale Services business, for example, has long-term plans to implement DME. However, its burgeoning Unix client/server installation cannot afford to wait up to two years for commercial DME-based products, said Roy Camblin, a senior vice president at the company.

With support from the entire Unix marketplace, including non-OSF members such as Sun, COSE "can't help but accelerate" the industry's progress toward standards, Camblin said.

However, the COSE group still has some internal negotiating to do before it can get down to work. Conflict may arise over how closely the group should align itself with the OSF DME effort. HP, for example, emphasized eventual convergence with DME, while Taber emphasized that the Open Management Group (OMG), not OSF, should be the "holder of the standard."

Members did agree that Tivoli Systems, Inc.'s systems management framework is a strong candidate for early inclusion as a COSE standard. The framework is DME-compliant and expected to support OMG's Common Object Request Broker Architecture (CORBA), which the Unix industry has adopted for key object management services. Tivoli already offers a bevy of applications and is a part of virtually all COSE members' systems management strategies, COSE spokesmen said.

In addition, Tivoli is working on an open application programming interface (API), based on its own framework and CORBA, for hooking third-party applications to common systems management services, Tivoli President Frank Moss said. Tivoli plans to propose the API as a COSE standard.

The COSE group will also consider platforms such as Sun's SunNet Manager and HP's OpenView, spokesmen said. COSE plans to hold a developers conference in October and to begin releasing marketable products, "probably including systems management offerings," by the first half of next year, a Sun spokeswoman said.

Much to discuss

Another key issue before COSE is user demand for interoperability across the group's two major environments: Sun's Open Network Computing Plus (ONC+) and the OSF's Distributed Computing Environment (DCE). COSE members have committed to supporting DCE, ONC+ and Novell/Univel's NetWare Unix client protocol. However, the group also plans to discuss how to resolve interoperability issues such as how to allow an application written to DCE to access database applications written to ONC+, and vice versa, an HP spokesman said.

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Sabre downsizing

CONTINUED FROM COVER 1

of Sabre to Unix. A total conversion — if the company takes that path — would take 5 to 10 years, he said.

Financial difficulties at AMR, which has lost $1.22 billion since 1990, has forced the holding company to seek low-cost alternatives to mainframes.

TPF is the operating system that drives the 12 on-line mainframes currently supporting Sabre. It is far more expensive than the Unix solutions that are becoming more feasible, Hopper said.

"Today, we run TPF because the volume we run is too great for other platforms to support," Hopper said.

However, he said the growing unification of the Unix industry, witnessed recently with the Common Open Systems Environment initiative [see story cover 1], should help propel development efforts that overcome some of today's Unix shortcomings, such as its resistance to downtime.

The biggest question, he said, is whether Unix vendors can supply boxes, or groups of boxes, to rival the sheer power of mainframes.

Still, Hopper described Unix as AMR's "most likely long-term option" for Sabre.

To support what could eventually be a broad migration to Unix, Hopper said, AMR has added an underlying Unix framework to Sabre that will accommodate future projects.

Specifically, the company has developed a set of remote procedure calls (RPC) that permit users to access information from either the TPF mainframes or the Unix system.

The new Unix infrastructure also includes a Fiber Distributed Data Interface link that AMR has installed to handle TPF-to-Unix communication.

C tool benefits

Gina Bradford, AMR's manager of systems engineering, said AMR will realize cost savings on the cargo routing Unix operation by using less expensive C programming tools and will benefit from having more C tools to choose from.

The decision marks an advance for Unix in the commercial world, not only because of the potential size of the migration but also because AMR is easing Unix into one of the world's most notable transaction processing systems — even though Unix is often assailed for its poor transaction processing features.

Hopper conceded that Unix currently is not the transaction processing workhorse that TPF is but said, "for at least low volumes, it runs very well."

Hopper noted Unix now outperforms TPF on integer-intensive operations and would therefore be better suited than TPF for functions with arithmetic requirements, such as yield management.

AMR chose one of Sabre's less transaction-intensive segments, cargo routing, for Sabre's maiden Unix voyage. Transactions can run to thousands per day, compared with hundreds of millions on other Sabre segments, particularly the passenger portion, Hopper said.

Cargo routing is one of many functions on the cargo portion of Sabre, which in turn is part of Sabre's Flight Operating System that resides on a separate mainframe from the 11-host system AMR uses for passengers and pricing. As such, it is a small element within Sabre.

Hopper said AMR runs Unix platforms as servers in several departments and for back-office travel agent work.

Packing more power

Hopper said he expects Unix vendors to eventually offer — perhaps three years down the road — more powerful boxes that will overcome today's limitations in transaction processing power. If TPF vendors were to shift their architecture to running smaller parallel boxes, they might be able to achieve price breaks that would stem further Sabre migration, Hopper maintained. He said today's IBM mainframe "is going to go away," as an ailing IBM moves toward CMOS and parallel processor designs.

"But I don't know how long it's going to be before they [TPF boxes] cost a lot less money," Hopper said. "I've got no commitment from any [TPF] vendor."

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Army enlists client/server

$1.8 billion plan drafts 9,000 LANs and 2 million lines of Ada code to serve 60,000 users

By Gary H. Anthes

■ Any information systems professional who has labored to set up a local-area network will sympathize with the task U.S. Army Maj. Gen. Gary A. Stemley faces: He has 9,000 of them to install during a five-year period under what some say is the largest client/server implementation ever attempted.

And anyone who has ever met an alligator in the swamp of large systems development will appreciate another challenge facing Stemley: writing 2 million lines of Ada code in order to replace a hodgepodge of automated and manual processes.

Even by the unique yardstick of government programs, the Reserve Component Automation System (RCAS) is a whopper, from its $1.8 billion price tag to its 60,000 users at 5,000 locations and its 35,000 pages of requirements documentation.

Nevertheless, after years of political wrangling, false starts and protests, RCAS in its current incarnation is off to a good start, observers agreed. Although many of the toughest challenges lie ahead, observers said the year-old project is a model of technological farsightedness.

Worth every penny

Indeed, after a five-month probe, the U.S. General Accounting Office recently supported an Army finding that the technical merits of the system proposed by winning bidder The Boeing Co. more than justified a $347 million price premium over the competing bid of $1.45 billion. Boeing's solution was judged technically superior in a number of areas. In particular, it was more user-friendly in its graphical user interface, and it was far more flexible in accommodating future technology upgrades.

Charlotte Swift, a technical manager at the Federal Systems Integration and Management Center, a unit of the General Services Administration that helps federal agencies develop computer systems, attributed part of RCAS' early success to the fact that the contract was awarded on the basis of "best value," not lowest cost, as is the case with most government procurements.

"That allowed them to get the best technologies available in the marketplace," Swift said.

Swift also praised RCAS for embracing open systems standards. "It's scalable, interoperable — all those words we use with open systems are true in this case," she said. "They have gone through a rigorous regime of making sure things work. But the size of it is the challenge."

Stemley said success stems in part from the careful homework that preceded the contract award. Although requirements were very carefully detailed in the request for proposals, solutions were left up to the bidders.

RCAS is intended to support the day-to-day activities of the Army National Guard and the Army Reserve as well as the rapid mobilization of forces during wartime. During the Persian Gulf war, Pentagon officials had difficulty getting the most basic information — including the number of fighting troops available — from thousands of local reserve units, which had unique automated systems or none at all.

"We had the Gulf war five years too soon," said Stemley, RCAS program manager. "In some cases it took several days to get data from files — both hard copy and electronic — from the units over into the systems they had to go to war with."

When RCAS is fully deployed in 1998, data needed for mobilization will be available in minutes, Stemley said (see story below right).

> "Every congressional district in the U.S. will have at least one RCAS LAN."
>
> —*Maj. Gen. Gary A. Stemley, RCAS program manager, U.S. Army*

On a roll

RCAS is in test use now at 21 sites in California, Virginia and Georgia. An additional 900 LANs will be installed during the next 10 months, with the balance to be put in at the rate of 1,000 to 2,000 per year, Stemley said.

Late this summer, RCAS will start to roll out the first of the Boeing-written, custom-developed Ada applications to support personnel management, equipment tracking and maintenance, supply, payroll, training and mobilization.

Maj. Gen. Gary Stemley is a 1957 West Point graduate who was called back to active duty during the Persian Gulf war. In between, he was a vice president at Merrill Lynch & Co., where he oversaw the implementation of LANs and office automation systems.

As each LAN is installed, Unix-based Zenith Data Systems 486 servers are loaded with Informix Corp. relational database management systems and electronic-mail, word processing and spreadsheet packages from Uniplex. At smaller installations, the Zenith Data servers run those software packages plus the custom Ada applications. At larger facilities, the Ada applications will reside on a Digital Equipment Corp. 5500 series reduced instruction set computing server.

All users will access the servers via diskless X Window System terminals, and connections to other locations will be made via a 56K bit/sec. backbone, part of the Federal Telecommunications System 2000 national network.

"The technical solutions are particularly elegant," said Paul A. Strassmann, until recently the Pentagon's director of defense information. "Their use of client/server and X Window is a prototype for what other [agencies'] systems should do."

By maintaining all databases and software on the servers, rather than on individual workstations, backup and recovery, maintenance and database synchronization will be simpler and less expensive, he said. In addition, the architecture allows the purchase of inexpensive user terminals and fewer software licenses, he pointed out.

"The approach allows integration at the server level," said Peter Dube, RCAS program manager at Boeing Computer Services in Reston, Va. "It would be very difficult to integrate across 60,000 users if each had a PC. Instead, we're integrating across about 10,000 processors."

Safe and secure

Strassmann said the diskless workstations reduced exposure to security breaches. "If you give people PCs with removable disks, that is a source of security exposure in at least a dozen ways, and viruses are just one of those. When you go into a protected file server environment the way they did, your ability to get security and accountability for the flow of information is greatly enhanced," he said.

For additional security, all data and E-mail that moves from one site to another over the network is encrypted, even if it is unclassified.

The Army has about 100 people assigned to RCAS management, and Boeing has about 450 people on the project, Stemley said.

Key RCAS components:

- **Decentralized** client/server architecture to ensure flexibility and scalability.
- **Diskless X terminals** for low cost, high security and centralized software support at the server level.
- **Multilevel security** at workstation and network levels.
- **Open systems** and network standards.
- **Applications** written in Ada, the Pentagon's programming standard, using a new Armywide data dictionary.
- **Automatic propagation** of database updates across the country and up and down the Army hierarchy.

Unusual challenges

The office automation, personnel and logistics support functions to be performed by RCAS are not particularly complex, but the new system faces some unusual challenges that account for much of the 2 million lines of Ada code expected to be written for it.

The greatest is the requirement that the system be "multilevel secure," meaning that a database may hold a combination of unclassified, confidential and secret data while the operating system permits access only to data for which an individual user is cleared.

"That's the overriding complexity issue," said Gary A. Stemley, the Army's RCAS program manager. "We've had individual offices running multilevel secure, but there has never been a nationwide system running multilevel secure."

The servers will run multilevel secure versions of The Santa Cruz Operation's Unix and DEC's Ultrix. According to Peter Dube, Boeing's RCAS program manager, the operating systems must do something not attempted before on a large scale: communicate over networks complying with the Government Open Systems Interconnect Profile protocols.

It is not enough for the operating system to know who is permitted to get what data within a given machine, Dube said. The system must be smart enough to know what locations on the network are permitted to receive what data.

Compounding the networking challenge is a requirement that local database updates be replicated automatically to higher echelons so databases are replicated at as many as a dozen levels in a national hierarchy.

Software running on every server examines each transaction and applies table-driven logic to see whether any data needs to be sent to the next level for approval or record-keeping. It does this automatically via E-mail, making dial-up connections where needed.

The same software at the receiving end then determines whether the data needs to go to another level.

—*Gary Anthes*

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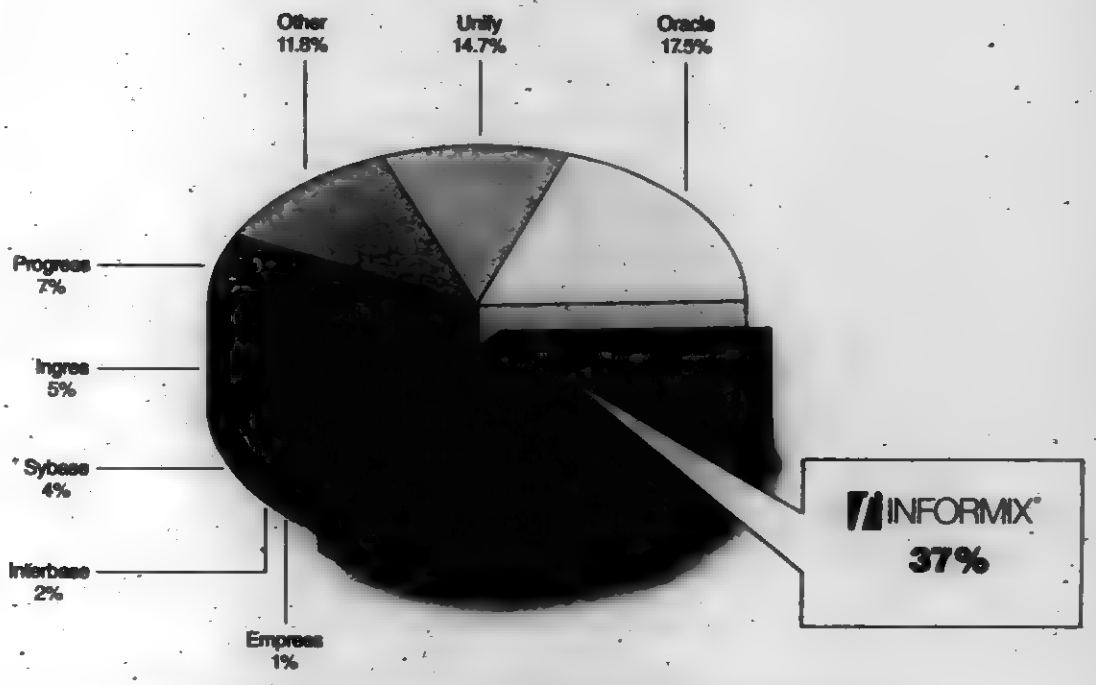

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Users cheer fresh start

CONTINUED FROM COVER 1

announcement favorably, although at the same time, many said they know very little about Gerstner. Dennis Murphy, acting vice president of corporate information management services at GTE Corp. in Stamford, Conn., echoed the thoughts of many other IBM customers. "You've got to look at the individual, as opposed to where he comes from. The key issues for IBM are strategy and organization — how IBM should be organized to best use its strengths. I don't think it's necessary to have computer industry experience," Murphy said.

> "He's a change agent and has a proven track record."
>
> — *Sid Diamond, consultant*

Gerstner has more technology experience than appears at first glance. During his tenure as president of American Express Co., he took charge of some IS initiatives that helped the company become a leading-edge information technology user (see story page 15). "He was a user," said Sam Albert, an independent consultant in Scarsdale, N.Y. "That's even more experience than some of the senior IBM executives have."

A PS/2 user

Gerstner is also said to have an IBM Personal System/2 on his desk at RJR Nabisco — maybe due to family ties. His brother Richard was an IBM vice president in charge of the Personal Systems division; he has since retired from IBM for health reasons.

Some users said they expect IBM to benefit from Gerstner's consumer products background. Frank Monteleone, information technology director at The NutraSweet Co. in Deerfield, Ill., said, "Consumer products companies are becoming much more short-term focused and much more responsive to the end consumer. If he can get IBM focused on what the customer really needs, that approach might work."

Other industry watchers said that having a nontechnical IBM chief is not new. "In the past, there have been sales executives who have worked themselves up to the top of the pyramid," said Dean Witter analyst Jay Stevens. "Jack Keuhler was technology adviser to John Akers."

Some observers said that Gerstner may well pick an existing IBM insider, such as James Cannavino or Ellen Hancock, as his top technical advisor. This move would also serve as a nod to the existing IBM power structure and may help smooth Gerstner's acceptance into the fold, some noted.

However the new CEO approaches the technology issues, the biggest part of his job will be to continue cutting back on IBM's huge infrastructure. Gerstner has already done that at RJR Nabisco, selling off some $8 billion in assets, paring about 2,300 employees from the tobacco business and ditching luxuries such as corporate jets, athletes on retainer and apartments. In total, Gerstner cut RJR Nabisco expenses by 12%, or $550 million per year.

It will take Gerstner at least six months to learn the business, most industry watchers said, and in the meantime, IBM's existing corporate structure will remain intact. Gerstner may speed up the emergence of more IBM operating units and may spin off some of its existing lines of business into separate companies.

In the meantime, many observers said, Gerstner appears to be the right person for the job, despite the huge difficulties that loom ahead and the fact that IBM, with 300,000 employees and $64 billion in revenue, is roughly four times larger than RJR Nabisco, which has 63,000 workers and $15 billion in revenue.

"He's a change agent and has a proven track record," said Sid Diamond, former CIO at Baltimore-based Black & Decker Corp. and now a consultant. He said that while the incoming CEO will have to learn a new industry, "the good news is he may come up with some innovations."

Bob Djurdjevic, president of Annex Research in Phoenix, said, "I was hoping that whomever IBM chose wouldn't know a 3090 if he or she tripped over it. Gerstner appears to fit that bill nicely."

Mercer's Tiano spoke for many users when he added, "I just hope it does something for the betterment of IBM."

West Coast correspondent Kim S. Nash and senior editor Ellis Booker contributed to this story.

It's a tough job, but . . .

Louis V. Gerstner Jr. is not the only computer executive to face massive layoffs and other daunting tasks. Recall what awaited other incoming CEOs:

James Unruh

• Unisys Corp.
James Unruh
Challenges: Technology and administrative tangles from merger of Sperry Corp. and Burroughs Corp.; massive overhead and debt; fearful customers; reputation as a proprietary hardware vendor.
Status: Unruh's cost-cutting moves and layoffs have saved more than $800 million annually in operating costs, leading the company to profitability for the past five quarters. Unisys now targets the software and services sectors.

• Wang Laboratories, Inc.
Richard Miller
Challenges: Specter of Chapter 11; disenfranchised minicomputer users; declining hardware sales; weak PC presence; embryonic imaging market.
Status: Miller resigned last month, six months after filing for Chapter 11 protection, halving a debt of $627.4 million, striking a hardware reseller deal with IBM, relentlessly downsizing and pushing toward a software and services track by curtailing research and development on proprietary hardware.

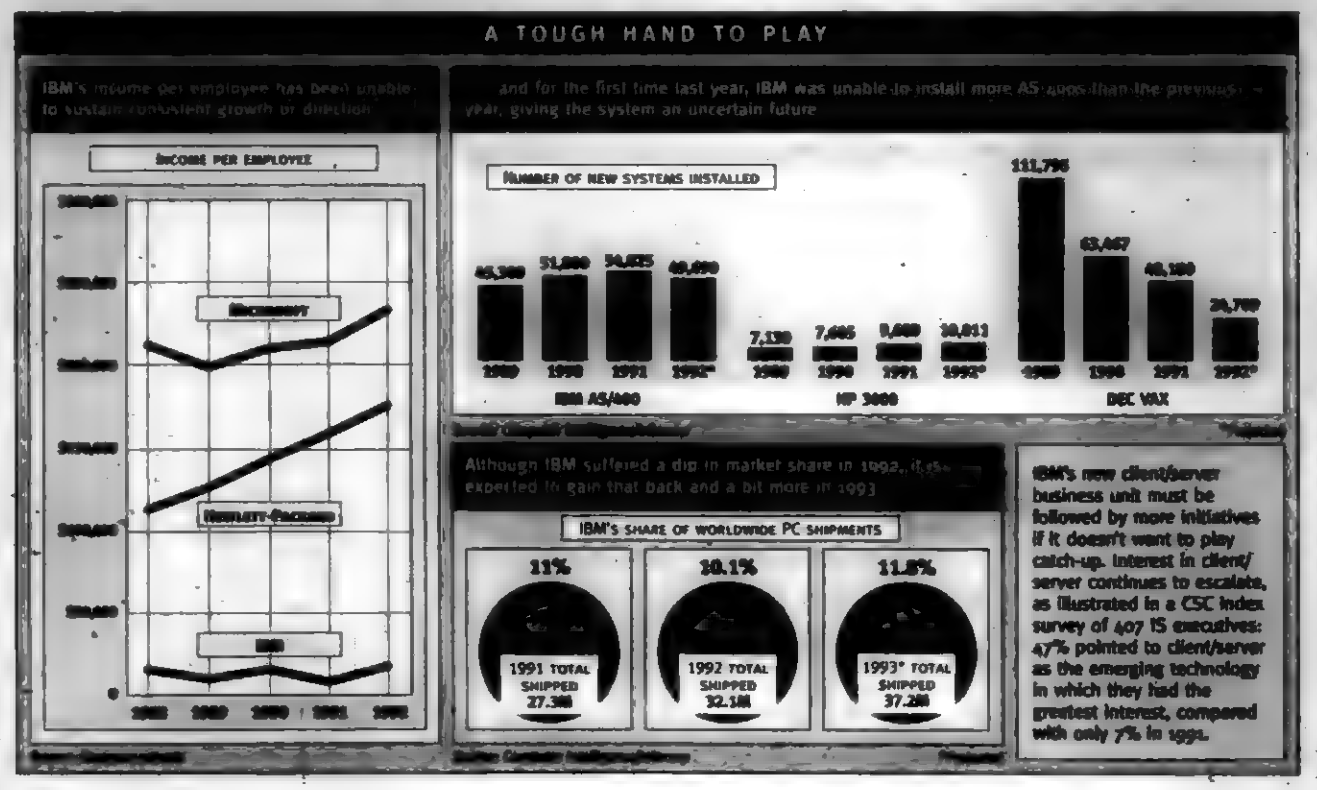
Richard Miller

• Compaq Computer Corp.
Eckhard Pfeiffer
Challenges: Lost PC market share; historic success due in part to resting on its laurels as a "premium" vendor of over-engineered, overpriced products.
Status: Restructuring led to June 1992 release of low-cost products and aggressive distribution expansion, which fueled growth and a return to profitability.

• Digital Equipment Corp.
Robert Palmer
Challenges: $2.8 billion losses for fiscal 1992; snubbing of Unix and PC arenas; poor marketing; low morale after massive layoffs.
Status: Losses have been stemmed, but it is too early to judge the long-term effects of Palmer's streamlining and splitting of DEC into discrete operating units. Palmer has also brought in outside talent, Enrico Pesatori from Zenith Data Systems, to head DEC's PC business.

Some optimists predict profits by the end of fiscal 1993 in July; large sales of DEC's new Alpha AXP reduced instruction set computing products will help.

Louis V. Gerstner Jr. has been chairman and CEO of RJR Nabisco since April 1989. Before then, he was president of American Express, which he joined in 1978.



IS track record

Gerstner's systems leadership garnered varied results

By Michael Sullivan-Trainor and Johanna Ambrosio

Louis V. Gerstner Jr. knows information systems, although his tenures at American Express Co. and RJR Nabisco, Inc. have been mixed from a technology perspective. Through investments he helped guide, American Express became one of the highfliers among technology users in the late 1980s. In comparison, strategic use of information technology at RJR Nabisco — Gerstner's most recent home before IBM — has been low key.

For example, with an estimated IS budget of $254 million, RJR Nabisco ranked 63rd in its industry in the 1992 *Premier 100*, *Computerworld*'s annual ranking of the most effective users of information technology.

Michael Mella

Louis Gerstner *upped American Express' IS budget to $1 billion*

Despite its low-key approach, RJR Nabisco is not without its leading-edge IS investments. These include a $3 million sales support project involving mainframe applications and handheld computers and an extensive image-processing application for inventory tracking based on Wang Laboratories, Inc. imaging systems.

RJR Nabisco's current crop of IS executives were not available for interviews. However, Gerstner has been quoted in some recently published reports as saying RJR Nabisco could do even more with technology. For example, IS could help customize products for different geographic regions and consumer groups.

While RJR Nabisco's decentralized nature has made it difficult for the company to use IS the same way American Express did, even the financial services giant was not an instant mega-user.

The first *Computerworld Premier 100* ranking in 1988 placed American Express 51st, with an estimated IS budget of $800 million and a $400 million installed base. The company placed sixth in its industry, behind five major insurance firms led by The Travelers Corp.

But in 1989, American Express soared to 25th overall and first in its industry group, with an estimated $1 billion IS budget. By then, Gerstner's harnessing of IS to differentiate American Express from its competitors was evident in high-volume transaction processing systems coupled with one of the first enterprise-wide image processing applications. Superior customer service and economies of scale were hallmarks of the IS achievements during Gerstner's tenure.

Gerstner also oversaw the start-up of American Express unit First Data Resources, a computer services provider.

He left American Express shortly after launching a futuristic project charged with implementing new technologies in all aspects of the business. Called the Genesis Project, the initiative was to involve an investment of more than $50 million in expert systems; it reportedly totaled $100 million.

Results of that project have been mixed, according to some reports. Some aspects, including the effort to authorize credit-card transactions more quickly, have come to fruition. But the ideal environment envisioned with Genesis — production applications being rewritten with computer-aided software engineering tools to provide a uniform set of software — has not been realized.

American Express' top IS executive, Garland Capp, did not return phone calls for this story.

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News Shorts

Middleware from IBM

IBM announced that it has started marketing Ez-Bridge Transact, a middleware product family developed by **Systems Strategies, Inc.** and based on IBM's Message and Queuing interface. The products are said to support a distributed application environment across a range of IBM systems, as well as Digital Equipment Corp. VAX/VMS and hosts from Stratus Computer, Inc. and Tandem Computers, Inc.

CA, Cheyenne in storage deal

Computer Associates International, Inc. announced that it has formed a technology and marketing partnership with **Cheyenne Software, Inc.** The alliance is expected to let CA use Cheyenne's local-area network storage technology with all of CA's network backup and archiving systems. Cheyenne's LAN storage technology will provide CA's systems management package, CA-Unicenter, with support for the storage media required by networked PC users. Earlier, CA announced plans to port CA-Unicenter to Unix and distributed platforms, including Hewlett-Packard Co.'s HP/UX version of Unix, IBM's OS/2 2.0 desktop operating system and Novell, Inc.'s NetWare network operating system. As part of the agreement, Cheyenne will resell CA-Unicenter to its installed base.

Carriers want keys to highway

Executives from the major local- and long-distance telephone companies last week joined in support of President Bill Clinton's plan for a national fiber-optic data "superhighway." The carriers and other communications companies urged Congress to let them build and run the network, limiting federal involvement to funding basic research and setting standards for the proposed "national information infrastructure." However, the firms publicly disagreed about how they should divide the multibillion-dollar network pie, and several executives testifying at a hearing asserted that local carriers might abuse their monopoly powers.

Tandem systems planned for PBXs

Tandem Computers, Inc. said last week it has adapted its fault-tolerant NonStop host computers to work with private phone systems from **Siemens AG**, Siemens subsidiary **Rolm** and **Ericsson Business Networks AB**. The move follows Tandem's announced partnerships with other private branch exchange makers, including **Northern Telecom, Inc.** Connectivity software for the Siemens, Rolm and Ericsson systems will be available in the fall for prices ranging from $15,000 to $69,000, Tandem said.

SHORT TAKES With a net income of $24.5 million for the fourth quarter, networking vendor **Cabletron Systems, Inc.** reported annual profit of $83.45 million for fiscal 1993, up from $56 million in 1992, and annual sales growth of 44% to $418.2 million.... Meanwhile, **Proteon, Inc.** said it expects to incur an operating loss during the quarter ending April 2 because marketing programs launched in 1992 are taking longer than expected to become effective.... **Micro Focus, Inc.** is working with DEC to port its Micro Focus Cobol systems on DEC's OSF/1 for AXP platform later this year. ... **NCR Corp.** pledged its support to **Unix System Laboratories, Inc.**'s Unix System V Release 4.2 for its NCR System 3000 workstations.... Minneapolis-based financial services company **Norwest Corp.** signed a three-year contract with **Sprint Corp.** for high-speed data links, inbound 800 service and outbound voice services.

Wireless computer card ships

PCMCIA adapter may aid mobile users, but high cost a deterrent

By Lynda Radosevich
MOUNTAIN VIEW, CALIF.

New wireless local-area network technology from Proxim, Inc. could simplify the transfer of information between mobile computers and desktop and host machines, users said.

However, high prices and low data transfer rates may stymie initial acceptance.

Proxim is shipping the first wireless LAN adapter for notebook computers equipped with Personal Computer Memory Card International Association (PCMCIA) sockets. The cards let mobile users link portable computers with existing networks or form a peer-to-peer network with similarly equipped devices.

"This is interesting," said Joe Barrett, lead analyst at the corporate information technology division of Whirlpool Corp. in Benton Harbor, Mich. "Right now, it is a pain in the butt to get stuff back to the desk from portables.... Most people end up transferring data floppy disk to floppy disk."

Called RangeLAN/PCMCIA, the $595 adapter uses spread-spectrum radio frequency technology. It has a range of 300 to 500 feet indoors, depending on physical barriers, and comes with drivers for Novell, Inc.'s NetWare and NetWare Lite and Microsoft Corp.'s Windows for Workgroups.

The wireless RangeLAN PCMCIA transfers data 40 times slower than Ethernet.

A $495 adapter card is required for connection to a server or PC on the network.

Spread your wings

Spread-spectrum technology allows users to roam the office and connect to different stations that have the RangeLAN cards, said John Donovan, director of groupware service at WorkGroup Technologies, Inc. in Hampton, N.H.

In contrast to wireless networks that use infrared technology, a spread-spectrum network does not require a direct line of sight between transmitting and receiving nodes, he added.

For Jockey International, Inc. in Kenosha, Wis., a wireless connection could answer the need to connect travelers' notebook PCs to the IBM Application System/400 when they return to the office, said PC coordinator Jacqueline Bynsdorp. Using docking stations is cumbersome and limits notebook alternatives, she said.

However, analysts said, low data transfer rates of 240K bit/sec. have to be improved and prices have to come down before there will be widespread deployment of the wireless cards.

Once that happens, said Walter Miao, vice president of technology at Link Resources Corp., in New York, there will be a big market for wireless by users of new mobile computing devices such as handheld portable terminals and personal digital assistants.

Xircom, Inc. said it plans to offer wireless notebook LAN connections this summer, and Intel Corp. indicated it is developing products for this market.

Demand forces PC paucity

CONTINUED FROM COVER 1

Component culprits range from hard drives to "literally a nickel part" in the case of IBM's ThinkPad, said Bruce L. Claflin, general manager of mobile computing at IBM.

Poor planning by vendors has caused some of the supply problems. Kimball Brown, an analyst at market research firm Infocorp in Santa Clara, Calif., noted that demand typically falls after the fourth quarter, but it has not dropped as much as usual in the first half of the year, which may have caught vendors by surprise.

Research firm Storeboard reported a decline in PCs shipped from 443,0000 in December to 322,0000 in February.

"For the bigger guys, demand is dropping off very little or even increasing," Brown added. In fact, vendors having trouble meeting demand are producing far more units than in the past.

"We're going to produce 35% more units in the first quarter than we did last year, and even then we'll be short," said Robert Corrigan, president of IBM PC Co. Corrigan said IBM's supply will be "in reasonably good shape" by the end of the second quarter.

Meanwhile, "shortages are still a significant problem ... for virtually all the major manufacturers," said Bill Fairfield, president and chief executive officer at Inacom Corp. He said he expects this situation to continue for most of the first half of the year.

"Our overall backorders are worse [now] than they were in the fourth quarter last year," agreed Steve Steinke, Computerland Corp.'s senior manager of vendor relations. Steinke added that vendors sometimes do catch up with demand on certain products.

In the meantime, users are figuring out ways to cope with the situation.

"The shortages have been a real hindrance in a lot of ways," said Glenn Jurmann, section manager of office technology at Baxter Healthcare Corp. in Deerfield, Ill.

Jurmann said his major information systems projects were not being affected, "but what is happening is we're getting individual customers within Baxter replacing equipment or putting in a LAN, and [finding] they can't get the two to 10 machines they need."

While some users have turned to alternate suppliers to fill their purchasing needs, analysts said, many will simply wait. "If you're just upgrading from older PCs to new ones, you'll wait out the supply problems," said Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa.

And not all vendors are suffering. Dell Computer Corp., which has been accustomed to high growth for several years, claims delays of only about 10 days in filling orders.

Another effect of the high demand has been a halt to the price war because vendors are cutting prices solely on old systems.

When major vendors catch up with demand, they could run smack-dab into the typical third-quarter PC slowdown.

With lower margins making higher volumes necessary to stay in business, a drop in demand — even for a quarter — could force shaky vendors over the brink, analysts said.

International Data Corp., a market research firm in Framingham, Mass., has predicted the market will shrink from 800-plus vendors to 50.

William Abiondi Jr., an analyst at BIS Strategic Decisions in Norwell, Mass., said, "Customers seem more willing to pay a little bit extra for a brand name and the likelihood that their vendor will be around."

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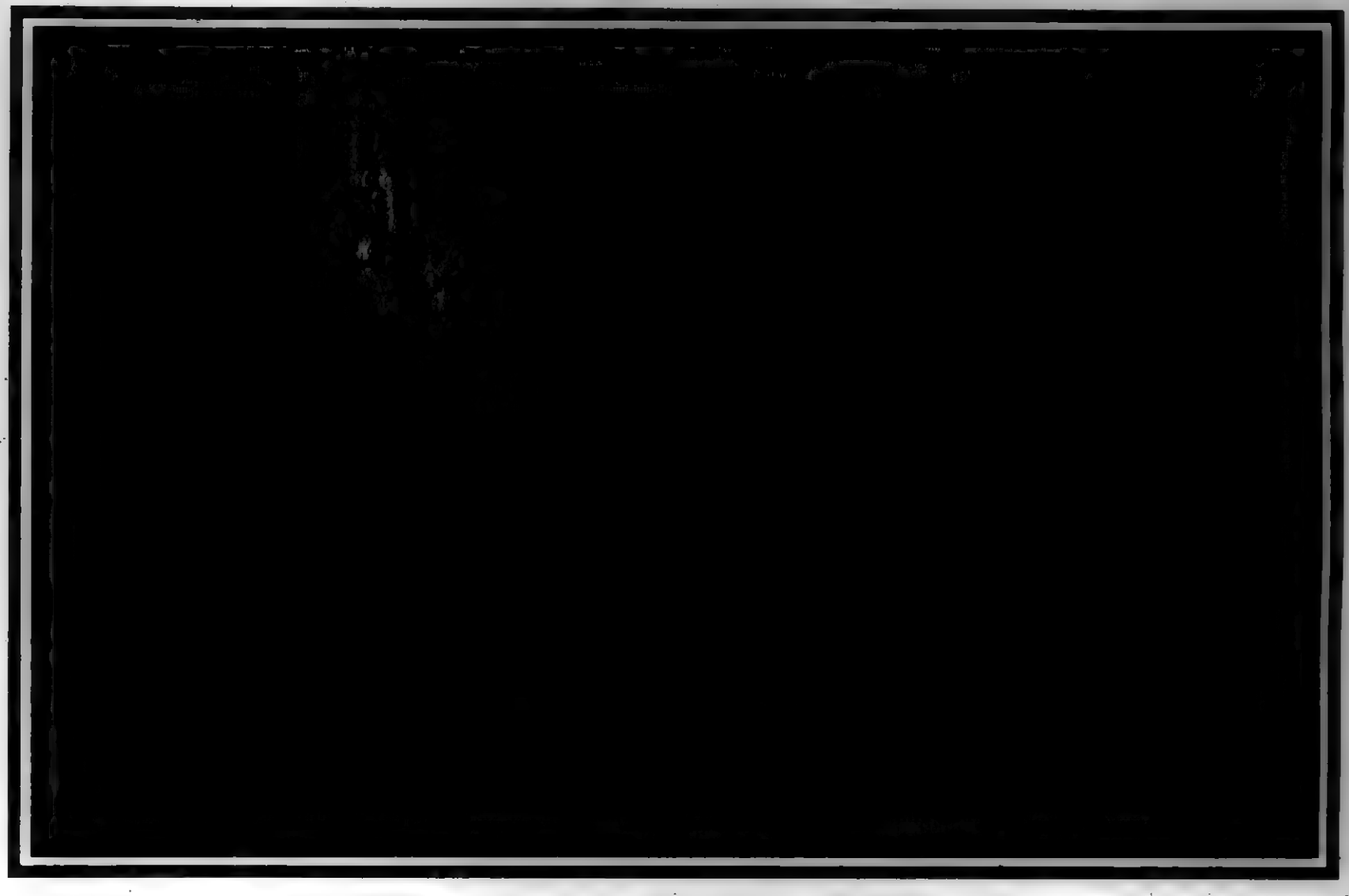

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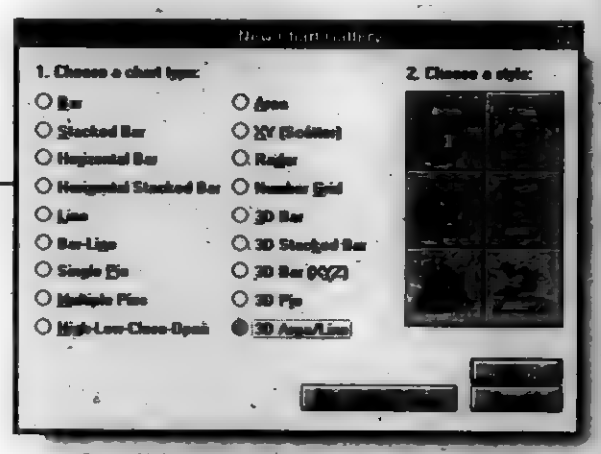

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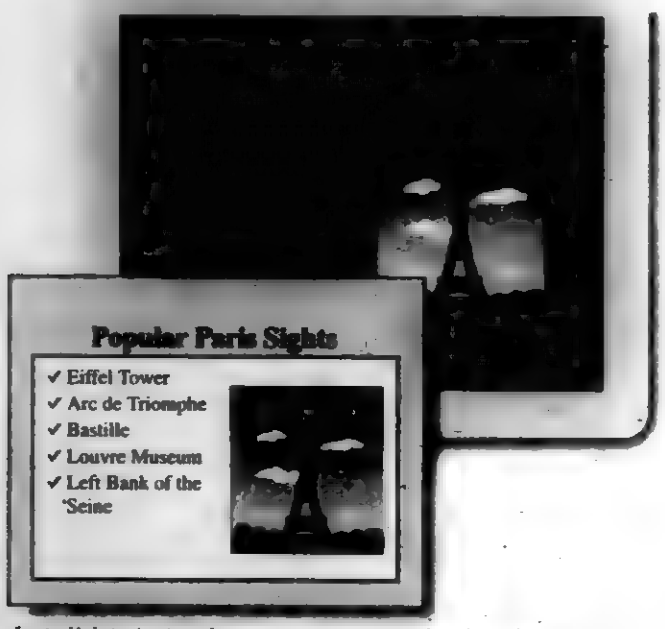

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Industry alliance

DEC sales force to market Macs

By Melinda-Carol Ballou

Although Digital Equipment Corp. and Apple Computer, Inc. announced an extensive alliance five years ago with great hoopla, it took three years to actually come out with significant products, such as Pathworks support for the Macintosh. Since then, neither company has publicly said much about the relationship.

Even as DEC ostentatiously wields the Microsoft Corp. Windows NT banner, the company is still quietly addressing the needs of mixed VAX and Apple sites. Last week, DEC issued a new version of Pathworks for the Macintosh and an agreement to sell and market Apple platforms in the U.S. (DEC began selling Macintosh platforms in Europe more than a year ago.)

DEC and Apple will also work together on a number of projects, including DEC compliance with Vital, Apple's framework for connecting disparate systems across the network. DEC is also developing the means to share files simultaneously across AppleShare, IBM's LAN Manager and Novell, Inc.'s NetWare via a layer above the network operating system to handle record-locking.

The sale of Apple platforms by DEC is part of the company's push into the systems integration market. While DEC was previously doing deals for Apple in that capacity, the new arrangement will facilitate and streamline the process for DEC sales representatives who need information about Apple products in order to provide one-stop shopping for users, DEC added.

Mac/DEC users

VAX sites have a mixed presence of Macintoshes that is higher than the norm. According to a study done last year by International Data Corp., 16.3% of DEC sites have installed Macintoshes, compared with the industry standard of 5.7%.

Users were supportive of the arrangement and the new Pathworks release.

"I'm delighted to see them moving forward," said George Bateman, a director of the MacIS Board of Macintosh users.

The new features of Pathworks for the Macintosh Version 1.2 announced last week target primarily large sites of 100 or more Macintoshes to make them easier to manage, according to Katrina Holman, group manager for PC integration marketing at DEC.

"We've cut down on the time and steps required for network administrators to do network management and configuration," she said. Other features include the ability to set up different zones for different departments, more complete system messages for easier diagnosis and support for up to 1,000 simultaneous connections by applications or clients to nodes running DECnet/Open Systems Interconnect. This release also offers Pathworks listener, a message alert signal for new messages or data from the file server and a new version of MacTerminal. Available next month, clients will be priced at $308 per Macintosh.

Industry analysts said the scope of the DEC offering must include more than file-and-print sharing. "Customers are expecting a lot more — such as ensuring interoperability across environments," said Michael Goulde, analyst at Patricia Seybold Group, a consulting firm in Boston.

Holman said that while the company currently offers mail interoperability and Data Access Language support for database access, the new generation of Pathworks releases will include AppleShare-based network management across environments. That capability will be rolled out in the next year and a half, she said.

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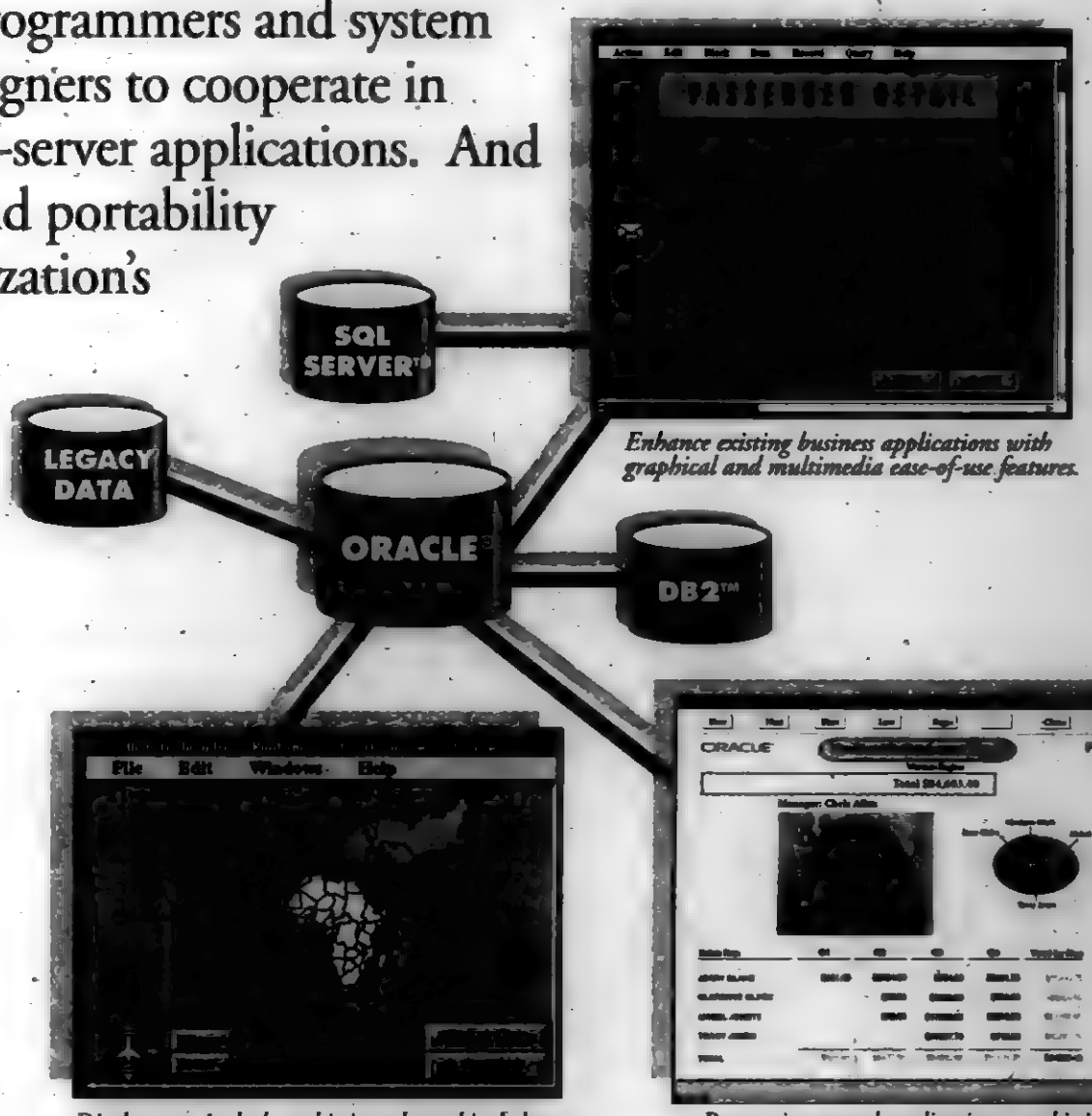

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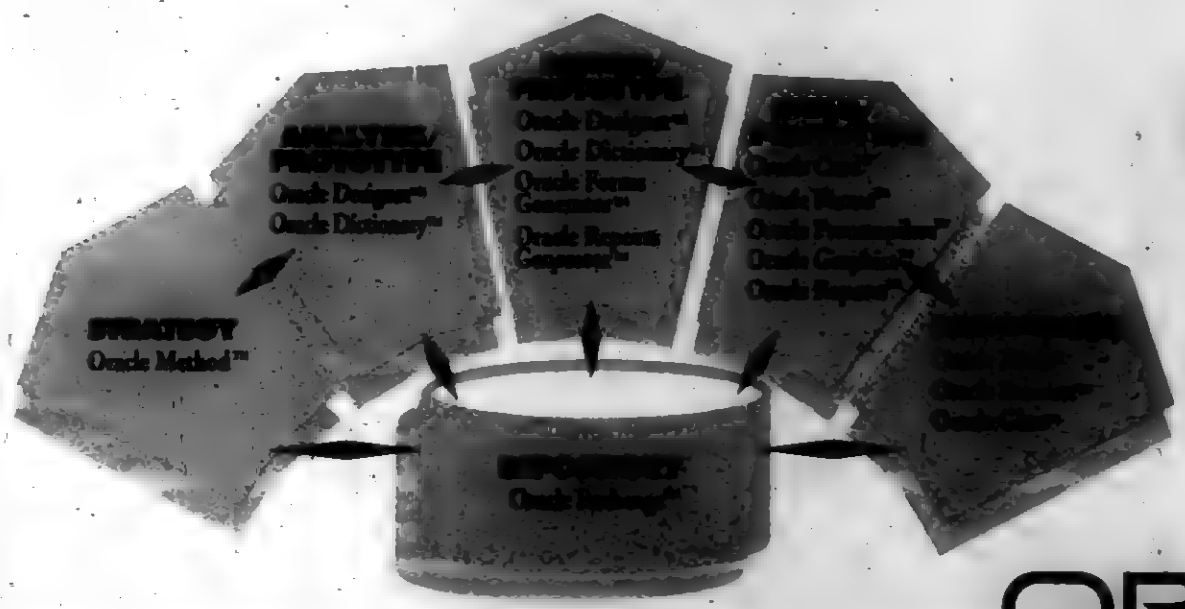

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Sun boosts Windows-to-Unix connection

PC-NFS 5.0 lets users run utilities from Windows without returning to Unix

By Lynda Radosevich
CHELMSFORD, MASS.

Sun Microsystems, Inc. made good last week on its promise to tighten the links between its Unix workstations and Microsoft Corp.'s Windows operating environment.

The company's SunSelect division introduced an enhanced version of its popular PC-NFS network file-sharing system and new electronic-mail software that runs on Windows- or DOS-based PCs.

PC-NFS 5.0 adds better integration with Windows by allowing users to run NFS utilities, such as file searching from within Windows, without returning to the Unix interface. The new version also supports the Windows Sockets application programming interface (API), which allows developers to write Windows applications that will work across disparate Unix platforms.

Michael Goulde, senior consultant at Patricia Seybold Group in Boston, said it is important for Sun to support Windows Sockets API. "It's not an advantage to do it; it's a gross disadvantage not to do it," he said.

The Sockets API is a standard interface that enables any Windows application written to the API to run over any Transmission Control Protocol/Internet Protocol (TCP/IP) network. Last summer, most major Unix vendors announced support for that API.

For The Foxboro Co. — a Foxboro, Mass., supplier of manufacturing process control systems for gas, oil, paper processing and other industries and a beta-test site for PC-NFS 5.0 — the new version has made life easier for end users by opening a new world of software possibilities.

Analysts say the installed base of PC-NFS is over 1 million.

"Previously, when you bought prewrapped software, it would just support networks such as Banyan's and Novell's. Now with Win Sockets [and PC-NFS], any DOS application written for Windows can run on an NFS network," said John Puckett, manager of engineering network services at Foxboro.

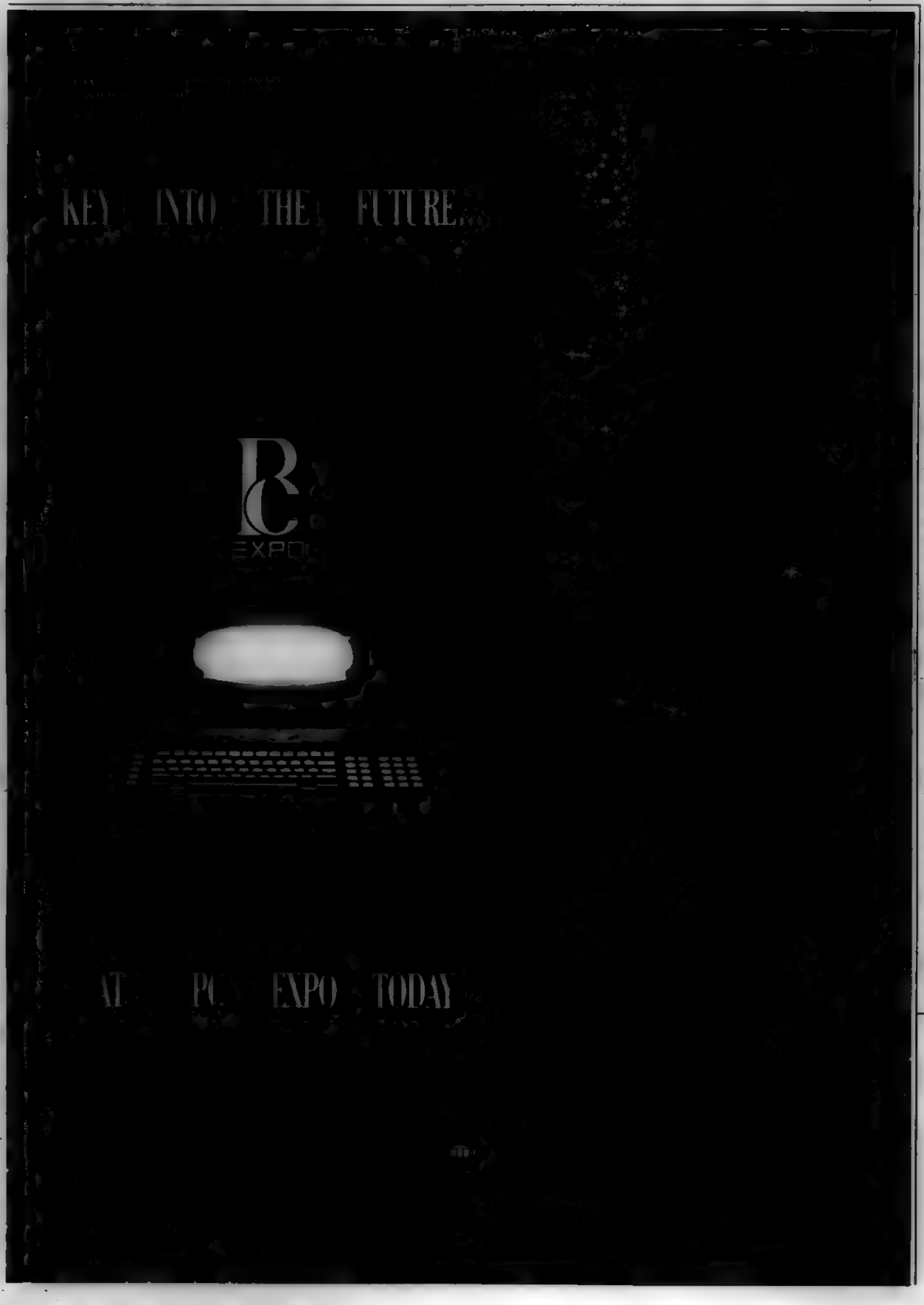
The company links 1,500 PCs to a network that includes 140 workstations, 10 operating systems, including Unix, and 30 servers. Broad support for the API is "one of the most intelligent moves the industry has made and long overdue," Puckett said.

Also new are features that let users run PC-NFS utilities, such as the Telnet terminal-to-host application, within Windows.

At Baylor College of Medicine in Houston, "Windows integration is the most used part of 5.0," said Danny Holden, manager of network services. For example, users now do not have to leave Windows to run Telnet, he said.

In addition, SunSelect announced SelectMail, E-mail for DOS or Windows PCs on PC-NFS networks. Baylor uses SelectMail because it lets users send mail across PCs, Sun workstations and other platforms across a TCP/IP backbone.

PC-NFS 5.0 also works with the NetBIOS interface. Sun announced last month that it will ship in the third quarter software that lets users of Microsoft's upcoming Windows NT access networks using PC-NFS.



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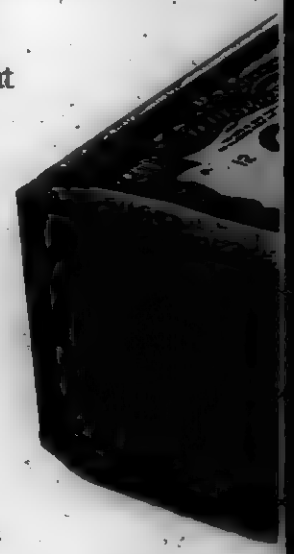

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Balancing technology, behavior

Better than most, MCI Communications Corp.'s chief strategy and technology officer Richard T. Liebhaber combines technological insight with a strong feel for how markets develop and consumer preferences ultimately pick winners and losers. Technologists, he declares, generally underestimate the need for what he calls "behavior change" when predicting how quickly a market will adopt a new technology.

Liebhaber joined MCI in 1985 as an executive vice president from IBM's Satellite Business Systems (SBS), where he was senior vice president of engineering and development. Before joining SBS in 1984, he was director of business development and policy at IBM. He sits on numerous panels and boards, including the Executive Council on Information Technology for the U.S. General Accounting Office and the Federal Networking Advisory Committee for the National Science Foundation.

He was interviewed recently by Ellis Booker, senior editor, Advanced Technology.

Q. What is your mission at MCI?

A. I serve as chief technology and strategy officer — "strategy" being business strategy. There's an important message in that combination. MCI is not a science company. We're an applied science company. We do not invent hard technology. We acquire it from our 76 suppliers and integrate it, and then we manufacture software.

We have an interesting advantage because we do not manufacture. We have access to everyone's laboratories. We recently met with three IBM fellows. We asked, "How many light waves do you think we can get on a fiber in the year 2000?" The answer was more than 100, which is important information. That tells me the effective cost of transport will continue to decelerate. We're talking about several thousand gigabits of capacity per [fiber] pair.

That's very important information for me because the MCI story is a story of cost performance and [demand] elasticity. That is, you take costs down and volumes increase faster than the price goes down, [provided] you worry about the application environment.

Q. You joined MCI in 1985. What technologies did you expect would be commonplace in 1993 that have not, in fact, arrived?

A. Of all the things we've thought about, the development that has been most frustrating has been the LAN interconnection or the workstation interactivity over wide areas.

Just about everything else is pretty much moving along. For example, we thought multimedia in the 1995 time frame would happen . . . and I think video on the desk *is* multimedia.

Q. Are technologists today better at evaluating how quickly things will be picked up by the market?

A. Some of us are. Those of us who bent our picks on behavior changes are. Electronic messaging requires behavior changes. At MCI, if you want to get my attention, you have to send an electronic message.

If you haven't experienced this phenomenon, you forecast crazy things. Those of us who are involved in this science get confused because we believe our market research, and we underestimate the demands of behavior changes. There has to be a driving force for behavior change. This has to be understood by the guys running the company, not some technocrat.

Technology task force

MCI's Systems and Technology organization is staffed by about 8,000 people, half of whom are programmers. About 200-300 of these programmers work on current technology; there is also a 22-person think tank studying where technology will be in the year 2000.

Q. Which networking technologies will have the greatest impact during the next 10 years?

A. What's happening on cable with multimedia and interactivity is going to have startling effects. Raw technology is very interesting, but the things that are successful in technology are the things that are important for life: television, the Walkman.

The Sony Walkman, by the way, is a perfect example of the way technology has to respond to be successful. There are 277 models of the Walkman — one comes out every three weeks. It's constantly adopting and changing and

turning and responding.

Q. What about wireless networking?

A. With wireless, you're really talking about two broad implications. One is portability. The other aspect is competition from a pricing standpoint. It's going to change the cost of [network] access. The one thing we know is that competition manages prices. So as soon as this radio technology is available — which has a much lower cost to the subscriber — the wireline costs are going to come down to match it.

Q. How about video at the desktop?

A. I think it's application-driven, and I think it's limited. We have this interesting thing going with consumer video phones. We announced one from a UK company for $750. We do not think this is a mass consumer product. If we sell 5,000 this year, that will be very interesting, and we'll learn a lot.

Q. What do you make of the complaint that for all the investment in technology, white-collar productivity has not made huge gains?

A. My observation is: All the productivity benefits from technology are there and that it is a management failure if you don't benefit from them. MCI is a white-collar company. Our revenue per employee exceeds $350,000 per year. But my target is J. P. Morgan, which does about $600,000 per employee per year. My target is not AT&T or IBM.

MCI is also known as being a "ready, fire, aim" company. That's a very good image for us. But you also have to be disciplined. In other words, if you install this technology and say, "This technology is going to make you 20% more productive in telemarketing," when the technology is installed, you take out 20% of telemarketing. It's also a case of managing technology and productivity when you're successful, not when you're [in trouble].

Q. What technologies excite you?

A. From a business opportunity standpoint, the most exciting technology under development today is the multimedia and programmable [TV] set top box. It's going to give me the opportunity to recall or schedule entertainment, education and information.

Q. What technology will have the greatest societal impact?

A. The cost dislocation of bandwidth in the medium- to long-distance [market] is probably the most significant factor. It's going to enable things like medical imaging, interactive education . . . a lot of things that are not plausible today because of the cost of transmission.

Tech Talk

The venue: a 40 ft by 12 ft carpeted rug. The game: Gather two sizes of kick balls and put them in your goal. Sound simple? Not if you are a remote-controlled robot.

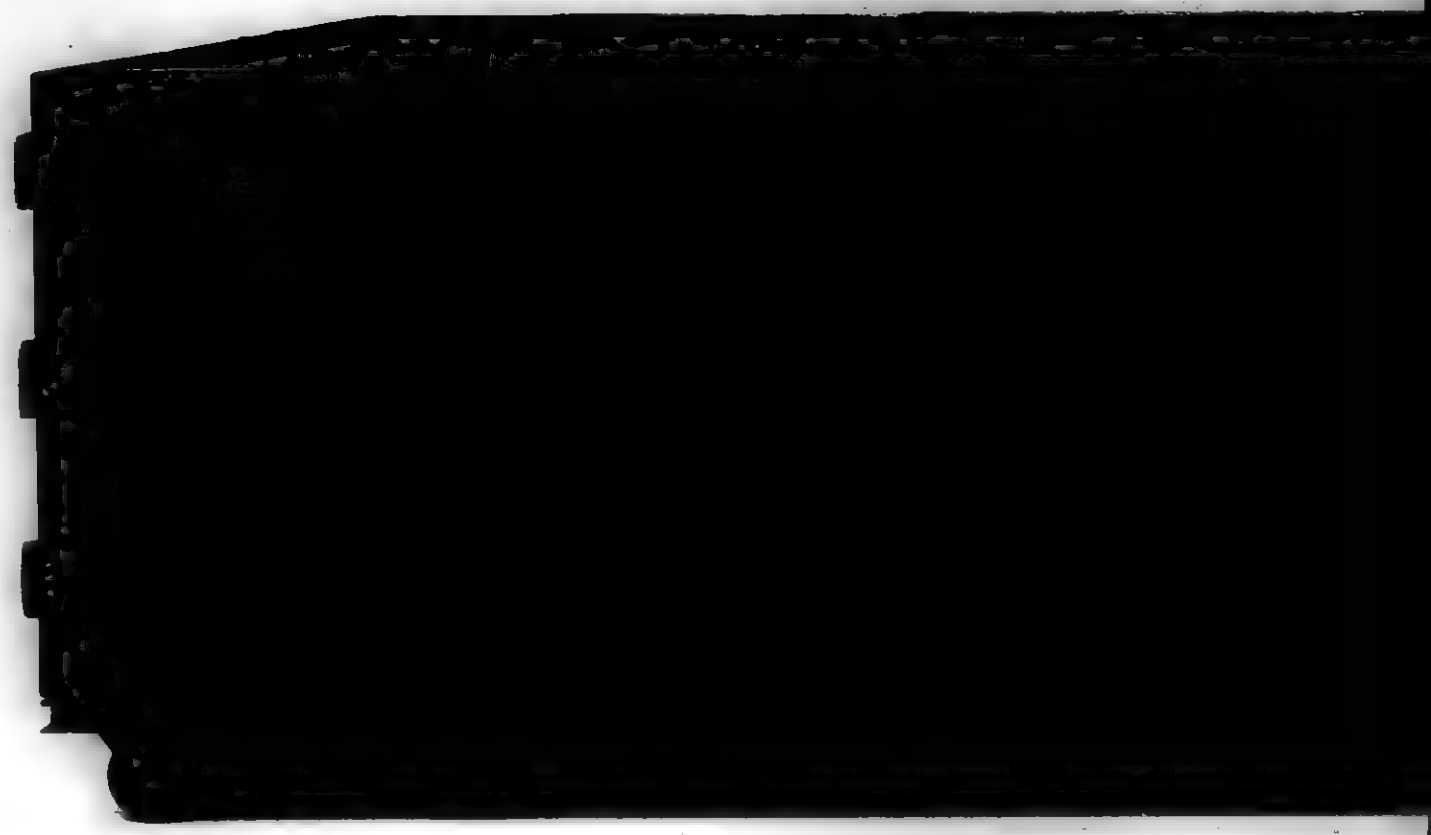
Last month, a "robo-athlete" named Dallas Rug Runner from the E-Systems, Inc./Dallas Christian High School team bested 24 challengers to win the second annual U.S. First Competition in Manchester, N.H.

The two-day competition was co-hosted by the Council on Competitiveness and sponsored by Motorola, Inc., which developed a wireless modem that was supplied as part of a "standard parts kit" to the

Dallas Rug Runner beat 24 challengers to win kick-ball title

teams of high school students and professional engineers.

The teams, composed of a who's who of U.S. technology companies, built the robots over a seven-week period. The robot competition is one of several innovative programs developed by U.S. First, a not-for-profit coalition founded in 1989 to excite interest in science and technology. —*Ellis Booker*



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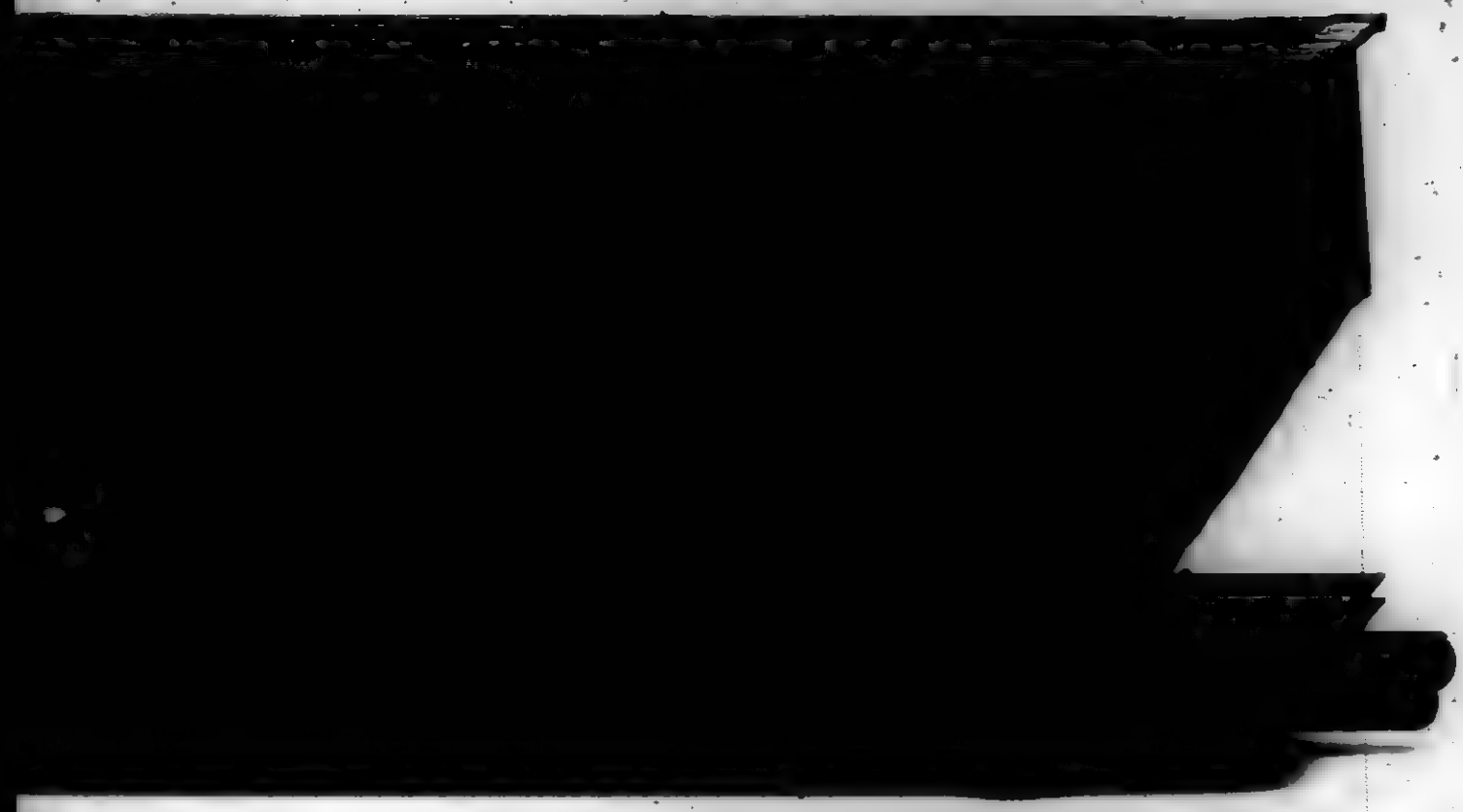

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Lou, *who*?

He's an iron-willed manager who has led by exemplifying hard work. He's shown excellent morale-building skills, which are vital to a company where employee morale is tanking. He's shown a flair for operating deftly in turnaround situations. He's tenacious, an aggressive ax-man when needed, and he's good with numbers.

The company? It's tied inescapably to a big iron heritage. Its management structure is notoriously inbred. It's a renowned technology leader, having pioneered some of the most innovative product strategies in the computer business.

Looks like a good match of an executive with a company in distress. Except for one thing: Rick Miller, who succeeded An Wang at Wang Laboratories, had to learn all about the computer industry from scratch. So while he ran as hard as one could for more than two years, feverishly restructuring the company, the industry raced on ahead of him. He failed, not through lack of effort, intelligence or hard work, but because he didn't know the business as well as his competing peers.

By all accounts, RJR Nabisco CEO Louis Gerstner will get the top job at IBM, perhaps even by the time you read this. He has all the great qualities Miller possessed upon entering Wang. He also has a far more formidable task of staunching a fiscal hemorrhage while restructuring a $60 billion punch-drunk giant.

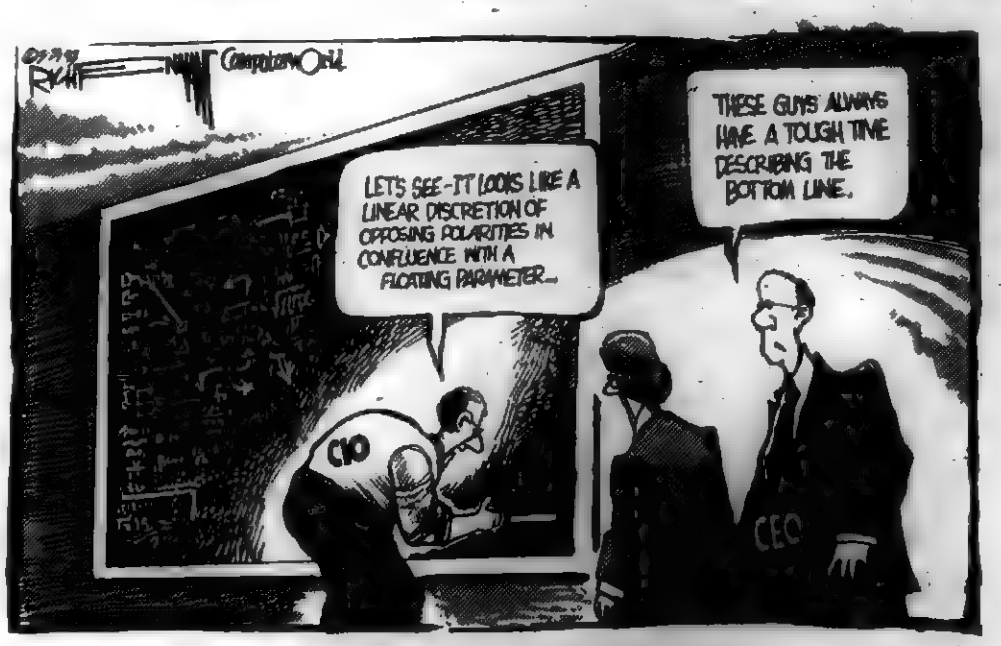
There is no doubt that Gerstner can make a quick, positive impact on IBM's numbers. He can slash and hack at the remaining dry rot inside the IBM family tree and present an illusion of renewed growth. That happened at Wang for a while, too. But new growth never materialized.

Why is it important for IBM to have a CEO who has a solid technology grounding? For one thing, its big customers say it's important, and the customer is always right. Unlike cigarettes and cookies, computers are not consumable commodities. Simply cutting costs and making them cheaper doesn't mean squat to users with $500 million worth of installed IBM technology running their business. They want technology pathways to the future, and they probably care very little about IBM's share price. Share price seems to be the driving force behind the IBM board's apparent decision.

Is the board caving in to the most serious and debilitating economic disease, one with its roots in the 1980s leveraged buyout mania? You know, the disease that throws long-term thinking out the window and replaces it with an unwavering quest for short-term performance?

Bill Laberis

Bill Laberis, *Editor in chief*



Make way for MCA

I had to laugh at the comment made by Eckhard Pfeiffer in his interview about winning the battle against IBM over Micro Channel Architecture (MCA) [CW, March 8]. Has he seen the ads that Apple has been running lately? It is much easier to upgrade Apple hardware than PC-compatible hardware. And you know why? There are no hardware interrupts to contend with. If I were him, I wouldn't worry about IBM; I'd keep a close watch on Apple.

If it is acceptability and consumer demand that wins in the PC marketplace, I expect Apple to continue its growth because of a few other companies' hardheadedness against a better idea. From a mathematical standpoint, MCA is far superior to EISA. From an ease of use standpoint, how many non-hardware experts and just plain old brown-bag users out there can figure out what the heck an interrupt is and what to do with it?

So to all you PC manufacturers, wake up before it is too late. Help us out by abandoning EISA and adopting MCA so we don't have to pull our hair out trying to get new equipment running.

Denys Tull
Cincinnati

Can't compare

The front page of the Feb. 8 issue had a table comparing Unix, Windows NT and OS/2 2.0. Why did you compare an available product like OS/2 with another of Microsoft's smoke-and-mirrors routines. Why didn't you compare OS/2 3.0 (Portable OS/2) to Windows NT? Please refrain from such misleading "comparisons" in the future.

In the article "NT knockout sought with Portable OS/2," you stated "in its race to deliver a portable OS/2 on a RISC platform, IBM is definitely trailing behind Microsoft." How can you trail something that doesn't exist? Name me a time that Microsoft has delivered an operating system on time.

In the article "Promises fly in OS market share battle," you state, OS/2 "sales have yet to make more than a blip in the charts." What about the fact that OS/2 is outselling Windows for Workgroups?

Two million sales in 10 months may not look like much compared with Microsoft's claims of selling 1 million copies of Windows every month, but compared with the feeble sales that OS/2 generated in its first five years, IBM has done a great job.

James R. McClure Jr.
Hampton, Va.

Software faux pas

"First raid tests felony law" [CW, March 15] suggests that Rusty & Edie's bulletin board was shut down for allowing the downloading of "copyrighted games and business applications." This terminology is a misnomer. Nearly all software is copyrighted. The licensing agreement is what makes it illegal to offer a program for downloading.

In the case of shareware, the licensing agreement states that the user is honor bound to pay for the software if he continues to use it past a trial period. Freeware usually does not require payment of a registration fee unless the user seeks a business site license.

All of these types of software are copyrighted, and your publication does a disservice to those shareware/freeware authors whose copyrighted programs are legally available for downloading.

Holly R. Henry
Cincinnati

Not dead yet

It has been obvious to mainframe dinosaurs like myself for some time that the exciting news in our industry is rarely in the mainframe area. I'm a realist, and I can live with that.

But when I read the March 8 issue, I noticed that even our last refuge is being eroded away. "NY saves big with client/server" is about a "large" network of client PCs (one sentence is devoted to the DEC server). The next largest article was "Minis bridge gap between city, county," which was about HP 3000s. And the last article was about system integrators helping multinationals, with references to desktop systems.

Come on, guys. Even the elephants got a graveyard to die in. Please do the dinosaurs the same courtesy.

Bruce Black
Denville, N.J.

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Productivity comes when we carve out new realities

Nicholas Rudd

What's that, you say? You know the new world of client/server, PCs-for-all computing will increase your organization's productivity, but you can't prove it? Your management wants return on investment when you're talking increased customer satisfaction?

Welcome to the "productivity paradox." It's a simple proposition: Companies in the service sector have poured billions into information technology for their white-collar knowledge workers, but the statistics show no change in productivity. Unfortunately, that's not a lot of help when you're presenting for this year's investment budget.

There may be some hope. There seem to be four main issues that must be resolved:

▶ **Measurement mismatch:** Traditional performance metrics focus only on financial parameters and don't take customer satisfaction or quality into account.

▶ **Technology misuse:** There is an unfortunate tendency for managers equipped with computers to divert their time to clerical tasks such as putting together presentations and fiddling with type fonts. These frivolous activities negate time savings. Technology can be unsuitable, too. You wouldn't run a worldwide airline reservation system on a network of PCs, but some people expect to support the flexible needs of a knowledge worker workgroup with a mainframe.

▶ **Value confusion:** Managing information technology doesn't add value. Changes in process and structure produce additional value. Information technology assists that. Traditional manufacturing perspectives mislead knowledge worker productivity analyses because the process fundamentals are different: human interactivity, not machine interdependence. And things get worse when organizations don't redesign themselves because new technologies such as LANs and WANs undercut command-control hierarchies.

▶ **Using the wrong denominator:** Organizational productivity happens at the workgroup level, not personal level, but we're only beginning to think about information technology that way. And designers, manufacturers and vendors haven't brought workgroup computing fully to market yet.

The prescription for these ills is straightforward: Combine a process orientation with the right technology.

There's the rub — and there's the hope.

Mismeasurement is clearly a problem. We need to figure out what we're trying to measure with current approaches. We also have to stop misusing technology and start changing skills, processes and organizational structures. Finally, we need the right technology for knowledge work. Virtually all of today's technology reflects traditional computing, which grew out of a manufacturing paradigm.

Fortunately, the right technologies and the supporting web of changing culture, practices and processes that make them work are beginning to show up, although you have to look closely. A common design characteristic centers on how human beings work with each other — what it is that we actually *do* when we say we are working and how we interact with one another.

As technology designed for the processes of knowledge workers displaces technology designed for manufacturing, those elusive productivity increases will materialize.

Rudd is senior vice president of management services and CIO at Young and Rubicam, Inc. in New York.

Microsoft's assault on the data center

FIRING LINE *by* John Gantz

As a purely analytical exercise — a brain teaser — I have been trying to find a chink in Microsoft's armor. The Federal Trade Commission has given up the antitrust quest. Operating income is over 35% of sales. The market is soaking up Windows 3.1. And with about one-fifteenth of IBM's revenue, Microsoft has practically the same valuation on Wall Street. If there are any chinks, they are microscopic.

But even hairline fractures, when stressed, can cause pain. And I think I have found a crack developing. It is in Microsoft's assault on the data center.

Coincident with the final development stages of Windows NT, which promises system management services, SQL database management and SNA gateway connection, Microsoft has been revamping its business practices to appeal to corporate IS managers. Changes include new volume licensing [CW, Feb. 1] and more support services and consulting [CW, Nov. 16, 1992].

Microsoft's plan is to deliver both licenses and business solutions — including major line-of-business applications — through a network of partners backed by Microsoft technical support. This is somewhat different from the IBM or DEC one-stop-shopping business model.

It all sounds great, but I see a number of problems with these new initiatives.

•First, the use of partners to deliver services and track licenses bought by large customers will lead to channel conflict — a problem that can stymie even the experienced, which Microsoft is not. Which channel partner should Microsoft's corporate sales rep bring to an account? What happens when two partners are calling on the same account? The questions will multiply.

•Second, the specific multiyear licensing plans announced by Microsoft may turn out to be difficult to administer and might yield some surprising complications. Anyone who followed what happened when AT&T and MCI suddenly offered volume pricing plans along with chargeback billing schemes knows how these things backfire. The information systems needed to support volume licensing plans sold by others are nontrivial.

•Third, mainstream Microsoft may rebel. Product and channel managers concerned with pumping Windows products out in quantity will resist the diversion of corporate resources to other, more complex channels. They will also experience culture shock dealing with IS.

I don't doubt that Microsoft is smart enough to figure out what IS managers need and to develop plans to serve those needs. Nor do I doubt that the company can bring in top talent to run the programs. But executing these new programs the first time out is a different matter, involving significant investments in employee and business partner training in logistics and IS and in overhead for managing complexity. Programs and practices that work for a handful of key customers have to be bulletproofed when they're rolled out to the universe at large.

If I were an IS manager being wooed by Microsoft, I'd expect some glitches to surface in these new programs, some field personnel and Microsoft partners to lag behind the learning curve and Microsoft to make plenty of midcourse corrections.

It ain't easy to go from selling DOS and spreadsheets to selling complex client/server solutions of interest to IS.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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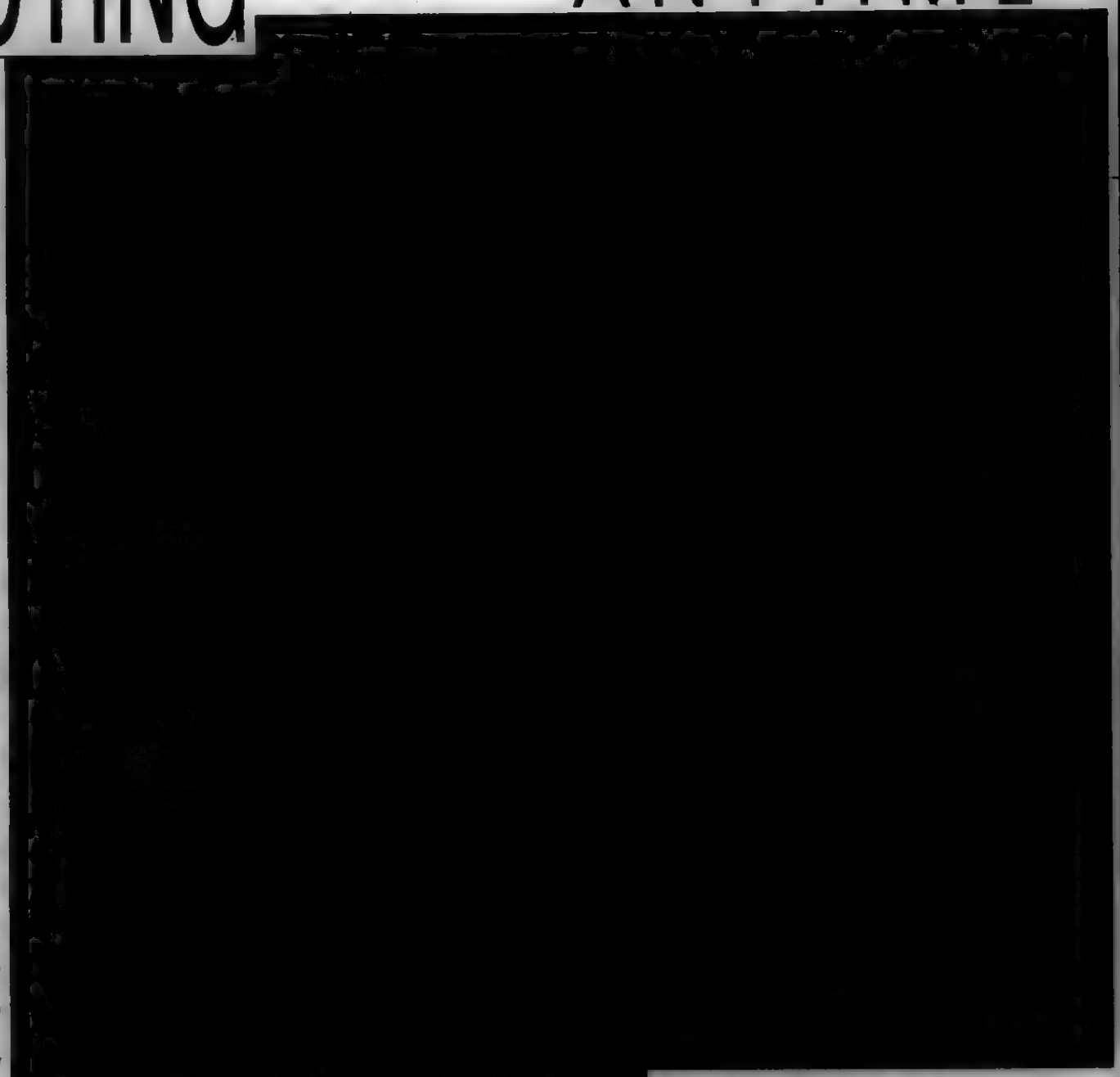

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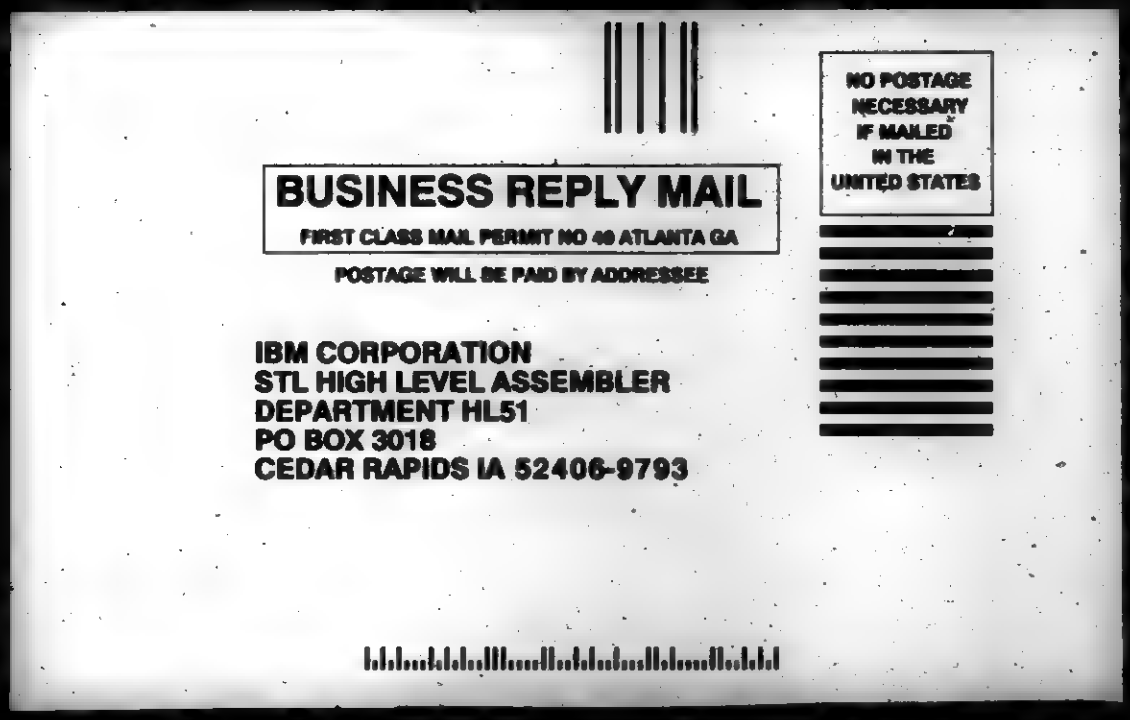
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Charles Babcock

Wanted: A Unix plan

With a collective hurrah, the leading Unix vendors threw down the gauntlet to Microsoft at UniForum 1993, saying they too would offer a common desktop environment. The UniForum brass declared it "the event of the decade," but it sounded more like a cry for help.

Fear of Windows NT is now palpable in the Unix community, and this group's response has both wit and desperation in it. Unlike the division of Unix vendors into warring camps four years ago, these vendors represent 85% or more of Unix sales, and they have suddenly decided to minimize their differences.

Sun, for example, is backing off its "Open Look only" stance and will offer an enhanced version of the OSF/Motif GUI it once scorned. IBM, HP, The Santa Cruz Operation and Unix System Laboratories will offer the same GUI. Incompatibilities in networking and graphics will be erased as specifications are written to which all parties will adhere.

It's as if the Unix community has stood an old aphorism on its head. If pride goeth before a fall, then pride must goeth before NT cometh.

Short-term fix

A group of leading Unix vendors promoting a common desktop environment will help broaden the appeal of Unix. Novell's dropping the price of UnixWare — its combination of NetWare and desktop Unix — to $250 will help. But these tactics are good for a few months or a year, not a decade. "I don't want to see people form another Unix consortia," said Carl Zeigler, the acidic Unix development director at the SAS Institute. "I'd like to see someone form a Unix strategy."

And that is exactly where the latest grouping of Unix suppliers falls short. Unix is a sophisticated, high-end operating system missing out on the rapid expansion of the PC computing base. Microsoft is a low-end, high-volume technology company with ambitions to become high end through Windows NT.

A dispassionate observer might say the two will meet in the middle somewhere, but only fools can be that aloof under today's circumstances. Microsoft has consistently shown greater insight into the needs of PC users than other companies and has earned the confidence of end users as a result.

It will be difficult for the Unix community to arrest this momentum. Xerox's PARC invented the windowing interface. Apple packaged it. And Microsoft came along to popularize it. When the Unix community proclaims it has a common GUI for the end user, in effect it has been reduced to offering a belated "me, too."

A real Unix strategy must focus on Unix's technical strengths and use them to capture the direction in which end-user computing is headed. Unix today is the best manager of the heterogeneous network and an effective application server.

In addition, OSF/Motif, based on the X Window System, is the GUI that was designed to be networked. A window with an application running in it may be projected from a server across a network to a client device such as an X terminal.

In a straight Microsoft environment, separate window managers and applications reside on clients as well as the server. The built-in networking characteristics and application-to-application communication of Windows NT indicate that it will serve as a client/server foundation as well, albeit of a different sort.

Unix continues to enjoy an edge as a multiuser system, and its use is frequently required by the large database system vendors, whose relational engines are a key component of distributed data.

Unix continues to enjoy technical advantages, and the Unix community must bid from its core strength for leadership of end-user computing.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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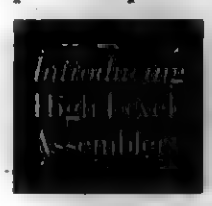

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Macintosh clones on the horizon

Start-up unveils Duet PC amid questions about market viability and legality

By James Daly

■ Send in the clones. The Macintosh clones, that is. After years of speculation and the threat of lawsuits, a low-cost imitation of Apple Computer, Inc.'s proprietary Macintosh PC finally seems to be just around the corner — in both unsanctioned and sanctioned forms.

Earlier this month, a small Silicon Valley start-up called NuTek USA Corp. began to test the mettle of Apple's tenacious refusal to allow Macintosh clones when it unveiled a cleverly engineered PC that it claims is functionally indistinguishable from the Macintosh. If successful, it could dramatically widen the PC market in much the same way that cloning IBM PCs has become a multibillion-dollar international industry.

"NuTek will do for Mac users what the first IBM-compatible developers did in the early 1980s — open up the market to increased innovation and competition by enabling major independent third-party manufacturers," said NuTek President Benjamin Chou at an office located only a few miles from Apple's corporate headquarters.

Chou said NuTek's $2,996 Duet computer is a "workalike" that will be targeted at mixed Macintosh/IBM environments. NuTek will also sell circuit boards that OEMs can use to build Macintosh compatibles.

So far, users are skeptical. "I can't ever recall a clone that was perfect, especially if it's unauthorized," said Tim Yancy, manager of customer service management systems at Southern California Edison in Rosemead, Calif., and a member of the MacIS user group board of directors. "It's inevitable that there would be some incompatibility, so any reduced price wouldn't be worth the grief."

Compatibility license

One solution would be legitimately produced Macintosh clones, which could come in the next year or two. According to one highly placed Apple official, the firm is going to license its Macintosh compatibility module "very soon." The component will allow high-end machines using the impending Apple/IBM/Motorola, Inc.-developed PowerPC chip to run Macintosh applications software.

Compaq Computer Corp., NEC Corp., Sharp Corp. and Toshiba America Information Systems, Inc. have reportedly talked to Apple about making Macintosh compatibles targeted at niche markets that do not directly compete with Apple's business, analysts said.

These developments represent a major shake-up for Apple, which for nine years has been the sole provider of the Macintosh technology. The advantage, which is guarded by dozens of patents and a cadre of corporate lawyers, has allowed Apple to charge premiums of up to 15% more than similarly configured IBM computers.

Although attempts have been made to emulate the Macintosh, they ran into technical and legal challenges. Legal action has revolved around the "look-and-feel" of the Macintosh user interface as well as the duplication of the Macintosh's read-only memory (ROM) chip, which contains a copyrighted program that controls the basic hardware and standardizes the user interface.

To date, no independent supplier has legally and successfully developed a Macintosh-compatible operating system and user interface, although Sony Corp. and Apple are reportedly producing a notebook PC incorporating Apple ROM chips. Outbound Systems, Inc. in Boulder, Colo., also produced a Macintosh laptop clone under Apple license using chips taken from old Macintoshes.

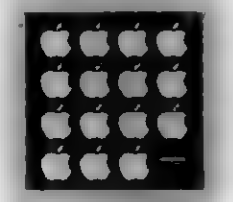
But so far no bid has been as ambitious as NuTek's. Chou said his firm will slip through Apple's legal noose because of its "clean room" development methodology, a four-year effort through which NuTek engineers built their ROM chip from publicly available sources and without references to the Macintosh's internal code. NuTek could thus stand a good chance of prevailing because its actions are analogous to those of Chips and Technologies, Inc., whose successful replication of the IBM PC chip sets led to aggressive cloning.

Additionally, Chou said he will sidestep the look-and-feel screen-appearance lawsuits Apple leveled against Microsoft Corp. and Hewlett-Packard Co. because NuTek's user interface is based on the Open Software Foundation's Motif interface. Apple officials refused comment because they had neither seen nor evaluated Duet but vowed to defend their property rights if they were impugned.

That threat could limit OEM acceptance of the NuTek strategy. NuTek officials said they will indemnify OEMs from any copyright infringement relating from an Apple suit, but questions remain over what responsibility NuTek could shoulder regarding OEM equipment investment should the NuTek products be defeated in court.

An Apple lawsuit, however, may be the least of NuTek's problems. The first is finding buyers. Analysts said NuTek may have missed its window of opportunity. If an inexpensive Macintosh clone had arrived several years ago, before Apple's aggressive price-cutting in the face of bitter competition from Windows-equipped PCs, it might have had a chance.

"They may find a niche group which wants a low-cost system that also has Mac and PC compatibility, but I think their success will be only marginal," said Tim Bajarin, president of Creative Strategies Research International, Inc.



Copycat

NuTek President Benjamin Chou says he has signed up more than 60 companies in the U.S., Europe and the Far East to sell the Duet, a Macintosh "workalike."

The number of System 7-ready Apple Macintoshes projected to be installed by the end of 1993 is 10.3 million, compared with 5.2 million installed in 1992, according to Peter Hartsook, editor of "The Hartsook Letter." The Macintosh should continue its stellar growth through 1995, when Hartsook estimates the installed base will be 26 million systems.

Utilities

Central Point moves to Windows

By Michael Fitzgerald
BEAVERTON, ORE.

After the most extensive beta test in company history, Central Point Software, Inc. recently brought its flagship product, PC Tools, into the Microsoft Corp. Windows environment.

Central Point enlisted 2,000 sites as beta testers, including 300 major corporate sites, and spent two years working on PC Tools for Windows. It said it believes the extensive testing will prevent any recurrence of its bug-ridden PC Tools 7.0.

The result is a utility that one user said works solidly (see review at right).

PC Tools for Windows has 14 separate modules, among them a File Manager for data management and WinShield, which protects data and includes the only Windows-based disk repair tool on the market.

"They put the extra effort into their product to give it special functions. There were things like their tape driver support — I didn't need any other tape software for my tape backup drive in my Model 80," said Joel Shulman, an office automation specialist at Farmers Insurance Group of Companies in Los Angeles.

Central Point has built right mouse button support throughout PC Tools for Windows and enhanced drag-and-drop capabilities.

Other features include Tag-along, which allows a user to have certain functions, such as electronic mail, "follow" through different folders.

David Roux, senior vice president of marketing at Central Point, said the product "ought to be really useful for [a user] in the first 15 minutes of having it installed."

Shulman said 15 minutes was probably not reasonable for users who lacked familiarity with Windows but would probably work for people who know Windows to begin with.

PC Tools strengths drawn from competition

By Christopher Lindquist

In the world of full-blown utilities for Microsoft Corp.'s Windows, Central Point Software, Inc. is entering late, but it is entering with a winner — a winner it needs if it is to succeed in a market currently dominated by Symantec Corp.'s Norton Desktop for Windows.

PC Tools for Windows had to be good if it was to go head-to-head with the popular Norton Desktop, and it is. PC Tools for Windows is defined by versatility.

Central Point claims to have interviewed some 200 Norton Desktop users in deciding on its design for PC Tools, and there are some resemblances. A menu bar appears at the top of the screen and various tools and applications can be placed on the desktop directly. A File Manager bar with available drive icons can also be put within easy reach. However, the similarities weaken once you get inside.

For starters, PC Tools for Windows offers virtual desktops similar to those found in Hewlett-Packard Co.'s Dashboard (which I still

PC Tools, *page 61*

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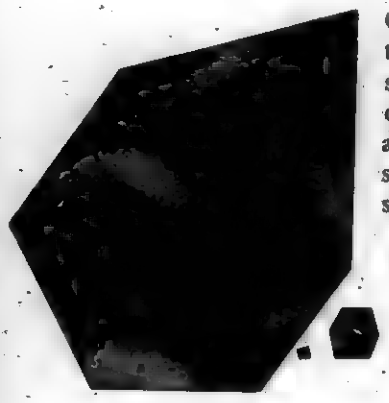
Introduction

One of the currently prevailing management doctrines states, "Success is dictated by one's ability to manage change." If that is the case, information systems (IS) departments will succeed or fail based on their ability to manage open systems, the primary vehicle of change in the information technology industry.

Unfortunately, an abundance of international standards, industry partnerships and technology advancements has brought both chaos and opportunity to the open systems arena. The challenge for users is taking advantage of open systems technology while avoiding the chaos. It is a formidible challenge.

The promises of open systems are alluring. Freed from the tyranny of proprietary vendor offerings, users find themselves calling the shots in a competitive marketplace increasingly populated with low-cost, standardized offerings. But these open systems offerings do not come bundled in one neat, convenient, turnkey package. In reality, they are like so many loose pieces of a puzzle — a puzzle that must be assembled by users.

This requires a diligent strategic plan that establishes guidelines and statements of direction. This plan must be based on an understanding of the advantages and disadvantages of available standards. In order to gain that knowledge, many tough questions must be asked. For instance, is it wise to build open systems around de facto standards that may be controlled by monopolistic vendors? Or is it better to wait — possibly for months or even years — for formal standards bodies to deliver truly open and uniform results?



Open systems profiles can help answer these questions. Designed to be more specific and tactical than strategic plans, they may address departmental, organizational or even industry-wide open systems applications, no matter how large or small. These open systems blueprints can provide a constant baseline as systems expand.

In the final analysis, users must coordinate the pressing — if more abstract — need for openness with the more tangible requirements of the business enterprise. When the proper balance is struck, users and vendors alike will benefit.

This White Paper was written independently of the Computerworld *editorial department by International Data Corp.*
The authors are Mark Leary, Director, Communications Research, and William Sines, Vice President, Midrange Systems and Servers.

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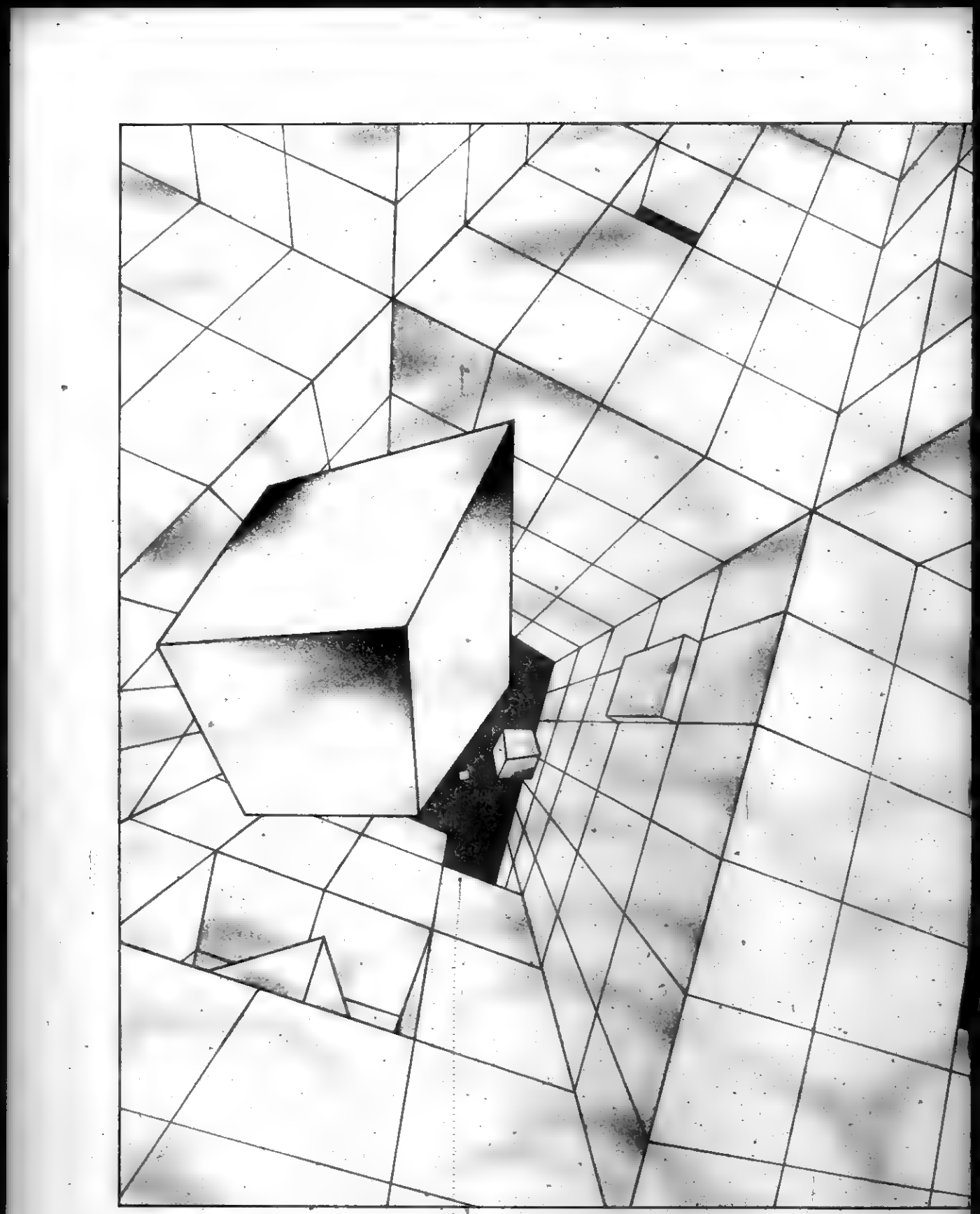


The evolution of information technology architectures has marched in lockstep with changing business models. In the '60s, businesses focused much of their efforts on growth — the more the better. The goal was to maximize economies of scale. In that environment, large backroom processing systems reigned supreme. The more processing power that could be crammed into the data center, the better.

In the '70s, information systems moved to the forefront as businesses took their first steps towards mission-critical systems. It was in this environment that airline reservation systems took off. Staying in tune with the times, American Hospital Supply built a large, loyal client base by placing its terminals within hospitals. Simultaneously, timesharing and on-line transaction processing provided immediate access to business applications — applications that were aimed directly at end-user functions.

Still in the '70s, minicomputers became the distributed processor of choice for interactive

computing.

The '80s ushered in the era of end-user and team productivity. PCs and LANs became ubiquitous on the information processing landscape. Software geared towards servicing individuals and small teams of end users dominated IS departments. Word processing, spreadsheets, graphics, electronic mail and network operating systems were the big-ticket items in many software budgets.

In the '90s, organizations are dramatically expanding the team concept. No longer satisfied with effective 10- or even 20-person teams, they are out to incorporate everybody, even people outside the enterprise.

The new business model calls for a high degree of integration across lines of business, functional areas, and between suppliers and consumers. In this environment, the aim is fourfold: maximize information access, optimize information systems component use and reuse, increase staff effectiveness, and accelerate return on investment. These four goals can only be fully realized with an open systems strategy.

OPEN SYSTEMS: THE IMPACT ON BUSINESS

Business activity in the '90s is characterized by three principal guiding forces: quality, time to market, and value.

Quality — The ability to gather, access and process accurate information is a critical success factor in designing, producing, selling and supporting any product or service. Open systems make information available and economical.

Time to Market — Information systems built from highly modular, open systems enable organizations to readily absorb new and more effective technologies. They also allow companies to quickly adapt to changing business practices, competitive pressures and end-user processes.

Value — Open systems provide greater value by maximizing the return derived from IS staff expertise, end-user experience, existing systems and supplier competition.

Organizations wishing to manage information systems change must increasingly expand their use of standardized open systems technologies. This becomes not just an information systems strategy, but a business strategy.

OPEN SYSTEMS: THE IMPACT ON IS OPERATIONS

While many people consider them to be part of a strategic, long-term imperative, open systems can have a direct impact on the short-term success of an organization as well. They can do this by providing:

- Reduced vendor dependence
- Optimized support provisioning
- Broadened product acquisition opportunities
- Lower learning curves for new systems
- Leveraged use of existing open systems
- Eased integration of multiple systems
- Gradual systems expansion.

Hardware and software acquisitions, information technology vendors, support strategies, organizational structure, systems analysis and application development are all influenced by the use of open systems.

Consider the following: an acquisition that is based on a proprietary, closed system has little chance of being a low cost solution. A support plan that calls for servicing a specialized and proprietary technology is destined for failure because it will not be resource-effective. An internally developed application built upon a closed system will never be easiest to maintain, adapt or enhance.

Many people confuse open systems with Unix, RISC workstations and personal computers. While these elements represent some open systems technical underpinnings, in reality, open systems are based on existing and proposed standards created to promote the rapid user adoption of new technology. In the process of expediting introduction of new technology, open systems are changing the competitive environment of the computer industry.

THE ROLE OF STANDARDS IN IS PLANNING

In an open systems environment, users benefit from a broad network of technology standards supported by many vendors. They are also freed from the single-vendor vice that currently holds many of them in its proprietary grip. Once they are released from this grip, they find a competitive marketplace where product prices are driven down by the affordability of standards.

The typical IS organization can only

TYPES OF STANDARDS

Type of Standard	Examples	Decision Power	Risk Short/Long Term
De jure	POSIX, IEEE	High	Low/Low
De facto/Product	VMS, MVS	Low	Low/High
De facto/Licensable	Sun, PC, Unix	Medium	Low/Medium
Alliance/Product	88 Open, OSF, UI	Medium	Medium
Alliance/Marketing	IBM/Apple, ARC	Low	High/???

Source: International Data Corp.

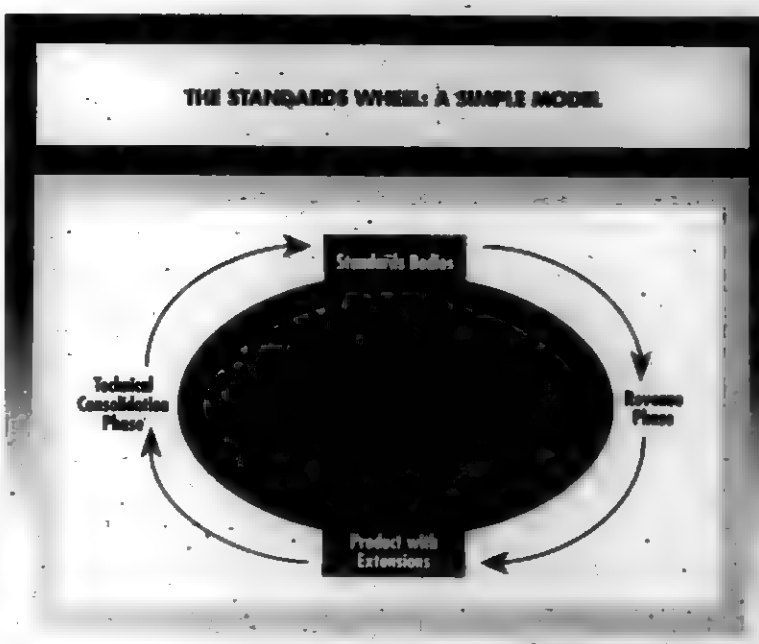
Decision power refers to the potential number of tactical choices that can result from a decision to adopt a standard.

take advantage of these changes if it develops a strategic IS plan that includes technical standards statements.

The strategic plan is not a tactical document. It does not set specific business requirements or propose specific solutions. It does provide guidelines and statements of direction. The strategic plan is therefore a framework for decision making in an environment of high uncertainty.

Strategic decision making in such environments, when multiple "correct" answers may ultimately be found, is very different from everyday tactical decision making where quick decisions must be made based on limited choices. Strategic decisions must set direction while yielding the maximum number of possible tactical alternatives. Then tactical decisions can more precisely match the problems at hand.

Strategic technical standards direct tactical decision making. Correspondingly, these standards should maximize future flexibility and, where possible, reduce future risks.



Source: International Data Corp.

The slow and steady circular path followed by standards creates stronger products, stronger markets and better information systems.

TYPES OF STANDARDS

There are five general types of standards:

De jure — This type of standard is established by a formal and independent standards body. It is often not associated with either a specific vendor or product. Unfortunately it often trails leading edge technology due to the excessive time required to formally codify it. Example: IEEE's Posix.

De facto/product — This is a widely accepted market-driven standard usually based on a specific product. The product is nearly always supplied by a single vendor with monopolistic objectives. Example: Microsoft's MS DOS and Windows.

De facto/licensable — This is also a market-driven standard but differs from a de facto/product standard in that multiple vendors supply the product and advance the technology. Example: Unix.

Alliance/product — This standard is created when a collection of vendors forms a confederation designed to advance a well defined product. Such a standard may lack wide market acceptance. Example: 88 Open, Open Software Foundation, Unix International.

Alliance/marketing — The distinguishing feature of this type standard is that no product based on it is yet available. The specific products and features are largely unknown, as are availability dates. In some cases, even a firm description of the product, service, or standard is unavailable. Example: IBM/Apple ARC.

Each of these standards has various properties that are important in a strategic decision model. One of these properties is "decision power." Decision power represents the potential number of tactical choices that can result from a decision to adopt a standard. De jure standards have a high decision power because many products from multiple vendors are typically available to meet tactical requirements. A de facto/product standard has relatively low decision power because it generally involves only one vendor and one product.

The various categories of standards also have varying degrees of short- and long-term risk. Short-term risk is incurred when investing in a new product that is not yet fully standardized but nonetheless can be used to address immediate tactical problems. Long-term risk is increased or decreased depending on how many vendors support a given standard and advanced compliant products.

Ranking Standards

De facto products make very poor strategic technical standards because they have both low decision power and high long-term risk. The most appropriate standards for strategic plans, in order of priority, are de jure and de facto/licensable. Unfortunately, it is not always possible to say which standards are most applicable to

In an open systems environment, users benefit from a broad network of technology standards supported by many vendors.

Sign of the times.

yes

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Everyone's talking about open systems these days, and for quite a good reason. They've become a business necessity.

After all it's hard to run a business without open access to information, and having different logos on your systems (not to mention the systems of your customers and suppliers) is no longer an excuse. Multivendor environments are a fact of life.

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strategic plans. This is because standards are not uniformly developed at all levels.

In some cases, vendors have not yet had a chance to bring a complete suite of products to market, or as in the case of object management, the standards activity has not yet been completed. In other cases, especially in the case of network operating systems, de facto/product standards still dominate. Example: PC and network operating systems.

Given the incomplete nature of many standards, it is wise to adopt one of several positions. One is deferring the standards decision until a future time. This may be a dangerous decision if it weakens the overall IS capability. Adopting several potentially competing lower-level standards is another option. This strategy allows users to maintain strategic control but is potentially wasteful of resources. However, it is often the safest approach.

Another option is adopting the highest-level standard possible and hoping that the vendor or vendor alliance behind it is successful in bringing the standard to de jure or de facto status. In this situation, evaluation of the vendor's historical ability to innovate and deliver on promises is key in the decision process.

Adopting a de facto/product standard and letting it drive the decision process toward similar standards at either the operating system or hardware level is not recommended. This course leads to proprietary lock-in.

STRATEGIC AND TACTICAL PLANNING

In the '70s and '80s, moving from strategic planning to tactical implementation implied selecting a single vendor to provide technology and guidance in technical skill transfer. In the era of open systems, this practice is changing as IS organizations find that nearly all vendors claim to be open. Suppliers are prepared to present lists of relevant standards that they support. Such lists may be useful but they may also be problematic.

These lists imply that vendors achieve openness by reaching a static goal. Just because they have met one standards goal does not mean that they will continue to support upcoming standards. They may ignore the dynamic future processes of the standards movement.

The computer industry is in the midst of significant change. Vendors are confused. They face shrinking margins, intense competition and short product life cycles. The old guard executives are failing as they attempt to play a new game by the old rules.

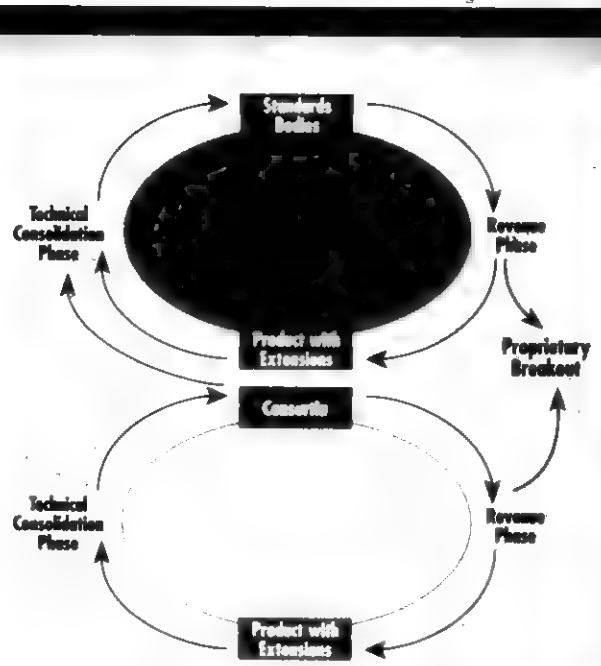
The problem is not simply the accelerating rate of technical progress, although this is significant. A more fundamental problem is the inability of any single vendor to provide all the necessary technology for a total solution directly from its own development laboratories. Technology must be obtained not just from other companies in the same industry but from other industries as well. The need to rapidly integrate technologies is at the heart of the open systems movement.

Like vendors, customers are also caught up in the changing times. Most IS executives recognize that no single vendor can supply all the technology required to address user demands. These executives face the same integration problems experienced by the vendors.

SPINNING THE STANDARDS WHEEL

One way to view the standards movement is via what IDC refers to as the "Simple Standards Wheel." There are four stops, or phases, on the wheel: standards bodies, revenue, product with extensions, and technical consolidation. In

THE STANDARDS WHEEL: IMPACT OF CONSORTIA



Source: International Data Corp.

Vendor and user consortia codify standards faster than traditional standards bodies.

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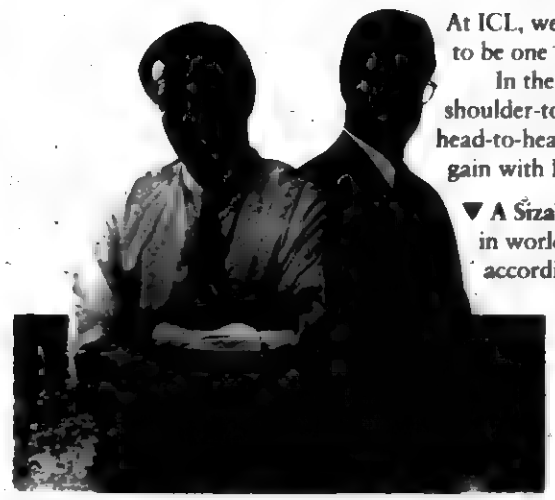

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Tips for Identifying an Open Systems Vendor

Identifying true open systems vendors is often difficult, especially if the IS executive does not have a long and established working relationship with the potential supplier. Uncertainty often prompts the IS executive to stick with the "devil he knows" even though it may lead to further proprietary lock-ins.

A vendor is an open systems supplier if:

- it does not believe that open systems are being developed as part of a "consumer-only movement." It is in the interest of both the consumer *and* vendor to adopt a standards-based competitive business model since standards accelerate the integration of new technology.
- it is an active member of an industry alliance or standards body. Such bodies represent a necessary source of technology that helps reduce both development and marketing risks. It is sometimes difficult to judge the vendor's claims of participation. One way to get a better understanding is to check with the alliance or body in question to see what working groups the vendor is on. Another is to ask competing vendors, although their answers are likely to be colored by their competitive biases.
- its latest products subscribe to a relatively broad set of standards. The fewer the standards, the more difficult it is to integrate new technology.
- its product cycles do not exceed industry or competitive times. Excessively long product cycles indicate organizational or financial problems, lack of experience with standards, a tendency toward extended revenue cycles or preparation for proprietary "value-added" products.
- it has a well-defined and active program to migrate customers who may have purchased previous proprietary products. It is not in the vendors' or customers' long-term interests to preserve islands of proprietary product installations.
- it has not steadfastly resisted obvious cost imperatives and refused to downsize or rapidly adopt a new business model.

following the course prescribed by the Simple Standards Wheel, industry standards lead to the development of revenue producing products, which are enhanced with market-driven extensions. As these extensions are more widely accepted, they are incorporated into new standardized products. The cycle then begins anew.

Unfortunately, the process is not so simple in practice. One major problem is the excessive time consumed in codifying and approving standards. Ironically, the life cycles of many products are far shorter than the time it takes to standardize them. For this reason, vendors (and some users) have developed consortia and alliances designed to accelerate the standards process.

When these vendor and user consortia are added to the standards equation, a new, more rapidly spinning, consortia-based standards wheel is created. No matter how fast this new wheel spins, however, the de facto standards that provide locomotion still face the braking effect of de jure approval that always comes from formal standards bodies.

At first glance, it seems like the common technical integration problem faced by vendors and IS executives would yield common and compatible solutions. It can, but only if vendors do not corrupt the process. Vendors face two powerful temptations: extending the revenue cycle as long as possible to recover investment costs, or reducing engineering costs by eliminating the technical consolidation phase.

Vendors that succumb to these temptations ultimately reduce their competitiveness. More importantly, they leave their customers in a technical backwater, which dampens their tactical flexibility, increases their risks and submerges their overall quest for open systems.

The greatest temptation of all is resorting to proprietary technology. Financial disaster will inevitably befall these misguided companies.

OPEN SYSTEMS PROFILES

Open systems profiles provide detailed open systems implementation plans. They are developed at a variety of different levels. Within a company they are developed to address specific departmental or corporate needs. Profiles are not necessarily company-specific. They may be developed for a desktop application common to many organizations, or an application unique to a particular industry.

A group of companies — even competitors — may cooperate in developing profiles that are application-specific to their market. The result could be greater leverage with vendors since a number of potential customers would be speaking with a common voice about their requirements.

As work progresses, profiles that include other profiles may be developed. For instance, within the broad domain of banking, the services needed by a loan department are quite different from those needed by an electronic funds transfer system. But systems serving both areas may need to interact with one another and with other distributed systems. Since profiles can be standardized,

a profile for a large application domain might be built from more focused standardized profiles.

IS organizations can take the following steps to optimize the profile design process:

- Isolate logical functional areas for profiling, particularly the area that may share common standards across the organization
- Identify standards, options and parameters to be included in the profile. Document areas where further standards are needed and identify characteristics that may be important in developing standards to fill the gaps
- Publish profiles and move them through formal channels for acceptance. Where appropriate, work with industry groups
- Maintain profile documents and encourage standards bodies to fill standards gaps in them.

It is possible for technocratic utopians in IS organizations to view the standards profiling process as an end in itself. While this may be the case in some organizations, IS shops should avoid the dictates of self-styled "Standards Czars." It is better to be pragmatic, issues-oriented and politically sensitive to users' requirements and needs.

While any type of standard may be appropriate for inclusion in a standards profile, some are more powerful than others. Legacy applications may demand that de facto/product standards be recognized in current profiles. However, including such standards can lead to new applications being built on dead-end technologies.

TAKING CONTROL OF STANDARDS

Standards profiles are valuable for IS organizations of any size. Most small-to-midsized organizations, however, are not likely to have the resources to rapidly develop them, and even large organizations can have difficulties testing vendors' products to assure conformance. This is why organizations such as X/Open are gaining strong support from the IS community.

X/Open, like many IS organizations, is attempting to integrate de facto and de jure standards into a practical and workable profile. De facto standards included in such a profile take on new meaning since they become frozen as baseline X/Open specifications, which then evolve through the X/Open process.

This process removes the de facto standard from the direct control of the inventing vendor, which is exactly what the users want. The X/Open specification remains a stationary target for procurement.

In addition to providing frozen baseline standards, organizations like X/Open provide a vendor-initiated branding process that guarantees compliance with the appropriate X/Open standard. In many cases, this eliminates the need for users to develop expensive conformance testing procedures that fit home-grown profiles.

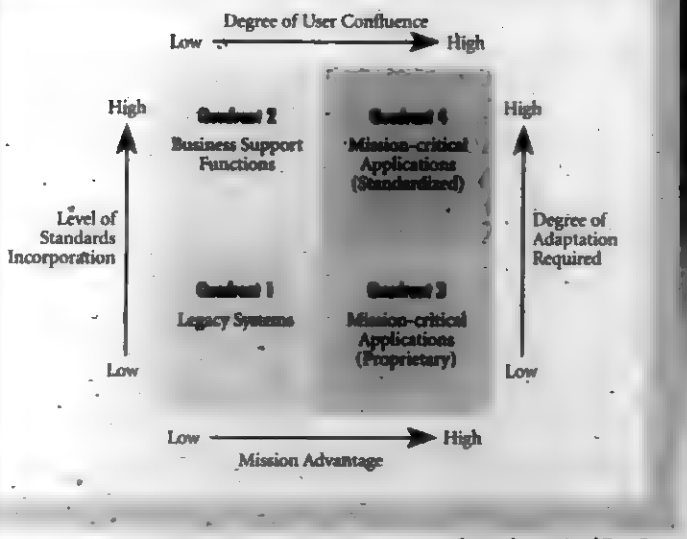
This process is also favored by vendors since single-point standards organizations such as X/Open make it easier to develop and prove conformance to a single user-driven standards profile. An X/Open profile, if appropriate for an IS organization, will undoubtedly receive more vendor support and attention than profiles developed by individual corporations or small user groups.

SELECTING OPEN SYSTEMS TARGETS

The justification process for building open standards-based information systems is not an easy one. And although many would like to believe that the process gets easier as standards are firmed up and conforming products are made available, this is not the case.

One reason the process is so difficult is that standards are only a reflection of current ideas and concepts. And when implemented within compliant prod-

THE OPEN SYSTEMS DECISION MATRIX



Source: International Data Corp.

The goal of users is to position their information systems in the standards-oriented Quadrant 4.

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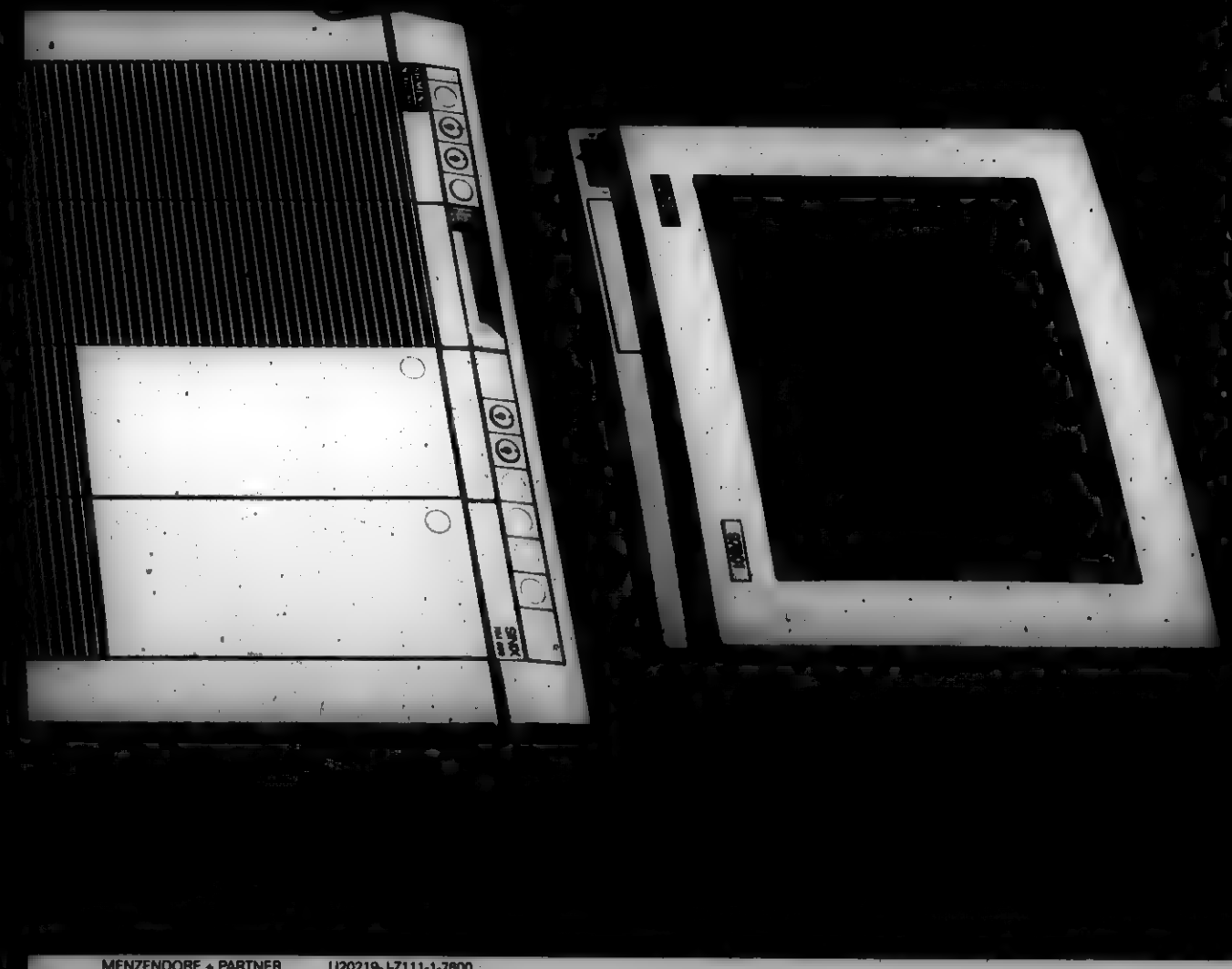

SINIX

The MUSIC Framework for Open Systems

To effectively implement open systems, technical managers need to match their application requirements to an open systems computing model that can execute them. These models provide vehicles for organizing and categorizing requirements and then comparing them with alternatives available from standards bodies, consortia and users.

There are currently several models under development within standards organizations such as IEEE, ISO, European Workshop for Open Systems and most recently X/Open. However, users interested in developing their own standards model may want to look to the one developed by the Central Computer and Telecommunications Agency, the procurement and specification arm of the British government. It uses the MUSIC model.

The MUSIC acronym stands for: Management, User interface, Service interfaces for programs, Information and data formats and Communications.

The management element includes:

- system administration
- security
- network management
- resource management
- accounting
- configuration management.

These elements are of specific interest to system administrators, operators and network managers. They provide central management for distributed environments.

The second MUSIC element, user interface, describes the interaction between the user and platform regardless of the application, such as the way a user starts an application or saves a file. Also included are the graphical and character interfaces between users and applications. This element is, of course, of most interest to end users.

The third MUSIC element, service interfaces for programs, includes language standards (application program interfaces), system service standards, graphic standards and tool standards. This category is of specific interest to application developers.

The fourth MUSIC element, information and data formats, describes the application's access to data, interchange formats, data-stream encoding and object-oriented services. This element is of interest to both data administrators and developers.

The fifth MUSIC element is communications. This includes networking services, protocols, physical connection standards and the general idea of interoperability. This element is of great interest to network managers.

There are other service standards not included in the MUSIC model that should be considered by IS organizations attempting to develop an open systems profile. They include training, physical integration, documentation, consulting, maintenance and support.

ucts, they remain only a snapshot of current technologies. Moreover, there will always be room for some proprietary systems that add value in specific instances. Often times, this added value can create otherwise unavailable strengths within a particular application.

The key for users is properly coordinating the more abstract need for openness against the more absolute requirements or restrictions of the business.

SUBSYSTEMS: BREAKING DOWN THE INFORMATION SYSTEM

Information systems, no matter how complex and well integrated, are composed of discrete sets of functions, each of which is aimed at a particular end-user work requirement. These requirements run the gamut from simple single-user word processing to mission-critical systems involving tens of thousands of users. Examples include airline reservation systems, package shipping/receiving systems and bank ATM networks.

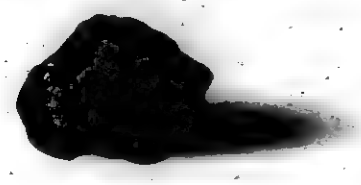
For a large organization, it is not unreasonable to expect literally thousands of discrete subsystems to exist across the entire enterprise.

As information systems evolve, it becomes more necessary for these discrete subsystems to interact. Today, many components interact to such a degree, they become more like a single master subsystem than individual interacting subsystems. As businesses require more and more data sharing across information systems, the need for this interaction further intensifies. The implementation of subsystems that interact well with others and perform well over long periods is critical to the short- and long-term success of users.

THE OPEN SYSTEMS DECISION MATRIX

The Open Systems Decision Matrix is designed to relate subsystems within an enterprise. This matrix is formed by the following four axes:

Mission Advantage — This indicates



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DECISION POINTS: PROPRIETARY VS. OPEN SYSTEMS

Mission-critical Applications (Proprietary)		Mission-critical Applications (Standardized)
More	Time-Critical	Less
Less	Support Requirements	More
Lower	Complexity	Higher
High, Shorter Term	Return on Investment	Gradual Build-Up
Low	Utility	High
Limited	Cross-Enterprise Influence	Extensive
Low	Technology Change Rate	High
Little to None	Anticipated Functional Change	High
Low	Organizational Unity	High
Shorter	Useful Life	Longer
In-House	Competency	To Be Developed
Little to None	Process Redesign	Necessary
High	Systems Readiness	Low

Source: International Data Corp.

There are times when proprietary systems are preferable to open systems.

the level of importance a subsystem carries relative to the organization's mission. A subsystem that provides a support function (e.g., word processing and spreadsheet) carries a relatively low value on this axis. A front-line subsystem that differentiates an organization from a competitor (e.g., airline reservations, package tracking, customer service, etc.) occupies a point at the highest level of advantage.

Midpoints along the axis are occupied by such functions as electronic messaging, shared utilities and operational support. These systems, although not necessarily mission-critical, provide a high degree of organizational efficiency and effectiveness.

Level of Standards Incorporation — This indicates the use of standardized components. In essence, this axis represents risk avoidance and vendor lock-in. The lower the location on this axis, the more proprietary the technology or product. An open systems strategy features subsystems that continually gain value along this axis. This strategy minimizes the risks associated with building, maintaining and operating information systems over time.

User Confluence — This axis indicates the importance of a subsystem to its user base and related user bases. Movement along this axis is partially determined by the number of users affected by a given subsystem. It is also determined by the importance of a subsystem's end users to the overall organization. Greater amounts of required sharing and the importance of that sharing determine the placement of a subsystem along this axis.

Degree of Adaptation Required — This axis indicates the stability of a subsystem. Some subsystems require constant adaptation as user requirements, business needs and IS strategies change. Other subsystems are more tactical, and require little alteration to perform as initially planned. Time is a factor here, because the longer the life of a subsystem, the more likely that subsystem will be adapted. Even more influential is the degree, rather than the rate, to which a subsystem must adapt.

The application of these four axes determines the placement of subsystems within the matrix. The matrix is further divided into four quadrants, each of which defines the type of subsystem that should exist within its borders.

SUMMARY

The open systems movement offers the potential for tremendous gains in productivity, freedom of movement and profitability. However, users must bear in mind that open systems will never meet all their requirements and will also need to change over time.

There are three keys to success for organizations looking to get the most from their information systems investments.

First, build modular systems. Modularity incorporates flexibility, allowing for the timely absorption of new technologies.

Second, develop an organization-specific open systems profile for ongoing reference: This profile will provide guidance for systems expansion and enhancements. It could also be used to identify areas of risk where it is wise to divert from the profile.

Finally, and most importantly, reassess continually. New standards, new technology advancements and new business requirements are all catalysts for change. Remember, building and operating an open information system is a process, not a project. ■

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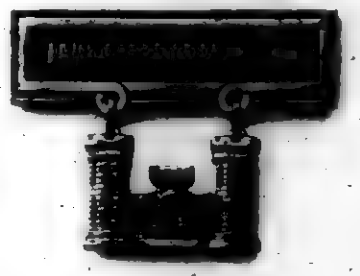

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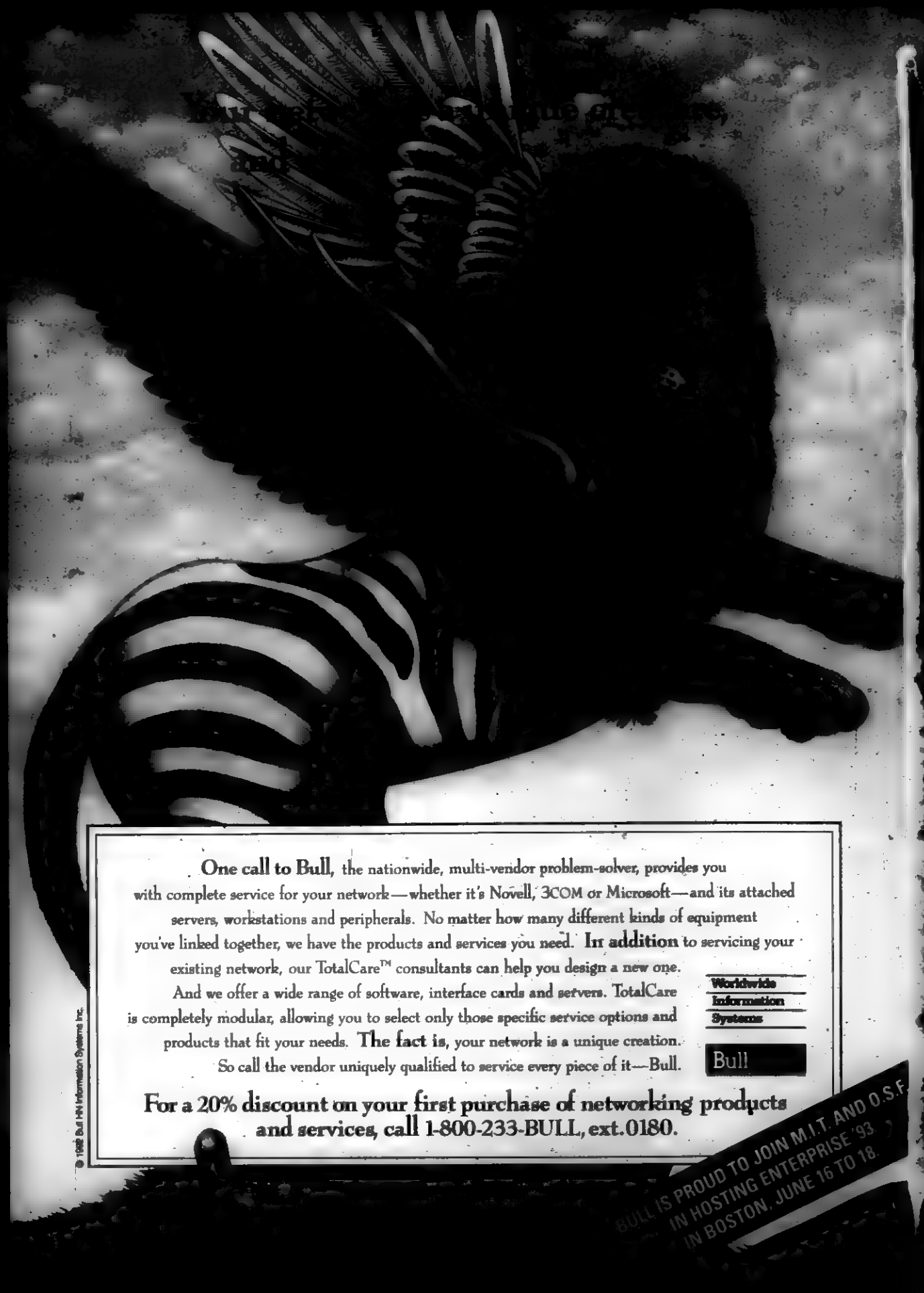

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David Coursey

Slow poke

Welcome to the Short Attention Span Guide-to Pen-Based Computers! As a public service, I've been asked to summarize your pen computing options and then take questions from the audience.

Here goes: There are two kinds of pen-based computers. One has good software that is hampered by a slow processor and kludgey handwriting recognition. The second has bad software that is hampered by a slow processor and kludgy handwriting recognition. Neither can be used for horizontal applications. Are there any questions?

OK, you in the first row: Certainly there must be more to pen computing than that? I read so much about it.

Yes, you do, but take my word for it, pen computing is supposed to be an adjective, not a noun, describing a feature that can be added to a computer, not a whole new style of computing. But even then it doesn't work right.

As for processor speed, you can demonstrate for yourself why pen computing doesn't work very well. Take an assistant to the park and find a small stick. Use a pocket knife to whittle a point at one end of the stick. Or, you may bring a sharpened pencil with you for this part of the test.

Now, jab your assistant with the stick or pencil. Anywhere on the upper body will do.

Notice that just before your assistant screamed and swung at you, the person recoiled immediately after being poked with the sharp stick. The point is that when you poke a person with a sharp stick, you get an immediate reaction.

Conditioned by this effect in childhood, we expect everything we jab with sticks or pencils to react just as quickly, including pen-based computers.

Sadly, however, you will occasionally poke a pen machine, wait and then poke it again only to discover that yes, it did receive your first command but was thinking about it. Now you are sliding down the slippery slope of a Too Slow User Interface. Some pen systems react more quickly than others, but of the dozen or so I've seen, none have the fast-twitch muscles of a track star.

A second question?

But aren't pens great for electronic note-taking?

Well, here's another test. Take a piece of paper and a pen. You might borrow some yuppie's Mont Blanc for this. Notice how the ink flows immediately onto the paper. Notice your ability to resolve even small letters. Pen and paper provides no waiting and great resolution.

The best of the pen computers provide neither. Writing on the screen requires a wait. If handwriting recognition is turned off, the digital "ink" takes a moment to appear, slowing your handwriting. Worse, screen resolution usually means your writing won't be nearly as legible as a message created with the Mont Blanc and a yellow pad.

With handwriting recognition turned on, the fun really begins. Not only does the slow computer have to think to put the ink on the screen; it has to think some more while it tries to convert your scrawl into text. Watch the professional demonstrators do this. If they can't get a success rate any better than they do, what hope is there for us?

During the next several months we are going to see more pen-based computers. Some will have really good software. None will be able to make that software a really useful tool.

The first problem that will be solved is processor speed. Decent handwriting recognition will come much later. The good news is that when the hardware and systems software catch up there will be good software running on pen machines. The bad news is that by the time that happens, our short attention spans will have moved to something else.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

Mathcad 4.0: Electronic math book

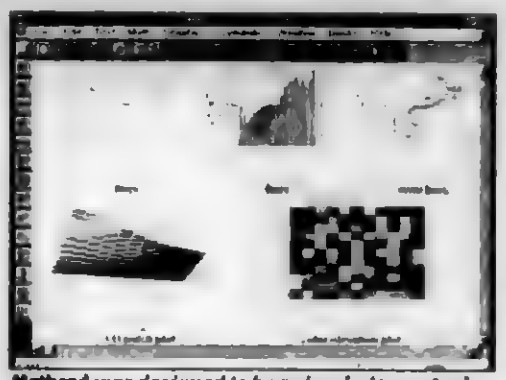
By Michael Vizard
CAMBRIDGE, MASS.

Continuing its campaign to eliminate the need for textbooks and programmable scientific calculators in laboratories and mathematics classrooms, MathSoft, Inc. has released an update to its Mathcad software for Microsoft Corp.'s Windows. It includes support for 32-bit processing, extensive graphics and a more powerful rules-based processor designed to support complex calculations.

Looking to leverage the use of laptop and desktop PCs, Mathcad 4.0 was designed to be an arithmetic tool that not only supports calculations but also includes a set of programming tools that will allow users to create electronic workbooks that display various arithmetic models.

These electronic workbooks will eventually replace the standard textbooks and calculators that are currently the staples of most classrooms and laboratories, MathSoft President David Blohm said.

"Unlike other packages that require complex programming knowledge, Mathcad is designed to be a simple-to-use tool that can be easily understood by students, while providing professionals with a full set of math algorithms," Blohm said.



Mathcad *was designed to be a simple-to-use tool*

With 280,000 licenses installed and 18 titles published using Mathcad, Blohm said Mathsoft's potential customer base is approximately 5 million people working at private laboratories, government facilities and universities.

"It's really aimed at people who think in terms of equations rather than spreadsheets," Blohm said.

Version 4.0 includes a 32-bit interface using Win-32S libraries from Microsoft and support for the Object Linking and Embedding protocol. The use of the 32-bit Windows interface has improved the performance of Mathcad by a factor of two, while also serving to make the software compatible with Microsoft's forthcoming 32-bit Windows NT operating system, Blohm said.

Mathcad 4.0, which is scheduled to ship by the end of this month, is priced at $495. Educational discounts start at $175. It requires at least 4M bytes of memory under Windows 3.1, but 8M bytes of virtual memory and a math coprocessor are recommended, company officials said.

PC Tools strengths

CONTINUED FROM PAGE 39

Central Point claims to have interviewed 200 Norton Desktop for Windows users, held 12 focus groups and talked to more than 300 corporate and government organizations during the design process for PC Tools for Windows.

feel is the best "entry level" shell going). PC Tools' MultiDesk allows users to organize their work in these virtual desktops according to function. These desktops are organized into "offices," and users can define multiple offices.

Unlike similar utilities I've used, MultiDesk is truly useful. Users can tell MultiDesk to load all open applications the next time Windows is started, and the applications automatically move to their appropriate desktop. In addition, open applications can "tag along" when you move between desktops, so important applications are always available.

PC Tools for Windows is also customizable. Menus and tool bars can be modified, giving users only the functionality they want — or that systems managers want them to have. Passwords can be assigned to just about every level. Folders can be viewed as standard program groups, lists or "tool boxes." Pop-up menus with options appear with the click of a right mouse button.

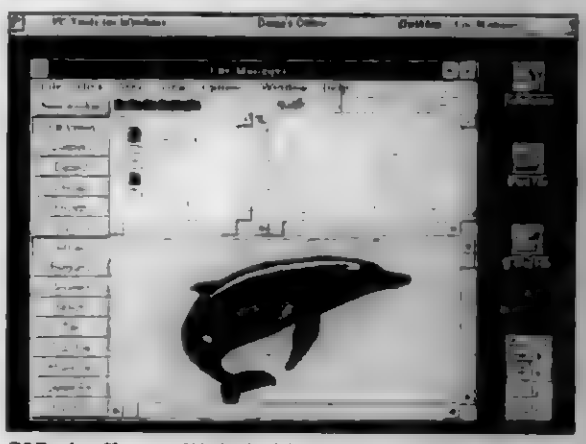
Name your favorite Norton Desktop feature and PC Tools probably tops it. File management? How about instant access and viewing of your .ZIP compressed files? Scripting? Central Point's ScriptTools includes network support and a recording facility that is not dependent on window position. File viewing? PC Tools for Windows supports 80 formats to Norton Desktop's 45.

The product also includes well-designed undelete, virus protection and backup utilities that are unobtrusive and easy to use.

One other thing that impressed me is the stability of PC Tools for Windows, especially for a Version 1.0 release. I have become accustomed to having bugs crop up when trying out new Windows programs, but not with this product.

PC Tools for Windows does lack the text editor and calculators found in Norton Desktop, but what it adds more than makes up for their exclusion. System Consultant provides information about the user's system and network. Optimizer is a Windows-hosted disk defragmenter that can be set to run whenever the system is idle for a user-selected length of time.

In all, PC Tools for Windows takes a market defined by Norton Desktop and moves it forward as a true corporate tool. Systems managers will appreciate the product's advanced network support, customization and password protection. Norton Desktop users who want the enhancements of PC Tools could even set up the interface to mimic their current environment. And to make the transition easier, PC Tools for Windows will import Norton Quick Access Groups.



PC Tools *offers multiple desktops, customizable menus*

Hardware

Pentium at heart of Unisys plan

By Thomas Hoffman
BLUEBELL, PA.

Recent PC and workstation introductions by Unisys Corp. might not be creating panic among desktop and networking product leaders such as IBM, Compaq Computer Corp. or Novell, Inc. — yet. But the latest systems have been positively received by Unisys users and analysts, following the vendor's promises earlier this month to deliver machines that are operating-system independent and ready for Intel Corp.'s Pentium.

"Since they're moving to a common Intel platform for their PCs and workstations, we can standardize on our own hardware platform," said Anne Stanford, assistant vice president and manager of information systems development at The Mechanics Bank.

Unisys recently added two workstations to its CTOS SuperGen product line — the SuperGen 3000 Intel 486SX-based client workstation and the SuperGen 1000 386SL-based CTOS notebook. Both models employ standard XT/AT bus or Personal Computer Memory Card International Association technology, are compatible with existing CTOS workstations and servers and are capable of running multiple concurrent applications such as CTOS, Posix and Microsoft Corp.'s MS-DOS and Windows 3.1., according to Bruce Halvorsen, manager of program marketing at Unisys' Distributed Systems Division.

More with four

This year, Unisys is placing even greater emphasis on the four vertical markets that composed 80% of its $8.4 billion in revenue in 1992 — the public sector, airlines, telecommunications and financial services.

"They have an established position in these four lines of business," noted Christopher Vasko, an analyst at BIS Strategic Decisions, a market research firm in Norwell, Mass. Vasko, who was briefed on Unisys' recently introduced PW2 Advantage Series PCs, called the machines "terrific in terms of price/performance."

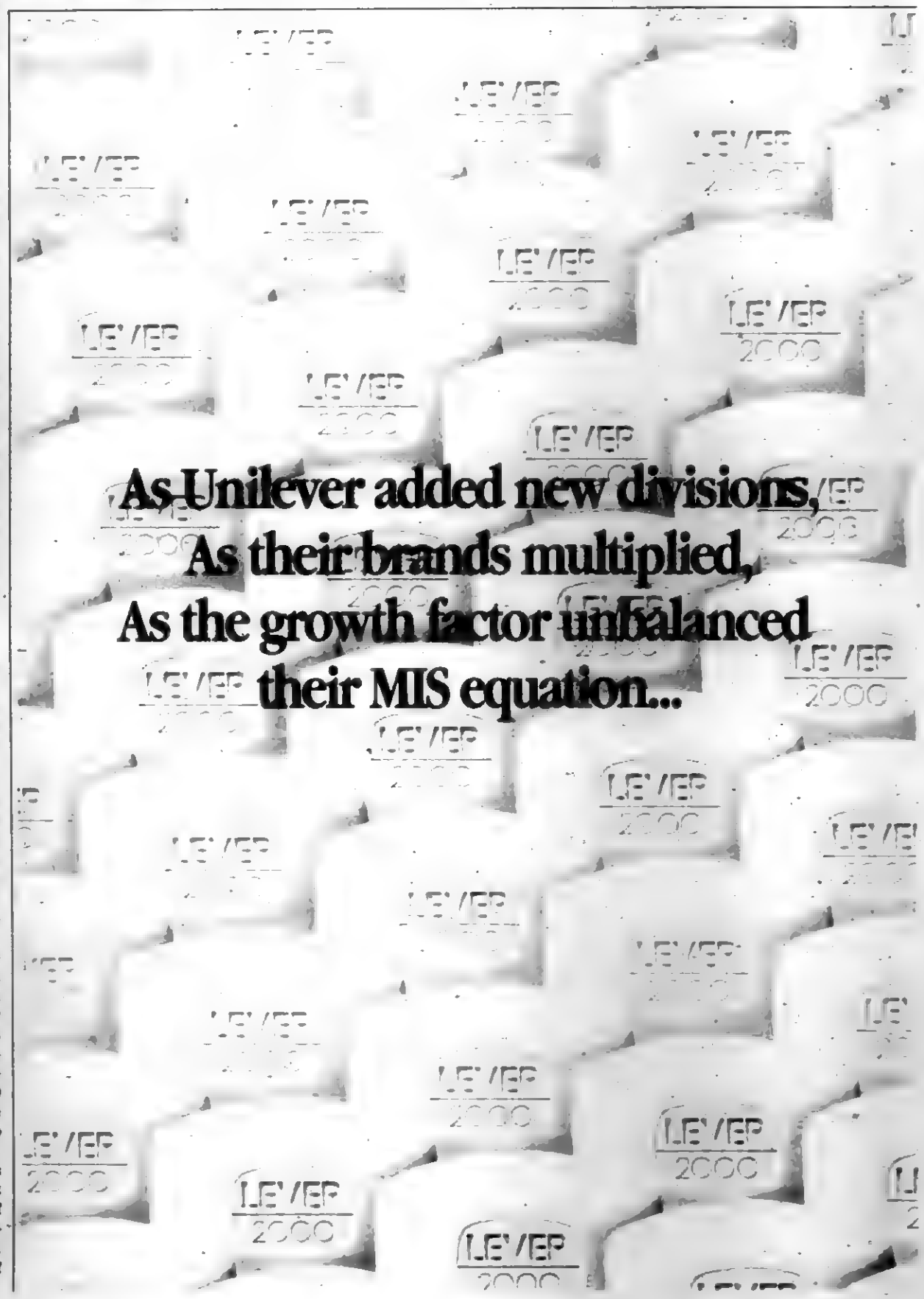
Jon Burns, program marketing manager at Unisys' workstation product group, forecasted that the five new Intel 1486/Pentium-ready PCs will account for 75% of the vendor's 150,000 PC shipments in 1993. Vasko called this estimate "aggressive" because BIS research indicates that Unisys shipped only 72,000 PCs and workstations throughout the U.S. in 1992, placing it 27th among the top 40 U.S. desktop suppliers for the year.

But Burns' estimate includes overseas shipments, such as the Australian Post Office's order of 8,000 PCs. Nearly 50% of Unisys desktop revenue is made in Europe, said Burns, who noted that U.S. sales compose roughly 30% to 35% of overall desktop sales.

Unisys recently nailed down a $900,000 contract with United Fire and Casualty (UF&C), a Cedar Rapids, Iowa-based insurance firm, for 300 SuperGen 3000 workstations. UF&C will use the systems, which feature the CTOS multitasking operating environment running on a standard PC platform, for claims processing, report writing and other functions.

Stanford said she is interested in both the SuperGen workstations and notebooks because Mechanics Bank has many remote users, such as lenders, who work out in the field. She said Mechanics Bank has ordered 12 SuperGen 3000 workstations and plans to increase that number to 50 by year's end.

In the meantime, she said, the bank intends to test a handful of notebooks. "We're very impressed with the notebooks, with features like the on-board mouse. I use an AT&T Safari right now, and this notebook had better capabilities, like a removable hard disk," Stanford said.



[redacted]

Systems

RasterOps Corp. has started shipping the SPARC Card TV II.

According to the company, the product is a single-slot overlay card that provides full-motion video-in-a-window for the Sun Microsystems, Inc. SPARCstation.

While working in any application from the desktop, users can see live or prerecorded video. The video signal can come from a variety of sources, including still-video cameras, cable television, medical scanners, video cassette recorders and camcorders. Images can be captured and stored in the product's frame buffer for placement into any application, and fully sizable videos are provided that can be found anywhere on the screen.

The SPARC Card TV II costs $1,500.

▶ *RasterOps*
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

Software application packages

PC Integrity, Inc. has introduced Copy Alert, a software management program.

According to the company, the product was designed to guarantee the use of only authorized software on portable, stand-alone and networked PCs.

Copy Alert offers a number of features, including the ability to alert users to copyright violations. It also maximizes help desk efficiency, centralizes administration of remote locations and decreases the need for ongoing audits. Virus protection is also provided.

Copy Alert prices vary depending on quantity. The cost for 30 licenses is $1,435.

▶ *PC Integrity*
Suite 106
301 N. Harrison St.
Princeton, N.J. 08540
(609) 466-1700

SBT Accounting Systems has introduced Pro Series 2.5 Unlimited and Pro Series 2.5 Multi User, part of the company's Professional Series software line.

The Unlimited version was designed for a large number of concurrent on-line users; the Multi User is the standard version geared toward small and medium-size companies.

Seven applications are offered in the Pro Series 2.5: General Ledger, System Manager, Accounts Payable, Accounts Receivable, Purchase Orders, Sales Orders and Inventory Control.

Features such as user-defined keys, pull-down menus, full mouse support and an on-line Help system are provided.

Prices start at $895.

▶ *SBT Accounting Systems*
1 Harbor Drive
Sausalito, Calif. 94965
(415) 331-0900

IMSI has introduced TurboCAD Professional 1.0 for Windows.

Features include ASCII Text Import, "hot keys" for every function that can be preset and defined and 17 dimensioning methods from both the American National Standards Institute and the International Standards Organization. A parametric programming feature has an "automated design" programming language for automating repetitious drafting and design work, the company said. More than 40 hatch patterns and an on-line Help system are also provided.

Requirements include an IBM-compatible 386 or higher PC with 4M bytes of random-access memory, 4M bytes of hard drive space and Microsoft Corp.'s Windows 3.0 or greater.

TurboCAD Professional 1.0 costs $395.

▶ *IMSI*
1938 Fourth St.
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Michael Vizard

Groupware needs IS

Since the coming of age of the PC, members of the IS community have been subjected to scorn by end users who found they could develop or buy an application for a lot less than it would cost the IS department to build an equivalent application on a mainframe or minicomputer.

Naturally, this has led to the deployment of millions of PCs all over corporate America. But a funny thing has happened in recent years: PC users have discovered that they need to work in groups that share information.

And while the PC is a wonderful personal productivity tool, it leaves a lot to be desired in the communications department. After all, sharing files across NetWare is not exactly the same as working together in a global collaborative environment with shared documents.

Enter the IS professional once again. In a drive to corral the reams of information that are now strewn across organizations in incompatible file formats, many businesses are looking to a new generation of groupware applications that are finally coming into their own.

The irony of this situation is that most of these groupware environments are a collection of software packages and utilities that are far too complicated for the average end user or department manager to install. So the IS department is once more in charge of creating standards for PC software that will run across an infrastructure built and policed by the IS department.

After all, most departments that run PCs simply don't have the knowledge associated with large-scale networks, distributed databases and E-mail that is required to link departments in a cohesive unit.

The challenge for IS directors, however, is to find the right set of

Vizard, *page 69*

Workstations

Sun puts SPARC future on the map

By Maryfran Johnson

■ Weary of getting kicked in the teeth by its rivals about mediocre microprocessor performance, Sun Microsystems, Inc. recently rolled out a surprisingly explicit five-year road map for the Scalable Processor Architecture (SPARC) CPU family.

The road map exposes details on nine CPU designs under development for the MicroSPARC, SuperSPARC and UltraSPARC lines. Sun has pledged to provide a 64-bit UltraSPARC chip that performs at least 20 times faster than its current "Viking" SuperSPARC chips by 1997.

IBM and Mips Technologies, Inc. — a subsidiary of Silicon Graphics, Inc. — have both unveiled similarly ambitious directions for their chip families, analysts pointed out. Yet so far, only Sun has revealed such specific details about its plans.

"My suspicion is that customers committed to SPARC will look at this and take reassurance from it that at least Sun has a plan," said Andrew Allison, editor of the "RISC Management Newsletter" in Carmel, Calif. "But smart customers will also monitor these milestones rather carefully. Sun is gutsy in the sense that this puts their engineers' feet very firmly into the fire, but now they have an obligation to deliver."

These days, the most commonly quoted metrics for Unix-based workstation and server performance are the SPECint92 and SPECfp92. These numbers measure integer and floating-point chip performance, which is essentially the result, as a geometric mean, of running several different benchmark tests on the chip in question.

Sun's maximum performance numbers today land in the 50s and 60s on the SPEC charts, while competitors such as Hewlett-Packard Co., IBM and Digital Equipment Corp. sit comfortably in the 100 to 200 range.

"There is obviously a market backlash against SPARC technology that Sun is trying to overcome," said George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn. "Significant questions have been raised about whether Sun can keep up in the technology areas."

Although they laud the show-and-tell marketing effort behind the road map, analysts expressed doubts that a five-year plan of what they see as essentially vaporware will persuade technical

and scientific users to pledge allegiance to SPARC.

Commercial customers, however, may be another story.

"Having a road map is a good thing to do, but frankly, the commercial customer is not all that concerned about it," said James Stikeleather, director of systems development at Tampa, Fla.-based Kash n' Karry Food Stores, Inc., which uses a network of more than 30 Sun SPARCstations.

"From a commercial perspective, if you architect your network correctly, you plug the machine into the network and the raw horsepower becomes less of an issue," Stikeleather added.

He said Kash n' Karry chose Sun systems instead for their "openness, portability of code, availability of tools and networking capabilities."

Some of the highlights of the SPARC CPU road map include the following:

•The MicroSPARC I, II and III chips will be pitched for low-cost desktops, portables and embedded processors. Available now in a 50-MHz version in the SPARCclassic and LX workstations from Sun, MicroSPARC will scale from its current 50 SPECint92 to about 100 SPECint92 by 1997.

SPARC, *page 67*

E-mail paves road to court

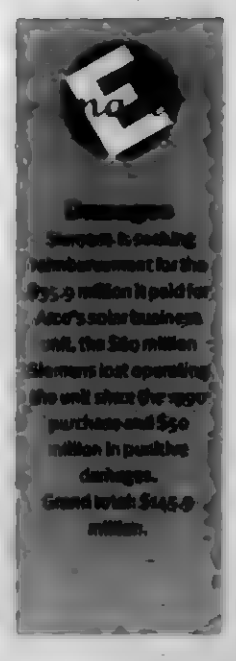
By Mitch Betts
NEW YORK

More and more organizations are finding that employees' electronic-mail messages can land them in very hot water. The latest example is Atlantic Richfield Co. (Arco), which must defend against a $146 million lawsuit triggered by its E-mail.

In a Feb. 26 lawsuit, electronics giant Siemens Corp. accused Arco of committing fraud in the 1990 sale of Arco's solar energy subsidiary to Siemens.

The suit, filed in U.S. District Court, alleged that Arco knew its solar products would not be commercially viable and hid that information from the buyer.

Siemens said its charges are supported by numerous E-mail messages that allegedly were exchanged among Arco employees prior to the sale.



One E-mail message, which was written about two weeks before the deal closed, said: "We will attempt to finesse past Siemens the fact that we have had a great amount of trouble in successfully transitioning technology from the laboratory to the manufacturing floor."

Another presale message read: "As it appears that TFS [Arco's solar technology] is a pipe dream, let Siemens have the pipe."

In a prepared statement, Arco said it rejects the contention that a sophisticated company such as Siemens was "hoodwinked" into buying the solar business unit and added that it will fight the lawsuit. Arco said it did not misrepresent the facts about its technology or business.

The lawsuit did not say how Siemens got the E-mail, nor did it provide any technical details.

The disclosure of E-mail messages also played a major role in the Iran-Contra scandal of the Reagan administration [CW, Jan. 11] and in the current dispute between Symantec Corp. and Borland International, Inc. over allegedly stolen trade secrets [CW, March 8].

Furthermore, experts in the field of records management said there is a growing trend toward lawyers obtaining access to opponents' E-mail through the legal "discovery" process and searching for the proverbial "smoking gun" [CW, March 2, 1992].

Companies with a records management program can avoid E-mail embarrassments, experts said, either by not retaining E-mail at all or by having a regular, systematic procedure of purging unnecessary E-mail files.

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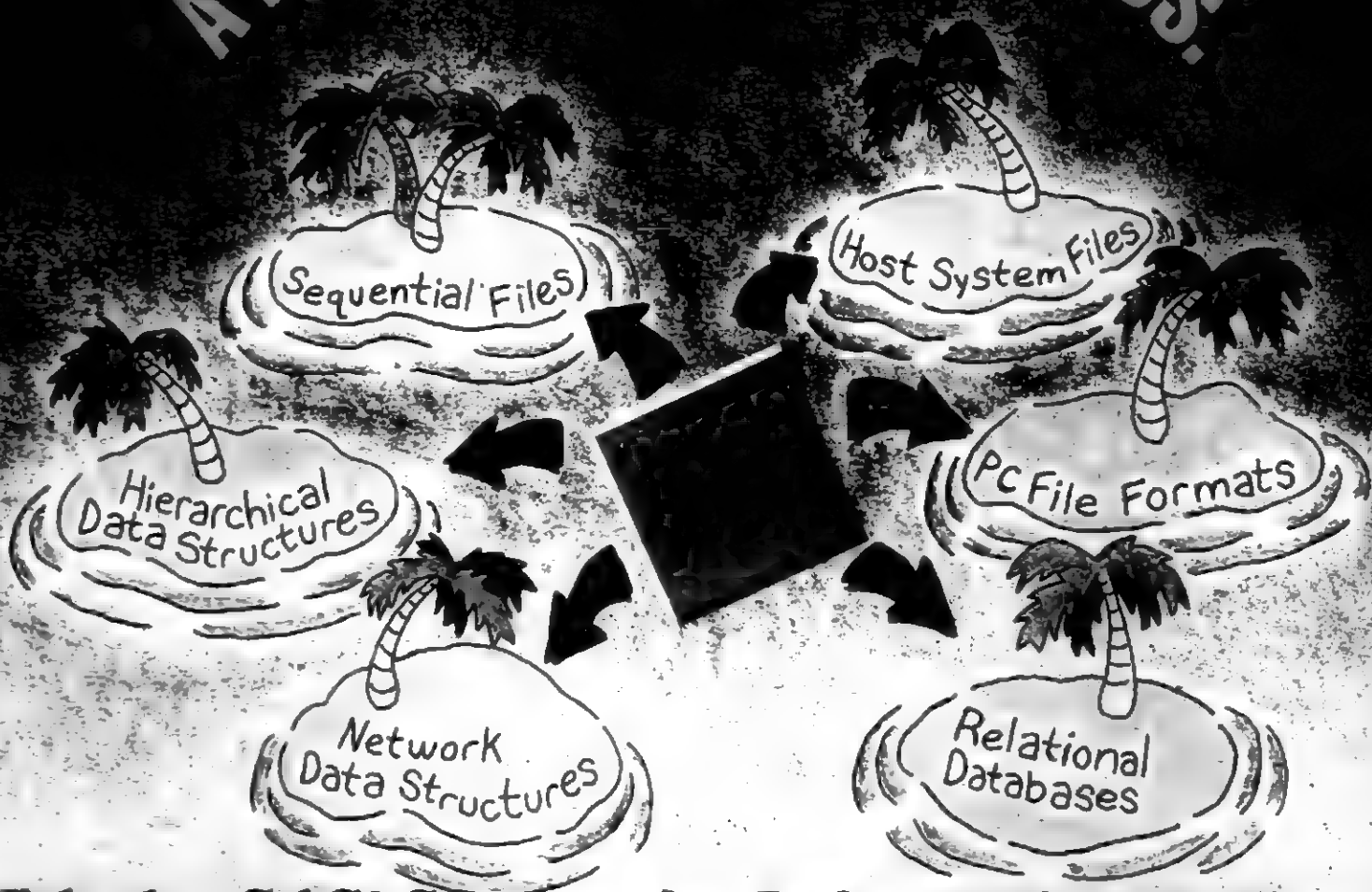

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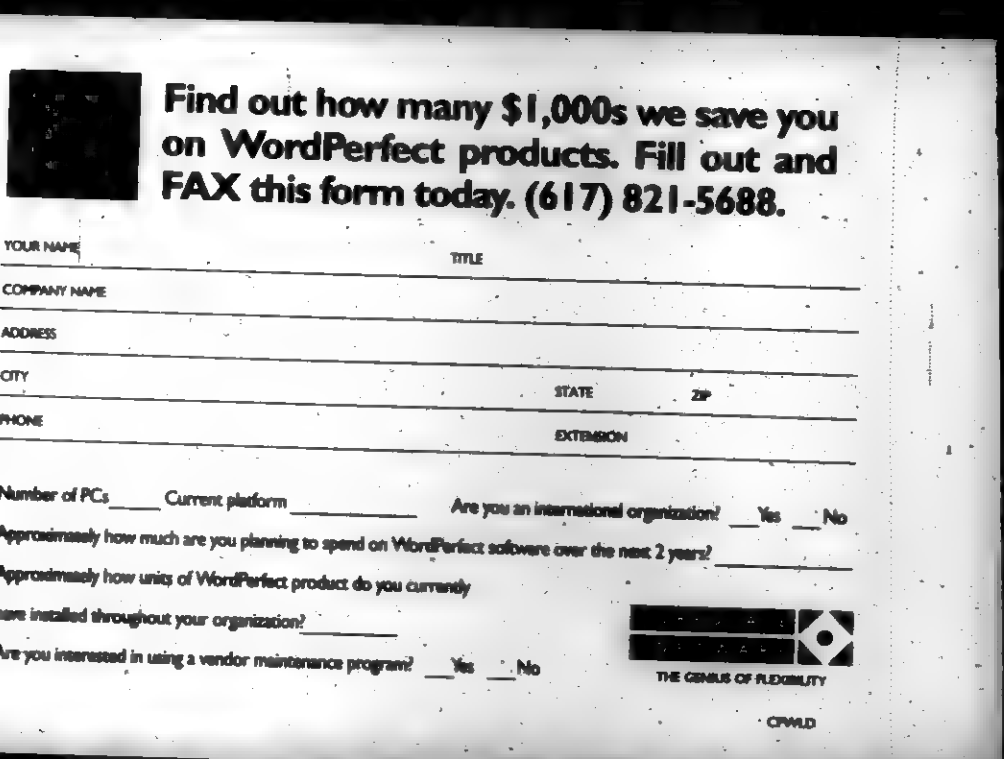

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In Brief

OSF revamps pricing

The Open Software Foundation unveiled a new pricing structure, effective May 15, for its Distributed Computing Environment (DCE) "middleware" software. With the goal of fostering high-volume deployment by system vendors, the pricing change offers new licensing options such as an annual, paid-up DCE 1.0 Executive option for $500,000 per operating system, which allows unlimited distribution of DCE object code for one year. Under the old system, vendors might have paid as much as $5 million for a high-volume deployment of DCE. Other pricing options include a onetime fee of $50,000 for application developers to distribute unlimited copies of DCE client/server object code. The new DCE source-code license fee is $25,000 for limited distribution and $250,000 for full distribution rights.

Unisys to enter desktop arena

Unisys Corp. next month will launch its first desktop Unix-based workstations specifically designed and marketed to run Univel, Inc.'s UnixWare, an operating system that combines Novell, Inc. NetWare and Unix System Laboratories, Inc.'s System V Release 4.2. Unisys' new commercial Unix workstations, intended for use as network clients, are based on Intel Corp. I486DX and 486DX2 microprocessors and will be priced from $4,700 to $8,200.

UniForum

NCR adds 3270 support

NCR Corp. announced availability of several enhancements to its Top End distributed transaction processing system, including IBM 3270 terminal support, Microsoft Corp. Windows Dynamic Link Library support and enhanced international language support. The changes mark Top End as the first open systems transaction processing product to offer 3270 support, according to company officials. Top End is available on the NCR System 3000 line of Intel Corp.-based systems, and also, through Independent Technologies, Inc., on Hewlett-Packard Co.'s 9000 line of Unix-based systems.

SPARC future

CONTINUED FROM PAGE 65

• The SuperSPARC chip will be earmarked as Sun's volume reduced instruction set computing chip for workstations and servers, with an emphasis on integrated multiprocessing features and ability to perform "more useful work per cycle" than competing chips from IBM, HP and DEC.

The SuperSPARC-Plus and SuperSPARC II will scale up from the current 50 SPECint92 performance to at least 120 SPECint92 by 1995.

• The UltraSPARC line is the next-generation, 64-bit microprocessor intended for workstations and servers in the 1995-97 time frame. Sun plans to exploit UltraSPARC's advanced process technology, expand its superscalar design and scale upward in performance from 700 to 1,000 SPECint92 and SPECfp92 measures.

"Basically, this is all a lot of brave talk until you get a system to ship," said Terry Bennett, an analyst at Infocorp. He noted that as its rivals have overtaken Sun in raw performance, Sun has tried to deemphasize that measure in favor of actual application performance, which is too subjective to measure reliably.

"Sun may never be the performance leader, but the reason people still buy from them is they're cheap," Bennett said.

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OURS presents interoperability findings

Open systems group gives opinions, defines pilot network requirements

By Michele Dostert

The computer talk in Salt Lake City last week went beyond Novell, Inc.'s NetWare. In conjunction with Novell's Brainshare Developer's Conference, the Open User Recommended Solutions (OURS) interoperability group held its second annual Information Technology Summit and set the stage for a pilot network.

OURS is unique among industry open systems consortia: it is user-driven rather than vendor-driven. Although vendors such as Microsoft Corp., Novell and IBM are consortium members, the group's agenda is set by user members, which are mostly large organizations such as MIT, Pacific Gas & Electric Co. and Wells Fargo. Service providers such as Electronic Data Systems Corp. and Ziff-Davis Labs are also members of the organization.

"OURS' goal is to explore and help solve multioperating environment computing challenges," said Elaine Bond, president of OURS. "Where else can users get multiple vendors in a room to discuss here-and-now problems?"

At the three-day summit, four of OURS' technology task forces presented their findings, along with recommendations for further action.

The OURS Security Task Force defined the requirements for a pilot network. Participants in this pilot, according to OURS, include financial institutions, manufacturers and software vendors. Pilot vendors and users will work from April to October testing their first topic, single user sign-on; results will be presented at the October OURS workshop.

The OURS Software Licensing Task Force found, to no one's surprise, that software licensing is a mess. Its paper, "Software Licensing Principles and Glossary," analyzes software licensing problems and proposes new license models. It also attempts to clarify the various licensing terminologies used by different vendors and users.

Another study released

The Multivendor Education Task Force released the findings of a study done by Gartner Group, Inc., a Stamford, Conn.-based research firm, which sought to discover which technical skills and training are most in demand. The task force also released a core curriculum for "basic training" for the computer industry, including objectives and course outlines.

The "What Works with What" Task Force presented an early design for OURS' proposed multivendor database, which, in its final form, will provide planners and architects with the information they need to design networks. The group also presented the first draft of a document called the "Connectivity Primer."

"The value of the OURS group is that it's made up of people down in the trenches looking for solutions now," said Stanley Jarocki, a vice president at New York-based CitiBank NA's Business Systems Review department.

"Unlike open systems standards groups, OURS, with its large-buyer membership clout, can pressure vendors for immediate answers to real-world problems in our multivendor systems," Jarocki said.

Unix awards presented at UniForum

These are the winners of the AT&T and Unix System Laboratories, Inc. Unix Awards, given March 17 at UniForum in San Francisco:

•Category: Academic driver
Robert Fabry, CSRD Berkeley; Deborah Scherrer, Lawrence Berkeley Lab; Bob Schiefler, MIT X Consortium.

•Category: Unix evangelist
Armando Stettner, Digital Equipment Corp.; Bob Marsh, UniForum Association; Mike DeFazio, Unix System Laboratories; Bruce Weiner, Mindcraft.

•Category: Technology innovator
Steve Bourne, the Bourne Shell; John Mashey, the Mashey Shell and MIPS RISC; Eric Schmidt, NFS; Vinton G. Cerf, TCP/IP.

•Category: Application creation
Frame Technology Corp.; Informix, Inc.; Oracle Corp.; Sybase, Inc.

•Category: Standards champion
Jim Bell, UniForum, OSF and X/Open Co.; Heinz Lycklama, X/Open and UniForum; Walter DeBacker, European Commission.

•Category: Global market builder
Larry Crume, Lotus Development Corp.; Geoff Morris, X/Open; Yoshiro Yoshioka, Fujitsu Ltd.

•Category: Special distinction
Mike Azzara, Open Systems Today; Ed Taylor, Pencom Systems, Inc.; Maureen O'Gara, Unigram.X.

•Category: Lifetime achievement
Pamela Gray, UniForum; Doug Michels, Santa Cruz Operation (SCO); Bill Joy, Sun Microsystems, Inc.

•Business commitment vendor
Hewlett-Packard Co., Wim Roelandts; SCO, Doug Michels; Sun, Scott McNealy.

•Business commitment end user
Burlington Coat Factory, Inc.; DHL, Inc.; Federal Express Corp.; Hyatt Hotel Corp.; Wal-Mart Stores, Inc.

Vizard

CONTINUED FROM PAGE 65

initial applications that will make groupware converts out of the entire organization.

At the recent Workgroup Computing Conference in Washington, D.C., the one constant theme that cut across all the presentations was that bringing groupware to your organization will require you to work closely with a member of the business side of the company. After a successful pilot, this person will then become your reference account, otherwise known as a champion, when you bring groupware applications to the rest of the organization.

In other words, IS has to adopt an active role in which it proselytizes the real-world benefits made possible by groupware applications.

For example, George Hesselbacher, who serves as the LAN application manager for the Environmental Protection Agency, lists the benefits of Lotus' Notes: rapid application development, more control over the distribution of data, a flattened organizational structure, a consistent user interface for applications, shortened business processes and a relatively inexpensive distributed database.

But realizing those benefits — whether they are ultimately provided by Notes or other solutions that are under development at Microsoft, Oracle or WordPerfect — can only happen if IS people are in tune with the company's overall business goals, as opposed to merely servicing requests from end users that quite frankly lack the ability to envision the benefits new technology can bring to a company unless somebody shows them.

And that somebody is the IS manager.

Vizard is a *Computerworld* senior editor, personal computing.

[redacted]

Local-area network hardware

LANart Corp. has introduced its eight-port MicroWorkgroup hub.

The product is powered through its Attachment Unit Interface (AUI) port network connection. The MicroWorkgroup hub can reportedly connect to the standard AUI port of any Ethernet controller card, bridge, hub or other device. Eight twisted-pair ports (RJ45) are supported that can be used with shielded or unshielded twisted pair and a male AUI port.

Up to eight PCs, workstations and file servers can be supported by each hub through its twisted-pair ports.

The product costs $445.

▶*LANart*
145 Rosemary St.
Needham, Mass. 02194
(617) 444-1994

General Datacom, Inc. has introduced Apex, an Asynchronous Transfer Mode (ATM) switching hub.

Designed for corporate networks, it provides pure cell- and adaptation-switching interfaces for non-ATM traffic in one platform, the firm said.

Apex can support an assortment of applications: It enables interconnection of circuit-switched data, voice and video; local-area network hubs with ATM or Ethernet interfaces; and transport of High-Level Data Link Control and IBM's Systems Network Architecture/Synchronous Data Link Control framed information from within a single backbone network, the company said.

Prices range from $50,000 to $125,000.

▶*General Datacom*
1579 Straits Turnpike
Middlebury, Conn. 06762
(203) 574-1118

Software applications

Digital Tools, Inc. has introduced AutoPlan II project management software.

According to the company, the product was designed to solve the problem of managing large projects where data is located on diverse platforms and in various geographical locations.

AutoPlan II includes a graphical user interface and is said to be the first project management package for Unix that graphically automates tasks, including planning and tracking projects, managing and reporting resource requirements and managing multiple projects.

AutoPlan II prices start at $1,495.

▶*Digital Tools*
18900 Stevens Creek Blvd.
Cupertino, Calif. 95012
(408) 366-6920

Veritas Software Corp. has announced that its Vista products are now available for Hewlett-Packard Co.'s HP9000 700 and 800 series workstations.

Vista is an assortment of tools that provide testing and quality assurance of Unix-based operating systems. The product reportedly uses industry-standard software-testing metrics and can give users a quantifiable analysis about the stability and maintainability of code and the completeness of testing.

Vista prices start at $5,400.

▶*Veritas Software*
4800 Great America Pkwy.
Santa Clara, Calif. 95054
(408) 727-1222

Delta Microsystems, Inc. has introduced FreezeFrame, a backup product.

FreezeFrame performs live backups of file systems and databases without noticeably degrading system performance.

FreezeFrame does not need any type of kernal modifications, and it backs up data at the device driver level. Any writes to a frozen disk are intercepted, and before it is overwritten, original data is saved on an alternate disk location, the company reported.

FreezeFrame costs $3,000 per server.

▶*Delta Microsystems*
111 Lindbergh Ave.
Livermore, Calif. 94550

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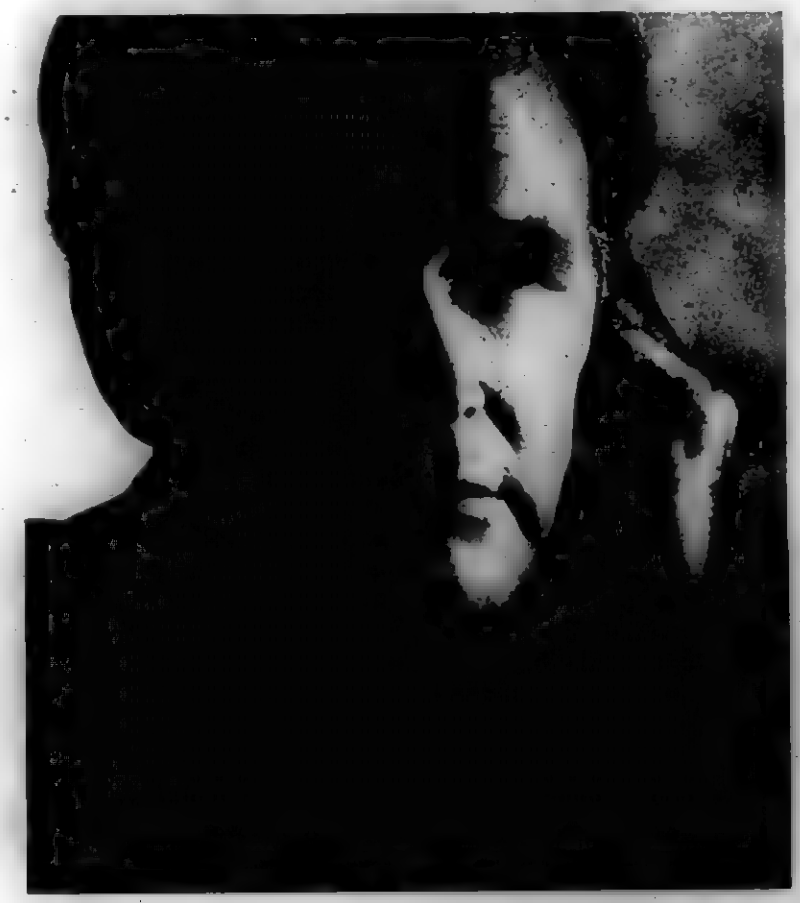

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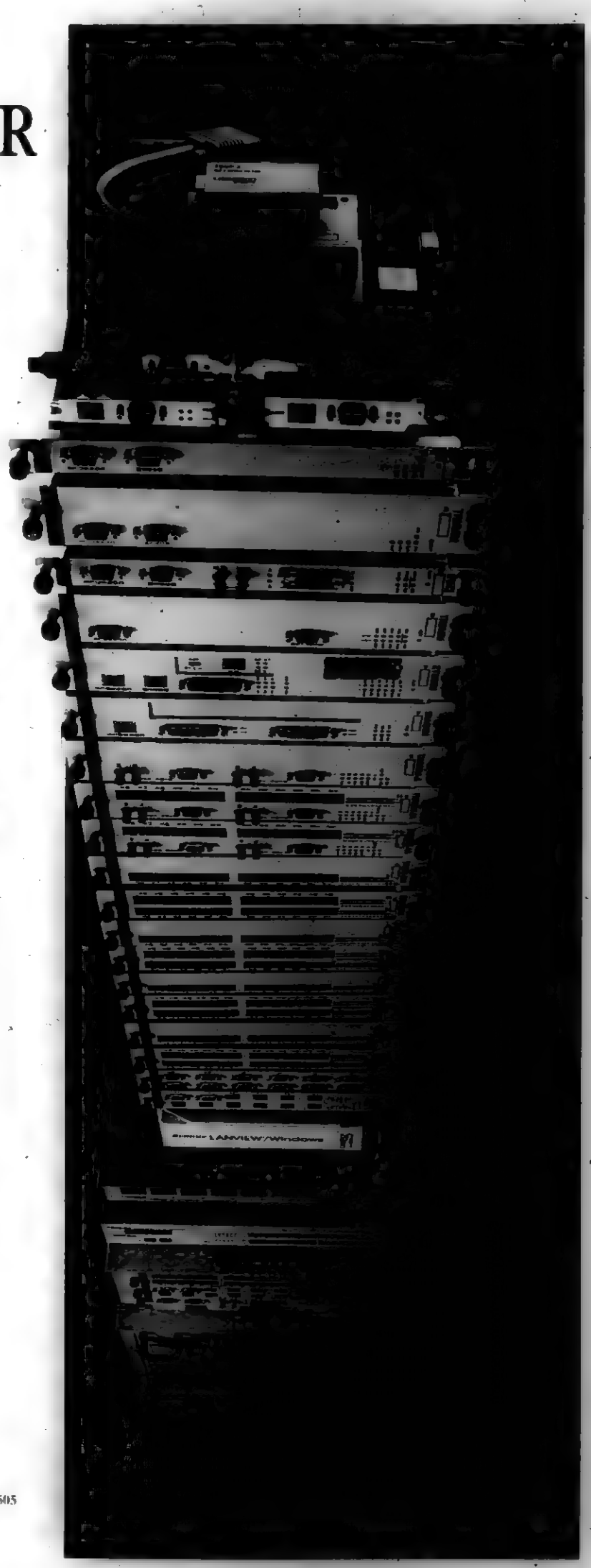
Here's How Our Token Ring Products Stack Up To The Competition's.



Stack us up to any other major hub vendor, and see for yourself. Cabletron offers more Token Ring modules for the intelligent hub than the competition. Period.

But that's only the beginning.

Our Token Ring products are driven by Intel's high-performance i960 32-bit RISC processor. The competition's? 16 bits. Our active Token Ring modules provide up to 24 ports. The other guy's? Half that. And we have an integrated solution for bridging Ethernet, Token Ring and Wide Area Networks with a single module. Their solution? A stand-alone box.

Our products use Flash EEPROM for easy upgradeability. Theirs don't. Our Desktop Network Interface Cards support both STP and UTP and provide *at-a-glance* diagnostics. Theirs won't. And we've integrated twelve station ports on a single, manageable repeater module with Ring-In/Ring-Out capabilities for both fiber and copper. They can't.

With 19 modules for our MMAC hub, Cabletron's Token Ring solution is "the complete solution." Theirs? Well, they simply don't stack up.

For more information on Cabletron's Complete Token Ring Solution, give us a call at (603) 332-9400, Ext. 2705. And ask for your free copy of Cabletron's *SNA and Token Ring Integration Strategy*, the white paper that maps out a smooth migration to the "new" SNA and integrated SNA/Token Ring environments.

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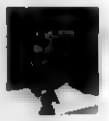

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Network Design & Engineering
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Global net solution still elusive

By Elisabeth Horwitt

■ Network administrators who have had trouble just getting a reliable dial tone in some parts of the world are experiencing a quantum leap in stress levels as they try to interconnect their companies' overseas local-area network installations.

Unfortunately, more and more telecommunications managers cannot afford to wait for the ideal service to support their corporations' internetworks.

Cargill, Inc., for example, is developing a strategy for setting up and managing a global backbone even as it implements the client/server LAN systems that the backbone will connect, said Reuben Lantto, director of international telecommunications at the Minneapolis-based conglomerate.

"Half the customers we talk to now have announced that they want to link all their LANs globally," said Len Elfenbein, president of Lynx Technologies, Inc., a Little Falls, N.J., consulting firm. Unfortunately, that "driving requirement is a little ahead of reality."

Neither is perfect

The two most common types of overseas circuits right now are packet-switched X.25 networks and leased lines. X.25 links typically do not support the 64K bit/sec. bandwidth that is a minimum for many LAN interconnections, Elfenbein said. Leased lines are often too expensive: The cost of linking 10 European sites at 64K bit/sec. over dedicated circuits ranges from $80,000 to $100,000 per month, he said. Extending those links outside of Europe boosts that figure.

The long-term solution, users and consultants agreed, is on-demand broadband services such as frame relay, Asynchronous Transfer Mode (ATM) and Integrated Services Digital Network (ISDN). Such services promise speeds of between 64K bit/sec. and 155M bit/sec. (for ATM). Furthermore, their usage-based pricing is ideal for LANs, which have traffic levels that tend to be erratic.

Unfortunately, frame-relay services are still limited to pockets around the globe, Elfenbein said. ATM services are expected to appear late this year from carriers such as WilTel.

For companies such as Cargill, this simply means using frame relay wherever possible and leased lines or other services wherever switched broadband connections do not reach.

A few months ago, Cargill became one of the first users of BT's frame-relay service for LAN connections. The strategy seems to be paying off: "I think from the third location on, we should save about $2,000 per location as compared with leased-line connections," Lantto said.

Cargill is now looking to expand its Minneapolis-to-London connection, possibly going with other carriers in countries where BT's services are not available, Lantto said. Frame relay is unlikely to be the company's sole LAN connectivity strategy, given that "the technology is not available everywhere," Lantto said.

One of the attractions that broadband switched networking has for Cargill is that "it gives you a chance to outsource network planning, managing and operating, which should help in staffing requirements and budgeting," Lantto said. "It's especially hard to meet staffing requirements overseas."

Schindler Informatik AG plans to connect its global LAN installations via international ISDN services wherever possible and cost-effective, according to Ed Hodgson, manager of computing and communications at the Swiss elevator company. When usage-based costs for a given site reach a certain level, the company will put in leased lines, he said.

Schindler chose AT&T to provide local ISDN access in the U.S. to a trans-Atlantic ISDN connection overseas, where the Postal Telephone and Telegraph authorities (PTT) will pick it up, Hodgson said.

Other companies with immediate global internetworking needs are trying "managed LAN services" from companies such as Infonet Services Corp., AT&T and BT/Syncordia. Such services take care of everything from design to installing, supplying and managing LAN backbones.

Global outsourcing vendors also take over the onerous task of designing and provisioning a backbone network across multiple countries, each with its own regulations, price structures, currency, language and network interface "standards."

Indeed, the lack of standardized interfaces between user equipment and foreign carriers is one of the biggest headaches when implementing overseas LAN backbones, users said.

European PTTs still pretty much insist on selling their own brands of customer premises equipment such as ISDN terminals, Hodgson said. As a result, an ISDN adapter bought in Germany will not necessarily work with the Swiss PTT's ISDN service, he added. "They don't have the equivalent of the ISDN/1 [standard for interfacing ISDN equipment and services] that we have in the U.S."

This problem is high up on the agenda of several user groups. The European Commission's (EC) User Workshop has been working on extending the EC's Open Network Provisioning Act to include some guidelines for standardization and more open competition in the broadband market, according to Iain Stevenson, a senior consultant at London research firm Ovum Ltd. and a member of the workshop.

And the Telecommunications Council of Multinationals (Telcom, Inc.), a year-old organization of telecom managers from 12 major corporations, is trying to persuade carriers to agree to "some standardization of billing and product offerings," said Lantto, who is a member.

How one company built safeguards into its global agreement

When J. P. Morgan & Co. decided to turn its global LAN internetworking over to AT&T two years ago, the New York financial services firm put a lot of thought and effort into making the arrangement bulletproof, said Tom Hynd, vice president of the telecommunications department.

J. P. Morgan signed up for AT&T's global LAN internetworking service, a custom network contract under which the carrier designed, installed and now maintains and manages a global backbone of Cisco Systems, Inc. routers and leased-line links. The routers handle a variety of protocols, including Apple Computer, Inc. AppleTalk, Transmission Control Protocol/Internet Protocol, Novell, Inc.'s IPX and Digital Equipment Corp.'s DECnet, Hynd said.

AT&T owns, manages and supports the routers. When something goes wrong, the carrier acts as a liaison with foreign PTTs to figure out where the problem lies, Hynd said. "We certainly considered [AT&T's offering] as cost avoidance relative to building and operating our own network."

Nonetheless, J. P. Morgan has held back from giving AT&T full responsibility for its overseas LANs. While AT&T directly manages the overseas network, J. P. Morgan manages the LANs, using a variety of network management tools, Hynd said. The firm considers it infeasible for a carrier to manage "a LAN environment, particularly a diverse one such as ours," he added.

In addition, J. P. Morgan's U.S. network management center has a link into AT&T's network management system so that in-house network managers can "monitor alarms and error conditions there," Hynd said. "It's moderately important. Although we contracted the operation of the network to them, we want a sense of what's going on, particularly in case of disaster."

To further protect itself, J. P. Morgan included a clause in the contract that levies financial penalties on AT&T should service fall below a certain level.

PROS CONS

On-demand overseas network services promising LAN connections

Unlike leased lines, the services below provide usage-sensitive pricing and put network management responsibilities on the carrier's shoulders.

Frame relay
PRO: Under-T1 speeds to 45M bit/sec.
CON: Limited availability; lack of intercarrier interoperability; some carriers are waiting for ATM.

ATM
PRO: Speeds of 34M bit/sec. up to 155M bit/sec.; potential to support multimedia; European consortia working on pan-European interoperability of services.
CON: Availability slated for 1994 or later.

ISDN
PRO: Basic Rate interface broadly available; inverse multiplexers becoming available to bundle multiple 64K bit/sec. circuits into one high-speed link.
CON: Cross-border links still limited to 64K or 128K bit/sec.

Virtual data networks with router support
PRO: Speeds of 2M bit/sec. or higher; typically, carrier handles everything from design through implementing and managing routers.
CON: User tied to one carrier; no one carrier is likely to provide the best service and support in all regions.

Directories frustrate users

By Lynda Radosevich

■ Despite their desire to integrate disparate electronic-mail systems, many user companies say they are not comfortable yet with messaging backbone and directory synchronization products based on the X.400 and X.500 international E-mail standards.

The biggest hurdle cited by users at the recent Interop '93 Spring show was incomplete directory services, including those based on the X.500 standard.

"Software directory services are probably more important to us than the X.400 transport software" because users need easy access to E-mail addresses, said an information systems manager at a major financial services company in New York who asked not to be identified. He said he did not see anything on the Interop show floor that would satisfactorily coordinate mail directories across multiple platforms.

The reason is due in part to an X.500 directory standard that is just becoming stable, said Daniel Blum, principal at Rapport Communication in Takoma Park, Md. That means that products using the stabilized standard are in the early stages of development and existing products only partially implement the standard.

Other integration concerns include a lack of standard administration tools, a lack of knowledge about X.400 products and uncertainty about advantages of an "open" backbone.

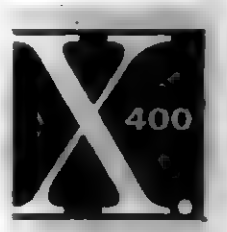
For example, Norwest Corp. in Minneapolis committed to moving to X.400 to get a scalable standard, but first it must learn more about the products and outline clear business advantages, said Rob Niederman, principal communication consultant at the firm's technical services division.

Despite their concerns, companies such as Philadelphia Newspapers, Inc. were clear about the importance of employing messaging standards. "Eventually we'll want to be able to talk to anybody and not have a wall thrown up because we don't talk the same protocol," said Andrew Caplan, network manager.

Gateways lend connectivity

Virtually all E-mail vendors now offer X.400 connectivity through gateways. And most plan to augment their offerings soon. For example, Lotus Development Corp. plans to ship a CC:Mail Directory Services module this year that will integrate with LAN-based "X.500-like" services from other vendors.

Microsoft Corp. said that the unannounced next generation of its Mail server — estimated to appear in early 1994 — will be based on the 1988 version of X.400. Novell, Inc.'s recently released NetWare 4.0 offers some features of the X.500 directory standard.



Vendors demonstrating directory synchronization products at Interop '93 Spring included the following:
- Enterprise Solutions Ltd. in Westlake, Calif.
- Isocor in Los Angeles
- Oakcat in Fairfax, Va.
- Pacific Bell Connection Service in San Ramon, Calif.
- Retix in Santa Monica, Calif.
- SoftSwitch, Inc. in Wayne, Pa.
- Wollongong Group, Inc. in Palo Alto, Calif.

In addition, "you'll see a lot more announcements over the next nine months" from companies new to the E-mail integration field, said Sara Radicati, president of information services at Creative Networks, Inc., a consultancy in Palo Alto, Calif.

One such company, Hitachi Computer Products, Inc., announced earlier this month that it would enter the E-mail market. Hitachi has already developed private X.400 software for the Japanese market. The company hinted that the first U.S. products would include directory synchronization software for Unix and PC platforms in the third quarter of 1993.

Too many addresses

Meanwhile, organizations such as the Department of the Navy's Naval Sea Systems Command will take a different approach.

Gifford Martin, a systems manager at the division, said his long-term goal is to move to open systems and X.500-based directory synchronization because "keeping up with all the Internet addresses that are flitting around is enough to drive you to distraction."

Although the department currently uses the Simple Mail Transport Protocol that runs over Transmission Contol Protocol/Internet Protocol networks, "to be consistent with the rest of the command, we are probably going almost immediately to CC:Mail, which, from an open systems point of view, is a step backwards."

Silencing APPN critics

IBM seeks to answer objections to its de facto standard

By Elisabeth Horwitt

IBM is on the verge of overcoming all the objections that users and vendors have made to its Advanced Peer-to-Peer Networking (APPN) protocol becoming an accepted de facto standard, IBM spokesmen said recently.

The objections all come down to the general perception that APPN is still primarily an IBM-controlled, proprietary protocol. But by the end of the spring, IBM spokesmen claimed, the protocol will be the following:

- Generally accessible: IBM is publishing this month the specifications for APPN Network Node, which include key directory and routing capabilities.
- Affordable to other vendors: A $25,000 per-year fee gives any vendor the right to use APPN Network Node specifications to develop a product and use the APPN trademark.
- No longer IBM-controlled: At the next APPN Implementors' Workshop, scheduled for April 15 and 16, IBM will elicit other vendors' input to set priorities for future APPN enhancements and address users' needs, spokesmen said.
- Available from other vendors besides IBM: UK Systems Network Architecture (SNA) software vendor Data Connections Ltd. recently announced a portable version of APPN Network Node that it plans to sell to other vendors. But the product will not necessarily be cheaper than IBM's version, a spokesman said.
- Enhancements offered on an (almost) level playing field: IBM is planning to make High-Performance Routing, the upcoming high-speed, multiprotocol version of APPN, available to third parties by year's end. IBM expects to provide its first commercial implementation on its 6611 router in first-quarter 1994.

IBM may have opened up APPN more quickly and more completely than it had intended because of the threat of Advanced Peer-to-Peer Internetworking (APPI), according to Harold Hauck, a consultant at Open Systems Computer Consulting in Corte Madera, Calif. Originally proposed by Cisco Systems, Inc., the Transmission Control Protocol/Internet Protocol-based protocol promises SNA users the same advanced routing and directory functions that APPN has but without the need to stay tied to IBM.

Router vendors Wellfleet Communications, Inc., 3Com Corp., CrossComm Corp., IBM, Cisco and Network Equipment Technologies, Inc. have committed to APPN support; Cisco, Proteon, Inc. and Ascom Timeplex have lined up behind APPI.

Cisco expects to release an initial draft of APPI in June, a Cisco spokesman said. He added that the protocol will be developed without the need for IBM patents. The drawback is that without those patents, APPI Open Network Nodes will not be able to interact with APPN Network Node devices.

This would make it impossible for users to combine, for example, Cisco routers running APPI with IBM 6611s running APPN on the same backbone — at least until Cisco starts routing APPN early next year. It would also preclude APPI routers' interoperating with IBM VTAM NCP hosts running APPN Network Node.

A number of companies are seriously considering migrating their existing VTAM NCP SNA networks to APPN's more flexible and dynamic routing and directory functions.

Testing affirms FDDI in busy environments

By Lynda Radosevich

■ Fiber Distributed Data Interface (FDDI) works well as a network backbone even in multivendor networks that are heavily loaded with other traffic, according to test results released recently by an independent laboratory.

"We were surprised because it seemed as though the demise of FDDI was some kind of self-fulfilling prophecy," said Kevin Tolly, president of Interlab, the network testing and consulting organization that ran the tests. Interlab is a division of Virtual Systems of New Jersey, Inc. "We're providing the first empirical evidence of how FDDI works in a real network, and the results are as good as possibly can be anticipated," Tolly said.

In one set of tests, data was exchanged between two IBM Personal System/2 PCs and an IBM mainframe using a peer-to-peer application built with IBM's LU 6.2. The data was sent across local and remote Token Rings and an FDDI backbone using various bridges, routers and concentrators.

Throughput measured

Interlab used Systems Network Architecture devices to measure the throughput of the application, then increased network traffic in increments of 10%, up to 90% utilization. The application, which ran at 10.13M bit/sec. on an empty network, ran at 9.79M bit/sec. on a 90% loaded network.

FDDI equipment was contributed by 3Com Corp., Ascom Timeplex, Inc., Crescendo Communications, Inc., Digital Equipment Corp., Du Pont Co., FiberNet Research, Inc., Hewlett-Packard Co., Interphase Corp., Madge Networks, Inc., National Semiconductor Corp., Proteon, Inc. and Wandel & Goltermann, Inc.

Advantage over ATM

"As a backbone technology, FDDI certainly has a market window over [Asynchronous Transfer Mode]," which won't threaten FDDI for a couple of years because of the high price tags on initial products and unfinished standards, said Marty Pafka, senior industry analyst of networking data at Dataquest, Inc. in San Jose, Calif.

The tests could help companies such as PMA Reinsurance Corp. in Philadelphia choose among high-speed backbone technologies. "As long as their comparisons are apples to apples, they are very useful," said John Cunningham, PMA's vice president of MIS.

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Electronic mail

Mainframe-to-LAN mail bypasses need for gateway

By Lynda Radosevich
ATLANTA

Companies using IBM's Profs and OfficeVision mainframe software and local-area networks will soon be able to integrate mainframe mail with LAN mail without using today's expensive gateways.

On April 1, Capella Systems, Inc. is slated to ship SmartScreen Message Manager, Microsoft Corp. Windows-based software that integrates mail from mainframes and LANs into one client application on a PC; the company will also show it at Comdex/Spring '93. The software provides native support for Microsoft's Messaging Application Programming Interface and IBM's Profs and OfficeVision/VM mainframe office automation systems. Support for Lotus Development Corp.'s Vendor Independent Messaging and Novell, Inc.'s Message Handling Service is slated for the second and third quarters of this year, respectively.

"This addresses a transitory problem for IBM mainframe customers with a very nice user interface," said Michael Heylin, senior associate at Creative Strategies Research International, Inc., a consultancy in Santa Clara, Calif. "This is like a router between LAN-based E-mail and Profs. Another option would be to use gateways that typically reside on a mainframe, but that is incredibly expensive."

SmartScreen Message Manager costs $495 per license and requires a 3270 terminal emulation device at each desktop or at a bridge.

While LAN-based E-mail systems will eventually supplant Profs and OfficeVision, the installed base of the mainframe packages numbers in the millions, so there will be a two- to five-year transition period, Heylin predicted.

IBM now offers IBM Mail LAN Gateway/2 to link its OfficeVision host software with Lotus' CC:Mail and Notes. IBM plans to offer a series of gateways and direct PC-to-host interfaces by midyear, company officials said.

> LAN-based E-mail systems will eventually supplant Profs and OfficeVision, but the installed base of mainframe packages numbers in the millions.

For test site Fidelity Investments, Inc. in Boston, SmartScreen Message Manager allows people in the distributed development group using Microsoft Mail to communicate with mainframe developers using Profs "with a fair degree of impunity," said John Trustman, senior vice president.

"It lets me send a single message to groups of people in each environment" using one mailing list, Trustman said.

The software also "completely insulates the [PC] user from the OfficeVision interface," said Randy Bassin, LAN administrator and developer at Amway Corp. in Ada, Mich. SmartScreen lets the PC users access both mainframe and LAN mail from one mailbox, and it lets users copy and paste text files into their messages, he said. However, "people that are fast at navigating OfficeVision prefer the old way," because the response time is quicker, Bassin said.

As more departmental LANs are hooked into the Office Vision system, Amway plans to use E-mail gateways rather than SmartScreen Message Manager, even though that is "a pain and a very expensive proposition," because gateways will be necessary to support the disparate mail systems of roughly 10,000 users worldwide, Bassin said.

Diagnosing Unix

SAS tool helps managers spot network problems

By Gary H. Anthes
CARY, N.C.

SAS Institute, Inc. has shipped a new performance monitoring tool for Unix-based networks to 55 test sites.

SAS/CPE for Open Systems takes raw performance data from commercial network products and summarizes, analyzes and reports it in accordance with user-specified parameters. It will be available in the third quarter for networks of computers running Sun Microsystems, Inc.'s Solaris, Hewlett-Packard Co.'s HP/UX and IBM's AIX operating systems.

Northwest Airlines is using SAS/CPE to help it monitor the performance of 48 Sun servers on local-area networks containing 500 Sun workstations devoted to passenger revenue accounting.

Each night, SAS/CPE takes data collected during the day by SunConnect's SunNet Manager, reduces the data and produces an exception report based on user-specified thresholds, such as CPU queue size, collision rates and the like.

According to Robb Newman, system software specialist at Northwest, the tool allows him to pinpoint trouble spots at a glance. "When you have so many boxes to manage, all you can do is worry about the problems," he said. "If it's OK, I don't want to know about it."

Newman said using SAS products for performance analysis and capacity planning is very common in the mainframe world but not in Unix environments. "Unix shops write Unix shell scripts to do the data reduction, then they put it all in a three-ring binder, which fills up in a week," Newman said.

He said more sophisticated Unix shops may write the performance data to a commercial database management system then extract and present it with a commercial spreadsheet package. This, however, is a lot of work, he said.

Newman said the airlines' Network Support Group will use SAS/CPE throughout the company to help analyze the performance of a variety of Simple Network Management Protocol (SNMP) routers and other devices.

For some time, SAS has distributed a primitive version of SAS/CPE for free, but it was a batch product with the ability to process SunNet Manager data only. The new version, to be an official, supported product, handles a variety of inputs and gives users interactive control via a graphical user interface.

Among the network performance data collectors supported are SunNet Manager, Cabletron Systems, Inc.'s Spectrum, HP's Performance Collection Software, Unix accounting and disk usage data from HP/UX, AIX and Solaris, Landmark Systems Corp.'s Probe/Net and Concord Communications, Inc.'s Trakker.

SAS/CPE comes with canned reports, charts and graphs but allows for ad hoc reporting as well. Level of detail and retention periods for data in an SAS "performance database" are under user control.

SAS/CPE for Open Systems is priced from $80 to $695 per CPU for a first-year license. Annual renewal is priced from $15 to $325 per CPU, depending on the number of copies installed.

Sneak previews

The experimental SAS/CPE for Open Systems was demonstrated at the recent Interop '93 Spring trade show in Washington, D.C. SAS/CPE for MVS was unveiled at the Computer Measurement Group conference in Reno, Nev., in December 1992.

[redacted]

Gateways, bridges, routers

Xyplex, Inc. has introduced Network 9003, a hub/router.

According to the company, the product offers up to 48 10Base-T or communication server ports and supports an integrated bridge/router. Through a local- or wide-area network, remote workgroups can connect to corporate headquarters. Network 9003 becomes an eight-port router and is configured with the company's 401 Bridge/Router modules for LAN or WAN applications.

Three slots are available for terminal servers, routers, wiring concentrators and other networking modules.

Pricing begins at $1,745.

▶ *Xyplex*
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Network Software Associates, Inc. has introduced NSA Router for Windows.

According to the company, the product is the first native Microsoft Corp. Windows-based router software for PC-to-Application System/400 connectivity. It has also been implemented as a Low Entry Networking node in IBM's Advanced Peer-to-Peer Networking architecture.

NSA Router has a true Windows Dynamic Link Library application and is incorporated as a standard module within the company's Elite/400 and Elite/400 DSP Version 2.0.

The Elite/400 DSP costs $295, and the Elite 400 costs $395.

▶ *Network Software Associates*
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

Combinet, Inc. has introduced four products designed to provide easy and affordable high-speed communication between enterprise local-area networks and remote locations.

Everyware LC/BRI Bridge supplies high-speed remote access to enterprise networks over Integrated Services Digital Network telephone lines. Remote LAN access over Switched-56 telephone lines at speeds of up to 112K bit/sec. is provided by the Everyware Dual/56 Bridge. Connection Manager is a Microsoft Corp. Windows-based network management application that collects caller statistics and supports logs for performance and security. Interoperability with the company's products is facilitated by the Everyware IVP Toolkit.

Prices range from $895 to $2,490.

▶ *Combinet*
Suite 320
333 W. El Camino Real
Sunnyvale, Calif. 94087
(408) 522-9020

Multiplexers, front ends

Data:Race has announced Mach DS plus, voice/fax/data multiplexers.

The firm said the products offers 38.4K bit/sec. per-user ports, synchronous/asynchronous selectable ports and 8K bit/sec. Free Speech and Flash read-only memory. Optional modules can be added through feature sockets.

These modules include an internal Data Service Unit/Channel Service Unit that can be used as a limited distance modem and an RS-232 serial port.

Prices range from $2,295 to $11,500.

▶ *Data Race*
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11550 IH-10 West
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IBM Business Partner

User Voices

Parallel plans

Question: IBM will introduce its first parallel-processing computer later this year for database query, and other vendors such as NCR Corp. already have parallel machines on the market. What plans, if any, do you have for parallel processing in your IS shop?

▶ DAVID BARNETT, *vice president of systems at Invesco Funds Group in Denver.*

We're rewriting and enhancing our major applications to run on an NCR [parallel-processing] 3600; this will replace two Data General Corp. MV10000s. Everything should be done by Christmas.

We decided to take a big jump into new technology, both hardware and software, to see if we could improve the capability of our applications going forward.

One reason we decided on NCR is because the 3600 is scalable, and we wanted something that will be able to handle the growth of our business. The 3600 is also based on an open systems platform, Unix System V, and that is important to us.

As an interim step — because the 3600 wasn't shipping at the time, and we were running out of capacity on the DG machines — we brought in an NCR 3550 in March 1992, which is also Unix-based. We converted our Cobol shareholder application from the MV10000 to the 3550.

The 3600 arrived in August 1992, and two of our corporate accounting modules are running on that. The shareholder system will be moved from the 3550 to the 3600 around midyear. The portfolio management system, now running on the DG, will follow, as will the marketing system. Everything will be on the 3600, all using one integrated database.

▶ JOSEPH VINCENT, *director of technical services at Humana, Inc. in Louisville, Ky.*

In the short term, we don't have a use for parallel here. Not every problem is "parallel-izable." For example, you can do payroll processing in parallel because there's no relation among the employees. But most processes are sequential. Taking a problem and making it yield to parallel processing is not as easy as most people think it is.

We have looked at a [parallel] database machine repeatedly for the past eight years. But we have not yet found a subset of our processing that makes sense to break out into that environment.

In the "User Voices" column, which relates among our technical sections, Computerworld shares user opinions solicited at random on computer-related issues. This week, users describe their plans — or lack thereof — for parallel processing.

▶ DAVID MOORE, *senior vice president of Mellon Bank Corp. in Pittsburgh.*

We're going to go wherever price/performance takes us. We're interested, but it will depend on how powerful [the IBM parallel machine] will be. Their challenge is how to get there without disrupting the software world. You have to step through it without having to rebuild the world.

Who wants to change code just for the sake of change? We want the advantage of lower cost processing and the ability to add incremental processing without having to change the code.

I wouldn't characterize ourselves as a huge DB2 shop. There are some applications where we'd like to use DB2 because of its powerful relational and query applications, but on the other hand, we can't stand the pain of a batch-processing cycle running through it.

Another technical challenge with parallel processing has been giving it the usability and systems management features we have on the mainframe: tape scheduling, archiving and so forth. These are real needs that have to be taken care of.

▶ TED DUBIN, *vice president of information resources at Northeast Utilities in Berlin, Conn.*

It depends on the tools available. My programming staff is not able at this point to make adequate use of parallel processing unless it becomes transparent to them. We might use it as a database engine because IBM will probably provide the code and isolate the programmers from the changes. Database backup and reorgs are particularly consuming of mainframe resources.

▶ THOMAS TAGUE, *senior director of high-performance computing at the Epsilon subsidiary of American Express Travel Related Services Co. in Burlington, Mass. Epsilon sells marketing databases and applications to consumer-goods and other firms.*

We have two Thinking Machines Connection Machine-5 parallel computers, one with about 64 processors and another with 130-plus.

Clearly, the big issue with integrating any new technology into a standard Big Blue shop is the 20 years of issues and procedures in the shop. The traditional mainframe and a parallel computer don't share the same operating system, security, scheduling or resource management packages. The big information systems vendors are somewhat loath to support two different sets of these tools.

Our solution has been to attempt to use IBM's tools or the tools that run on the IBM platform to drive the processing on the Connection Machine. For example, we use IBM-resident job-scheduling packages to initiate jobs and data transfers and to monitor the status of jobs on the Connection Machine. This is instead of using a different package altogether.

Another big challenge was the communications between the two platforms. The Connection Machine moves data at 3G to 4G bytes per second, and the IBM can't feed it at those speeds.

So the question is, does data remain resident on the IBM system, and is it transported to the parallel system for processing? It implies a new level of complexity for managing data. Or do you trust the parallel system enough to entrust the corporate jewels of data to it? In our system, there's a combination of both.

We developed our own software to manage almost all the communications and data transfers between the Connection Machine and the IBM platforms. It was not a minor effort; it took several people a year just to develop that piece.

▶ ROBERT GOLDBERG, *vice president of Old Stone Bank in Warwick, R.I.*

I don't think we'll be doing much in parallel processing for several years. A corporation would have to look at it and see how it will fit from a cost standpoint as well as everything else. Most companies are downsizing these days.

Responses compiled by Computerworld *senior editor Johanna Ambrosio. Comments have been edited slightly for clarity.*

Hitachi Data Systems to ship 13 GX series mainframes

By Jean S. Bozman
SANTA CLARA, CALIF.

Just when you thought there were too many mainframes, Hitachi Data Systems Corp. has come up with 13 more. But in this case, it is not quantity that matters. It is the "flavors" of the various computer models that should appeal to users, as HDS attempts to allow users to upgrade in smaller steps than competitors IBM or Amdahl Corp.

In all, there are now 26 models in HDS' flagship GX series of IBM-compatible mainframes. They range in power from 16 million instructions per second (MIPS) to 390 MIPS and include an eight-way processor.

Big chill
HDS' new air-cooled mainframes range from 16 MIPS to 75 MIPS. The water-cooled mainframes range from 50 MIPS to 390 MIPS. Pricing has yet to be announced.

HDS expects to follow its mainframe news with an April 6 announcement of a far-reaching open systems strategy that will start with a mainframe that runs the Open Software Foundation's OSF/1 version of Unix and will extend to Unix workstations and Unix supercomputers, some analysts said.

But for now, HDS' March 16 announcement has shortened the leaps customers must make between mainframe models, industry analysts said. HDS has regulated the speed of the central processor engine to come up with many variations on a theme, said Susan Gannon Middleton, a senior analyst at International Data Corp. in Framingham, Mass.

HDS has also made sure to match the new IBM Enterprise System/9000 models announced Feb. 9 and to add models that span gaps in the IBM lineup. "You can announce as many mainframes as you like, but basically they're building blocks," said Marc Butlain, chairman of Meta Group, Inc. in

Hitachi, *page 78*

Standardization buoys open systems

ON SITE

Chesebrough-Ponds, Inc.
Greenwich, Conn.

Challenge: To downsize the 74 major applications that run Chesebrough-Ponds from its IBM mainframe environment onto open systems platforms.

Technology: Computer Associates International, Inc.'s CA-Unicenter for Unix; Hewlett-Packard Co.'s 9000 series Unix computers; IBM Application System/6000s.

Results: Increased service levels, energy reductions and quality improvements have saved $100,000.

By Thomas Hoffman
TRUMBULL, CONN.

Chesebrough-Ponds, Inc., the health care manufacturer widely known for products such as Vaseline and Q-Tips, is following the steps of an 18-month-old hardware and software product standardization model put in place by parent Unilever PLC.

The effort was designed for all Unilever subsidiaries to have common, open systems-based architectures that are globally networked.

"Open systems are absolutely critical from a progressive posture and for day-to-day needs," said E. E. (Gene) Goodmaster, director of management information at Chesebrough-Ponds.

Unilever's 500-plus subsidiaries, including Elizabeth Arden Co. and Thomas J. Lipton Co., benefit from the standards move by being able to develop applications at one location, such as Calvin Klein, Inc., and port the applications to common operating environments at other Unilever divisions, such as Lever Brothers.

In fact, one of Unilever's British subsidiaries, Alida Gibbs, is developing some manufacturing applications that it will port to Chesebrough-Ponds by year's end, according to Sam Palm, manager of corporate data processing at Chesebrough-Ponds.

But perhaps the largest benefit from Unilever's "badging" initiative for Chesebrough-Ponds will be the unit's ability to downsize each of the 74 major applications that run the company onto distributed systems and off its complex of IBM 3090-200 mainframe systems by 1996.

Unilever's standardization effort, known in-house as "badging," includes the parent firm's endorsement of equipment from Digital Equipment Corp., Hewlett-Packard Co. and Lotus Development Corp., among others. Chesebrough-Ponds began migrating from a predominantly IBM mainframe environment to open systems last year, according to Palm. The open systems drive started with the installation of an HP 9000 Model 827 machine to handle its consumer affairs processing.

Now, Chesebrough-Ponds is installing a corporatewide word processing system also driven by an HP 9000 Model 847 machine. Palm said the group has just begun training staff members at its Clinton, Conn., manufacturing plant. He added that he expects the WordPerfect Corp. environment to be rolled out to all 10 distribution centers and five manufacturing plants in the U.S. and Puerto Rico by the first quarter of 1994. Each of these facilities uses IBM Application System/400 machines to manage plant and distribution center functions.

All Chesebrough-Ponds facilities are in the process of being linked via Transmission Control Protocol/Internet Protocol over an IBM 3270 backbone. All the buildings are now rewired, except for a handful of small sales offices and five plants, which are scheduled for completion by the first quarter of 1994.

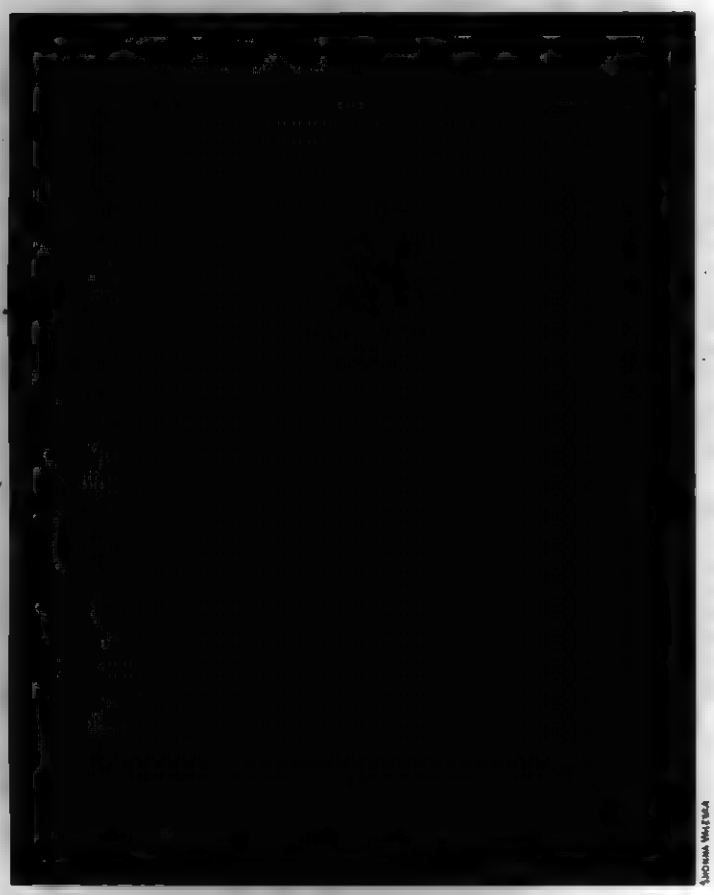
Full support

Chesebrough-Ponds is getting behind CA's CA-Unicenter for Unix systems management package. Sam Palm, the firm's manager of corporate data processing, is spearheading the development of a CA-Unicenter for Unix user group, with plans for a first meeting in April.

The word processing project is just one example of how Chesebrough-Ponds is moving applications off its mainframes, which support all legacy systems ranging from payroll and benefits to order processing.

"After we move all our applications away from the mainframe, we'll keep the mainframe as a server and then eventually phase it out" by 1996, said Palm, who noted that the migration of applications to a distributed platform will enable users to access data 24 hours a day, which is critical for a division of a transcontinental giant such as Unilever.

Chesebrough-Ponds' data center here also supports Elizabeth Arden in nearby Stamford, Conn., but Palm said that division is in the process of installing its own AS/400 systems by year's end.



SUSANA MASTRA

Sam Palm, manager of corporate data processing: *Migration to a distributed platform will give users 24-hour access to data*

Put to the test

Chesebrough-Ponds is beta-testing Computer Associates International, Inc.'s CA-Unicenter for Unix systems management package for its HP/UX systems. The company is testing all nine CA-Unicenter modules, said Palm, including scheduling, problem management, security and back-up resources. It expects to go live with these four modules by mid-April, Palm said.

Thus far, application scheduling tests have gone smoothly, Palm said. He expects to add CA-Unicenter to manage the company's help desks at a yet-undetermined date. "With CA-Unicenter, we won't have to teach our folks new Unix verbiage," Palm said of the Chesebrough-Ponds 80-plus-member IS staff.

Goodmaster said Chesebrough-Ponds will be a beta-test site for IBM's RISC System/6000 machines under IBM's AIX Unix environment. The RS/6000s, which will be used as logistics systems, will replace most, if not all, of the AS/400s located throughout Chesebrough-Ponds' facilities by 1996, Goodmaster said.

He added that the replacement delay is based on the maturation and arrival of the Open Software Foundation's OSF/1 and Distributed Computing Environment/Distributed Management Environment standards.

Chesebrough-Ponds' switch to open systems is already starting to pay off, Goodmaster noted. Energy reductions and other quality improvements have helped the firm save $100,000 over the past year.

Hitachi to ship mainframes

CONTINUED FROM PAGE 77

Westport, Conn.

Several IBM-compatible special features will be developed by HDS and offered separately for all HDS GX mainframes. Analysts said they expect it to take HDS and Amdahl at least a year to match IBM's firmware-based data compression and IBM's Asynchronous Data Mover, which saves cycles while moving data from expanded memory to the central processor.

In general, IBM's mainframe line requires bigger jumps in power for each upgrade and ties the new IBM features to future upgrades, analysts said. "HDS is positioned to provide much better granularity [in pricing] than IBM or Amdahl," said Mark Hess, vice president of Gartner Group, Inc.'s Large Computer Strategies group in Stamford, Conn. Some jumps in the IBM upgrade path are as much as 90 MIPS or 115 MIPS, he said.

Users at some large HDS sites said they like the new GX lineup. "Our business tends to grow in leaps, but we don't like to buy more excess capacity than we need," said Sheri Anderson, senior vice president of production and systems services at Charles Schwab & Co. in San Francisco. "It's very good for us to have options." Schwab is in the process of expanding its six-way HDS computer to a seven-way HDS GX model, Anderson said.

Dow Chemical Co. in Midland, Mich., has no immediate plans to upgrade HDS mainframes, but the options are welcome in the multivendor shop. "Any time you have more choices, the buyer is at an advantage," said Wayne Garner, Dow Chemical's manager of technical architecture. The state of Wisconsin negotiated an upgrade option last summer and installed an HDS GX 8320 last fall. Now it is going ahead with its $1.2 million upgrade. "If we didn't have such a good price, we could have used the new options," said Neal Steinhoff, administrator of the Info-Tech division of the state's Department of Administration in Madison, Wis.

Hess said IBM will begin to deliver its special features in October, and HDS would probably begin to do so next year. Amdahl has not announced when it would ship, Hess said.

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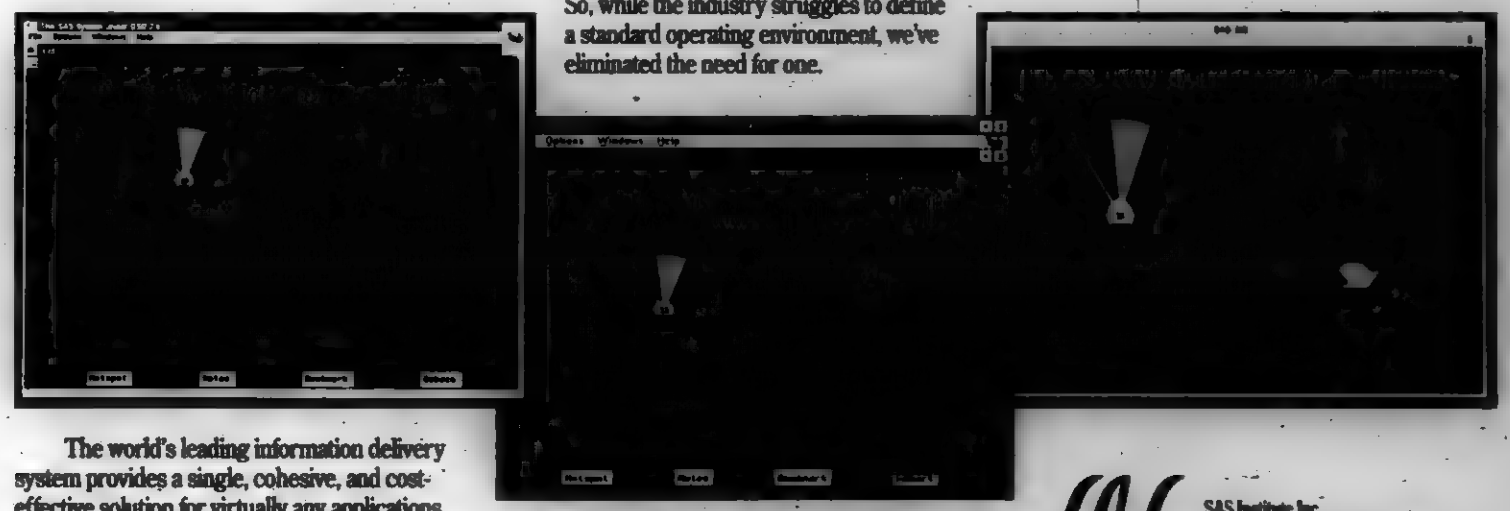

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Move off mainframe requires more than new equipment

By Mark Halper
W[illegible], Wis.

A mainframe-to-Unix conversion at Wausau Insurance Cos.' group retirement division served as a reminder that while technology marches on, human elements play just as large a role in computer projects.

"I had formed a misconception that the tools that make programming faster also make overall development faster," group retirement Vice President Tom Erickson said. "It doesn't. You still have to figure out what you're going to do."

The tool in Wausau's case was the fourth-generation language in an Oracle Corp. Oracle SQL Forms database development environment. Wausau had decided in 1989 to move an outdated, in-house-developed IBM 3090-based pension management system to a Unix platform — originally a RISC System/6000, later replaced by a Sequent Computer Systems, Inc. Symmetry system.

"There are a lot of issues that have to be worked through before you go ahead and start programming," Erickson said.

For instance, before programming the procedures for processing deposits into employee accounts, Wausau and its software development partner, Super Solutions Corp. in Minneapolis, first had to think through how they wanted to do it, what information the employees should see and what sorts of editing features and controls the task should include.

"It took us a good deal of time to determine what we wanted to do," Erickson said of the overall process. As a result, the conversion, which had been scheduled for completion in the third quarter of 1991, stretched into 1992, he said.

In the end, it was worth the agonizing, Erickson said. With the Unix system, pension portfolio administrators are able to perform their tasks 30% faster than on the old mainframe, he said.

Erickson was not originally receptive to the switch, which Wausau's information systems shop had decided on with inspiration from Chief Executive Officer Leon Weinberger. According to IS Vice President Dick Lund, Weinberger was advocating decentralization and multiple sourcing for all aspects of the company.

Tom Erickson: *'Nobody likes to be the guinea pig'*

"[Erickson] was very reluctant to go with a new piece of technology," Lund recalled. "We had a lot of selling to do."

But the need for change of some sort was clear. Wausau had been running its mainframe-based pension administration program for 15 years, and the program had grown so outdated that the market for managing corporate pension funds was passing the company by.

Among other shortcomings, the mainframe system could manage only three funds in any one pension portfolio, and it could change funds only once a quarter at the most.

Dick Lund, *IS vice president: 'We had a lot of selling to do'*

"We couldn't compete," Lund said.

Moving to Unix meant asking Erickson and his pension department to rely on an unproved technology for mission-critical operations.

"Nobody likes to be the guinea pig, and we found ourselves in that role," Erickson said.

So Wausau gave Erickson wide-ranging latitude to establish performance levels for the new system, which was to be a customized program running over an Oracle database.

Erickson rejected the first two Unix boxes tested by his 40 users, an RS/6000 and a Sequent system. He eventually settled on a larger Sequent system.

Erickson remembered the glaring shortfall of the RS/6000: "Transactions that we wanted to take 60 to 120 seconds could take as long as 45 minutes," he said, remembering dress rehearsals in November 1991.

While the solution cost the company more than it had originally anticipated — about $600,000 for the Sequent system compared with the approximately $150,000 it would have spent on an RS/6000 — it still saved several million dollars that it would have spent upgrading its new mainframe to accommodate the pension system, Erickson said.

Wausau's cost also included an additional $96,000 for 32 X Window System terminals and 10 386-based PCs, as well as a discounted package from Oracle that included forms, a database, transaction processing, SQL networking, a SQL 4GL, a SQL menu, a SQL report writer and a C compiler. Wausau used a standing contract between Oracle and Wausau affiliate Nationwide Group to negotiate a reduction of the $150,000 list price of the Oracle package.

Meanwhile, IBM's RS/6000 was not left completely out in the cold. Wausau discovered that while the Sequent Unix system met all its expectations for data manipulation, Unix had a generic flaw in handling electronic-mail requests.

"It slowed everything down immensely," Erickson said.

Wausau bought and installed an RS/6000 as an E-mail link between the pension division's 40 terminals and Wausau's mainframe-based E-mail system.

ON SITE

Wausau Insurance Cos.
Wausau, Wis.

Challenge: To replace an aging mainframe-based pension management system that was blunting Wausau's competitive edge.

Technology: Sequent symmetrical multiprocessing system, Oracle database and development tools.

Benefits: Pension portfolio managers are 30% more productive, and the system is far more flexible. Use of Unix-based software allowed company to change platforms twice before settling on final hardware choice.

Tape libraries overshoot user needs

By Johanna Ambrosio

The first Application System/400 automated tape libraries out the door are meeting with scattered user interest, although some observers said the devices may be ahead of midrange customers' needs for a while.

The Nearline Library System, announced recently by XL/Datacomp, Inc. in Hinsdale, Ill., holds up to 270G bytes on two 8mm helical-scan tape drives. In contrast, the Model 5100 from Memorex Telex Peripherals Group in Milpitas, Calif., introduced late last month, holds up to 315 ½-inch cartridges and stores up to 283G bytes. Options bring the capacity up to 756G bytes.

These are just the first two out the door, with more companies expected to jump in soon. "Virtually every vendor in the midrange tape market is working on one," said consultant Teresa Elms, president of Elms Information Services Group in San Diego.

Some early user reaction has been positive. But it is not a sure bet that midrange users will be as receptive to automated tape libraries as mainframe shops have been.

John Wood, vice president of computers and network services at the Royal Bank of Canada in Montreal, said he saw the Memorex system. "It looked like a great unit to me," he said. "It could increase the capacity of our AS/400s at a relatively modest price and also be useful for backups and recoveries."

Although his company has no immediate purchase plans, Wood suggested that information systems people responsible for Royal Bank's offshore AS/400s look into it.

Others were not so sure. "We haven't seen much need for tape management yet," said James Matsey, corporate director of IS at Reynolds Metals Co. in Richmond, Va. The company has four IBM AS/400s installed, with some 120G bytes. Instead of going the tape route, he said, "with the low price of disk, we're mirroring everything."

Another large shop, with 30 AS/400s, is Gannett Co. in Silver Spring, Md. But it, too, has no real need for a midrange tape library, said Scott Plumer, project manager in technical support. Most of the machines are used in distributed business units, "so we don't have a need for anything that massive," he said. And even for the centralized corporate data, "everything we have is on-line."

It may be some time before the vast majority of even the largest AS/400 installations are ready for this type of system, analysts said. Large corporations account for approximately 27% of the AS/400 installed base of more than 200,000 units, according to Business Research Group, a market research firm in Boston.

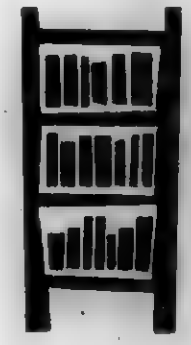
No large installed base

"The mainframe market was ready for this technology because there was a huge installed base of ½-inch cartridges, and users didn't know what to do with all this media," said Robert Abraham, vice president at consulting firm Freeman Associates, Inc. in Santa Barbara, Calif. "In the case of the AS/400, there is nowhere near that installed base of cartridges."

Still, Abraham predicted "some" early demand. "In any big user group, there are some that are ready for anything."

Not everyone agreed. "No one has any proof there is a requirement, except in the vendors' minds," Elms said. "Users are saying, 'We don't need no stinking software.'" Tape management software is one component of an automated system. "I have my concerns," she added.

Prices for the Nearline library start at $65,825, and the unit will ship by June, the company said. Data can be accessed in three to four minutes, the company said. Prices of the Fujitsu Ltd.-manufactured Memorex-Telex library begin at $172,000. It is shipping now. Access times average nine seconds, the company said.

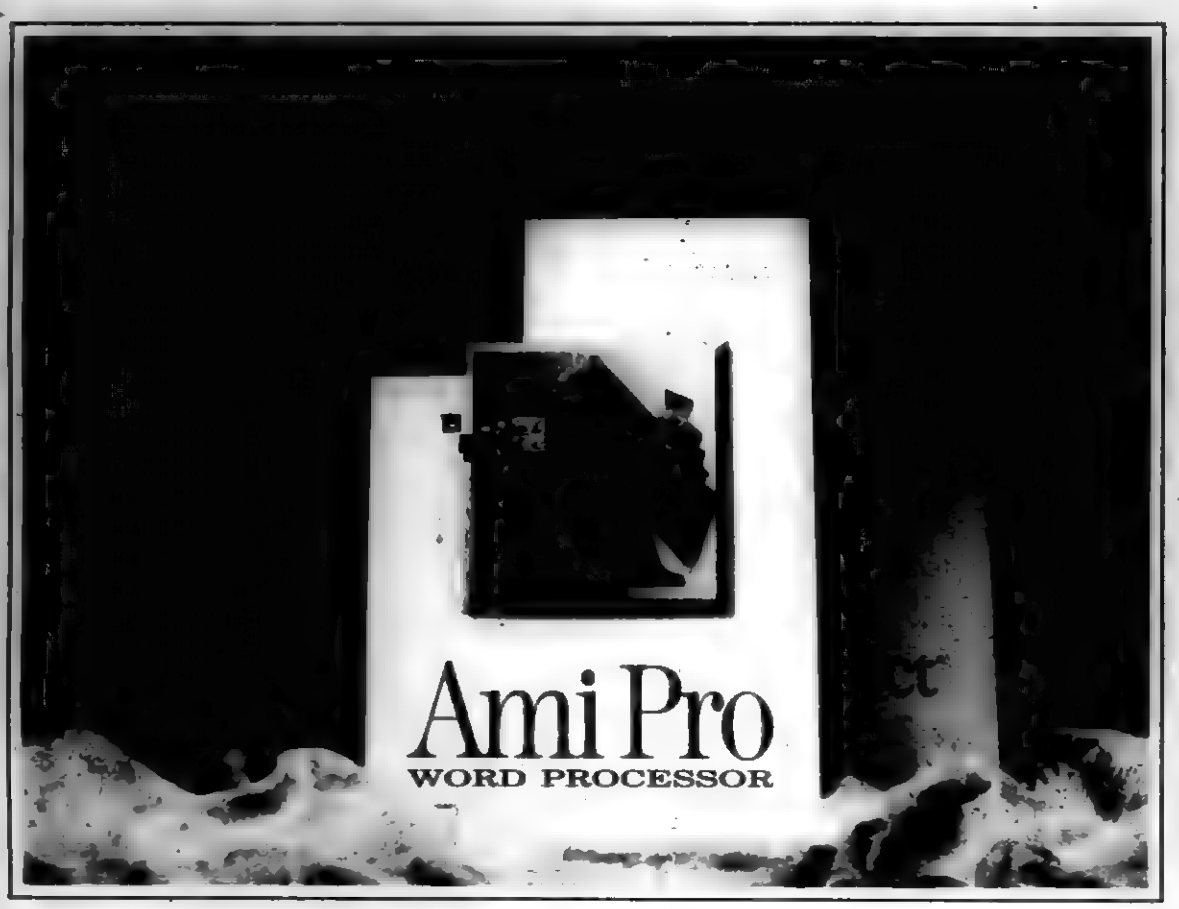


Tape libraries

About 700 midrange tape libraries will ship this year, vs. approximately 2,000 mainframe units, according to consulting firm Freeman Associates in Santa Barbara, Calif.

There's quite a battle raging between Word and WordPerfect.

For seco



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PC Magazine recently named Ami Pro one of the Best Products of 1992. They said, "No other product can match...the sheer pleasure of using it." Microsoft Word received an Honorable Mention, with the comment "...it's a step behind Ami Pro." (1/93)

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†Among all word processors tested. Software Digest, Ratings Report, Vol. 9, #6, Sept. 1992. Reprints available upon request. *On weekdays, plus 7AM to 4PM on Saturdays. **Offer expires 9/30/93. Call for

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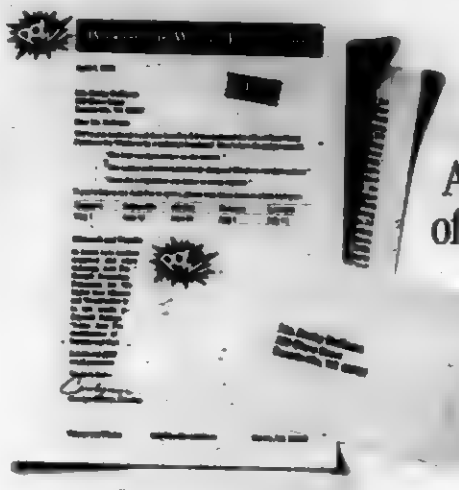

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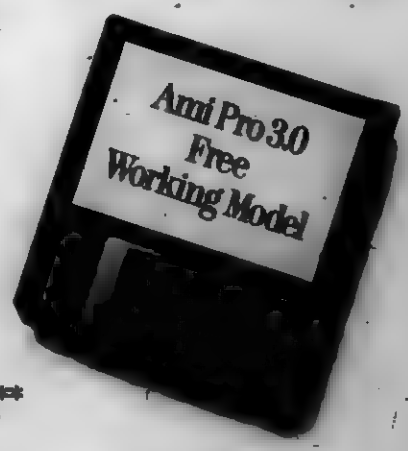

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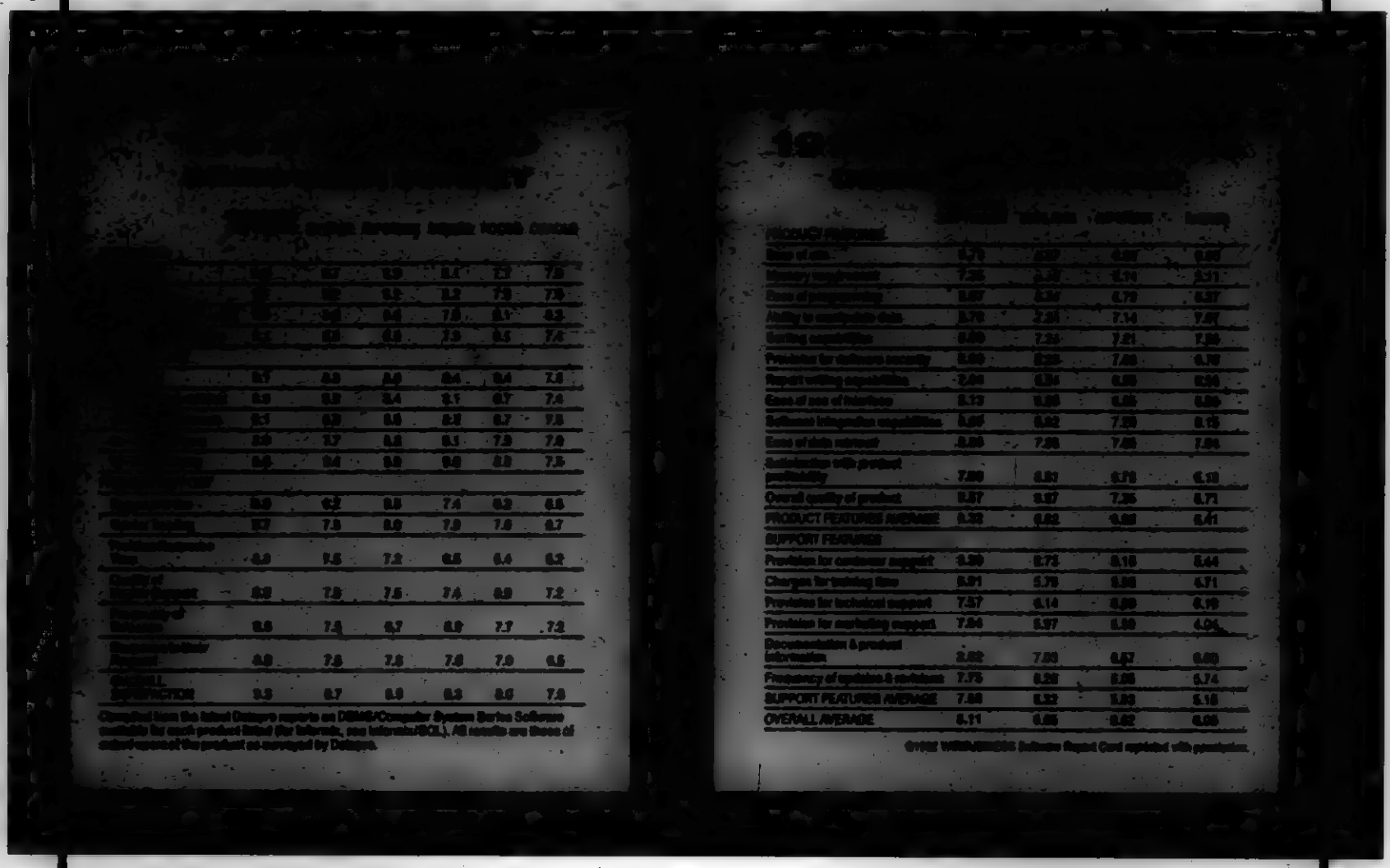

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CPWADV0329

Client/server

Hot development tools not replacing CASE yet

By Kim S. Nash
SAN FRANCISCO

■ Few integrated computer-aided software engineering (CASE) vendors have kept pace with the latest and greatest in object-oriented and other so-called client/server development products. But that does not mean information systems shops should toss out traditional tools altogether in favor of products from new kids like Powersoft Corp. or Gupta Technologies, Inc.

To be sure, traditional CASE workbenches from the likes of KnowledgeWare, Inc. and Texas Instruments, Inc. have a long way to go to match the ease of use and affordability of hot PC-based tools. But while hot properties such as Powersoft's PowerBuilder and Gupta's SQL family are super for departmental development efforts, they lack the scalability and management features necessary for enterprisewide projects, according to analysts.

Both camps have nice features missing from the other guy's tent, and until the two sides converge technologically, analysts said, users are best off using both kinds of tools — although for different purposes.

"You don't want to dump I-CASE, but you want to use what's in your repository for client/server development," said Peggy Ledvina, program director of application development strategies at Meta Group, Inc. in Westport, Conn.

In broad strokes, analysts said the biggest feature missing from CASE is object-oriented technology. As much as CASE tools may automate some stages of software development, generating applications is still not as quick as using object-oriented programming.

CASE also lacks strong PC modules. Many CASE workbenches have moved from mainframes to IBM OS/2 workstations and servers, and some have even landed on DOS-based PCs; but by and large, these ports are not as easy to use as tools built specifically for PC users, Ledvina said.

On the other hand, newer client/server products do not support structured methodologies to help developers plan, monitor and assess large development projects. The products also lack an organized way to maintain programs once they are built, according to Geoffrey Barnes, head of the applications management practice at consulting firm Cap Gemini America in New York.

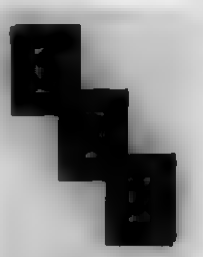
"Having a C++ compiler doesn't mean a whole lot without methodology, analysis and design support," agreed Ed Yourdon, author of several books on software development.

No example to follow

At the same time, existing structured CASE methodologies have had to scramble to keep up with changes in the way IS shops think. "I'm finding that people basically have no idea how to do client/server development. It's new, and the blueprints just aren't there," said Terrie McAllister-Rollins, an analyst at DMR Group, Inc. in Glendale, Calif.

For example, CASE methodologies provide few hooks to incorporate application development now common at the user level. "Power users go off and do a lot of their own application development at their PCs, and CASE methods don't know what to do with that work," said Pieter Mimno, an analyst at Technology Insight, Inc., a consultancy in Marblehead, Mass.

In fact, power users get partial credit for driving the client/server application development boom in the first place, Mimno said. "Without those people taking matters into their own hands, much of what we see today on the PC-based front wouldn't exist," he said.



Ed Yourdon, software development guru, offered these words of wisdom for IS shops developing new applications:

- **CASE may no longer be avant-garde, but it is still expensive, ranging between $30,000 and $60,000 per seat for a full life cycle integrated workbench.**
- **Plan large-scale development projects very carefully. The average lifespan of a chief information officer's job is two years, Yourdon said, so make sure you deliver tangible results regularly to top management to keep the project — and your job — alive.**

Some gaps filled

The two sides are beginning to plug technology holes to fulfill client/server requirements. For example, object-oriented methodologies are starting to emerge, such as guidelines from industry consortium Object Management Group. But these plans are immature and have not been adopted on a grand scale.

In lieu of a formal methodology for client/server development, project management tools — especially those supporting Microsoft Corp.'s Windows — are hot tickets, as demonstrated by the many such products that popped up at CASEWorld recently [CW, March 22]. These tools organize tasks and help project leaders gauge costs and deadlines.

Such decidedly unglamorous products are lacking in most of the new PC-based development environments, but they are absolutely necessary for large-scale development projects, Barnes said.

Meanwhile, TI and other CASE makers are counter-punching object-oriented vendors' reusability claims by offering templates, which are blueprints for entire applications that can be reused. Vertical industry consortia, too, are building templates to trade with one another.

However, analysts cautioned that the ground will not be fully solid for client/server development in either the CASE or the object-oriented area for another 18 months to two years. Until then, Ledvina and others recommended using PowerBuilder and its brethren for smaller, departmental applications and keeping CASE for enterprisewide development.

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Cincom extends AD/Advantage to DEC platforms

By Melinda-Carol Ballou
CINCINNATI

Cincom Systems, Inc. announced earlier this month that its AD/Advantage application development system is shipping for Digital Equipment Corp.'s VAX/OpenVMS and reduced instruction set computing-based Ultrix architectures.

AD/Advantage integrates computer-aided software engineering (CASE) tools, including KnowledgeWare, Inc.'s ADW and Intersolv, Inc.'s Excelerator. It provides a prototyping and refinement environment with a reusable code management system to automate development activities in each phase of the application life cycle, company officials said. This allows developers to analyze, design, build, generate, test, implement and maintain their applications. AD/Advantage also automates other activities such as project and resource management, documentation and change management, they added.

AD Advantage provides a prototyping environment with a reusable code management system to automate development in each phase of the application life cycle.

"We can generate [executable] applications from a variety of different sources of information and specifications. One such source is upper CASE tools," said Dennis Butler, director of application development technologies at Cincom.

AD/Advantage will also allow developers to generate SQL code to support any function of DEC's Rdb or Cincom's Supra databases directly from the database directories, Butler added. "This dramatically reduces development time but still gives users the flexibility to customize applications afterward."

Many platforms supported

These applications can be deployed on any platform supported by Cincom's Mantis application development language, which in addition to VMS and Ultrix includes DOS- and OS/2-based PCs, IBM mainframes, numerous Unix platforms and systems from Groupe Bull, Fujitsu Ltd., ICL Ltd. and NCR Corp., Butler said.

The architecture for AD/Advantage allows for easy integration both with DEC's Common Data Dictionary/Plus Repository and Cohesion environments and with IBM's Systems Application Architecture AD/Cycle framework, company officials said.

Separately, Cincom announced the availability of XpertRule, a knowledge-based system for easing the transfer of complex logic and business rules for integration into applications. XpertRule can be an add-on component for AD/Advantage.

XpertRule represents expert knowledge graphically, using learn-by-example techniques to automate its transfer to an application. Once rules are captured with XpertRule, the developer can automatically generate Mantis, Cobol, C or Pascal code, company officials said.

Data Analyzer, a stand-alone component of XpertRule, lets developers discover patterns and rules hidden in corporate data files and captures decision-making and performance rules.

AD/Advantage pricing starts at $5,900 for VMS and Ultrix. The system is also available on IBM's MVS and VSE platforms. It will ship on Siemens/Nixdorf Information Systems, Inc.'s BS/2000 platforms as well as other Unix and PC environments, including Microsoft Corp.'s Windows NT this year.

DEC's Alpha architecture will also be supported on OpenVMS, OSF/1 and Windows NT.

XpertRule and Data Analyzer are both priced at $10,000.

Cincom also anounced lower pricing and user-based pricing for its Control Manufacturing System. It will announce its distributed database with multimedia and object support in May.

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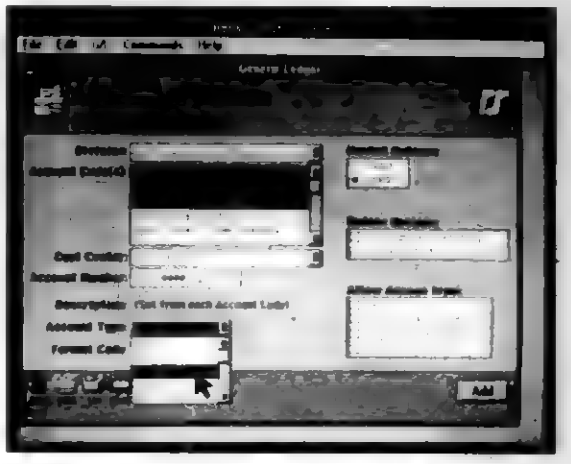

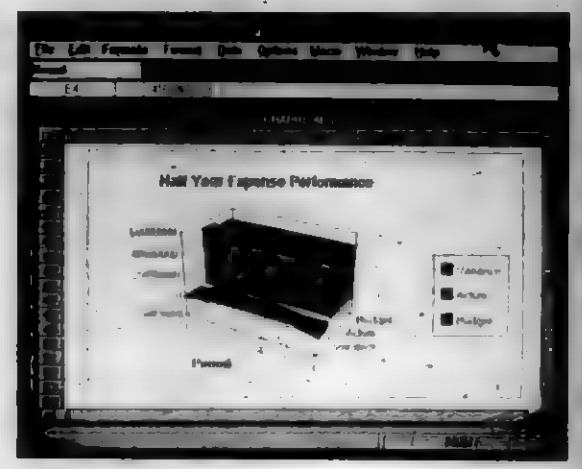

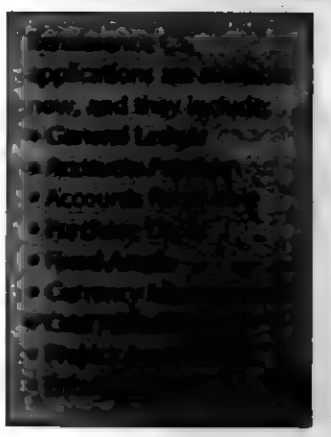

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Application development tools

Magus has introduced Magus View, a PostScript language-rendering library.

According to the company, the product is a Dynamic Link Library that lets users create programs for Adobe Systems, Inc. PostScript images either on-screen or as printed output. All standard PostScript display functions are supported, such as standard vector graphics, clipping functions and vector and bit-mappped fonts.

Developer kit prices start at $495.

▶ *Magus*
2071 Plymouth St.
Mountain View, Calif. 94039
(415) 940-1109

Information Builders, Inc. has announced Release 6.5 of Focus for OpenVMS, a fourth-generation language for report writing and application development.

Two major features are Shared Image Applications that increase the product's data management application performance and a facility called Stylesheet that lets users create customized, operational reports using Adobe Systems, Inc.'s PostScript functionality.

Enhanced reporting as well as features that enable users to perform such functions as minimize locking and database I/O when accessing relational databases are provided.

Prices range from $3,200 to $194,000.

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1250 Broadway
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Languages

Natural Language, Inc. has announced Natural Language for Microsoft Corp. Windows.

Under Dynamic Data Exchange, direct file transfer is provided for Lotus Development Corp.'s 1-2-3 and Microsoft's Excel. Text transfer is made possible via the Clipboard to word processors and other applications, according to the company.

Natural Language for Windows supports a number of formats including ASCII. It runs on an Intel Corp. 80386 or 1486 CPU. Other requirements include 8M bytes of physical memory, 15M bytes of free disk space and 15M bytes of permanent swap space.

The product is now available for Oracle Corp.'s and Sybase, Inc.'s relational database management systems.

A runtime client version of the product costs $595.

▶ *Natural Language*
2910 Seventh St.
Berkeley, Calif. 94710
(510) 841-3500

Compilers

Symantec Corp. has introduced the Zortech C++ compiler.

The product was designed for Microsoft Corp. Windows NT and is being offered as part of an early program that tracks the development of the new operating system.

The compiler supports Microsoft's preliminary Win32 Software Developer's Kit (SDK), providing users with free updates as the operating system is refined, full documentation and a finished product to support the final release of the Win32 SDK, the company said.

Full AT&T C++ 3.0 and ANSI C support is provided. Zortech C++ conforms to the IEEE-754 floating-point standards.

The Windows NT Early Developers program costs $499 for new users and $249 for registered users of any Zortech C++ compiler.

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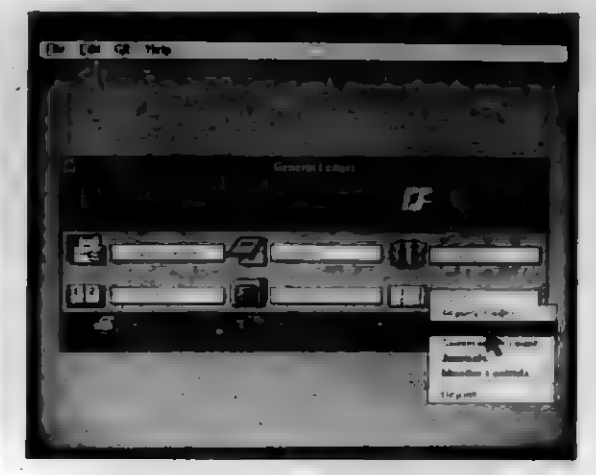

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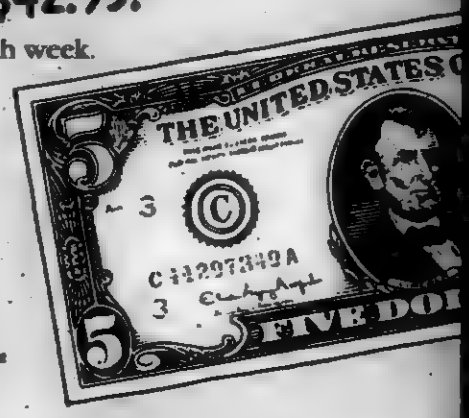

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Candy from STRANGERS

Straight talk and a focus on service will help convince end users that letting you manage their distributed LANs is a sweet deal

By Michele Dostert

As corporations move to reorder the chaotic aftermath of the local-area network revolution, information systems managers charged with the task are discovering they need to speak softly and carry a big *shtick*.

Instead of donning an iron glove, the savviest IS managers are adopting new, more subtle tactics in hopes of slashing spiraling network management costs and protecting sensitive LAN-based data.

According to IS managers who have recently taken over departmental LANs, careful planning, clear communication and attention to the needs of disenfranchised users can greatly diminish possible strife and produce huge gains for corporations.

The new approach seems promising. "We're starting to see order come out of chaos," says Stan Schatt, a LAN analyst at Computer Intelligence/Infocorp, a Santa Clara, Calif., research firm.

More and more departmental and workgroup LANs, Schatt says, are being taken over by IS groups. "But," he warns, "IS has to move gently when it takes control."

So how do you gently restore order to a crazy web of departmental LANs? IS managers who have fought the battle share some of their tactics below:

•Structure IS to maximize teamwork. Because few workers are experts in all LAN areas, troubleshooting requires teamwork and constant communication among support personnel. Experienced hands say the organization must be set up to foster this teamwork.

"A traditional IS structure just doesn't work in a networked computing environment," says Steve Hemelstrand, communications services manager at Affiliated Banks Service Co. in Thornton, Colo. "We have to reorganize and work as a team, or there will be lots of finger-pointing — and downtime."

Companies that can't set up a framework for partnership are doomed, experts say. That's because LANs — unlike mainframe-based systems, where problems can be neatly labeled as communication, system or application faults — are hard to classify.

So what looks like a simple application error may be traced to any number of causes, from the desktop hardware to a handful of network cards to the network operating systems.

"To be successful," concludes Dean Crutchfield, network manager at Welchem, Inc., a Houston chemical manufacturer, "you need a centralized team support effort, where people who know one area of the LAN very well cooperate with others to pin down problems."

•Sell department heads on your services. Business managers will more readily surrender control of their computing environments, according to experienced IS managers, if they know they will get more productive departments in return.

Mike Blackman, assistant vice president at Baltimore's Maryland National Bank, says centralizing his company's LANs will let businesspeople focus on their work instead of worrying about their LANs.

His staff is launching a major LAN centralization project to provide single-point support for its 1,000 LAN users. To do so, he sold line

Candy from strangers, *page 92*

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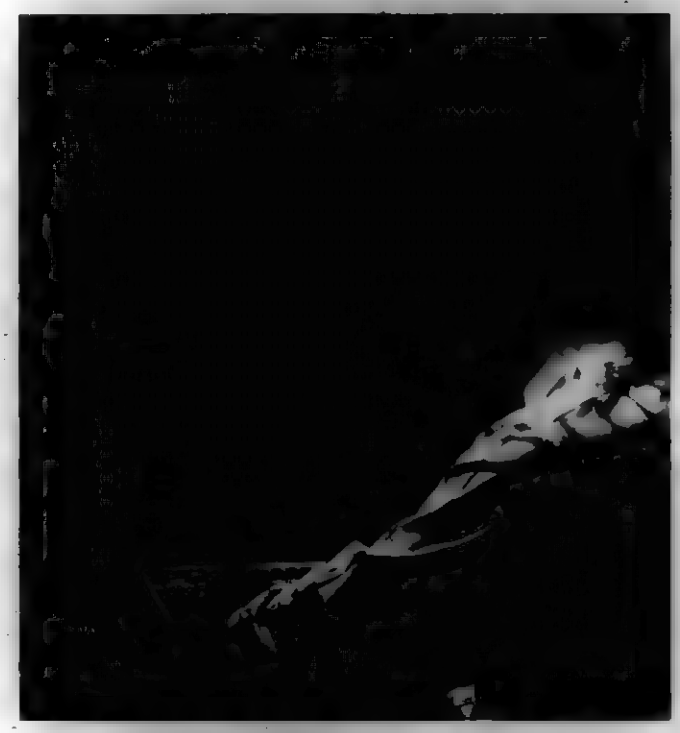

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Candy from strangers

CONTINUED FROM PAGE 89

management on the idea that centralized support would bump up productivity.

"We showed our department heads that centralized support will be better support, which makes for better-resource utilization and better end-user productivity," he says.

•Minimize user resistance.
Once IS has executive buy-in for taking control of LANs, the next big task is to handle opposition to the impending move.

IS managers and analysts say IS-based LAN support teams must keep in constant touch with LAN users. A little psychology can help here: The local power user who stubbornly clings to his custom-programmed spreadsheet, for example, is more likely to give it up if he's first been able to extol its virtues in meetings with the IS staff. Similarly, users must understand that standardized, stable, easily supportable networks make their own jobs easier — not just IS LAN managers'.

If a user suspects that IS won't support his beloved Next, Inc. workstation out of sheer sloth, he will probably cling to that black box with tooth and nail, analysts say.

Even when most of the user population embraces centralized support, the task isn't over.

"Of our sites, I'd say 10% are stubbornly determined to retain local management and control," says Larry Quinlan, who manages LANs at the Nashville offices of Deloitte & Touche.

"Another 25% would like a little more local control but don't think it would be worth the aggravation to do their own management," Quinlan says. "The remaining 65% are absolutely thrilled to have our central LAN group managing their LANs."

•Don't be a know-it-all.
IS staffs that listen to user requirements and suggestions with an open mind may discover that departmental solutions may in fact be the best fix for a specific problem.

Mike Wenger, director of MIS planning and operations at Rayovac Corp. in Madison, Wis., says learning to listen to users has given his staff a new role.

"Our position has changed to be more of a technical facilitator rather than the 'keepers of mysteries.' Our LAN support personnel work as a team with the users; we don't make decisions in a vacuum," he says.

For example, Wenger's staff now meets regularly with users to assess how IS can best meet departmental needs.

•Be flexible and self-critical.
IS staffs must also subject themselves and their standards to constant scrutiny. Old hands warn against stepping over the fine line between control and rigidity that caused LANs to flourish in the first place.

"You have to really commit to being a source of solutions, not problems, for your users," Wenger emphasizes.

Because many LANs have been configured and optimized for specific departmental needs, IS managers must be flexible about the type and degree of LAN control that will remain in local departments.

Hard and fast rules may make planning easier for IS, but they may not fit the way your company does business. For example, Ron Rosen, manager of LAN support and planning at American Express Co.'s headquarters in New York, has worked out a sliding-scale level of support for his departmental LANs.

"The level of central management of our LANs depends on the skills of the local support person; we think we get the best overall support that way," Rosen says.

According to Rosen, departments in Amex's headquarters that have knowledgeable support staff are supported by IS on major problems but handle their own routine network management.

•Train your people.
Network managers agree: An approachable and competent IS staff is the key to a smooth transition between locally and centrally managed LANs.

Users who give up control of their computing destiny only to find that the network crashes more often under IS management will be furious — and rightly so.

"Remember, IS is a service provider to the company, the same as an outside janitorial or auditing firm is," says Craig Anderson, director of MIS at Lutheran Brotherhood Fund, Inc., a Minneapolis-based insurance company that runs on a centrally managed LAN platform.

"If you don't provide good service, they'll either do it themselves or replace you with someone who will." •

LAN facts

According to Forrester Research, Inc., the biggest frustrations in managing a LAN are the following:
- Lack of centralized management.
- Too many disjointed products.
- No updated map or inventory.
- Difficult troubleshooting.
- Inability to reach isolated LANs.
- Problems with network products.

Annual corporate network support costs run about $1,270 per user. Of that, 58% goes to LAN administration, 22% for physical LAN support, 9% for LAN internetwork support, 8% for the help desk and 3% for LAN outer network support, according to Forrester Research.

Re-engineering projects: Up, up and away

Payoffs lag, but number of projects doubles

By Rosemary Cafasso

▶ Although most chief information officers involved in re-engineering projects say results are lagging behind expectations, the average company has more than doubled its number of re-engineering projects in the last year.

These and other findings were reported earlier this month in the Fifth Annual Survey of North American CIOs by Deloitte & Touche, which polled 500 executives in various industries.

In general, CIOs are finding that their re-engineering projects are falling short of key goals such as improved customer service, reduced costs, increased quality and process timeliness. Jeff Plewa, a partner at Deloitte & Touche, speculated that many projects may not be measuring up because they were not based on a strategy that employs genuine re-engineering principles.

Profitable firms prosper
A classic re-engineering effort involves radical change to every major piece of a business process and delivers dramatic results. Plewa said top-down commitment and cross-functional involvement are also key to a project's success.

"I think there is a tendency to call any sort of restructuring or cost-cutting effort re-engineering," Plewa said.

The study also showed that the most profitable companies tend to get the greatest number of benefits, while struggling companies report the least success in meeting goals.

"The least profitable expect the most [from re-engineering], and I think they are just searching for an answer," Plewa said.

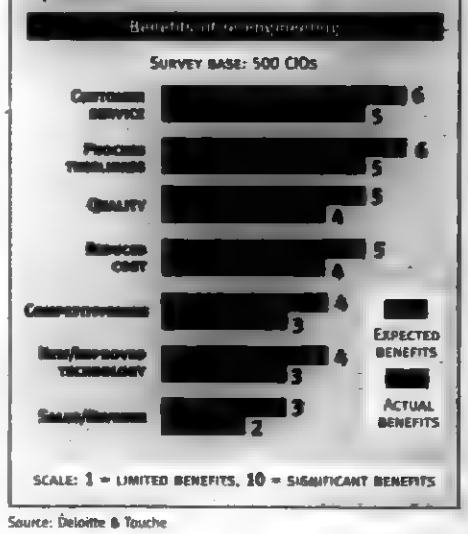
And why, then, are healthy companies reaping bigger benefits? "It's kind of like asking the question, 'Why are profitable companies profitable?' " Plewa said. "On average, they do things better."

While the consulting firm heralded the enormous increase in re-engineering projects — overall, a 175% boost from 1991 — it also noted in its report that "some of the increase may be attributable to the habit of applying the re-engineering label to any business improvement project."

Deloitte & Touche said that even though the total may include an assortment of business projects, the results showed that at the very least, most businesses are seriously rethinking their current ways of doing business.

Overreaching expectations

In spite of the increased popularity of business re-engineering, CIOs report that the actual benefits of re-engineering projects have fallen short of expectations



Source: Deloitte & Touche

CIOs in manufacturing reported the most re-engineering projects, an average of 5.5 per respondent. Financial services reported the fewest, with only 1.3 per respondent.

Close link to rightsizing

By Neil Margolis

▶ Re-engineering has moved past buzzword to a top information systems issue for IS executives. So say a spate of survey statistics from leading market research and consulting firms in recent months — among them, International Data Corp. (IDC).

When IDC released its annual Global Information Technology Survey earlier this month, perhaps the most striking finding was between the lines. "Rightsizing — which means retooling and redesigning information systems and support structures to meet new business needs — is the appropriate model for IS management today," said Frank Gens, vice president of IDC subsidiary Technology Investment Strategies Corp. "And this re-engineering of the IS organization is being driven by business process re-engineering on the part of user companies."

The survey, which pooled information from IS and corporate executives of some 7,000 large users in the U.S., UK, Germany, France, Italy and Japan, found the following:

- 35% said they were aggressively pursuing downsizing strategies; an additional 19% reported that they were mulling the option.
- Approximately 50% of the surveyed customers have a move to client/server under way or on the drawing board.
- 79% of the surveyed chief executive officers ranked information technology as a significant source of competitive advantage or a steady contributor to the firm's operational clout.

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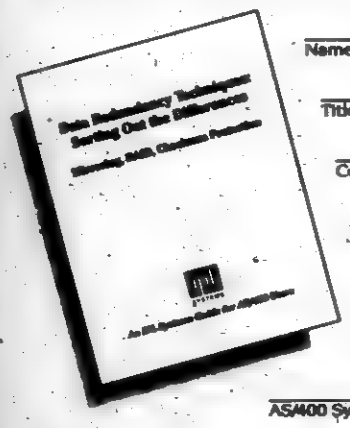

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Les Gilliam

Time for IS to give up on keeping up

There's an old country and western song called "Keeping up with the Joneses" that reminds me of the current client/server fever in the IS kingdom.

In the song, the singer spins the woes of trying to keep up with the next-door neighbors. The effort eventually lands him and his wife in divorce court, along with the Jones couple. While looking across the courtroom, he states, "I sure wish the Joneses would cry."

Work with what you have

There are a lot of sad-faced IS directors wishing both their staff and users would stop chasing every new product on the market and learn to property apply the tools they already have. Just because someone else is doing it does not make it the right thing to do.

How many people do you know who are supposed to be IS service providers but spend more time reading magazines and talking to vendors and their buddies about new products than solving business problems?

If that sounds familiar, maybe it's time to ask a few more questions: Does IS management need to be reminded that its basic responsibility is to solve business problems in the most cost-effective manner using the best tools available? How can that message be transmitted to the users? Does changing tools with every new moon make sense?

How long does it take to recoup the investment of time and money for evaluation, selection, acquisition, installation, training and the infamous learning curve before ever realizing one iota of benefit in the way of business solutions?

Hero or villain?

Take the current client/server craze, for instance. Almost everyone seems to believe this technology holds the key to lower costs and improved productivity — and perhaps it does, in time. But installing the company phone book on a LAN is a lot easier than moving the corporate accounting system off the mainframe to a server.

So wait a minute: Isn't a server just another processor? Many firms are now replacing groups of servers with superservers. If you replace a group of superservers with a larger processor, what do you have? That's right, a mainframe.

It took us 30 years to figure out how to use and manage mainframe hardware and software technology so as to achieve stability and quality. Should all these proven practices be ignored just because the chip is cheaper and faster than the tube or transistor? Of course not.

The wise IS manager will realize that the mainframe is just another server being phased out and replaced by lower cost processors as a result of improvements in technology. And this conversion will be difficult, time-consuming and expensive. Further, those time-proven mainframe-related practices that took years to develop should also be applied to this new client/server world.

Cold shoulder

What are some of the practices currently being ignored by many client/server zealots?

First of all, there's the fact that the flip side of the control for which users clamor is responsibility — which they do not necessarily want. Is there a clear understanding among IS and its users or customers as to the responsibilities each party will assume? Do the users who say they want to control their own computing universe fully realize all the tasks that time has proved necessary, such as security and asset protection?

Who is assuming the responsibility of determining the long-range business needs that justify the investment in user-based resources? And for how long will these resources be sufficient?

> How many people do you know who are supposed to be IS service providers but spend more time reading magazines and talking to vendors about new products than solving problems?

Client/server proponents also need to ask about tools, which are still in the fledgling stage in many areas of client/server.

Are the tools available to provide for full-scale development and maintenance of large, mission-critical applications from the desktop? Are there tools that can support normal computer operation functions, such as performance monitoring and measurement, capacity planning, data security, application scheduling and control, problem management and change control? Do the users even understand application development methodologies and why they are necessary? Who will handle production application scheduling and management, file backup and system recovery?

The right support

One of the subjects now causing the most conflict between IS and users in the client/server world is support.

Users don't think they will need much and don't want to pay for any. IS knows the users will need it — usually in an emergency — but won't pay for IS staffing and training so as to be ready with quality support when it is needed.

In the client/server environment, IS and users alike need to realize there is a difference between a video arcade and running a business and adopting some old habits that time has proved to be worthwhile.

Gilliam is president of Gilliam Associates, a computer management consulting firm in Ponca City, Okla.

User software testing takes to the road

By Christopher Lindquist

Smile: You're on user camera. Computer usability labs are hitting the road — with video cameras, no less — and testers are turning a thumbs-up on the results.

Increasingly, information systems managers interested in making their systems and applications more useful are sending testers to users instead of vice versa, which is the usual approach.

"When you get out to the user's environment, you see how they try to perform their tasks," says Don Ballman, manager of usability laboratories at Mead Data Central, Inc. in Dayton, Ohio, maker of the Lexis and Nexis information-retrieval systems. "When I bring somebody into my lab, that in itself creates an unnatural environment."

On site, says Janice James, manager of the usability lab at American Airlines in Dallas, "there are lots of variables that you have to be able to deal with that you wouldn't in the lab."

United Airlines has had a usability lab since 1989.

Usability experts say testing that includes such everyday interruptions as phone calls, visits by co-workers and the inevitable trip to the copy machine make for far more realistic — and useful — results.

Interest in usability has grown rapidly in recent years as companies struggle to ensure that costly software products actually be used.

Among those sold on the new approach is Kay Chalupnik, manager of the usability lab at IDS Financial Services, Inc. in Minneapolis. Chalupnik has performed some "real world" testing that she says illustrates the importance of testing products outside a lab.

One test involves Apple Computer, Inc. Macintosh and DOS laptop computers. User perceptions of the products, Chalupnik says, vary considerably between tests done in the lab, those done in a noisy office and "those performed outside in the rain while trying to balance the machine on a garbage can." Her conclusion: On-site testing provided the best overall perspective.

Advocates say there are several benefits to this new approach. One big plus, they say, is the relatively low start-up cost.

For about $5,000, according to Ballman, you can get started with a portable usability lab that includes an 8-mm handheld video recorder, an inexpensive portable LCD television and software to index videotapes. The whole "lab" can be easily transported to a user's environment in a large briefcase, he says.

Another plus: instant feedback. Because testing, recording and editing can be quickly done on-site, important feedback can be sent back to developers in a short time, reducing project time.

On-site video can often yield better quality information than standard lab testing or question-and-answer approaches, boosters say.

For starters, handheld cameras tend to be far less threatening to users than a lab, Ballman says. (Users often feel inhibited about giving negative information in an artificial surrounding, he explains.)

Using a video camera, a tester can engage in a real dialogue with the user, which can often produce far more detailed information. Plus, videotapes can be played back on the spot, so users can add comments that might not have occurred to them during the first round.

Vendors also like

Portable usability testing has also caught on among commercial vendors of computer products. Microsoft Corp.'s Desktop Applications Division in Redmond, Wash., has been conducting field software testing for some time, says David Malcolm, product manager.

Malcolm says the plan works this way: Microsoft employees lie in wait at software resellers. They then approach purchasers of Microsoft products and ask if they can watch the customer install and use the product in question.

Such "follow me home" tests, according to Malcolm, let Microsoft see products being used in a more realistic environment than the lab can provide.

Don't close the lab yet

While portability is a helpful twist on the road to making software useful, testers agree it does not make traditional labs obsolete.

For example, traditional usability labs can help focus attention on the problem being studied and help create reproduceable hard data much easier than in the unstructured "real world."

Even so, backers say using video certainly has helped improve the quality of data. "I think that creates a more relaxed environment," James says. "It's real life."

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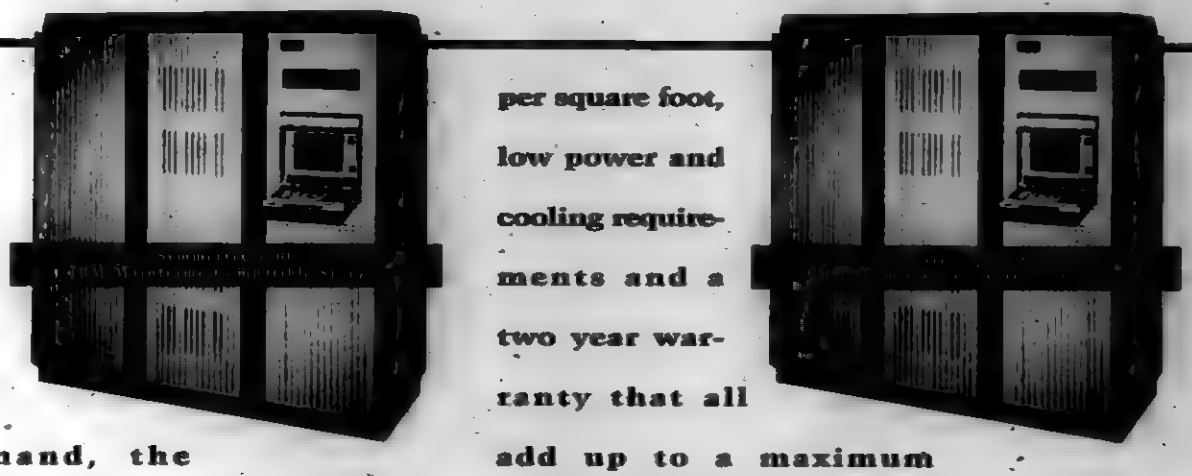

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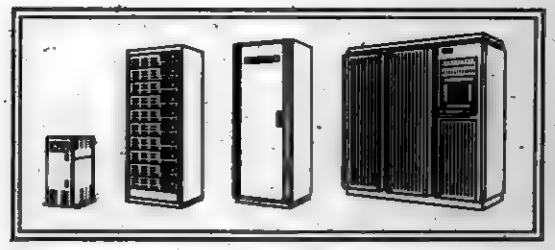

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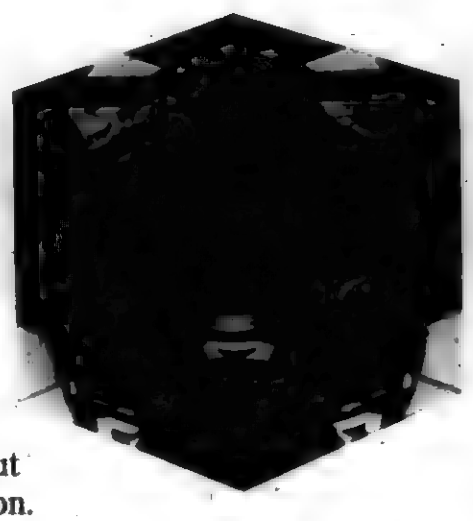

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Executive Track

Robert J. Funk, former vice president and chief operating officer of Swindon, England-based **Galileo Distribution Systems**, is the new vice president of technology and information services at **Rosenbluth International**, a travel management company based in Philadelphia.

Funk, who also served as director of **Covia Partnership**'s Apollo Customer Support Center in Atlanta, will manage Rosenbluth's information systems operations, including development of technology-based products. He will also oversee the firm's relationship with its computer reservation systems vendors.

The board of directors of White Plains, N.Y.-based **AGS Computers, Inc.** earlier this month elected **Pierre M. Vallee** as president and chief executive officer of the firm's **AGS Information Services, Inc.** operating unit.

Vallee, a seasoned consultant and executive who most recently directed the Cooperative Education Program at Canada's **Dalhousie University**, succeeds 25-year IS veteran **Anthony F. Stepanski**, who will retire April 1.

In the consultants-on-the-move department, banking specialist **Diogo Teixeira** has added "entrepreneur" to his list of credentials. The former principal at **Ernst & Young**'s Boston-based Center for Information Technology and Strategy is now heading his own firm, **The Tower Group**. Based in Dover, Mass., the fledgling consultancy will target its services at the financial sector.

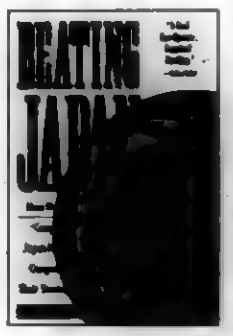
As of midmonth, Milwaukee-based banking software specialist **M&I Data Services, Inc.** has a new president and chief operating officer: **Joseph Delgadillo**. Formerly M&I Data's vice president of financial services, Delgadillo succeeds **Dennis Kuester**, who continues to serve as chairman of the board.

David J. States has been named director of the **Institute for Biomedical Computing** at Washington University in St. Louis. At his new post, States, who formerly served as a senior staff fellow at the **National Library of Medicine**'s National Center for Biotechnology Information, will oversee expansion of the university's network communication systems.

Intelligence Files

Taking back power

While Japan keeps rolling in the worldwide economy, quiet insurrections are being fought — and won — by American businesses intent on taking back their turf. *Beating Japan — How hundreds of American companies are beating Japan now — and what your company can learn from their struggles and successes* takes a look at what companies can do to steal a little glory and revenue from the Land of the Rising Sun. Technology can play a vital role, particularly when it comes to decentralizing the organization.



The book provides a how-to guide to setting up your corporation for competition, complete with small modular quick hits that are set up as action items and danger signs.

For example: Action item: Locate all activities near your customers — corporate headquarters, factories, laboratories and sales offices should be across the street from key customers.

Beating Japan also spends time dissecting Japan's strengths and weaknesses, allowing competition to better target their market.

Source: *Beating Japan*,' Francis McInerney, Sean White, authors. Truman Talley Books/Dutton, New York. $25.

Ready to battle

Size, friendly government policies, world-class manufacturing, a strong position in desktop markets, excellent software, top design and innovative skills — none of these, it seems, is sufficient, either by itself or in combination, to ensure competitive success in the computer field.

A new paradigm is required to explain patterns of competitive success and failure in information technology.

Simply stated, competitive success flows to the company that manages to establish proprietary architectural control over a broad, fast-moving, competitive space.

Source: *Harvard Business Review*, March/April 1993, Charles R. Morris, Charles H. Ferguson, authors.

Calendar

APRIL 11-APRIL 17

Software Performance Engineering. Santa Fe, N.M., April 13-16 — Contact: L&S Computer Technology, Inc., Austin, Texas (505) 988-3811.

Electronic Data Interchange. San Antonio, April 14-16 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

International Conference and Exhibition on Multichip Modules. Denver, April 14-16 — International Society for Hybrid Microelectronics, Reston, Va. (703) 471-0066.

Society for Information Management 1993 Institutional Member Conference. Rancho Mirage, Calif., April 14-16 — Contact: Society for Information Management, Chicago, Ill. (312) 644-6610.

Virtual Voice and Data Networks III. Washington, D.C., April 15-16 — Contact: Telecommunications Reports, Washington, D.C. (202) 842-3022.

APRIL 18-APRIL 24

The Fifth Annual Data Administration Management Association International Symposium (DAMA). Boston, April 18-21 — Contact: DAMA International Symposium, Boston, Mass., (508) 987-7132.

Patricia Seybold Group Spring 1993 Conference. Boston, April 18-23 — Contact: Deborah Hay, Patricia Seybold Group, Boston, Mass. (617) 742-5200.

Supercomm '93. Atlanta, April 19-22 — Contact: Telecommunications Industry Association, Washington, D.C. (202) 457-4912.

APRIL 25-MAY 1

Xplor International's Vendor Interaction Symposium Information Opportunity Networking '93. Denver, April 25-28 — Contact: Xplor International, Palos Verdes, Calif. (310) 373-3633.

Marketing the IS Organization Internally. Philadelphia, April 26-27 — Contact Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

The Sofkool User Group. Santa Barbara, Calif., April 26-28 — Contact: Sofkool Corp., Goleta, Calif. (805) 683-5777.

National Computer Graphics Association (NCGA). Philadelphia, April 26-29 Contact: NCGA, Fairfax, Va. (703) 698-9600.

Third Sourcing Interest Group (SIG) Conference. Chicago, April 27-28 — Contact: SIG, Sherman Oaks, Calif. (818) 784-7755.

Distribution/Computer Expo '93 — Exhibit and Seminar. Chicago, April 27-29 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 458-8926.

Incotek '93. Warsaw, April 27-30 — Contact: Global Technologies, Inc., Washington, D.C. (202) 797-3782.

MAY 2-MAY 8

Information Systems Audit, Control and Security Conference. Lake Buena Vista, Fla., May 2-7 —Contact: The EDP Association, Rolling Meadows, Ill. (708) 255-1545.

The Workflow Conference on Business Technology. Boston, May 3-5 — Contact: The Workflow Institute, Alameda, Calif. (510) 769-0927.

LotusWorld '93. Boston, May 3-6 — Contact: Daniell & Keefe Associates, Sudbury, Mass. (508) 443-3330.

DB/Expo '93. San Francisco, May 3-7 — Contact: NDN Enterprises, Inc., Mountain View, Calif. (415) 968-8440.

James Martin World Seminar. Boston, May 3-7 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Dev Con '93. Costa Mesa, Calif., May 4-6 — Contact: Frasson, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

The National On-line Meeting. New York, May 4-6 — Contact: Carol Nissa, Learned Information, Inc., Medford, N.J. (609) 654-6266.

Unix Reseller Show and Conference. Dallas, May 4-6 — Contact: Expocomm International, Inc., Princeton, N.J. (609) 987-8400.

Process for Using Quantitative Data to Manage Information Technology Projects and Activities. San Diego, May 6-7 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

MAY 9-MAY 15

Advanced Topics in DBs. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1266.

Eastern Communications Forum (ECF). Washington, D.C., May 10-12 — Contact: ECF, Chicago (312) 938-3500.

Micro Focus Users Conference. Orlando, Fla., May 10-12 — Contact: A&R Partners, Redwood City, Calif. (415) 363-0982.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles (310) 825-1679.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

MAY 16-MAY 22

ICA CamNet Dallas '93. Dallas, May 16-20 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Wireless DataComm '93 Exposition and Conference. San Jose, Calif., May 18-20 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Annual 1993 Midwest Computer Show. Rosemont, Ill., May 19-21 — Contact: Illinois CPA Society Foundation, Chicago, Ill. (312) 993-0393.

Virtual Reality Conference and Exhibition. San Jose, Calif., May 19-21 — Contact: Meckler Managing Information Technology, Westport, Conn. (203) 226-6967.

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The Newspaper of Information Systems Management

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The SECRET of their SUCCESS

Three award-winning organizations prove you can bring IS to bear on business — with spectacular results

▲ **Robert D. Lynch (center)** *led a multidisciplinary team of IS and publishing managers to create a custom electronic publishing system*

By Julia King

Don't let anyone tell you that aligning information systems and business is an impossible task. Tough, sure. Impossible, never.

Just ask McGraw-Hill, Inc., The Chase Manhattan Bank NA or Boston College, three organizations that spent the last few years proving that IS and business can come together. These organizations succeeded in creating a new market (McGraw-Hill), enlightening decision makers (Chase Manhattan) and putting key information at users' fingertips (Boston College).

Here are their stories:

McGraw-Hill, Inc.

Technology: Primis, an electronic publishing system.

IS/business alignment: McGraw-Hill practically invented the market of customized books using database technology and a just-in-time electronic publishing system.

Declining sales. Those are the two most dreaded words in the English language for any self-respecting businessperson. But those are the words that Robert D. Lynch, a vice president and editor at McGraw-Hill in New York, was hearing in 1988. Several years of stiff competition from the used book market and a rise in the use of customized texts were eating into McGraw-Hill's profits.

Customers were dissatisfied with the publisher's traditional line of college accounting texts and were taking matters into their own hands. Accounting professors — Lynch's largest customer segment — were passing up McGraw-Hill's textbooks in favor of developing their own course materials. These were usually composed of selected chapters from texts, supplemented with newspaper and magazine articles and educators' own research.

Recognizing a new market opportunity and a way to reverse the downward sales, Lynch proposed to management an idea for developing customized books using an electronic database of publications then under development at McGraw-Hill. A year later, the New York company launched Primis, its proprietary custom electronic publishing system.

Today, colleges nationwide use Primis to mix and match materials from a broad array of sources covering multiple disciplines to create unique texts available within 72 hours of ordering. The texts cost about the same as traditional books.

Developed by a team led by Lynch and including staff from McGraw-Hill's IS and corporate manufacturing departments, Primis is made up of McGraw-Hill's database, which now contains more than 70,000 pages of text, and Unix-based software that IS developed in conjunction with Eastman Kodak Co.

Primis software runs on Sun Microsystems, Inc. workstations, with custom texts printed at a rate of 92 page/min. on high-

Success secrets, *page 100*

In November, managers at McGraw-Hill, Chase Manhattan and Boston College were named winners of Awards for Achievement in Managing Information Technology. The awards, co-sponsored by Arlington, Va.-based American Management Systems and the Graduate School of Industrial Management at Pittsburgh's Carnegie Mellon University, recognize professionals "for outstanding contributions to their organizations and industries through the exceptionally effective use of information technology."

King is a free-lance writer based in Ridley Park, Pa.

Success secrets

CONTINUED FROM PAGE 99

speed Kodak printers at a centralized printing facility. Primis systems can also be licensed or purchased by universities to create on-campus custom publication centers, such as the one set up by the University of California at San Diego, where professors have begun adding their own materials to the Primis database. The total cost of the system is about $200,000.

On the administrative side, the publishing system is tied into new order entry, credit check and royalty payment systems, all of which were developed by in-house IS personnel to create a seamless electronic path from order entry through delivery. This system enabled the publisher to set up a just-in-time manufacturing process.

Developing Primis was relatively cheap. Specific cost information is proprietary, but costs "were too small to warrant inclusion on the company's profit-and-loss statement," Lynch says.

All costs were also up-front, onetime expenditures. That's because once text is digitized and put in the database, it can be reused at no additional cost. Bringing out updated versions of books in traditional book publishing, in contrast, is costly because of the labor involved in rewriting, editing and typesetting.

Because Primis is based on just-in-time manufacturing, there are no warehousing or handling costs.

"With a traditional book, a publisher always runs the risk of poor sales. If a book doesn't sell, there are inventory costs. But with Primis, there is no inventory, so we can go into new markets with a lower level of risk," Lynch says. "With Primis, we are selling into markets we couldn't sell into before."

Primis, according to McGraw-Hill Chairman and Chief Executive Officer Joseph Dionne, "revolutionized the publishing process."

Primis offers custom-made texts at typical textbook prices within 72 hours.

As an editor and product manager, Lynch says, he probably had an easier time than an IS person would have had selling the Primis idea to upper management. "From the very beginning, I had proof that the concept would sell in the marketplace because everywhere I looked, teachers were customizing materials for their classes," he says.

Also, because Primis came from the editorial side, "all of the business issues were addressed early on," Lynch says. "We could lay out for management how we were going to sell it."

His advice to IS managers looking to implement any new project is "to make sure it makes sense from a customer's point of view. Make sure that somebody is going to buy it."

The Chase Manhattan Bank NA

Technology: Chase Information Exchange (CIX), a news-retrieval system.

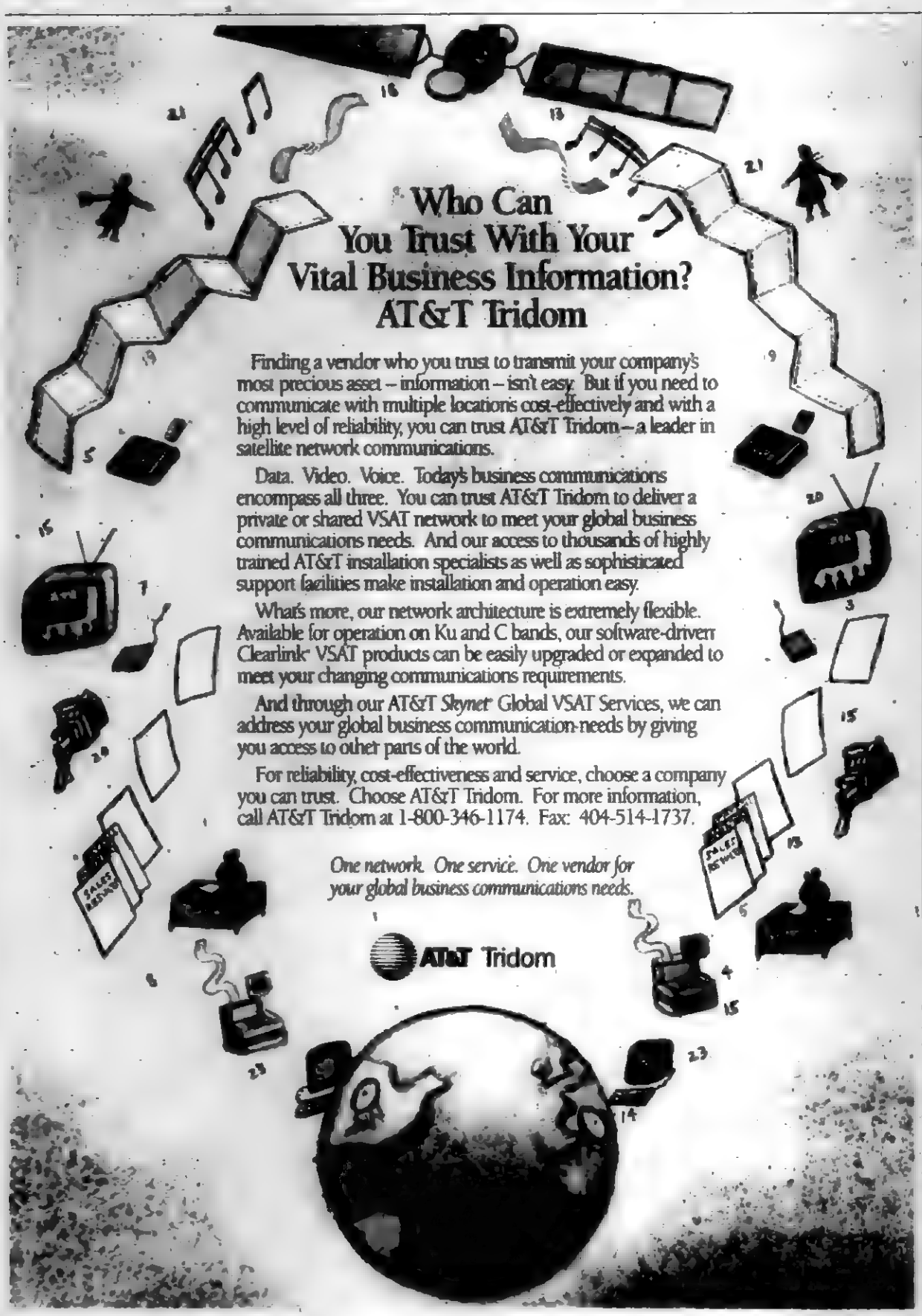
IS/business alignment: CIX gives Chase Manhattan bankers desktop access, through a local-area network, to corporate data and on-line news for better decision-making.

Chase Manhattan's 1,100 New York investment bankers used to spend hours scanning dozens of day-old newsletters and other business publications for company and financial information that could lead them to new clients. But all too often, the competition was beating the $97 billion financial institution to the table to make deals.

To remedy the situation, Chase Manhattan Chief Information Officer Craig Goldman proposed an on-line information news-retrieval system, which is part of CIX, a $1.8 million Novell, Inc. LAN-based electronic highway that links Chase Manhattan facilities worldwide.

The on-line news-retrieval component of the network links Chase Manhattan dealmakers via PC with corporate data and breaking news from more than 70 on-line sources. It also provides them with real-time analysis of events, ranging from a downturn in gold prices to the outbreak of a civil war — information that could impact an investment decision.

Additionally, CIX furnishes all Chase Manhattan employees at its New York headquarters with network access to a kit of standardized office tools, including electronic mail, Lotus Development



Corp.'s 1-2-3 spreadsheet and WordPerfect Corp.'s namesake word processor, which replaced the dozen or so different word processing packages in use prior to the LAN's implementation in 1987. Standardized tools worked to create consistency across all applications.

What is particularly noteworthy about the network's on-line news-retrieval system is that it was designed and implemented during a five-month period, between May and September 1988.

"We deliberately set tight time frames to overcome the sense that these things take forever," Goldman explains. Faced with declining revenue in an ever-tightening market, "we also needed to bring up these systems fast," he says.

Goldman's first challenge in setting up the news and analysis system was persuading information vendors to provide their largely paper-based data in electronic form. "We had to convince them that customers besides Chase would pay for the service," Goldman says.

"We were able to show them the revenue potential of furnishing information to multiple users rather than to a single printer," which was previously shared by Chase Manhattan staff, he says.

A second hurdle was overcoming what he describes as vendors' "paranoia" about providing electronic access to companies' financial information. Goldman says information providers were terrified of the potential loss of control and revenue as their information entered a worldwide network in which any terminal had the capability to access their data.

But Chase Manhattan's 20-member IS team overcame both barriers by developing use-tracking and billing methodologies, which worked to convince information providers that their data was protected from unauthorized use.

Chase Manhattan's IS team also went to work on an expert systems-based analysis system, which contains detailed models for measuring potential business risks associated with events such as a drop in a particular company's stock price or a freeze in Florida, which could adversely affect citrus crops as well as the businesses that depend on them. Dealmakers are alerted to these events via a built-in warning system that issues a beeping sound and/or flashes breaking news in a screen-based alert window.

Goldman says CIX has been instrumental in winning new business and bolstering customer service. He relays the case of an investment executive who was at his desk late one Friday when the system alerted the banker to what looked like a hostile takeover of a Chase Manhattan client company in California. The banker called the client, then assembled a team to fly to the West Coast for a weekend strategy session.

By Monday morning, the team had put together a package and worked out a satisfactory deal.

That incident was not an isolated one, according to Executive Vice President Mike Dacey, who heads Chase Manhattan's corporate finance and capital markets business in North America. "With CIX, it is not unusual at all for us to find out information on a given client before the company itself knows of the news," he says. "We can be on the phone with a solution before a VP of finance at a client company even knows they have a problem."

Since their inception four years ago, CIX and the on-line news system have been continually enhanced and expanded. Initially targeted to serve 1,100 employees in New York, the network now serves 4,000 Chase Manhattan employees worldwide.

"What started as a system for North America has grown to be our global infrastructure," Goldman notes. "Over time, we've also consistently added new capabilities, including Lotus' Notes, more information products and new models and analysis tools."

"We've gone from an information desert to a tropical forest," Dacey notes.

At the heart of the project's success is strong user involvement and support, Goldman says. Granted, at first banking executives new to PCs had to be "handheld and babysat" by in-house IS training groups. IS also confronted user resistance to standardizing on certain office applications, but in the end — thanks to a massive training effort — users came around, Goldman says.

Chase Manhattan CIO Craig Goldman: *'What started as a system for North America has grown to be our global infrastructure'*

Boston College

Technology: User Information System (UIS).
IS/business alignment: UIS provides users with direct access to administrative and other data through a Transmission Control Protocol/Internet Protocol (TCP/IP) network, saving time by cutting out the middleman.

Bernard W. Gleason Jr., Boston College's executive director of information technology, was in line at an automated teller machine (ATM) in San Francisco back in 1984 when he was struck with an idea. "Hell, if I can access money from my bank in Boston 3,000 miles away, I should be able to do the same thing from systems on campus," he thought.

Boston College's Bernard W. Gleason Jr. *created UIS, a campuswide TCP/IP net that allows students to register, receive bills and check on grades with an ATM card*

Four years later, Gleason's idea materialized in UIS. UIS is a key part of Project Glasnost, Boston College's long-term strategy initiated in the late 1970s for furnishing users with direct access to administrative computing systems.

UIS is a campuswide TCP/IP-based network that enables 15,000 students, 8,500 faculty members and thousands of full- and part-time staff members to use ATM cards to do things such as check out library materials or pay dining hall tabs. Other applications accessible from six on-campus ATM kiosks enable users to register for courses, check on grades and receive printed bills for housing and long-distance telephone service.

Users off-campus or in dormitory rooms can also reach UIS, accessing IBM and Digital Equipment Corp. host-based student accounts, student records and other systems from desktop PCs and Apple Computer, Inc. Macintoshes via a single graphical user interface (GUI) for all applications. For some applications, notably course registration, even a Touch-Tone telephone will do the job.

"At the beginning of each semester, the lines of students at our counter used to be four and five deep," says Louise Lonabocker, registrar at the Chestnut Hill, Mass., college. "But with UIS, students register themselves from the device that is most convenient to them."

The result: Lonabocker's office has cut back staffing as well as taken on new work, including the design and production of all student catalogs. Last year, the registration counter that was once thronged with students was removed.

Gleason says laying the groundwork for UIS actually began some 15 years ago, with the adoption of what he describes as very basic yet very critical computing concepts. Topping the list was the notion that all of the college's systems should be part of one system and that the system should be accessible to all through a consistent GUI.

For IS, putting these ideas into practice entailed following highly structured programming principles, including developing consistent screens and menus across all applications.

"Fifteen years ago, we were writing our own screen and program generators even on what was then a terminal-based system," Gleason notes.

Equally important was the early implementation of a consistent format for user names and identification codes, which in the mid-1980s simplified linking expanding numbers of PC and Macintosh users into different LANs and creating a single X.500-based directory of all users.

ATM security is furnished on two levels. One way is through identifying information embedded in the magnetic stripe on each ATM card, which allows users to enter the network. The other is through the applications, which contain expert systems-based rules, technology developed and implemented by the college's 12-person IS applications staff.

In tying together physical and data security on the ATM system, the IS group was able to off-load everyday security tasks such as issuing and changing passwords, which is now done by the college's campus security department.

"One of our specifications for the system was that it had to be low management," Gleason says. "We didn't want a lot of security managers in IS. We didn't want to spend time and money doing routine tasks."

Gleason says nailing down the overall cost of the ATM project and Project Glasnost as a whole is impossible "because you can't put a price tag on a vision. Glasnost isn't a project with a defined start and finish date but a philosophy of opening up all systems," he says.

His advice to other IS managers looking to implement open computing is to first institute an open strategic planning process. After that, he says, IS must deliver improved services, building confidence that technology can deliver. •

Hiring outlook

Spring thaw for IS jobs

Job WATCH

Computerworld introduces Job Watch, a quarterly feature that looks for the promising jobs, industries and regions for IS professionals.

By Kelly E. Sewell

AS SPRING ARRIVES, the job market for information systems professionals may finally be thawing.

Computerworld's interviews with IS recruiters, analysis of help wanted ads and its exclusive poll on the hiring plans of 687 U.S. firms showed first-quarter growth that is expected to carry into June. The outlook for the Midwest and in manufacturing looked especially strong.

"I don't know if it's Bill Clinton or that the weather's getting better," says Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles-based placement firm. "But there's a lot more hiring going on right now."

Observers say they are uncertain if the current modest upturn is only seasonal.

"At the beginning of the year, companies are coming up with new staffing plans," says Jeff Jones, a partner at Andersen, Jones and Muller Associates, a Detroit-area placement firm. "By February and March, they're ready to start fresh hiring again."

Rust Belt shines

Midwest firms posted more help wanted ads than any other region surveyed, accounting for 30% of all listings, followed by the Southeast. Most postings were for Detroit and Chicago.

Jones says much Motor City growth can be traced to a major automotive parts division that is moving IS operations into the area. Electronic Data Systems Corp., a General Motors Corp. unit, also remains a large IS employer.

Also promising, says Stan Durbas, president of Data Careers in Middletown, Conn., is the region from Washington, D.C., to Atlanta. "With taxes and the cost of living in the Northeast, a lot of companies are moving to that area."

The worst showing came from the Mountain states, which accounted for only 5% of firms with advertised openings. Analysts fault a stagnant industry base and a lack of new growth areas.

Wanted: Hands-on workers

Computerworld's ad analysis found that demand was highest for programmer/analyst jobs. But many recruiters say they've been hiring for higher-level jobs such as project managers.

Client/server, Unix, C, SQL and MS-DOS skills are especially in demand, as are software engineering and database skills. Only 6.5% of the ads were searching for IS managers or directors.

Manufacturers hottest

Computerworld's survey of U.S. corporations found that planned job growth was strongest in manufacturing firms. Some 30% of manufacturers with fewer than 100 IS employees reported plans to boost IS hiring in 1993. Approximately 40% of large manufacturers say they will enlarge their IS work force this year.

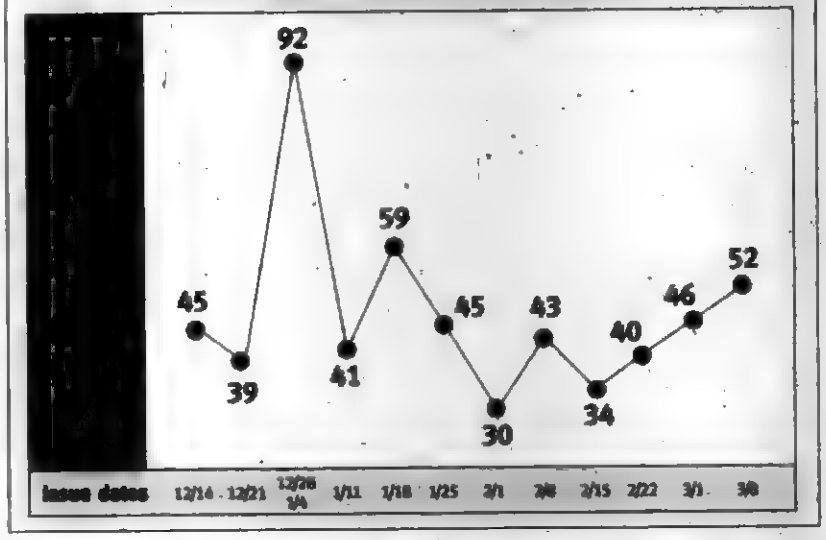
Finance, insurance and real estate were also strong (see chart next page). Some 30% of large companies and 25% of small companies polled in these industries say they plan to increase IS hiring.

Some analysts speculate that firms could be binging to make up for a few years of neglecting technology.

"I would hope that '91 and '92 were low points and that we've hit the bottom," Durbas says. "I think it's going to be a very, very slow cautious growth."

Promising upturn

AFTER A SHAKY START, IS JOB OPPORTUNITIES SHOWED A STEADY INCREASE TOWARD THE END OF THE FIRST QUARTER



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Hogan SYSTEMS

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Positions require extensive software development background with at least 4 years in a management role. Prefer experience with banking applications (i.e. Cards, Loans, Deposits, etc.) Experience in implementing and supporting workstation based tools and programming tools a plus. Responsibilities include hiring and managing a technical staff in a new development effort. (Response code DM)

Programmer Analysts - PC Development
Positions require skills in PC development, DOS, OS/2 and COBOL. Windows and/or Presentation Manager is desired along with a basic knowledge of IBM environments. KnowledgeWare's ADW experience needed along with CUA standards and GUI development experience. (Resp. code PAD)

Programmer Analysts
Mainframe experience with DB2, COBOL, CICS, ALC, DL1, IMS, and/or VSAM. Banking applications experience (Cards, Loans, Deposits, etc.) highly desireable. (Resp. code PA)

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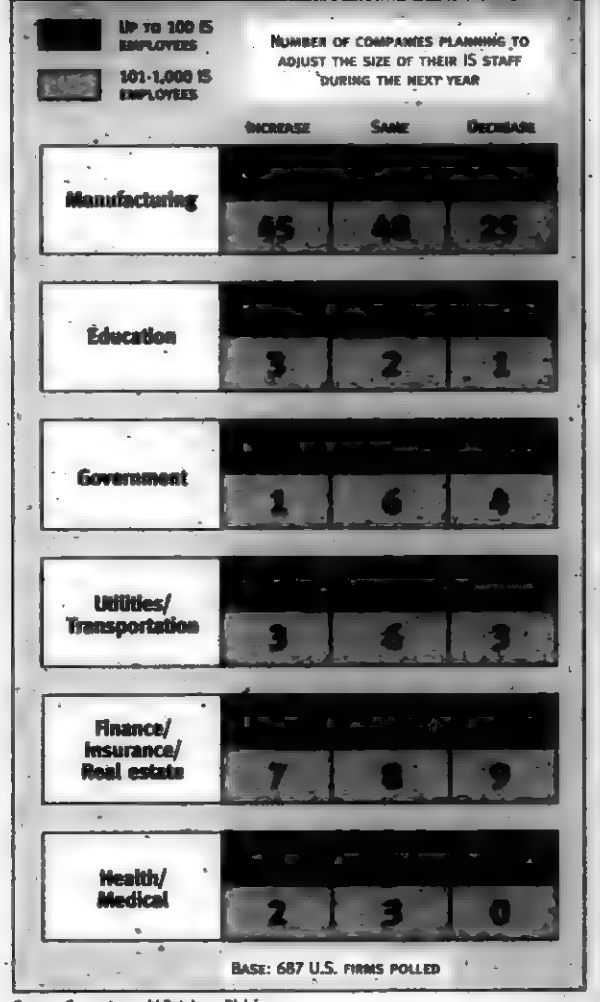
INDUSTRY Most small and large manufacturers say they plan to increase IS hiring in 1993 or at least hold steady. Other fields plan modest gains.

TOP TITLES Hands-on software programmers and planners accounted for 58% of all job postings. High-level jobs were more scarce.

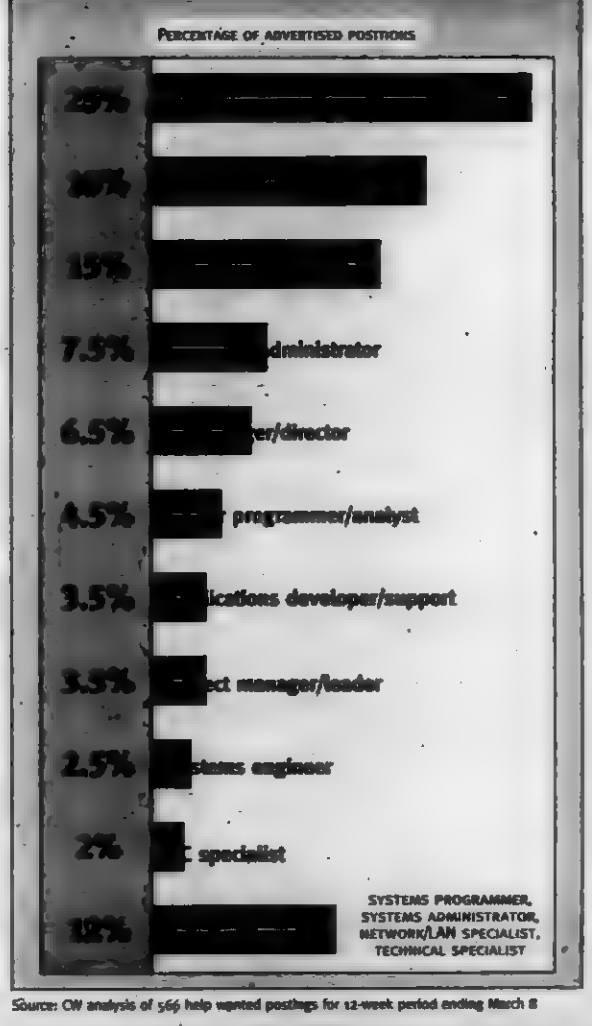
REGION More than half of all job postings were for the Midwest and Southeast. Detroit, Chicago and Atlanta were especially strong.

Manufacturing expands



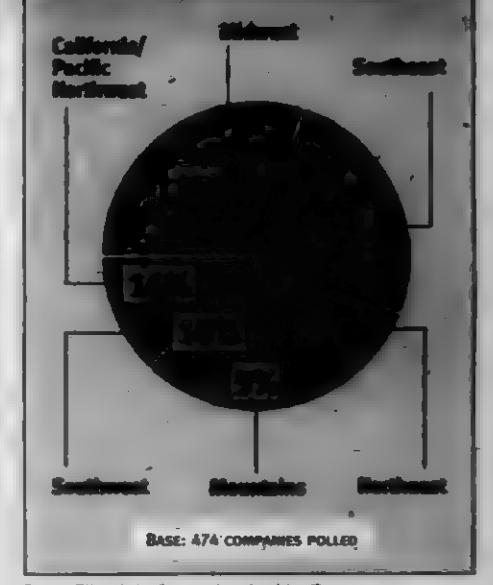
Source: *Computerworld* Database Division

Programmers in demand



Source: CW analysis of 566 help wanted postings for 12-week period ending March 8

Midwest booms



Source: CW analysis of companies advertising IS job openings for 12-week period ending March 8

How we track jobs

Computerworld's classified ads were analyzed between mid-December and mid-March to track advertised IS job openings. Temporary, contract or consulting positions were excluded. A total of 566 ads were tracked.

In our exclusive industry survey, 687 firms were contacted between Jan. 1 and March 17, 1993, and were asked if they planned to adjust their IS staffs in the current year.

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(Chief Information Officer)

The Assistant Vice President and Director of Information Services (AVP) will have leadership and management responsibility for administrative systems and information technology at the University of Nebraska. The AVP will direct the operations and management of the University of Nebraska Computing Services Network (UNCSN), which is responsible for enterprise-level information systems and administrative computing for financial management, accounting and budgeting, human resources management (payroll and personnel), and student information systems. She or he will provide vision in the investigation and design of computing architectures for information systems that support the University's missions. The AVP will work closely with campus administrators in proposing the appropriate use of technology so that the University of Nebraska has a coordinated approach to the implementation of tested techniques in our computing and communications infrastructure. This position will report to the Vice President for Business and Finance.

To be qualified for this position applicants must possess: a bachelor's degree in an appropriate field; recent large-scale information system and computing management experience in a leadership capacity; demonstrated expertise in strategic planning and management of mainframe and distributed computing, networking, communications systems, and end-user support services. Applicants must be able to develop consensus support for university-wide strategic plans. An advanced degree and relevant experience in a comprehensive university will be preferred. The salary will be competitive and commensurate with qualifications and experience.

Consideration of applications will begin immediately and continue until the position is filled. Qualified candidates should forward a letter of interest, a resume, and the names, addresses and telephone numbers of three references to:

UNIVERSITY OF NEBRASKA
John Russell
Search Committee Chair
3835 Holdrege Street
Lincoln, Nebraska 68583

The University of Nebraska is an equal opportunity educator and employer, and specifically invites and encourages women, minorities and people with disabilities to apply. If you need assistance with the application process please call (402) 472-5900.

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Submit State of Florida employment application and/or resume to: Jo Mixon, HRS Tallahassee Centre, 1940 North Monroe Street, Tallahassee, FL 32303-0710, (904) 487-4188 FAX (904) 487-4766. DEADLINE: 5 p.m., April 6, 1993.

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PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with C, SHELL Programming, UNIX® Systems Programming, INGRES, FORTRAN, VMACMS and Telephony Software Tool and Design Development. Must have Master's in Computer Science or Engineering or Math. Experience required is six months in job offered or six months as a Systems Analyst or Systems Engineer. Additionally, experience must involve use of C, SHELL Programming, UNIX Systems Programming, INGRES, FORTRAN, VMACMS and Telephony Software Tool and Design Development. M-F, 40 hrs/week, 8:00-5:00, salary $35,000/year; Cary NC location. Must have proof of legal authority to work in the U.S. DOL #NC7224220 and DOT Code 030.162-014. Please apply to nearest Job Service office or submit a resume to Job Service, 700 Wade Ave., Raleigh, NC 27611. *UNIX is a tm of AT&T. EOE.

Systems Engineer for electronic circuit designs as well as systems simulation, combining DC and brushless motor control. Utilize integrated circuits and 6085 and MCS-51 microprocessors to design and implement various systems and circuits by utilizing the application software of TANGO-SCH, TANGO-PCB, and TANGO ROUTE. Use Simulink, a simulation software, to simulate the environment to ensure that engineering solutions accurately reflect client requirements. Simultaneously test fuel control units and pumps by utilizing modern test rigs operated by microprocessor systems. Collect, record, and process all tests by means of a computer aided system. Require Master's degree in Computer Engineering and Master's thesis using microprocessor application in motor testing. Graduate level coursework must include: Optimizing Design for Electrical Machines; Electromechanical Energy Conversion; Parallel Processing Hardware; and Real-Time Language. 40 hr wk - 8am to 4pm, $748.15/wk. Send resume to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 19393. Employer Paid Ad.

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Programmer/Analyst desired for exciting job in historic, sunny Salisbury, N.C. 3 years experience in Unix, Fox, Informix. BS/Computer Science or equivalent experience required. Skills also required in user interview and systems analysis. Send resume to: SOMAR Telemarketing, PO Box 1008, Salisbury, NC 24145 att: Margaret Winslow. Teamwork is the key to our success.

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Manager/Systems Analyst. Information Systems, 40hrs/wk, 8:00am - 5:00pm, $39,000/year. New application systems design, database design, maintenance and documentation for proprietary information system. Electronic data communication systems maintenance. Technical support. Network administration/troubleshooting. Tools: C; Paradox; SQL; Windows; UNIX; Novell; Ethernet; UTP; Crosstalk; 3AS; C++ M.S. in Computer Science as well as one year experience in job offered or as a Systems Programmer required. Previous experience must include: CA/NEX; Novel Network; network administration; as well as six months with: Paradox; Windows; 3AS; SQL. Graduate education must include one course each in: Software Engineering Environment; Object-oriented Design, C++, Graphics. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Pete Kuta, Reference #V-IL-5276-K. NO CALLS. An Employer Paid Ad.

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Programmer/Analyst, 40 hrs/wk, 8am - 5pm, $36,000/year. Development/implementation of financial applications including cellular billing. Apply Fagan and CASE development methodologies. Testing/troubleshooting. Relational database techniques. Tools: C; Ingres; ESQL, 4GL; UNIX; VMS; ABF; OBF, RBF, Vifred, Vitamin C. M.S. in Computer Application as well as one year experience as a Programmer/Analyst or Programmer required. Previous experience must include: Vitamin C/C/4GL/ESQL/SQL in UNIX with INGRES. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Pete Kuta, Reference #V-IL-10065-K. NO CALLS. An Employer Paid Ad.

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Should have at least 2-4 years systems programming experience supporting an MVS/ESA environment, including installation and maintenance of operating system software and OEM software products. Familiarity with MVS problem determination and dump analysis, IPCS usage and project administration also desired.

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We prefer at least 3-5 years experience with VTAM/NCP, as well as thorough knowledge of communications hardware and software (front-end processors, modems/DSUs, link and process level encryption, channel extenders, circuits, NetView, and SNA). Working knowledge of OSI, X.25, and LAN/WAN also desired.

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Should have at least 2-4 years direct experience with NetView CLIST/REXX programming, in addition to Automated Operations experience, specifically IMF/IMS Automation, AOC/MVS customization, and ANO Network Automation.

We'll reward your ideas and expertise with a competitive salary structure, complete benefits including relocation assistance, and tremendous opportunity for professional growth. For confidential consideration, please send resume, indicating position(s) of preference, to: **Harvey Daniels, Dept. CW329, FEDERAL RESERVE AUTOMATION SERVICES, 701 E. Byrd St., P.O. Box 85103, Richmond, VA 23285.** EOE M/F/D/V.

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Application Deadline: 4-12-93

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- Programming in a Manufacturing Environment
- GEMBASE or USERBASE experience a plus

Please send your resume to Micron Custom Manufacturing Services, Inc., 8455 Westpark St., Boise, Idaho 83704 or fax your resume to (208) 368-2789 by the deadline. Relocation assistance available. EEO/AA

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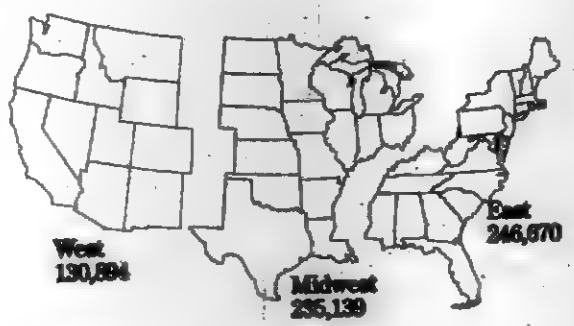

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for personal computers	97,695
for technical workstations	33,217
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DP Service Bureau/ Contract DP Services	71,293
Consulting/Planning	76,848
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SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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Superstore shopping

In search of 'super' service

By Alice Bredin

YOU MAY HAVE AVOIDED computer superstores in the past because you felt they lacked the technical know-how to handle corporate needs. The huge product selections and lower prices were enticing, but the poorly trained sales staffs turned you off.

Finding a technically competent salesperson in a superstore is still a hit-or-miss situation, but store managers are working to add more technically capable staff, especially in an effort to differentiate themselves from cheap box pushers and to compete with traditional retailers and value-added resellers (VAR).

A buyer who shops around can find a superstore that offers good prices, availability of product and good purchasing advice, says Adam Levin, president of Levin Consulting, a marketing consultancy in Shaker Heights, Ohio.

The larger chains offer the most sophisticated service and technical know-how, but some regional chains are also aggressively providing technical training for their salespeople. The superstore credited with the most comprehensive and sophisticated staff is CompUSA, Inc., based in Dallas. CompUSA's service programs manager, Greg Miller, says the company hires floor salespeople with an average of two years of technical experience, usually from other resellers. All salespeople receive about three days of vendor and product technical training before starting the job.

"We don't have the luxury of sending them off to a class at first, so we hire them experienced and send them to authorization training class," Miller says. A call to CompUSA's human resources department confirmed that you cannot be considered for a sales job without "considerable technical knowledge."

At the regional level, Elek-Tek, Inc., a four-store chain based in Skokie, Ill., is known industrywide for offering high-level sales service in its Chicago-area stores. For the first six months, all new hires receive one month of off-floor training at corporate headquarters. When they move to the store, they do book work before being partnered with an experienced salesperson. They then work independently but under supervision.

"Before you go out on your own, you have to take written and verbal tests about the fundamentals concerning Elek-Tek's products," says company President Hal Goldman.

Afterwards, the sales staff receives vendor training twice a week to learn the differences between products and internal training once a month in whole categories of products.

Corporate specialty

To cater to the corporate buyer, most larger superstores have a corporate sales force in addition to its regular sales force. Corporate sales staff excel in offering good buying advice — not necessarily technical guidance, says Alan Brody, a channel marketing consultant in Scarsdale, N.Y. For instance, "they'll help explain what products the store carries to suit a particular need."

Brody, who spent a few days on assignment working as a salesman in superstores, says that for a corporate buyer who already knows his needs, superstore sales staff can help by suggesting appropriate products. They are proficient to answer most technical questions except specific, highly technical or vertical ones. For instance, they can help if you want to network 10 computers and buy laser printers for all of them, but are less likely to help if you need to connect three different types of networks.

"If you are a mainframe shop downsizing to a Novell client/server network, I wouldn't go near a superstore," Brody says.

As with any purchase, asking questions and researching is the only way to see if a superstore offers the technical help you need. Says Brody: "The odds of finding one are about one in three."

Bredin is a free-lance writer based in New York.

Shopping list

Superstores sell an average of 15% to 20% of their systems and software to corporate customers. Up only slightly from last year, this number is expected to increase gradually during the next few years.

When shopping for a superstore, it's important to work with a chain that is committed to corporate sales. To determine this in a superstore, ask the following:

▶ How much of their business is corporate? There isn't a recommended cutoff point, but under 5% may not be a good choice.

▶ What level of parts inventory do they have? A superstore may offer four-hour replacement parts, but if they do not stock the items you need, this service will not be possible.

▶ What level of training and experience does the sales staff have. Analysts stress that in-house training that compares different products is preferable to vendor training.

—Alice Bredin

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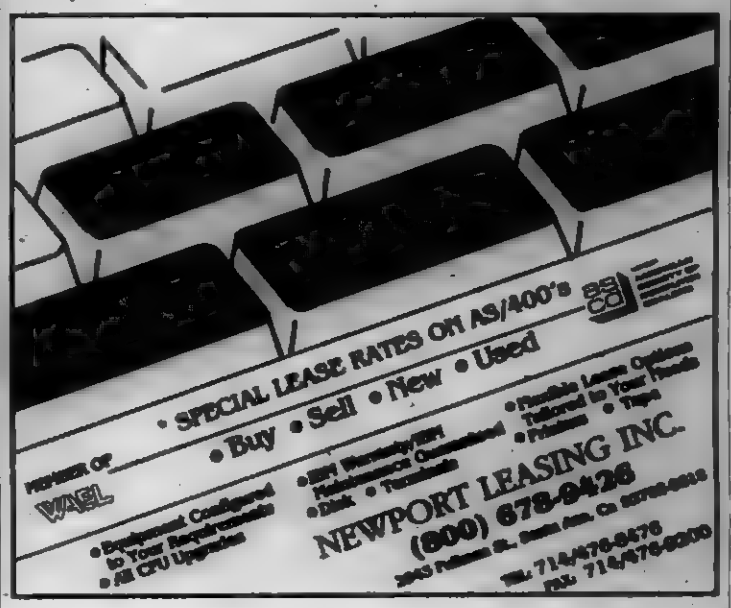

Index of used computer prices

Week ending March 19, 1993

	Closing Prices	
	BoCoEx	AmCoEx
IBM AT 339	$390	$400
PS/2 Model 30 286	$400	$450
PS/2 Model 55SX	$875	$750
PS/2 Model 60	$450	$450
ThinkPad 300	$1,550	$1,500
PS/2 Model 95-OKF	$3,300	$2,750
Compaq Portable II	$225	$300
Portable III	$350	$425
Portable 386	$750	$800
SLT-286	$650	$625
LTE-286	$790	$800
DeskPro 486/33I	$1,850	$1,825
Apple Macintosh SE	$575	$625
IICX	$1,600	$1,500
IICI	$2,250	$2,150
IIFX	$2,800	$2,400
Quadra 700	$3,250	$2,550

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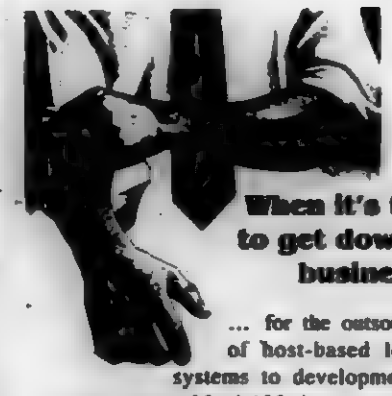

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Government	62,291
Utilities, Communications Systems, Transportation Services	58,516
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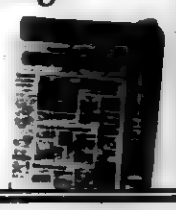

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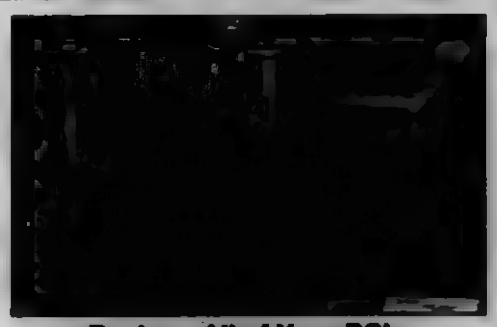

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Friday Stock Ticker

Gainers

Percent

Ultimate Corp. (H)	34.8
Phoenix Technologies	21.2
PeopleSoft	18.9
SynOptics	18.9
Novell Network Corp.	13.6
Stratacom Inc.	13.3
Corporate Software	12.8
CI Software	12.7

Dollar

Novell Network Corp.	7.50
PeopleSoft	3.25
SynOptics	4.88
Computer Sciences	4.50
Gateway Electronics	4.25
Wellfleet Communications	3.25
Southwestern Bell Corp.	3.25
Evans & Sutherland	2.88

Losers

Percent

Micrografx Inc. (L)	-46.4
Intuit Corp. (L)	-41.2
Wang Labs Inc. (H)	-25.0
Aztec Communication Corp.	-24.5
Walker Interactive Systems (L)	-23.6
Ask Computer Systems	-22.3
Radius Inc.	-20.5
Adobe Corp.	-19.0

Dollar

Ask Computer Systems	-5.75
Brooktrout Technology	-5.13
Creative Technologies Inc.	-4.50
Micrografx Inc. (L)	-4.00
Bmc Software Inc.	-3.75
Intuit Corp. (L)	-3.50
Ibm	-3.00
Silicon Graphics	-2.75

Price/earnings multiples

A stock trading at a high price/earnings ratio should generally prompt buyers to take a wary look. However, rapidly growing companies can sometimes sustain share prices at a high multiple of earnings. For example, Powersoft Corp. earned a Buy rating in a recent Alex. Brown & Sons, Inc. report, despite the stock's extremely high price/earnings ratio.

—Derek Slater

Highs and lows

SELECTED STOCKS COVERED BY ALEX. BROWN THAT ARE TRADING AT HIGH AND LOW MULTIPLES OF 1992 EARNINGS PER SHARE

Powersoft Corp.	29 1/8	$0.35	83
Integrated Device Technology, Inc.	7 1/2	$0.11	68
Wellfleet Communications, Inc.	39	$0.58	67
Newbridge Networks Corp.	54 1/8	$0.84	64
America Online	25 3/4	$0.43	60
Oracle Corp.	34 7/8	$0.61	57
Sybase, Inc.	53 3/4	$0.96	56
Wescott Communications	30 1/4	$0.61	50
Dell Computer Corp.	34 1/2	$2.57	13
McAfee Associates	7 3/8	$0.57	13
Exar Corp.	23 3/4	$1.95	12
Apple Computer, Inc.	53 1/4	$4.40	12
Trident Microsystems, Inc.	11 1/2	$1.06	11
Computer Horizons Corp.	10 1/4	$0.97	11
Digital Systems International, Inc.	7 1/2	$0.73	10
Artisoft, Inc.	8 1/4	$0.83	10
Banctec, Inc.	17	$1.90	9
Digital Communications Associates, Inc.	15 3/4	$1.81	9
AST Research, Inc.	13 1/2	$1.82	7

SOURCE: ALEX. BROWN & SONS, INC.

EXCH	52-WEEK HIGH	52-WEEK LOW		MAR 26 3 PM	WK NET CHANGE	WK PCT CHANGE
COMMUNICATIONS & NETWORK SERVICES						
OTC	35.13	9.63	3 COM CORP.	35.13	2.75	8.5
NYS	76.88	56.38	AMERICAN INFO TECHS CORP. (H)	76.50	-0.13	-0.2
NYS	59.13	40.13	AT&T	57.63	-1.00	-1.7
OTC	3.56	0.75	ASTEL COMMUNICATION CORP.	2.13	-0.69	-24.5
OTC	24.50	10.25	BANYAN SYSTEMS INC.	17.00	-0.25	-1.4
NYS	56.75	40.25	BELL ATLANTIC CORP	54.63	1.50	2.8
NYS	57.50	43.38	BELLSOUTH CORP.	55.13	0.75	1.4
NYS	6.25	3.63	BOLT, BERANEK & NEWMAN	4.88	0.00	0.0
OTC	18.50	10.00	BROOKTROUT TECHNOLOGY	11.25	0.25	2.3
NYS	92.25	42.13	CABLETRON SYSTEMS	86.88	2.88	3.4
OTC	34.50	17.75	CHIPCOM CORP.	30.50	0.50	1.7
OTC	96.50	33.00	CISCO SYSTEMS INC.	45.50	0.81	1.8
OTC	24.38	5.50	COMPRESSION LABS INC.	11.38	-1.25	-9.9
OTC	4.63	0.88	DATA SWITCH CORP.	4.00	-0.38	-8.6
NYS	22.25	13.75	DIGITAL COMM. ASSOC.	15.75	0.00	0.0
OTC	12.75	7.00	DIGITAL SYSTEMS INT'L INC.	7.00	-0.50	-6.7
OTC	29.50	6.00	DSC COMMUNICATIONS	27.25	1.38	5.3
OTC	9.50	4.75	FIBRONIX INT'L INC.	7.88	0.13	1.6
OTC	34.75	10.00	FILENET CORP.	10.00	-1.75	-14.9
OTC	4.38	1.50	GANDALF TECHNOLOGIES INC.	3.38	-0.06	-1.8
OTC	2.06	0.69	GATEWAY COMMUNICATIONS	1.50	-0.06	-4.0
NYS	11.50	2.88	GENERAL DATACOMM INDS. (H)	11.00	0.75	7.3
ASE	4.13	2.00	GO VIDEO	2.63	0.06	2.4
NYS	37.75	28.88	GTE CORP.	36.63	0.50	1.4
NYS	80.38	62.50	ITT CORP. (H)	80.38	1.75	2.2
OTC	45.63	29.50	MCI COMMUNICATIONS CORP. (H)	44.88	0.50	1.1
OTC	12.75	2.25	MICROCOM INC.	3.88	0.00	0.0
OTC	24.25	5.00	NETRIX CORP. (L)	5.00	-3.50	-41.2
OTC	19.00	9.63	NETWORK COMPUTING DEVICES	11.50	-1.25	-9.8
NYS	15.38	6.50	NETWORK EQUIPMENT TECH. (L)	6.50	-1.00	-13.3
OTC	23.25	8.00	NETWORK GENERAL	12.13	-1.38	-10.2
OTC	15.75	8.50	NETWORK SYSTEMS CORP.	10.13	-0.38	-3.6
OTC	62.63	13.63	NEWBRIDGE NETWORKS CORP.	62.63	7.50	13.6
NYS	48.00	30.50	NORTHERN TELECOM LTD.	38.00	-5.13	-11.9
OTC	35.25	22.50	NOVELL INC.	33.25	0.25	0.8
NYS	92.50	69.13	NYNEX CORP.	90.00	1.63	1.8
OTC	33.25	14.50	OCTEL COMMUNICATIONS CORP.	25.00	-0.75	-2.9
OTC	8.00	3.38	PERMIL DATA COMM NETWORKS	4.63	0.19	4.2
OTC	43.25	10.25	PICTURETEL CORP.	20.00	-1.88	-8.6
OTC	15.75	6.25	PROTEON INC. (L)	6.25	-0.13	-2.0
NYS	30.38	18.16	SCIENTIFIC ATLANTA INC.	24.38	2.38	10.8
NYS	75.88	56.63	SOUTHWESTERN BELL CORP.	75.88	3.25	4.5
NYS	31.75	20.75	SPRINT CORP. (H)	30.88	-0.38	-1.2
OTC	27.00	8.75	STANDARD MICROSYSTEMS CORP	19.50	0.50	2.6
OTC	18.50	6.88	STRATACOM INC.	12.75	1.50	13.3
OTC	95.50	18.75	SYNOPTICS COMMUNICATIONS	87.88	2.13	2.5
OTC	7.13	4.25	TELEBIT CORP.	4.50	-0.13	-2.7
OTC	9.38	2.13	TELEMATICS INT'L INC.	6.88	-0.38	-5.2
OTC	25.50	13.38	US ROBOTICS	19.00	-1.25	-6.2
NYS	63.88	32.88	U S WEST INC.	63.50	1.25	2.0
OTC	46.00	12.00	WELLFLEET COMMUNICATIONS	43.00	3.25	8.2
OTC	22.00	7.00	XIRCOM	8.00	-0.50	-5.9
PC STANDALONE SYSTEMS						
OTC	7.50	2.75	ADVANCED LOGIC RESEARCH (L)	2.81	0.00	0.0
OTC	65.25	41.50	APPLE COMPUTER INC.	53.50	-0.50	-0.9
OTC	24.25	11.25	AST RESEARCH INC.	13.75	-0.25	-1.8
NYS	15.38	4.75	COMMODORE INT'L	5.00	-0.63	-11.1
NYS	58.50	22.25	COMPAQ COMPUTER CORP.	50.13	1.88	3.9
OTC	49.88	15.00	DELL COMPUTER CORP	36.38	1.00	2.8
NYS	82.88	50.25	HEWLETT PACKARD CO.	73.63	-1.63	-2.2
NYS	33.00	14.13	SILICON GRAPHICS	27.63	-2.75	-9.1
OTC	41.00	22.50	SUN MICROSYSTEMS INC.	28.38	-2.00	-6.6
NYS	32.13	22.25	TANDY CORP.	28.00	1.63	6.2
NYS	9.50	5.00	ZENITH ELECTRONICS	6.88	0.25	3.8
OTC	15.25	2.75	ZEOS INTERNATIONAL LTD.	5.00	-0.13	-2.4
LARGE SYSTEMS						
ASE	18.38	6.38	AMDAHL CORP.	6.38	-1.50	-19.0
NYS	12.13	4.75	CONVEX COMPUTER	5.38	-0.13	-2.3
OTC	6.13	1.88	CRAY COMPUTER	3.19	0.31	10.9
NYS	42.25	19.00	CRAY RESEARCH INC.	27.50	1.13	4.3
NYS	13.88	7.13	DATA GENERAL CORP.	12.50	-0.38	-2.9
NYS	54.88	30.38	DIGITAL EQUIPMENT CORP.	46.25	0.50	1.1
NYS	38.63	26.63	HARRIS CORP.	38.13	1.13	3.0
NYS	100.38	65.88	IBM	91.25	-5.00	-5.5
OTC	22.00	5.50	KENDALL SQUARE RESEARCH	16.00	-2.63	-14.1
NYS	120.00	83.00	MATSUSHITA ELECTRONICS	102.50	4.25	4.3
OTC	17.00	6.00	PYRAMID TECHNOLOGY	14.50	-0.75	-4.9
OTC	24.00	11.13	SEQUENT COMPUTER SYS.	17.88	-0.25	-1.4
OTC	16.38	1.38	SEQUOIA SYSTEMS INC.	2.25	-0.13	-5.3
NYS	49.50	29.50	STRATUS COMPUTER INC.	35.13	0.25	0.7
NYS	16.88	9.88	TANDEM COMPUTERS INC.	12.63	-0.75	-5.6
NYS	13.88	7.75	UNISYS CORP.	13.25	-0.25	-1.9
ASE	5.88	0.06	WANG LABS INC. (H)	0.38	-0.13	-25.0
SOFTWARE						
OTC	56.50	25.25	ADOBE SYSTEMS INC.	44.50	1.38	3.2
OTC	26.00	10.25	ALDUS CORP.	18.50	1.00	5.7
OTC	18.75	5.63	AMERICAN SOFTWARE INC.	7.25	0.00	0.0
OTC	28.13	9.75	ASK COMPUTER SYSTEMS	20.00	-5.75	-22.3
OTC	56.50	27.75	AUTODESK INC.	42.25	-0.75	-1.7
OTC	23.75	3.50	BACHMAN INFO. SYSTEMS	3.75	0.13	3.2
OTC	43.00	34.00	BGS SYSTEMS INC.	39.75	-1.25	-3.0
OTC	84.13	37.25	BMC SOFTWARE INC.	48.00	-3.75	-7.2
OTC	28.25	17.00	BOOLE & BABBAGE	27.25	1.00	3.8
OTC	56.75	17.50	BORLAND INT'L INC.	22.75	0.00	0.0
OTC	8.13	3.00	CE SOFTWARE	3.88	0.44	12.7
ASE	35.00	9.38	CHEYENNE SOFTWARE INC.	29.50	0.25	0.9
OTC	19.50	8.25	CHIPSOFT	12.00	1.00	-7.7
OTC	9.75	5.63	COGNOS INC.	6.63	-0.13	-1.9
NYS	27.38	10.88	COMPUTER ASSOCIATES	24.50	0.38	1.6
NYS	12.38	4.00	COMPUTERVISION CORP	5.00	-0.25	-4.8
OTC	17.25	6.75	CONSHARE INC.	8.00	-1.00	-11.1
OTC	17.25	10.75	COREL CORP.	14.75	0.00	0.0
OTC	36.25	6.00	EASEL CORP.	9.50	-1.38	-12.6
OTC	25.75	12.00	4TH DIMENSION	22.25	-0.75	-3.3
OTC	24.00	7.50	FRAME TECHNOLOGY	8.00	-0.50	-5.9
OTC	22.25	12.50	GROUP 1 SOFTWARE	15.00	0.00	0.0
OTC	35.25	21.50	GUPTA (L)	23.88	-0.38	-1.5
OTC	8.75	3.50	HOGAN SYSTEMS INC.	7.00	-0.75	-9.7
OTC	25.75	12.25	IMRS	14.75	-1.75	-10.6
OTC	34.75	18.50	INFORMATION RESOURCES	27.50	-1.00	-3.5
OTC	47.00	12.13	INFORMIX CORP.	34.25	2.00	6.2
OTC	18.75	11.00	INTERGRAPH CORP.	12.00	0.00	0.0
OTC	13.63	7.75	INTERLEAF INC.	9.63	0.00	0.0
OTC	18.00	7.00	INTERSOLV INC.	7.50	-0.50	-6.3
OTC	17.50	9.25	KNOWLEDGEWARE INC. (L)	10.13	0.38	3.8
OTC	54.75	28.75	LEGENT CORP.	40.50	0.00	0.0
OTC	35.50	14.75	LOTUS DEVELOPMENT	27.25	1.25	4.8
OTC	23.00	14.25	MATHSOFT (L)	14.25	-1.00	-6.6
OTC	23.25	5.50	MCAFEE ASSOCIATES	6.50	-1.00	-13.3
OTC	10.25	1.88	MECA SOFTWARE (H)	9.63	0.75	8.5
OTC	17.88	5.25	MENTOR GRAPHICS	9.50	-0.50	-5.0
OTC	46.00	27.25	MICRO FOCUS	35.50	-1.50	-4.1
OTC	20.50	4.63	MICROGRAFX INC. (L).	4.63	-4.00	-46.4
OTC	95.00	65.50	MICROSOFT CORP.	86.50	1.88	2.2
OTC	36.88	12.00	ORACLE CORP.	36.63	2.00	5.8
OTC	31.88	13.13	PARAMETRIC TECHNOLOGY	29.25	0.75	2.6
OTC	40.50	22.50	PEOPLESOFT	33.00	5.25	18.9
OTC	18.25	3.50	PHOENIX TECHNOLOGIES	5.00	0.88	21.2
OTC	40.00	29.00	POWERSOFT (L)	32.25	1.75	5.7
OTC	25.00	11.25	PLATINUM TECHNOLOGY	14.50	1.50	11.5
OTC	61.50	29.00	PROGRESS SOFTWARE CORP.	63.50	+1.50	-3.3
OTC	18.75	2.94	QUARTERDECK OFFICE SYS.	3.19	-0.31	-8.9
OTC	24.50	11.75	RAINBOW TECHNOLOGIES INC.	18.50	-1.00	-5.1
OTC	21.25	4.00	RASTEROPS	6.75	-0.13	-1.8
OTC	14.75	3.63	ROSS SYSTEMS	14.75	0.88	6.3
OTC	27.25	8.50	SAPIENS USA INC.	21.75	0.25	1.2
OTC	23.25	6.75	SOFTWARE PUBLISHING CORP.	14.38	1.25	9.5
OTC	9.13	2.00	SOFTWARE TOOLWORKS INC.	7.75	-0.38	-4.6
OTC	5.00	0.75	SPINNAKER SOFTWARE	2.06	-0.19	-8.5
OTC	15.00	3.25	STATE OF THE ART	11.00	-0.25	-2.2
NYS	24.63	13.75	STERLING SOFTWARE INC. (H)	24.00	-0.50	-2.0
OTC	20.25	8.00	STRUCT. DYNAMICS RESEARCH	16.63	0.88	5.6
OTC	62.25	21.00	SYBASE INC.	57.00	-0.50	-0.9
OTC	47.50	5.88	SYMANTEC CORP.	12.00	0.38	3.2
NYS	13.50	5.25	SYSTEMS CENTER INC.	9.50	0.75	8.6
OTC	25.50	10.00	SYSTEM SOFTWARE ASSOC.	12.50	-2.00	-13.8
OTC	6.88	2.50	TENEX CORP.	4.50	-0.13	-2.7
OTC	22.75	9.13	VIEWLOGIC SYSTEMS	16.25	-0.63	-3.7
OTC	23.50	6.88	WALKER INTERACTIVE SYSTEMS (L)	6.88	-2.13	-23.6
OTC	4.25	1.38	WORDSTAR	2.50	0.00	0.0
SEMICONDUCTORS						
NYS	24.50	7.38	ADVANCED MICRO DEVICES	22.75	-0.75	-3.1
NYS	21.00	9.00	ANALOG DEVICES INC. (H)	21.00	0.38	1.8
OTC	20.13	7.63	ATMEL CORP.	18.00	0.63	3.6
OTC	10.38	3.13	CHIPS AND TECHNOLOGIES	3.63	-0.38	-9.4
OTC	39.75	16.29	CIRRUS LOGIC	26.38	1.25	5.0
NYS	14.25	7.38	CYPRESS SEMICONDUCTOR CORP.	10.50	-0.13	-1.2
NYS	16.13	7.00	DALLAS SEMICONDUCTOR	15.13	0.88	6.1
OTC	121.25	46.50	INTEL CORP.	115.25	0.25	0.2
NYS	14.13	6.88	LSI LOGIC CORP.	12.50	-0.13	-1.0
NYS	28.50	12.88	MICRON TECHNOLOGY	24.63	1.50	6.5
NYS	66.50	36.66	MOTOROLA INC.	65.38	2.13	3.4
NYS	14.13	8.25	NATIONAL SEMICONDUCTOR	12.75	-0.25	-1.9
NYS	21.25	8.25	SIERRA SEMICONDUCTOR	11.75	-1.00	-7.8
NYS	38.50	22.25	SYNOPSYS	32.00	0.88	18.9
NYS	63.38	31.50	TEXAS INSTRUMENTS	59.00	1.88	3.3
OTC	9.13	6.00	VLSI TECHNOLOGY	6.88	0.00	0.0
OTC	7.63	2.13	WAFERSCALE	6.25	-0.63	-9.1
ASE	9.63	3.50	WESTERN DIGITAL CORP.	5.50	0.00	0.0
OTC	37.50	14.50	XILINX	35.00	1.75	5.3
OTC	27.88	12.50	ZILOG INC.	23.00	-0.75	-3.2
PERIPHERALS AND SUBSYSTEMS						
OTC	32.75	10.38	AMERICAN POWER CONVERSION (H)	29.88	-0.50	-1.6
OTC	20.16	13.66	BANCTEC INC.	18.50	-0.38	-2.2
OTC	20.75	9.75	CAMBEX CORP.	11.00	-0.50	-4.3
ASE	18.38	7.38	COGNITRONICS CORP.	8.13	0.25	3.2
NYS	25.50	16.00	COMPEX PERIPHERALS	16.00	-0.38	-2.3
OTC	38.50	10.75	CREATIVE TECHNOLOGIES INC.	28.63	-4.38	-13.3
OTC	30.75	14.25	DATA RACE INC.	19.00	-2.50	-11.6
ASE	18.88	4.75	DATARAM CORP.	8.63	-0.38	-4.2
NYS	28.75	7.25	EMC CORP.	23.88	-0.38	-1.5
OTC	10.50	5.38	EMULEX CORP.	7.00	0.13	1.8
OTC	19.00	13.25	EVANS & SUTHERLAND	16.75	0.25	1.5
OTC	39.25	12.00	EXABYTE	14.50	-0.50	-3.3
OTC	26.00	7.09	INTELLIGENT INFO. SYSTEMS	21.63	0.13	0.6
OTC	8.88	3.88	IOMEGA CORP	4.88	0.13	2.6
OTC	33.25	5.75	IPL SYSTEMS INC.	7.00	0.25	3.7
OTC	24.00	10.75	KOMAG INC.	20.88	0.63	3.1
OTC	19.63	6.88	MAXTOR CORP.	8.00	-0.13	-1.5
OTC	12.38	6.50	MICROPOLIS CORP. (L)	6.88	0.00	0.0
NYS	110.50	85.50	3M CORP (H)	110.25	0.50	0.5
OTC	7.75	4.00	PRINTRONIX INC.	7.00	-0.25	-3.4
NYS	17.13	6.88	QMS INC.	15.00	0.00	0.0
OTC	17.88	12.13	QUANTUM CORP.	13.63	0.13	0.9
OTC	17.75	3.75	RADIUS INC	3.88	-1.00	-20.5
NYS	16.25	7.50	RECOGNITION EQUIPMENT	12.38	-0.25	-2.0
OTC	13.88	5.50	REXON INC.	5.75	-0.88	-13.3
OTC	22.38	12.00	SEAGATE TECHNOLOGY	15.25	0.25	1.7
NYS	64.00	18.00	STORAGE TECHNOLOGY	25.63	0.63	2.5
NYS	27.13	16.88	TEKTRONIX INC.	27.13	1.38	5.3
NYS	88.88	66.75	XEROX CORP	83.75	1.63	2.0
SERVERS						
OTC	23.50	12.16	AMERICAN MGMT. SYSTEMS	22.38	0.25	-1.1
NYS	5.00	3.00	ANACOMP INC.	4.00	0.00	0.0
OTC	35.75	16.00	ANALYSTS INT'L	27.50	-1.75	-6.0
NYS	56.13	38.75	AUTO DATA PROCESSING	52.38	0.25	0.5
NYS	17.25	9.41	CERIDIAN CORP.	14.88	0.50	-3.3
NYS	17.38	12.50	COMPUSCO INC.	16.50	-0.13	-0.8
OTC	13.00	6.75	COMPUTER HORIZONS	10.50	-0.13	-1.2
NYS	80.50	57.00	COMPUTER SCIENCES	79.50	4.50	6.0
NYS	9.75	7.00	COMPUTER TASK GROUP	7.38	-0.13	-1.7
NYS	40.50	22.00	COMPUSA INC	32.00	1.50	5.1
OTC	17.50	6.00	CORPORATE SOFTWARE	13.25	1.50	12.8
OTC	28.00	7.63	EGGHEAD DISCOUNT SOFTWARE	7.88	-0.38	-4.5
NYS	35.88	25.25	GENERAL MOTORS E (EDS)	30.50	-0.25	-0.8
OTC	25.50	9.25	IMAGON CORP.	18.88	-0.38	-1.9
OTC	22.25	6.25	INTELLIGENT ELECTRONICS	14.25	-0.13	-0.9
OTC	14.38	6.63	MERISEL	12.00	0.00	0.0
OTC	13.50	5.75	MICROAGE INC.	13.00	0.25	2.0
OTC	47.00	21.75	PAYCHEX	41.13	1.13	2.8
NYS	86.88	59.75	POLICY MANAGEMENT SYS.	83.50	-1.50	-1.8
NYS	35.38	16.81	REYNOLDS AND REYNOLDS	34.13	0.25	0.7
OTC	31.75	22.00	SEI CORP	30.00	0.75	2.6
OTC	24.38	16.88	SHARED MEDICAL SYSTEMS	21.38	-0.25	-1.2
OTC	14.38	5.75	SHL SYSTEMHOUSE	10.25	0.13	1.2
OTC	29.25	18.25	SOFTWARE SPECTRUM INC.	23.75	-0.50	-2.1
OTC	33.75	20.75	SUNGARD DATA SYSTEMS	31.38	1.25	-3.8
NYS	3.88	1.13	ULTIMATE CORP. (H)	3.88	0.75	24.0

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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In Brief

Oracle profits rise

Oracle Corp. last week recorded fiscal third-quarter earnings of $45 million, up 167% from the same period last year. A $24 million charge resulting from the settlement of a class action lawsuit, plus tax provisions, brought net earnings to $29 million in the period ended Feb. 28, the Redwood City, Calif., firm said. Revenue in the period increased 28%, to $370 million.

3Com continues up

3Com Corp. tallied its fourth consecutive quarterly profit, posting third-quarter net earnings of $10.2 million compared with a $4.4 million loss in the same period last year. Revenue grew 52% to $161.4 million in the period.

SHORT TAKES **Everex Systems, Inc.** is cutting its work force by 25% to 500 worldwide and is streamlining its products to focus on high-end systems and servers. The firm is also outsourcing some production and narrowing distribution to better focus on value-added resellers as it tries to navigate its way out of Chapter 11 protection.... **Micrographx, Inc.** is implementing cost reductions of $8 million to $10 million amid an unexpectedly slow fourth quarter. A quarterly loss is expected, the firm said.... **CrossCom Corp.** has filed an initial public offering of 1.5 million shares, priced at $29.75 each.... **Retix** expects results in its fiscal quarter ending April 3 to be below analysts' expectations. Delays in shipping enhancements for its Router Xchange 7000 series of routers contributed to a revenue shortfall, the firm said.... **Former MCI Communications Corp.** data czar Donald Heath has left the company to become vice president of product management and marketing for BT North America.

Venture capitalists bullish on client/server

By Kim S. Nash

■ If investment money had legs, it would sprint into the arms of young software firms with PC-based products in the network administration and client/server development markets. Expect money to run like the wind in 1993 because such companies are cropping up all over, with investors itching to buy and bigger software companies willing to collaborate.

More initial public offerings (IPO), mergers and acquisitions and venture capital investments are expected this year than in any of the five previous years, according to financial analysts.

For example, software mergers and acquisitions are expected to number 200 this year, up from 150 in 1992, according to Broadview Associates, an investment banking firm in Fort Lee, N.J., that focuses on merger and acquisition activity in the technology industry.

Venture capitalists are expected to fund more start-ups this year than last year, too. Having already invested in two firms this year, Ann Winblad, principal at Hummer Winblad Venture Partners in Emeryville, Calif., said she expects her $35.5 million fund to finance four to six new firms in 1993. It funded four in 1992. Still, that is darn selective, considering the fund has auditioned more than 1,200 software hopefuls since 1989.

Venture capitalists like software firms because they are not capital-intensive. Unlike hardware companies, which require a lot of money up front to buy manufacturing equipment and facilities, software companies can sell themselves on an idea, according to Winblad.

In fact, that is how six of the 14 firms that 3-year-old Hummer Winblad has financed got their starts, she said.

Out of steam

But not all hopefuls will see cash infusions. Certain technologies have hit a wall, such as PC utilities and data compression, said Scot Sedlacek, a Broadview partner.

Growth in the utilities and compression markets has been stalled by Microsoft Corp.'s plans to include and enhance such features in DOS 6.0 this month, Sedlacek explained. "There's only a small window of opportunity there until Microsoft decides to move in on these things," he said.

For example, Central Point Software, Inc., which makes backup utilities and antivirus software, pulled a planned IPO last June because sales growth slumped, he said. Such firms are "essentially at the mercy of Microsoft," he said.

But a company can still hope, which in financial circles means going out on the road to promote yourself, as 47 software makers did last week at International Software Partnering, a deal-making forum in Palm Springs, Calif.

One attendee, Mountain View, Calif.-based Brio Technology, Inc., is seeking $2.5 million in capital and a distribution and technology partner for its PC-based database access tools.

Bigger players with money to spend, such as Symantec Corp., NCR Corp. and Taligent, also went to the conference looking for products to plug holes in their product lines.

"For us, acquisition is not just a tactic, but a major strategy," said Ted Schlein, vice president of business development at Symantec.

Start-up companies can attract big brothers by demonstrating that their products "work easily with and add value to my products," said Fred Gibbons, chief executive at Software Publishing Corp. "I don't see enough new companies with the idea to leverage their products off mine, but that's what I'm looking for."

Seedlings take root

Recent venture fundings include:

Company	Lead investor	Amount	Product area
St. Paul Software St. Paul, Minn.	R. J. Steichen and Co.	NA	EDI
International Telemanagement Vienna, Va.	Lawrence, Tyrell, Ortale & Smith	$5 million-plus	Network management
Cantel Communications Network, Inc. Vancouver, British Columbia	Institutional and private investors	$11 million	Telecom
Proactive Software, Inc. Mountain View, Calif.	Mayfield Fund	$4 million	Customer service applications

CW Chart: Janell Genovese

Broadview Associates says...

- "Computer industry mergers and acquisitions numbered 530 in 1992, down 9% from 1991. Eighty percent of these deals were valued at $100 million or less."
- "Sixty-eight companies raised $2.8 billion in initial public offerings last year."

Study cites software industry growth, piracy problems

By Gary H. Anthes
WASHINGTON, D.C.

An independent study commissioned by the Business Software Alliance had good news and bad news for the U.S. software industry. On the plus side, the study found that during the past decade the industry grew 268% — 16% per year — while the rest of the economy moved up 30%.

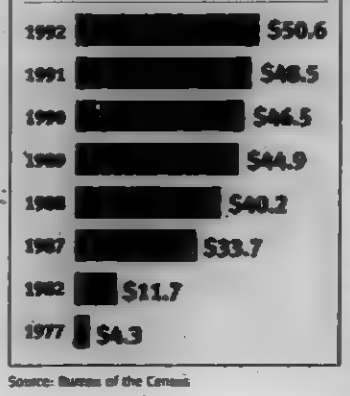
The bad news, according to Washington, D.C.-based Economists, Inc., which prepared the report, is that the industry was robbed of billions of dollars in potential sales by software piracy and international trade barriers.

Economists who drafted the report said government data on the software industry understates the industry's importance to the U.S. economy. That is because the economists consider only those organizations whose primary activity is software-related. They do not include contributions from programmers in other industry segments, such as manufacturing.

Big contributor

Growth in the software industry has contributed significantly to the gross national product

CORE SOFTWARE INDUSTRY REVENUE (IN BILLIONS OF 1992 DOLLARS)



Source: Bureau of the Census

The study also argued that software revenue growth figures understate real growth because of technological innovation. Unlike most industries, where because of inflation $1,000 buys fewer goods in 1992 than it did in 1982, $1,000 buys more software now than 10 years ago.

But just considering "core" software industries — computer programming services, prepackaged software and computer-integrated systems design — the figures are impressive. Receipts have climbed from $4.3 billion in 1977 to $50.6 billion last year. Meanwhile, employment soared from 51,000 to 421,000.

The report called software piracy the industry's worst problem. It cited an estimate by International Data Corp. that U.S. firms captured 75% of the $52.5 billion worldwide market for prepackaged software in 1991. However, the report said the industry forfeits $10 billion to $12 billion each year to software pirates.

Industry Pulse

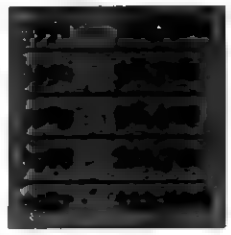
Equipment sales (in billions)

*Projected

Source: North American Telecommunications Association

Includes network equipment, private branch exchanges, key/hybrid telephone systems, data communications equipment, fax equipment, call/voice-processing equipment, public pay phones, videoconferencing equipment, consumer telecommunications equipment and mobile communications equipment.

Total employment (Equipment production)



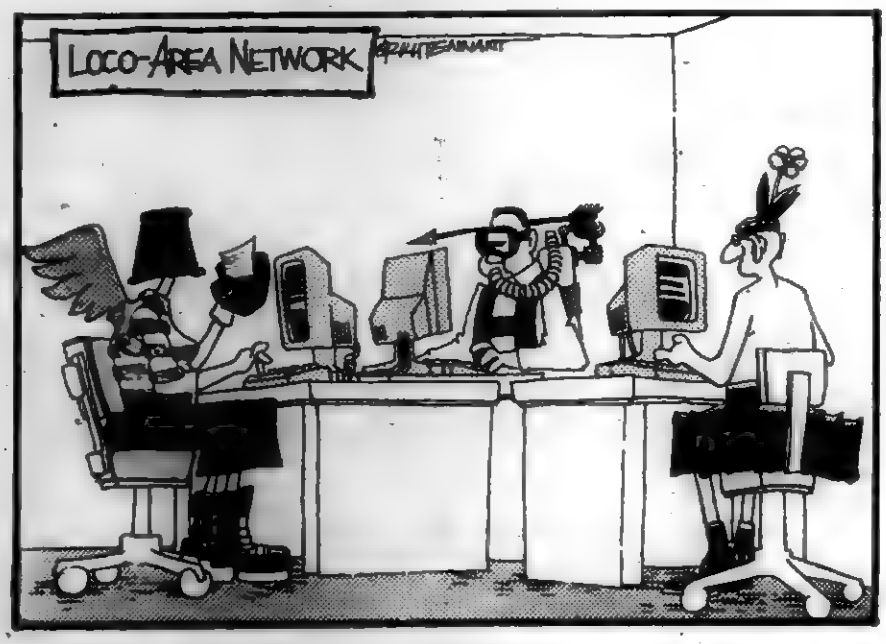
Source: Bureau of Labor Statistics

Regulatory action

One of the last vestiges of the old Bell System monopoly will be blown away on May 1, when the Federal Communications Commission is set to open the $7.5 billion market for toll-free service to full competition. Users will be able to switch their 800 numbers to carriers other than AT&T.

1992 net income by regional Bell operating company (in billions)

The Fifth Wave *by* Rich Tennant



Inside Lines

Futzing with the facts

Microsoft officials may have been a tad overzealous in their latest bid to stop alleged software pirates. During the company's most recent raids against DOS and Windows bootleggers, corporate attorney Jim Lowe said "any Microsoft products in the marketplace today should be considered counterfeit if they bear the trade names of Spring Circle or BTI," the two company names that pirates put on the bogus software. He neglected to mention that until this past autumn, the Whittier, Calif.-based Spring Circle *was* a licensed producer of DOS and Windows. Spring Circle officials say that since Lowe's statement they have been swamped with calls from nervous users of their legitimately manufactured versions of DOS and Windows.

First National EDS

Long known as a financing source for its outsourcing customers, Electronic Data Systems last week was more than ever the banker. According to an *American Banker* report, EDS put up $50 million to cover withdrawals at automated teller machines that had been knocked out when the roof of an EDS data center collapsed during the East Coast blizzard two weeks ago. The industry daily said the $50 million covered customers whose banks could not settle transactions during the outage. EDS is expected to recover most of those funds.

Mark your calendars

SunSoft's enhanced Solaris operating system, Solaris 2.2, is due in five weeks, according to Michael Sears, head of business development. Sears, meanwhile, said SunSoft wants to expand its alliances to include signing up small software companies to sell their wares through Sun's large distribution channels. Sun is also within a year of shipping a $5,000 SPARCstation that runs Novell's NetWare, a source said. Sun reportedly has been showing a prototype of this system to IS managers, and the prospect of a cheap Unix and Novell solution has them itching to get their hands on it. Finally, the Solaris Developer Conference opens today with the official debut of Solaris on Intel hardware, a closer look at Sun's plans for its Distributed Objects Everywhere strategy and a joint technology agreement with Kodak.

A glint in the mist

Signaling that Taligent is getting closer to releasing product, Randy Livingston, the CFO of the Apple/IBM/Motorola joint venture, sought application development partners at an investment confab last week in Palm Springs, Calif. Livingston declined to specify when Taligent's object-oriented operating system was due but explained that the company is now lining up third-party software makers to start building applications and tools for it. Meanwhile, Kaleida, the joint multimedia venture between IBM and Apple, is developing a language called Script X, which is a cross-platform "scripting" language designed to provide multimedia access across multiplatform PC environments as well as personal digital assistants and other handheld devices.

The ultimate sacrifice?

Microsoft Chairman Bill Gates' presence was felt at the launch of Lotus Notes 3.0 last week, even though he was not there. Lotus Chief Technical Officer John Landry congratulated Gates on his pending nuptials. "I guess Bill would do anything to upstage this event," Landry said.

Vice President Al Gore's information highway project is realistic and doable by Gore's target date of the year 2015, according to 65% of 1,000 UniForum attendees surveyed during the show two weeks ago by UniForum and Dun & Bradstreet Software. However, more than half of the pessimistic respondents said the project will not get done because of the government's lack of understanding about the technology and management issues involved. Phone, fax or CompuServe Assistant News Editor Patricia Keefe with news tips at (800) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice mail tip line at (508) 820-8555.

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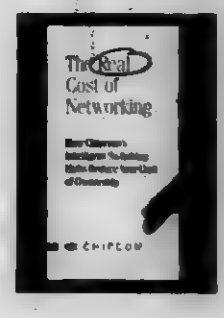

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Queries optimized for stand-alone & networked computers	Yes	No
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Full cross-platform compatibility	Yes	No
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Multiuser ready	Yes	No

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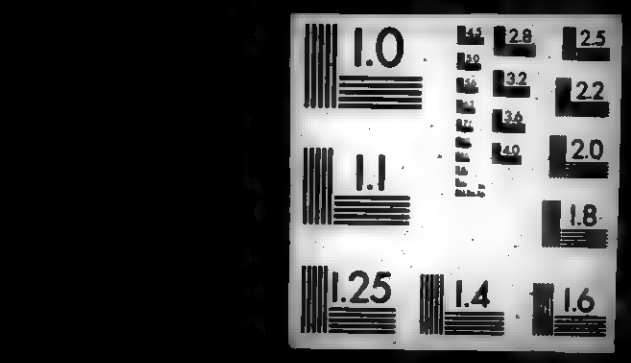
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COMPUTERWORLD

Inside

OPERATING SYSTEMS
SunSoft's Solaris Developers Conference sets the stage for a slew of announcements, including a May ship date for Solaris on **Intel**-based PCs and plans to port Solaris to **IBM**'s PowerPC chip. *Page 12.* Do users really need MS-DOS 6.0? A test drive indicates its utilities may help nonexpert users but mainly when the product is delivered with a new system rather than as an upgrade. *Page 39*

MAINFRAMES
In a bid to move customers gracefully to open systems, **Unisys** this week will roll out new A series hardware and software with added Unix integration capabilities. *Page 2*

COMPUTER CRIME
The **Justice Department** proposes new sentencing guidelines that should toughen penalties for convicted computer criminals. *Page 20.* A judge with a sense of humor fines a computer 60M bytes for contempt of court *Page 2*

TCP/IP barriers falling

By Elisabeth Horwitt
COLUMBUS, OHIO

The official TCP/IP standards body began moving aggressively last week toward knocking down the last remaining barriers to the protocol's full adoption by the multinational, corporate business community.

Moves by the Internet Engineering Task Force and International Standards Organization to work together on future internetworking standards were of particular promise to users. They follow efforts by various workgroups to address specific Transmission Control Protocol/Internet Protocol shortcomings.

Task force bits

The Internet Engineering Task Force first met in 1986. Attendance jumped from 112 people in 1989 to 600 at last week's meeting.

The TCP/IP market was estimated at about $2 billion in 1992, according to Lyman Chapin, chairman of the Internet Advisory Board.

The two standards bodies also discussed the possibility of merging the best features of the ISO's Open Systems Interconnect and TCP/IP into a single, international internetworking standard.

"We want to have one focus of internetworking protocols from now on: no more war," said Lyman Chapin, chairman of the Internet Advisory Board.

As such, the IETF meeting provided good evidence of TCP/IP's progress from a down-and-dirty network engineer's protocol to a mature standard that corporate information systems departments can trust with business-critical applications.

TCP/IP, *page 8*

Users push hard for EDI, X.400 integration

By Lynda Radosevich

Users are clamoring for vendor assistance in merging electronic data interchange and messaging technologies onto a single network, a move that would provide them with better tracking and security than they get with EDI services today.

Large companies are also looking to exchange electronic business documents and send electronic mail across one standards-based messaging network because they want to slash the hefty cost of maintaining separate network resources.

The technologies that will let them achieve these goals are the X.400 protocol for messaging and its corresponding X.435 EDI component. However, X.435 translation software and EDI value-added network gateway and transport services must emerge before users will be satisfied.

Oiling the gears

Behind the push to spur vendors to action is the Petroleum Industry Data Exchange, whose members include Texaco, Inc., Chevron Corp.,

EDI, *page 8*

Growing support options challenge PC planners

By Kim S. Nash and Christopher Lindquist

Suddenly, PC software support is not so simple anymore.

A barrel of new options has spilled into the market in recent months as users demand more attentive service and vendors seek to make money from what has typically been a money-losing proposition. The result: Users will now have to pay for some services they once got for free, and they will have to do more homework before signing support contracts.

However, many more options are now available. Among the recent changes in support channels are the following:

• Borland International, Inc. confirmed last week that it will outsource end-user support for 12 "nonactive" applications that are no

Support options, *page 6*

Travel firms rush to avert system cutoff

Former Confirm partners argue as deadline nears

By Mark Halper
DALLAS

■ With just six weeks left before outsourcer AMR Corp. terminates a reservation processing agreement, Hilton Hotels Corp. and Budget Rent A Car Corp. have yet to make alternate arrangements.

AMR is scheduled to pull the plug on the reservation system, called North, on May 15. As of last week, it appeared unlikely that Beverly Hills, Calif.-based Hilton and Budget, based here, would have processing arrangements in place when the contract to operate North ends.

Bob Aprati, general counsel at Budget, declined to speculate on the firm's options if the contract is not extended or a replacement service is not found in time. However, he said, "we don't believe" that operations will grind to a halt.

Hilton declined requests for interviews. A spokeswoman said officials there "do not feel comfortable at this date in talking about the details."

Budget and Hilton's quandary appears to mark the latest fallout from the failed Confirm reservation project, which had called for AMR to develop a state-of-the-art system for Hilton, Budget and Marriott Corp.

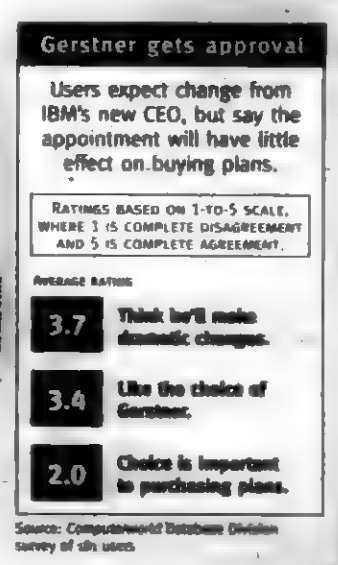
Confirm was to have provided Hilton and Budget with far greater functionality than the aging North system, which is more than 20

Travel firms, *page 16*

Advice plentiful for IBM CEO

▶ As Louis V. Gerstner Jr. takes over as IBM chairman, he faces a complex series of decisions about where to compete and which product lines to emphasize. *Computerworld* interviewed analysts and users last week to find out what they think the challenges IBM faces are in each of its major markets and what strategies it needs to employ to get back on its feet. The consensus: IBM has more strengths than some people think, but it needs to eliminate corporate deadwood to take advantage of them. Pages 14 and 33.

Louis V. Gerstner Jr. *will earn up to $3.5 million this year as the new head of IBM, nearly three times as much as his predecessor, John Akers*



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CLIENT/SERVER

While the idea of client/server projects may cause visions of development tools to dance in PC zealots' heads, the real key to success lies in planning and interactive teamwork. Seasoned IS managers share their advice on winning with client/server. *Page 75.* **IBM** "downsizes" CICS transaction processing to OS/2-based client/server environments, with AIX servers to follow in June. *Page 4*

LANs

Apple's push to install Macintoshes on more corporate desktops has been hampered by past difficulties in connecting the Macintosh to PC-based LANs. However, all the major LAN vendors, including **Novell**, **Microsoft** and **Banyan**, have recently announced plans for improved Macintosh support on corporate LANs. *Page 47*

WORK FLOW AND IMAGING

Imaging software may have dropped in price, but you still have to pay $5,000 to $10,000 per seat to get an extensible, customizable system. *Page 81.* As for the traditional systems from **IBM**, **Wang** and **FileNet**, Buyers' Scorecard respondents rated them high in user satisfaction. *Page 90.* FileNet Corp. describes a new, object-oriented, general-purpose work-flow system for availability in early 1994. *Page 10.* **The Securities and Exchange Commission**'s electronic filing system shifts into high gear. *Page 59*

PC SOFTWARE

Managers don't use PCs as much as they should because current software doesn't support their three primary tasks: coordinating groups, communicating ideas and controlling money. An author argues that what would be on target is software that takes the best features from personal information managers, project management tools, spreadsheets and bulletin boards. *Page 93.* **Microsoft**'s Bill Gates outlines modest expectations for **Windows NT** shipments and reveals plans for a single programming interface for Windows, the **Apple** Macintosh and Unix. *Page 6*

FACE TO FACE

As SAS Institute prepares its biggest product rollout ever (*page 24*), founder **James Goodnight** talks about how his company has survived the ups and downs of 17 years in the industry. Goodnight may be the only major software company head to continue to be the lead programmer on a company product. *Page 113*

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Unisys to augment A series

By Thomas Hoffman

BLUEBELL, PA.

■ In an effort to forestall the migration of its A series mainframe customers to cheaper distributed systems, Unisys Corp. this week will introduce several models and related software components designed to provide further integration between the mainframe environment and Unix platforms.

Informed sources said Unisys will introduce an A-7 midrange mainframe machine designed to run on the vendor's proprietary Single Chip A Series Mainframe Processor chip. The A-7 package will include a Unisys application called the Cooperative Computing Environment (CCE), which will allow A series customers to place a Unix or IBM OS/2 workstation or server in a parallel processing mode with A series machines.

CCE enables users to integrate A series and Unix applications with each other, said Thomas Willmott, vice president of the Aberdeen Group, a Boston consultancy. It permits users to create single-image applications using key components of three primary operating environments, including the A series MCP/AS, IBM's OS/2 and Unix.

For example, primary processing, monitoring and database management of an on-line transaction processing application could reside in the A series domain, while the user interface portion of the application could be hosted by a graphical user interface in Unix or OS/2 environments.

In addition, Willmott said, Unisys will announce that Oracle Corp.'s SQL Star and SQL Net software packages will be configured to run on A series platforms.

Willmott said Unisys' A series line of computers has been a surprisingly strong revenue generator during the past year, given the moribund state of the mainframe industry overall. Pointing to the $338 million A series contract that Unisys won last year with the U.S. General Services Administration, he estimated that Unisys A series revenue alone was roughly $1.9 billion, or 23% of the vendor's $8.4 billion in total revenue last year.

Frank G. Brandenberg, vice president and general manager of Unisys' Computer Systems Group, stated earlier this year that the vendor's A series revenue grew 20% from 1991 to 1992, due in large part to customer demand for the high-end A-19 mainframe and last year's A-11 machine.

However, Willmott and other analysts cautioned that the A series will eventually face the price/performance and portability challenges confronting other mainframe platforms, such as IBM's MVS environment.

Big money

In 1992, Unisys landed approximately 150 new A series mainframe customers solely through an alliance with Information Technology, Inc., a software developer that provided Unisys with more than $100 million in new revenue, according to Ron Bell, Unisys' chief technology officer. Unisys' combined 1992 mainframe revenue was roughly $3.5 billion — or 42% — of the firm's $8.4 billion revenue total.

Rogue computer fined for contempt

By Mitch Betts

MIAMI

In at least one jurisdiction, that modern-day excuse, "It's the computer's fault," is no longer acceptable.

A federal bankruptcy judge with a sense of humor has cited a NationsBank Corp. computer in contempt of court and fined it 60M bytes of memory for sending erroneous bills.

The case began late last year when the NationsBank computer sent a dunning letter to John and Margaret Vivian in Miami Lakes, Fla., even though the bankruptcy court had excused them from paying the debt.

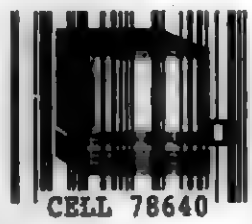
The bank apologized, "proceeded to appropriately chastise their computer and directed it not to send any more notices to the Vivians," Judge A. Jay Cristol wrote.

But "the rampage of the rogue computer" continued, Cristol said, as it sent the Vivians dunning notices for the next two months. Although the bills showed no balance due, Cristol said, the Vivians were upset.

They wrote a scathing letter to the court asking, "Why can't you or your court get these continuing and very annoying letters STOPPED?" and threatened to take the matter to a federal judge who is a family friend.

Judge Cristol said it was this letter — which "has truly established, beyond all reasonable doubt, that Mr. and Mrs. Vivian have no sense of humor" — that led to the Dec. 8 contempt citation, which was just recently published.

Accordingly, the judge fined the NationsBank computer "50M bytes of hard drive memory and 10M bytes of random-access memory." NationsBank's attorneys responded by sending the court a hard disk and nine computer chips that exceeded the amount of the fine.



Court documents indicated that the defendant was an IBM microcomputer (model unspecified) linked to a Novell, Inc. local-area network. The offending notices were generated by a corrupt database file.

Corrections

- An item in the March 1 issue should have said KC Branscomb left Intellicorp to join Lotus Development Corp.
- A story in the March 15 issue misspelled the name of Steve Gardner, the former head of Groupe Bull's Integris unit.
- An article in the March 22 issue reported that Mallinckrodt Medical, Inc. will probably buy several hundred Versas this year. In fact, Mallinckrodt has not chosen a vendor.

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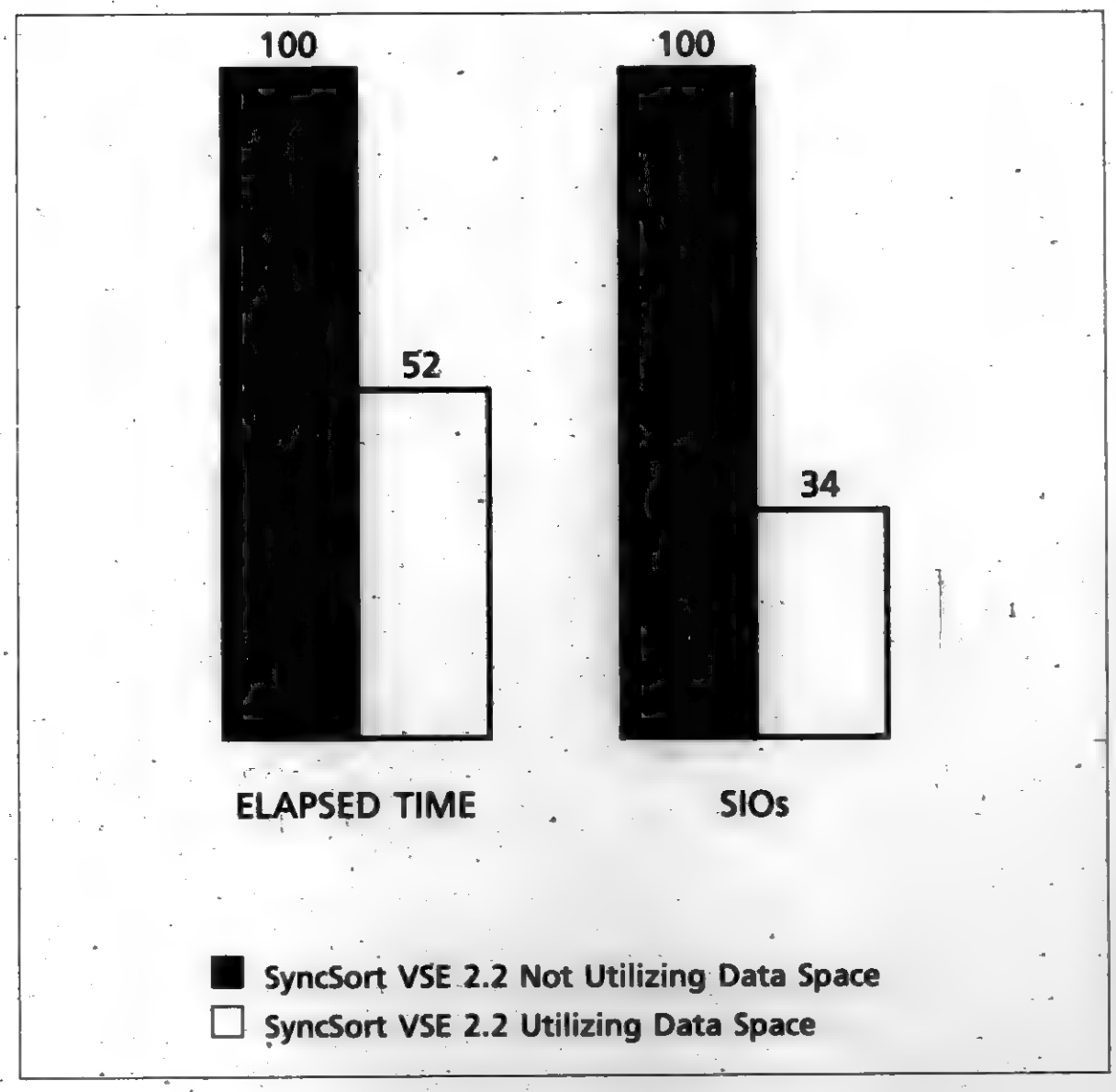

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First Data buys Anasazi

By Mark Halper
NEW YORK

In a fusion of low-profile forces intended to create a strong presence in the reservation outsourcing business, outsourcer First Data Corp. has acquired reservation technology specialist Anasazi, Inc.

The deal, consummated quietly earlier this year, was not disclosed because its value was immaterial to the stock of First Data, a First Data spokesman said.

First Data is a $1.2 billion company that went public a year ago. It was once part of American Express Co., which still owns a 22% stake, he noted.

The company is primarily a mainframe operator that sells credit-card processing services for 700 banks. It also processes data for hospital billing, mutual funds and cable television billing clients and is in the money order and money wire transfer business.

First Data's reservation activity has been limited to a processing job with Ryder System, Inc., and it acquired Anasazi to help catapult it into the travel sector, the spokesman said. It has a phone-answering business — often an element in reservation deals — by virtue of a telemarketing operation, he said.

Anasazi in Phoenix provides Unix-based reservation software licenses and also sells processing services using Unix technology. The 6-year-old company had revenue last year of about $20 million, said Chief Executive Officer Tom Castleberry.

Anasazi's licensing customers include Choice Hotels International, whose properties include Clarion Hotels & Resorts, Comfort Inns, Econo Lodge, Rodeway Inns and Quality Inns; Hospitality Franchise Systems, Inc., which owns Days Inn of America, Inc., Howard Johnson Hotels and Ramada Franchise Systems and is acquiring Super 8; and Promus Cos., which own Embassy Suites and Hampton Inns.

Its processing customers include Regent International Hotels, Four Seasons Hotels Ltd. and Sonesta International Hotels Corp. Prospective customers include Hilton Hotels Corp.

It is not yet clear how First Data will match its mainframe technology with Anasazi's largely open systems approach.

First Data details

First Data has data centers in Boston; Charlotte, N.C.; Denver; and Basildon in the U.K. It earned $144 million on sales of $1.2 billion for the year ended Dec. 31.

Syncordia wins mega outsourcing pact

By Elisabeth Horwitt
LONDON

British Petroleum Co. (BP) has decided to outsource its data, voice and video communications needs and employees to Atlanta-based BT subsidiary Syncordia.

"It's part of a larger move toward outsourcing that BP has been doing for years now," a BP spokesman said. For example, BP Exploration outsourced all of its accounting services two years ago, which was a "huge success," he added. "Outsourcing provides substantial cost savings and allows your key personnel to concentrate on the core activities of the company."

Under a five-year contract, whose initial amount is $12 million per year, Syncordia will design, provision, manage and maintain network operations for BP's corporate headquarters here, as well as for the BP Exploration business, the company announced last week.

Other BP subsidiaries could buy into the contract during the next few months, a BP spokesman said.

The contract is part of an overall strategy on BP's part to outsource its entire data center, local-area network, desktop and network operations, the BP spokesman said. While the deals have not been officially announced, BP plans to outsource its data center services to Birmingham, England-based The Sema Group and outsource its desktop and LAN operations to Systems Applications International Corp. in San Diego, according to an industry source.

BP initially put out a request for information in December 1991 for a network outsourcing provider. Syncordia won the contract from a short list of six vendors.

BP's three outsourcers will integrate their management systems and support structures to provide the "proverbial one-number call" to resolve all problems, the Syncordia spokesman said.

Syncordia will provide network services through subcontracts with companies such as AT&T, Mercury International and BT, the spokesman said. Syncordia will also provision and manage all voice, videoconferencing and data networking equipment down to routers on the premise, he added. One of the other two vendors will manage BP's LAN equipment.

Up to 30 BP telecommunications employees will work at Syncordia. Ten have moved already.

Contracts with all three outsourcers include financial penalties for failure to provide a certain level of service, as well as credits for better service and greater cost savings, the Syncordia spokesman said.

Signed, sealed

BP Chemicals signed a three-year contract last August, under which Syncordia and BT's Global Network Service will interconnect 11 of the BP business' European sites.

Transaction processing

IBM downsizes CICS for OS/2-based client/server nets

By Joanie M. Wexler
WHITE PLAINS, N.Y.

Client/server computing won a minor victory last week when IBM said it would make its widespread, mainframe-oriented CICS transaction processing software available for OS/2 2.x servers and Apple Computer, Inc. Macintosh clients in September.

The IBM announcements, made in sync with the vendor's delivery of CICS-complementary "middleware" code, mean that companies can run CICS applications in local-area network environments either cooperatively with mainframes or sans big iron. To date, CICS has functioned primarily as a mainframe-based subsystem that implements transaction-based routing between terminals and applications.

A version of CICS for OS/2 is available today; however, it is a single-user system in which an OS/2 desktop is both client and server, and applications are not shared among end users.

With more than 20,000 copies of mainframe and OS/2 CICS packages already installed, "a key facilitating factor in downsizing is preserving the embedded software maintenance and expertise you have with CICS," observed Peter Burris, director of commercial systems research at International Data Corp., a research firm in Framingham, Mass.

Mac the client

Macintoshes will be used as clients in just 5% of all on-line transaction processing applications in 1993, according to the Standish Group International, Inc., which last week tabulated the results of a cross-industry, 3,600-company survey of client/server implementation plans.

To that end, Sears, Roebuck and Co. is beta-testing the new version of CICS OS/2 for servers in 800 retail stores for reading and checking pricing data and credit-card authorizations, according to IBM.

No immediate plans

Other CICS shops comforted by IBM's direction are not necessarily ready to install the software tomorrow.

For example, Robert Catalanotti, manager of information systems at manufacturing firm BW/IP International, Inc. in Vernon, Calif., said that while he has "no desire to put CICS on LANs now, it is important that IBM is making CICS available in a client/server environment so that we have alternative platforms" to choose from.

"However, the Unix platform [IBM's AIX] would be more attractive because it is more open; OS/2 is quite proprietary," Catalanotti said.

IBM intends to deliver CICS for AIX in June and a version for Hewlett-Packard Co. Unix platforms at the end of the year, according to Olwyn Spencer, IBM's CICS workstation products manager.

CICS for OS/2 client/server software costs $3,995 for the server. The client version — regardless of platform — costs $150.

IBM leads OLTP

1992 U.S. on-line transaction processing (OLTP) revenues (in millions)

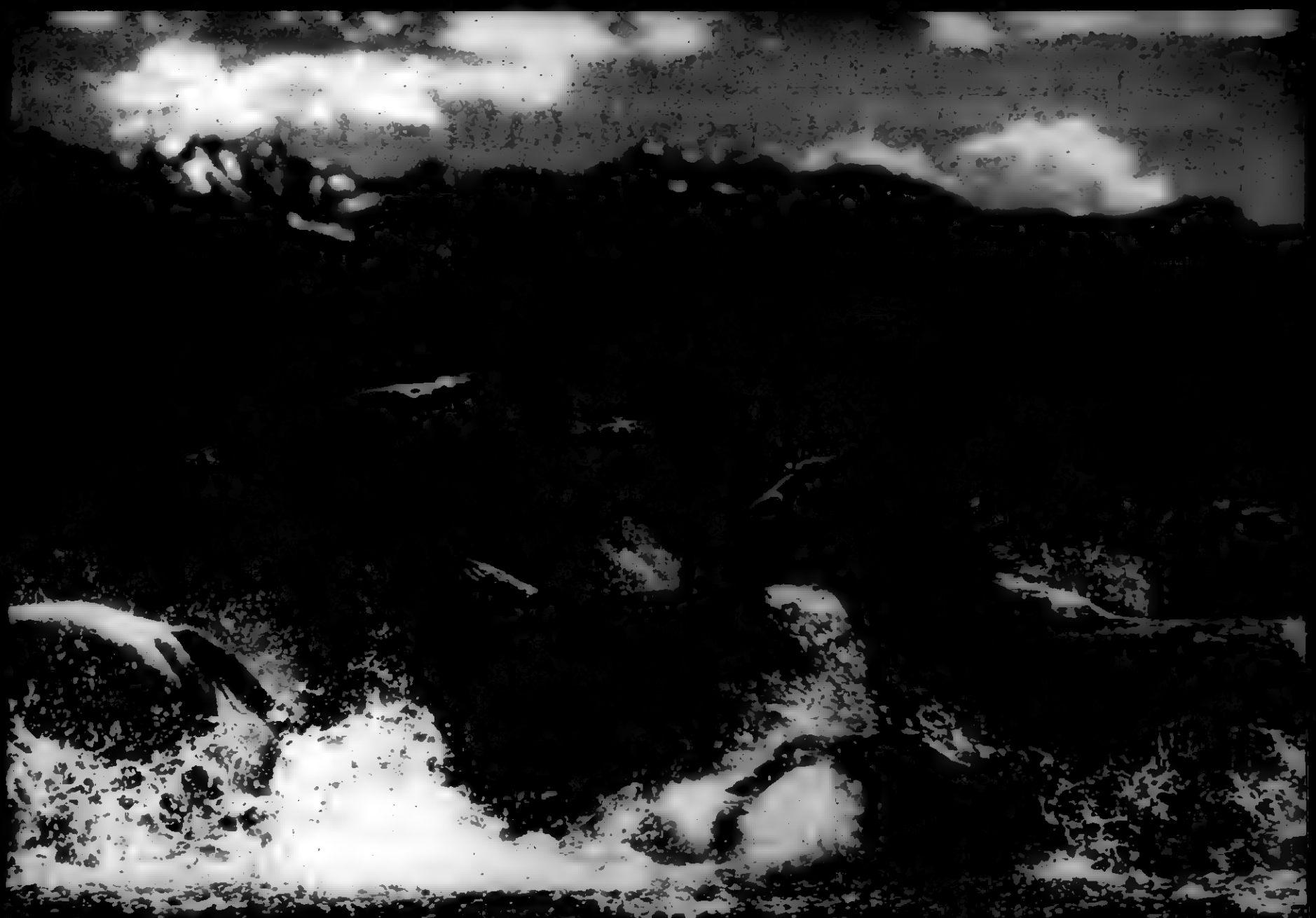
Platform	
IBM CICS	$620
Other IBM	$90
Tandem	$75
Unix	$13
Other	$115
Total	$913

Source: Standish Group International, Inc.

Thirty-five companies had signed up to develop applications running under client/server CICS for OS/2 as of late last month.

IBM also filled in another box of its IBM Networking Blueprint last week with the Messaging and Queueing Series middleware it co-developed with Systems Strategies, Inc. for isolating programmers from the complexity of underlying networking protocols.

Messaging and Queueing handles the asynchronous (store and forward) portions of a given application, while CICS handles the synchronous (real-time) transaction processing activities.



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News Shorts

SQL Server kits ship

Microsoft Corp. last week shipped a second wave of beta-test kits for its 32-bit SQL Server for Windows NT software, boosting the number of beta-test sites from 600 to 1,500 — more than half of them at corporate sites. At the same time, the company is shipping a $495 client/server development kit to independent software developers and corporate developers.

Travel agencies to go wireless

In a significant endorsement of wireless local-area networks, **American Airlines'** Sabre reservation unit announced last week that it will allow its subscribers to install wireless LANs beginning in the middle of this month.

PC wave from IBM

IBM PC Co. plans to unveil tomorrow some 40 new models of its Personal System/ValuePoint machines, which will feature a minitower and top out at 33- and 66-MHz DX2 power. IBM will expand storage capacity up to 527M bytes and add second-level cache and two local buses. Last week, it announced two versions of its ThinkPad 710T, a second-generation pen-based machine. Meanwhile, company President Robert Corrigan told *The New York Times* that the business unit will post significantly better financial results in 1993 than it did in 1992.

New Apple attack on multimedia

Apple Computer, Inc. put new blood into its multimedia efforts last week with a series of announcements, including a five-part agreement with **MacroMedia** to provide Macintosh-based multimedia authoring tools and training centers. Apple also unveiled its newly created New Media/New Markets group, which will be charged with expanding Macintosh multimedia opportunities. **Kaleida**, the company resulting from an alliance between Apple and **IBM**, also announced that it is developing standards and licensing technology for cross-platform multimedia products.

Sterling makes golden deal

Sterling Software, Inc. last week agreed to acquire **Systems Center, Inc.** in a stock swap worth $185 million. Dallas-based Sterling provides systems software for data storage management, application development, information management and reporting and data communications. Systems Center, based in Reston, Va., sells tools for automating and controlling systems and networks, data transfer across heterogeneous environments and software distribution. The company's line of products for IBM's VM systems is especially strong.

SHORT TAKES Atlanta-based **Softlab, Inc.** said it has joined IBM's AD/Cycle alliance. . . . **Lotus Development Corp.** said it has delivered 125,000 copies of the Improv spreadsheet for Windows since it began shipments in early March. . . . **Spinnaker Software Corp.** completed its acquisition of utilities maker Power Up Software. . . . **Object Design, Inc.** in Burlington, Mass., and **Cadence Design Systems, Inc.** in San Jose, Calif., reached an agreement under which Cadence will build future versions of its software-aided design tools on top of Object Design's own ObjectStore database. . . . The Precision RISC Organization, which promotes **Hewlett-Packard Co.**'s Precision Architecture-RISC technology, is circulating specifications for an application programming interface designed to assure compatibility among different vendors' PA-RISC-based products.

News shorts, *page 16*

Gates feeds CAMPers tasty tidbits

By Michael Fitzgerald
ROSEMONT, ILL.

Microsoft Corp. Chairman Bill Gates fed interesting morsels, including better support for the Macintosh and Unix, to the audience at last week's meeting of the Corporate Association of Microcomputer Professionals (CAMP).

Gates told some 2,000 CAMP members that a beta-test version of his Windows NT operating system will ship this month to some 50,000 users and eventually will reach 70,000 beta-test users.

Citing a midyear Windows NT ship date, Gates hedged his bets by saying the shipment date could slip, "depending on the beta user feedback process."

Moreover, he said Microsoft is promising developers only that one million copies of NT will ship in the product's first 12 months on the market. That is less than the current run rate for IBM's OS/2.

Gates said that further down the road, DOS and Windows will merge with DOS 7.0 into a 32-bit, multithreaded operating system with graphical and character-based versions. He said this product is more than a year away.

Microsoft's Bill Gates *warned users NT could ship late*

Addressing multivendor systems, Gates said Microsoft plans to build a single application programming interface that will work between Windows, the Apple Computer, Inc. Macintosh and Unix.

"We are productizing our internal tools" for porting products between Windows and the Macintosh, Gates said. "We will provide a runtime layer for popular versions of Unix, though we will stay with the Windows interface."

Sun Microsystems, Inc., meanwhile, is working on "Wabi," or the Windows Application Binary Interface, which will run Windows applications native on Sun's Unix.

Gates avoided a question about when Microsoft will overtake Novell, Inc. in the networking market, but he predicted that Windows for Workgroups will outstrip Novell in small office environments, where the market leader is Artisoft, Inc.'s LANtastic.

Gates also conceded little to OS/2, predicting that it will fail to build "critical mass" with software developers. He said Microsoft will not develop OS/2 applications as long as OS/2 supports Windows applications, although it will develop certain products, such as electronic mail, for OS/2.

Support options

CONTINUED FROM PAGE 1

longer being enhanced.

•Free-support stalwart WordPerfect Corp. acknowledged that it is looking at for-fee programs and outsourcing support during peak periods.

•Microsoft Corp. recently started electronic, CD-ROM and network consulting programs priced at up to $15,000 per year.

•Third-party support providers such as Software Support, Inc. and Corporate Software, Inc. now offer extensive end-user support programs, including dedicated on-site help.

•Retail outlets such as Computerland Corp., Merisel, Inc. and Egghead Software now sell support offered by their own technicians or third parties.

Users said they will not pay for support plans unless they receive tailored, high-quality service in return. "If I have an advanced question, I should not have to deal with front-line people who read the manuals back to me," said Greg Feeler, information systems manager at Employer's Resource, Inc. in Boise, Idaho.

Paid support should lead to better service, said Jeff Tarter, publisher of "SoftLetter" in Watertown, Mass. He said many corporate users doing tricky implementations "are perfectly willing to pay for support."

But to make sure they get what they are willing to pay for, users will have to adjust to studying support needs more carefully than they had been, observers said. Balancing the cost/value equation is key, agreed Andrew Boswell, associate consultant at Baxter Healthcare Corp.'s I.V. Systems Division in Round Lake, Ill.

"If you need an hour of staff time to answer a question vs. a two- or three-minute phone call, would it really cost you to pay for services?" Boswell mused.

Most of the major PC software makers offer so-called "premium" for-fee support programs to large customers. But now users of all sizes can bypass vendors and opt for paid programs from third-party providers or retailers that, in some cases, offer services that vendors do not (see chart).

Free no more

Free PC software support services are minimal compared with what corporate users need, especially as downsizing fever burns and support questions become more complicated

FREE	PAID
• First 90 days.	• 24-hour hot lines — both 800 and 900 numbers.
• Fax-back programs.	• Remote help desks.
	• Tailored attention from support staff who know users' particular hardware and software setups.
	• Detailed reports of frequent trouble spots.
	• Electronic distribution of software.
	• CD-ROM manuals and answers to commonly asked questions.

CW Chart: Janell Genovese

For example, users can get on-site technical staff from third-party providers. Those technicians become intimate with a firm's hardware and software configurations and can better troubleshoot problems, industry watchers said.

Further, because firms such as Software Support and Corporate Software act as backup resources to vendors during peak periods, customers are more likely to reach technical people on help lines.

That in itself is an improvement, said John Morgan, manager of pharmaceutical systems at Pfizer, Inc.'s U.S. Pharmaceuticals Group in New York. "Any way we can avoid [waiting on the phone] is welcome," Morgan said.

His unit outsourced PC software support to Corporate Software a year ago to support some 1,200 DOS, Microsoft Windows and IBM OS/2 PC users. Corporate Software offered attractive deals, Morgan said.

Dealing with one vendor for total support needs attracted Chemical Bank Corp. in New York to Corporate Software, said Anni Levy, manager of vendor relations and contract negotiations. More than 1,300 PC users in the bank's Geoserv unit call a toll-free number at Corporate Software for help, and Levy is thinking of expanding that contract.

"If there's a company able to bundle help desk support without jacking up the price of the packages too much, all the better," Levy said. Geoserv also buys standard spreadsheet and word processing packages from Corporate Software.

Senior writer Michael Fitzgerald contributed to this report.

Until now, distributing software involved a plan of action that was long on action and short on plan.

Other than the fact that somebody racks up a lot of frequent flyer miles, there's not much good you can say about how some companies typically distribute software to end users. But now, there's a way to automate the process — AM:PM™, the centrally controlled Electronic Software Distribution and Asset Management solution.

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In fact there's only one drawback: no more vacations to Hawaii courtesy of frequent flyer miles.

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TCP/IP barriers falling

CONTINUED FROM PAGE 1

This is of particular importance to user consortia such as the User Alliance for Open Systems and the Electronic Power Research Institute, which have turned to OSI as the "official" international standard but do not expect their existing TCP/IP installations to go away, according to Angie Nevolo, chief telecommunications engineer at Pacific Gas & Electric Co.

The U.S. government also expects to deal with both protocol stacks in the future, according to Richard Colella, a spokesman for the National Institute of Standards and Technology. A number of government users "comply with the spirit" of the Government OSI Profile by providing OSI-based gateways between systems that are running TCP/IP, he added.

Another user, at a major aerospace firm, expressed hope that a closer association with ISO would make the IETF more responsive to the needs of corporate users. For example, TCP/IP applications such as Telnet lack the application programming interfaces (API) that would make corporate IS managers' lives so much easier, he added.

Vendors, not the IETF, are addressing the API problem, Chapin said.

The IETF just recently began addressing security on the Internet and in TCP/IP, Colella said. This has grown increasingly crucial to commercial and government users on the Internet, who are finding it harder to control access from the comparatively insecure Internet because their computing installations are becoming more distributed, he added.

Network reliability is another top priority for commercial users that the IETF has been slow to address, Chapin said. "In the engineering world, a network failure is exciting; in the commercial world, it's the worst thing that can happen."

We can work it out

The IETF formed its first working groups last week to deal with the problems of integrating TCP/IP and IBM SNA networks. One set of groups will come up with specifications for managing SNA devices via Simple Network Management Protocol systems.

A less formal "birds of a feather" session chaired by Cisco Systems, Inc. discussed strategies for enabling TCP/IP backbones to handle SNA more effectively.

Taking care of business

IETF workgroups last week addressed several issues near to commercial users' hearts, including the following:

- More standardized, trouble-free, reliable transport of IBM Systems Network Architecture (SNA) traffic and devices that are linked to TCP/IP backbones.
- Implementation of key OSI applications on top of TCP/IP. Prominent among these are the X.400 electronic-mail and X.500 directory standards, which provide a number of features that corporate users would like to see in TCP/IP applications.

Unlike TCP/IP's Simple Mail Transfer Protocol (SMTP), for example, X.400 supports compound messages that can include pictures, compressed video and encrypted digital signatures, Chapin said.

- Guaranteed delivery time over a TCP/IP network — a capability that would pave the way to supporting multimedia applications, videoconferencing and more effective SNA communications over TCP/IP.

One of the thornier issues at last week's meeting was how to enhance TCP/IP addressing and routing protocols to handle increasingly gargantuan networks.

If the problem is not addressed within the next two or three years, major network communities such as Internet will run out of new addresses to allocate, and routers may start dragging or even breaking down, according to IETF spokesmen.

Four proposals were on the table at the meeting, one of them based on the OSI ConnectionLess Network Protocol. Consensus seemed a long way off.

EDI, X.400 integration push

CONTINUED FROM PAGE 1

Instructions included

One of the main benefits of using X.400 messaging technology for EDI includes the ability to send multiple types of data to trading partners. For instance, rather than just sending an electronic form for ordering parts, a company could include an E-mail message with instructions and an attached graphics file with an illustration.

Shell Oil Co. and Meridian Oil. PIDX met with software vendors and network service providers in Houston last week to advocate hardware, software and network services that support X.400 and X.435.

"Oil companies see it as the way to go to reduce costs and provide a better level of service," said Bryan Swinney, EDI specialist at Texaco and a PIDX member.

In addition, some of the largest companies from the aerospace, chemical and automotive industries see X.400 and X.435 as vital to the growth of EDI. And government agencies, including the Department of Defense and the Internal Revenue Service, plan to use X.400 with X.435-based EDI.

Users have already had some success with vendors. For example, in 1991 the aerospace industry prompted value-added network (VAN) carriers to agree to link their X.400 messaging services, said Ray Day, manager of EDI systems at Vought Aircraft Co. in Dallas who is on the Aerospace Industry Association's EDI panel. The push for X.435 EDI service is the next step, he said.

Only the beginning

However, this is only a first step. "Our goal is to move [EDI] to X.400 as soon as possible. If the right products were there for the right price, we would switch tomorrow," said Bob Majowicz, EDI project leader at Air Products and Chemicals, Inc., a chemical and gas manufacturer in Allentown, Pa.

Some vendors are dragging their feet because they doubt that large companies that have already invested in smaller trading partners will be quick to change to new X.435 networks, predicted Chris Finn, an analyst at TeleChoice, Inc. in Verona, N.J.

So some user companies are forging ahead with X.400-based EDI on their own.

Byer California, a clothing manufacturer in San Francisco, is using X.435 software from Isocor and EDI translation software from St. Paul Software. With those tools, it automatically downloads EDI data from trading partners into an order-entry system, eliminating human intervention.

"It's going slowly, by choice," said Michael Higgins, technical support manager at Byer. "We didn't want to risk what we have" to switch to the new technology.

The good news is that this fall, users can expect support for X.435 to show up in many VAN services and EDI software products, said Vic Wheatman, a program director at Gartner Group, Inc.'s Santa Clara, Calif., office (see story below).

The moves should come none too soon, as users are already describing traditional EDI technology as outdated.

"If you have two users on different VANs, there are no guarantees that your EDI document will get from one [network] to another," said Paul Markovitz, a computer scientist at the National Institute of Standards and Technology in Gaithersburg, Md., which is prototyping X.435 for several federal agencies.

"The inter-VAN communication is dial, dump and pray. If it makes it, fine. If it doesn't, who's to blame?" he asked.

There are non-X.435 techniques for solving inter-VAN problems, said Martha Hanlan, director of application services at VAN service provider BT North America, Inc. in San Jose, Calif. However, the arrival of X.435 should help inter-VAN communications prevent vendor fingerpointing, she said.

Who uses EDI?

Of the 25,000 companies using EDI in the U.S. as of October 1992, breakdown by industry was as follows:

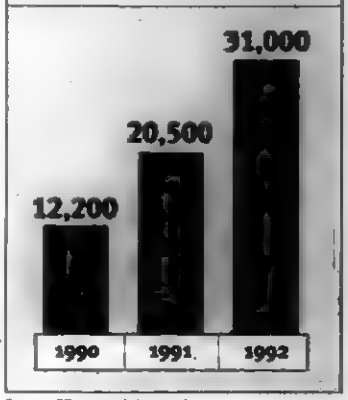
NUMBERS HAVE BEEN ROUNDED

Chemical	48%
Aircraft and suppliers	4%
Automotive and trucking	3%
Petroleum	.01%
Other	45%

Source: EDI, spread the word

More firms cut paper costs

The number of companies going paperless grew by half from '91 to '92

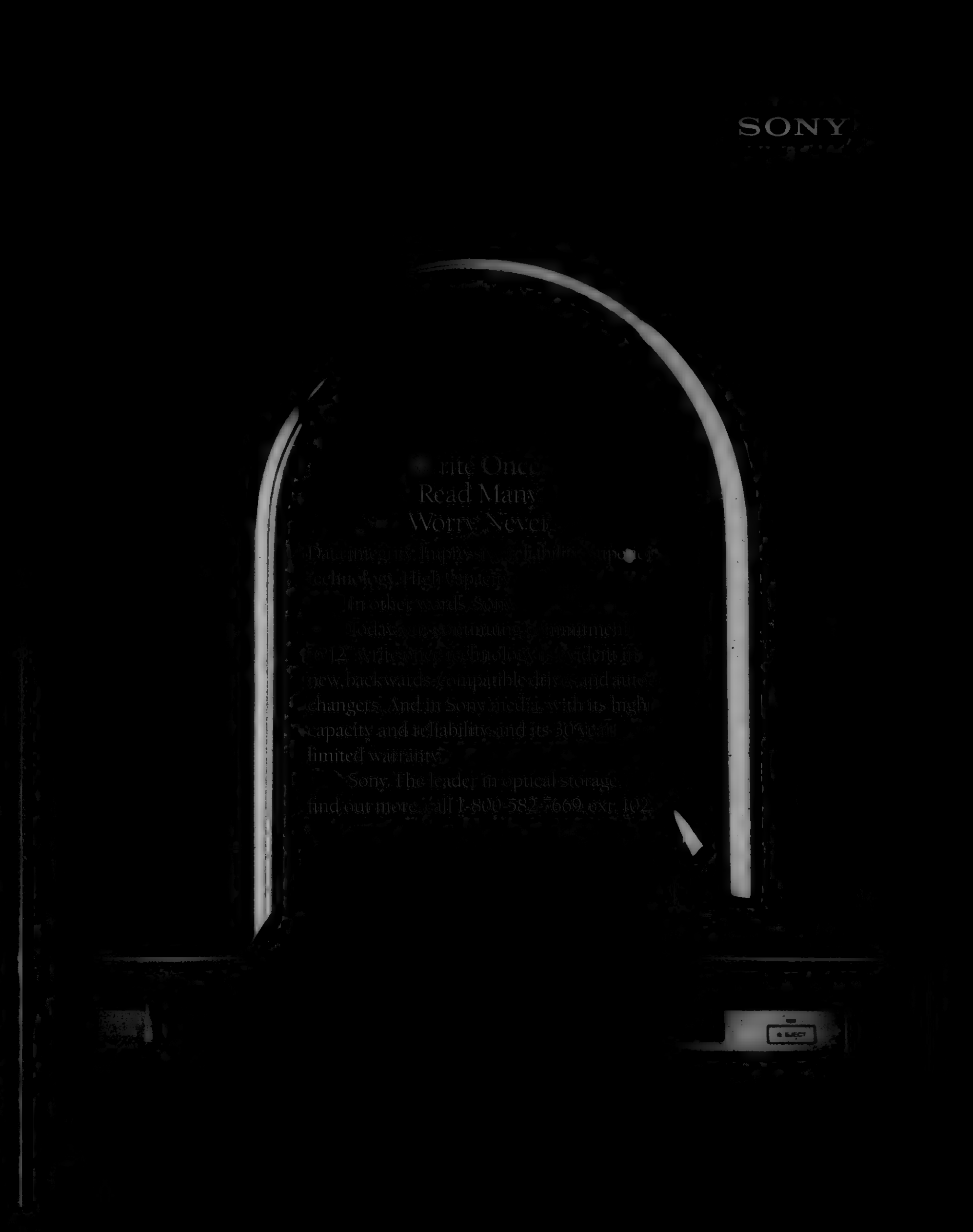


Source: EDI, spread the word

X.435 vendor support plans galore

Support for X.435 is beginning to coalesce, and several vendors plan to roll out new products by year's end, including the following:

- **BT North America, Inc.** will announce on April 14 an EDI-to-X.400 gateway service with "X.435-like" features that let users track and secure messages.
- **Digital Equipment Corp.** intends to ship X.435 capabilities in the next version of its DEC EDI gateway software. Although DEC would not confirm ship dates, analysts said they expect a May or June release.
- **General Electric Information Services** will add elements of X.435 to its EDIExpress service and mainframe and midrange translation software in the fourth quarter.
- On April 14, **Sterling Software, Inc.** will announce X.400 connectivity for its EDI service, but it will not pursue X.435 until there is more market demand, a spokesperson said.
- **Texas Instruments, Inc.** is testing X.435 EDI translation software for internal use and plans to prerelease commercial versions in June or July.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EJECT

FileNet to add to work-flow lineup

By Ellis Booker
CHICAGO

FileNet Corp. will take the wraps off its next-generation work-flow product this week with the introduction of Visual WorkFlo, a system that combines object-oriented and visual programming technologies to model, re-engineer and automate business processes.

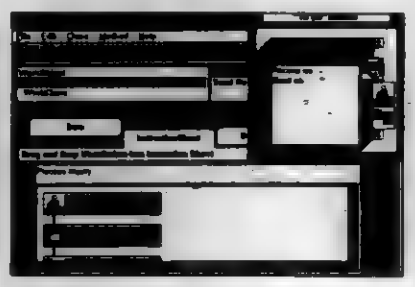
Visual WorkFlo is slated to debut this week at the annual Association for Information and Image Management show in Chicago, but the first pieces will not be commercially available until the first quarter of 1994. Pricing will be announced in July prior to a controlled release in the fourth quarter.

In its initial release, the system will be targeted at developers building work-flow applications with or without imaging services.

"Work flow" has become the "battleground for vendors of imaging systems, as well as for the fast-evolving market for process re-engineering software tools. FileNet's existing WorkFlo scripting language will continue to be enhanced and can be incorporated into Visual WorkFlo, according to FileNet.

End users and analysts said promised features in Visual WorkFlo — notably an ability to use objects created by other application development systems — reflect broad technical and customer requirements.

"It's something the industry needs — a platform for developing applications in which image is just a part, just another data type," said John Squires, group supervisor of image processing at St. Paul Fire and Marine Insurance Co. in Minnesota, which has 16 users on a FileNet imaging application. Squires was able to see the new FileNet software in prototype form earlier this year at the vendor's Costa Mesa, Calif., headquarters.



Visual WorkFlo *promises features such as the ability to use objects created by other application development systems*

"It's great they are moving to objects," said Jan Scites, senior vice president of individual life insurance at Connecticut Mutual Life Insurance Co. in Hartford. Although it is FileNet's largest installation with more than 400 image-enabled workstations, Connecticut Mutual will not use the new work-flow product because it developed an object-oriented tool that is already being used in a dramatic re-engineering project.

The software consists of "InstructionSheet" objects built up from libraries of reusable programs called "WorkPerFormers," which can image and display services from FileNet or other desktop or server applications written in other environments.

Nevertheless, Scites said, FileNet has the competence to take on the broader market for business process re-engineering tools. Some analysts agreed.

"They have the largest installed base of work-flow customers there is," said Mike Howard, vice president of office information systems at Gartner Group, Inc. in Stamford, Conn. If FileNet can convert its existing work-flow scripts into Visual WorkFlo objects, "they'll create a valuable library," he said.

Scott McCready, director of image systems at IDC/Avante Technology in Framingham, Mass., compared FileNet's approach to the plethora of graphical user interface-based work-flow systems now coming to market.

At least "80% to 90% of what good business process automation is about is what happens when the work arrives at the desktop. Getting it to the desktop is easy," McCready said.

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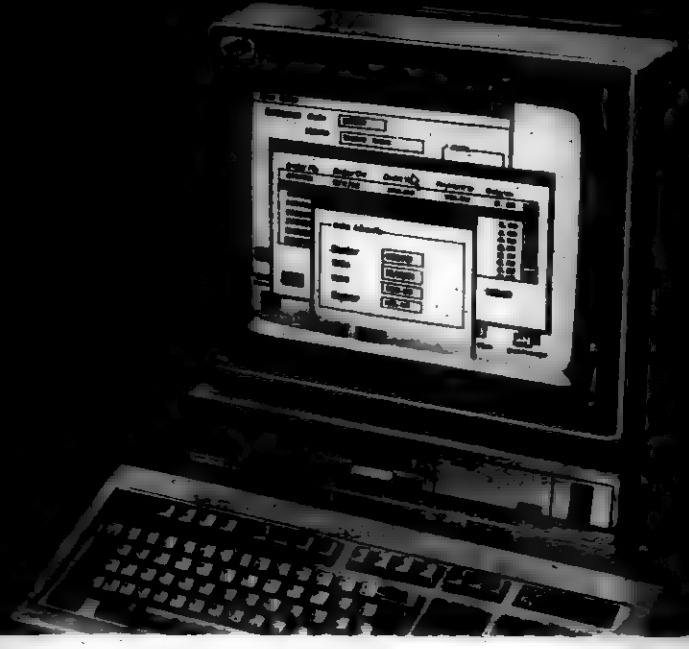

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Solaris strategy seeks to steal thunder from NT

By Maryfran Johnson
SANTA CLARA, CALIF.

■ SunSoft, Inc. sharpened its claws for the climb onto corporate desktops last week, rolling out a new version of its Solaris Unix operating system for Intel Corp. PCs and declaring IBM's PowerPC chip as the next target platform for Solaris.

SunSoft used the Solaris Developers Conference, which attracted 1,700 attendees, to hammer home the message that its 32-bit operating system is far more ready for commercial prime time than Microsoft Corp.'s upcoming Windows NT. Sun also demonstrated new technology that allows Windows applications to run under Solaris.

The emphasis on using Solaris to run large commercial enterprises was highlighted by conference speaker Dennis Jones, chief information officer at Federal Express Corp.

"Client/server computing with Sun platforms and products is a key part of our overall plan for information technology," Jones said. He noted how Fedex's internal command and control system for transportation management will eventually include 1,000 SPARCstation 10 workstations and servers.

Ease of use was another issue developers and users identified as an increasingly important element for Sun to address.

"If Solaris is to succeed, Sun needs a set of video training courses that make it as easy to use Unix as Bob Vila made repairing your house in *This Old House*," said David Pensak, corporate adviser of computing technology at Du Pont Co. in Wilmington, Del.

As an early user of Solaris on Intel, Pensak said he was pleasantly surprised at the solid technical job SunSoft did with the X86 port. "The only real fly in the ointment," he added, "is that most of the Unix goodies designed for 1,280 by 1,020 [high resolution, 17-in.] monitors don't look so good on the smaller, 14-in. monitors on PCs. The windows get all squished together and just don't read as well."

Although Sun officials said there will be 1 million installations of Solaris by the end of this year, the thought seemed to lend them little comfort. The phantom presence of Microsoft Corp. Chairman Bill Gates was pervasive at the conference, where "Bill bashing" led to some bizarre demonstrations of technology. In one display of multiprocessor use of SPARCstations, a simulated wind tunnel was used to blow a model of Gates' head into smithereens.

"I thought the display of hostility against Bill Gates was a little much," said Jeff Canin, an analyst at Salomon Brothers, Inc. in San Francisco. "It suggests that there's a lot more fear there than Sun [will] acknowledge."

Gates' predictions

For his part, Gates seems to have no problem accepting Unix as a permanent part of the computing landscape. In remarks made last week at a meeting of the Corporate Association of Microcomputer Professionals, Gates said future desktops will be dominated by Windows and Windows NT, Apple Computer, Inc.'s Macintosh and Unix. He also revealed plans to provide a single Win32 application programming interface for Macintoshes and Unix.

A few hardware tidbits also surfaced at the developers conference, including Sun's expected entry this summer into the X Window System terminal market and the spring announcement of the eight-way "Scorpion" multiprocessor SPARCserver.

The X terminal will be based on the Sun ELC low-end system, with the unusual twist of allowing upgradability to a full workstation, according to users familiar with the still-secret Sun X terminals.

While the marketing thunder was deafening at the developers conference, some attendees found the rain of details to be a bit too light. A number said they had hoped to hear more solid details about Sun's participation in the Common Open Software Environment (COSE), but no details were forthcoming.

Of concern to developers is the fate of Sun's OpenLook graphical user interface (GUI), which lost the battle to the Open Software Foundation's Motif GUI in the COSE effort.

Senior writer Michael Fitzgerald contributed to this report.

Solaris directions

Announcement highlights from the Solaris Developers Conference include:

- **Solaris for X86 Intel-based systems is slated for May delivery, with commitments lined up from major PC system vendors such as AST Research and Dell. Dell will initially offer Solaris X86 on its i486-based systems and then on machines running Intel's Pentium microprocessor.**
- **With assistance from Motorola, SunSoft plans to have its 32-bit Solaris Unix operating system ported to the PowerPC RISC chip by early 1994. PowerPC is being developed by IBM, Motorola and Apple.**
- **SunSoft will ship Solaris 2.2 in May with a number of enhancements aimed at commercial enterprisewide computing. Those include a 60% performance increase in multiprocessing, more robust graphics products, multithreading to speed up application performance and a 10% to 15% improvement in the speed of network data transfer.**
- **Sun demonstrated a new but still unannounced product called "Wabi," for Windows Application Binary Interface, which will run Microsoft Windows applications native on Solaris Unix at performance equal to 486-based PCs. Sun will ship Wabi bundled with Solaris 2.2 next month on Intel and SPARC platforms.**

Source: SunSoft, Inc. — CW Chart: Janell Genovese

X86 pricing

SunSoft's Solaris X86 will ship next month in three price categories: **Solaris Desktop** at $795 for a single client license; **Solaris Workgroup Server** at $1,995; and **Solaris Enterprise Server** at $5,995. Among the basic system features are **SunOS 5**, ONC+ networking, multiprocessing, **DeskSet** tools and **OpenWindows**. The software developer's kit costs $495.

DEC deal drives 3-D graphics push

By Melinda-Carol Ballou

With the aid of Kubota Pacific Computer, Inc., Digital Equipment Corp. last week broke into the high end of the three-dimensional graphics market, which so far has been dominated by Silicon Graphics, Inc. and Hewlett-Packard Co.

DEC and Kubota are now shipping imaging and graphics workstations that bring together Kubota's high-speed graphics subsystems and the CPU power of DEC's OSF/1 Alpha AXP workstations. This, along with DEC's shipment of new Alpha OSF/1 workstations this month, may bring DEC full force into the raging price/performance wars in the technical workstation market.

The Kubota Kenai workstations announced last week are based around DEC's already announced DEC 3000 Models 400 and 500 for OSF/1. They feature a desktop architecture that combines hardware support for both high-performance imaging and graphics rendering, Kubota officials said.

The Denali graphics subsystem connects to the Kenai workstation's 100M byte/sec. open I/O bus and can be configured with up to six transform engine modules. These perform all floating-point operations, imaging and geometry processing in the graphics subsystem, leaving the Alpha processor on the workstation available for data manipulation.

Kubota's graphics subsystems will also run in conjunction with new OSF/1-based DEC platforms to be announced later this month. Those workstations will put DEC in the top price/performance tier along with IBM, HP and Sun Microsystems, Inc., according to industry analysts. However, an initial lack of applications may hinder DEC's progress, they added.

Later this year, DEC will ship a new family of midrange graphics products based on its PXG graphics and Alpha AXP workstations.

Those products will let DEC/Kubota fill out offerings on the high end with the DEC 3000 Model 500Z, which runs at 200 MHz, has SPECmark ratings of 105 SPECint92 and 160 SPECfp92 and costs approximately $80,000; and on the lower end with the DEC 3000 Model 300, which is priced at roughly $7,999, according to sources. A third platform, the DEC 3000 Model 300L, will be priced at $4,995, the companies said.

Teaming up with Alpha

Kubota targets the technical market with DEC's Alpha AXP-based graphics workstations. Here's how the competition and DEC/Kubota boxes line up:

Vendor	Platform	MHz	SPECmarks: Floating point	SPECmarks: Integer	Base price
DEC/Kubota	Kenai 3500 E1.5	150	127.7	84.4	$51,995
DEC/Kubota	Kenai 3400 E1.5	133	112.5	74.8	$34,445
Silicon Graphics	Indigo R4000 Elan	100	60.5	57.5	$32,500
HP	735 CRX-24Z	99	150.6	80.0	$48,045
IBM	RS/6000 370 GTO	62.5	118.2	59.8	$48,835
Sun	SPARCstation 10/41-GT	40	63.4	53.2	$45,717

MCAE, CAD/CAM configuration with 32M bytes of RAM, 1G-byte disk, 19-in. color monitor. DEC/Kubota price also includes CD-ROM, roughly comparable lowest end offerings for graphics performance.

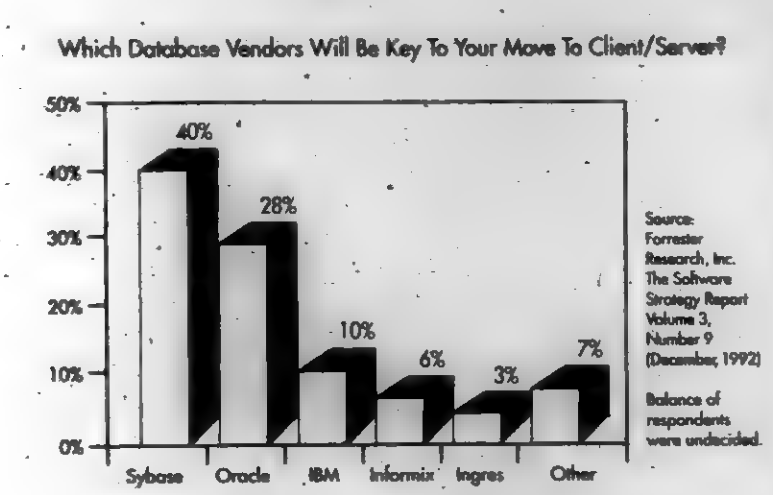
Source: D. H. Brown Associates, Inc.

New dimension for Alpha

"What this [Kubota announcement] does for DEC is let them sell Alpha workstations for the first time to customers who require 3-D graphics," said Ted Krum, an analyst at D. H. Brown Associates, Inc., a consulting firm in Port Chester, N.Y. "DEC now has a package that will enable it to start getting back into that game at a very good price/performance level."

HP's highest performance graphics offering, the CRX-48Z, transfers 600,000 flat-shaded, unlit 50-pixel triangle/sec., and Silicon Graphics' highest end VGXT offering supports 1.1 million flat-shaded, unlit 50-pixel triangle/sec., according to Krum. With its Denali V620, Kubota offers 1.2 million Garoud-shaded, lit 50-pixel triangle/sec. that are buffered to offer depth, he said. The Kubota products also support 2-D and 3-D imaging and will be available from both companies.

The analysts have graphed the future of Client/Server computing.



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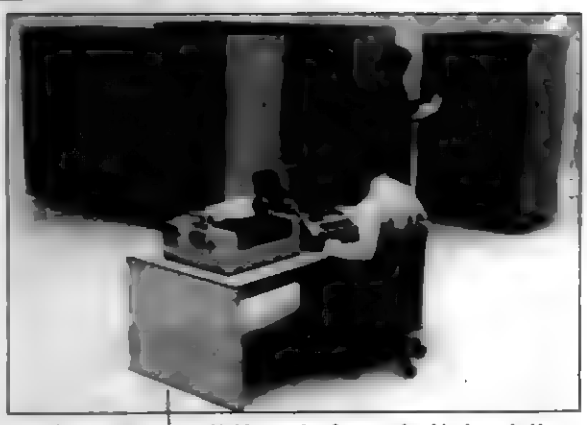
Prescription for a troubled IBM

By CW Staff

As the industry waits to see what decisions IBM's new chairman makes during the next six months, many users and analysts say they expect to see the struggling giant reduce the number of products it sells and supports.

"They have to assess every product in the sales manual to determine profitability and likely future profitability and get down to the core products that are going to take them into the next century," said James Cassell, an analyst at Gartner Group, Inc. "Why should IBM make modems?"

Specific product-line decisions will likely come during the next six to 12 months, analysts said. Following are the key strategies and challenges ahead:



Mainframes, long an IBM staple, face a declining dollar market, although processing demands are growing

▶Mainframe hardware

Estimated 1992 revenue: $12.7 billion, an 8% drop from 1991.

Challenge: To sustain a mainframe business that still accounts for about 50% of IBM's profits, while developing the next generation of parallel processing.

Strategy: IBM's large systems have taken a beating in the past few years as the overall market has shrunk nearly 25%. But these figures can be somewhat misleading. "Mainframe MIPS are growing 20% a year," Cassell said.

The problem is that IBM's prices are still higher than competitors'. Nick Donofrio, IBM's Enterprise Systems general manager, recently conceded that his top priority is to "get the costs out of our current set of platforms."

To do that, IBM will deliver in the next year a family of parallel-processing mainframes that will cut costs at least in half. These machines should eventually become more general-purpose and will not require customers to rewrite their computer applications.

Big Blue bucks

In addition to giving new chairman Louis V. Gerstner Jr. a $3.5 million base compensation, the IBM board voted to pay him a onetime fee of $5 million to reimburse him for options he gave up when he left RJR Nabisco, Inc. Last year, Gerstner earned $3 million in salary and bonuses at RJR Nabisco. Another part of Gerstner's compensation package is a guarantee allowing him to buy up to 500,000 IBM shares at a price that has not yet been set.

▶Application System/400

Estimated 1992 revenue: $14 billion.

Challenge: To keep small to medium-size users satisfied while enhancing products for large corporate customers.

Strategy: With 200,000 units installed worldwide, the AS/400 is still primarily a small and medium-size business machine with some applications in far-flung global networks. Now IBM must turn the AS/400's key features, such as built-in database and systems management software, into assets. One obstacle is that the AS/400 is still proprietary, which limits developer flexibility.

Users also said IBM needs to make good on its promises of client/server support for the AS/400, which still relies too heavily on terminal emulation. For large corporations to take to the AS/400, IBM must serve as a business partner. "They should have very seamless integration, which would be an advantage over other vendors' Unix systems," said Michael Chang, director of decision-support systems at Nissan Motor Corp. in Gardena, Calif.

▶Enterprise software

Estimated 1992 revenue: $2.7 billion.

Challenge: To make relational databases competitive with other vendors' products and move toward client/server.

Strategy: IBM's Programming Systems business unit is one of its best hopes for the open systems market, but only if IBM will support other vendors' platforms. IBM has taken its first steps in that direction by saying it plans to port its DB2/6000 Unix database to Hewlett-Packard Co. machines.

IBM's Distributed Relational Database Architecture will be supported by many database vendors, but this alone is not a competitive advantage.

IBM software facilities will also have to act quickly. Donald Feinberg, a Gartner Group program director, said IBM designers have already shown they can cut time to market in half compared with the traditional two-year cycle.

▶Storage

Estimated 1992 revenue: $6.1 billion.

Challenge: To continue technology leadership while cutting costs.

Strategy: Most of the IBM Adstar subsidiary's research and development will continue to pour into general-purpose 2-in. and 3-in. disk drives. Adstar will also focus on alternative storage, such as optical and tape, that work with computers from other suppliers.

But Adstar is coping with some hefty staff cutbacks — going from a high of 17,500 people to 13,600 by year's end. It will consolidate its 10 manufacturing facilities into three primary plants. Many analysts said they expect Adstar to become a fully independent business within about two years.

▶Open systems

Estimated 1992 revenue: $2 billion.

Challenge: To deliver on the promise of open computing throughout IBM.

Strategy: "Open systems" has become a mantra at IBM. This year alone, IBM has played up the "open" angle in product introductions for its mainframe and AS/400 product lines. Within the next two years, the AS/400 unit will begin building its machines based on the PowerPC chip.

"It's clear that each division is responding to open systems pressure in its own way," said Omri Serlin, an analyst at ITOM International Co. in Los Altos, Calif.

▶PC hardware and software

Estimated 1992 hardware revenue (including RISC System/6000): $9.8 billion.

Challenge: To regain market share and establish OS/2 as a viable operating system contender.

Strategy: The IBM PC Co. must garner higher sales volumes to survive price wars with clone suppliers. Recent turns toward direct

ThinkPad is needed to improve IBM's leadership image

sales and aggressive price-cutting have stopped market share erosion, and products such as the ThinkPad are improving IBM's image as a technology leader.

At the same time, IBM faces a struggle with Microsoft Corp. to deploy the next generation of object-oriented operating systems.

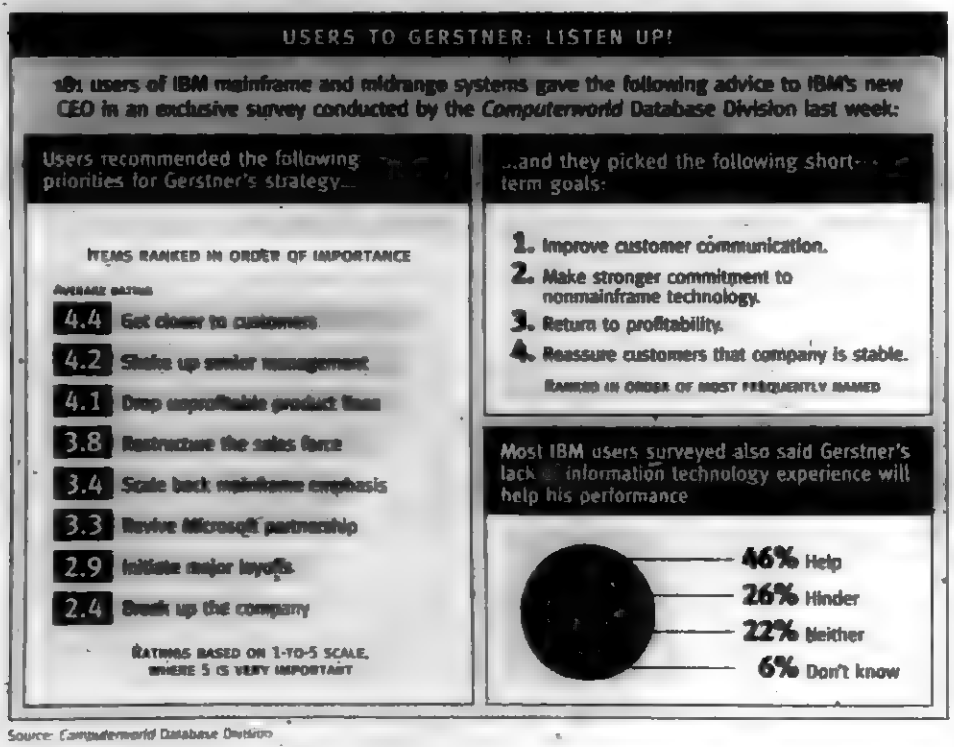
In the near term, IBM will position OS/2 on Intel Corp. platforms against Unix and Microsoft's forthcoming DOS 7.0 offering, which is expected to add multitasking capabilities. IBM also plans to deliver a portable version of OS/2 for its PowerPC reduced instruction set computing systems that it will position against Microsoft's Windows NT/Unix.

But IBM's ultimate success may ride on the Taligent object-oriented operating system that it is building with Apple Computer, Inc. The challenge is that Taligent can be delivered before Microsoft brings its rival Cairo operating system project to fruition.

▶Networking

Estimated 1992 revenue: $5.3 billion.

Challenge: To remain profitable while exploiting new markets and promoting wider adoption of its networking software on platforms other than its own.



Source: Computerworld Database Division

IBM makes first break with no-layoff policy

By Nell Margolis

Moving to put teeth in its mid-December promise to streamline its efforts for renewed profitability, IBM last week laid off about 2,400 people in its mid-Hudson Valley, N.Y., region. The first significant, product line-related break with the company's historical no-layoff policy struck at the heart of its mainframe and peripherals manufacturing operations.

"This is the bare beginning," said David Wu, an analyst at S. G. Warburg & Co. Dismissing IBM's recent estimate that it will eliminate 25,000 jobs this year as "the Akers regime figure," Wu predicted that the job-cut tally will swell, and perhaps even double, in the first years of new Chairman and Chief Executive Officer Louis V. Gerstner Jr.'s reign.

IBM spokesman James Ruderman agreed that 1993 job cuts are almost certain to exceed the 25,000 target.

The higher it turns out to be, the better, said Robert Djurdjevic, president of Phoenix-based Annex Research. A veteran IBM analyst, Djurdjevic is one of a large cadre of industry observers who have long tarred IBM's slimming efforts as too little, too late.

"I expect to see more like 34,000 jobs eliminated worldwide by the end of 1993 — about 13,000 of them from the lines of business, particularly Enterprise Systems, Adstar, Personal Systems and Technology Products," he said.

However deep the layoffs cut within given product lines, Djurdjevic added, no specific product line is likely to be hard hit. There is still sufficient waste in the company's operations to allow for major cutting without endangering quantity or quality, he said.

IBM's year-end 1992 figures show the company's work force at approximately 301,500 worldwide, with the U.S. accounting for some 158,000 and Europe an estimated 90,000.

The latter count could drop sharply in the coming months, according to analysts. Several predicted a strong spate of job cuts across IBM Europe's 11 regions this year. By the end of last week, the company had already begun to prove them right. IBM Europe announced it has targeted 10,000 jobs for elimination — 2,600 of them within the current year.

Smaller Blue

ONCE UNHEARD OF, WORK-FORCE REDUCTIONS ARE BECOMING MORE FREQUENT AT IBM

- IBM targets for elimination 6,000 jobs in New York's mid-Hudson Valley region.
- Employees receive layoff notices:
  - 1,400 in Poughkeepsie, N.Y., and Kingston, N.Y.
  - 1,000+ in East Fishkill, N.Y.
- IBM Europe announces that 2,600 jobs will be cut by the end of 1993.

Source: IBM

Troubled IBM

CONTINUED FROM PAGE 14

Strategy: IBM's Networking Systems business unit faces a large market opportunity in emerging high-speed network markets, such as Asynchronous Transfer Mode, where there is no installed base to penetrate. IBM must also profitably migrate or blend users of hierarchical Systems Network Architecture-based terminal-to-host networks with downsized, local-area network based computing.

Expect the company to push ahead with alliances and licensing programs for getting IBM communications software, such as SystemView and NetView, CICS transaction processing and Advanced Peer-to-Peer Networking (APPN) communications protocols, onto widely installed non-IBM platforms.

IBM must also commit to making its key networking software, particularly APPN Network Node, as nonproprietary as possible by licensing code or providing written specs at little or no cost.

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News Shorts

SEC to look at Wang stock decision

While **Wang Laboratories, Inc.**'s stock was originally going to be delisted as of March 31, the American Stock Exchange reversed its decision last week and Rep. Edward Markey (D-Mass.), chairman of the House Telecommunications and Finance Subcommittee, asked the Securities and Exchange Commission to investigate the exchange's decision. Markey is concerned that unwary investors will be exploited in the exchange of Wang shares, which will be traded for "warrants" under Wang's reorganization plan and have lost nearly all their value.

Hertz and ISSC sign

The Hertz Co. last week signed a five-year, $80 million outsourcing contract with IBM's **Integrated Systems Solutions Corp.** (ISSC) subsidiary. The two companies had reached a tentative accord five months ago [CW, Nov. 9, 1992]. The deal calls for ISSC to take over IBM-based operations and "business recovery services" and a large amount of application development, an ISSC spokesman said.

Huge router net down under

Telecom Australia said it intends to slash internal communications costs by up to $50 million per year with a network backbone based largely on high-end routers from **Network Systems Corp.** The network will consolidate 26 previously separate wide-area networks into one Transmission Control Protocol/Internet Protocol and **Novell, Inc.** IPX-based backbone serving 25,000 PCs, 15,000 terminals, 500 Unix workstations and more than 1,200 Novell servers.

Cray-3 ready

Cray Computer Corp. last week introduced the Cray-3, its long-awaited, general-purpose supercomputer series. Seymour Cray formed Cray Computer in May 1989 after splitting off from **Cray Research, Inc.** Starting with a single-processor, $2.95 million system with 64 Megawords of memory, the Cray-3 scales up to a 16-processor system with 1 Gigaword of memory. It is priced at a little more than $30 million.

DEC expands TP services

As expected, **Digital Equipment Corp.** added support for new clients and services for the company's Application Control and Management System last week [CW, March 8]. Additional servers for the transaction processing system will include the **Open Software Foundation**'s OSF/1 in 1993 and **Microsoft Corp.**'s Windows NT platforms thereafter. Support for clients on Windows NT will be available on Alpha AXP platforms later this year and on Intel Corp. clients shortly thereafter.

SHORT TAKES President Bill Clinton last week nominated **Western Digital Corp.** Chairman and Chief Executive Officer Roger W. Johnson to head the **U.S. General Services Administration** (GSA).... **Colorado Memory Systems, Inc.** in Loveland, Colo., said President and CEO Edwin L. Harper is leaving the company April 16.... Storage vendor **IPL Systems, Inc.** named former **Memorex-Telex** executive Greg R. Grodhaus as president and CEO.... Computer retailer **CompUSA, Inc.** announced third-quarter sales of $365 million, up 68.2% over the comparable period in 1992.... PC network products vendor **Standard Microsystems Corp.** reported first-quarter profits of $15.8 million, compared with only $595,000 for first-quarter 1992, and revenue growth of 89% to $250.5 million.... **DEC** announced it is moving its offices at the Maynard Mill complex to DEC-owned facilities in Maynard, Mass., starting later this summer.

AMR back in hot seat

Partner Budget Rent A Car files suit in alleged Confirm cover-up

By Mark Halper
DALLAS

■ AMR Corp. has again come under fire for allegedly concealing technical and financial realities in the now-defunct Confirm reservation project.

Budget Rent A Car Corp. has filed suit in state court here against AMR and its AMR Information Systems (AMRIS) subsidiary. It is seeking more than $100 million in damages for AMR's failure to develop a state-of-the-art travel system.

AMR was the development partner in Confirm, which fell apart last summer at the hands of insurmountable technical problems.

20-20 hindsight

Budget noted in its suit that "in retrospect," AMR provided "a sobering, early indication of things to come" when it did not assign its heralded Sabre crew to develop Confirm but instead "hired a large group of outsiders."

Fingerpointing

AMR sued its three partners, Budget, Hilton Hotels Corp. and Marriott Corp., in October 1992, alleging they caused Confirm's failure by withholding funds, making poor staffing assignments and withdrawing prematurely. Marriott and Hilton countersued in separate actions similar to the new Budget suit filed by its BRAC RPS, Inc. subsidiary.

"AMRIS and AMR repeatedly made false representations to BRAC and the other defendants that the Confirm project was on schedule and would be delivered within budget," BRAC alleged.

AMR and AMRIS "concealed from its partners the difficulties it was experiencing," Budget claims, noting that this caused "BRAC and the other user partners to continue their payments, commitment and reliance upon the expectation of timely completion of the project, long after either AMR or AMRIS had any real hope that the project could be accomplished."

Budget also cited AMR for mismanagement, incompetence and a poor choice of development tools and methodologies.

As in the Marriott suit, BRAC cited as evidence of a cover-up some of AMR's own references.

For instance, Budget referred to a letter from AMR Chairman Robert Crandall to BRAC "in which Crandall conceded that AMRIS' employees had lied about the status of the project and that AMRIS was at fault for the failure of Confirm."

Budget cites *a letter written by AMR's Max Hopper as evidence of a cover-up*

It also cited a letter written by AMR Senior Vice President of Information Systems Max Hopper to AMRIS employees stating that "some people who have been part of Confirm RS management did not disclose the true status of the project in a timely manner" [CW, Aug. 10, 1992].

AMR declined to comment, referring inquiries to the language in its countersuit.

Travel firms rush to avert cutoff

CONTINUED FROM PAGE 1

years old. AMR has run the mainframe-based North system since 1989.

The Confirm project crumbled last summer amid allegations that AMR covered up technical problems [CW, Aug. 10, 1992]. Budget recently added its own voice to those charges (see story above).

Discussing commitment

The two sides are now haggling over whether AMR is committed under its contract to continue supporting North beyond May 15 should Hilton and Budget not have new provisions in place. AMR quietly sent termination notices last October.

Last week, an AMR spokeswoman said the extension question "is not settled," although she added, "we do expect that date to be extended."

Aprati also said the extension is an "open question" but added that AMR has not indicated to Budget that it is willing to stay on.

Meanwhile, with Confirm in shreds, Hilton and Budget have been left with North supporting them while they search for new partners to take them to a next-generation system.

The AMR spokeswoman said AMR terminated the arrangement because it was not profitable. However, Aprati said, "Maybe they just had a change of heart after we got in the controversy with the failure of Confirm. Maybe they thought there was enough bad blood."

Aprati said AMR never gave Budget a reason for the termination. He characterized as "not plausible" the explanation AMR gave that it was not making money running North.

Request for help

Sometime around the beginning of this year, Budget and Hilton sent out a request for proposals (RFP), seeking someone to take over near-term processing of North, Aprati said.

Ironically, AMR is one of several companies to which Hilton and Budget sent requests.

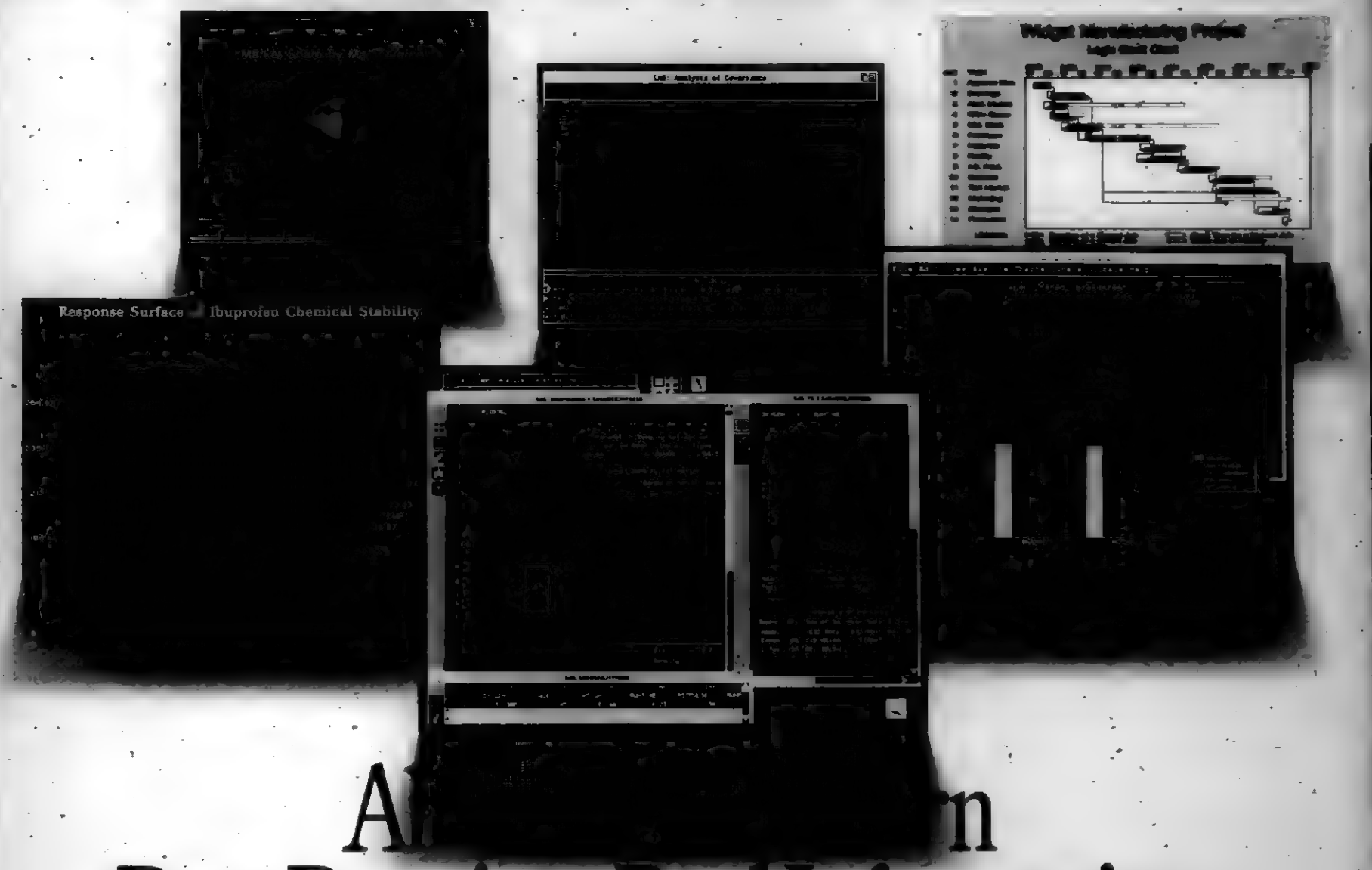
Aprati said one reason the rental car company would consider AMR is that Budget is simply looking for a short-term arrangement until it finds a next-generation partner. Going with AMR again under a restructured deal would eliminate the costs and headaches of changing horses.

Budget has talked about longer term possibilities with Electronic Data Systems Corp. [CW, Aug. 17, 1992] and is believed to have sent EDS an RFP on the near-term project.

Hilton has discussed possibilities with several vendors, including Anasazi, Inc., a Phoenix-based provider of Unix-based reservation technology and services, according to Anasazi Chief Executive Officer Tom Castleberry.

Anaszi was recently acquired by New York-based outsourcer First Data Corp. (see story page 4).

The AMR spokeswoman said AMR's AMRIS subsidiary is a "finalist" on Hilton and Budget's list for the near-term solution.



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HEWLETT PACKARD

Tougher computer crime laws sought

By James Daly
WASHINGTON, D.C.

The U.S. Department of Justice has proposed new sentencing guidelines aimed at cracking down on electronic bandits convicted of stealing credit history reports, pilfering telecommunications services and peddling stolen passwords.

The new rules were designed to shift the current computer crime sentencing yardstick away from its focus on monetary damage and toward consideration of the larger reverberations of the misdeed. The result could be stiffer fines and jail sentences for convicted criminals.

The Computer Fraud and Abuse Act of 1986 subjects violators to fraud punishment guidelines that rely heavily on the victim's dollar loss. But Justice Department officials said it is just as important to factor in issues such as the harm that occurs when data confidentiality and integrity are compromised.

"We're saying that computer crime is a unique offense that not only has monetary consequences but can invade personal privacy and even compromise national security," said Roger Pauley, director of the office of legislation for the criminal division of the Justice Department.

For example, illegal access to consumer credit reports or individual passwords poses potentially serious intrusions into privacy. Illegal intrusions into computers that control telephone systems may disrupt normal telephone service and present hazards to emergency systems, neither of which is readily quantifiable.

Consultants said the Justice Department's focus on data privacy issues is a good one and could encourage those who have been invaded by computer criminals but suffered little financial loss to come forward.

"Data has become a very real currency, and the requirements for keeping it private are essential in such institutions as banks," said Robert Kane, a partner at Intrusion Detection, Inc., a New York network and security consultancy.

Each case different

Critics contend that the idea of strict punishment guidelines, which were instituted on a federal level in the 1980s as a way to prevent arbitrariness in sentencing, do not take into account the vagaries of each case.

"One of the best things we see in computer crime cases is that judges have a lot of autonomy in sentencing, and I'd hate to see that lost," said Mike Godwin, legal counsel for the Electronic Frontier Foundation in Washington, D.C.

The sentencing proposals, however, are expected to remain little more than paper tigers for at least a year until the U.S. Sentencing Commission examines computer crime more closely, said Paul Martin, the commission's deputy staff director. "This issue [of computer crime] is clearly on our screens, but we need to give it more thought and analysis," he said.

A commission study group should be in place by June and will come up with recommendations next year.

The sentencing commission recently scheduled a public hearing on the proposed amendments and is expected to report its findings to Congress by May 1.

Lawmen said changes are needed because the current statute has simply been outrun by today's electronic breakthroughs.

"Criminal laws need to reflect technological advances," said Scott Charney, head of the Justice Department's computer crime investigation unit. "Unfortunately, technologies move faster than the laws, and some of the statutes are out of date."

Charney has called for a wide-ranging update of the computer crime statute. Among his proposals is a forfeiture provision that would allow the government to confiscate the defendant's computer and other property used in the commission of the offense.

Charney is also helping draft legislation that would criminalize the increasingly common practice of planting viruses in apparently legitimate programs and mailing them to companies, which then insert them into their machines.

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Annual software update

SAS to roll out updated products

By Gary H. Anthes
CARY, N.C.

SAS Institute, Inc. will announce this week general availability of a new version of its products for information management, retrieval, analysis and presentation.

In the company's largest rollout ever, SAS Release 6.08 is being shipped to 12,500 customer sites running IBM's MVS, CMS, VSE and OS/2 2.0; Digital Equipment Corp.'s Open VMS; and Microsoft Corp.'s Windows 3.1, according to the company.

The new release, which for the first time promises easy portability of SAS applications across diverse environments, contains new products, new product features and substantially improved performance, users said.

James Brink, information technology manager at Chevron USA Production Co. in Houston, said he had the previous release of SAS for the desktop — SAS 6.06 for MS-DOS — but never used it partly because it was too slow.

However, Brink said Chevron has been using a beta-test version of the new release to move SAS applications from a mainframe to a Windows-based client/server environment. "We moved the catalogs down, changed the data directories, and everything rolled right along and kept on working," he said.

"This allows us to develop an application on a PC and migrate it to a mainframe for production," said Dave Gardner, catalog control system development manager at JC Penney Co. "Before, we couldn't upload and download directly; that has all been fixed under this new release."

Robert Johnson, manager of acute care systems at Health Span Systems Corp. in Minneapolis and a beta-test user of SAS 6.08 for MVS and OS/2, said he likes a new feature that allows file sharing so that one user can access a file while it is being updated by another. He said SAS now runs noticeably faster — perhaps by 30% to 40%.

Product highlights

SAS says highlights of its new software release include a product for building and maintaining executive information systems, enhanced client/server capabilities and enhanced application development capabilities across platforms.

But Elaine Oaks, documentation librarian for the state of Utah, said the desktop improvements come at a price. "It works well, but it is a hog. It takes 10M bytes of memory. Several people have had to buy more memory."

Lynne Harris, SAS' desktop product manager, said SAS for Windows and SAS for OS/2 will run on Intel Corp. 80386 machines, but she recommended one with an 1486 processor and 6M to 12M bytes of memory.

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The new release puts these previously announced experimental products into production:

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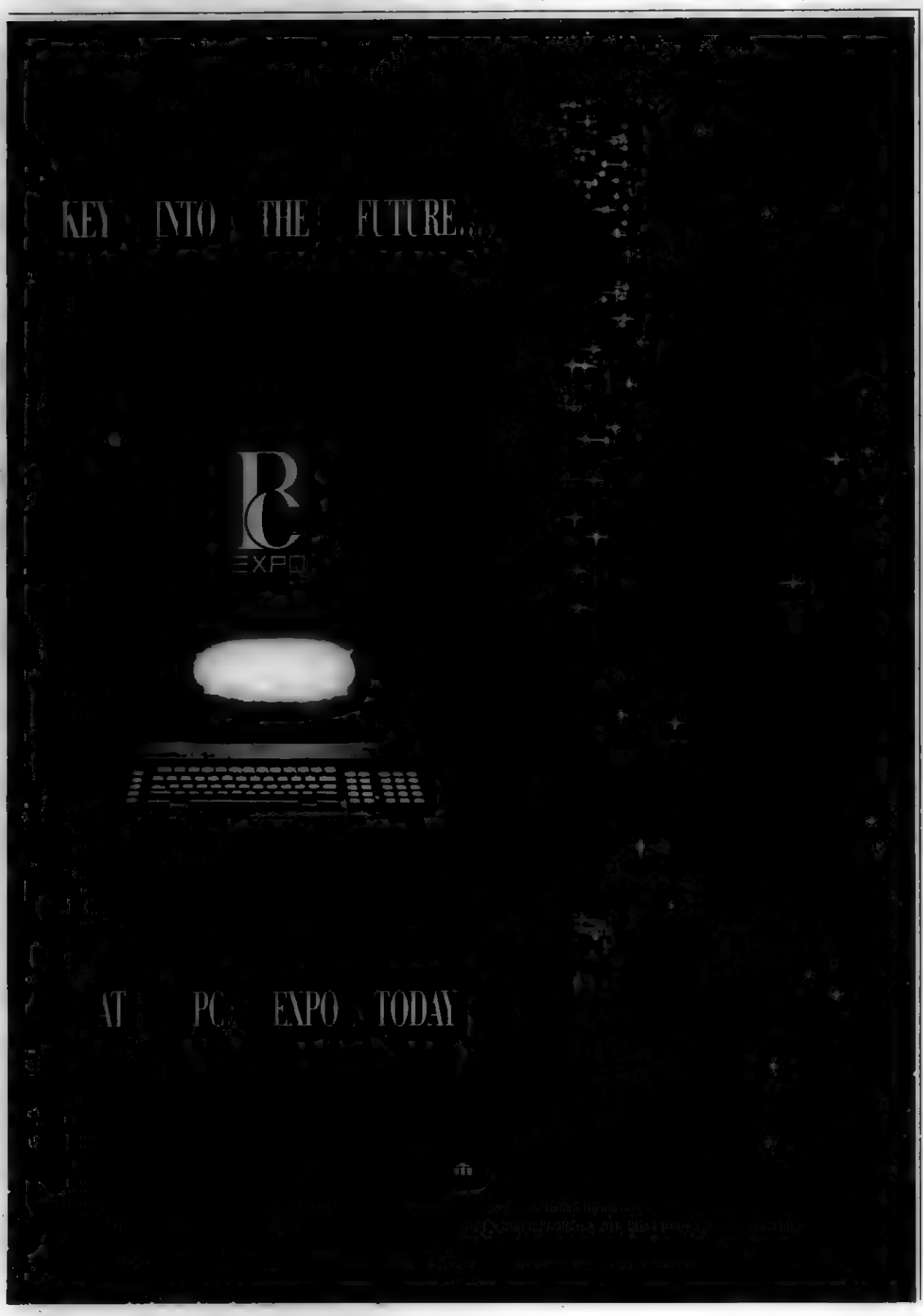
- **SAS/Insight**, for data visualization.
- **SAS/Lab**, for "suggestion-driven" data analysis.
- **SAS/Ph-Clinical**, for clinical data analysis in the pharmaceutical industry.

Harris said 86% of SAS' 3 million customers will be affected by the new release. The balance are mostly SAS Unix users who will get their next production release by year's end. That release will also include SAS for Microsoft's Windows NT, she said.



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Although affordably priced, they're COMPAQ computers in the truest sense. They endure the same torturous testing as every other computer that we build.

Inside there's an Intel 486SL chip. Unlike the 486SX chip in comparably priced notebooks, this one has an integrated coprocessor. And it runs more efficiently, helping to extend battery life.

You have your choice of three Contura screens, all of which offer razor-sharp definition. There's an active matrix screen that displays information in 256 colors. There's an advanced passive matrix color screen that offers 50% better contrast, and 33% improved response time over earlier passive technology. And there's a crisp and clear monochrome version as well.

4/25CX: *Active color VGA ◆ Integrated EasyPoint trackball ◆ NiMH battery ◆* **4/25c:** *Advanced passive color VGA ◆ COMPAQ Trackball ◆ NiMH battery ◆* **4/25:** *Monochrome VGA ◆ COMPAQ Trackball ◆ Enhanced NiCd battery.*
All models: *Intel 25MHz 486SL with 8K cache and numeric coprocessor ◆ 4MB RAM (up to 20MB) ◆ 120MB or 209MB hard drive ◆ Pre-installed Microsoft Windows 3.1 and MS-DOS 5.0 as published by Compaq*
4/25 starts under $1,999*

The COMPAQ Contura 4/25CX comes with an EasyPoint trackball that eliminates the need for a mouse. And all of the Contura models offer a unique feature called

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DABLE NOTEBOOK THAT WON'T COULD AFFORD MORE.

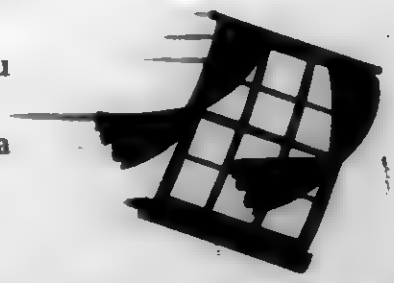
any data, and marks the spot where you left off. When you start your PC up again, it automatically brings you right back to where you were.

Hibernation. This allows you to shut your PC off quickly without losing

Contura notebook PCs also come with an external battery charger that lets you recharge batteries in as little as an hour. And a variety of modem options, including cellular, allow you to send and receive data and faxes anywhere.

All of which explains why the editors at *PC LapTop Computers Magazine* recently named our Contura the best value in notebook computers.

If you'd like to know more, give us a call at 1-800-345-1518, and ask us about Contura. The notebook PC designed to accommodate your budget limitations, not constantly remind you of them.



*Thanks to our advanced graphics accelerator, Contura blows the doors off most other Windows notebooks. In fact, it runs Windows 30% faster than most 486 machines.**

*Nothing is backed like a Compaq because nothing is built like a Compaq. Contura includes a free three-year, worldwide warranty with a year of on-site** service in the US or Canada.

COMPAQ

*In tests run by Compaq using PC Magazine Labs WinBench Release 3.1. **This service is provided by Contracted Service Providers and may not be available in certain geographic locations. Certain restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. For further details on our limited warranty, contact the Compaq Customer Support Center.

Tech Talk

Virtual tool

IBM's Virtual Worlds Group unveiled an application development tool kit for virtual-reality environments. Scientists at the IBM group, which was formed in 1989, said the modular VR Toolkit marks the culmination of their efforts to date. The scalable Unix tool kit provides modules for building virtual-reality environments. Modules can be modified, even while the application is running, until the user finds a suitable configuration for a particular VR application. The tool kit is not yet commercially available.

Parallel pass

Boston University's Center for Computational Sciences is providing undergraduate students with direct access to parallel supercomputing in the hopes of exposing a new generation to this computing paradigm early in their careers. With support from the National Science Foundation, it has introduced a new interdisciplinary curriculum in massively parallel computing. Students will work on an 8 billion floating-point-operations-per-second Connection Machine CM-5 supercomputer from Thinking Machines Corp. in Cambridge, Mass. The CM-5 is also being used by more than 300 university researchers in a dozen different departments.

Computer gin

The world's only fully computerized cotton-ginning system has been developed by W. Stanley Anthony, an engineer at the U.S. Department of Agriculture in Stoneville, Miss. Current ginning methods give all cotton the same amount of cleaning, but Anthony's customized system puts the raw cotton through only the steps needed to clean a specific batch, which reduces energy use and fiber damage. The computer considers cotton moisture, trash content, color and prices to calculate ideal ginning conditions.

A new method of seeing?

Users explore visualization's potential in commercial sector

By Ellis Booker

WHY DO SNAPSHOTS taken at the Grand Canyon never seem to capture its beauty?

One simple explanation has to do with what might be called the "bandwidth" of the two experiences. To stand at the rim of the canyon is to have every sense flooded with information, but to view a two-dimensional representation of the scene later is, in terms of bandwidth, a far narrower experience.

Developers of visualization systems attempt to harness human beings' capacity to absorb multiple types of incoming information simultaneously.

If translated into symbols, graphics or other representations, massive amounts of data can be appreciated and understood. Even more important, relationships hidden within these data sets can be revealed through visualization.

This is where visualization is distinct from simulation, a close relative. The goal of simulations is a precise and accurate model of the single event; visualizations, however, attempt to extend comprehension, sometimes at the expense of a realistic simulation. For instance, in a visualization on the electrical potential racing across a cat synapse, the researcher used changing volume, in the form of a symphony, to indicate changes in one electrochemical variable.

Until now, however, this emerging technique, which some believe might unleash the full potential of human/computer interaction, has had a small scientific audience.

Software such as AVS Network Editor *enables users to construct applications to view their data using any mix of visualization techniques*

But the promise is enormous, said Ben Shneiderman, head of the Human-Computer Interaction Laboratory at the Center for Automation Research at the University of Maryland in College Park, Md.

"Our capacity to perceive patterns is enormous, and I believe [the computer industry] has inadequately attended to that," he said at the eighth annual ACM Computer Science Conference earlier this year. "We still have the legacy of the teletype and the fantasy of [artificial intelligence]."

Why hasn't visualization taken hold in commercial settings? The reason is twofold: To make visualization systems work requires the collection of raw numerical data and an intuition about how the data interacts — the two common aspects of a "scientific" approach.

"Commercial environments are a little more complicated, since you're more interested in decision-making and trends," agreed Charles Kreitzberg, president of Cognetics Corp., a Princeton, N.J.-based company specializing in the design of user interfaces.

Part of the blame also rests with generally unreceptive IS departments, he said.

In addition, scientists as a group are ahead of their commercial counterparts in their use of powerful workstations and the building of simulations. Easier-to-use visualization tool kits may help end users build or modify visualization systems and get on with understanding the data at hand.

A final, mundane reason why visualization has not become more widely accepted has been the cost of access, according to Hambleton Lord, director of product marketing at Advanced Visual Systems, Inc. (AVS) in Waltham, Mass.

"A couple of years ago, doing 3-D graphics required a $30,000 [workstation]," he said, noting that the newest generation of microprocessors from Intel Corp. will bring this capability to desktop PCs.

The vast majority of AVS' customers are scientific or industrial concerns. Lord hints that a handful of them, including banks, are playing with the technology.

"They feel if they can understand the market and make a trade 30 seconds ahead of their major competitor, that's an advantage," Lord said.

Testing the interface

The question "How can we make the next-generation computer interface" follows Ben Shneiderman wherever he goes.

As head of the Human-Computer Interaction Laboratory (HCIL) at the Center for Automation Research at the University of Maryland in College Park, Md., Shneiderman has worked to turn the debates about interfaces into a more scientific enterprise.

Once a user community and a set of tasks have been decided on, Shneiderman said he believes the following measurable criteria for the effectiveness of a human/computer interface can be applied:

- Rate of human errors.
- Time to learn specific functions.
- Speed of task performance.
- Subjective user satisfaction.
- Human retention of functions over time.

Overall, however, interfaces have been "stalled in the 1984 valley," he said, referring to the year the Apple Computer, Inc. Macintosh was introduced.

HCIL's own projects point the way toward different conceptions of the interfaces.

For instance, the laboratory has developed an application it calls the "Home Finder," which uses sliders, buttons and attribute values to help a user "see" the distribution of houses on a map around Washington, D.C. — *Ellis Booker*

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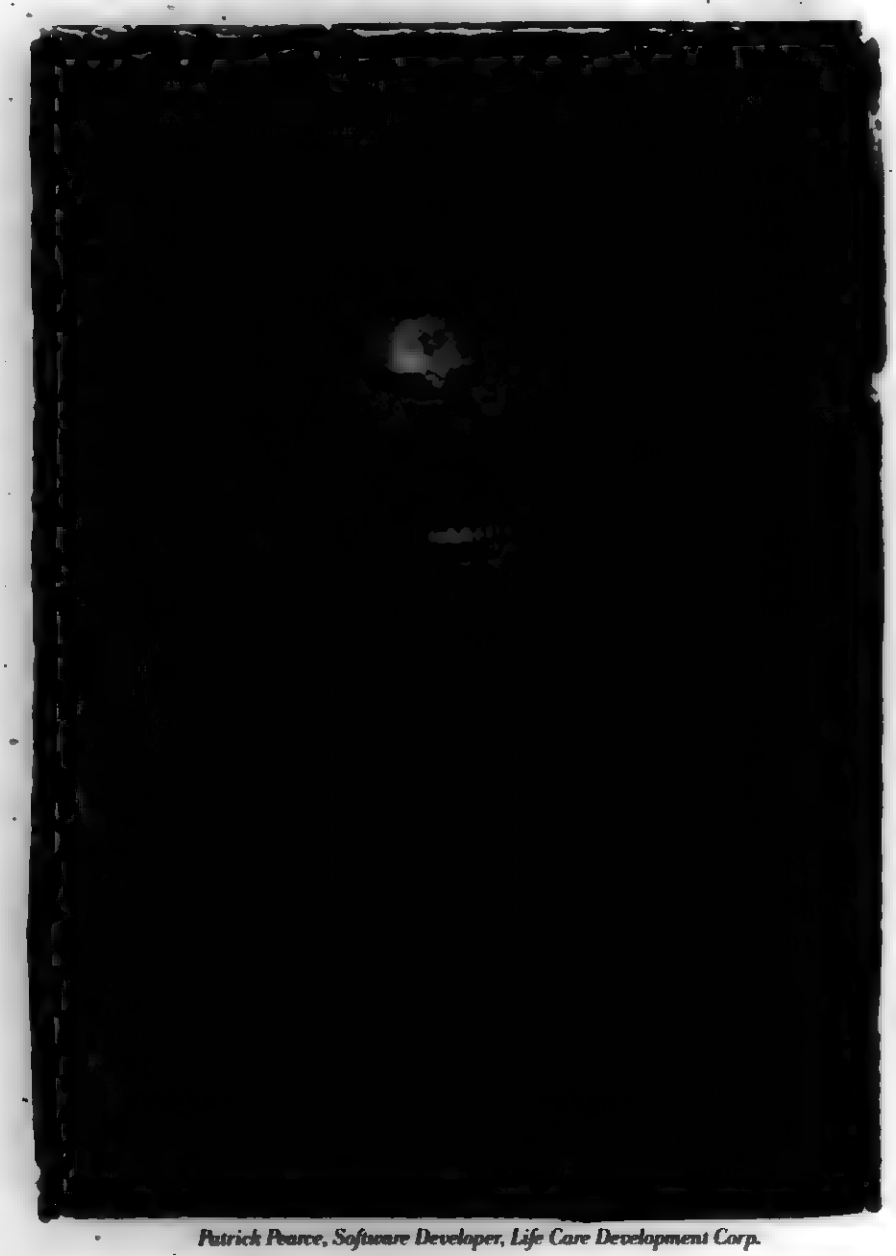
"Why I



Patrick Pearce, Software Developer, Life Care Development Corp.

"Time is money."

The advantages of OS/2® are clear. "At Life Care Development Corp., we create applications for sale to physicians, psychiatrists and drug counselors for tracking patient and insurance information, and medicine and treatment goals. We make use of OS/2's inherent development capabilities like the REXX language as well as WorkFrame/2 (IBM's development environment), C Set/2 compiler and Borland ObjectVision. For us, OS/2 has meant heightened productivity, shortened development time and improved quality of product."

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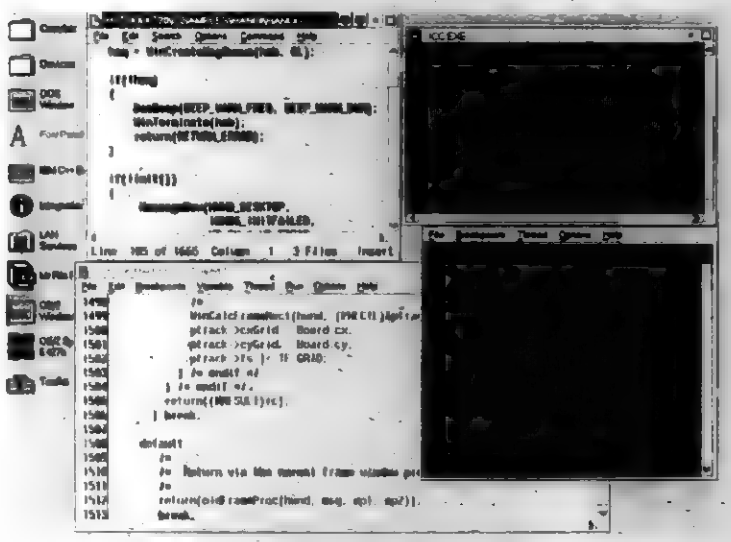
"I'll never go back."

"I may be a small ISV, but IBM has always treated me like a big fish." IBM's valuable technical service and marketing support includes OS/2 Support Line, IBMLink, the IBM OS/2 bulletin board system and several OS/2 developer forums on CompuServe®. "If I run into a problem, the OS/2 Developer Assistance Program is there to help."

The 32-bit operating system lets you break through



In the Workplace Shell,™ you can edit source code files while compiling and debugging in the background.

don't do Windows anymore.

The no-comparison comparison chart.

	Windows 3.1	OS/2
Virtual memory limit	4 x physical	512MB (disk space)
Memory model	Segmented (64KB)	Flat memory objects
APIs	16 bit	Full 32 bit
Multitasking—DOS apps	Time slicing	Pre-emptive time slicing
Multitasking—Windows/PM apps	Cooperative	Pre-emptive
Priority	Static (set by user)	Dynamic
Dispatchability	Process	Thread
System services	Serial	Parallel
Protection between apps	Unprotected	Protected
Kernal protection—DOS/Win/PM apps	Unprotected	Protected
File system	FAT	Enhanced FAT and installable file systems (HPFS, CD-ROM)
User interface	Windowed	Object oriented

the 64K code segment barrier and convert to a flat memory model with up to 512MB of memory per session for writing code. "Writing is easier and faster than ever—and bugs have never been easier to uncover and zap."

"I'm actually having fun again."

But the best reason for leaving Windows and other DOS extenders is the opportunity to develop truly revolutionary OS/2 applications. You could say OS/2 has closed the door on Windows. For the free white paper on why OS/2 is the developer's platform of choice, or for more information, call 1 407 982-6408.

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Ghost image

The imaging industry's biggest show gets under way in Chicago today amid a burning question: Will imaging technology ever become all it's been cracked up to be? Or do we have another artificial intelligence-like paper tiger by the tail?

This much is known: After getting a jump-start from the re-eningeering craze, imaging technology has started to fade in the eyes of top-line IS managers as a key emerging technology. In its annual survey of more than 400 North American chief information officers, CSC Index watched imaging systems sales plummet following three consecutive years of growth. The percentage of respondents listing imaging as a key emerging technology dropped from 49% to 29%. Among European CIOs polled by CSC Index, imaging fell from 28% to 19% of the sample.

In recent years, the only other technology on the survey to get as hammered is computer-aided software engineering (CASE). The pummeling of CASE mirrored widespread disenchantment with its unfulfilled promises, sending the CASE vendors scrambling for cover, after which they re-emerged, calling themselves client/server companies or solution providers. Geez.

I believe that imaging technology need not suffer the same fates as CASE or artificial intelligence and that the current waning interest will improve over time. My main reason is that the promises of imaging are real — the ability to redesign work flow, vastly reduce paper files, greatly speed up access to archives and generally reduce office automation expenses.

At this point, it seems users are reacting to the legacy of the early image vendor pioneers. It's not that their systems were expensive (they were), nor that they failed to deliver as promised (many early users reported excellent results).

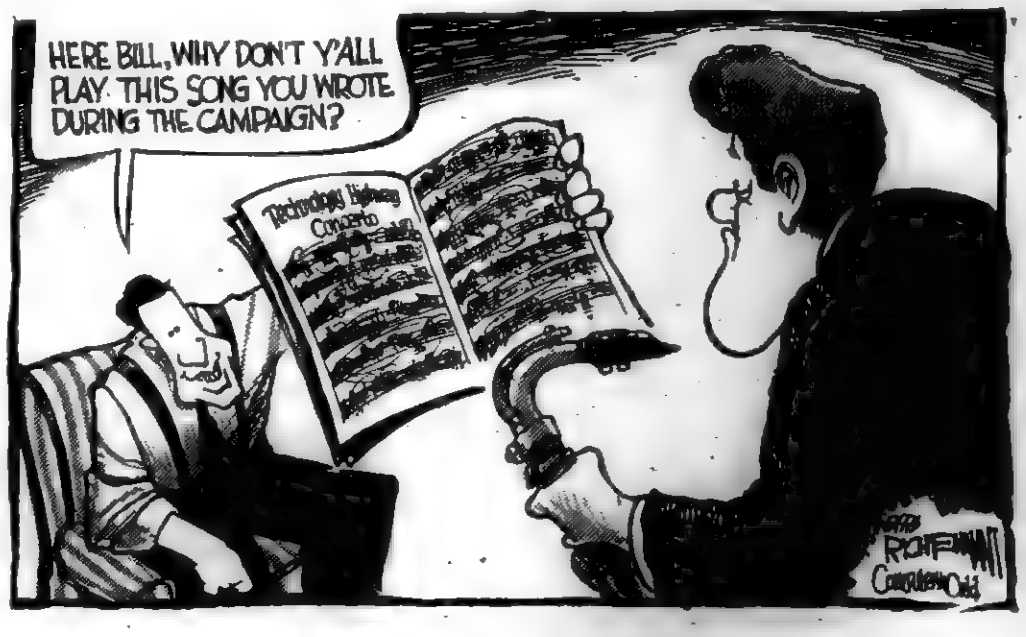
Instead, they were afflicted with the "P" word — as in proprietary. If you were willing to buy into the religion of most of the early providers lock, stock and barrel, you too could have lived the imaging dream.

However, the ground rapidly shifted in the last years, and the hue and cry of open systems and interoperability began to overwhelm the proprietary world. Proprietary became a very dirty word and quickly soiled all with which it came into contact, like imaging.

So the big news today is not just that the price of imaging is falling dramatically, by better than 50% in the last two years (see CW Guide page 81). Rather, the industry is now catching up with the underlying dynamics that are driving it.

Bill Laberis

Bill Laberis, *Editor in chief*



Dear Abby

The article "Rethinking re-engineering" [CW, March 15] might have been OK if it appeared in a Dear Abby section of the newspaper. I could not help but shed a tear for the IS executives who discovered that "huge [re-engineering] projects are very tough."

Dear Abby's counsel to those poor souls was to take on smaller jobs so if they fail, no one will notice. Doesn't this advise them to leave significant business change up to functional managers and get back to their bits and digits?

The difference between how functional and IS managers think about re-engineering is simple. IS thinks about re-engineering in terms of "projects." They gauge their involvement in re-engineering by whether they have one, two or 10 projects going on and whether those projects are big or small.

Functional management, on the other hand, thinks of re-engineering as a "business process." They think about whether their re-engineering process works or not, that is, makes a difference in revenue and costs.

Challenging the concept of re-engineering is like challenging the concept of marriage. Marriages don't fail because marriage itself is a bad idea. They fail because those involved do it wrong.

You must challenge your re-engineering process. If you fail, you either used a bum re-engineering process or you did it wrong. And, if you fail, the next section of *Computerworld* that you should read is the want ads.

Daniel S. Appleton
D. Appleton Co.
Manhattan Beach, Calif.

Why the hype?

I haven't figured out why everyone is getting so excited about Windows NT, Microsoft's most visible software development effort. It will end up being a graphical user interface (GUI) tool on top of the Unix operating system. Doesn't anyone have the nerve to tell Bill Gates there already are GUIs for Unix?

Many people bought into the Windows concept for DOS 10 years ago. But today, true multitasking, interoperability and mainframe accessibility are a must. Windows NT doesn't address these operating system requirements.

Once corporate IS realizes that IBM's OS/2 is the operating system that meets their needs, the Windows NT effort could end up being the biggest failure in software history.

William T. Voris
Troy, Ohio

Happy with 3.0

I feel I must respond to the comments made by Bruce J. Muckian in his commentary "Windows: Calling it awkward would be kind" [CW, Feb. 22]. I work for a county agency that has suffered a 30% loss in revenue for fiscal 1992-93 and will probably be faced with another deep cut for the fiscal year that starts in July. We are working desperately hard to avoid layoffs, furloughs and/or pay cuts.

One way we are saving money is by limiting the amount we spend on computing upgrades (software and hardware). We never had a Windows 3.0 problem because we bought only one copy after 3.1 came out. Even now, less than 10% of our micros have Windows.

We resent the obvious snobbery demonstrated by some of the letters printed in your paper [CW, March 15]. Not everyone has the cash flow that would allow chasing technology and buying the latest and greatest toys available.

Edward M. Gallagher
Riverside, Calif.

Tariff truth

"AT&T: Feigned ultruism?" [CW, March 15] appears to imply that a decision not to require the tariffing of enhanced services was based on a desire to promote the "health" of the industry. There's more to the story.

Although the FCC considered competition in the enhanced services industry when it determined what regulatory regime to apply, the FCC also deemed the offering of enhanced services not to be common carriage. The Communications Act of 1934, as Ms. Wexler notes, requires the tariffing of only interstate common carrier communications services.

Susan J. Bahr
Washington, D.C.

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We all owe IBM – and IS owes it an apology

George Gowen

When I graduated from college back in the early 1970s, I had an offer to work at IBM. I turned it down because I wanted to develop application software, not sell computer hardware or software. Today, I look back on that decision with some regret.

IBM has provided the computer community with not only a vast array of computer products but also a standard for quality, service, marketing and research.

Remember those guys with the three-piece suits, white button-down collared shirts and wing tip shoes? Yes, IBM had a standard for everything from dressing to managing projects and beyond.

Oh sure, there were times when you wanted to strangle your IBM marketing support rep and wished that IBM would roll over and die, but no single company has done more for computing than IBM has. Look at all the hot computer companies of today. Most of them got started based on an IBM white paper, or an ex-IBM employee, or by setting a goal to be better than IBM in a particular field.

Don't get me wrong — I don't believe IBM or its employees walk on water or created the world, but you must admit they've been instrumental in shaping the computer world as we know it.

Now everyone is wondering what IBM should do. I believe what it needs to do is step back in time to the days when its business clients were its best friends. IBM got its start listening to the back office and manufacturing needs of its clients. It provided marketing, service and other support teams to help the client company establish computer environments to meet those needs. In turn, the client companies built organizations (IS departments) to interface with IBM. While these organizations could understand "IBM-ese" and helped with the computerization of the company, they became a major part of IBM's problems.

At first, IBM was meeting directly with its clients' businesspeople and the IS departments were confined to a support role. As time went on, IS departments grew in size and responsibility to the point where IBM was no longer talking with businesspeople but instead listening to an IS person's interpretation of the company's needs.

The IS departments saw PCs as threats and banned them from the corporate environment. But the businesspeople did not agree, and the PC took hold. All this time, IBM was being told by the IS departments not to fear the PC movement because they still had control over the computing needs of the company.

Needless to say, by listening to the IS departments, IBM lost out in more ways than one. As a result, it came late to the PC movement — so late that even OS/2 could not make the same impact on PC users that VM and MVS had made on mainframe users. And the business community became convinced that IBM was only a mainframe player.

Big Blue is gone. IBM is still here and will be for some time to come. And what the company needs to do is re-establish its ties with business users, with the IS departments taking a back seat.

Gowen is chief executive officer of Boca Raton, a financial software development company in Fremont City, Calif. His company sometimes competes with IBM and develops software for a variety of platforms.

What IBM needs is a little TeamFocus

OPEN MIND *by* Esther Dyson

DEAR MR. GERSTNER:

You'll be getting lots of advice, so let me put in my two cents' worth.

There are many things to discuss, including markets and marketing strategies, corporate hierarchy and decentralization, technology leadership and competitive advantage. But basically, IBM's problem is internal management. Yes, the markets have changed, but the issue is IBM's ability to respond to those changes.

So here I'd like to talk about how to get the background information to assess IBM and a software tool for doing so — a tool that your own company is actually selling. It's called TeamFocus. You resell it for its developer, Ventana Corp. in Tucson, Ariz.

Unfortunately, your company uses this tool only for tactical, nuts-and-bolts tasks such as designing new products. You could make good use of it, however, as you tackle the job of designing a new company. (There's no hope of rebuilding IBM as it once was; the world has changed.)

What TeamFocus does is help increase the level of free expression in meetings. The tool lets people participate in meetings anonymously, and it lets more people participate. They sit in a meeting room or on a distributed network and type in their comments, answers and thoughts in response to the meeting leader's questions and prompts. Because they are making their comments anonymously, people feel freer to be honest.

I believe in allocating tasks properly between computers and humans — and I'm not bedazzled by the technology — but such software tools can have an impact on a very human factor: fear. In part, it is fear that has kept IBM from change — fear of upsetting one's boss, fear of being out of line, fear of new ideas, fear of failure. The very success of IBM's culture in the past has made its people afraid of voicing doubts, airing problems, disagreeing with accepted wisdom.

Users have found that wisdom, new ideas and hidden knowledge of problems tend to surface more rapidly with this approach. Some managers can't take it. I talked to one company that had stopped using a similar product precisely because its managers didn't like what they were hearing from their employees.

But your job is to find such things out, and as a newcomer, you should be able to hear the bad news without becoming defensive. In addition to finding out a lot, you'll give your employees a greater sense of participation. People who were scared to say anything will be free to talk without risking their careers.

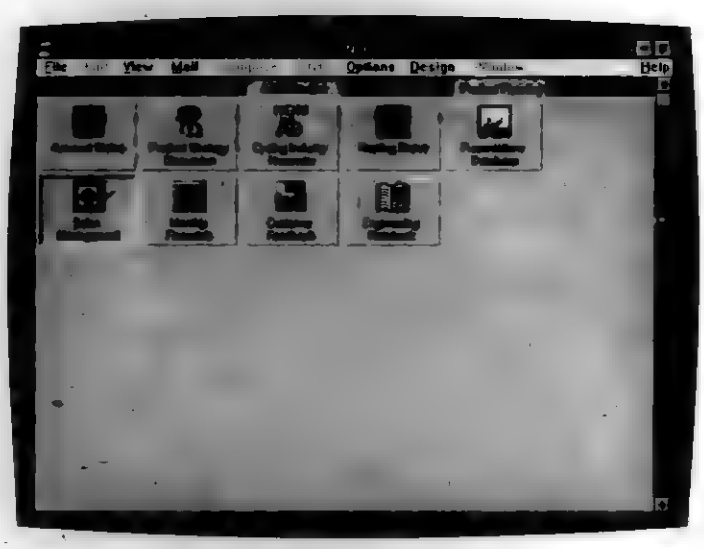
You might try this with customers, too — not just with senior employees at your flagship accounts, but with junior employees who use the products senior people buy, and with small accounts that don't get priority treatment. You should also go after people who aren't your customers and analysts who aren't recommending your products or your stock.

I'm not suggesting that you need consensus management — it's almost precisely the opposite. Consensus tends to uphold the existing power structure. It tends to squash new ideas and bad news. You need to find out a lot, rapidly, from people who might be afraid to tell you. You need new ideas and unpopular opinions.

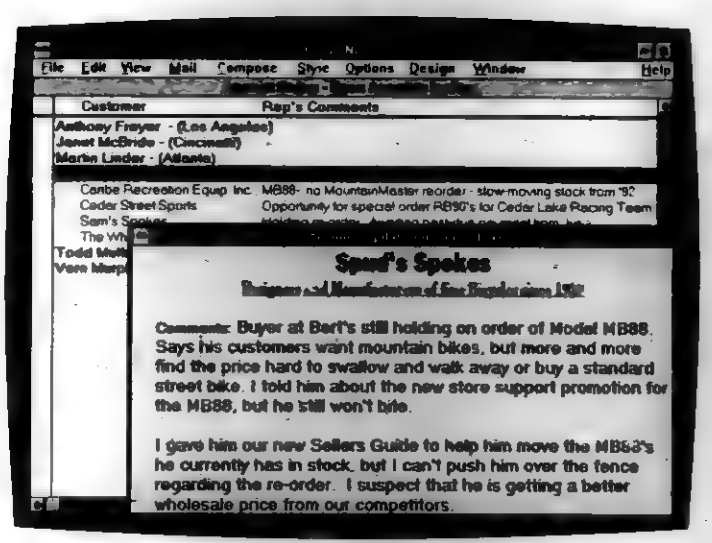
Then, Mr. Gerstner, you need the courage to make up your mind.

Good luck.

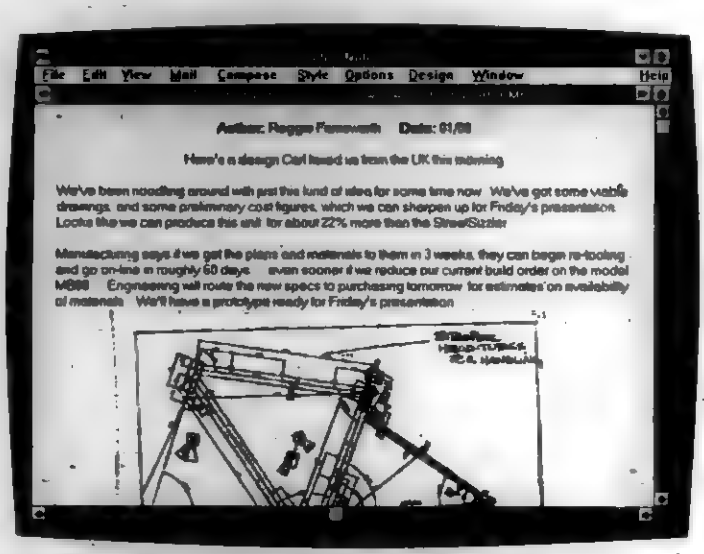
Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.



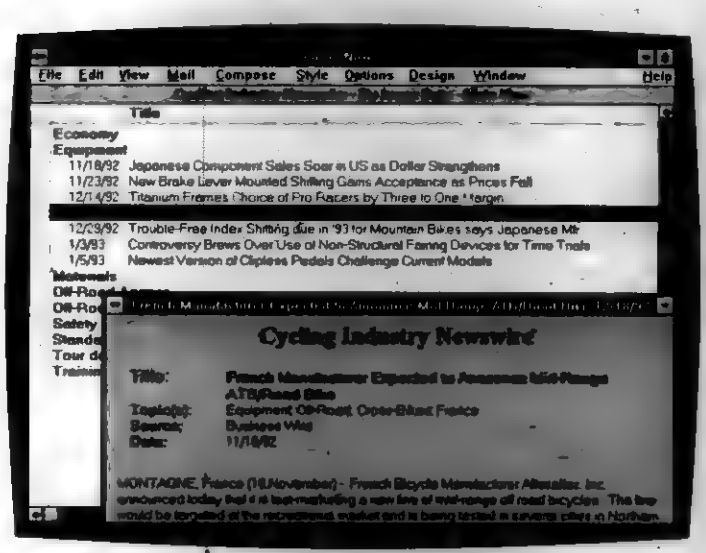
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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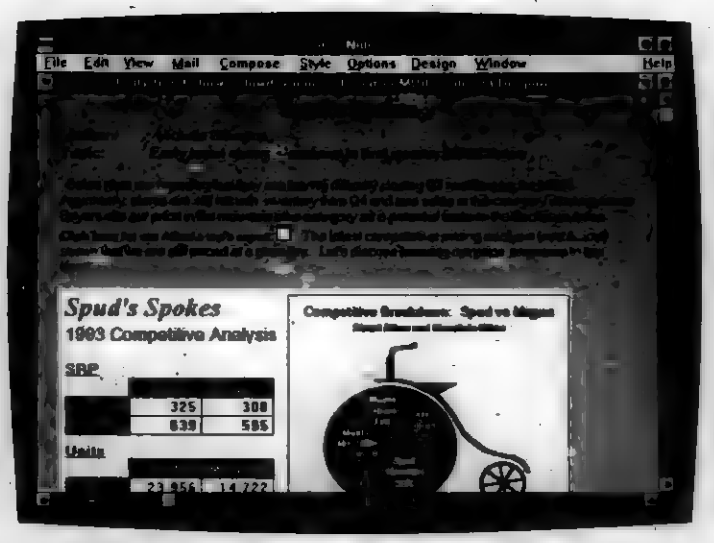
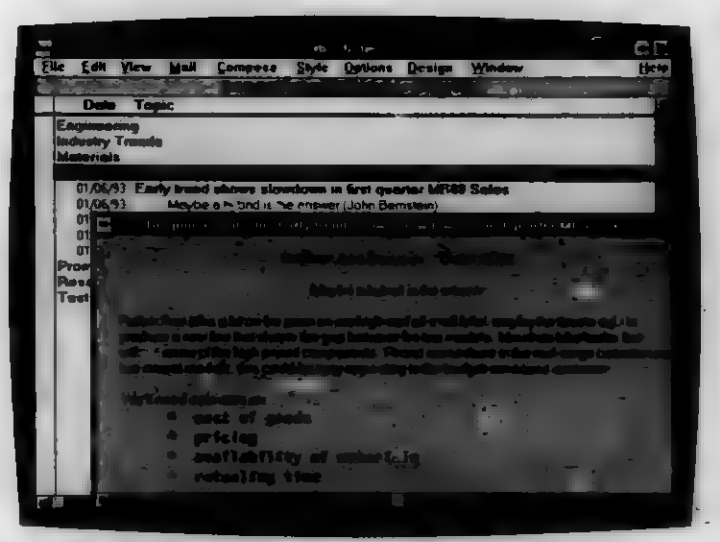
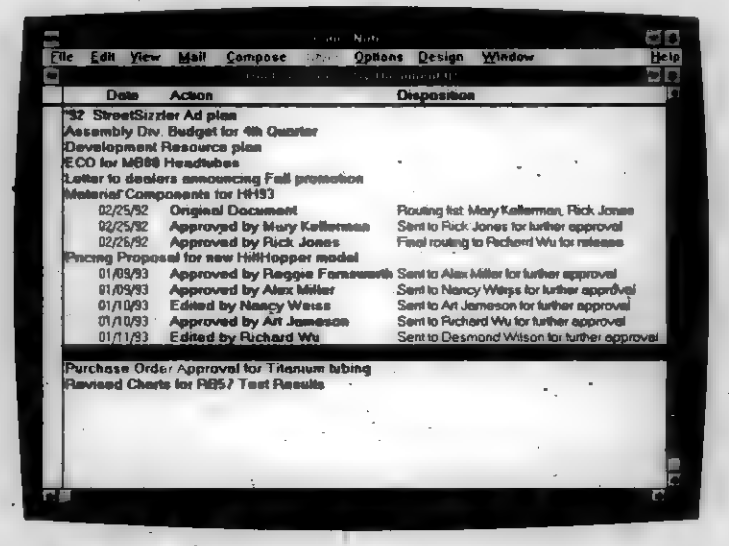


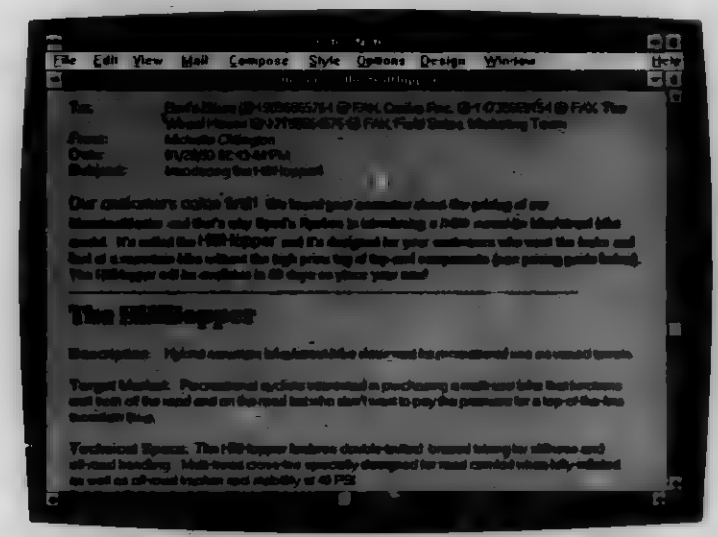
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

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Charles Babcock

Selling Unix in a PC way

For the first time, a PC-based company is pushing Unix toward the desktop. Borrowing a page from Johnny Appleseed, Novell is trying to propagate copies of UnixWare, its trimmed-down version of Unix System V, across thousands of Intel-based PCs.

UnixWare is a hardworking, 32-bit operating system with a standard GUI. It works in tandem with both a NetWare LAN and TCP/IP. And clearly, Novell believes that if enough UnixWare can be dispersed, the field will be prepared for client/server computing based on Unix and NetWare.

With UnixWare, Novell shrank System V down to PC proportions. Now it is sending its sales force into the field to spread the news that pricing has also been downsized, dropping from $495 to $249 on the client and $2,495 to $1,295 on the server.

The authors of this strategy are Kanwal Rekhi, executive vice president of Novell's Unix products group, and Joel Applebaum, president of Univel, a Novell subsidiary in Sandy, Utah, close to the parent company in Provo. They have absorbed the lessons of the desktop marketplace the hard way. Rekhi, the founder of Excelan, which was acquired by Novell in 1989, helped Novell survive challenges to its LAN predominance by both IBM and Microsoft. If there is one thing he has learned, it is that there is strength in numbers.

Applebaum has watched the various members of the Unix community engage in fratricidal competition while the hypergrowth of PCs threatened to pass it by. "It seemed to me Unix was missing the boat. Some people were urging Unix Systems Labs [USL] to do its own version of Distributed Computing Environment [middleware being assembled by the Open Software Foundation]. We didn't need to do that."

Instead, for $249, Novell is offering UnixWare with the capability of running MS-DOS, Windows and Unix applications. UnixWare consists of the Destiny desktop version of Unix developed by USL; Digital Research's DR DOS owned by Novell; and Microsoft's Windows Merge, which allows UnixWare to support Windows 3.0 and 3.1 applications. Everything is geared to plug and play with the Novell NetWare LAN.

DREP, AWK and other Unix commands not needed by the end user have been thrown out. The load of fonts has been stripped down and the software developer's kit has been broken out as a separate product, yielding a lighter, firmer Unix.

Coming together

Whether this kernel will take root remains to be seen, but for the first time, all the pieces are in place for what could be called a Unix desktop strategy.

The strategy is not yet fully articulated, but Rekhi said server-based Unix will remain an open system with input from many participants. On the client side, Unix will be driven by the direction that Novell wants it to go, not by committee, and Novell will listen carefully to what end users want, he said.

The leading Unix vendors recently got together behind standards that brought application programming interface unity to Unix. If effected, this will allow a customer to move from one brand of Unix to another by recompiling applications. But PC users want binary-level compatibility, like that which exists in the MS-DOS and Windows markets, with no need to recompile.

Rekhi said he believes the only way to generate binary compatibility in desktop Unix is through numbers — big numbers to attract software developers to a common denominator, workhorse system. This may sound like a backward way of setting standards, but it is the way things have always worked in the PC arena.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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Hardware hinders pen market

Users anxious to deploy systems, but hardware scarce and rudimentary

By Michael Fitzgerald

If vendors build pen systems, will users come? The answer seems to be yes, but vendors appear hesitant to take the bait.

"Everybody's waiting for hardware," said John Katich, president of Access International, Inc., a field sales force automation reseller in Lansing, Ill., that has six customers who have ordered units and cannot get them.

Currently, only a few of the industry's big-name vendors have followed Grid Systems Corp. into pen computing, and of those, only NCR Corp. is widely credited with being able to ship products on demand.

The other players, notably IBM PC Co., Toshiba America Information Systems, Inc., NEC Technologies, Inc. and Fujitsu Personal Systems, Inc., have experienced various problems getting their first units out the door.

Toshiba, for instance, can make its DynaPad, but the Japanese parent refuses to ship systems until Go Corp. fixes a problem with its drivers for Personal Computer Memory Card International Association sockets.

Overall, though, hardware problems rather than software problems, have delayed users from deploying or even piloting pen projects in many cases.

"For IBM, Mitsubishi, Toshiba, NEC — either evaluation units aren't available, or they don't have someone to come by here," said Al Lake, computer systems specialist at the Association of Oregon Counties in Salem, Ore. According to Lake, NCR and start-up Tusk, Inc. let him see systems but would not leave a unit for evaluation purposes. He said that despite his interest in purchasing 75 units, only Grid had pursued him aggressively.

Hands are tied

Some users want to deploy pen systems, perhaps in the hundreds of units, and cannot.

"I have enough critical mass in software to go forward and I am just waiting for hardware, like I have been for a year," said William Tsang, manager of medical systems at Pfizer, Inc.'s U.S. Pharmaceuticals Group.

Tsang said his group would like a 486-based system or a system based on AT&T's Hobbit chip. He said he thinks these systems will hit the market in the next quarter.

Most observers said the first-generation hardware available today is simply too crude to spark the market. According to Katich, the hardware is too heavy and runs the software too slowly. His company develops applications in Communication Intelligence Corp.'s relatively lean PenDOS environment.

"PenPoint tends to be exceedingly slow in the 386 environment, and Windows for Pen is only a little better," said William Lempesis, publisher of "Pen Vision News" in Pleasanton, Calif. "Most users doing pen applications would rather have 486 machines or maybe Hobbit machines."

Others said the problem with pen computing will not be solved this year. "I don't think we're one 5-pound 486 [pen machine] away from the market exploding," said Joseph Schoendorf, a partner at Accel Partners, a San Francisco venture-capital firm.

While vendors with 386-based systems may be behind the times, the pen market has not worked the same way as others. For example, the 8088-class GridPad remains the best-selling piece of pen hardware and small handheld systems based on less-than-cutting-edge processors are expected to drive the pen market.

Lempesis Research in Pleasanton, Calif., said 65,000 pen systems were sold in 1992. 144,000 units will sell this year and 362,000 units are expected to sell next year. By comparison, market research firm Infocorp in Santa Clara, Calif., placed the total mobile computer market at 6 million units in 1992.

Chasing the chef

One of the nation's Top 50 food-service distributors is looking to pen computing to give its sales a boost.

"In our industry, the first wave of automation was laptops, but we didn't jump into the full laptop experience," said Blair Labatt, president of Labatt Food Service, Inc. in San Antonio. "There's a certain rhythm to a sales call, and we felt [notebooks] distracted from that. We were also looking for a truly mobile device, something so they could chase the chef around the kitchen."

Currently, Labatt's top sales rep is testing a pen-based system using OrderWriter from Access International. Labatt said the rep has cut two to three hours of administrative work out of his day with the pen-based system. The company will purchase 50 units by the end of the year.

"Our application is fully functional, but we feel there's so much change taking place in the hardware that we want to wait a bit," said Tony Canty, Labatt's MIS director. Canty said his beta test is being done on Samsung's 386SX-based PenMaster, but he expects to buy 486-based units now hitting the market, perhaps IBM's ThinkPad 710T. He also said battery life of two or three hours per battery on notepads is not long enough.

Still, Labatt will not wait long to implement pen computing because it expects the technology will increase its efficiency. It will roll out several units a month.

Pen systems are "automating the way [our reps] work, rather than making them work a different way," Labatt said.

MS-DOS upgraded, but do you need it?

By Christopher Lindquist

MS-DOS 6.0 is good — very good. But what is new to MS-DOS 6.0 is not new to the DOS world, and that will limit the flow of upgrades in companies that have already found third-party solutions to their problems.

For every new utility that MS-DOS 6.0 offers, there is something, usually with more features, already on the market. Data compression, automated memory management, backup, virus protection, disk caching, file transfers, support for multiple configurations: All are available from third-party vendors.

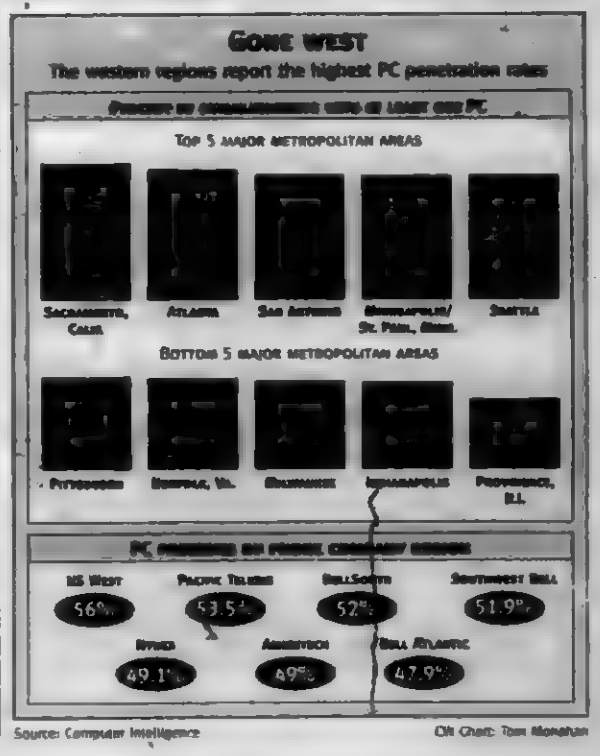
Granted, the average user buying a machine with MS-DOS 6.0 installed may no longer have to buy these utilities, and the availability will undoubtedly expand the use of these types of tools. It just remains to be seen whether this will be enough to persuade large firms to go through the trouble of an upgrade.

MS-DOS 6.0 does have one advantage over many third-party products: ease of use. The utilities are well-integrated into the operating system, and running them is generally a matter of typing one command and hitting ENTER a few times. The upgrade eliminates the most serious deficiency in MS-DOS 5.0 — getting the most out of it required users to modify their configuration files by hand, which is a recipe for trouble.

That is not the case with MS-DOS 6.0. DoubleSpace data compression does not require users to modify configuration files, and it loads with a single command. MemMaker optimizes drivers and resident programs in upper memory. Anyone using DOSKEY macros to move files and directories will not have to anymore — a MOVE command that handles subdirectories is built in. And the on-line Help files are extensive and contain command examples, syntax and notes.

What all this means is that for average users there should be fewer machines out there with 4M bytes of memory but only the first 640K being used because the user does not know how to install EMM386.EXE. It should also extend the life of a lot of hard drives by "doubling" the space (I got

MS-DOS, *page 40*



Financial firm banks on imaging

By James M. Connolly
BOSTON

Sometimes being on the bleeding edge can work out just fine.

Four or five years ago, anyone might have scoffed at a plan to go with outsourcing, imaging, client/server and OS/2 all at once. But Massachusetts Financial Services Co. rode the bleeding edge all the way to cash savings, better productivity and improved customer service.

Massachusetts Financial's James Bailey *was behind OS/2 push*

Massachusetts Financial is reaping the benefits of a companywide work-flow system based on IBM's OS/2 as a desktop operating system, an IBM Application System/400 minicomputer, local-area networks and peer-to-peer links from the desktop to the outsourcer's mainframe.

The firm had started out using MS-DOS-based client software but scrapped it in favor of OS/2 after a 90-day pilot.

"We found that DOS wasn't going to cut it and that we had to go to OS/2," said Senior Vice President James F. Bailey, who swears by the oft-criticized IBM operating system.

"I am an extremely strong proponent of OS/2. [Release] 2.0 is a true preemptive multitasking operating system. It is what someone had in mind when they developed OS/2 five or six years ago," Bailey said.

OS/2's communications manager provides the company with a core communications capability that ties the PCs to the AS/400 and, through peer-to-peer networking, to host data on a mainframe from DST Systems, Inc. The original desktop machines, IBM Personal System/2s based on 20-MHz Intel Corp. 80386 chips, are being swapped out for IBM 486SLC2-based machines with 25/50-MHz clock doublers.

Massachusetts Financial's Automated Work Distribution System and the process review that led to it have helped the mutual fund company reduce the number of business steps involved in servicing customers from 600 to 270.

Massachusetts Financial has seen an early payback on its $5 million investment and efficiencies: The company can handle its $30 billion in funds using 100 fewer employees than before.

Now Massachusetts Financial sees opportunities to build on the document management system. Bailey has his eye on voice recognition and annotation, character recognition for reading account names and numbers, on-line customer access and a telecommuting option in which customer service reps could work with the image system from home.

The system was built by DST Systems in Kansas City, Mo., which also provides transaction processing for several financial services firms including Massachusetts Financial.

That original outsourcing deal was driven by boomtown-style growth at Massachusetts Financial during the 1980s. Without adequate systems in place to handle the transaction growth, the firm "threw people at the problem," according to Bailey, and employment soared to 1,000 people.

Once Massachusetts Financial outsourced its processing to DST five years ago, its head count shrunk to about 600. Then, about the time Massachusetts Financial started looking for a work-flow system for servicing customer accounts, DST proposed a document system based on the AS/400.

Before committing to the DST system, however, Massachusetts Financial launched an internal business process review. That analysis showed that too many people were handling each business transaction. For example, a customer's request to redeem shares could involve 20 steps, 14 more than necessary.

A key to success, according to Bailey, was employee participation during the review process and the subsequent 40-workstation pilot project.

"We told them that we wanted to improve productivity, and the only way we could do that was to reduce head counts. We also told them that we were not going to lay anybody off and that any attrition would come through a managed process," Bailey said.

Massachusetts Financial plans to install a new version of the DST system that will move the core applications out of the AS/400's 5250 emulation modes and into a true graphical environment. It will also include voice annotation, limited character recognition and will generally tighten integration.

ON SITE

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Challenge: To improve customer service and save money by streamlining flow of paper-based correspondence.

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Operating systems

DOS 6.0 adds utility features

By Michael Fitzgerald

Microsoft Corp.'s 6.0 version of DOS plugs holes in the operating system that utility vendors used to fill but leaves plenty of room for new features.

Many of MS-DOS 6.0's features were licensed from established utility vendors. For instance, DOS 6.0 uses a subset of Symantec Corp.'s Norton Backup, the Norton disk defragmenter and Central Point Software, Inc.'s antivirus software. Microsoft also modified disk compression software licensed from Vertisoft Systems, Inc.

At least one user said he still sees a need for utility products.

"I can see home users using the [DOS] utilities set, but corporate users will need a full-featured utility," said Philip Ketchum, network administrator at Baxter Healthcare Corp.'s cardiovascular group in Irvine, Calif. Ketchum said MS-DOS 6.0.'s backup utility does not support tape backup, for instance.

Utility vendors have anticipated the release of MS-DOS 6.0 by building more features into their own products.

Central Point released Safe Six, an update for the 300 viruses that have been discovered since the antivirus component in MS-DOS 6.0 was completed. Central Point also released PC Tools 6.0, which has been optimized to run on MS-DOS 6.0.

Symantec released Norton Utilities 7.0, with special support for MS-DOS 6.0.

Quarterdeck Systems, Inc. will release QEMM Version 7.0 "within 45 to 60 days of MS-DOS 6.0's actual ship date," a spokesman said.

Tomorrow, Stac Electronics is scheduled to release Stacker 3.1 for Windows and DOS. The compression utility maker, embroiled in a suit with Microsoft over the inclusion of compression features in MS-DOS 6.0, claims Stacker 3.1 is capable of being fully integrated into MS-DOS 6.0 through the same hooks used by DoubleSpace.

While some utility vendors have bemoaned MS-DOS 6.0's release, such vendors "know they need to change their products on a regular basis or go out of business," said Amy Wohl, head of Wohl Associates in Bala Cynwyd, Pa.

MS-DOS upgraded

CONTINUED FROM PAGE 39

about 1.7 to 1; your mileage may vary). And the multiple configuration support is nice (I've always used batch files to accomplish the same thing), but not something the average user is going to need.

As for the other utilities, they tend to be stripped-down versions of releases from other vendors. Backup is Symantec Corp.'s Norton Backup minus tape drive support and scheduling capabilities, so anyone serious about backups who does not want to sit at the machine and swap floppies will need to get a more complete package.

The virus protection package comes from Central Point Software, Inc., and you must join a subscription service to keep it up to date. And MemMaker does not support multiple configurations completely: You have to create your configurations, optimize them separately and then combine them into a single file, a process that may stymie less-than-power users.

And none of the features of MS-DOS 6.0 are compelling for a firm that does not have disk space problems and is already using other, more full-featured utilities on its systems. Microsoft will have a harder sell into corporations with this version than it did with MS-DOS 5.0.

So if your current DOS setup ain't broke, MS-DOS 6.0 won't fix it.

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Casper no friend of computers in April

By James Daly

Forking a check over to the Internal Revenue Service isn't the only thing you have to worry about this month. A plethora of viruses provides another taxing situation for information systems security managers.

Although most viruses triggered in April are nondestructive nuisance viruses, several are quite devilish. The Christmas Tree and Casper viruses activate in early April. A virus program that uses an integrity checking approach should be able to detect and then eradicate both of them.

A particularly nasty virus, however, arrives on April 15, when Casino rears its ugly head. Casino is a memory-resident infector of .COM files, including COMMAND.COM. Upon activation, the virus challenges the user to a slot machine game with the following message: "DISK DESTROYER. A SOUVENIR OF MALTA. I have just DESTROYED the FAT on your Disk!! However, I have a copy in RAM and I'm giving you a last chance to restore your precious data. WARNING: IF YOU RESET NOW, ALL YOUR DATA WILL BE LOST FOREVER! Your data depends on a game of JACKPOT. CASINO DE MALTE JACKPOT." If your system loses the game, Casino will trash the file-allocation table.

The virus activation dates are for general awareness and are not exclusive. And remember to back up those floppies.

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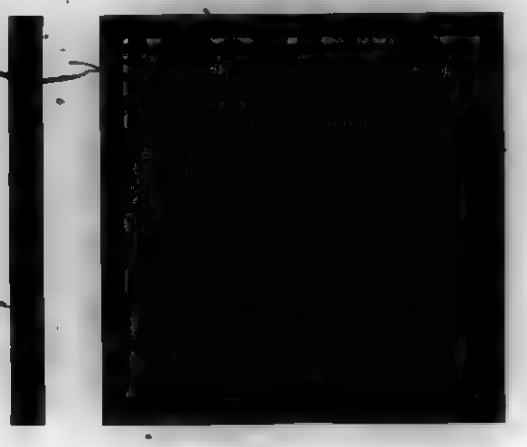

Sue Wolk
Executive Director
Association for Information and Image Management

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"We are teaming up with Computerworld and IMC this year for an upcoming White Paper on 'Workflow Technologies in the 1990s' to be published June 14, 1993. This paper presents a detailed examination of the imaging applications and buyer's requirements for workflow technologies as well as projected market growth forecasts for the coming years. This will be the first published paper to examine this market in both the U.S. and Europe."

"AIIM's mission is to educate IS management on the ever-changing world of electronic imaging and micrographics. This Computerworld White Paper will help us reach the most influential IS decision-makers."

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Verbex delivers continuous speech interface for Windows

By Michael Vizard
EDISON, N.J.

Verbex Voice Systems, Inc. has taken a big step toward making voice recognition systems more practical and affordable by delivering an interface for Microsoft Corp.'s Windows that supports continuous speech.

The Verbex offering, with an introductory price of $695, consists of Listen for Windows software and a digital signal processing (DSP) board that converts human speech into keystrokes that a Windows application can understand.

"Voice recognition applications require lots of floating-point calculations that are provided by Fast RAM in DSP boards. The price of Fast RAM has come down to the point where we can now offer a Windows product on PCs," said Verbex President Larry Dooling.

The Verbex offering is capable of recognizing up to 300 words out of a palette of 420 words supplied by Verbex.

In addition to the typical office automation applications usually associated with voice recognition, the Verbex offering is also finding a place on the factory floor.

Circuitest, Inc. in Nashua, N.H., is using the product to free the hands of printed circuit board testers, who typically must use both of their hands to inspect boards using a pair of electronic probes.

The Verbex software allows them to display and manipulate a schematic of the board while they test it.

"It makes an incredible difference. The testers are about 30% more productive," said Mike Gowing, a software engineer at Circuitest.

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There's quite a battle raging between Word and WordPerfect.

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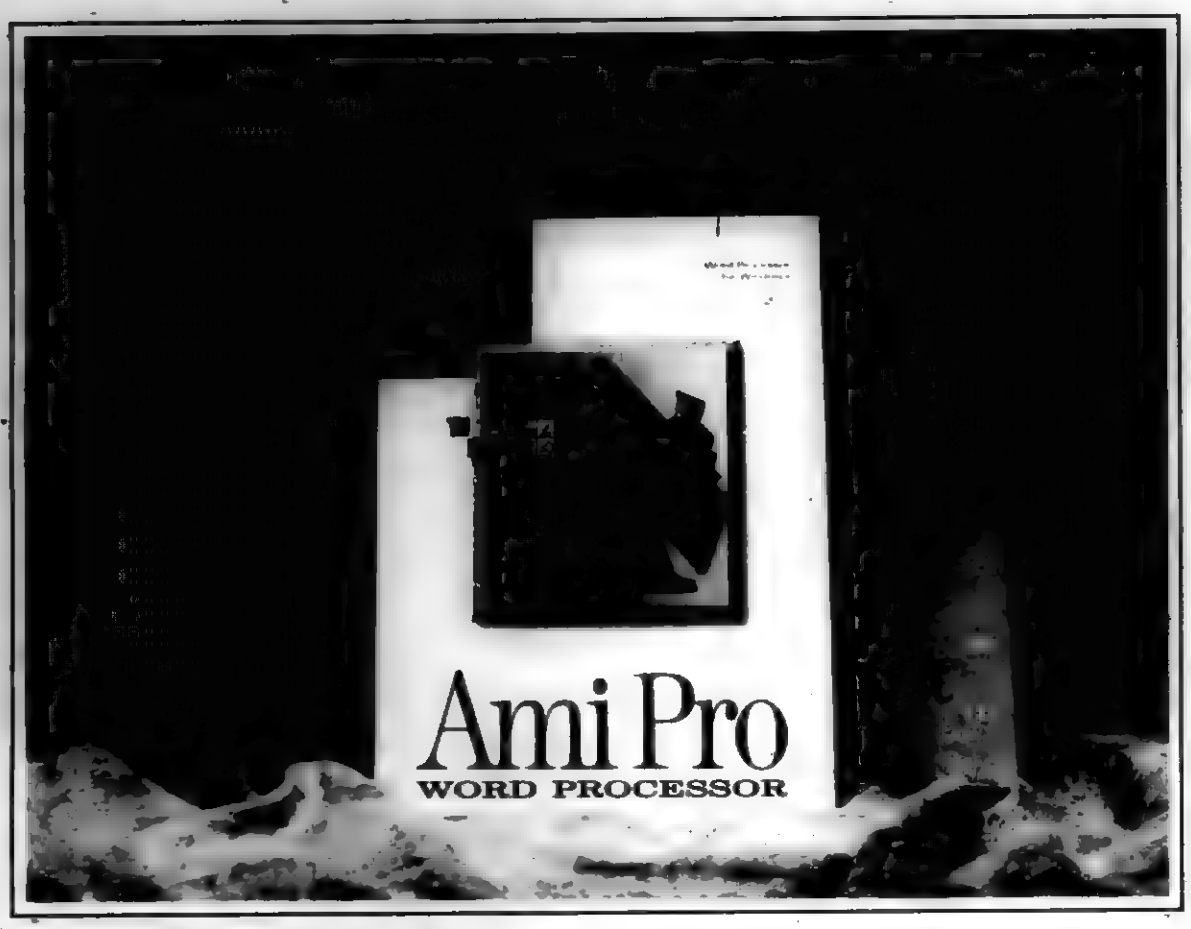
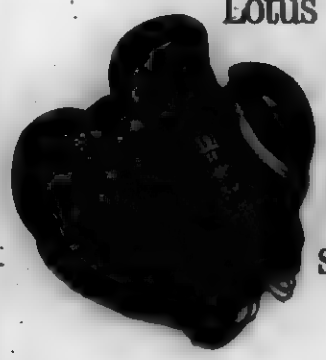


In the War of the Words, there's one clear winner. Ami Pro.

Word vs. WordPerfect.® It's billed as the battle of the world's two greatest word processors. Hardly. According to most independent judges, Lotus® Ami Pro® 3.0 is the clear and convincing leader of the word processing pack. Word and WordPerfect are following its lead, scrapping it out for second and third.



Check the rankings.

Ami Pro 3.0 is ranked the #1 Advanced Word Processor for Windows™ by the National Software Testing Laboratories. (9/92)†

Recently, in an InfoWorld review, Ami Pro received the highest score ever given for a Windows word processor. (9/28/92)

Lotus Ami Pro captured the 1992 PC Computing MVP Award. (12/92) (Note: The MVP award also appears in the new WordPerfect ad. That's last year's award.)

PC Magazine recently named Ami Pro one of the Best Products of 1992. They said, "No other product can match...the sheer pleasure of using it." Microsoft Word received an Honorable Mention, with the comment "...it's a step behind Ami Pro." (1/93)

Now, perhaps the battle royale between Word and WordPerfect has been put into perspective.

And you probably wonder what it is that makes Ami Pro clearly better?

†Among all word processors tested. Software Digest, Ratings Report, Vol. 9, #6, Sept. 1992. Reprints available upon request. *On weekdays, plus 7AM to 4PM on Saturdays. **Offer expires 9/30/93. Call for

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nd place.

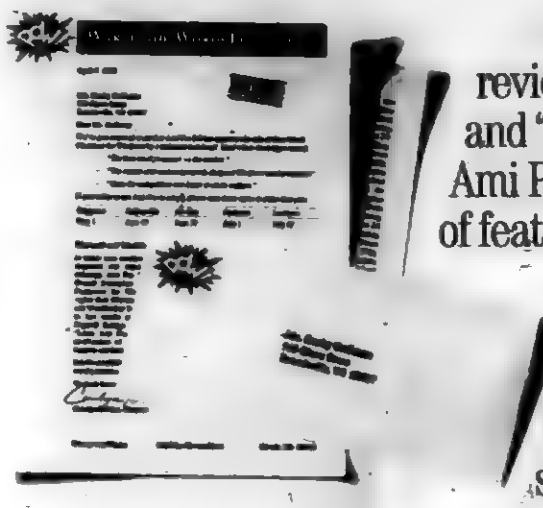
The battle of the features.

Simply put, Ami Pro is a faster, easier, friendlier word processor to use. It does so many things with so little effort, most people never even bother to open the manual.

To name a few, there's real, honest, no ifs-ands-or-buts WYSIWYG. There's Fast Format, for quick repetition of text formats. There are customizable, editable SmartIcons.™ Not to mention SmartClick, where the right mouse button will automatically shift you to the appropriate dialogue box to change fonts, styles or frame formats, based on what you're doing.

There's automatic renumbering of lists. Preview of Style Sheets. QuickStart on-line tutorial. Free 24 hour a day technical support.* And to ease your mind, a 60-day money back guarantee of your complete satisfaction.

And, if you're switching from WordPerfect for DOS, relax. Ami Pro makes it easy with a number of special features. Like seamless conversion of WordPerfect files. And a SwitchKit so that when you type in WordPerfect commands, Ami Pro shows you how to perform the same functions using pull-down menus or one-click SmartIcons.



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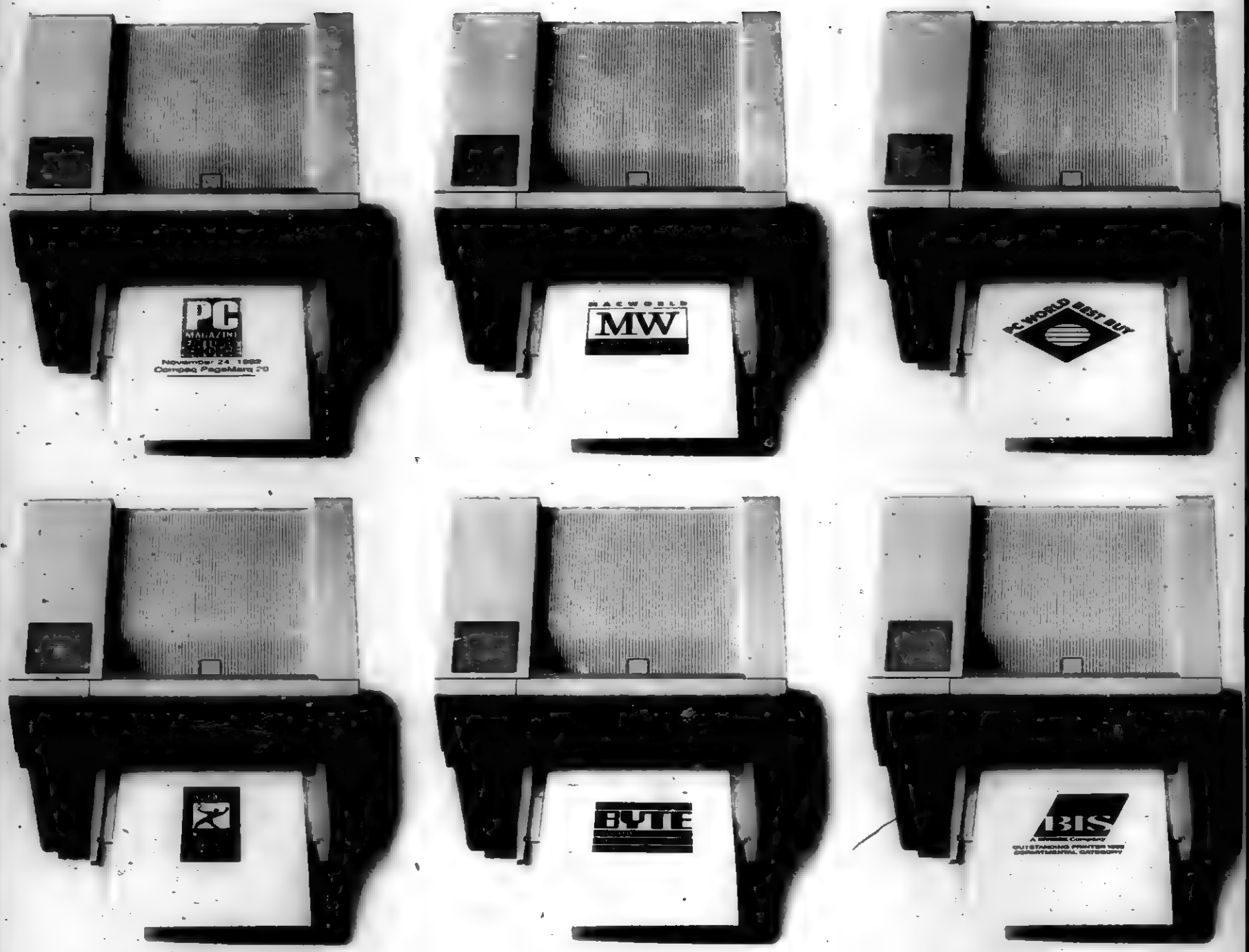

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AppleShare lineup will reach larger workgroups

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. has announced two new versions of its AppleShare software that are tailored to meet the more demanding print and file service needs of users in larger workgroups.

Both AppleShare 4.0 and the high-end AppleShare Pro were announced along with Apple's Workgroup Servers at the CeBIT computer show in Hannover, Germany, recently.

Morris Taradalsky, general manager of the Enterprise Systems Division, said the newcomers were designed for "Macintosh-mostly networks" but will support DOS and Microsoft Corp. Windows clients.

Poised for client/server

The beefing up of AppleShare represents another move on Apple's part to take advantage of increased user enthusiasm for designing client/server architectures.

Taradalsky said Apple hopes to sell the Macintosh as an easy-to-use way of designing client/server systems and thus increase Apple's presence in information systems shops across corporate America.

According to a study by the Business Research Group, a Boston computer consultancy, AppleShare servers were less expensive to manage during a one-year period than comparable file and print servers on other platforms. The study concluded that ease of use could be translated to lower life cycle costs.

Workgroup-ready

AppleShare 4.0 was designed for small to medium-size workgroups and supports 150 concurrent user log-ons. The $1,899 package was specifically designed for machines running Motorola, Inc.'s 68040 microprocessor, company officials said.

Version 4.0 will come preinstalled on the new Workgroup Server 60 and 80 and will also run on the Centris 610 and Quadra 700, 800 and 950. The package is scheduled to ship this summer.

AppleShare Pro, which was designed for demanding file service environments, will run on the new Workgroup Server 95. The $2,399 package will support up to 200 concurrent user log-ons moving large data files around the network. It is expected to ship later this month.

The company will also continue to offer the $1,199 AppleShare 3.0 as an entry-level way to build a centralized file/print server. AppleShare 3.0 can turn any Macintosh into a network server, Apple officials said, and can support up to 120 concurrent user log-ons.

Mac client efforts grow

Novell, Microsoft, Banyan offer connectivity solutions

By Michele Dostert

■On the corporate desktops of America, Apple Computer, Inc. Macintosh computers have suffered from a perceived snobbishness. While they connected to one another easily, they were often unwilling, limited participants in PC-based local-area networks.

"People have avoided Macs because they just don't want the hassle of connecting them to the same LAN, E-mail and file-and-print sharing used by PC desktops," said Patrick Carney, information systems director at Asea, Brown, Boveri in North Brunswick, N.J.

In the past six months, however, leading LAN operating system vendors, including Novell, Inc., Microsoft Corp. and Banyan Systems, Inc., have all announced plans for improved Macintosh support that should lower resistance to Macintoshes among corporate IS groups.

Virtually a Macintosh

Novell, the LAN market leader, has detailed a three-stage plan for improving the lot of Macintoshes on NetWare LANs. Currently, Novell's NetWare v3.11 operating system supports Macintoshes through a server-based NetWare Loadable Module, called NetWare for Macintosh, that loads the AppleTalk protocol stack and the Apple File Program (AFP) into the PC server, turning part of the server into a "virtual Macintosh."

NetWare for Macintosh users have no NetWare shell on their Macintoshes and no log-in script in the NetWare server, and they can only address the "Mac-aware" part of the server on a peer-to-peer basis. NetWare for Macintosh for NetWare 4.0 is scheduled to ship by June.

According to Steve Nelson, vice president of Novell's NetWare clients group, the company plans to beef up Macintosh support considerably in the next year. Novell is beta-testing a product called MacIPX, a version of Novell's IPX/SPX protocol stack that will allow Macintosh users to access the NetWare server or other DOS machines without first loading an AppleTalk stack into the PC.

However, Nelson emphasized that MacIPX will provide only transport-layer services, not full client support for Macintoshes on NetWare.

By the end of 1993, Novell plans to roll out a third-party development product called NetWare Server Support for Macintosh, an application programming interface (API) aimed at third-party developers that will allow them to use NetWare Core Protocols and other NetWare services, such as directory and messaging, when developing distributed applications for the Macintosh.

In around a year," Nelson said, Novell will roll out a product called NetWare Workstation for Macintosh, new client software that will bring the Macintosh into full citizenship on NetWare LANs. "We're going to teach the Mac to speak NetWare, just like DOS, Windows and OS/2 clients do now," Nelson said. He noted that Macintoshes running NetWare Workstation for Macintosh will appear like any PC-based NetWare client to LAN managers and can be managed as such.

Microsoft currently supports the Macintosh in its LAN Manager products the same way Novell does in NetWare — by loading AppleTalk and the AFP into the LAN Manager server.

The Advanced Server, Microsoft's upcoming Windows NT-based version of LAN Manager,

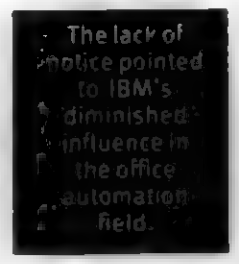
Mac client, *page 48*

IBM adds scheduling software too quietly

By Lynda Radosevich
WHITE PLAINS, N.Y.

With fanfare so lacking that users and analysts marveled at its absence, IBM began shipping last month a local-area network scheduling software package as part of its LAN Office strategy.

Called Time and Place/2, it supports electronic coordination and scheduling of meetings and resources using IBM OS/2-based servers and OS/2- or Microsoft Corp. Windows-based clients. A connection to IBM's host-based OfficeVision calendars is being tested at beta-test sites, but IBM said it does not have a ship date scheduled yet.



"They haven't played it up as much as they should have," said Tom Cox, director of information support at the Carolina Electric Cooperatives, an association of electric companies in North Carolina. "IBM needs to get off its corporate hind end and blow its own horn."

The lack of notice, said David Ferris, editor of the electronic-mail industry newsletter "Ferris E-Mail Analyzer," pointed to IBM's diminished influence in the office automation field.

The Carolina Electric Cooperatives beta-tested Time and Place/2 while looking for a scheduling package for 140 end users, most of whom have OS/2-based PCs. Cox said he plans to purchase the software for all 140 people to schedule meetings and the use of resources such as notebook computers and cars.

Consequently, the association plans to better allocate the work of its support staff.

"We took a poll of our secretaries and found that they spent up to two weeks per month just scheduling people," Cox said. "Now any person in the corporation can just click on an icon [in the OS/2 WorkPlace shell] and see who's busy or not busy and schedule a meeting."

Before making the final purchase decision, Cox will look at Lotus Development Corp.'s Organizer. The organization already uses Lotus' Ami Pro word processor and CC:Mail E-mail, and Cox said he wants to see whether the Organizer integrates better with those packages than Time and Place/2.

However, because the IBM scheduler supports Lotus' Vendor Independent Messaging (VIM) interface, IBM said it will send mail meeting notices to all VIM-enabled mail systems such as CC:Mail.

Time and Place/2 includes a group time manager, an individual to-do list and memos. It will operate over IBM OS/2 LAN Server or Novell, Inc. NetWare LANs. It is priced at $595 for the server software and $55 per client.

The particulars

The server for Time and Place/2 is an OS/2 2.0 32-bit application that uses the IBM Extended Services Database Manager. It will support Database 2 OS/2 when it is available. It is one of the first OS/2 2.0-based client/server applications from IBM Programming Systems.

Unix-based server scalable to five processors

By Kim S. Nash

Wyse Technology, Inc. recently unveiled a new Unix-based symmetric multiprocessor designed to support up to 250 active users.

The Series 7000i Model 760MP server will also support Microsoft Corp.'s Windows NT, the San Jose, Calif., company said.

With a base price of slightly less than $20,000 for a one-CPU system, the Model 760MP server is scalable to five Intel Corp. 66-MHz i486DX2 processors and will accommodate Intel's Pentium chip after mid-May, when Intel formally unveils Pentium, according to Dave Everett, senior vice president of marketing at Wyse.

The other server companies that are expected to ship Pentium machines next month include Compaq Computer Corp., NCR Corp. and NetFrame Systems, Inc.

While Pentium remains elusive, users can expand Wyse servers with additional i486DX2 boards for $7,499 apiece. A maxxed-out 760MP — a five-CPU configuration — would cost approximately $50,000.

Wyse has worked with Microsoft to build a hardware abstraction layer (HAL) to let Wyse technology act as an interface between the operating system microkernel and hardware device drivers. Wyse's HAL was included in Microsoft's preliminary developer's release of Windows NT.

Attendees at Comdex/Fall '92 in November saw a demonstration of the 760MP, which is now shipping. The machine runs a special symmetric version of Unix System Laboratories, Inc.'s Unix System V Release 4.

Hewlett-Packard Co. will provide onsite support for the new boxes, Wyse said.

Mac client effort

CONTINUED FROM PAGE 47

will feature drastically improved Macintosh support, according to Tom McCann, Microsoft's product manager for Advanced Server. New services will include support for 255 Macintosh clients, improved manageability of Macintosh clients in NT's File Manager and new NT-based security for Macintosh clients that will map file access across Macintosh, DOS, Windows, OS/2 and NT platforms.

"One of the neatest things we're adding is letting Macs print seamlessly to non-PostScript printers. If Mac users send a file to one, we will map it over for them on the fly," McCann said. He also promised that Macintosh support for LAN-based Microsoft Mail, SQL Server and SNA Gateway will be released by the end of the year.

Macs on Vines

Banyan also beefed up Macintosh support in its newly released Vines 5.5 LAN operating system. According to Pam Campagna, product line manager for Vines, Banyan also supports the Macintosh by loading AppleTalk and AFP on top of the Vines kernel. However, Banyan has created a "file translation" algorithm, mapping Macintosh 32-character file names to DOS 8-character syntax and vice versa, so all Vines-stored files can be seen on any client, regardless of where they were created.

Banyan also built a "security translator" that maps both Macintosh and PC file access rights into the Vines security system so that users will have consistent access, depending on specifically granted rights, across all platforms.

Since AppleTalk can be tunneled through Vines servers, Macintosh in remote sites can use AppleTalk to connect together locally and use the T1 or Integrated Services Digital Network support in Vines servers to access wide-area network-based mail, file and print services, Campagna said. She added that Macintosh APIs will be included in the forthcoming Vines 5.5 tool kit, a set of third-party development tools for Vines 5.5.

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While some people view imaging systems as just document storing tools, others view them as something much more powerful.

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We suggested ImagePlus,® IBM's imaging offering for work process management. In short, they projected savings of $2 million per year by

Reach ships WorkMAN work-flow software

By Lynda Radosevich
SUNNYVALE, CALIF.

Observers say users can expect quick paybacks from new local-area network-based work-flow technology such as the new WorkMAN work-flow management package from Reach Software Corp.

"The attraction of work-flow systems is that the payback is astonishing; it's routine to see a 100% return on investment in two months," said John Donevan, director of groupware services at WorkGroup Technologies, Inc., a consultancy in Hampton, N.H.

In general, work-flow systems automatically route and track forms and data through an organization in a logical manner. The payback comes in increased efficiency resulting in less personnel and faster product development cycles.

"The other attraction is that you can install work-flow systems one workgroup at a time rather than starting at an enterprise level," Donovan said.

To reach that market, Reach Software has begun shipping WorkMAN.

The software is aimed at businesses that want to develop work-flow applications that work with their Banyan Systems, Inc. Vines and Novell, Inc. NetWare Global Messaging and Message Handling Service-based electronic-mail systems.

The Reach package is composed of a desktop Microsoft Corp. Windows application that displays task lists, projects and messages; a forms router that can track forms and attached files; management software that transparently controls how tasks are processed and tracks the work done; graphical programming tools for building applications; and scripting language for launching and debugging the work-flow applications.

EMC Corp., a disk storage device maker in Hopkinton, Mass., is testing work-flow applications built with WorkMAN to increase the efficiency of its manufacturing process.

Peter Markell, MIS director at EMC, said work-flow applications would add value to his Vines network. He said he is looking at several packages, including Lotus Development Corp.'s Notes with an Action Technologies work-flow add-on. However, he said he likes WorkMAN because it can use the Banyan Vines StreetTalk addressing directory.

Now, most work-flow systems are deployed enterprisewide and send images rather than editable documents, analysts said. However, they said they expect E-mail-enabled work-flow applications to gain popularity.

The full WorkMAN package starts at $4,995.

In Brief

4GL integration

Information Builders, Inc. announced the integration of its Focus 4GL fourth-generation language product with the Tuxedo System/T transaction monitor from Unix System Laboratories, Inc. It combines a popular 4GL with an open systems transaction monitor. Focus for Tuxedo will work with the System/T monitor and the Focus read/write interface to relational database management systems such as those from Oracle Corp. and Sybase, Inc.

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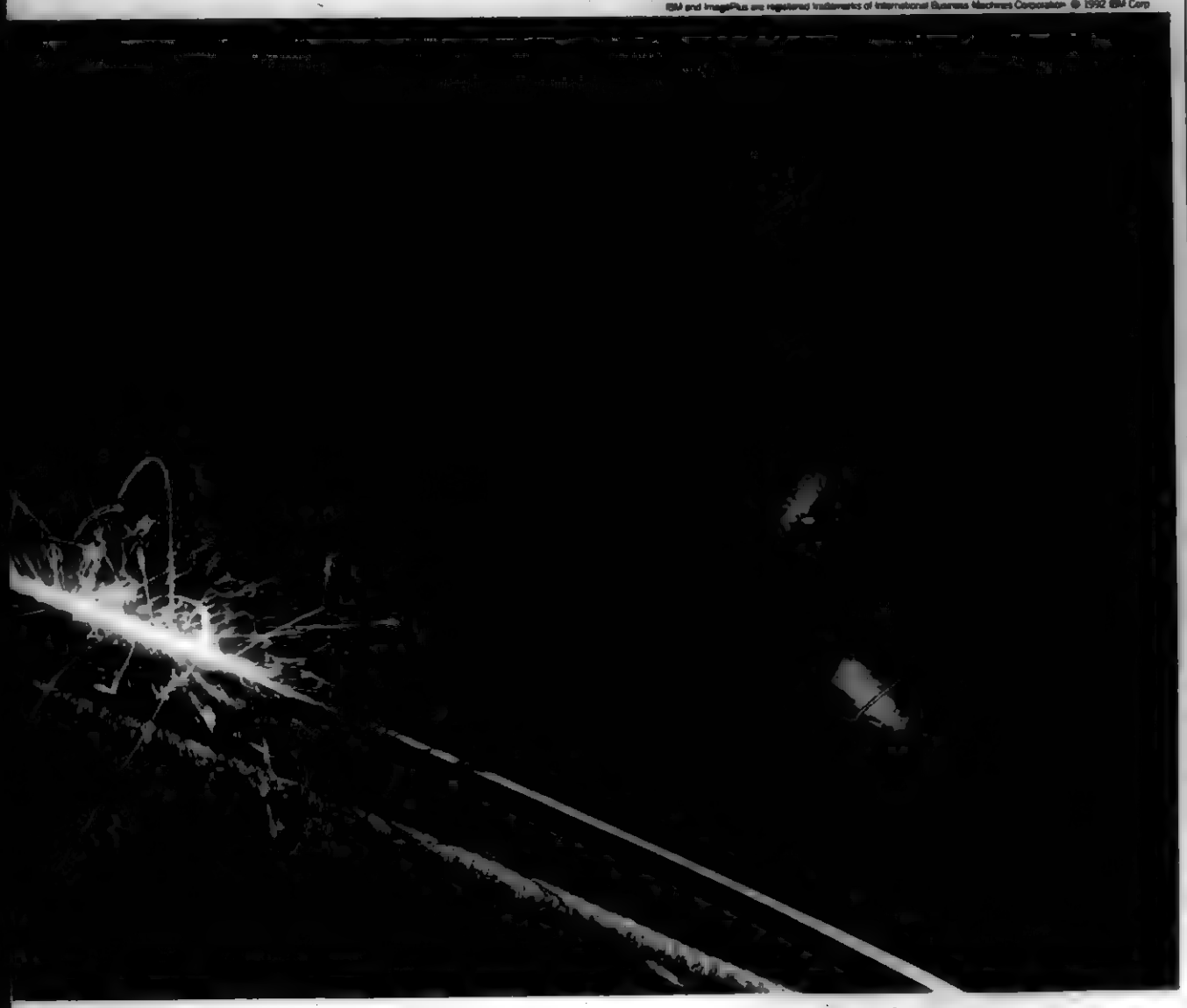

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Tune in the prisoner

By Joanie M. Wexler

■ Videoconferencing has begun to make its mark in a somewhat controversial sector of society: the courts.

Several state judicial systems are using the technology to replace short sessions during which a judge might quickly reduce an inmate's bail or grant a trial continuance. The main goal is to dramatically reduce the number of inmates transported from jails to courthouses. The reason: Physically moving them means big costs in labor, vehicles and fuel consumption in an economic climate that can ill afford it.

And despite some squeamishness about the constitutionality of videoconferences replacing live courtroom appearances, the cost-cutting, logistical and security benefits of the technology have prevailed in 17 U.S. counties for routine court business.

Some counties have gone as far as to use videoconferencing for arraignments, an accused's first court appearance after arrest during which the judge sets bail and a court date. This application has spurred much of the controversy over an individual's legal right to physically stand before a judge. In fact, some public defenders appointed by the state to represent those who cannot afford to hire their own attorney blanketly object to the courtroom videoconference if the defendant has not waived his right to a live appearance.

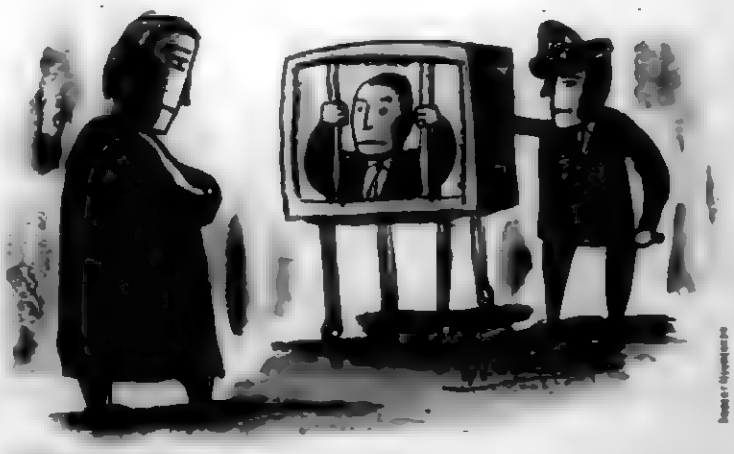
For example, John Darrell, a trial attorney for the Committee for Public Counsel Services in Plymouth County, Mass., views electronic sessions as discriminating against an individual based on financial status.

"If you can afford bail, you have the opportunity to go to court," he said. "The videoconferencing alternative means a person who doesn't have the money to make bail is prevented from going. When money [is the determining factor], I see that as a violation of due process."

Camera-shy

In addition, Darrell said, the impression an inmate makes via video could make him look "guiltier." Each time one of his clients has been on video, he said, the individual has appeared "confused and uncertain," as he is usually not technology-savvy, he said.

Darrell intends to soon file a motion against videoconferences with the Massachusetts Supreme Judicial Court to halt what is currently a 90-day test under way in Massachusetts'



Many hats here, Hatgood

More than 26,000 defendants were transported more than a quarter of a million miles during 1992 from the Plymouth County House of Correction to various locations throughout Massachusetts.

Plymouth County for transporting inmates from the Plymouth County House of Correction to Brockton District Court — a 45-minute drive. A Massachusetts law requires incarcerated individuals to see the judge every 10 days.

However, these frequent visits, which often last a matter of minutes, entail strip-searching inmates at the beginning and conclusion of the trip, transporting them from jail to courthouse accompanied by a sworn deputy and confining them to a supervised holding room for three to six hours before taking them before the judge, explained Roy Lyons, a Plymouth County

Virtual court, *page 54*

Network management

Novell NMS to manage IP

By Joanie M. Wexler
SANTA CLARA, CALIF.

Novell, Inc. made strides last month in its ongoing efforts to accommodate all facets of enterprise networks when it announced that business partner SynOptics Communications, Inc. has ported its Unix-based Optivity network management application to Novell's NetWare Management System (NMS) platform.

To date, SynOptics has no plans to incorporate management of Novell IPX devices into its SunNet Manager version of Optivity.

The new version will be available this month for $3,495.

The move is significant for users pressuring Novell to deal with network components beyond its NetWare operating system — such as bridges, hubs and routers — which Optivity manages, said Kevin O'Neill, vice president of research at Business Research Group in Newton, Mass. "Novell can no longer say 'anything other than the network operating system is not our problem' because they've built end-to-end network expectations," he said.

However, today, there is a "patchwork quilt" of hardware and software products for managing enterprise networks containing NetWare, "which creates confusion to users. They're not confident they've struck upon a cohesive end-to-end scheme" for managing their increasingly critical networks, O'Neill said. This is a situation that the Optivity announcement should address, he said.

SynOptics has also become the first third-party vendor to resell NMS, which is Novell's answer in the DOS/Microsoft Corp. Windows world to successful Unix- and Simple Network Management Protocol (SNMP)-based management platforms such as Hewlett-Packard Co.'s OpenView and Sun Microsystems, Inc.'s SunNet Manager.

Novell and SynOptics cited overlap in their customer bases as an impetus for the alliances.

"At least well over half of SynOptics accounts are NetWare shops," estimated Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif.

Optivity for NetWare and SynOptics hubs will support SNMP for both Internet Protocol (IP)- and Novell IPX-based networks so that users with mixed IP/IPX shops can manage both environments together. Today, it would not be uncommon for users running mixed IP/IPX networks to have two separate management domains.

This is because NMS' core capability, called NetWare Management Map (NMM), automatically discovers individual IPX devices and the existence of IP networks but cannot manage individual IP devices, Howard said. Optivity for NetWare will allow network administrators to put IP devices on NMM, and "anything on the map, Optivity will manage," Howard added..

However, "this isn't slick," Howard said, because administrators have to manually enter IP devices onto the map rather than the system automatically discovering them, as it does with IPX resources. The degree to which this is a headache depends on how large a user's IP population is.

Schwab taps Sun for client/server

By Elisabeth Horwitt
SAN FRANCISCO

Charles Schwab & Co. is one firm that cheered when Sun Microsystems, Inc. announced its commitment to the Common Operating System Environment (COSE).

COSE is a recent initiative by six Unix vendors to produce a common "look and feel" across their platforms and to adhere to common application programming interfaces (API) by mid-1994. The vendors' main goal with the joint effort is to ease user frustration with the many flavors of Unix that are causing compatibility problems today [CW, March 22].

Schwab's Sheri Anderson: Schwab will use the 'Sun classic'

Schwab recently tapped Sun to provide workstations for a client/server architecture that the investment firm is in the process of implementing [CW, April 20, 1992]. Although no contract has been signed yet, Schwab plans to use "the Sun classic running Solaris Version 2.2" in local-area network configurations, said Sheri Anderson, Schwab's senior vice president of technology.

By joining COSE, Sun is committing to support the Open Software Foundation's Distributed Computing Environment (DCE), which is the "software glue" that is being used to tie the various client/server systems together, she said.

Prior to the COSE announcement, Schwab was counting on buying DCE software for its Sun systems from Transarc

Schwab, *page 54*

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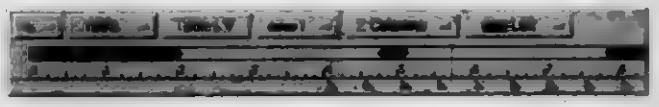

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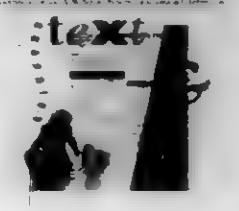

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Schwab taps Sun

CONTINUED FROM PAGE 51

Corp., Anderson said. Now, however, the brokerage house will be able to both purchase DCE software and get support directly from Sun.

A major criterion for the brokerage firm's selection was the workstation's ability to access stock data from services such as Quotron Systems, Inc. and ADP Network Services, Anderson said. Many of the major services deliver information to proprietary Sun SPARCstations now; Schwab will be working with them to support the investment firm's APIs, she said.

Schwab also welcomed the emergence of the COSE user desktop environment, a common graphical user interface (GUI) that will run across various COSE members' systems.

"It fits right into our strategy," Anderson said. Her staff has been working on a GUI-based desktop environment that would have a common look and feel, while providing "sockets" for in-house-developed and packaged applications.

In addition, Schwab programmers are using the GUI to develop "workbenches," or desktop environments tailored to a given type of user, Anderson said. "A trader would do a lot of transaction processing, while an analyst would do a lot of personal computing along with accessing a large amount of mainframe and server data."

Schwab will "absolutely adopt the COSE desktop environment, which is right along the lines of what we were doing," Anderson said.

Schwab is in the process of off-loading "a set of our mainframe applications" based on Information Builders, Inc.'s Focus to Hewlett-Packard Co. midrange systems running Unix, Anderson said.

The firm has yet to pick a vendor for the "middle tier" of its client/server architecture: the application and data servers. HP, IBM and Sun are all strong contenders, Anderson added.

The virtual court

CONTINUED FROM PAGE 51

Sheriff's Department spokesman.

He added that inmates leaving the jail "presents all kinds of opportunities for mischief."

Sheriff Peter Flynn said Plymouth County last year transported 2,800 inmates from the jail to the court, "and we really feel that 60% to 70% of those trips would be unnecessary using video communications."

While the county has not yet translated expected savings into dollars, "in talking to other jurisdictions around the country doing video, we know they have paid for the equipment in one to two years. After that, it's pure savings," Flynn said.

Implemented in Alameda

Among the 17 districts where the technology's constitutionality has been upheld is California's County of Alameda, where some inmates can conduct interviews with their attorneys from a video room in their housing units "so they don't even need to be accompanied by a sworn deputy," explained Don Naples, chief of communications for the county.

Alameda County conducted about 8,400 courtroom video sessions in 1992 alone "primarily to handle the logistics problem" of transporting inmates 30 miles from the Santa Rita County Jail to the public defender's office for attorney meetings, Naples said. All inmates "had to get on the same bus no matter where they were going," so getting the accused around to public defenders' offices, courts and other jails became a logistical nightmare that ate up time and money, he explained.

The district has invested more than $1 million in PictureTel Corp. videoconferencing equipment — the same gear that many of the other districts, including Plymouth County, are using. Alameda is using the technology for arraignments and attorney/client interviews.

Plymouth County in Massachusetts "has not yet been granted penny one" from the county, state or federal government of the $90,000 it will take to outfit the Plymouth jail and Brockton District Court with PictureTel video gear. Sheriff Flynn, however, has received videoconferencing funds for a new 1,140-bed jail.

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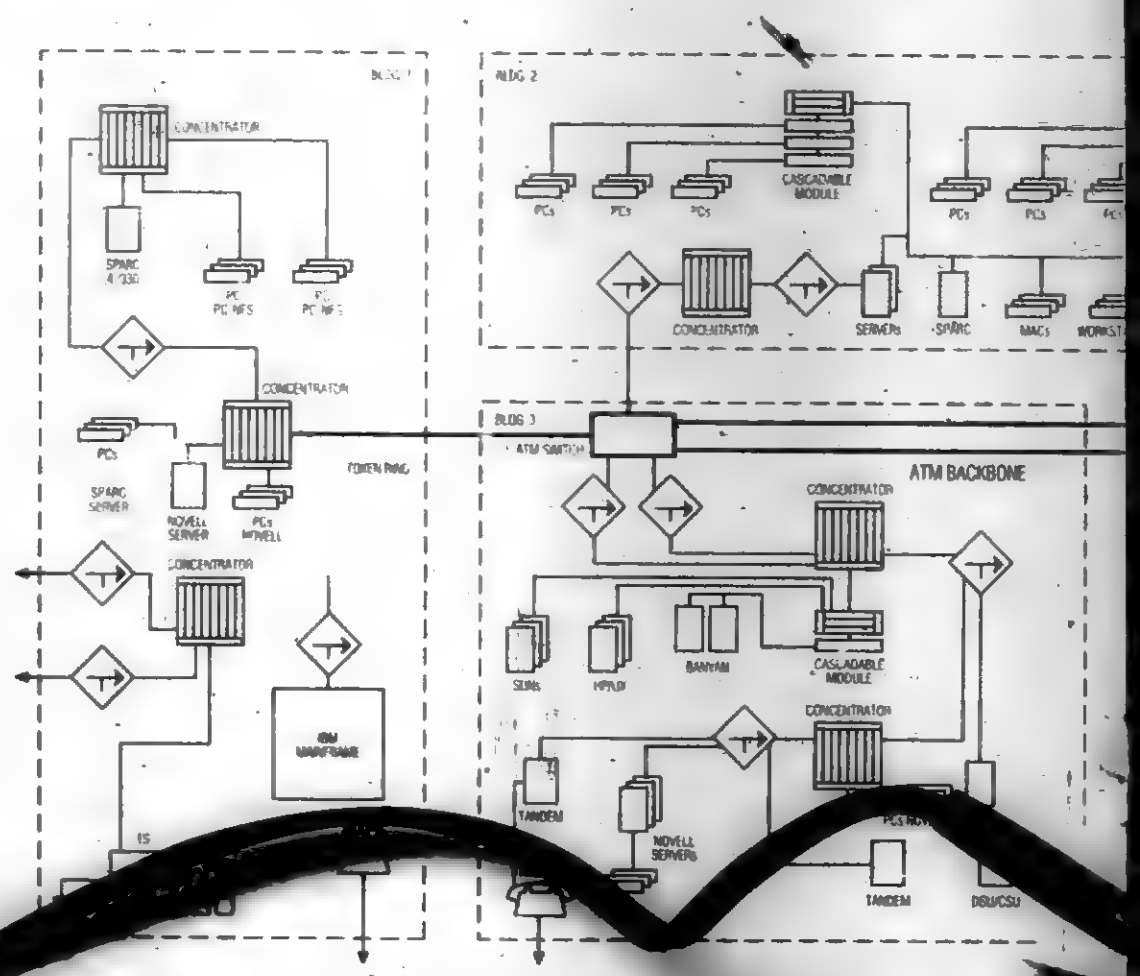

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Novell traveling in new circles

By Michele Dostert
SALT LAKE CITY

More than 3,000 NetWare developers crowded Novell, Inc.'s recent Brainshare conference, with many asking the kinds of questions they might have posed to IBM or Digital Equipment Corp. a few years ago.

Attendees filled sessions on upcoming NetWare application development services such as global messaging, imaging, telephony and multimedia.

"We'll be incorporating some of these technologies, such as imaging and telephony, into our products — not right away, but we came to start looking at them," said Robert Moldoff, operations manager at Applied Business Technologies, Inc., a Newton Square, Pa., developer of NetWare-based applications for the education market.

Bob Young, Novell's product marketing manager for NetWare, said the company will publish application programming interfaces and ship software development kits for global messaging and imaging within the next two months. Telephony kits are due within six months and multimedia within a year.

Popular sessions

Attendees also packed sessions on Novell's new NetWare 4.0 product, listing storage and directory services, upgrading techniques and performance tuning as their overriding concerns. Sessions on LAN-to-host application development and wide-area network how-tos were also well attended.

"We have 11 servers in three states, so the wide-area stuff is critical," said John Galvin, a software engineer at Swiss Colony, Inc., a mail-order house based in Monroe, Wis. "But we're working on building PC applications that can access our mainframe data, so the NetWare for SAA sessions were most important to us."

Filling NEEDS

At its recent conference, Novell moved to enhance NetWare's appeal to corporate programmers with a pilot support program.

Novell Enterprise Developer Services (NEEDS) subscribers will receive the same services offered by Novell's Professional Developer's Program, including early access to development tools, unlimited priority support and 10 free Software Developer's Kits.

NEEDS customers can also purchase additional Novell services, including a system assessment by Novell Consulting Services.

After the assessment, Novell will make recommendations to facilitate in-house application development or contacts with Novell's custom development partners such as Electronic Data Systems Corp. and Business Systems Group.

"In shops like ours, where we have 300 [NetWare engineers] doing customized application development, we absolutely have to have this high level of support," said Stanley Jarocki, a vice president at Citibank NA's business systems unit.

Corporations that have a master license agreement with Novell can enroll in NEEDS at no extra charge. Others have to pay $25,000 for one year.

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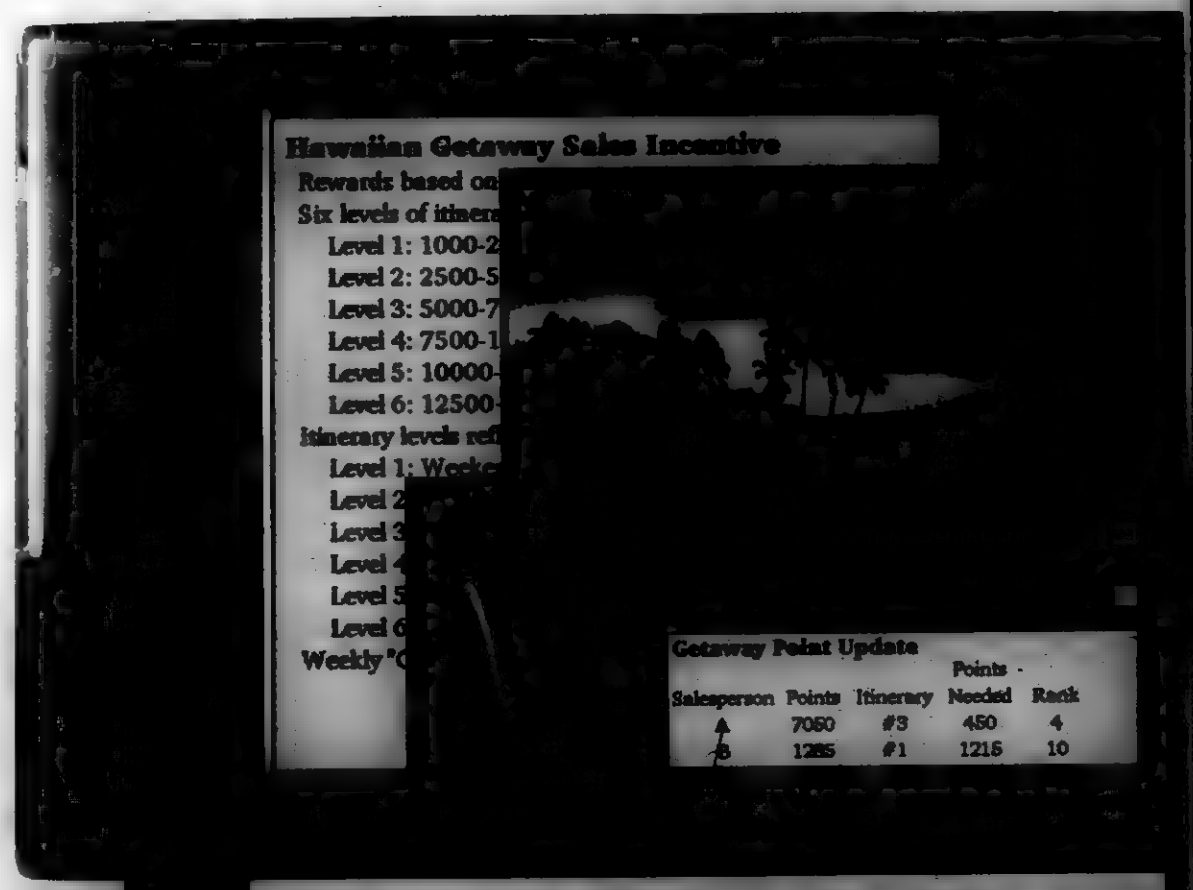

PRESENTING THE T44

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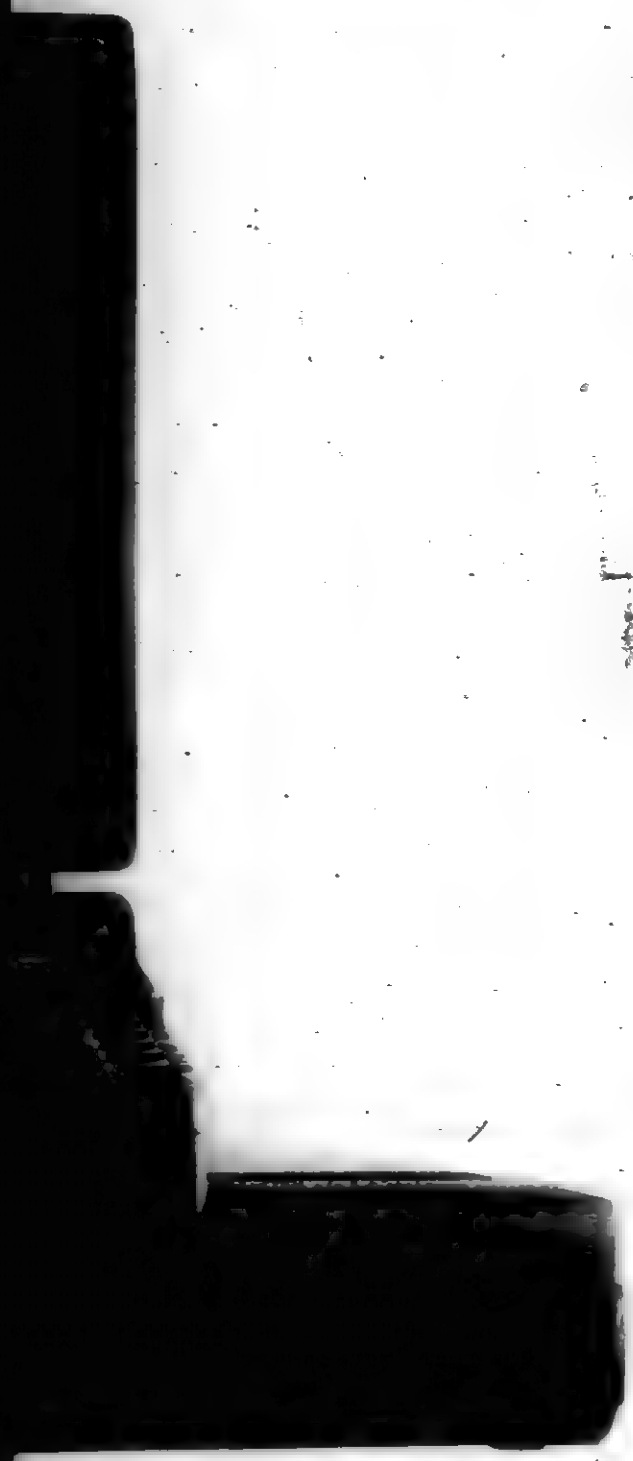

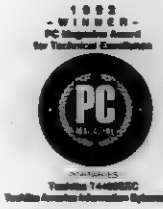

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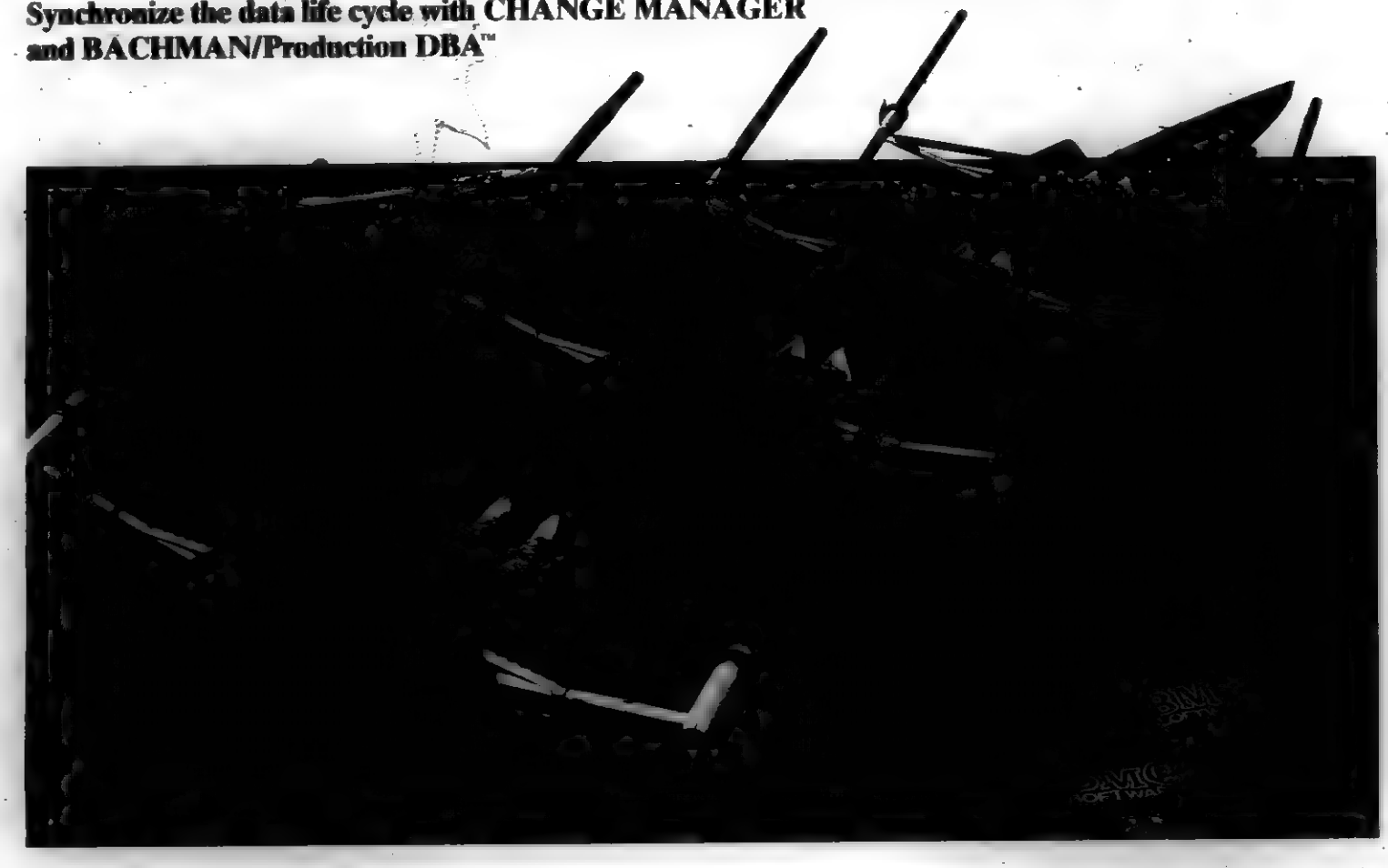

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IBM Business Partner

SEC electronic filing system in high gear

By Gary H. Anthes
WASHINGTON, D.C.

After nearly a decade of pilot tests and volunteer filings, the first 500 of some 15,000 companies this month are beginning mandatory electronic filing of financial data with the U.S. Securities and Exchange Commission (SEC).

The Electronic Data Gathering, Analysis and Retrieval system, or Edgar, is intended to replace with electrons the mountain of paper the SEC receives from corporations that offer securities to the public. It now takes in about nine documents — averaging 40 pages each — per hour, and that is expected to grow to one document per minute by year's end.

Monthly growth

The implementation schedule for Edgar calls for growth throughout the year in the number of companies subject to mandatory filing through the system. The cumulative number of firms is:
April: 500;
July: 1,700;
October: 2,500;
December: 3,500.

By 1996, the SEC will process some 10 million pages annually through Edgar, according to John J. Lane, the SEC's chief information officer.

At the heart of Edgar are a pair of high-end Stratus Computer, Inc. fault-tolerant computers. The fault tolerance is necessary because a delay in processing could adversely affect a filer's financial well-being, Lane said.

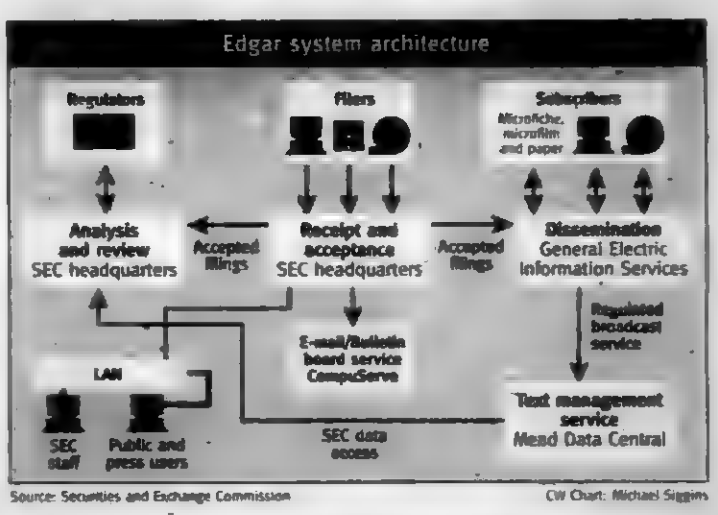
For example, a delay could cause a company to postpone a public stock offering, possibly forcing it into a period of less attractive market conditions.

Corporations or their financial printers can send in filings on tape or floppy disks. Or, they can use EdgarLink, DOS-PC software that the SEC provides free. EdgarLink formats ASCII data and applies the same checks now done manually by SEC personnel and mainframe batch processing. Wordy financial "boilerplates," stored previously in an Edgar database, can be referenced for automatic inclusion in the final SEC filing.

EdgarLink also includes communications software so filings can be sent in electronically simply by invoking a "send" command. EdgarLink compresses the data before transmission.

Bell Atlantic Corp. has voluntarily filed several thousand pages of financial statements from its Philadelphia headquarters in each of the past several years.

According to Robert Fitzmire,
SEC, *page 67*



Source: Securities and Exchange Commission — CW Chart: Michael Siggins

Retired HP chief on open systems

John A. Young, recently retired president and chief executive officer of Hewlett-Packard Co., was honored last month by the American National Standards Institute with an award named for him. While in Washington, D.C., to receive the award, Young met with Computerworld*'s senior Washington correspondent, Gary H. Anthes, and offered these observations.*

John A. Young: *Open systems demand is growing*

Q. Nearly all vendors say they are committed to open systems. Are they?
A. It is the politically correct position to have, the natural response to overwhelming pressure from users. But there are variations in the level of commitment. If that's not where the bulk of your business is or where the most profitable lines are, you may do a lot of bait-and-switching in which you say, "Yeah, we're in favor of this, but why don't you try that." Fortunately for customers, not only is the demand for open systems growing but so is [the customers'] sophistication.

Q. How strong is HP's commitment to open systems?
A. We are totally committed because we don't have a choice. We decided clear back in the early 1980s to terminate all work on our proprietary networking technology. We have been working for 10 years to make open systems happen.

Q: Did you worry at the time you made this commitment that you would get lower profit margins on standards-based products?
A. No. Don't confuse standards and standardization.

HP chief, *page 61*

Data integrity

Start paying invoices once, not twice

By Mitch Betts

As companies search every nook and cranny for places to cut costs, they may be shocked to learn that thousands of dollars are trickling out of their coffers because they pay suppliers twice for the same invoice.

The combination of human error and inadequate accounts payable software means that, on average, 0.1% of a company's payments are duplicates, according to consultant Bob Fields, president of Fields & Associates, Inc. in Burlingame, Calif.

That 0.1% may seem small, but spread over the whole U.S. economy, it amounts to $3.5 billion in duplicate payments per year, Fields estimated. His firm specializes in helping companies identify and recover overpayments — as much as $10 million for one client.

Every firm vulnerable

Fields has reviewed the payment records of more than 300 companies during the past 20 years and found overpayments at every one.

The cause can be as simple as paying both the priced packing slip and the invoice, or overpayment can be triggered by mistakes in data entry that defeat the software's error-checking routines, he explained.

Most invoice-processing software packages have a feature for preventing or flagging duplicate payments to a single vendor, but data-entry errors can render it worthless because computers require exact matches.

For example, dropping a hyphen in the invoice number or vendor number or spelling a vendor's name in different ways will allow a duplicate payment.

Fields said companies need to develop naming conventions for vendors as well as a standard policy on how to handle invoice numbers that are either too long or too short for their software's data field.

Anatomy of a big mistake

When invoice numbers are entered incorrectly, duplicate payments can result

ACTUAL INVOICE NUMBER	A00027-335
POSSIBLE INPUT ERRORS	
Dropped zeroes	A27-335
Dropped A and zeroes	27-335
Dropped A	00027-335
Letter O instead of zeroes; dropped A	oo027-335
Space after A	A 00027-335
Flush right with "fill zeroes" at left	00A00027-335
Dropped hyphen	A00027335

Source: Fields & Associates, Inc.

Numerous causes

Most inaccurate payments are not intentional or the result of incompetent staff, he said.

"They occur because massive amounts of data are processed by many people, the level of training varies with each company, procedures may be outdated and turnover is at all-time record highs," Fields said.

He claimed the error-checking routines in today's software packages are inadequate. "The systems are designed to pay bills as efficiently as possible," Fields said, "but not to avoid duplicate payments."

However, he declined to provide details on exactly how the software can be improved because the core of his business is using proprietary software — full of error-checking algorithms — that scans a company's records looking for payment errors.

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You say: "Wrong. PC- and UNIX-based stuff. Windows. NetWare. *Open* stuff."

They say: "Well . . . So what? They can't image-enable *our* system, anyway. We've got multiple platforms, multiple languages, *all kinds* of networks . . ."

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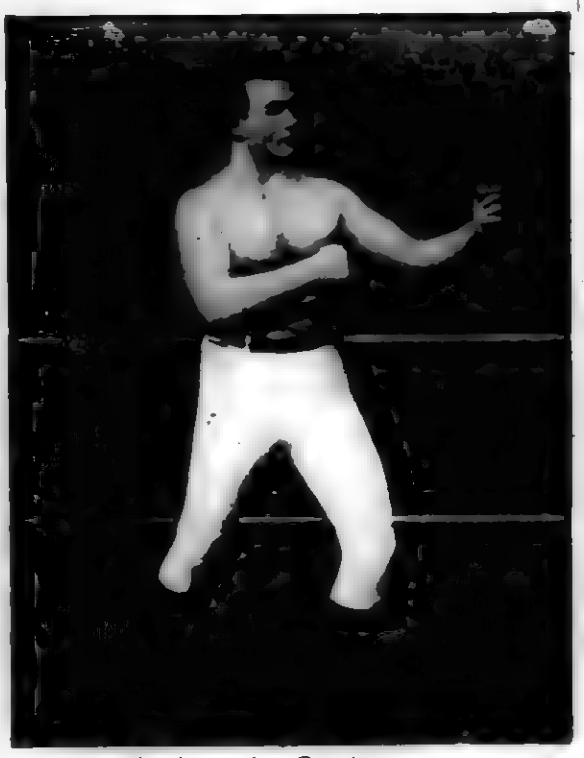
They say (after a pause): "No kidding?"



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HP signs minicomputer deal with 7-Eleven Japan

By Mark Halper
PALO ALTO, CALIF.

Hewlett-Packard Co. recently won a $12.5 million deal to sell five HP 9000 Unix minicomputers and 200 HP workstations to 7-Eleven Japan Co. for sales analysis and other operations.

The deal is part of a general push by HP into the retail business, where information technology is helping retailers assert themselves with their suppliers by better arming them with information about what products are selling, noted Chris Friede, HP marketing manager of retail technologies.

The win marks HP's first foray into the supermarket and convenience store retail automation business, Friede said.

HP's professional services organization — the company's integration arm — is tying the systems into a 7-Eleven-operated Hitachi Ltd. mainframe, which gathers data from point-of-sale terminals at 5,000 stores in Japan.

The new system was designed to make that data more accessible to 7-Eleven buyers and merchandisers.

Retired HP chief

CONTINUED FROM PAGE 59

Standardized things are the same, like milk cartons. But standards are fundamentally essential in order to have innovation. [At one time,] if you wanted a telephone, your choice was a black one with a rotary dial and that was it. Now, with a standard — a plug in the wall — you can get a football phone, a bubble gum machine phone, every kind of phone. You have to think about what happens in the layers above the standard. That's where innovation takes place.

Q. How confident were you that the strategy would succeed?
A. It seemed like the idea of open systems just had to come. But admittedly, it was high risk. Was it this decade or the next decade or the 21st century? There were a lot of headlines in [publications] like *Computerworld* that said, 'HP risks company on RISC.'

Q. Do you have any strategic advice for users considering the new computing paradigms such as client/server?
A. My advice to customers is to spend a lot of time getting informed on the architecture they need to implement their strategic business needs. What are you going to do with your business to succeed in the worldwide marketplace? What are the information needs that are implicit in that strategy? What's the architecture to make that happen? Then you can get some help from vendors in testing your ideas.

Q: Any tactical advice?
A: Get experience with some of these [Unix] machines in a controlled environment. Pick a key application like customer service, where you're undoubtedly getting pressure from the operating folks who are saying, 'Gee, this is not responsive.' Pick one like that and just re-engineer the process and get a client/server solution in.

Q: Is the end of the mainframe at hand?
A: I don't know if we'll live long enough to see the last mainframe plug being pulled and the lights going out. Frankly, some of these old systems are certainly not worth rewriting.

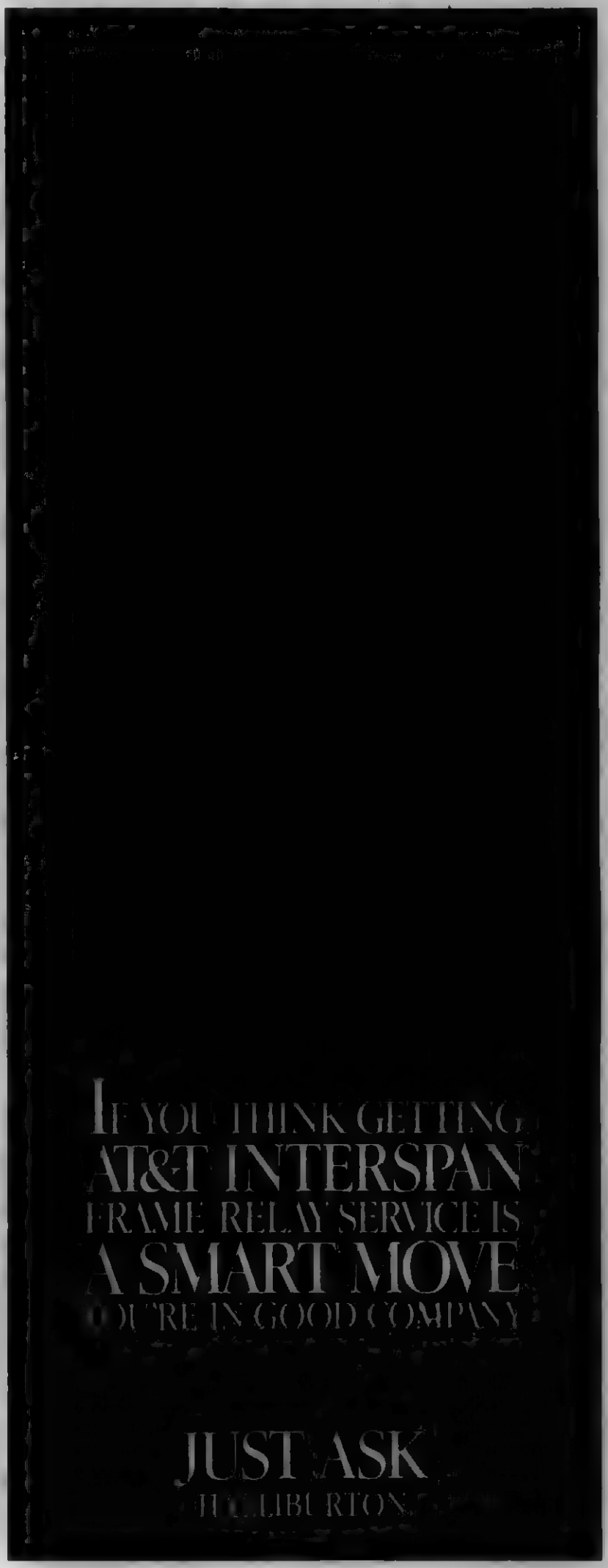
Q: Is Unix ready for heavy-duty, mission-critical applications?
A. The capability is coming up every day. [Proprietary operating systems] offer a richer environment still. But that gap is closing. I don't know whether it is one year or two years, but I think that's the kind of time frame in which the intersection will take place.

Q. Will the recent multivendor agreement to deliver a Common Open Software Environment for Unix [CW, March 22] accelerate this process?
A. Yes, that is definitely part of the objective. It is a very powerful signal to the software community that this is something the vendors are all lined up behind. And for the big data center managers, this is an underscoring of a commitment that this is a fundamental operating system.

Q. Is it also a defense against Microsoft Corp.'s Windows NT?
A. There is nothing that concentrates your mind like the fear of a real big event coming that could have a dramatic impact on your business. It is clear that NT is going to have a powerful position, but all the utilities, all the networking and so forth won't be in NT for a long time. So this provided a chance to bring all the vendors together. We're going to have a powerful operating system that will have many more features than NT.

Q. What contributions has the Open Software Foundation made?
A. Getting the graphical user interface done has been very popular. Also, they have really perfected the process of requesting and getting the best technology assembled and to the market quickly. They have done a superb job of building relationships [to universities and government agencies] so that advanced ideas can be brought in to provide a richer and more powerful offering.

Q. Will we see more vendor alliances?
A. Yes, the underlying driver is [a shrinking] time to market. If your time to market is down 12 to 18 months, and you miss that window very far, you're out of business. So you ask, who do I have to work with to hit the window? You can't do it all; you can't start with a sandpile and build every chip and every piece of code.



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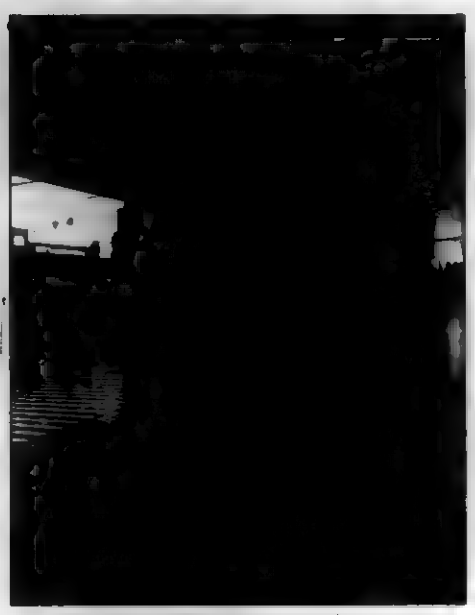
N.Y. bombing delays data center consolidation

By Thomas Hoffman
NEW YORK

The bombing of the World Trade Center in late February has delayed the plans of its owner — the New York/New Jersey Port Authority — to meld a data center at the financial complex into the Port Authority's Teleport facility on Staten Island, according to Wilma Horne, the agency's chief information officer.

The Port Authority, which owns and operates the 16-acre World Trade Center complex, originally had planned to complete the data center consolidation by the end of last month, according to Horne. However, the bombing forced the agency to go into disaster recovery mode with Sungard Recovery Services, Inc., and city officials have not yet cleared the path for Port Authority staff members to return to the building to complete the consolidation efforts.



Port Authority's Wilma Horne *says data center is still in disaster recovery mode*

The Teleport mainframe was originally intended to serve as a backup to the World Trade Center hub, but Horne said the agency decided it would be more prudent to consolidate operations between the environments onto an IBM 3090-400J.

At the time of the disaster, the Port Authority had already loaded some of the software applications onto the IBM 3090, which is running but not yet fully operational. Once the agency is cleared to return to the World Trade Center, the data center consolidation will be completed and the bulk of the 270 mainframe-based applications will be loaded onto the 3090.

Horne was unable to determine when the data consolidation project would be completed. However, sources estimated the Teleport facility would be fully operational by late this month.

The efforts are expected to help the agency automate more of its operations and improve productivity, though Horne declined to elaborate. She said the project will eventually enable the agency to manage its data center operations, a new 12,000-tape automated tape library from Storage Technology Corp. and other operations remotely from the World Trade Center.

"In our long-term plan, there will be no people at Teleport to run these systems. We will be able to do it automatically," Horne added.

Richard S. Wexler, a contingency planning consultant at RSW Associates in Brooklyn, N.Y., was providing disaster recovery consultation to Port Authority staff members at 1 World Trade Center when the bomb exploded. He said the agency is developing remote T-1 and T-4 links between the combined data center location at Teleport with users and administrators at the World Trade Center. Horne denied knowledge of such plans.

Micro Technology's Informer-HSN debuts

By Melinda-Carol Ballou
ANAHEIM, CALIF.

Micro Technology, Inc. recently introduced Informer-HSM, which tracks file activity for hierarchical storage management in Digital Equipment Corp. VAX shops.

Informer is a software utility that extends the VMS file system by providing explicit file access information. It captures I/O activity for files, and that data is then stored in a database to create a master file directory for each disk, which Informer then uses to create reports. Informer can be used with Micro Technology's Virtual Library Manager (VLM) or Archive Manager to determine if a file should be migrated to a faster technology, such as solid-state disk, or archived. It can also be used with Software Partner/32, Inc.'s Hierarchy and Raxco, Inc.'s Archive for the same purpose.

Most existing technologies, including VLM, Hierarchy and Archive, only monitor files that have been modified, so an active read-only file may seem dormant, Micro Technology officials said. Informer was designed to help information systems managers save money by tracking both write and read-only activity, thus enabling managers to weed out those files that are never accessed. It also allows managers to balance the file system and automatically updates the database.

The product is scheduled to ship next month and ranges in price from $385 to $16,000, company officials said.

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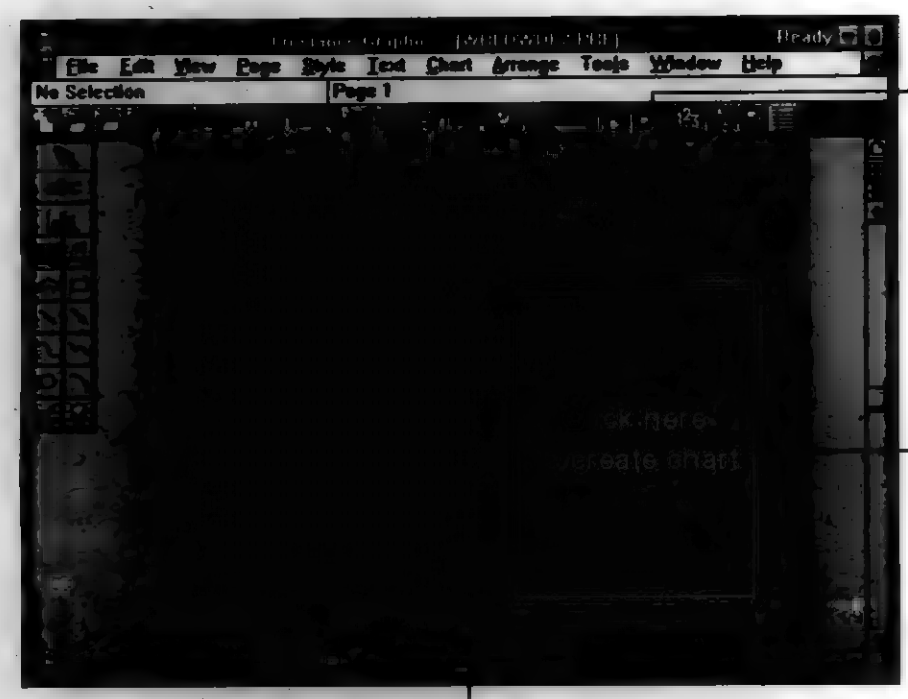

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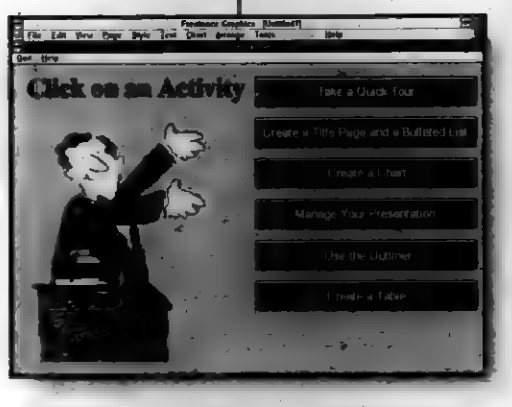

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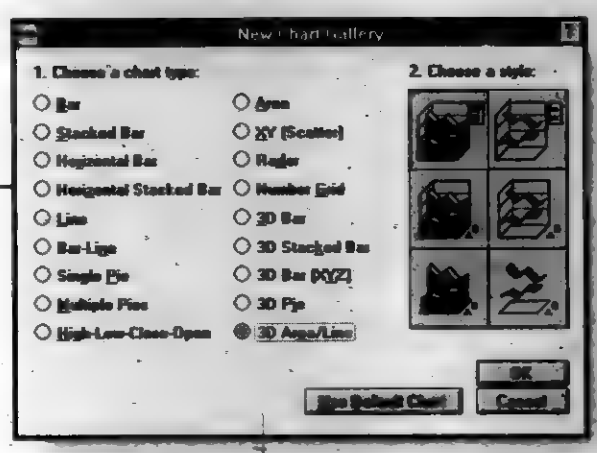

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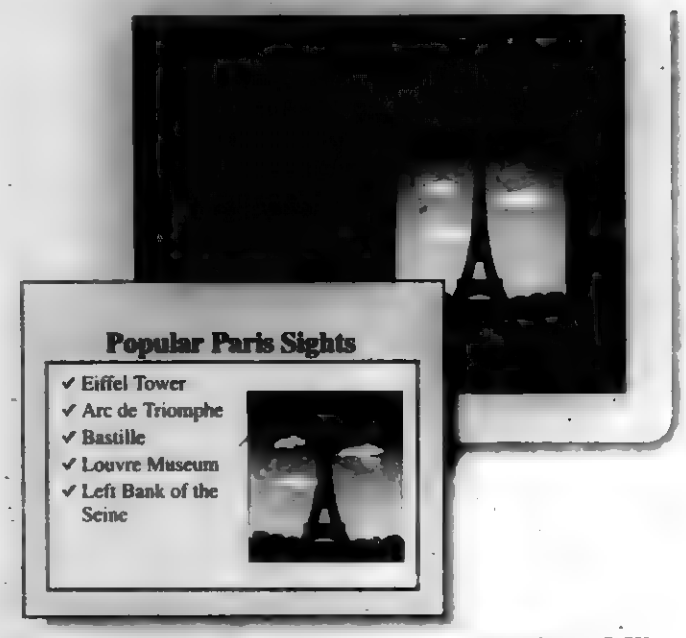

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SEC system

CONTINUED FROM PAGE 59

assistant manager for security financing and SEC matters, the ability to get the filings validated on-site, plus the ability to transmit them to Washington, D.C., in minutes or seconds, adds flexibility to his staff's work load.

SEC CIO John Lane *says that by 1996, the SEC will process 10 million pages annually with Edgar*

"It's really convenient," Fitzmire said. "It saves us from having to have a courier waiting, and we don't have to have people working overtime to check everything the night before a filing is due. In a securities situation, you often have a very short time frame to get something filed."

Edgar currently uses 36 9.6K bit/sec. modems but can accommodate up to 460 modems, according to David Copenhafer, acting director of the Office of Systems Support. He said that as the March 31 deadline for filing annual reports approached, Edgar was moving closer to receiving 1G byte of data per hour.

After processing on the first Stratus system, called Receipt and Acceptance, accepted filings are sent via General Electric Information Services (GEIS) in Rockville, Md., to Mead Data Central, Inc. in Dayton, Ohio, where the centralized database of corporate financial information is maintained.

Users who have CompuServe electronic mailboxes are notified of the status of their filings within 30 minutes.

Internal SEC users — as well as visitors to the SEC's public reference facilities in Washington, D.C., New York and Chicago — can obtain free access to the records by logging onto local-area networks attached to the second Stratus system, called Analysis and Review.

If user queries cannot be satisfied with data kept locally on the Stratus, the request is automatically routed to Dayton over one of four dedicated lines.

Eventually, Mead and other companies buying Edgar data wholesale from GEIS are likely to offer the data to the public for a fee, Lane said.

Troubled past

"In a town riddled with systems that don't work, [the SEC] built one that works," said John J. Lane, the SEC's recently appointed chief information officer. "I think the system is successful. I feel fortunate to have inherited a system that does what it is supposed to do."

If Lane sounds a trifle defensive, it is with good reason. Edgar, the SEC's high-profile system for electronic filing, had a painful birth. In 1985, a congressional panel called a pilot Edgar system a "boondoggle," a "blind stumble" and a "glorified microfiche" system. The panel cited alleged cost overruns and system deficiencies.

Last September, the U.S. General Accounting Office (GAO) issued a report saying Edgar was three years behind schedule and $29 million over its $50 million budget, in part because the number of system requirements had risen from 350 to 999.

Lane pointed out that the GAO had not criticized the usefulness of the system — 1 million lines of C code — and he said the SEC has taken a number of actions to address the GAO's concerns. It beefed up oversight and strengthened communications among managers and users, and it "froze" the system design against all but essential changes, he said.

Even with the $20 million cost overrun, Edgar may be a bargain; an independent study done in 1988 said Edgar would provide a net benefit to filers of $170 million over eight years. —*Gary H. Anthes*

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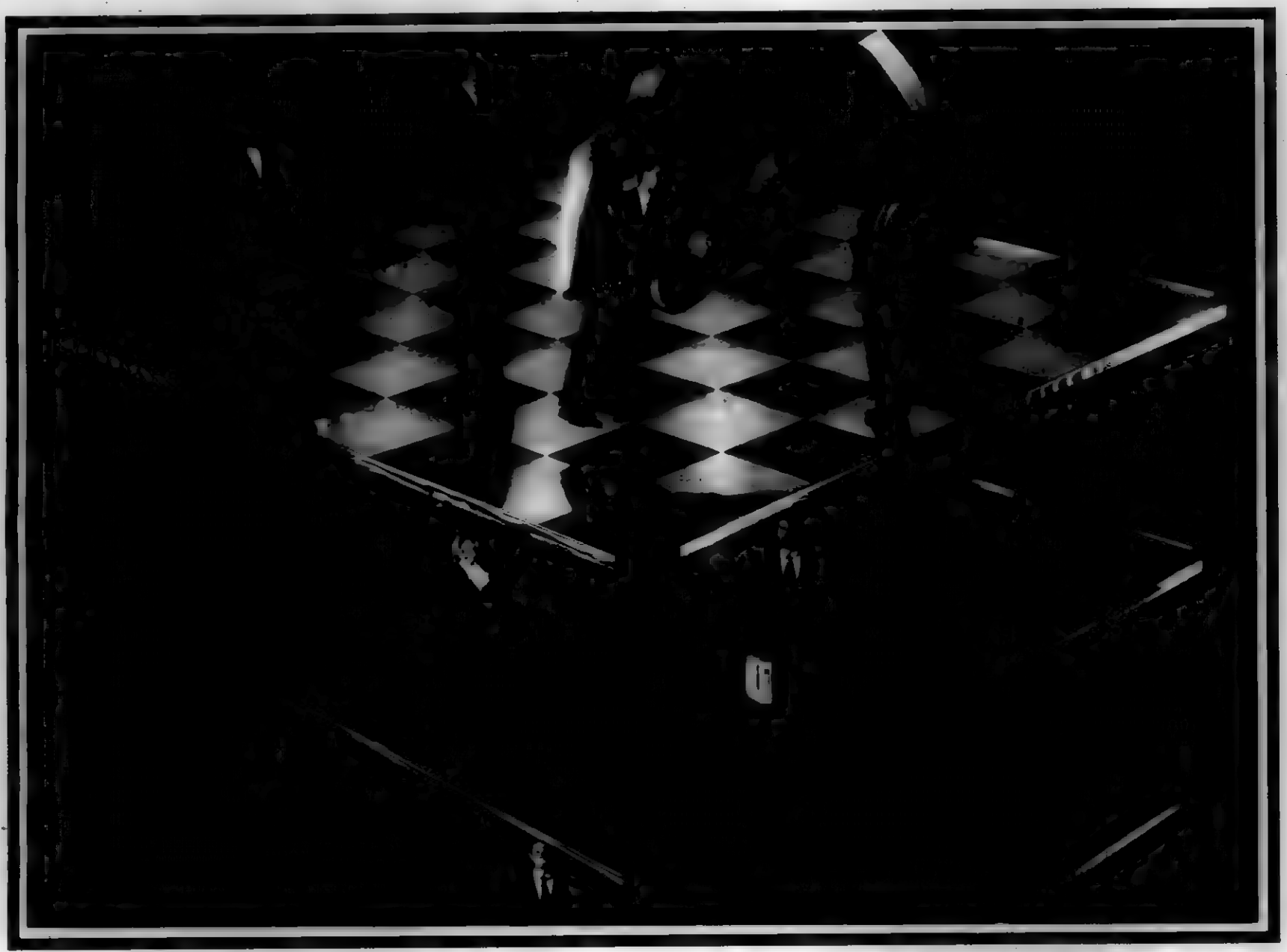

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Software quality key to staying competitive

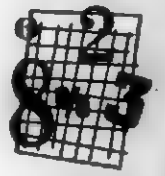
Capers Jones, chairman of Software Productivity Research, Inc., has been measuring programmer productivity for more than a decade. Computerworld *senior editor Garry Ray met Jones at his Burlington, Mass., office to discuss his new book,* International Software Productivity and Quality: The Global Perspective.

Q. What are some of the findings in your book?
A. U.S. programmers are less productive in terms of costs. But if you switch to the effort required to build software, we look pretty good. We're in the Top 3 or 4 in almost everything we do. But there's no guarantee that we'll be the dominant software producer into the next century. We lost the leadership in automobiles.

Q. How do we keep our leadership?
A. First, quality control. Then, we need to invest in technologies that, despite our high labor costs, have kept us advancing and efficient in software production. Notably, things like reusability.

Q. How will object-oriented technology affect productivity?
A. Reusability has a negative value for the first year because you have to construct or acquire your reusable artifacts. Over the second, third and fourth years, reusability seems to have the highest return of any technology you can buy.

Q. You seem to talk about object oriented as a subset of reuse. Why is that?
A. Object oriented is only a partial solution to the reuse equation. Beyond that, there are 10 different areas where reusability is important, such as plans and estimates.



Measures up

Software Productivity Research uses its Checkpoint measurement tool to compute quality measures and productivity ratings for application development projects. The $20,000 tool, recently announced for Unix and Microsoft Corp. Windows, includes a historic database of development projects collected by Software Productivity Research. New projects can also be evaluated in terms of life cycle, business and maintenance metrics.

Q. Why do you think companies are doing so much outsourcing? Is it really an economic move?
A. Outsourcing doesn't originate in MIS; it originates above MIS. It originates because the people above MIS regard their MIS folks collectively as a bunch of dunces who don't know the first thing about business and have been out of control or have failed in their daily performance for a long time. It's because of dissatisfaction. If you're satisfied, there's no reason to outsource.

Capers Jones: *Client/server needs quality control*

Q. Is this a critical period in the life of the U.S. software industry?
A. Ed Yourdon in *The Decline and Fall of the American Programmer* said the the U.S. software industry will be the next industry to decline. I'm not quite as pessimistic as Ed, but I certainly share his concern.

Q. Is this necessarily going to happen?
A. No. There are alternate scenarios for the future. The worst-case scenario is that it happens. The best case is that we dominate for another 50 years.

Q. What are the competitive strengths of other countries vs. the U.S.?
A. There are about 40 or 50 key software engineering technologies, and we are ahead in about 15 of them. Europe is ahead in around a dozen, and the Pacific Rim and Japan are ahead in around a dozen.

Q. In your studies of U.S. companies, what has been particularly notable?
A. We studied Baldrige Award winners. One of the most striking differences is that all Baldrige companies measure quality. Even though the Baldrige has nothing to do with software, they measure software quality as well as product quality and user satisfaction.

Q. Do you have any specific observations on client/server development?
A. The quality of client/server applications is not as good as the older technologies. Client software tends to be shoddily and quickly developed.

Q. Why is that?
A. The people building client/server applications don't know about quality control. If you don't use those techniques, you're going to pay for it with high maintenance costs and low user satisfaction.

Q. Then why are companies embracing client/server development?
A. It's an easier decision. A small client system of 5,000 or 10,000 lines of code is a disposable asset. A large system requires more of an investment but lasts much longer. The analogy is that if we get tired of the chairs in this room, we can replace them. If we get tired of this office building, we can't just throw it away.

BMW's Softlab seeks U.S. foothold

Shift from CASE to re-engineering part of $45 million tack

By Kim S. Nash
ATLANTA

With just one U.S. customer, Germany's Softlab, Inc. will have to work hard to make a name for itself as a re-engineering vendor in the U.S. But parent company Bayerische Motoren Werke GmbH (BMW) is betting that a new chief executive officer and $45 million in financing will put Softlab on the map.

The company recently outlined plans to seize the burgeoning application redevelopment market, which means it is going after large mainframe shops that are breaking down and then redesigning legacy applications to run in a client/server setup.

"For BMW to see any profits from us, we have to crack the U.S.," said Dan Jenkins, Softlab's new president and CEO. Jenkins replaced David Marshall, who resigned after less than two years on the job.

BMW removed Marshall as part of a recent strategy shift away from computer-aided software engineering (CASE) to re-engineering. Softlab has moved its U.S. headquarters from San Francisco to Atlanta, close to KnowledgeWare, Inc., with which Softlab tried to pull off a friendly merger last year. KnowledgeWare rejected the reported $350 million offer [CW, April 6, 1992].

Buyout timetable

1988: BMW owns 10% of Softlab, upping stake to 40% in the late 1980s.
January 1992: BMW acquires an additional 35% of the company.
September 1992: BMW buys balance of company.

Financial report card

1992 sales topped $210 million, with none coming from the U.S.
1993 is an "investment year," with no major sales expected.
For 1994, revenue of $15 million to $20 million is expected.

Growing from within

After other buyout proposals also failed, BMW decided to build Softlab's presence here the old-fashioned way: through its own product offerings. Softlab has narrowed its U.S. product focus, targeting its Maestro II product set at redeveloping legacy mainframe applications to run under Unix.

Softlab, *page 73*

Complexity of client/server promotes 4GL use

By Michael Vizard

The complexities associated with building client/server applications across diverse architectures are pushing information systems departments to adopt fourth-generation languages (4GL) that mask the underlying operating systems and network protocols from developers.

Although Microsoft Corp.'s Windows and DOS systems are the most popular client platforms available today, developers are finding that linking Windows clients to OS/2 or Unix servers usually involves hundreds of lines of code written in either C or C++.

"The fact is that most organizations don't have programmers with the expertise to write code in native environments that access databases on multiple servers across a network," said Liz Barnett, vice president of New Science Associates, Inc. in Westport, Conn.

And, in many cases, a lack of programming knowledge is further exacerbated by a Windows platform that presents developers with a number of memory management issues in client/server environments.

"Microsoft is not owning up to the fact that Windows crashes are costing a tremendous amount of money in lost productivity," said Rich Pinkelstein, president of Performance Computing, Inc., a consulting firm in Chicago.

To shield themselves from the complexities of building client/server platforms, IS groups have been turning to 4GLs that have been architected for client/server

Client/server, *page 72*

Client/server promotes 4GL use

CONTINUED FROM PAGE 71

application development.

For example, Ontario Hydro Ltd., an electric utility in Toronto, recently built a client/server application using PowerBuilder tools from Powersoft Corp. in Burlington, Mass. At the same time, Ontario Hydra is also beta-testing financial accounting software from PeopleSoft, Inc. in Walnut Creek, Calif., as part of an effort to downsize from custom-built applications on an IBM mainframe to a client/server environment based on Windows clients and OS/2 servers.

"A client/server application may have as much as 200 windows. If you use C or C++, the developer has to code every window. Our tools operate above Windows to simplify development," said Dana Baner, product marketing manager at Powersoft.

"The secret to building client server applications is not to make [them] too complex. When you start to look at all the connection issues between different networks and servers, you can easily create a Frankenstein situation," says John Calahan, CEO, Timeline, Inc.

In the future, Ontario Hydro plans to move from an SQL database from Gupta Technologies, Inc. that runs on OS/2 to an Oracle Corp. database that runs on Unix. However, there is a faction at the utility that is pushing Microsoft's upcoming Windows NT because of its support for Windows.

"If we move to NT, we'll probably open up our database standard to include other databases, such as Sybase," said Jeff Goddard, branch coordinator for financial management systems at Ontario Hydro.

Goddard said he is very pleased with the performance of both the PeopleSoft applications and the applications they built using PowerBuilder. "PeopleSoft is one of the leading developers of client/server applications, and the latest release of the PowerBuilder tools are much improved," he said.

In general, the goal of most developers is to keep their initial client/server applications relatively simple using 4GL tools from companies such as Gupta, Oracle, SmartStar Corp., Progress Software Corp., Ross Systems, Inc. or Cognos, Inc.

"The secret to building client/server applications is not to make the application too complex. When you start to look at all the connection issues between different networks and servers you can easily create a Frankenstein situation," said John Calahan, chief executive officer of Timeline, Inc., a supplier of financial accounting software in Bellevue, Wash., that is developing Windows applications.

However, while most initial client/server applications are relatively simple, Barnett noted that IS organizations would do well to specify 486-based systems as their clients. The horsepower of 486 systems would give them a scalable platform for building more robust applications in the future that are likely to be based on 32-bit operating systems.

In particular, developers should note what type of client/server application they need to build. Most client/server applications today rely heavily on processing on the server. But in the future, Barnett said he expects to see applications that exploit the large amount of horsepower that will be available on desktops.

In the short term, however, most IS organizations will simply leverage their installed base of 386 systems.

"Telling people that their future client/server applications are going to be too big for their PCs is not a message that corporate America wants to hear," said Gordon Rabkin, vice president of product development at IMRS, Inc., the Stamford, Conn., developer of the Hyperion business applications for Windows.

"Right now, Windows/DOS is the client, but as IS directors lay down technology specifications, they may have to take into account new software and hardware," Rabkin said.

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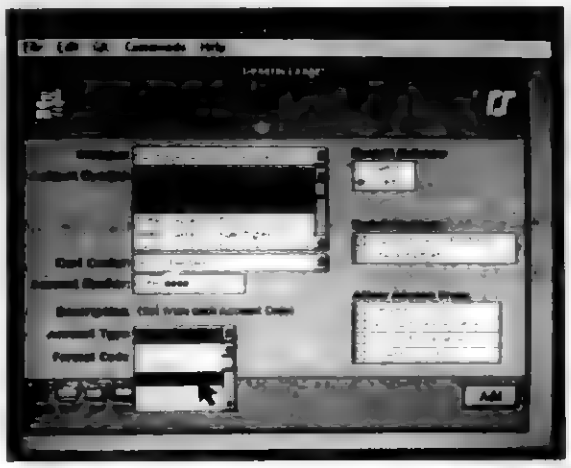

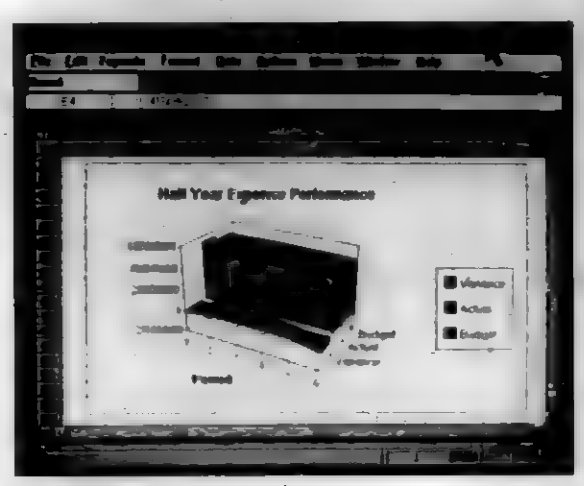

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BMW's Softlab seeks U.S. foothold

CONTINUED FROM PAGE 71

Maestro II includes a repository, project management and application building aids. Kaseworks, Inc., another Atlanta company, recently signed a joint development deal to provide graphical user interface tools.

Softlab's revamp sounds like a good idea, but the company is going against established U.S. vendors, such as Bachman Information Systems, Inc. and Texas Instruments, Inc., which recently made an initial pitch to potential redevelopers along with partner Price Waterhouse.

"Certainly there's a need for this kind of redevelopment plan, but I don't know that Softlab has any expertise in this area," said Martin Garvey, an analyst at Meta Group, Inc. in Westport, Conn.

"There's more to moving to Unix than rebuilding apps," Garvey said, such as systems administration and security issues.

Still, Softlab's repository is a selling point, according to Ed Acly, an analyst at International Data Corp. (IDC) in Framingham, Mass., saying that the store house is easy to use.

BMW's $45 million donation does not hurt, either. Jenkins said he will use the funds to follow through on an aggressive plan that includes the following:

- Sign up six showcase companies this year, to serve as reference sites. "We know we'll have to give away the product to set these up," Jenkins said, "but we're asking for a big commitment from these people, too." He is looking for Fortune 500 firms in a variety of vertical industries that want to undertake "major" client/server redevelopment projects.
- Acquire a small consulting firm by the end of this month to help users implement Maestro II, Softlab's development tool set and repository.
- Partner with a hardware company. "We have good relationships with IBM in Germany and the UK," Jenkins said, adding that Maestro II will be targeted squarely at IBM mainframe downsizers. However, he would not confirm or deny reports of any potential deal with IBM or its Client/Server Computing unit in Armonk, N.Y.

Softlab leads the CASE market in Germany, the Netherlands and the UK, according to Ovum Ltd., a European market research firm.

"But we don't have a good track record in the U.S. Being a foreign company, we have to build trust," Jenkins acknowledged.

Culture no doubt has played a role in Softlab's lack of success in the U.S. CASE market, Acly said. "Not many foreign software vendors have made a go of it."

Competitors on move

Meanwhile, TI and Price Waterhouse earlier this month unveiled the first tool in a product line to analyze and rebuild mainframe software [CW, March 8].

Further, Bachman holds the lion's share of the re-engineering market, according to IDC, and is pursuing client/server redevelopment business with its Model Driven Development product line and other tools. However, the Burlington, Mass.-based company's financials have been up and down recently as well, forcing the company to cut 15% of its 340-member staff in November 1992.

In addition to the deep pockets of its parent, Softlab may have a technological advantage in Maestro II's built-in redevelopment methodology. The Systems Redevelopment Methodology was specifically created for guiding users through the new territory of client/server development by Tactical Strategy Group, Inc. in Aptos, Calif.

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HAVE TOOLS - NEED BLUEPRINT

Careful planning and user buy-in, not tools, are the key to client/server success, experts say.

By Garry Ray

You'd think that by now information systems professionals would know better than to start swinging tools without a blueprint and a full work crew.

But experts warn that many companies now building client/server systems are not learning from past mistakes and so are destined to suffer bruised thumbs and banged heads.

"We see people scrapping two to five years of effort because they went too wild with the tools," says Christine Comaford, president of Corporate Computing, Inc., a consultancy in Sausalito, Calif.

It's easy to understand why companies are tempted to focus on technology: Client/server projects often originate with PC-savvy users and developers who love plug-and-play software and hate drawn-out planning.

Larry Constantine, principal consultant at Constantine & Lockwood, a software development consulting firm in Acton, Mass., says users are often "micro-based people who think of software as something that's cheap and flexible and comes out of a box."

More fundamentally, client/server is by nature a technological concept. It serves as an important cornerstone of distributed computing, downsizing and many other movements that promise cheaper, better and faster computing.

Yet users, consultants and development managers say that a product-driven approach to client/server is a surefire way to ensure wasted effort, chaos and, ultimately, failure. Careful attention must be given to people-oriented issues, they say, or projects will fail.

Think soft

The notion that "soft" factors can make or break a project is hardly new to IS.

Yet some concerns are magnified and stakes are higher because client/server "puts more power into the hands of users," says Bill Bedor, manager of application development at Medtronic, Inc., a billion-dollar medical manufacturer in Minneapolis.

Ken Haase, vice president of IS at the National Futures Association, a commodity industry watchdog in Chicago, agrees, noting that the approach gives users far more "control and responsibility" than the old mainframe-focused environment.

Unfortunately, business departments and users are not always eager to embrace their new, expanded role.

Too bad, says Pieter Minmo, president of Technology Insight, Inc., a consultancy in Marblehead, Mass., because if users are not brought in early, client/server projects can die or never get off the ground. "If users don't show up, you can't make decisions," Minmo says. "That's where the process usually breaks down."

Little wonder that some consultants say that at least half of all time spent on a client/server project should be devoted to organizational issues and planning.

MARCEL GENOVESE

Realistic hopes key

Only when business units are on board, Minmo says, does it make sense to choose tools, which depend heavily on the application.

Experts agree that among the most important tasks is managing user expectations. "Users always think that moving to client/server is going to be a piece of cake; you just plug it in and it will work," Comaford says.

Straight talk is needed to prepare users for the rough reality, Haase adds.

"You've got to talk to people," Haase says, "and explain to them that this is a different world."

And a riskier one. Client/server systems have "more parts and pieces" than other systems, Bedor notes, so they crash more often. While a single mainframe system might experience one serious failure per year, Haase adds, a client/server system has multiple clients, servers and networks that collectively might crash more than 100 times per year.

Clear roles needed

To develop and run such a complex system, experts say it's crucial for IS managers to ensure that each department understands its role in the project.

Ideally, IS should make decisions about infrastructure, including database models, networking and servers, some suggest, while

Have tools, *page 77*

INSIDE: All together now: A look at work teams in insurance. Page 78

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InfoWorld Product of the Year, March 1992

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BYTE Magazine Reader's Choice, June 1992

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BYTE Magazine Award for
Cross-platform E-Mail, March 1993

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Network Computing's Certified Interoperable
Application Award, December 1992

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Network World's Enterprise
Technology Award, December 1992

•

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

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Have tools — need blueprint

CONTINUED FROM PAGE 75

user departments should handle desktop applications and operating systems. While meetings between IS and users are rarely fun, they are a must if client/server projects are to proceed.

Bill Lodge, project manager at Turner Corp., a New York construction company that moved off a mainframe and onto client/server in 1990, says that it is impossible to develop applications without users.

"We've done it wrong in the past," Lodge says, "and when we go back and analyze what went wrong, it's always because we didn't have user input."

"The business effort is at least equal to the technology effort... probably bigger," says Howard Rubin, a faculty affiliate at New York consultancy CAP Gemini America and a longtime authority on application development.

Building a solid frame that included both IS and users was the first goal of a client/server project at the Federal National Mortgage Association (Fannie Mae), according to Bill Kelvie, executive vice president and chief information officer at the the quasi-government agency in Washington, D.C.

From the outset of a 2½-year-old effort to move 3,000 employees from mainframe terminals to local-area networks, the agency, which secures more than $1 billion in home mortgages, also "built a strong data resource management team," Kelvie says.

IS must refocus, too

Lest you be tempted to heap all blame on users, don't. According to consultants, IS groups frequently can be obstacles to client/server success.

Experienced hands say the problem is especially serious in large, well-funded companies driven by a "fast and flexible" mentality. That is exactly the opposite of the careful up-front planning that client/server requires.

It's crucial that mainframe, networking and end-user groups in IS put aside parochial interests and function as a team, says Lucy Lockwood, another principal at Constantine & Lockwood. She suggests that cross-training is a good way to break down intra-IS barriers.

"Provide networking, the mainframe department and end-user computing with cross-functional training," Lockwood advises, "so that everyone knows some of the other group's technology."

Implementing strategies

Consultants and users say there are a variety of ways to better implement client/server systems. Among their recommendations:

- Plan for cross-group training so that each department knows something about each others' systems.
- Allocate at least 50% of the total project schedule to planning and formal business process re-engineering.
- The linear, "waterfall" development life cycle does not work well in client/server planning and development. Instead, from the outset, plan on an iterative approach involving users and development groups.

Consultants warn strongly against adopting an old, hierarchical approach to system development, led by an omnipotent CIO.

"With a single person making the decisions, all of the needed voices will not be heard, and useful knowledge will be excluded from the table," Lockwood says. Comaford adds: "The point that developers miss is that users will do a lot of design work for them."

Meet, meet and meet again

Once a basic outline has been sketched, consultants say concerned groups should meet to assess current business processes and information systems.

Companies ignore this step at their own peril, Rubin warns. He recounts how one multinational chemical company jumped into a mammoth client/server project with too little organizational planning and ended up with predictable results. "The business was not ready to change its business structure or its business processes, so [the project] fell apart," he says.

Ongoing meetings can be formal or informal, as long as they happen. Medtronic has been holding such sessions for more than four months.

Bedor, who describes the sit-downs as "just hard work," not tea parties, sees the dialogue as a crucial step to the company's client/server success.

After discussions of key issues, users and IS staff go back to their home organizations to talk more with peers. "We just beat on [the design] until we have the answers," Bedor explains.

At Fannie Mae, Kelvie says, discussions have helped reduce the project to workable size. "We look at the business case, hammer out a script for the project and break it into small chunks." The secret? "We locked the business and systems groups in the same room for a week," he says.

"We locked the business and systems groups in the same room for a week."
— Bill Kelvie, Fannie Mae

"With a single person making all decisions, needed voices will not be heard."
— Lucy Lockwood, Constantine & Lockwood

Some consultants suggest the use of more formal, professionally facilitated approaches, such as Joint Application Design (JAD) and Rapid Application Design (RAD).

"JAD and RAD sessions are an exceedingly good answer," Minmo says, "because they bring users and IS into a facilitated group to talk to each other."

Kelvie shares the enthusiasm; he says Fannie Mae's JAD sessions have been so successful that the agency is now creating internal guidelines based on work with an outside consulting group.

Keeping on track

Once work begins, organizing groups to maximize productivity and handle the fast turnaround required in client/server projects becomes paramount, experienced hands say.

For instance, users might be required to sign off on prototyping schedules, Comaford suggests. "If they miss the schedule, we say 'Sorry, catch us next time around,'" she says.

Similarly, developers can be kept on track with productivity guidelines. "Programmers can get so enamored with the new environment that they'll spend all day developing the right screen," Comaford says. A better approach: Create several different screens and let users choose.

Indeed, IS managers say it's an ongoing challenge to keep things rolling.

At Medtronic, for instance, Bedor says it's been a major challenge to rally the 10 engineers involved in the prototyping effort to come to a consensus on the design of the software. "Getting the individuals sharing the system to do things in the same way has been a challenge," he acknowledges.

Lodge says IS managers must also be prepared to deal with difficult changes during client/server development projects.

"We were taking our payroll off-mainframe," Lodge explains. "We were trying to retain payroll experts who were our programmers, and there was a cultural shock. Some mainframers went through a cultural shift. It was a difficult period."

Done right, Lockwood says, client/server development is like building a house. "There are contractors, architects, carpenters and electricians. They're not working as an integrated team, but they are definitely working in partnership." •

Intelligence Files

Going global

Becoming a "global corporation" is currently in vogue, but many of the strategies that organizations use to achieve that end are unproductive, according to a recent study of 43 U.S. firms.

For example, the study notes that things such as setting up global divisions, cross-border task forces and globally integrated management information systems have little or no correlation with the financial success of a corporation on an international basis.

However, the study did find 11 strategies that work, such as requiring international experience for advancement to top management. Another successful strategy: Linking international managers with a global electronic-mail network.

Source: "Organizing for Global Success," McKinsey & Co., New York.

Skills gap?

A recent survey of 420 electronics industry executives by the American Electronics Association found that 55% of the vendors believe that a "skill gap" is hampering their efforts to implement quality programs.

Profiling 'softlifters'

Why do people engage in "softlifting," the practice of stealing computer programs by copying them instead of buying them?

According to faculty members at Northwestern State University of Louisiana, a person's decision to copy software is based not on "ethics" but on a variety of other factors, including the following:

- A stimulus to act, such as an employee needing a software package for working at home, or a situational factor, such as not having time to make the purchase.
- Personal factors, such as gender, religion and self-concept. "Women are less likely [than men] to pirate software," said Debasish Banerjee.
- Sociocultural and legal factors, such as workplace policies, laws and the actions of peers and supervisors.

Source: Paper by Debasish Banerjee, Claude Simpson and Penny Simpson, Northwestern State University of Louisiana in Natchitoches, La.

Compiled by CW staff.

It's time for teamwork

Insurance firms recognize the importance of synergy

By Nell Margolis
DALLAS

Where re-engineering is afoot, look for self-directed work teams, say information systems executives exploring the territory.

At the Life Office Management Association (LOMA) annual conference recently, "team" was the buzzword du jour. Although many of the 1,000 insurance IS professionals in attendance acknowledged that snags were inevitable, few are heading back to hierarchical structures.

"We've got a long way to go, but we're excited about getting there," says James Gentsch, lead systems analyst at Unum Life Insurance Co. in Portland, Maine.

The nation's traditionally most conservative companies are putting on pioneer shoes for one reason, their executives say: There's no alternative in a commoditized market that is breeding steep competition.

As a result of shared commitment, responsibility and reward, "Teams foster the skills and motivation to adapt quickly to changes," Gentsch says.

Amid re-engineering initiatives that make change a fact of daily life, "We can't afford *not* to try self-directed work teams," says Gentsch, whose company fielded its first team pilot a year ago.

E. P. Rogers, vice president of computing services at Mutual of New York (MONY) in Syracuse, N.Y., says that during the last two years his 168-person department has evolved into a 95-person league of self-directed work teams. He claims that service levels, customer satisfaction and morale have greatly improved.

Not a cure-all

But even avid boosters of the team approach caution that, like the re-engineering efforts it aids, teamwork is no quick fix for whatever ails an organization.

"It isn't for everyone," says Chris Jermyn, assistant vice president of computing services at MONY. It also isn't for anyone who thinks that the process will be quick or easy, she adds.

Others are still more cautious. "I'm not yet convinced it's going to work," says Karen Cornwell, a quality consultant at London Life in London, Ontario.

Cornwell's eight-year-old department was chosen as a pilot for a teamwork experiment because its small size and relatively unorthodox mission suggested it might accommodate change less painfully than a larger, more conventionally trained group.

In retrospect, Cornwell says, that thinking still looks smart. However, she adds, the firm underestimated the "people issues" and politics of even the most hedged transition to teamwork.

"We're still grappling with all the problems of self-direction," Cornwell notes. "Teamwork is easy in good times, but when you're up against the wall, difficult questions arise. Is everyone supposed to be equal? If so, how can we recognize peoples' different strengths? How much empowerment do we really have? How much do we really *want*?"

Never turning back

Still, her team recently voted itself a second year of existence.

And at MONY, Command Center specialist Bonnie Miller — a former computer programmer who says she spent months pining for the familiar compatibilities and satisfactions of her preteam department — has a one-word timetable for returning to the old ways: "Never!" she says.

"There are things I would have done differently," she acknowledges. "On the company's side, I would've liked to see leadership people get more input from the rank and file. You can't just say, 'Poof! You're empowered.' ... For my part, I would've given up my old ways sooner. But I can't imagine going back — it would seem way too stifling."

Tips from the trenches

There are three keys to successful team implementation: "Communicate, communicate and communicate," says Chris Jermyn, assistant vice president of computing services at MONY in Syracuse, N.Y.

"It's suicide to do this without training," says E. P. Rogers, MONY's IS head.

A reward system tailored to individual accomplishments won't work for teams, says Cigna Corp. Vice President Eric Scheffler. His department tossed out its traditional employee evaluation model and created a new one around group accomplishment.

Executive Track

Former life insurance executive Robert H. Plast is the new chief information officer at New York-based executive recruiting firm **Russell Reynolds Associates, Inc.**

Plast, who most recently served as vice president of information systems at Metropolitan Life Insurance Co., has also teamed up with his wife to co-author several books on the business applications of PCs.

In Longview, Wash., **William J. Nowoy** has been named vice president and CIO of **Columbia Bank FSB**. He is responsible for the bank's full complement of computer and telecommunications systems.

Nowoy, a 30-year veteran of banking IS, most recently served as data processing manager at Great Northwest Bank in Bremerton, Wash.

Carlson Cos., a $10 billion travel services firm in Minneapolis, has a new IS head. **Rex Carter**, a longtime Electronic Data Systems Corp. veteran who most recently served the company as senior manager of business development, became vice president and CIO at Carlson last month. He replaces **James Goodlett**, who picked Carter as his successor and is currently mulling his next career move.

John C. Bennett, 51, has been named vice president of infrastructure and systems at the **Long Island Rail Road**. Bennett had served the railroad as vice president of planning and systems.

The Data Processing Management Association recently named **Robert A. Dengler** as its executive director. A seasoned executive with deep roots in association management, Dengler comes to the Park Ridge, Ill.-based IS managers' professional association after serving as associate director of administrative services and meetings at the International Reprographics Association in Oak Brook, Ill.

Have you, or a colleague in the information systems field, recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at (800) 343-6474 to pass the news along.

Calendar

APRIL 11-APRIL 17

FOSE. Washington, D.C., April 12-15 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8509.

APRIL 18-APRIL 24

The Fifth Annual Data Administration Management Association (DAMA) International Symposium. Boston, April 18-21 — Contact: DAMA International Symposium, Boston, Mass. (508) 967-7132.

Patricia Seybold Group Spring 1993 Conference. Boston, April 18-23 — Contact: Deborah Hay, Patricia Seybold Group, Boston, Mass. (617) 742-5200.

Superconn '93. Atlanta, April 19-22 — Contact: Telecommunications Industry Association, Washington, D.C. (202) 457-4912.

APRIL 25-MAY 1

Xplor International's Vendor Interaction Symposium Information Opportunity Networking '93. Denver, April 25-28 — Contact: Xplor International, Palos Verdes, Calif. (310) 373-3633.

Marketing the IS Organization Internally. Philadelphia, April 26-27 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

The SoHool User Group. Santa Barbara, Calif., April 26-28 — Contact: SoHool Corp., Goleta, Calif. (805) 683-5777.

USE/Plus/CUBE Exposition. Phoenix, April 26-28 — Contact: The Sanford Organization, Wauconda, Ill. (708) 526-2010.

National Computer Graphics Association (NCGA) Solutions Applications for Implementation '93 Conference. Philadelphia, April 28-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Third Sourcing Interest Group (SIG) Conference. Chicago, April 27-28 — Contact: SIG, Sherman Oaks, Calif. (818) 784-7755.

Distribution/Computer Expo '93 — Exhibit and Seminar. Chicago, April 27-29 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 456-8926.

Incotek '93. Warsaw, Poland, April 27-30 — Contact: Global Technologies, Inc., Washington, D.C. (202) 797-3782.

MAY 2-MAY 8

The Workflow Conference on Business Technology. Boston, May 3-5 — Contact: The Workflow Institute, Alameda, Calif. (510) 769-9627.

LotusWorld '93. Boston, May 3-6 — Contact: Daniell & Keefe Associates, Sudbury, Mass. (508) 443-3330.

DB/Expo '93. San Francisco, May 3-7 — Contact: NDN Enterprises, Inc., Mountain View, Calif. (415) 986-8440.

James Martin World Seminar. Boston, May 3-7 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Dev Con '93. Costa Mesa, Calif., May 4-6 — Contact: Franson, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

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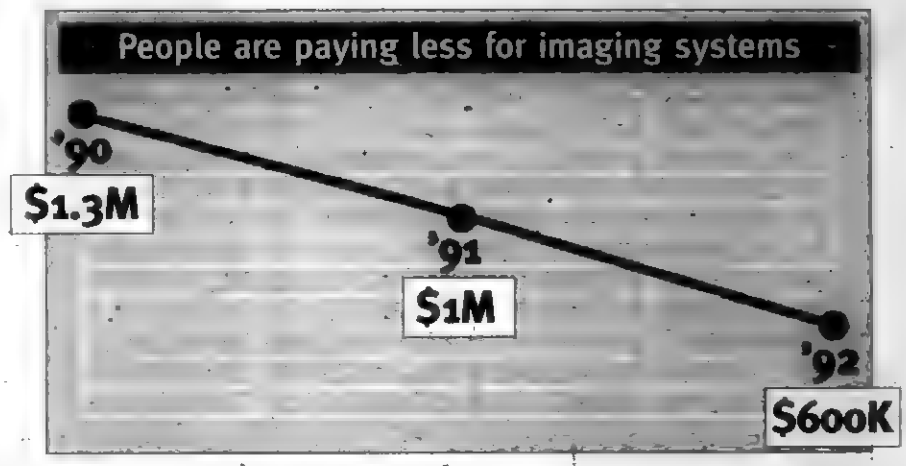
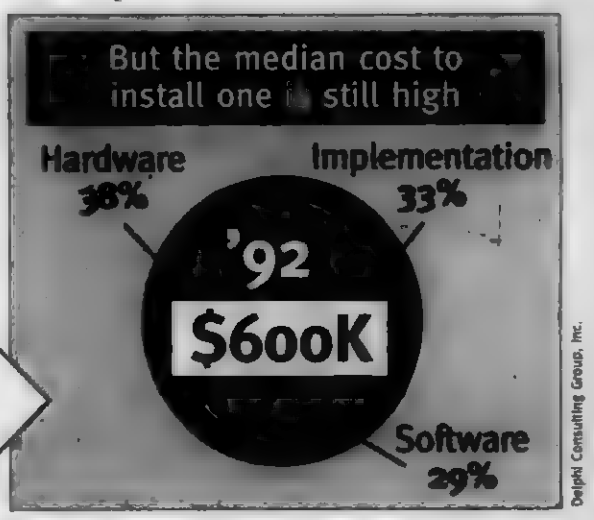
Cost-effective imaging? Perhaps.





Numbers reflect the median price paid by users to purchase and implement an imaging system, from a 1992 study.

Low-cost? Probably not.

Good news: Imaging products can now be bought for a low price. Trouble is, the lowest-cost products ($1,000 per seat) will run out of steam quickly. Not until you get into the realm of $5,000 to $10,000 per seat do you get into products that can grow with your needs.

But back to the good news. Even the $10,000-per-seat products are 25% cheaper than the old-guard imaging systems from the likes of IBM, Wang Laboratories, Inc. and FileNet Corp. Because these middle-tier systems mostly run on PC local-area networks and use industry-standard databases, many companies won't have to make a huge investment in a new infrastructure. ● Good things are also happening at the very low end. Never have such unique features been available for a small investment. (See *page 82* for a discussion of low- to high-end products.) Even popular packages offer imaging (see our review of Lotus Development Corp.'s Lotus Notes: Document Imaging, *page 89*). ● The service and support that's available is also top-quality because it's increasingly being done by the vendors that started the industry. (For more on service and support, see *page 91*. *For user satisfaction ratings of IBM, Wang and FileNet, see page 90*). ● Is imaging "worth it"? We spoke with users who think so. One says he saves $80,000 a year in office labor and paper costs alone. (For a case study, see *page 85*). ● The secret is, don't expect to start with a "showcase" application. Not everyone is American Express. Most people are better off setting short-term goals and applying the technology to a smaller workgroup before establishing a precedent for the enterprise. •

Imaging for everyone

You no longer have to dive into imaging. New products let you start small.

By Thomas M. Koulopoulos

Imaging is no longer relegated to the showcase applications of the Fortune 100 or organizations brave enough to undertake massive reengineering efforts. Plummeting software and hardware costs are on the brink of creating a commodity market, and although cost is still a consideration, it is no longer the key obstacle for most evaluators (see box at right).

The latest breed of low-cost imaging products speaks to the value of implementing imaging department by department rather than across the entire enterprise all at once.

Enterprise imaging at one time required dedicated hardware, extensive customization and a high level of financial and organizational commitment. It was characterized by the likes of IBM, Wang Laboratories, Inc. and FileNet Corp. Enterprise applications were large-scale, with lots of users, a huge investment and a long payback cycle, measured in years.

Two years ago, however, a small cadre of what were thought to be insignificant vendors was busy developing and installing relatively low-cost imaging systems intended for workgroups of 20 to 50 users on local-area networks. Companies such as LaserData, Inc., Compulink Management Center, Inc., Viewstar Corp., Sigma Imaging Systems, Inc. and others were busy addressing the needs of people who couldn't afford enterprise imaging.

Today, an even lower cost category of mostly Microsoft Corp. Windows-based products has emerged. These are the first shrink-wrapped imaging products, intended for plug-and-play use, even for single users of an imaging application. With all this activity, you have to wonder if lower costs and easier integration makes it any easier to achieve the goal of most imaging systems: more efficient document management. If it does, will the initial low-cost workgroup solution be able to grow into a cost-effective imaging system for the enterprise?

Vendors of lower cost imaging products certainly want you to believe that, and in some cases they may be right. The answer, however, is not that simple.

A good way to find out is to take a closer look at the various categories of imaging products. Today, there are nearly 100 imaging products from which to choose. A good way to categorize them is to look at the key differentiators of every imaging system: customizability and scalability. After all, there are two certainties with any imaging system: It is bound to change, and it is bound to grow.

By customizability, we mean the ability to change the application as time goes on. Among products, there are two extremes: low-cost, off-the-shelf products with little customizability potential and higher priced tools-based systems. By scalability, we mean the ability to add users and expand the system to other departments. Available systems range from single-user to enterprise-capable.

Using these two characteristics, we can plot some well-known imaging products in a matrix, according to their primary position and capabilities (see chart this page).

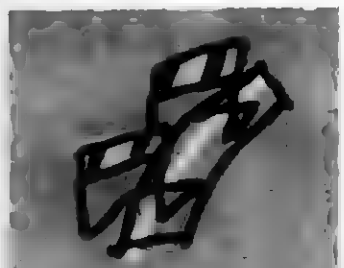
LOW END (LOWER LEFT): Most confusion today rests with these products. That's probably because the largest number of new product entries is in this space. These not only represent inexpensive, usually Windows-based imaging systems but also, in many cases, include add-ons for basic optical character recognition (OCR), fax, scanning, work flow and text retrieval.

Products of this type can be beneficial for introducing users and workgroups to imaging at a low cost. But the tools provided to build applications are minimal and may lead to a hard stop as user demands for customized applications and interfaces increase.

Certainly for some companies, paper elimination is a significant improvement in productivity. Entry-level tools, such as ImageFast Software Systems, Inc.'s ImageFast or Keyfile Corp.'s Keyfile, can help in that regard.

Other packages, such as Westbrook Technologies, Inc.'s File Magic, provide a complete environment for imaging, including OCR, text retrieval and basic work flow for a minimal investment.

HIGH END (UPPER RIGHT): These products are highly customizable because they include



Room for improvement

Where imaging systems really need to improve, according to a survey of 400 users at Delphi Consulting Group, Inc., is in their ability to integrate with existing systems and applications. When it comes to the greatest obstacles to implementing an imaging system, organizational and technological issues dwarf the cost issue, even though 27% of users find cost to be a hurdle. Users are concerned with the approval process (45%) and process changes (33%) as organizational issues. Technological issues included the fact that imaging is a new technology and lacks standards (22%).

Before you leap...

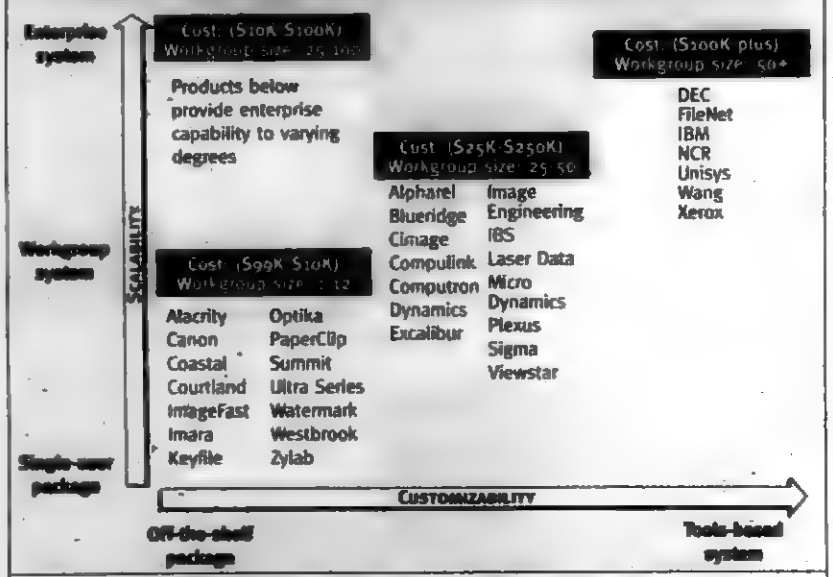
What you don't ask about an imaging system could hurt your business. The following questions force you to focus on the issues that are often overlooked during imaging evaluations.

- Has a system audit been conducted to determine the media to be accessed, such as electronic, paper, microform, etc.?
- How much of this information will be converted?
- What will back-file conversion costs be? Depending on factors such as document quality, OCR characteristics, compound images and text, you will spend between 50 cents and $4 per page.
- Will users need to access the information based on descriptive text through a content-based retrieval functionality?
- Has a sponsor been established to organize, push along and promote the development of the system?
- Has a methodology been used to determine which applications are best suited for imaging and which will act as the pilot?
- Has a set of organizational metrics been identified for gauging the pilot's success?
- Which standards are supported? Look for existing or proposed standards such as CCITT, G3/G4, ODA/ODIF for image format and compression; Fiber Distributed Data Interface for networks; TWAIN for peripherals; and Integrated Services Digital Network for telecommunications.
- Is an integrated database part of the system, or can one be easily linked to it?
- What are the network requirements?
- What are the legal ramifications of using the system on regulatory, evidentiary or records management requirements?

Koulopoulos is president of Delphi Consulting Group, Inc., a leading imaging consulting firm in Boston.

Market view

It is difficult to categorize imaging products. Instead, we've grouped some popular systems according to their scalability, price range and the extent to which they can be customized.



- **Products to the lower left** have a low-cost entry-level price but can often scale into enterprise solutions (upper left) to the extent that the company uses a common GUI such as Windows and doesn't require customization.
- **Products to the upper right** often cost more but allow for extensive customization and integration with existing applications and large numbers of users.
- **Products in the middle** but provide a wide range of scalability options and customization tools. Their cost can, however, quickly mount in an enterprise application with a large number of users.

Source: Delphi Consulting Group, Inc.

Imaging

a usually proprietary fourth-generation language (4GL) and a library of callable modules often written in C. People who choose these products are usually planning a process redesign project and have the resources to customize interface components and integrate multiple applications and technologies.

These products are also relatively expensive, especially because you have to purchase the entire system — including the hardware in many cases — and the vendor tends to provide significant support in the implementation and integration effort.

Vendors in this category — such as FileNet — have attempted to address the cost issue through user-based pricing models. In fact, hardware and software costs may not be radically different from lower end solutions in large workgroups. The more significant cost is in business analysis and the level of integration required.

MIDTIER (MIDDLE): These products — usually based on industry databases and languages and able to run on existing PC LANs — provide scalability and customizability at a moderate price. Their cost, however, can quickly mount in an enterprise application with a large number of users because of the customization and integration involved.

So far, products in this category are not yet installed in a large number of enterprise environments. In addition, these systems do not have the traditional track record of major vendors such as IBM. Some of these vendors, such as Sigma and LaserData, sell mainly through value-added resellers, which perform the integration, rather than the vendor itself.

As the market matures, however, this category will grow the fastest, drawing both high- and low-end vendors.

LOW END/ENTERPRISE (UPPER LEFT): "Enterprise/off-the-shelf" is a category that many would claim is an oxymoron. But the advent and strong appeal of Windows, coupled with the broad use of networks and electronic mail, have established an infrastructure and a precedent for this type of imaging. The integration of Watermark Software, Inc. with Beyond, Inc.'s Beyond Mail or the integration of imaging with Lotus Development Corp.'s Notes (Lotus Notes: Document Imaging) are examples of this approach (see page 89 for reviews of Lotus Notes: Document Imaging).

The availability of a standard graphical user interface (GUI) such as Windows is an absolute must for this type of solution. Products strongest in this category are those that take full advantage of Windows tools such as Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) and have support for popular networks.

What is not available in these solutions is the ability to tightly integrate imaging with existing application and customized user interfaces through a 4GL or extensive application programming interface (API) library.

Compress It
Compression and decompression of images is a must. At one time, the only viable alternative was additional hardware for the server and the client. Today software from vendors such as Xionics, Inc., Kofax Image Products, Inc., Decomp and Pixview is not only viable but also preferable in many cases where the host processor is based on an Intel Corp. i486 or on reduced instruction set computing.

Three levels of integration

This — integration with existing applications and user interfaces — is where the greatest area of debate can be found in discussing cost-effective imaging. There are at least three distinct levels of integrating imaging with an information system.

The first level is achieved through the GUI, such as Windows, which provides basic hooks into other applications. This approach is appropriate for basic imaging requirements but offers, at best, a loose coupling between the imaging application and other applications. Products such as Greengage Development Corp.'s FilePlus, ImageFast, Imara Research Corp.'s Imara Lite and Keyfile are examples of this.

The payback of these applications is in paper elimination, faster access to documents and the transfer of images through a messaging or work-flow process. Other applications, such as a spreadsheet or a word processor, can be tied into the imaging environment through OLE and DDE, which launch the application directly from the image interface.

The second level of integration provides for the linking of the imaging system to other ap-

Imaging for everyone, *page 85*

What is imaging?

Every imaging system, small and large, consists of the same basic array of six components.

Capture or scanning

The imaging process starts with documents or images being converted into digital form, usually via a scanner. Optical character recognition (OCR) may also be involved to make it possible to edit the image.

Scanning introduces numerous issues for the imaging system. Support for scanner drivers, throughput rates, double-sided scanning, character recognition, accuracy and speed, compression and image formats used, forms removal and document quality are just some of these. Luckily, even low-end solutions today provide a broad range of options in each of these categories.

Indexing

The indexing capabilities of low-end, off-the-shelf products differ dramatically from high-end, customizable solutions. The primary difference is the support of a standard database. A proprietary database will create havoc if you decide to migrate to another imaging system or want to integrate multiple systems.

Another dimension to indexing is not found as easily in most products: the ability to index the complete text of a document, often referred to as full-text retrieval. You can either integrate a third-party product, such as Cimag's integration of Fulcrum, or get the imaging vendor's proprietary offering, such as Compulink's embedded text retrieval. These systems must also provide an OCR component to convert the scanned image to text.

Storage

Few systems provide storage as part of the system, but there are exceptions, such as Micro Dynamic's Mars and Pinnacle Micro's Paperless 1.

Bundling isn't necessary because optical storage is easily integrated. Problems may come into play, however, in client/server architectures. Here, the support of a particular network can become a critical issue.

The intelligence of the imaging system's storage configuration is also something to consider. For example, how are jukebox operations handled? Is caching to disk or memory provided? What network services are used to avoid bottlenecks and long queues?

Printing and display

Most users will want a large monitor; otherwise, they'd have to scroll, pan and zoom to view multipage documents. Despite software advances, such as scale-to-gray capabilities that enhance black-and-white images, screen size is still a key ergonomic factor.

Don't dismiss the importance of paper output. Since standard laser printers do not accommodate large image files, you might consider upgrading to a departmental printer or using an imaging accelerator. Some vendors, such as LaserData, provide added intelligence to speed printing. Most offer third-party accelerator boards, such as Kofax, to accelerate printing.

Work flow

This is the process by which images are distributed to appropriate people on the network. Capabilities of imaging products vary considerably here. Two basic alternatives exist. In the first, the images exist only in compressed format on the image server and are sent to the client for decompression and viewing.

The second — work flow — is being claimed by virtually all image vendors. True work-flow automation requires a sophisticated set of tools to define routing rules and report document activity use. Few vendors actually provide this level of functionality. Some who do include Computron, Keyfile, FileNet, Viewstar, Plexus, I Levy, IBS, Sigma and Summit.

Retrieval

Retrieval is intimately tied to indexing. A database management system approach will provide key-field retrieval for a set number of items that are entered manually by a data entry operator during the scanning process or extracted by a field-oriented OCR. A full-text approach will provide retrieval on any text item within the document that was capable of OCR during scanning. Most products offer a DBMS approach.

Send Three and Sixpence We're Going to a Dance

by Scott McCready

As the old British joke goes, a daring group of soldiers during World War 1 sent an urgent message to Group HQ, "Send reinforcements we're going to advance." The message was subsequently passed from person to person down the trenches until it reached HQ. At that point it was interpreted as "Send three and sixpence we're going to a dance."

As the advocates of reengineering rapidly form ranks, we hear a great deal about the glory, but very little about the challenges or risks associated with re-engineering. However, even the simple task of getting senior management directives correctly interpreted in the trenches of the workplace can be problematic. Reengineering is useful as a rallying cry for US business that "all is not well." However, the re-engineering banner, while flying high, may not be the appropriate regiment to bet the life of your company on.

Re-engineering all too often plays on the adages of old, i.e., there is an optimal business process or structure, and you cannot automate an activity that resists definition.

Welcome to the world of workflow — in which there is no ultimate process or structure except the ability to re-configure processing resources in real-time, and there is something better than simply tools to cope with the "indefinable process." What workflow software provides is a general set of tools that are flexible enough to manage a wide range of business objects and processes — sort of an "open computer-integrated manufacturing environment."

If you're an IS manager whose voice may be heard but not always correctly interpreted within the trenches, plan on attending Workflow '93: Turning Point.

For more information call 1-800-343-4952.

McCready is a principal at IDC/Avante Technologies, a market research firm in Framingham, Mass. The company recently completed a 1200 page report on workflow software entitled, "Workflow Software: Challenge for the 1990s."

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31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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13. Treasurer, Controller, Financial Officer

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reality check

Application: Tracking blood donations.

Application requirements:
- No disruption of current applications and data.
- Diverse platform support.
- Ability to share information with existing database management system.

AIDS has put an enormous burden on health care providers and blood banks. Hundreds of dollars are spent testing every blood donation. The paperwork required is overwhelming, and the process has to be flawless.

The systems on which blood data is tracked must be certified by the Food and Drug Administration and therefore cannot be altered without significant elapsed time and cost.

As a result, blood banks needed an imaging solution that did not interfere with the existing systems in any way.

Image Engineering, Inc. was the chosen system because it didn't require modification of preexisting programs or code.

Several new vendors have taken this approach through the use of existing systems facilities for application integration. Watermark Software, Inc. uses Microsoft's OLE, for instance, and Paperclip Imaging Software, Inc. uses a screen-based method of associating alphanumeric screen display items with images.

Certain questions should be considered when you choose a system like this: Does the integrity of the images and the database need to be synchronized; that is, if you delete an entry in the database that refers to an image, does the image still exist? Is the integration seamless, or will users be required to jump back and forth from one product to another?

In most cases, these issues are easily resolved.

Case study

Preserving investment

By Robert Knight

Exactly 301 years ago, the concerned citizens of Salem, Mass., decided the community would be better off if its witches departed. They did, by way of a place on the road to Boston, now known as Gallows Hill.

Today, Gallows Hill is a park (bewitched, some say), and its records are available somewhere in the archives of Essex County. These records aren't part of the county's automated document imaging and retrieval system, but an estimated 4 million other records are. They reside in an indexing system on a Unisys Corp. A6 mainframe, flanked by a local-area network that provides imaging chores.

Essex County's Michael Miles: *'I don't think you should allow a verdict to tell you what your business is'*

The automation of Essex County's Registry of Deeds, which covers most of the state's North Shore, began 17 years ago, when the registry decided that the manual processing of mortgages, liens and other land documents could be streamlined and made more cost-effective.

"When I came here in 1977, we had 70 employees processing 250 documents per day," says Michael Miles, assistant register. "Currently, we have 45 employees, processing 600 to 800 documents per day."

This is largely because of the registry's most recent and most promising project: the implementation of the InfoImage Folder, a $500,000 LAN-based imaging system from Unisys that acts as a front end to the mainframe. Running on a DOS workstation, this electronic file folder management system automates the movement of paper-based information.

Before this addition, processing one document took about three weeks. Now, incoming land deeds are captured and stored as electronic images to which electronic notes — such as annotations and comments — can be attached.

Two key factors enabled the existing mainframe and new imaging system to work together cost-effectively, Miles says.

First, the indexing system was designed and executed in-house. "It was a solution designed by people who work with it everyday," he says. "I don't think you should allow a vendor to tell you what your business is."

Second, the new imaging system was designed to work with the mainframe system, not to take its place. "It could have been a big deal if we weren't thinking about maintaining our existing investment," Miles says.

In addition, he says, "because the imaging system is an open system, in the future we're going to add more to it for more productivity."

One of the bigger paybacks of the system is the "duplex video laser printing," Miles says. This provides the hard copy of the documents required by state law. Miles figures this function alone will achieve payback in three years plus an additional $80,000 per year that the office saves on labor, paper and toner. •

Knight is a free-lance writer based in Chicago.

Imaging for everyone

CONTINUED FROM PAGE 83

plications through callable modules.

For example, you might invoke an imaging system through an API, through a Windows facility such as DDE or OLE (in Watermark's case) or simply by associating it with screen-display areas, as in the case of PaperClip Imaging Software, Inc. These products offer the full functionality of imaging without requiring extensive programming or integration.

Many packages use proprietary database engines to perform indexing and retrieval. That can create problems when migrating to a more advanced imaging system or trying to integrate imaging systems across the enterprise.

With both the first and second integration levels, the interface components of the imaging systems are relatively standardized. This can be a benefit to quick application development and user acceptance; but it can also present a problem for sophisticated applications or especially novice users who are not accustomed to a specific GUI environment.

That's where the third level of integration comes in: database integration. This is achieved through products that support industry-standard database engines and 4GLs, such as Oracle Corp., Sybase, Inc. and Borland International, Inc.'s dBase. For instance, Viewstar works with Gupta Technologies, Inc. and Sybase products, while LaserData works with Oracle databases.

The primary benefit of this approach is a highly customizable configuration and interfaces, integration capabilities with existing applications and programmable extensions such as work-flow routing modules.

Growing up the key

Ultimately, the myth and reality of imaging are flip sides of the same coin. The imaging myth is that simply adding imaging to your technology suite without considering business analysis and work process issues can reduce the cost of an imaging application.

The imaging reality is that low-cost products — along with easy availability, installation and use — do nothing to change the complexity of the underlying enterprise business problems. If you view imaging as an intricate part of the business processes, you are far more likely to make the right choices and achieve the goal of cost-effective imaging, regardless of the actual products you choose. •

reality check

Application: Catching money launderers.

Application requirements:
- Scanning and OCR.
- LAN-based operation.
- PC-based platform support.
- Minimal integration.
- Bundled text retrieval, OCR and compression/decompression.
- Client/server architecture.

Money laundering leaves behind a monumental paper trail. When a trial comes up, a task force of the Internal Revenue Service, Department of Justice and Drug Enforcement Agency has to sift through mountains of paper that include testimony, financial documents, deposit slips, check stubs and endorsements.

Recently, a pilot was undertaken to assess the viability of converting trial documents to an imaging system. The solution needed to be not only inexpensive but also easy to install and use.

The product chosen, Compulink Management Center, Inc.'s LaserFiche, was a PC-based solution that cost slightly more than $100,000 for a five-user license and included hardware, software and integration. (The high bid received by the same user for another integrated solution was almost $900,000 — of which $800,000 was the cost for integration services.)

Compulink's advantages were its compatibility with existing hardware and networks along with a virtual turnkey image applications interface. The system also included a full-text retrieval function that was automatically enabled for every document scanned in as an image.

The final system is intended to provide both the prosecuting and defending counsel with trial documents on optical disc, eliminating the task of copying and shipping original documents back and forth.

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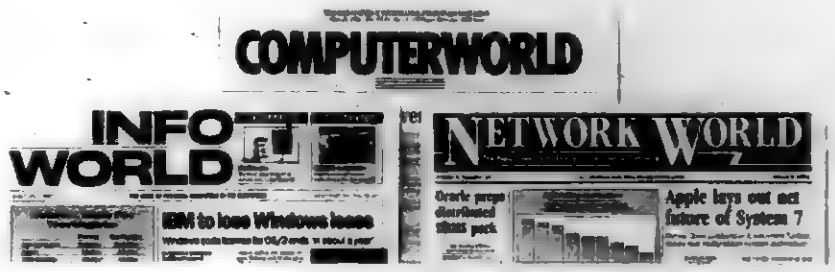

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Technology Analysis: Lotus Notes: Document Imaging 1.0 a robust bargain

Reviews	Ease of use	Performance	Document management features	Documentation	Compatibility	Media/Data import	Security	Technical support	Overall value
LAN Magazine 3/93	Great to work with	Robust	Logical	Excellent information use	A little troublesome	NC	NC	Can be difficult	This baby's right on time
PC Week 11/2/92	Easy to learn	Intelligently handles image files	Should be more transparent	NC	Especially useful	TIFFs and PCXs can be imported	Problems will crop up	Support contract must be purchased	Notes data distribution leveraged
Datamation 7/15/92	Making life a little easier	Saves time	A set of APIs	NC	Scanner-, fax-, gateway-compatible	NC	NC	NC	Uses of this product are extensive
Users									
Sally Jennings, Texaco Chemical Co.	■	▙	■	▙	▙	■	NC	■	It's fantastic for the price
Sarah Hanny, Cabletron Systems, Inc.	■	■	NC	▙	■	▙	NC	■	It's proved invaluable
Jerry DiMezzo, Cincinnati Bell Information Systems	■	▙	■	▙	▙	▙	▌	■	Very enthused about the product
Randy Eckel, Infoimage, Int.	■	▙	▙	▙	■	■	■	▙	Excellent value
Analysts									
Peter Kastner, Aberdeen Group	▌	▙	■	▙	▌	▙	▙	▌	Good value
David Marshak, Patricia Seybold Group	▙	▌	■	▙	▪	▌	▙	▌	Good option within a Notes environment

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Lotus Development Corp.'s Lotus Notes: Document Imaging 1.0 is the first in a series of planned add-ons for the company's groupware Notes program. The offering targets Notes users who want to share and store document images with one another. Users can integrate images into word processing documents, electronic-mail messages and databases.

Ease of use: The reviewers said that although Lotus Notes: Document Imaging is challenging to set up; its pull-down menus and displays are convenient. Lotus' SmartIcons are used for speedy access to common functions and to simultaneously open several documents.

Document management: The product enables images to be used in Notes documents by linking and embedding. Linking uses the Mass Storage System to determine the location where the image files are temporarily placed. With embedding, an embedded image file in a Notes document transports the document for replication to all other Notes servers on the corporate local- or wide-area network.

PC Week reported that the product's use of Dynamic Data Exchange and Object Linking and Embedding is a bit more complicated than the typical Edit/Copy and Edit/Paste commands found in most Microsoft Corp. Windows-based programs with the same features. Users need to put the cursor in the Notes document on the spot where they want the image to be placed. Next, the Document Imaging editing software has to be opened and then either Link or Embed must be chosen from the menus.

Compatibility: Lotus Notes: Document Imaging spontaneously migrates files from the temporary storage area of the Mass Storage System to another location whenever the temporary storage nears capacity. A variety of storage media, including hard drives, jukeboxes, network drives and optical discs, is supported.

Media/Data import: The product can import and export both Tag Image File Format and PCX format files.

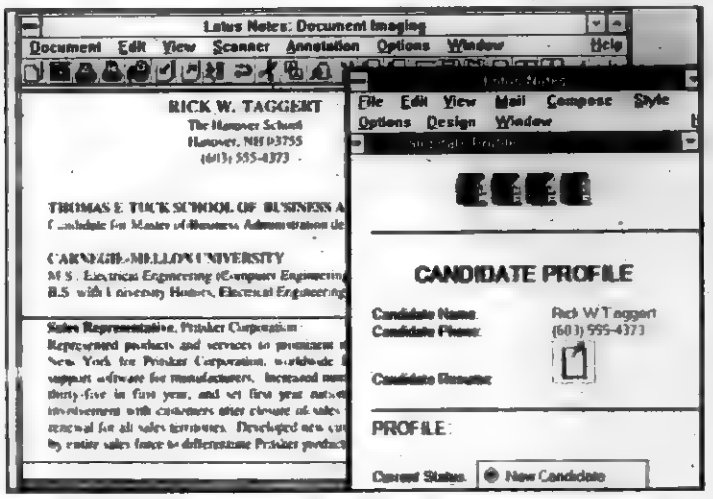
Security: *PC Week* reported that Lotus Notes: Document Imaging is missing a few important features — namely, the ability to protect images from annotation by unauthorized users.

According to *PC Week*, security problems will crop up because users can edit linked images in a Notes document even when they have read-only access.

Technical support: Support is provided Monday through Friday, 8 a.m. to 8 p.m. EST. However, a support contract must be purchased for technical support.

Overall value: At $295 per user, Lotus Notes: Document Imaging is a bargain. Reviewers said the product is robust enough to tackle the demanding imaging needs of the corporate paper trail, offering a diverse set of features including the Object Monitoring utility and the Mass Storage System utility that run on the server to track and manage images.

Summary by Lisa Davidson.



Lotus' Lotus Notes: Document Imaging 1.0 *enables images to be used in Notes documents by linking and embedding*

LOTUS RESPONDS

Mike Mitsock, senior product marketing manager:

Document management: The scanner can be used a couple of ways. It can be set up as a shared scanner with walk-up access — sort of like a copy machine. Our Object Linking and Embedding method is more akin to what we call embedding an image. Since linking is involved, it is not just a desktop phenomenon but could also be a group or enterprise phenomenon. While it could appear clumsy to some, it is not just an issue of scanning into an individual document. A shared database imposes other issues.

Security: That is something that we want to fix in the next release, which is not too far off.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Steven Frankel, Adams Harkness and Hill, Inc.	▙	▙
James Meyer, Janney Montgomery Scott, Inc.	▌	▌

Lotus' net income rose 87% to $80.4 million for the year ended Dec. 31, 1992, from $43.1 million in 1991. Revenue for 1992 grew 9% to $900.1 million from $828.9 in 1991.

Buyers' Scorecard: Proprietary systems still have their advantages

By Derek Slater

Sales of PC and local-area network imaging software are on the rise. However, users surveyed in the Buyers' Scorecard satisfaction poll indicated that these low-end and midtier solutions have a lot of work to do to match the functionality and ease of use of traditional packages. (For a listing and description of both types, see page 82.)

The traditional high-end systems — Wang Laboratories, Inc.'s WIIS, FileNet Corp.'s Workflo and IBM's ImagePlus — are also referred to as production systems, in contrast to what International Data Corp. analyst Scott McCready calls "ad-hoc" systems.

Respondents using the low-end and midtier systems indicated that they spend less than half of their work time using imaging functions, hence the ad-hoc moniker. Production system users tend to use their imaging applications full-time.

Roughly 50% of the ad-hoc system users said their products are capable of handling mission-critical applications. These packages earned satisfaction marks roughly comparable to the high-end products in performance. Two key areas in which the ad-hoc systems earned much lower grades were service and support and ease of use.

Management issues

Users indicated that traditional systems also offer much more work-flow management functionality, but low-end users said that area was relatively unimportant for their needs.

Despite the dominance of the high-end systems in user satisfaction, the growth of shrink-wrapped imaging software sales indicates that the imaging market is following the general trend toward PC and open systems solutions.

The traditional imaging vendors are moving to counter the momentum of the ad-hoc systems by increasing support for smaller platforms and by offering greater connectivity to other vendors' hardware.

Wang's Openimage series, for example, runs the company's imaging software on relabeled IBM RISC System/6000 servers.

Wang also recently announced it will port the software to Hewlett-Packard Co. workstations, which Wang will resell under the HP label. Client PCs running Wang's applications (which can also connect to mainframe hosts) use a Microsoft Corp. Windows front end. FileNet has also released Workflo for Windows.

"The traditional market is becoming a software category because people don't want the proprietary hardware. The value added by the hardware supplier is minimal," according to McCready. (See next page for more about the traditional vendors' strategic directions.)

The move away from expensive proprietary hardware is borne out by patterns in the market's growth. According to preliminary figures from market research firm Dataquest, Inc., the number of commercial imaging systems shipped in 1992 totaled more than 7,700, up 60% from 4,868 in 1991.

Revenue rose much more slowly. Revenue of $2 billion was generated, up only 11%, compared with $1.78 billion in 1991 revenue.

A poll of information systems managers conducted by CSC Index, Inc. also ranked imaging as the No. 2 emerging technology for 1993. Of the survey's 407 respondents, 29% mentioned imaging as the key technology, ranking it behind client/server computing's 47%. (Multiple responses were allowed.) Imaging finished first in the poll in 1992.

Diverse respondent base

The survey respondents were drawn from a wide range of industries: Roughly 30% were from government agencies; the other traditionally paper-intensive banking, insurance and financial services industries accounted for another 30%; the remaining respondents came from the transportation, health care and consumer goods industries.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their imaging systems in specific product categories.

All categories were factored into the final scores. The scores for each high-end product in the six most important categories are listed in the tables on the next page.

Old guard, new guard

Low-end and midtier packages outscored traditional production imaging systems in user satisfaction with cost per seat but trailed behind in other key areas

	High end	Midtier and low end
Service and support	8.2	6.6
Performance	7.6	7.5
Ease of use	7.9	6.8
Cost per seat	6.3	6.6
Scalability	7.6	6.8
Work-flow management features	7.7	6.2

Response base: High-end, 97 users. Low-end and midtier, 30 users.

(High-end products include Wang, FileNet and IBM. The response base for low-end and midtier products includes users of LaserData, Westbrook and similar vendors. Scores represent the average of all users' responses within the product category.)

Staying put

Users who have already installed integrated systems are staying put

Q. Are you planning to move your imaging applications to a smaller platform?

	Yes	No	Don't know
Wang WIIS	6	20	1
FileNet Workflo	7	32	0
IBM ImagePlus	3	26	2

Living up

In general, users of production systems said their products have delivered as expected

Q. Does your imaging system provide the cost savings or productivity increase you expected when you bought it?

	Yes	No	Don't know
Wang WIIS	26	0	1
FileNet Workflo	30	7	2
IBM ImagePlus	24	6	1

METHODOLOGY

User names were obtained from a combination of vendor and nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 39 users for FileNet, 31 for IBM and 27 for Wang.

Thirty users rated their low-end and midtier products. The respondents rated individual products; scores for these products were arranged to derive the ratings for the entire group in the chart above.

The performance score for the traditional systems is the result of two distinct criteria: transaction throughput and image-retrieval speed.

To compute the overall score for each of the traditional products, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance rating is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

ACKNOWLEDGMENTS

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High-end systems

User demands force old-guard changes

By Tom Koulopoulos

The founders of imaging are undergoing profound changes in their product offerings, especially as the imaging market shifts from a pioneering effort requiring vendors to convince users of its viability to a freewheeling competitive field driven by user demands.

Major vendors such as IBM, Wang Laboratories, Inc. and FileNet Corp. have spent untold millions in the past five years trying to prime the pump of industry and government by creating an awareness of benefits and payback.

They were so successful in their promotions that users are now demanding image processing products. But users want low-cost entry-level solutions, not the expensive proprietary systems once sold by the pioneers.

Indications are that these vendors are more than capable of providing competitively positioned solutions, if needed. For example, an entry-level system can be purchased for less than $10,000 per seat, compared with more than $20,000 per seat two years ago. "For many users, price has been an obstacle," says Gordon Libert, vice president of marketing at FileNet.

The traditional vendors are shifting their emphasis from a single, all-purpose hardware or software solution to that of adding value through the process of integration and services. IBM, for one, has staked out a position by emphasizing how much it costs to customize the emerging low-cost hardware and software systems to individual business requirements. "The real question," according to David Liddel, IBM brand strategy manager for image solutions, "is not how much will it cost to customize, but rather do you want to buy experience from a third party and put the cost on your books, or are you going to absorb the cost with your resources?" Either way there will be an additional cost.

With this in mind, the major imaging vendors are emphasizing the need for planning and integration.

The impact can't be underestimated. Traditional vendors, such as Digital Equipment Corp., already recommend other hardware platforms and non-DEC solutions to customers. Italian computer giant Ing. C. Olivetti & Co. derives more than 60% of its revenue from service-related activities.

Following this strategy, Wang expects service revenue and margins to increase as hardware and software revenue falls. "Someone will grab the commodity software market [for imaging]," says Ron Arenson, director of image marketing at Wang.

Wang recently decided to discontinue hardware manufacturing operations and focus strictly on services and software.

This shift among the traditional vendors means the market for low-end imaging systems for small workgroups and commodity imaging will belong to some other player. That vendor will not likely be an organization that concentrates on services and integration.

Another result of the shift is a heightened push for open systems and document standards that encourage interoperability of imaging systems. This is necessary for a true commodity solution at the low end to emerge.

The process of selecting an integrator will certainly become much more interesting because virtually all major hardware vendors will be in the running.

reality check

Application: Regulatory compliance.

Application requirements:
- Fast remote access to images and documents.
- Little training for end users.
- Minimal initial investment.
- Retrieval based on "fuzzy" criteria.

Since the chemical disaster in Bhopal, India, the chemical industry, the Environmental Protection Agency and the Occupational Safety and Health Administration (OSHA) have upped their emphasis on safety and information relating to hazardous materials.

Much of this information is contained in vast repositories of engineering drawings, plant maps, Materials Safety Data Sheets (MSDS) and myriad regulatory guidelines. Access to this information has historically been through a number of interfaces, including paper, blueprints, regulatory guides and updates, company memoranda, maintenance logs and a variety of on-line databases.

OSHA has put pressure on organizations to put all documents and data in electronic form to provide immediate access to critical information. The problem: Previously separate systems must be integrated into a single document management system.

Few products can meet such a broad range of demands. Organizations have had to turn to integrators to develop a system.

One user of a novel, cost-effective approach is Lockheed Advanced Development Co. Lockheed chose Excalibur Technologies Corp., which provides an integrated imaging, optical character recognition and full text-retrieval package for DEC VAX and PC workstations. The novelty of Lockheed's approach is a dial-in and fax-back capability that allows remote access to all documents stored on a central image server. Field personnel can dial into the imaging system using a standard Touch-Tone phone and request that an MSDS be faxed to them at a number they specify.

Vital statistics

What is your responsibility for imaging software?

Evaluate or recommend vendors	97
Determine need	88
Select vendors	83
Set standards for your organization	79

RESPONSE BASE: 127 USERS (MULTIPLE RESPONSES ALLOWED)

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.

Wang's WIIS

OVERALL SCORE 77

8.8	Reliability
8.7	Sufficient capacity
8.6	Ease of use
8.3	Responsiveness of vendor service
8.1	Quality of technical support
7.8	Transaction throughput

Would you buy the program again?

LIKELY — REASON: Good performance (19)

UNLIKELY — REASON: Vendor's financial problems (8)

RESPONSE BASE: 27 USERS

FileNet's Workflo

OVERALL SCORE 75

8.7	Sufficient capacity
8.3	Reliability
8.2	Responsiveness of vendor service
8.2	Quality of technical support
7.3	Ease of use
7.3	Transaction throughput

Would you buy the program again?

LIKELY — REASON: Good product (34)

UNLIKELY — REASON: Better products available (5)

RESPONSE BASE: 39 USERS

IBM's ImagePlus

OVERALL SCORE 72

8.3	Reliability
8.2	Responsiveness of vendor service
7.6	Quality of technical support
7.6	Sufficient capacity
7.6	Transaction throughput
7.3	Ease of use

Would you buy the program again?

LIKELY — REASON: Easy to operate (27)

UNLIKELY — REASON: Better products available (4)

RESPONSE BASE: 31 USERS

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The entire community seems to want tickets to this year's NeXTWORLD Expo, and no wonder. Our Second Annual Expo kicks off May 25 with the most important event in NeXT's history. The release of the shrink-wrapped NeXTSTEP software for Intel processors. It's a don't-miss-it opportunity to experience object-oriented computing, and what's been called "the most respected piece of software on the planet,"* on industry-standard computers. **STEVE JOBS AND ANDY GROVE, KEYNOTES.** Besides seeing the release, you'll also be given insight into it by the two people best equipped to talk about it—NeXT Chairman Steve Jobs, and Intel Chairman Andy Grove. They'll give the two keynote speeches. **THREE EVENTS IN ONE.** In addition to the all-important product release, the Expo consists of a Worldwide Developer's Conference featuring numerous industry luminaries; the annual User Conference and User Group Program; and a Product Exposition with over 100 exhibitors. All are key events for the object-oriented computing community. **$2500 DEVELOPER DISCOUNT.** Two major discounts give you added incentive to attend. If you attend the Developer Conference, you're eligible for a special bundle. For $300** and your $695 Admission Fee, you'll get not just admission, but a copy of NeXTSTEP for Intel Processors User Environment and NeXTSTEP Developer. Register now as space is limited. **50% SOFTWARE DISCOUNT.** In addition, everyone attending any part of the Expo will be eligible for a 50% discount on the purchase of NeXTSTEP software products. **CALL NOW.** For information or to register, call 1(800)767-2336 today. But whatever you do, be sure you've got a ticket.

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Why business managers are empty-handed

By David Vaskevitch

Do managers really spend most of their time processing words, building spreadsheets and maintaining simple databases? That's what you'd think, looking at today's software sales and the primary efforts of the PC software industry.

The dominant software categories are word processors, spreadsheets and databases, which account for 75% of the world's PC software purchasing dollars. The next tier of applications includes presentation graphics, project management and electronic mail.

But word processors never found their way into the hearts and minds of managers. Spreadsheets can be liberating for budget-building, but most managers spend little time calculating numbers other than at budget time. And while database software is quite powerful, it can also be quite complex.

In reality, most managers use their PCs for only a fraction of the day, instead preferring copiers, fax machines, telephones, filing cabinets, secretaries and personal interaction.

In fact, while the PC is supposed to represent an electronic desk, it doesn't even come close to replacing the piece of furniture on which the machine sits. That's because today's PC software doesn't fit in with what today's managers really do.

SPREADSHEETS ARE FINE; WORD PROCESSORS ARE GREAT. BUT AT LEAST 90% OF BUSINESS MANAGERS' TIME IS SPENT DOING OTHER THINGS — TASKS NOT SUPPORTED BY AVAILABLE SOFTWARE. ISN'T IT TIME WE STARTED PUSHING FOR SOFTWARE THAT INFLUENCES THE WAY MANAGERS WORK?

During the '90s, the software industry has to gain a clearer picture of how managers work so it can deliver useful tools.

Managers tend to work through others instead of accomplishing tasks themselves. Rather than being generators of words and numbers, managers focus primarily on the three C's: communication, control and coordination.

The computer, particularly in a networked form, can help managers concentrate on communication, control and coordination, but only if new categories of software, as described in the following pages, emerge.

INFOSTR

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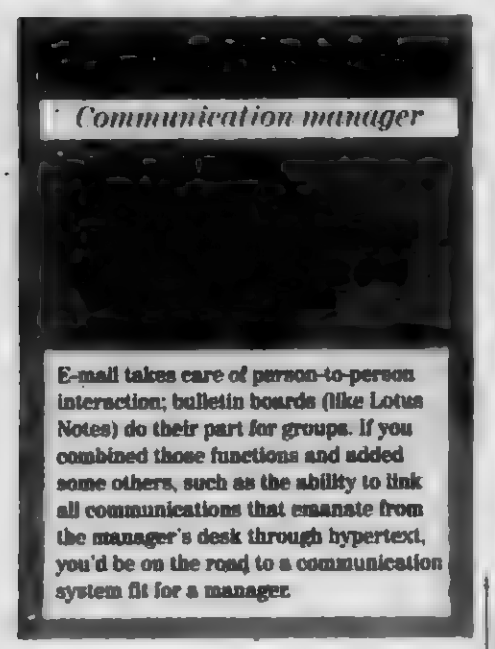
A new generation of applications that will finally support a manager's everyday tasks of communication, control and coordination will make its appearance before the decade is out. With a new set of software (described on these pages), the PC could become a tool managers use all day, every day. These machines will become — finally — a central part of every manager's job.

Communicate

Managers probably spend most of their time communicating. As new PC software becomes available that more directly supports this activity, the managerial workstation will become indispensable.

Today, most managers would hardly notice if the PC on their desks were taken away — except at budget time or while writing a key memo. However, in companies with active electronic-mail systems, managers notice and complain within minutes if the mail system or their PC stops working.

E-mail, in its ability to improve the informal communications process, is the first tool to change the underlying patterns that are implicit in a manager's everyday working life.



E-mail takes care of person-to-person interaction; bulletin boards (like Lotus Notes) do their part for groups. If you combined those functions and added some others, such as the ability to link all communications that emanate from the manager's desk through hypertext, you'd be on the road to a communication system fit for a manager.

Yet in many ways, E-mail addresses only a small part of the real need. For one thing, most E-mail systems don't remember any history. In addition, they are limited in scope, best suited for directed communications among either individuals or small groups of people.

Other types of communications software, namely bulletin board systems, markup packages and multiuser hypertext systems, start to address the rest of the need.

Bulletin board systems were specifically designed to remember lots of history, and they facilitate communication among medium and large groups of communicators. The system is organized around topics — that is, any subject a group of people is interested in discussing. Every message sent through a bulletin board is typically kept for subsequent display by all other interested users.

With a bulletin board system, a manager can confront an issue, come up to speed quickly, bring his longer term perspective to bear and make a decision that enables a deadlocked team to start making progress again.

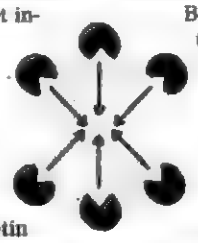
A bulletin board system facilitates this process in three ways:

- The manager can stay on top of active topics by skimming the structure of the bulletin board to decide where he most needs to get involved.
- Once he has decided that an issue requires his involvement, the manager can quickly come up to speed on the context and background.
- Before making a decision, the manager can poll the team and others for additional input. The bulletin board provides both a mechanism for everyone involved in the decision to be equally up to speed and for contributors to add their input quickly, facilitating a rapid decision.

If bulletin boards are so useful, why aren't they more popular in the managerial community and among corporations in general? Part of the reason is that until recently, this technology did not really exist in a form that corporations could use internally. Lotus Development Corp.'s Notes is probably the first large-scale commercial product that is bringing bulletin board technology to commercial organizations.

But E-mail and bulletin boards are just the beginning. Waiting in the wings is an approach to communicating based on E-mail and bulletin boards that goes beyond those technologies.

To understand this communications environment, you need to understand the concept of multiuser hypertext. Whenever someone writes text, such as a memo, a story, a letter or a piece of E-mail, the author is taking a complex web of concepts and thoughts and reducing it to a linear, sentence-based form. Hypertext, on the other hand, enables users to store the original, nonlinear web of concepts directly in the computer.



Because the hypertext system maintains all the relationships between concepts, it is possible to jump from one concept to another.

Today, when a PC user communicates, he is forced to save his communication in one of three places: the traditional file system on his hard disk and network, his E-mail system or a bulletin board repository. Each of these meets a particular need, but they do not tie together very well.

Suppose you could replace all three with a single, organizationwide — or even worldwide — multiuser hypertext system?

In this new world, each time a manager communicates, what he writes would be stored in a universal shared information space. Each communication could be linked to all related communications.

Eventually, this system — in essence a synthesis of E-mail and bulletin board concepts — would be so powerful and ubiquitous that it could replace the current concept of a file system and become the underpinning of a PC-based information environment.

The file system is transformed from a passive, storage-based repository to an active communications environment that is visible to the user on a constant basis.

E-mail's role

E-mail is one of the existing technologies that has helped interest managers in PCs. In an extensive E-mail implementation in one military organization, the following occurred:

Patterns of communication changed. Formerly, almost all conversation was vertical between adjacent levels in the chain of command. With E-mail, users felt free to send mail to anyone else on the system.

Decisions were made more quickly, and more people knew about decisions after they were made.

The volume of formal memos and telephone calls each decreased by at least a factor of four.

Control

To be in control, a manager must be on top of his numbers; managers are expected to produce solid budgets and forecasts. Today's software not only falls short of supporting budget and forecasting needs, but it also fails to facilitate information access so managers can determine whether operations are on target.

You'd think budgeting and forecasting are well-served by existing tools, particularly the spreadsheet. Well, yes and no. Of course, the spreadsheet has become the primary tool used to develop budgets and forecasts, and, of course, it has simplified life tremendously compared with calculators. Yet the spreadsheet ignores two key components of budgeting: mathematical forecasting and data collection across the organization.

The standard spreadsheet leaves forecast model building, for instance, entirely up to the user. Because most people are notoriously bad at developing accurate forecasts, most business plans are based on some form of simple linear growth.

What managers need is access to some form of modeling tool that provides more sophisticated forecasting capabilities, along with built-in expert assistance in how to use them.

As for collecting data across the organization, spreadsheets again come up lacking. Most large organizations collect budget data from individuals and departments to get a corporatewide picture. Changes are then compared with overall profit targets, and managers are asked to redo their budgets. This process is repeated again and again.

The single-user spreadsheet tools available today cannot support this process. While limited facilities are provided for one spreadsheet to reference another, no spreadsheet available today has any understanding of how organizations are structured and how data is consolidated and controlled on an ongoing basis.

Budgeting is a hierarchical operation; managers need better tools for consolidating numbers across teams and departments, monitoring expenses and investigating anomalies.

It is not hard to imagine a budgeting and control tool that would solve both of the problems described above. The system would start with an understanding of the organization's structure. It would also contain basic forecasting facilities, including a model for seasonal trends by product line as well as the company's master assumption about growth in the quarters ahead.

Individual managers would be able to use the system much as they use a spreadsheet today — in fact, the spreadsheet might be the basic mechanism for accessing the system. However, the underly-

Continued on next page

Continued from previous page

ing support structure would make all budgets and forecasts automatically part of the larger structure of organizationwide numbers without any need for copying spreadsheets or sending disks around by mail.

Such a system is not currently available. If it were, it would likely take the form of a spreadsheet front end to a database-oriented budgeting and accounting system.

Beyond sophisticated budget and forecasting, managers need to determine how their operations are doing against budget. Today — 30 years after the introduction of the first computerized accounting systems — most managers have a hard time accessing that kind of performance information.

Understanding expenses often requires accessing more than accounting information; the manager must go back to the original memos, plans, proposals and status reports describing the project.

In theory, if this information is computer-based, it should be easy to find. Unfortunately, that's not the case.

Searching through multiple directories across several servers on a network is only slightly more likely to result in a retrieval than looking through file cabinets.

What managers need is a fast, friendly way of finding documents when they need them. This is an area that has received much attention during the last 20 years, yet the basic filing system most companies use continues to be based on DOS and its eight-character file names.

The kind of filing system managers need to make information access easier should have the following characteristics:

- Foldering facilities that enable documents to be filed in multiple places.
- Cross-document linking so that any document can refer to any number of other documents.
- Content-based retrieval so that documents can be located based on key words and phrases found anywhere in the text.
- Automatic archival both to migrate unused documents off the network and to bring these documents back.

Today, the only way to get the kind of filing system described here is to sweat through building it from scratch with third-party tools. Eventually, however, these types of facilities will likely become a basic part of operating systems.•

Spreadsheets are good for budgeting, but they could be better. Budgeting is a hierarchical process, but spreadsheets can't collect data across an organization. They do not help with forecasting either, which no one does well. Budgeting also requires immediate and flexible access to lots of data. Put all of that together in a system, and you've got a budget/forecasting system for a manager.

Improved search

Filing systems on networks need to enable managers to find documents quickly and easily, no matter where they are. Many people assume that content-based information retrieval solves all problems — but that is far from the case. Retrieving documents primarily by key word searches is expensive (in both time and space) and not very accurate. Most users have trouble picking just the right set of key words. Therefore, other facilities, particularly those based on foldering and linking, become important.

Coordinate

Coordinating the activities of a team is a time-consuming activity for most managers. This task largely involves goal-setting, schedule-setting and attending regular meetings to keep in sync with the team.

Superficially, project management software and personal information managers appear to address many of these coordination needs. Yet even managers who depend on project management software tend to view it as a highly formal mechanism that they use only on the largest projects rather than as a vehicle for routine team coordination. Project software isn't suited for the kind of goal-setting important to the team environment.

Personal information managers, for their part, can establish and track goals and create to-do lists as well as coordinate multiple calendars to simplify meeting scheduling. But most are limited in a team setting, unable to manage the calendars of any group larger than about five to 10 people.

What business managers need is a combination of project manager and personal information manager features to yield what might be called a "team coordination system."

Such a system would include the following functions:

- **Goal manager:** *A shared forum to agree on goals, including unscheduled future objectives.*

How often have you thought of a future project that your team has no time for now and wondered how to keep track of that goal so it can be reconsidered periodically for eventual implementation? How about being able to see how all the goals for several groups, all part of a larger department, fit together?

A goal management system would deal with these kinds of problems, enabling goals set during an annual performance review to be reflected in quarterly, monthly and weekly objectives. The goal manager would enable a manager to see high-level objectives for himself, his managers and his team. He would be able to drill down to uncover the underlying details associated with accomplishing particular objectives within certain time frames.

Just Gantt help it

The progress manager portion of the team coordination system needs to produce simplified reports updating everyone on whether a team is meeting objectives. Two report types will be useful:

- **Calendar Gantt:** A monthly calendar view, with Gantt lines for key projects and goals superimposed.
- **Linked Gantt:** A classical Gantt chart, with lines to show dependencies between tasks.

Goal managers would be for team use. The software would provide a framework for group planning meetings, allowing the group to see high-level long-term goals or zero in on a particular area to plan a specific project.

Best of all, the system would provide a shared structure for all managers so they can share goals and coordinate activities.

- **Progress manager:** *A tracking mechanism for the timelines (strict and otherwise) associated with projects and goals.*

While the goal manager deals with the highest level planning and coordinating, a progress manager deals with the next level down. It tracks progress against objectives for a manager and his team.

Progress management software ensures that goals and schedules are in sync, it has no fixed beginning or ending date and it produces a fluid schedule that consists of multiple, unrelated activity networks. Goals, projects and tasks don't have to be part of a larger project.

Finally, progress management software has different types of output that are both simple and easy to annotate.

- **Schedule manager:** *A more detailed framework for sharing schedule information, including travel, meetings and activities related to goals.*

The final component of the team coordination system is a schedule manager. This component would include all the standard facilities of schedule, calendar and diary management, from scheduling meetings to keeping up on team travel and what project everyone is working on.

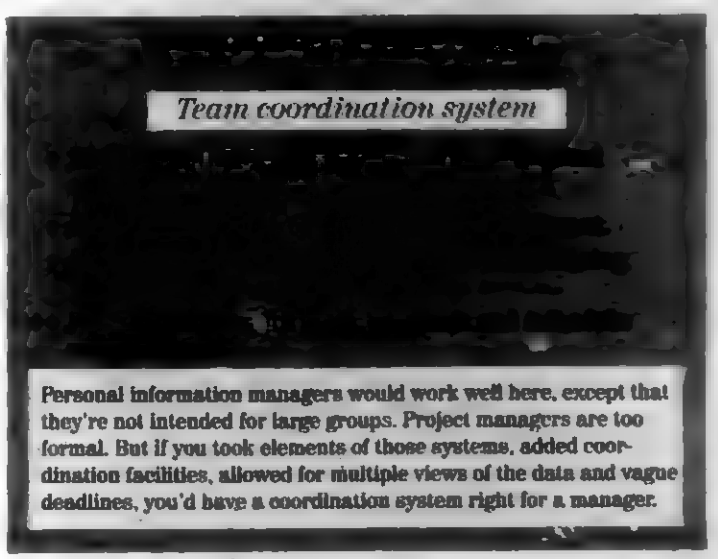
To make it all work, the system would have to exhibit some of these key characteristics:

- Fast and easy to use.
- Robust. Because calendar information, particularly for groups, is critical, it can't be lost. So a schedule manager would need the type of the integrity features found in transaction database systems.
- High throughput. Because the schedule manager has the potential for heavy use, it should be based on a highly distributed, scalable technology.

For large organizations, for instance, systems based on simple sharing of DOS files on a server would quickly run into critical performance limitations.

Some organizations have started to implement their own team coordination systems. One large government department, faced with a software project that will take eight years and involve thousands of programmers, is writing specifications for a comprehensive system. However, some companies can't afford the build-it-yourself approach.

In time, packaged software should emerge that marries personal information managers with the functionality in project management programs.•



Personal information managers would work well here, except that they're not intended for large groups. Project managers are too formal. But if you took elements of those systems, added coordination facilities, allowed for multiple views of the data and vague deadlines, you'd have a coordination system right for a manager.

Vaskevitch is director of enterprise computing at Microsoft Corp. in Redmond, Wash.

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Getting the GOOD GOOP on OOP

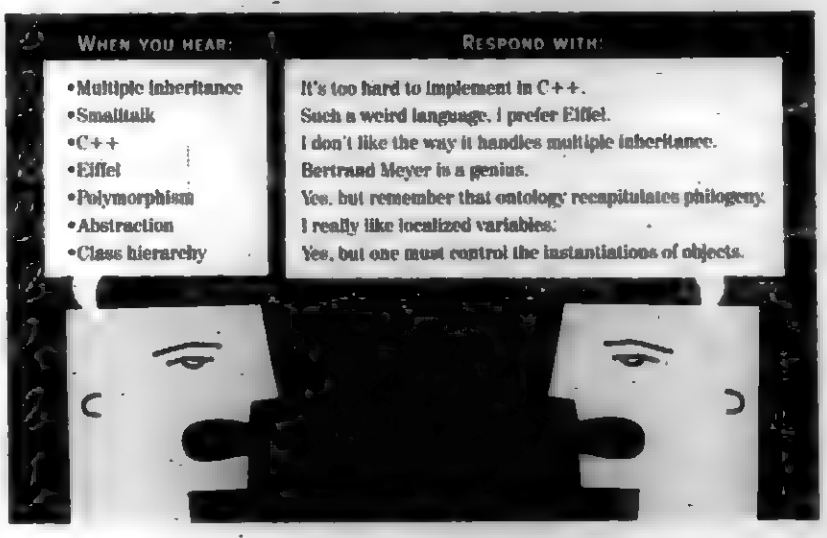
By Don Burleson

EVEN IN TODAY'S tight job market, programmers with object-oriented skills find themselves in high demand, bombarded with offers for prestigious and highly paid positions. Object-oriented programmers command some of the best jobs in the industry, and their career opportunities are bright.

But how does a programmer become versed in object orientation? There are no certification programs for object-oriented skills and no "OO" degrees.

When object-oriented programming first became the industry fad, there was a rush to understand this complex approach to systems development. When I attempted to become knowledgeable about it, I was confounded by abstract languages such as Eiffel, Smalltalk and C++. Even more confusing was the large array of object-oriented acronyms. I knew there had to be an easier way.

Rather than spending hundreds of hours actually learning object-oriented programming, I discovered it was far easier to memorize all the words and acronyms associated with the technology.



I've collected all this information into a manual of Global Object-Oriented Double-talk (GOOD) and General Object-Oriented Phrases (GOOP). By using these terms generously in conversation, you will impress your colleagues with your in-depth knowledge of GOOD GOOP.

Object-oriented societies are a good source of acronyms. You must be well-versed in these to impress co-workers with your object-oriented knowledge.

There is the Systems Conference on Object-Oriented Programming (SCOOP), the Object-Oriented Programming Systems Languages Association (OOPSLA), the Principles of Object-Oriented Programming Association (POOPA), the European Conference on Object-Oriented Programming (ECOOP) and the Symposium on Object-Oriented Programming and Analysis (SOOPA).

These organizations pool their membership for joint conferences such as the popular OOPSLA-ECOOP conference in Phoenix. There are rumors that a mega-conference is planned for next summer in New York. The name? POOPA-SCOOP.

To be regarded as an expert in object-oriented programming, you must first know the Principles of Object-Oriented Programming (POOP). After mastering POOP, you can move on to the most sensuous of the acronyms, Object-Oriented Analysis (OOA), pronounced "Ooooh-Aaaah."

Now that you get the idea, you can confound your associates by creating your own object-oriented acronyms. Your colleagues will be impressed that you are keeping up with the latest developments.

Here is my collection:

- FOOL: Fouled-up Object-Oriented Language.
- OOLALA: Object-Oriented Lexical Algorithm Language Application.
- DROOL: Database-Related Object-Oriented Language.
- HOOPLA: Heuristic Object-Oriented Programming Language Algorithms.

The possibilities are endless. With a little creativity, you can create an object-oriented acronym for any career situation.

Burleson is a database administrator at Thomson Professional Publishing Information Technology in Webster, N.Y.

What's it really like out there? Look around you. What are typical co-workers like? How are IS department meetings really run? DOES THE GRASS LOOK GREENER FROM SOMEONE ELSE'S DESK? IS THERE MORE TO A JOB IN THE IS SHOP THAN MEETS THE EYE? SEND YOUR OBSERVATIONS — SERIOUS OR OFFBEAT, BUT ALWAYS CANDID — TO KELLY E. SEWELL, ASSISTANT EDITOR, FEATURES.

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Overnight delivery industry

Packaging your skills for express delivery

By Joe Panepinto

THE CRITICAL QUESTION for most express delivery companies is finding the shortest distance between two points on the globe. Unfortunately, the answer isn't always a straight line. For instance, moving goods from a tennis shoe manufacturer in South Korea to a wholesale distributor in St. Paul, Minn., might involve a complicated network of air, sea and land transport. Unexpected disasters might mean figuring out a whole new — and nonlinear — route for getting a product quickly from point A to point B.

Information systems career opportunities in overnight delivery industries run the gamut from systems analysts to network specialists and application developers. In spite of the recession, the industry is growing: Overnight service is so critical to business needs that companies haven't been cutting back, hiring managers say.

Opportunities exist in a variety of areas — technical support (help desk), development and operations. And the pay is competitive. IS professionals with three to five years' experience can expect to earn $30,000 but can command up to $60,000 per year with rare skill sets.

Never a dull moment

A word of warning: This industry is not for the staid or meek-at-heart. The byword for IS personnel in express delivery, especially for those in operations, is: "Expect the unexpected."

John Ricker, vice president of corporate systems development at Federal Express Corp.'s Memphis headquarters, likens the operations side of the industry to a large-scale military command-and-control operation.

"Our command-and-control system is a real-time, end-to-end asset management system that optimizes and schedules trucks, airplanes and people," Ricker says.

Although most large-scale systems developed and supported by overnight courier companies are mainframe-based — Fedex's Cosmos Network and Air Express International (AEI)'s Logis System, for instance — there is a movement toward smaller Unix and client/server systems. The price/performance of Unix systems has improved, and the cost of maintenance is lower than it is for mainframes.

At the same time, object-oriented skills are very much in demand as companies look for ways to reduce development cycle time and increase the reusability of code. Because of the nature of the business, there is little patience for slipped development deadlines.

Stand and deliver

"We work in a very fast-paced environment," says Cynthia Smith, vice president of information services at Danzas Corp. in Bellevue, Wash. "Our internal clients think if they can get a 500-pound box from here to the other side of the world overnight, we should be able to build applications in short order."

While the majority of development job opportunities in this industry are centered around the major data centers, there are also opportunities at scattered field sites for operations and support personnel. The challenges on the operations and system support side are much different from those on the development side.

IS personnel in operations have to deal with rerouting and rescheduling shipments around all sorts of natural disasters; system support personnel face equally daunting challenges of keeping the system up at all times.

When Hurricane Andrew struck in Florida, Smith had to track down a backup generator in Atlanta that could be shipped to Miami to ensure the local system stayed up. In the express business, disaster recovery and contingency planning experience is a plus.

Other challenges for IS personnel depend on the nature of the organization. For example, Fedex owns 450 airplanes and therefore has to develop extensive scheduling and flight plans. IS builds applications for airplane handling and scheduling, similar to what ticket agents and traffic controllers use to track arrival and departure times.

AEI in Darien, Conn., has to manage contracts with 28 airlines worldwide. In this situation, IS creates applications that tie right into commercial airline schedules using electronic data interchange (EDI).

Wanted: EDI personnel

The desire for EDI personnel is part of a larger push toward greater interconnectivity with client companies. Many overnight delivery companies have developed proprietary PC-based systems for use at client sites.

For example, the United Parcel Service, Inc.'s (UPS) Maxi-Ship system consists of a PC, UPS-developed EDI software and a printer. The system enables the user to produce all shipping documentation and manage all cost accounting on-site. Other companies, such as Fedex, offer similar services.

To provide these services to their customers, these companies need IS professionals with experience developing in C, C++ and Unix. Networking skills are also essential because these companies are constantly adding new client sites to the network.

"The real difference in this industry has been the development of value-added information technology systems," says Glen Holmstrom, human resources manager for information services at UPS, referring to UPS' custom-built systems.

Panepinto is a free-lance writer in Amherst, Mass.

Where the jobs are

Opportunities in overnight delivery revolve around each company's data center locations: Fedex: Memphis, Colorado Springs, Los Angeles. UPS: Mahwah, N.J. Danzas: Bellevue, Wash. U.S. Postal Service: Washington, D.C.; San Mateo, Calif.; Minneapolis; Wilkes Barre, Pa.; Raleigh, N.C.; St. Louis; New York. AEI: Darien, Conn. BNI Corp.: Redwood City, Calif.; Houston.

Money talks

IS pros with three to five years' experience and a rare mix of skills can earn $30K to $60K: object-oriented Unix programmers with industry knowledge.

Unix, EDI hot

Object-oriented, Unix development and network operations skills, especially EDI, are required.

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Cutting repair costs

A PC technician's advice: Do some legwork before you call

By Todd Henschell

MOST FIRMS can reduce PC repair bills by abiding by a very simple rule: Preparation is everything. Any information you can gather before a technician arrives — no matter how insignificant — can reduce the time the technician spends on-site. Because you're probably paying between $80 and $200 an hour (and considering that most services bill in 15-minute increments), costs can really add up. Here are a few things that can cut time off service calls.

If the PC is still operational, the first step is to systematically replicate the error. Reboot and take detailed notes of everything you do before the problem occurs again. If the error repeats only under certain conditions, note what's different. For instance, maybe your word processor won't load a letter written yesterday but will load one written today.

Get the exact wording of every error message. It's more useful to say "Lotus 1-2-3 won't load and DOS says, 'Packed File Corrupt.'"

Savings tips

- If the problem is network-related, be sure the technician you call is certified to service your network.
- An outside service should give you a written estimate after looking at your PC.
- Watch out for avalanching repair bills, which are common with outside repair technicians. While tinkering, the urge to upgrade can be overwhelming and profitable.
- What's the warranty on the repair? Get it in writing. If the PC breaks again, will the repair be 100% free the next time? Or will you pay a fixed charge? Policies vary.

than the user "got some message."

Next, make a plain DOS boot disk. If the machine will at least boot normally when using a "raw" configuration, you have narrowed down the search.

If you've booted with that disk and are running "plain DOS" and can't use the software or hardware on the local disk that was causing problems, tell the technician the error doesn't happen when you run the system without the usual boot-up configuration.

> Most PC repairs are billed in 15-minute increments. Therefore, any information you gather may cut your costs.

For large multiuser systems and networks, one of the best ways to track a difficult glitch is to see if anyone else is experiencing a similar problem. This tells the technician that there is a conflict with something in your system configuration files. This information may take 15 minutes off the service call.

How can you find out which it is and speed the repair? Just as you would on a stand-alone machine: Test a "control" system that's connected to the network by running the same sequence of software that led to the failure of the first system. If a different piece of hardware shows identical symptoms, you can bet your local system isn't to blame.

When a PC fails completely, you may not be able to gather much data. When this happens, write down what you were doing before the failure and the state the PC is in.

Although it may be safe, don't use a PC that is exhibiting unusual behavior. You risk the data's integrity and damage to other files.

If you experience a partial drive failure, talk to your technician before powering down. The drive contents may be salvageable by copying them to floppy disks. In general, with everything except a minor hard disk failure, your best bet is to power down and keep a boot disk handy. If you're struck with a virus — or think you are — be sure to write-protect your boot disk prior to using it.

Henschell is a PC consultant and freelance writer based in Burbank, Calif.

Investigate

Before calling for repairs, make sure you've gleaned all the clues you can about the situation.

- ▶ **Take notes** detailing your actions prior to the error, including print functions, logging onto the network and software run.
- ▶ **Replicate the problem** if the PC is operational.
- ▶ **Note the exact language** of every error message. If it flashes too quickly, reboot and try again.
- ▶ **If the problem is erratic,** start a log of everything you do and wait for it to fail again before calling.
- ▶ **Isolate** whether it's a software or hardware problem. Do all programs fail or just some?
- ▶ **Reboot the PC** with a boot disk. Can you load software or use hardware that wasn't operational before?
- ▶ **Have a printed copy** of the config.sys and autoexec.bat files before a problem ever occurred.
- ▶ **Explain the problem** on the phone. If the situation is diagnosed, it will save you a few minutes once the technician is on-site.

— Todd Henschell

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PS/2 Model 55SX	$875	$725
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PS/2 Model 95-041F	$3,300	$2,800
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Portable III	$350	$400
Portable 386	$750	$775
SLT-286	$650	$625
LTE-286	$700	$775
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Apple Macintosh SE	$575	$600
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IICI	$2,250	$2,150
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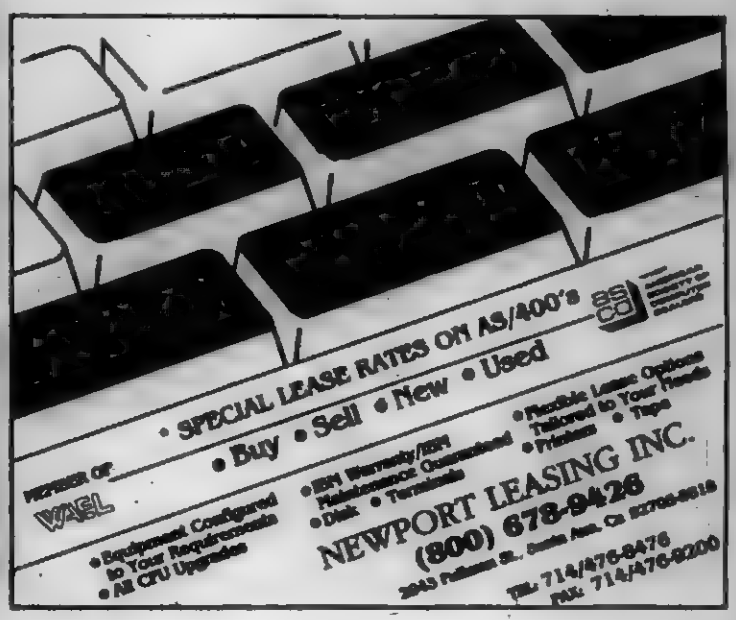

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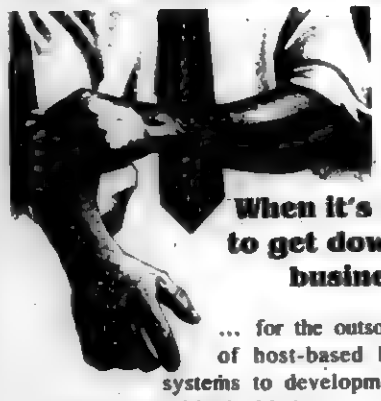

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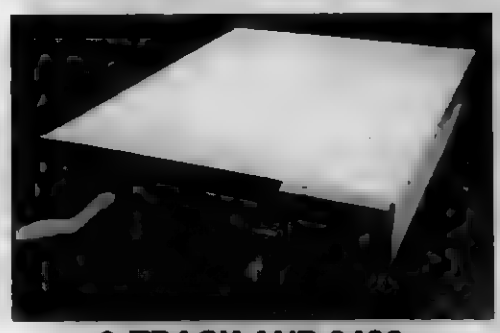

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Percent

Video Labs Inc. (h)	33.3	Ask Computer Systems	-46.3
Micrografx Inc. (L)	27.0	Micron Technology	-19.8
Artel Communication Corp.	23.5	Wyse	-16.0
Quarterdeck Office Sys.	21.6	Creative Technologies Inc.	-15.7
Systems Center Inc.	15.8	Sierra Semiconductor	-14.9
Telebit Corp.	13.9	Picturetel Corp.	-14.4
Sequoia Systems Inc.*	11.1	Cabletron Systems	-14.1
Network Computing Devices	10.9	Proteon Technologies	-13.7

Dollar

Mitsubishi Electronics	4.00	Ask Computer Systems	-9.25
Synoptics Communications	4.50	Intel Corp.	-7.75
Microsoft Corp.	3.25	Newbridge Networks Corp. (h)	-5.50
Progress Software Corp.	2.25	Texas Instruments	-5.38
Sapiens USA Inc.	2.25	Micron Technology	-4.88
Analysts Int'l.	2.00	Creative Technologies Inc.	-4.50
Information Resources	1.63	Micro Focus	-4.00
Systems Center Inc.	1.50	Ardent Systems Inc.	-3.75

IPOs stoke merger fire

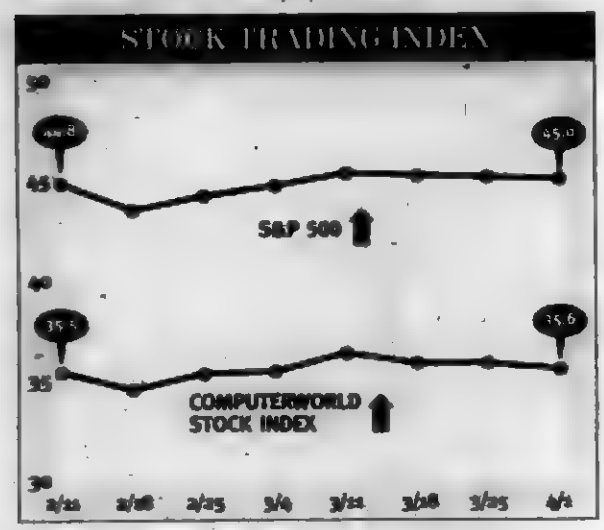
The hot initial public offering (IPO) market of the past 18 months has created a raft of middle-tier software companies looking to plug product gaps by buying smaller firms, according to Scot Sedlacek, partner at investment banking firm Broadview Associates.

IPO money will likely feed more than 200 mergers and acquisitions this year, he said. The financial goodwill stems from the fact that stockholders drove share prices up "tremendously" for firms that completed IPOs from late 1991 until now. "These companies know they can't sustain those high valuations and growth, so they have to acquire other companies with the piles of cash they're sitting on," he said.

And that is just what is happening. For example, application development vendor Bachman Information Systems, Inc. (BACH), which went public in November 1991, recently bought Windtunnel Software, Inc., whose PC-based application testing tool helps round out Bachman's portfolio.

Similarly, after Frame Technology Corp.'s (FRAM) February 1992 IPO, the company bought Datalogics, Inc., a graphics utility maker.

Many of the big names in software — Novell, Inc. (NOVL), Lotus Development Corp. (LOTS) and Borland International, Inc. (BORL) — started as single-product companies. And that is what investors are looking for now: strong young firms with potential runaway products. Not coincidentally, some of those same one-product firms made several acquisitions last year: Novell bought three companies, and Borland purchased two. — *Kim S. Nash*



Exch	52-Week Range			April 2 Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES					
OTC	35.13	9.63	3 COM Corp.	33.63	-1.50	-4.3
NYS	77.75	56.88	American Info Techs Corp. (H)	77.75	1.25	1.6
NYS	59.13	40.13	AT&T	56.38	-1.25	-2.2
OTC	3.56	0.75	Artel Communication Corp.	2.63	0.50	23.5
OTC	24.50	10.25	Banyan Systems Inc.	16.25	-0.75	-4.4
NYS	56.75	40.25	Bell Atlantic Corp.	54.25	-0.38	-0.7
NYS	57.50	41.38	Bellsouth Corp.	55.63	0.50	0.9
NYS	6.25	3.63	Bolt, Beranek & Newman	5.00	0.13	2.6
OTC	18.50	9.75	Brooktrout Technology* (L)	11.50	0.25	2.2
NYS	92.25	42.13	Cabletron Systems	87.00	0.13	0.1
OTC	34.50	17.75	Chipcom Corp.	31.38	0.88	2.9
OTC	48.25	16.50	Cisco Systems Inc. (L)	42.50	-3.00	-6.6
OTC	24.38	5.50	Compression Labs Inc.	9.88	-1.50	-13.2
OTC	4.63	0.88	Data Switch Corp.	3.94	-0.06	-1.5
NYS	22.25	13.75	Digital Comm. Assoc.	15.25	-0.50	-3.2
OTC	12.75	6.00	Digital Systems Int'l Inc. (L)	6.75	-0.25	-3.6
OTC	29.50	6.00	DSC Communications	26.38	-0.88	3.2
OTC	9.50	4.75	Fibronics Int'l Inc.	7.13	-0.75	-9.5
OTC	33.75	9.00	Fibronics Int'l Inc. (L)	9.13	-0.88	-8.8
OTC	6.38	1.50	Gandalf Technologies Inc.	3.38	0.00	0.0
OTC	2.06	0.69	Gateway Communications	1.56	0.06	4.2
NYS	11.50	2.88	General Datacomm Inds	10.63	0.38	3.4
ASE	4.13	2.00	Go Video	2.50	-0.13	-4.8
NYS	37.75	28.88	GTE Corp.	36.38	-0.25	-0.7
NYS	81.00	62.50	ITT Corp. (H)	79.88	-0.50	-0.6
OTC	46.00	29.50	MCI Communications Corp. (H)	43.25	-1.63	-3.6
OTC	12.75	2.29	Microcom Inc.	3.50	-0.38	-9.7
OTC	24.25	4.75	Netrix Corp. (L)	5.25	0.25	5.0
OTC	19.00	9.63	Network Computing Devices	12.75	1.25	10.9
NYS	15.38	6.00	Network Equipment Tech. (L)	6.00	-0.50	-7.7
OTC	23.25	8.00	Network General	11.50	-0.63	-5.2
OTC	15.75	8.50	Network Systems Corp.	9.88	-0.25	-2.5
OTC	64.00	13.63	Newbridge Networks Corp. (H)	57.13	-5.50	-8.8
NYS	48.00	30.50	Northern Telecom Ltd.	37.25	-0.75	-2.0
OTC	35.25	22.50	Novell Inc.	31.00	-2.25	-6.8
NYS	92.50	69.13	Nynex Corp.	90.75	0.75	0.8
OTC	33.25	14.50	Octel Communications Corp.	23.00	-2.00	-8.0
OTC	7.63	3.38	Penril Data Comm Networks	4.31	-0.31	-6.7
OTC	40.50	10.25	Picturetel Corp.	17.13	-2.88	-14.4
OTC	15.75	5.75	Proteon Inc. (L)	6.13	-0.13	-2.0
NYS	30.38	10.16	Scientific Atlanta Inc.	23.63	-0.75	-3.1
NYS	77.00	56.63	Southwestern Bell Corp. (H)	76.75	0.88	1.2
NYS	31.75	20.75	Sprint Corp	29.88	-1.00	-3.2
OTC	27.00	8.75	Standard Microsystems Corp	17.00	-2.50	-12.8
OTC	18.50	6.88	Stratacom Inc.	11.50	-1.25	-9.8
OTC	95.50	18.75	Synoptics Communications	92.38	4.50	5.1
OTC	7.13	4.25	Telebit Corp	5.13	0.63	13.9
OTC	9.38	2.13	Telematics Int'l Inc.	6.75	-0.13	-1.8
OTC	25.50	13.38	US Robotics	18.75	-0.25	-1.3
NYS	43.88	32.88	US West Inc.	43.25	-0.25	-0.6
OTC	46.00	12.00	Wellfleet Communications	40.00	-3.00	-7.0
OTC	22.00	7.00	Xylogn	7.75	-0.25	-3.1
PC AND WORKSTATIONS						
OTC	7.25	2.75	Advanced Logic Research	3.00	0.19	6.6
OTC	65.25	41.50	Apple Computer Inc.	49.88	-3.63	-6.8
OTC	24.25	11.25	AST Research Inc.	13.50	-0.25	-1.8
NYS	14.63	4.75	Commodore Int'l	5.00	0.00	0.0
NYS	58.50	22.25	Compaq Computer Corp.	46.88	-3.25	-6.5
OTC	49.88	15.00	Dell Computer Corp.	32.88	-3.50	-9.6
NYS	82.88	50.25	Hewlett Packard Co.	73.13	-0.50	-0.7
NYS	33.00	14.13	Silicon Graphics	26.00	-1.63	-5.9
OTC	41.00	22.50	Sun Microsystems Inc.	28.88	0.50	1.8
NYS	32.13	22.25	Tandy Corp.	29.50	1.50	5.4
OTC	15.25	2.75	Zeos International Ltd.	4.88	-0.13	-2.5
LARGE SYSTEMS						
ASE	18.38	6.00	Amdahl Corp. (L)	6.13	-0.25	-3.9
NYS	11.63	4.75	Convex Computer	5.38	0.00	0.0
OTC	6.13	1.88	Cray Computer	3.00	-0.19	-5.9
NYS	41.00	19.00	Cray Research Inc.	27.38	-0.13	-0.5
NYS	13.88	7.13	Data General Corp.	11.50	-1.00	-8.0
NYS	54.88	30.38	Digital Equipment Corp.	42.88	-3.38	-7.3
NYS	38.63	26.63	Harris Corp.	36.88	-1.25	-3.3
NYS	100.38	65.88	IBM	52.63	1.38	2.7
OTC	22.00	5.50	Kendall Square Research	16.00	0.00	0.0
NYS	130.00	83.00	Matsushita Electronics	108.50	6.00	5.9
OTC	17.00	6.00	Pyramid Technology	13.50	-1.00	-6.9
OTC	24.00	11.13	Sequent Computer Sys.	18.25	0.38	2.1
OTC	16.38	1.38	Sequoia Systems Inc.	2.50	0.25	11.1
NYS	49.50	29.50	Stratus Computer Inc.	35.75	0.63	1.8
NYS	16.88	9.88	Tandem Computers Inc.	11.63	-1.00	-7.9
NYS	13.88	7.75	Unisys Corp.	12.88	-0.38	-2.8
ASE	5.38	0.06	Wang Labs Inc. (n)	0.50	0.13	33.3
SOFTWARE						
OTC	54.25	25.25	Adobe Systems Inc.	40.75	-3.75	-8.4
OTC	24.50	10.25	Altus Corp.	18.75	0.25	1.4
OTC	16.63	5.63	American Software Inc.	7.00	-0.25	-3.4
OTC	28.13	9.75	Ask Computer Systems	10.75	-9.25	-46.3
OTC	56.50	29.75	Autodesk Inc.	41.63	-0.63	-1.5
OTC	23.00	3.50	Bachman Info. Systems	3.69	-0.06	-1.7
OTC	43.00	34.50	BGS Systems Inc.	39.00	-0.75	-1.9
OTC	84.13	37.25	BMC Software Inc.	44.50	-3.50	-7.3
OTC	28.25	17.00	Boole & Babbage	27.25	0.00	0.0
OTC	55.25	17.50	Borland Int'l Inc.	20.00	-2.75	-12.1
OTC	7.13	3.00	CE Software	3.75	-0.13	-3.2
ASE	35.00	9.38	Cheyenne Software Inc.	30.13	0.63	2.1
OTC	19.50	8.25	ChipSoft	10.50	-1.50	-12.5
OTC	9.75	5.63	Cognos Inc.	6.63	0.00	0.0
NYS	27.38	10.88	Computer Associates	23.00	-1.50	-6.1
NYS	12.38	4.00	Computervision Corp.	4.75	-0.25	-5.0
OTC	34.25	24.00	Compuware Corp.	26.75	-1.50	-5.3
OTC	17.00	6.75	Condshare Inc.	7.38	-0.63	-7.8
OTC	17.25	10.75	Corel Corp.	15.00	0.25	1.7
OTC	33.25	6.00	Easel Corp.	9.50	0.00	0.0
OTC	25.25	12.00	4th Dimension	22.00	-0.25	-1.1
OTC	24.00	7.25	Frame Technology (L)	7.75	-0.25	-3.1
OTC	20.75	12.50	Group I Software	14.00	-1.00	-6.7
OTC	35.25	21.00	Gupta (L)	22.75	-1.13	-4.7
OTC	8.75	3.50	Hogan Systems Inc.	6.88	-0.13	-1.8
OTC	25.75	12.25	IMRS	14.00	-0.75	-5.1
OTC	34.75	18.50	Information Resources	29.13	1.63	5.9
OTC	42.00	12.13	Informix Corp.	32.00	-2.25	-6.6
OTC	18.75	11.00	Intergraph Corp.	11.50	-0.50	-4.2
OTC	13.63	7.75	Interleaf Inc.	9.00	-0.63	-6.5

Exch	52-Week Range			April 2 Wk Net Change	Wk Pct Change
OTC	18.00	7.00	Intersolv Inc.	7.00	-0.50	-6.7
OTC	17.50	9.25	Knowledgeware Inc.	10.00	-0.13	-1.2
OTC	54.75	28.75	Legent Corp.	37.50	-3.00	-7.4
OTC	35.50	16.75	Lotus Development	24.75	-2.50	-9.2
OTC	23.00	12.63	MathSoft (L)	12.63	-1.63	-11.4
OTC	23.25	5.50	McAfee Associates	5.63	-0.88	-13.5
OTC	10.50	1.88	Meca Software (H)	9.00	-0.63	-6.5
OTC	16.50	5.25	Mentor Graphics	9.00	-0.50	-5.3
OTC	46.00	27.25	Micro Focus	31.50	-4.00	-11.3
OTC	20.50	6.50	Microgram Inc. (L)	5.88	1.25	27.0
OTC	95.00	65.50	Microsoft Corp.	89.25	3.25	3.8
OTC	37.50	12.00	Oracle Corp. (H)	34.88	-1.75	-4.8
OTC	31.88	13.25	Parametric Technology	28.00	-1.25	-4.3
OTC	40.50	22.50	Peoplesoft	31.88	-1.13	-3.4
OTC	10.25	3.50	Phoenix Technologies	4.31	-0.69	-13.7
OTC	40.00	29.00	Powersoft	30.25	-2.00	-6.2
OTC-	25.00	11.25	Platinum Technology	14.13	-0.38	-2.6
OTC	61.50	29.00	Progress Software Corp.	45.75	2.25	5.2
OTC	18.63	2.94	Quarterdeck Office Sys.	3.88	0.69	21.5
OTC	24.50	11.75	Rainbow Technologies Inc.	20.00	1.50	8.1
OTC	21.25	4.00	Rasterops	5.88	-0.88	-13.0
OTC	15.25	3.63	Ross Systems (H)	13.25	-1.50	-10.2
OTC	27.25	8.50	Sapiens USA Inc.	24.00	2.25	10.3
OTC	20.75	6.75	Software Publishing Corp.	13.00	-1.38	-9.6
OTC	9.13	2.00	Software Toolworks Inc.	7.38	-0.38	-4.8
OTC	4.88	0.75	Spinnaker Software	3.94	-0.33	-6.1
OTC	14.75	3.25	State of the Art	11.00	0.00	0.0
NYS	24.63	13.75	Sterling Software Inc.	22.13	-1.88	-7.8
OTC	19.50	8.00	Struct. Dynamics Research	15.00	-1.63	-9.8
OTC	62.25	21.00	Sybase Inc.	56.00	-1.00	-1.8
OTC	47.50	5.88	Symantec Corp.	12.63	0.63	5.2
NYS	12.88	5.25	Systems Center Inc.	11.00	1.50	15.8
OTC	25.50	10.00	System Software Assoc.	12.75	0.25	2.0
OTC	8.88	2.50	Tomzic Corp.	4.13	-0.38	-8.3
OTC	22.75	9.13	ViewLogic Systems	15.50	0.75	4.6
OTC	23.50	7.25	Walker Interactive Systems	7.50	-0.63	9.1
OTC	4.25	1.38	Wordstar	2.25	-0.25	-10.0
SEMICONDUCTORS						
NYS	24.50	7.38	Advanced Micro Devices	21.25	-1.50	-6.6
NYS	21.25	9.00	Analog Devices Inc. (H)	19.38	-1.63	-7.7
OTC	20.13	7.63	Atmel Corp.	17.13	-0.88	-4.9
OTC	9.63	3.13	Chips and Technologies	3.75	0.13	3.4
OTC	39.75	16.25	Cirrus Logic	23.88	-2.50	-9.5
NYS	14.25	7.38	Cypress Semiconductor Corp	9.50	-1.00	-9.5
NYS	16.13	7.00	Dallas Semiconductor	16.38	-0.75	-4.0
OTC	121.25	46.50	Intel Corp.	107.50	-7.75	-6.7
NYS	14.13	6.88	LSI Logic Corp.	11.75	-0.75	-6.0
NYS	28.50	12.88	Micron Technology	19.75	-4.88	-19.8
NYS	67.00	36.66	Motorola Inc. (H)	63.13	-2.25	-3.4
NYS	14.13	8.25	National Semiconductor	12.50	-0.75	-2.0
OTC	21.25	8.25	Sierra Semiconductor	10.00	-1.75	-14.9
OTC	38.50	22.25	SynOpsys	32.75	0.75	2.3
NYS	83.38	31.50	Texas Instruments	53.63	-5.38	-9.1
OTC	9.13	6.00	VLSI Technology	6.75	-0.13	-1.8
OTC	7.63	2.13	Wyse	5.25	-1.00	-16.0
ASE	9.63	3.50	Western Digital Corp.	5.13	-0.38	-6.8
OTC	37.50	14.50	Xilinx	31.50	-3.50	-10.0
OTC	27.84	12.50	Zilog Inc.	24.00	1.00	4.3
PERIPHERALS AND SUBSYSTEMS						
OTC	32.88	10.38	American Power Conversion (H)	29.50	-0.38	-1.3
OTC	20.16	13.66	Banctec Inc.	17.13	0.63	-3.8
OTC	18.00	9.25	Cambex Corp.	10.50	-0.50	-4.5
ASE	18.38	7.38	Cognitronics Corp.	7.75	-0.38	-4.6
NYS	25.50	13.75	Conner Peripherals (L)	13.75	-2.25	-14.1
OTC	38.50	10.75	Creative Technologies Inc.	24.13	-4.50	-15.7
OTC	30.75	14.25	Data Race Inc.	19.25	0.25	1.3
ASE	18.88	6.75	Databarn Corp.	8.75	0.13	1.4
NYS	28.75	7.25	EMC Corp.	24.25	0.38	1.6
OTC	10.50	5.38	Emulex Corp.	6.75	-0.25	-3.6
OTC	19.00	13.25	Evans & Sutherland	15.50	-1.25	-7.5
OTC	39.25	12.00	Exabyte	14.50	0.00	0.0
OTC	26.00	7.09	Intelligent Appl. Systems	20.00	-1.63	-7.5
OTC	8.88	3.88	Iomega Corp.	4.50	-0.38	-7.7
OTC	31.00	5.75	IPL Systems Inc.	6.50	-0.50	-7.1
OTC	24.00	10.75	Komag Inc.	18.38	-2.50	-12.0
OTC	19.63	6.88	Maxtor Corp.	7.63	-0.38	-4.7
OTC	12.38	6.50	Micropolis Corp.	6.50	-0.38	-5.5
NYS	111.25	85.50	3M Corp (H)	109.75	-0.50	-0.5
OTC	7.75	6.00	Powerdrive Inc.	7.38	0.38	5.4
NYS	17.13	6.88	QMS Inc.	16.38	-0.63	-4.2
OTC	17.88	12.13	Quantum Corp.	12.13	-1.50	-11.0
OTC	12.75	3.50	Radius Inc. (L)	3.75	-0.13	-3.2
NYS	16.25	7.50	Recognition Equipment	13.38	1.00	8.1
OTC	13.88	5.50	Reexon Inc.	6.25	0.50	8.7
OTC	22.38	12.00	Seagate Technology	14.75	0.50	3.5
NYS	64.00	18.00	Storage Technology	23.63	-2.00	-7.8
NYS	27.63	16.88	Tektronix Inc. (H)	26.13	-1.00	-3.7
NYS	88.88	66.75	Xerox Corp.	80.88	-2.88	-3.4
SERVICES						
OTC	23.50	12.36	American Mgmt. Systems	22.13	-0.25	1.1
NYS	5.00	3.00	Anacomp Inc.	3.75	-0.25	-6.3
OTC	35.75	16.00	Analysts Int'l	29.50	2.00	7.3
NYS	56.13	38.75	Auto Data Processing	52.25	-0.13	-0.2
NYS	17.25	9.41	Ceridian Corp.	15.38	0.50	3.4
NYS	17.38	12.50	Comdisco Inc.	15.88	-0.63	-3.8
OTC	13.00	6.75	Computer Horizons	10.50	0.00	0.0
NYS	80.50	57.00	Computer Sciences	76.00	-3.50	-4.4
NYS	9.75	7.00	Computer Task Group	7.38	0.00	0.0
NYS	40.50	22.00	CompUSA Inc.	30.25	-0.75	-2.4
OTC	17.50	6.00	Corporate Software	13.13	-0.13	-0.9
OTC	28.00	7.63	Egghead Discount Software	7.88	0.00	0.0
NYS	35.88	25.25	General Motors E (EDS)	32.00	1.50	4.9
OTC	25.50	9.25	Imacon Corp.	19.25	0.38	2.0
OTC	35.75	6.25	Intelligent Electronics	13.50	-0.75	-5.3
OTC	14.38	6.63	Merisel	11.38	-0.63	-5.2
OTC	13.75	8.79	Microage Inc. (H)	13.50	0.50	3.8
OTC	42.00	21.75	Paychex	41.25	0.13	0.3
NYS	86.88	59.25	Policy Management Sys.	84.75	1.25	1.5
NYS	35.38	16.81	Reynolds and Reynolds	33.50	-0.63	-1.8
OTC	31.75	22.00	SEI Corp.	27.75	-2.25	-7.5
OTC	24.38	16.88	Shared Medical Systems	21.38	0.00	0.0
OTC	14.38	5.75	SHL Systemhouse	10.88	0.13	1.2
OTC	29.25	18.25	Software Spectrum Inc.	22.25	-1.50	-6.3
OTC	33.75	21.00	Sunguard Data Systems	30.75	-0.63	-2.0
NYS	4.00	1.13	Ultimate Corp. (H)	3.50	-0.38	-9.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Interview

James Goodnight

Face to Face

SAS Institute founder says customer focus has kept company on top all these years

Q. SAS has made the transition from mainframe to client/server vendor better than most companies. What did you do differently?

A. We've been driven by our customers. We used to be MVS only until customers asked us to get onto CMS and then onto VAXs. We have a yearly software ballot we send to our users, and our tech support staff tracks what users are saying all year long. When we moved to PCs in 1984, we decided to rewrite the entire system from the ground [up] to be portable across platforms. So only 10% of the code on any machine has been written for that machine.

Q. What are the biggest mistakes you have made?

A. Not being able to move slightly faster to release systems that are on the cutting edge. But it hasn't hurt us too badly. Our revenues were up 27% this past year, and they're looking very good again this year.

Q. Does your past as a statistical software company cause you any problems trying to make the transition to the general information delivery business?

A. Just look at the product counts. We've got 5,800 base products under MVS, but only 2,300 of those are stat products. Stat is just one of over 20 modules that make up the SAS system.

Q. Does it ever hurt you getting in the door?

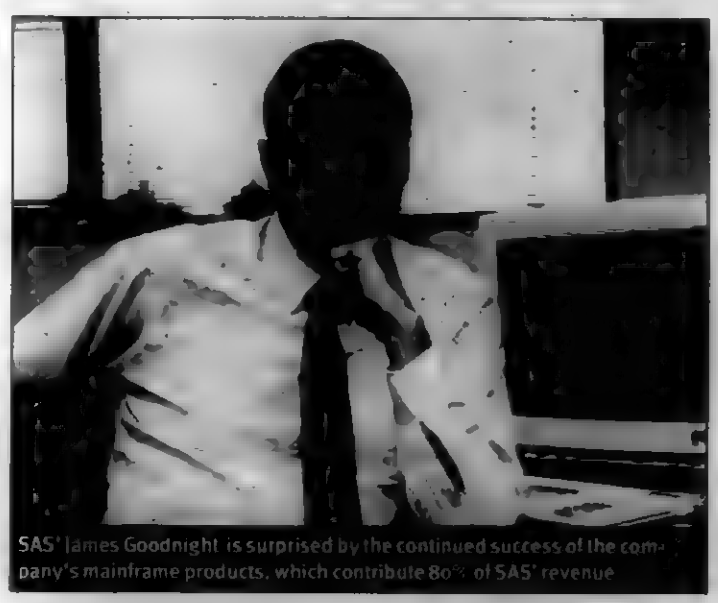
A. Well, we're in most doors already. We've got nearly all the Fortune 1,000.

Q. How have you maintained such devoted user groups?

A. I'm not sure we've done anything in particular except for our SASware [user wish list] ballot and working with the groups to provide logistical support.

The decisions about what's going to be said at the user group meetings are made by the users. They decide the program content.

Our user group meetings are never unfriendly. We've always had a lot of new things to show them.



SAS' James Goodnight is surprised by the continued success of the company's mainframe products, which contribute 80% of SAS' revenue

Q. The software industry is under pricing pressure right now. Your users have sometimes complained that your prices are high.

A. We've never had a lot of complaints about our tiered price structure. We will negotiate large site license contracts if companies will make SAS a strategic information delivery system.

And so much of our revenue goes back into research and development, which is what users want us to spend our money on.

Q. Your mainframe revenue grew 19% last year. What is going to happen to that business in the future?

A. I keep thinking it's going to slow down someday because I really want the desktop products to be a larger percentage of revenue. We're still getting almost 80% of our revenues from mainframes and minis. As everyone has quit supplying software to the mainframe market, we may have a market to ourselves soon. We've got a helluva lot of products out there on Unix and the desktop; we just don't charge a lot for them.

Q. Why do you continue to take an active role in programming your own products? You still are the primary programmer on FSEdit.

A. I enjoy it. As a programmer I have the same frustrations and problems that our developers do. I've actually given away a lot of the products I used to maintain to other people. I'm down to just one.

Q. You were recently quoted as saying you want to be THE information delivery system for an organization. But that puts you against database vendors that are in a stronger position.

A. I disagree. They don't have the analytical tools that we have. It seems like everybody who bought a Unix box went out the next day and bought a database because it seems like we're having to interface with every database around. But now we can read and write many databases, so you've got the analytical power of SAS and your data doesn't just sit there.

Q. What do you think Windows NT's prospects are?

A. I think it will fairly quickly replace Windows entirely. This is an operating system we should have had four years ago instead of the mess that IBM and Microsoft created for their users. They should have gone from PC-DOS to a 32-bit operating system. Instead, they went to 16-bit OS/2.

Q. You were pretty critical of object-oriented programming recently. Why?

A. I wasn't that critical. All of our new EIS and frame-technology products are object-oriented. But are you going to abandon C and write everything in object-oriented code? I don't see that as a panacea.

A system like the SAS System, with 25,000 different files — if they all had to talk to each other before the system fired up, it'd be a year before you saw the first screen.

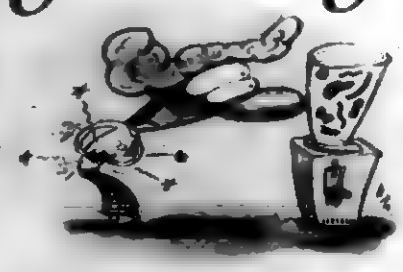
We've had subroutine libraries for years that have done the same thing as objects.

Q. Is there any kind of management philosophy that has served you especially well?

A. Yes: Hire very bright people, have good independent managers and leave me alone to program.

Interview by Paul Gillin, *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

Wysiwyg



Hal Mayforth

The World of E-Mail

Get the message

At my last place of employment, the unwritten rule was: If you drink the last of the coffee, make a fresh pot. Unfortunately, not many people did. In response, an angry coffee drinker sent a raging five-page E-mail message regarding his dissatisfaction. The message was so long and went to so many people, it used all the memory of at least one disk, and no one could access their E-mail messages. — *John Beamish, senior systems analyst, Ministry of Education, Toronto*

Misfired message

An employee sent a confidential E-mail message regarding a water cooler to her manager, stating that every time she drank from it, she got "the runs." Instead of sending it to her manager, however, it went to a group of over 200 users in the company.

— *Tracy Mitchell, network training and support specialist, WHDH-TV, Boston*

GREAT NAMES

BILL GATES, DATABASE ADMINISTRATOR, OFFICE OF THE TREASURY, MINISTRY OF TREASURY AND ECONOMICS, TORONTO

QUIPS & QUOTES

Butler W. Lampson, recent winner of the prestigious A.M. Turing Award from the Association for Computing Machinery for his work at Xerox's Palo Alto Research Center in the '70s and '80s, defines distributed systems this way: **"A distributed system is a system in which I can't get my work done because a computer has failed that I've never even heard of."**

The Fifth Wave *by* Rich Tennant

"THE SYSTEM CAME BUNDLED WITH A GRAPHICS BOARD, A SPREADSHEET AND THE DEVELOPER'S OUT-OF-WORK NEPHEW."

Inside Lines

What's that buzz?

Bulletin board users are being warned about a bug in MS-DOS 5.0 that can wipe out part of the hard disk. The bug only affects disks with capacities of 127M bytes to 129M bytes, 254M bytes to 258M bytes, 508M bytes to 516M bytes, 1,016M bytes to 1,032M bytes and 2,034M bytes to 2,061M bytes. The problem occurs when using the UNDELETE/ALL, CHKDSK/F functions. The /F and /ALL switches activate the fix options in order to alter errors in the file allocation table (FAT) and recover lost units. When CHKDSK or UNDELETE are run, they write 256 copies of the FAT all over the root directory, making data recovery almost impossible.

Open, sesame . . .

After a year of false starts and delays, Hitachi Data Systems is expected this week to announce the Osiris family of products for the open systems market. An implementation of the Open Software Foundation's OSF/1 operating system and a network coprocessor will be included. Targets include large companies that want to integrate open systems with their traditional IBM System/370 mainframes. Future plans include porting Oracle's database management system and a high-speed network data manager being developed with Epoch Systems.

Alive and kicking

While the noise and excitement around Microsoft's Windows NT has been nearly overwhelming, contrary to rumors, VMS is not dead yet. DEC will this week announce new versions of its VMS operating system with planned 64-bit addressing for files and databases and, ultimately, full 64-bit support, according to industry sources. The operating system will also be more modular.

Covering all the bases

Win32 and Win32S APIs from Microsoft will be joined by a third in the near future. According to sources at Microsoft, Win32C will be an API designed to run on "medium-level" hardware, but it will also support multithreading and preemptive multitasking in addition to Win32S' 32-bit memory addressing. It will lack such features as the security API found in Win32, however. The new API appears to be aimed at applications developed for Microsoft's next-generation Windows-on-DOS product, code-named Chicago.

Control freaks

Numerous sources report that Microsoft intends to control the operating system in the personal digital assistant environment. They say Microsoft is working on a new, pen-centric version of Windows, called WinPad, that will abandon DOS entirely but maintain the Windows API. Microsoft is mum about the project.

AppleScript out the door

Rolling out at this week's Apple Enterprise Computing Conference in San Francisco will be Apple's long-awaited AppleScript, a System 7 software extension designed to allow tight interapplication communications.

Revolving door spins at Compaq

Compaq is saying little about the recent loss of four sales executives, including Dave Davis, vice president of North American sales. The company is known to be examining a restructuring of its field sales group, which currently operates largely as a reseller support organization, and the loss of these four people could signal a new Compaq sales model for the 1990s.

TII, Inc., a Santa Clara, Calif., software vendor, has announced that the first commercial copy of its WeddingWorks for Windows wedding planning package will be delivered to Microsoft President Bill Gates. Gates will receive the package for free because "Bill's budget is likely to get strained in the months prior to the wedding," said a TII press release. If you know of any big plans, phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

Inside

SYSTEM REVIEW
LAN managers are eagerly eyeing Novell's NetWare 4.0. But our Firing Line evaluation reveals it is not a plug-and-play upgrade. NetWare 4.0 requires plenty of up-front, managerial planning to meet its promise. *Page 60*

TAXING TIMES
The IRS faces many challenges in its Tax Systems Modernization program, but it has made some important strategic improvements during the past year, including plans to deploy two document imaging systems in time for the 1994 tax season. *Page 20*

USER SUPPORT
Vendors are responding to user calls for better support. At its Enterprise Computing Conference last week, Apple laid out a series of service and support packages. *Page 12.* Hewlett-Packard told Interex members it will revamp its ordering process and slim down bulky contracts. *Page 10.* Sun will unveil "one price per box" service to ease tracking of support contracts. *Page 1*

Cisco offer could avert routing tiff

Overture made to IBM, competitors

By Elisabeth Horwitt

■ In an unexpected hatchet-burying move, Cisco Systems, Inc. last week proposed working with IBM and other keyrouter vendors on a standard for routing IBM's SNA traffic over TCP/IP backbones, which would be based on IBM's Data Link Switching protocol.

Right now, each vendor has a different way of providing Systems Network Architecture-oriented services that classic Transmission Control Protocol/Internet Protocol connections lack, said Dick Boyle, a program director at Gartner Group, Inc. (see story page 55). As a result, some vendors' solutions work better than others, and no two vendors' routers can exchange traffic, he added.

If the initiative realizes its potential, users would finally be able to install whatever brand of router works best for a given site or application and still have the differ-

Cisco, *page 16*

Fat DASD on way

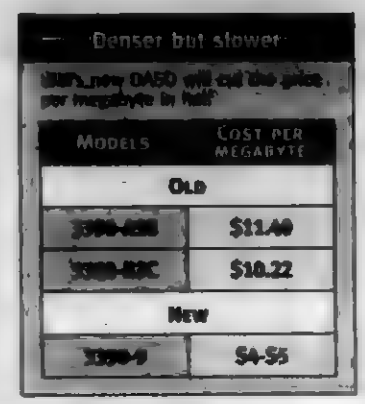
By Johanna Ambrosio
SAN JOSE, CALIF.

IBM will debut a new high-end direct-access storage device next month, offering mainframe customers a choice in magnetic disks for the first time.

The new model will hold more information and cost less than the existing high-end unit but will also be significantly slower.

Some customers said they see no immediate need for such a device but might use it down the road. "If it's priced right, it will be just dandy," said Thomas Loane, vice president at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla. "Someone in San Jose finally got the idea that the world doesn't sit on one disk."

Still, as customers and analysts pointed out, Adstar, IBM's storage unit, will likely not have the edge for long. Storage providers Hitachi Data Systems Corp. and Fujitsu America, Inc. are expected to announce competitive products soon after IBM's 3390 Model 9 makes its official debut, slated for May 18.



Source: International Data Corp.

Sun to bolster support

Program addresses longtime complaints

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. will unveil a streamlined and revamped customer support program today that analysts said finally addresses longstanding complaints from users about the quality of Sun's support.

The SunSpectrum Support Program boils down a hefty price book of service contracts to a single 8½- by 11-in. sheet of paper. It also introduces "one price per box" contracts covering hardware, software, networking gear and peripherals.

During the past year, Sun spent more than $1 million on customer research and focus groups as it redesigned its support program to make it simpler for users to administer and understand.

Sun, *page 10*

Time for change

Jon Judge, assistant general manager of marketing at Adstar, refused to comment on the specifics of the announcement but acknowledged that IBM has changed its high-end storage strategy.

"In the past, we provided one [high-end] storage system that was a balance of all customers' requirements," Judge said. "It's become obvious that customers really want a series of alternatives that are optimized for different needs. It's silly to pay for screaming performance if you don't really need it."

The 3390 Model 9, which has

DASD, *page 12*

Desktop computing

Tools aid 32-bit push

By Christopher Lindquist and Michael Vizard
REDMOND, WASH.

■ Anxious to push new software development onto the 32-bit platform, Microsoft Corp. in recent weeks has quietly provided at least two tools designed to promote that migration.

Microsoft Windows 3.1 users may begin to notice that some upgraded applications are running faster than they used to now that developers have a Windows application programming interface that allows them to take advantage of some 32-bit Windows 3.1 features.

Win32s, a subset of the Win32 API used by Windows NT, was included in last month's release of the Windows NT Software Developer's Kit. Win32s gives developers access to flat memory addressing and can greatly improve the speed of some applications. As an added bonus, applications written using Win32s also run as native applications under Windows NT.

But even using

32-bit, *page 14*

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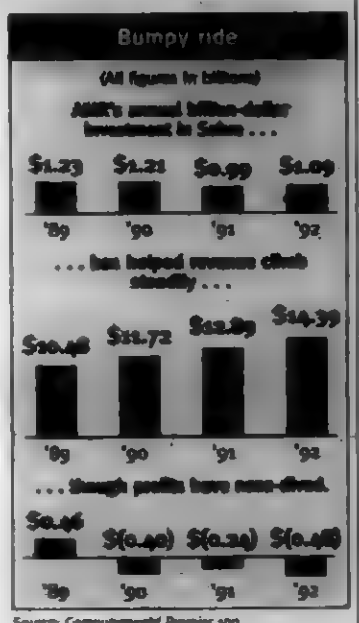
AMR revamps IS, alters CIO's role: Did Confirm debacle influence moves?

By Nell Margolis
DALLAS

AMR Corp. and its beleaguered subsidiary American Airlines last week lashed five information systems units into one autonomous group that will be led by former Sabre Travel Information Network President Kathy Misunas. Acting as president and chief executive officer of the new group, Misunas will take on responsibilities formerly handled by longtime AMR IS executive Max Hopper, who chairs the new group.

The reorganization, which seemed to raise as many eyebrows as it did expectations, will speed and sharpen AMR's earlier announced focus shift from travel services to travel-related informa-

AMR, *page 15*



Source: Computerworld Premier 100

CLIENT/SERVER

Hitachi Data Systems enters the open systems market with a server that links its hosts with Unix-based networks. *Page 7.* **Microsoft** readies **SNA Server for Windows NT**, while beefing up an NT version of **LAN Manager** called **Advanced Server** that features multidomain support, enhanced security and TCP/IP support. *Page 4.* First users of **TriCord**'s high-end server say they like its power and multiuser support, but the high price discourages some. **IBM** cuts PS/2 Server 295 prices by 30% and unveils a low-end server expected to compete with **Compaq's SystemPro XL**. *Page 14*

OPERATING SYSTEMS

VMS lives, as **DEC** plods forward with new releases. *Page 6.* **HP**'s early bid to open its venerable **MPE** operating system with Posix hooks is off to a rough start. *Page 10.* Further **IBM OS/2** and **Unix** integration capabilities make up the core of **Unisys'** mainframe introductions made last week. *Page 7*

APPLICATION DEVELOPMENT

Development can get sloppy when hundreds of developers are working with bigger, more complex and modular programs simultaneously. **Configuration management** prevents coders from misplacing and overwriting software. *Page 89.* The development community is sharply divided over the issue of how — and whether — software innovation should be protected. *Page 73*

PC HARDWARE

The president of IBM PC Co. says he's willing to break all the old rules to become competitive. *Page 39.* **Canon**'s combination notebook and printer debuts in the U.S. *Page 24*

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Compaq, Microsoft to extend partnership

By Michael Fitzgerald and Christopher Lindquist
WASHINGTON, D.C.

■ Microsoft Corp. and Compaq Computer Corp. will announce a partnership here tomorrow that will see Compaq gain "preferred" status in its dealing with Microsoft, particularly in the realms of multiprocessing and mobile computing, according to sources close to the companies.

Details were sketchy, but sources said Microsoft Chairman Bill Gates and Compaq Chief Executive Officer Eckhard Pfeiffer will expand on the effort that last year produced Business Audio, a hardware and software voice-recognition tool.

One goal would be to produce a plug-and-play PC that would offer the same ease of setup and use as the Apple Computer, Inc. Macintosh.

The deal would also see the two work to develop pen-based computers and personal digital assistants, markets that remain in limbo.

While the two companies have worked closely in the past, this enhanced partnership would make Compaq Microsoft's closest hardware partner, the sources said.

The broad agreement will bear some similarity to agreements Compaq has in place with Novell, Inc. and Oracle Corp. Compaq is a strategic development partner with those firms, sharing personnel and establishing joint marketing and development efforts for products such as Novell's NetWare.

Compaq is expect to bundle Microsoft applications, such as Office, with its products, effectively acting as a distribution channel for Microsoft. Microsoft has a similar distribution deal with Gateway 2000 Ltd.

Microsoft is expected to take pieces of its program with Compaq and extend them to other hardware vendors over time, the sources said. The two companies declined comment but said they will make an announcement tomorrow.

Restructured PC unit

Compaq is expected to put in place a new structure for its PC unit within 30 days. The restructuring, announced last October, will force the layoff of about half of Compaq's estimated 400 field salespeople, sources said. Compaq refused to confirm any details, although it did say a "major" restructuring of the PC business will happen "sooner rather than later."

PowerBuilder may add Intersolv tools

By Garry Ray
BURLINGTON, MASS.

A pending deal between Powersoft, Inc. and Intersolv, Inc. could be the first sign of a new trend in client/server development tools.

Powersoft is negotiating with Rockville, Md.-based Intersolv to integrate that company's PVCS version control software with Powersoft's PowerBuilder, sources close to Powersoft said. Users of PowerBuilder and other client/server tools have long grumbled about the lack of support tools such as version control, configuration management and software testing.

"It's an issue that has been brought up by a number of users and needs to be addressed," said Paul Olson, an analyst at Database Decisions, a consultancy in Newton, Mass.

Sources said integrating PowerBuilder and PVCS would require an Intersolv software component, which would be sold by both Powersoft and Intersolv. Both companies would also sell the range of PVCS version control products, according to sources.

A source close to Powersoft confirmed the negotiations. Intersolv and Powersoft officials declined to comment.

PowerBuilder users said an improved version control system would be well-received. "It would be more than useful," said Rik Brooks, senior programmer analyst at U.S. Intelco Networks. "It would be fabulous."

Powerbuilder's "library painter," included in Version 2.0 last year, had eliminated some problems, Brooks added.

But "now we have fast-fingered programmers like me forgetting to move their code to a new build," Brooks said.

The move could also point to a larger trend in client/server tools, said Peter Kastner, vice president at Aberdeen Group in Boston. "If users want to enter into enterprisewide development projects, version control is mandatory," he said. "Users have been saying they can't go forward with client/server because the support tools haven't been there."

Sources said the alliance will be announced next week at Powersoft's user conference.

NEXT WEEK:

What 203 top executives from premier U.S. corporations say about the role of information technology in their companies

Corrections

- A story in the April 5 issue should have said David Marshall resigned as president of Softlab, Inc.
- The CrossComm Corp. stock offering reported in the March 29 issue will be the company's second offering, not an initial public offering, as was reported.

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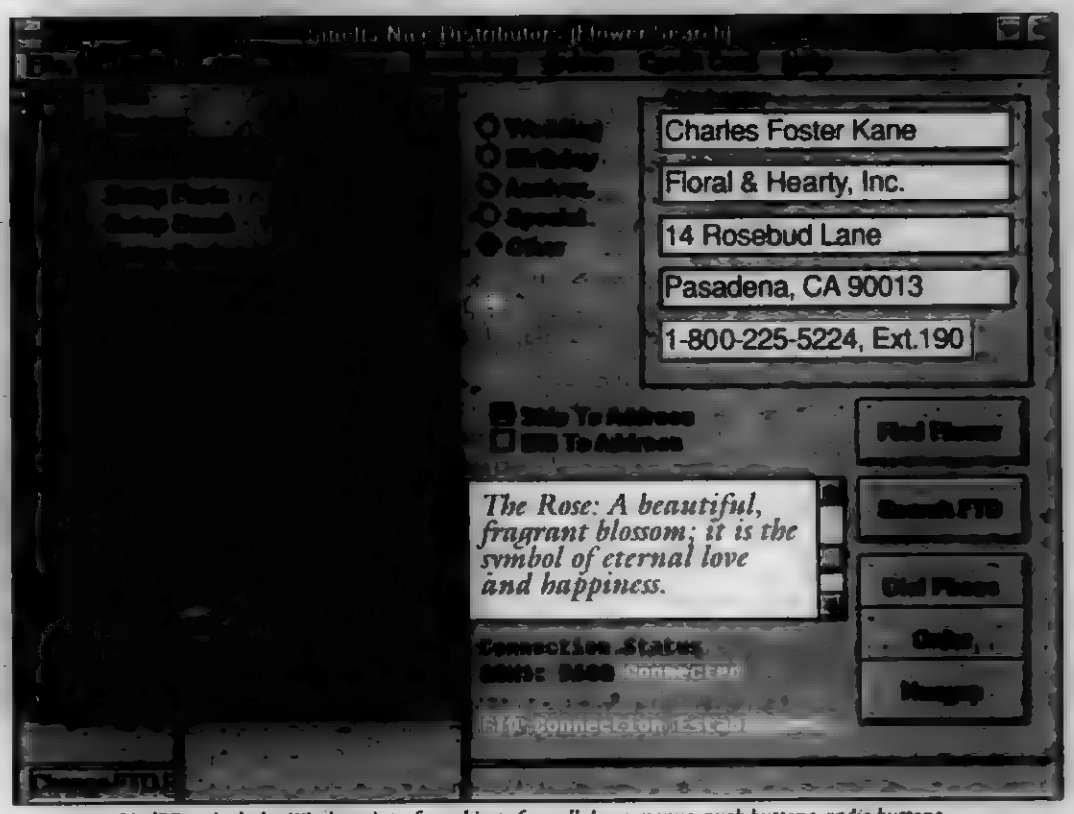

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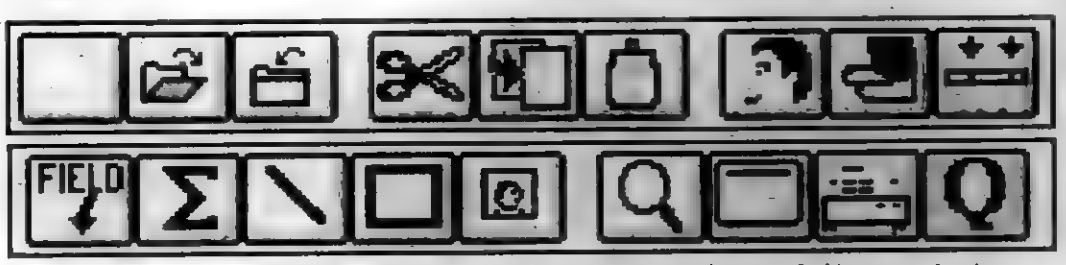

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SNA Server for NT stretches for enterprise

By Christopher Lindquist
REDMOND, WASH.

Sending yet another signal that it understands enterprisewide computing, Microsoft Corp. last week announced plans to ship a security-conscious SNA Server product featuring tight integration with its Windows NT operating system.

Slated to ship 90 days after the scheduled late-summer arrival of Windows NT, SNA Server will also spell the end of Microsoft's involvement in the jointly developed, OS/2-based Digital Communications Associates, Inc. (DCA) Microsoft Communications Server product. DCA will continue to support the OS/2 version of Com Server.

Using SNA Server for Windows NT, PCs on a local-area network would connect to one or more Windows NT-based SNA Server machines that would provide shared links to the host using Systems Network Architecture (SNA) protocols such as LU6.2 and PU2.1.

SNA Server would also support a variety of LAN protocols, including NetBEUI, Transmission Control Protocol/Internet Protocol and IPX/SPX.

Any data retrieved by the system would be protected by Windows NT's built-in C2 security, the company claimed.

Initial reaction positive

Microsoft has so far completed some internal testing and shown the product to some developers. While the product has just gone into beta testing, SNA Server is drawing an enthusiastic reaction from some quarters, based mostly on Microsoft's specifications.

"It's something we will definitely be evaluating the moment we get it," said Doug Farmer, lead LAN administration and systems integration at Chevron Canada Ltd.

Farmer said he is happy with the DCA/Microsoft Com Server that Chevron is using to connect networks to multiple mainframes. However, it is "not as seamless as we might have hoped," he added.

Farmer said he hopes having a version of SNA supported directly on a 32-bit operating system will make his links more reliable. He said the security features in Windows NT should help ease fears about moving sensitive corporate data off the highly secure mainframe.

Other users agreed. "That's one less thing to learn about and support if it's already woven in by the same corporation that's doing the operating system," said Eric Singleton, director of the information systems division at the Orange County Appraiser's Office in Orlando, Fla.

While SNA Server underscores Microsoft's upmarket interests, it is by no means first to market. Analysts noted that other products are available — including NetWare for SAA from Novell, Inc. and the DCA Com Server — that do much of the job already. However, they said tying SNA Server tightly to Windows NT could gain Microsoft the upper hand.

One issue that may arise for some users is the lack of Advanced Peer-to-Peer Networking (APPN) support in the current SNA Server.

Microsoft said SNA Server will support APPN as a "low-entry node" or the most basic level with this version.

NT LAN Manager faces uphill battle

By Michele Dostert
REDMOND, WASH.

■ While beta-test users are enthusiastic about the networking component of Microsoft Corp's Windows NT, industry watchers said they doubt an NT incarnation of LAN Manager will gain immediate converts.

Windows NT will be offered in two editions: the Desktop version, which will be Windows NT with some peer-to-peer networking thrown in, and the Advanced Server version.

Advanced Server constitutes a major rewrite of LAN Manager Version 2.X and is based on the 32-bit processing power of NT. Key additions to the software include enhancements in security, multiprotocol connectivity, performance and multidomain directory services.

Microsoft is emphasizing Advanced Server's compatibility with Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines, hoping to carve out a niche as a "good citizen" high-end application server in NetWare and Vines networks.

For example, a new, faster 64-bit file system, called NT File Service, improves network-critical file access times, according to beta-test users; and long file name support increases the number of users from 256 to an unlimited amount. A thread scheduler will let network managers tune Advanced Server for optimal perfomance in their environment.

Advanced Server comes with both NetBEUI and Transmission Control Protocol/Internet Protocol (TCP/IP) stacks. An open architecure allows the loading of different protocol stacks, such as NetBEUI, TCP/IP or Novell's IPX/SPX, simultaneously. Novell has promised that its NetWare for NT requester, which can be loaded on both desktop NT and Advanced Server, will ship simultaneously with NT.

"Advanced Server has much better performance than the old OS/2-based LAN Manager," said Doug Farmer, lead LAN administrator at beta-test site Chevron Canada Ltd. in Vancouver.

But will Advanced Server be a hit in corporate networks? Craig Burton, president of Salt Lake City-based consulting firm The Burton Group, said he does not foresee an immediate rush to Advanced Server. "Microsoft will not have a distributed directory service, which both Novell and Banyan already offer, until late 1994 — a year and a half away, which is too long to be behind the technology curve," he said.

Advanced Server has domain-based, rather than global, directory and security services. A new "trusted domains" functionality allows administrators to replicate users' profiles and rights across all domains in the enterprise.

But while both Vines and NetWare 4.0 replicate the same hierarchical global directory across every server attached to the network, Microsoft's directory services are replicated only across every server in the same domain. Users said, for networkwide access, it is necessary to construct a "Primary Domain" of all network users, stored on a single server, which can then be "trusted" by all other domains.

Domain downfall

One problem with this approach is that if a primary domain server goes down, users could be trapped within their own domain.

Microsoft's LAN Manager users are grateful for the new multidomain manageability.

"It's much easier to manage than the old single-domain scheme was. I can set up a user once, in a single domain, and then give him access to all other domains he needs from a single log-in, without reentering the information on every server," said Claude King, a beta-test user and senior systems analyst at the University of Florida in Gainesville.

There are other issues. For example, Microsoft acknowledged that some planned pieces of Advanced Server, such as data compression and support for double-space disk drives, will not be ready for the first release, although redundant arrays of inexpensive disks-5 support will be included.

In addition, many third-party device drivers will not be ready when Advanced Server rolls out.

Microsoft tightens Mail link to NetWare

By Lynda Radosevich
REDMOND, WASH.

In a move that some network administrators said is long overdue, Microsoft Corp. is tightening weak links between its electronic-mail software and Novell, Inc.'s network operating system. Separately, Microsoft demonstrated its budding work-flow technology (see box).

Microsoft said last week that it is shipping Mail Version 3.2, which includes a utility that lets administrators automatically create user accounts from Novell NetWare's bindery, the database that contains definitions for users and groups. However, many of Mail's biggest competitors in the local-area network E-mail market have been shipping similar bindery support for some time.

"I've been asking them to do that for years and years," said Ed Wilk, network manager at WHDH-TV in Boston. Now, the television station maintains separate Mail and NetWare directories for more than 200 users. "It just doesn't make sense," he said, adding that the new capability may justify the cost of an upgrade.

"Before, [bindery support] was lower on their priority list, but it's a good move for Microsoft Mail because it integrates them better into the Novell network," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif.

Already playing

Other E-mail market leaders, including Lotus Development Corp., DaVinci Systems Corp., WordPerfect Corp. and Notework Corp., said they have offered bindery support for up to two years.

Microsoft said the new version of Mail, priced at $695 for server software, also includes directory support for Microsoft's LAN Manager network operating system, native support for X.25 networks and the ability to move users between E-mail "post offices" by dragging graphical icons with a mouse. Also shipping is a separate Message Transfer Agent (MTA) for $1,995, which runs on IBM's OS/2 and can simultaneously process messaging operations.

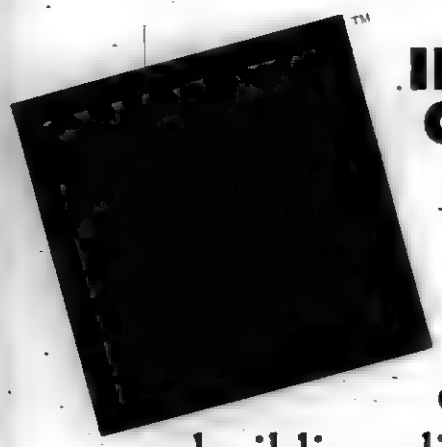
For Mail beta-test site Star Enterprise, a petroleum refinery in Houston, the multitasking MTA speeds up directory synchronization operations by up to 20%, said Michael Harrison, a programmer/analyst.

Separately, Microsoft said it is shipping a version of Mail for remote users. Running on Windows, the $195 software is said to allow users to read and create messages off-line to save phone line charges.

IDG News Service European correspondent Elizabeth Heichler contributed to this report.

Notes beware

Microsoft demonstrated last week in London its workgroup technology, including forms design software based on Visual Basic and mail-enabled routing for Windows for Workgroups. The firm said the software will enter beta-testing soon, but no dates or prices were given. Microsoft plans to add a database architecture to compete with Lotus' Notes, a London analyst said.



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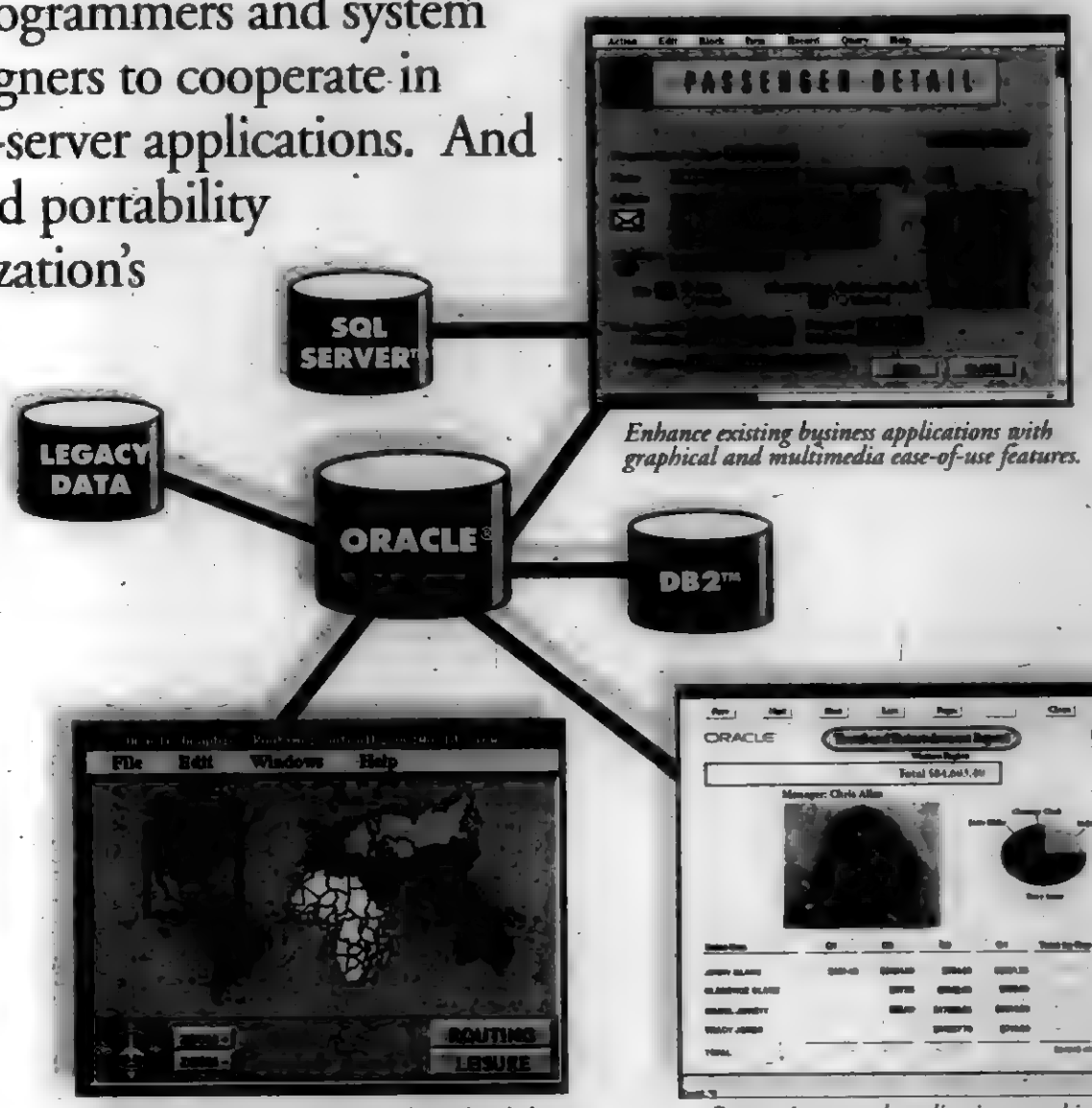

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News Shorts

Stock option reporting rules tightened

In a blow to small high-tech firms, the **Financial Accounting Standards Board** said last week that by 1997 it would require companies to deduct from earnings the estimated value of stock options granted to employees. The options are the only major form of compensation that does not hit the P&L statement. The **Coalition for American Equity Expansion**, a group of computer hardware and software firms, said the proposed ruling would inhibit hiring in an industry that has used stock options as a way of attracting and motivating people in high-risk ventures.

Lotus previews Notes' imaging add-on

Lotus Development Corp., in conjunction with Eastman Kodak Co. subsidiary **Imagery, Inc.**, last week previewed Release 2 of its Lotus Notes: Document Imaging software, a Notes add-on package developed by Imagery that will add support for color and gray-scale images. "We don't see a crying demand for color, but people will use the gray-scale support to add photographs to documents," said Mike Mitsoc, a senior product marketing manager for Notes. Release 2, which is slated to be available early in the third quarter, also includes support for Object Linking and Embedding, an improved Microsoft Corp. Windows interface and better storage algorithms.

Internet group endorses SNMP-2

The **Internet Engineering Task Force** announced last week that it has made Simple Management Network Protocol-2 a proposed standard. **Hewlett-Packard Co.**, **SNMP Research, Inc.**, **Carnegie Mellon University**, **Digital Equipment Corp.** and **Nynex Corp.'s Alltak Division** will participate in an SNMP-2 interoperability demonstration at the Third International Symposium on Integrated Network Management, to be held in San Francisco next week. However, vendors, with the exception of **Sun Microsystems, Inc.** and **Epilogue Technology Corp.**, are not saying when they plan to release SNMP-2 products.

ISDN deployment ahead of schedule

Bell Communications Research, Inc. said last week that the regional telephone companies have accelerated their plans to deploy Integrated Services Digital Network (ISDN) lines. By the end of 1994, 62% of regional phone lines are slated to provide ISDN service; deployment plans issued in June 1992 said that just 55% of total local lines would be able to handle ISDN traffic in that time frame.

Sequent, Isocor team up on messaging

Sequent Computer Systems, Inc. and **Isocor** said last week that Isocor's X.400 messaging products will run on Sequent's Symmetry line of multiprocessing servers. Combined with electronic-mail connectivity software from **The Boston Group, Inc.** and Sequent's parallel-enabled Novell, Inc. NetWare capability, the arrangement will let users run X.400 messaging, X.500 directory synchronization and X.435 electronic data interchange from one high-throughput server. The software is slated to ship in the second quarter. Pricing will start at $7,995.

SHORT TAKES **Texas Instruments, Inc.** announced a scaled-down model of its TravelMate 4000 notebook computer, featuring 4M bytes of memory and a 120M-byte hard drive. It is priced at $3,099. It also cut prices across its notebook line by up to 22%. . . . **IBM** lowered the list price of all its network adapter cards last week, bringing the price of a Token Ring adapter, for example, from $395 to $285. However, wholesale prices remain the same.

News shorts, *page 16*

Imaging takes back seat at AIIM

Tools for building work-flow applications steal the show

By Ellis Booker
CHICAGO

At last week's Association for Information and Image Management (AIIM) show, the industry's leading vendors spent hours *not* talking about document imaging.

Instead, they displayed next-generation, object-oriented development tools for building work-flow applications and discussed systems integration and consulting expertise — either their own or that of their strategic partners.

This change of pace illustrates a desire on the part of document imaging vendors — from IBM to FileNet Corp. to Lotus Development Corp. — to take on a far broader mandate: to become the hot center of the nascent "business process re-engineering" software industry.

At the heart of this industry migration is work flow, the software that automates the routing of work such as documents, images, graphics and even sound between individuals and applications.

While a number of development tools for work-flow applications already exist, the upcoming generation of products will add an all-important simulation component to the mix, according to Abigail D. Shaw, an analyst at Shaw-Novinger & Odell in Berkeley, Calif.

"You'll be able to create a model work flow, set test parameters such as the number of documents and see where the bottlenecks are," she predicted. A second feature will be the ability of these graphical tools to spit out code a la a computer-aided software engineering package, Shaw said.

Users, meanwhile, are indisputably eager for work flow to emerge as a way to leverage their investments in technology.

"Long term, we'd like to see a modeling piece that allowed managers to tinker and model their own piece of the business," said Stanley E. Cook, office systems unit manager at Kemper Reinsurance Co. in Long Grove, Ill.

Cook was on the prowl at AIIM for a local-area network-based system that would use the preponderance of 386 (IBM Personal System/2s) or above workstations he already deployed to some 310 employees in the U.S. and overseas.

Eventually, Cook will scan in several million contracts, now maintained in a 75- by 100-ft vault with floor-to-ceiling shelves. "I can easily cost-justify this with what we'll save on paper and microfiche," Cook said. However, the work-flow component is the real magnet, he said.

The universal assessment at AIIM was that users have become much more sophisticated about the core technology of jukeboxes, scanners and optical character recognition software, as well as the subtleties of work flow.

For this reason, there is currently tremendous pressure on vendors to provide these work-flow tools, first to developers, then to company information systems shops and, ultimately, to users.

Not all roses

But proclamations of easy-to-use, object-oriented, work-flow interfaces should be taken with a grain of salt, said Ajit Kapoor, principal at Intelligent Solutions, an information technology consultancy in Marshfield, Mass.

"Object-oriented does not mean icons," Kapoor said, noting that many of the new products have simply put a graphical front end on scripting procedural languages. An additional overlooked problem, he said, is that neither Microsoft Corp.'s Windows nor the Apple Computer, Inc. Macintosh use an object-oriented operating system. "This first generation [of work flow] will be for developers, not end users," he said.

"Most of the stuff we've looked at seems pretty complex," said Todd F. Brandt, a principal engineer at Commonwealth Edison in Chicago, who wants to image-enable 50 users who routinely access regulatory and procedural documents. Like a growing number of users, Brandt is interested in using his future image server as a vehicle to offload certain mainframe applications.

DEC plods steadily into the future with open VMS releases

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. underscored a commitment to VMS in its three-headed operating system portfolio last week when it introduced a new version of OpenVMS for Alpha AXP, with plans for 64-bit addressing, and OpenVMS 6.0 for the VAX.

A key feature of OpenVMS AXP Version 1.5 is symmetric multiprocessing, which allows multiple CPUs to share physical memory and other resources. Dual symmetric multiprocessing is available on the DEC 4000 AXP machines, with up to six processors on the 7000 AXP and 10000 AXP systems.

In addition, the software adds VMScluster capabilities [CW, March 21]. Plans for initial 64-bit addressing, which will be beta-tested later this year, will support large databases and files.

OpenVMS VAX Version 6.0 offers more memory, 2G bytes of virtual address space, C2 security certification and other I/O improvements, company officials said.

While some users had been concerned that DEC might back-pedal on development for what had been its premier operating system, disclosure of 64-bit plans for VMS AXP allayed some users' concerns.

"It's a very encouraging sign. Some of the applications that we're investigating take advantage of very large addressing," said Arnold De Larisch, coordinator of computer systems at Florida Atlantic University in Boca Raton, Fla.

Another beta-test user, Larry Finnegan, assistant head of automation services at Cleveland Ohio Public Library, said he is happy with OpenVMS 6.0.

"This was the cleanest install of a major new release that we've ever done. We never before had done an upgrade like this that didn't involve three to four jams to get everything running," Finnegan said. He added that extended memory support was the key point of interest at his site.

"It's a good update. They've been fulfilling their promises on time," said Chris Christiansen, a director at International Data Corp., a market research firm in Framingham, Mass. But Christiansen also raised questions about DEC's long-term plans for operating system development, with a VAX/VMS market that is likely to shrink eventually, and an OSF/1 operating system that now mainly targets the technical market.

Don Harbert, DEC's vice president of OpenVMS engineering, said the company will continue developing versions of OpenVMS VAX for "several years — as long as customers demand it."

HDS serves up link with Unix nets

By Maryfran Johnson
SANTA CLARA, CALIF.

Hitachi Data Systems Corp. (HDS) last week unveiled a powerful Unix server designed to work in large client/server networks. The Osiris Super Server is the first in a series of HDS products that will link HDS mainframes with local-area networks.

Osiris includes a network coprocessor with a Sun Microsystems, Inc. Scalable Processor Architecture (SPARC) reduced instruction set computing engine and HDS' HI-OSF/1-M operating system, an enhanced version of the Open Software Foundation's OSF/1 Unix.

When channel-attached to HDS' EX series or GX series mainframes, the coprocessor acts as a Network File System accelerator and physical interface to the network.

"About 50% of enterprise data is now outside the glass house, and it's growing faster than the data inside the glass house," said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "There is a true demand [for information systems departments] to regain control and to back up and manage that data. This is Hitachi's entrance into open systems, and it addresses that requirement."

One "market-limiting factor" for the superserver's bid to jump into open systems, however, is that it was not designed to run in conjunction with IBM mainframes, Cassell pointed out.

HDS claims that Osiris delivers four times the data throughput at half the response time of current mainframe network processing technology, making "multiple terabytes" of on-line data transparently available to end users.

At Clemson University in Clemson, S.C., an Osiris server is now linked to an HDS mainframe as a large file server. "We're trying to maximize the value of our current Hitachi mainframe," said Chris Duckenfield, vice provost for computing and information technology. "If the mainframe can play in a Unix environment, then we can use our mainframe as we move toward that environment."

Duckenfield said many mainframe shops also find a certain "comfort level" with products from vendors such as IBM and HDS, "who understand our needs for security and data integrity."

The server is available now, priced at $150,000 for the hardware and from $2,500 to $25,000 per month for software licensing.

Unisys hints at parallel processing

By Thomas Hoffman
BLUE BELL, PA.

Unisys Corp. last week spelled out the firm's initial plans for massively parallel processing computing.

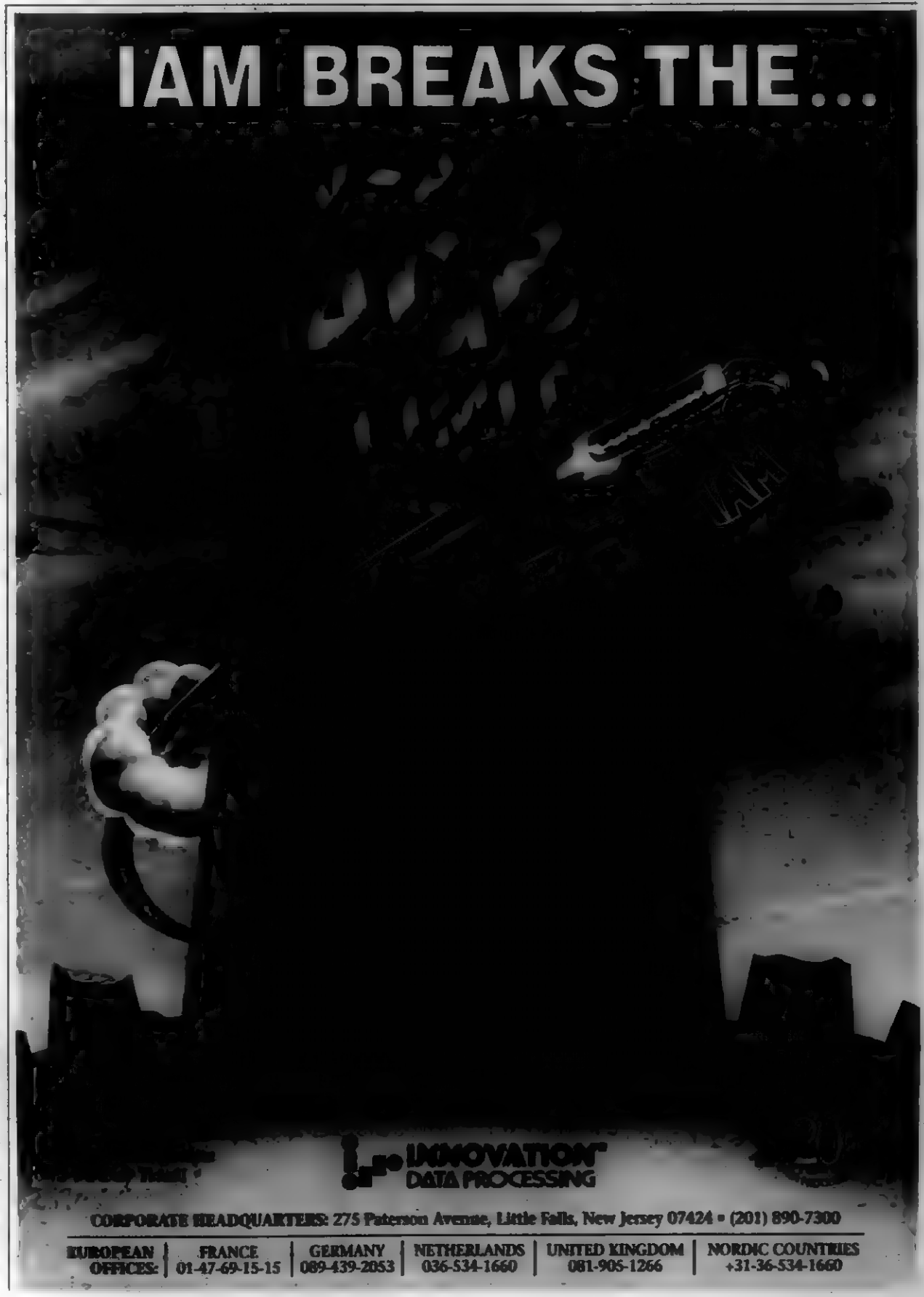
That foundation was laid when Unisys announced that its Single Chip A series Mainframe Processor (SCAMP), which powers the scalable A series product line — including the new A-7 low-end machine [CW, April 5] — can now be cooperatively linked to an Intel Corp. I486 chip running on a Unisys U6000/65 server.

The SCAMP hosts the A series operating system and handles core application and transaction processing, while the 486 chip supports both I/O functions and the companion operating systems, which can be either IBM's OS/2 or Unix.

John A. Rioux, vice president of Unisys' computer systems group, said the vendor plans to usher in a new high-end A series machine — perhaps a Model A-21 — in one year that would likely contain at least midlevel parallel processing capabilities running Unix and OS/2.

Company executives were unable to speculate on the cost of such a machine.

The A series and Unix-based U6000 platforms can now be linked via Unisys' Cooperative Computing Environment (CCE). By running CCE over an Extended Industry Standard Architecture bus, applications can be optionally integrated over parallel environments.



Data retrieval

Sybase gateway taps distributed RDBMS

By Melinda-Carol Ballou

EMERYVILLE, CALIF.

Sybase, Inc. last week made good on earlier promises by releasing a gateway to access data residing across Sybase SQL Server, Oracle and DB2, as well as RMS and ISAM flat files.

OmniSQL Gateway uses Sybase's OmniSQL Server as its engine. The engine comes with an SQL parser and optimizer and was built with Sybase's Open Server application tool kit. It comes standard with access to Sybase SQL Server, RMS and ISAM files.

Separate modules provide access to Oracle Corp.'s relational database management system and IBM's DB2. The gateway is the first in a series of products that Sybase will market as the Sybase 10 family of products [CW, Nov. 23, 1992].

The gateway includes support for Global Stored Procedures for incorporating business rules and optimizing queries and transactions across multiple databases, officials said. This brings performance benefits, allowing users to encapsulate complex queries and reuse code in multiple applications. It also provides a single debugging environment across the various databases, they said.

Industry analysts said RDBMS vendors in the past have had difficulty developing stable gateways that perform adequately when distributing queries across homogeneous databases, let alone in mixed environments. But the Sybase offering may improve on previous attempts.

"The key thing here is how well Sybase has been able to optimize queries and boost performance using special capabilities such as stored procedures," said Rich Finkelstein, president of Performance Computing, a Chicago consulting firm.

Pricing

Sybase OmniSQL Gateway is priced between $2,550 and $102,460, based on platform and number of users. The OmniSQL Access Modules for Oracle are priced between $2,550 and $102,460; for DB2, they range from $51,260 to $102,460. Additional modules for Informix, Rdb and Ingres will ship later this year.

Sybase officials also touted the ease of use of their new gateway. Because the OmniSQL catalog stores the location of each table for all DBMSs, users do not need to know where each type of data resides or which server controls the database, company officials said. It also translates Sybase Transact-SQL into the SQL dialect of the targeted database and automatically joins data from multiple databases to respond to queries.

Greatest challenges

The biggest challenges to users of the product, according to Finkelstein, are likely to be the manual maintenance of catalogs and single site updates (which will be alleviated when Sybase releases a replicated server to automate the update process for remote catalogs this summer) and the need for a sophisticated query optimizer.

"This technology gives Sybase an edge in the market but will only be able to be used for decision support," he noted.

And that is what users are doing with the product.

The U.S. Navy's Naval Undersea Warfare Center in Keyport, Wash., is using OmniSQL for a Sybase RDBMS on a Digital Equipment Corp. VAX to access corporate data on an Oracle RDBMS.

"Some of it we do in real time and some of it's in batch," said Jon McCall, an electronic engineer at the center. "We needed to have a link to perform simple queries, and we didn't have a real-time interface, except for flat-file transfer." McCall added that the performance is "fine" and that the center is likely to use the remote procedure calls to transfer selected data into the Sybase database tables.

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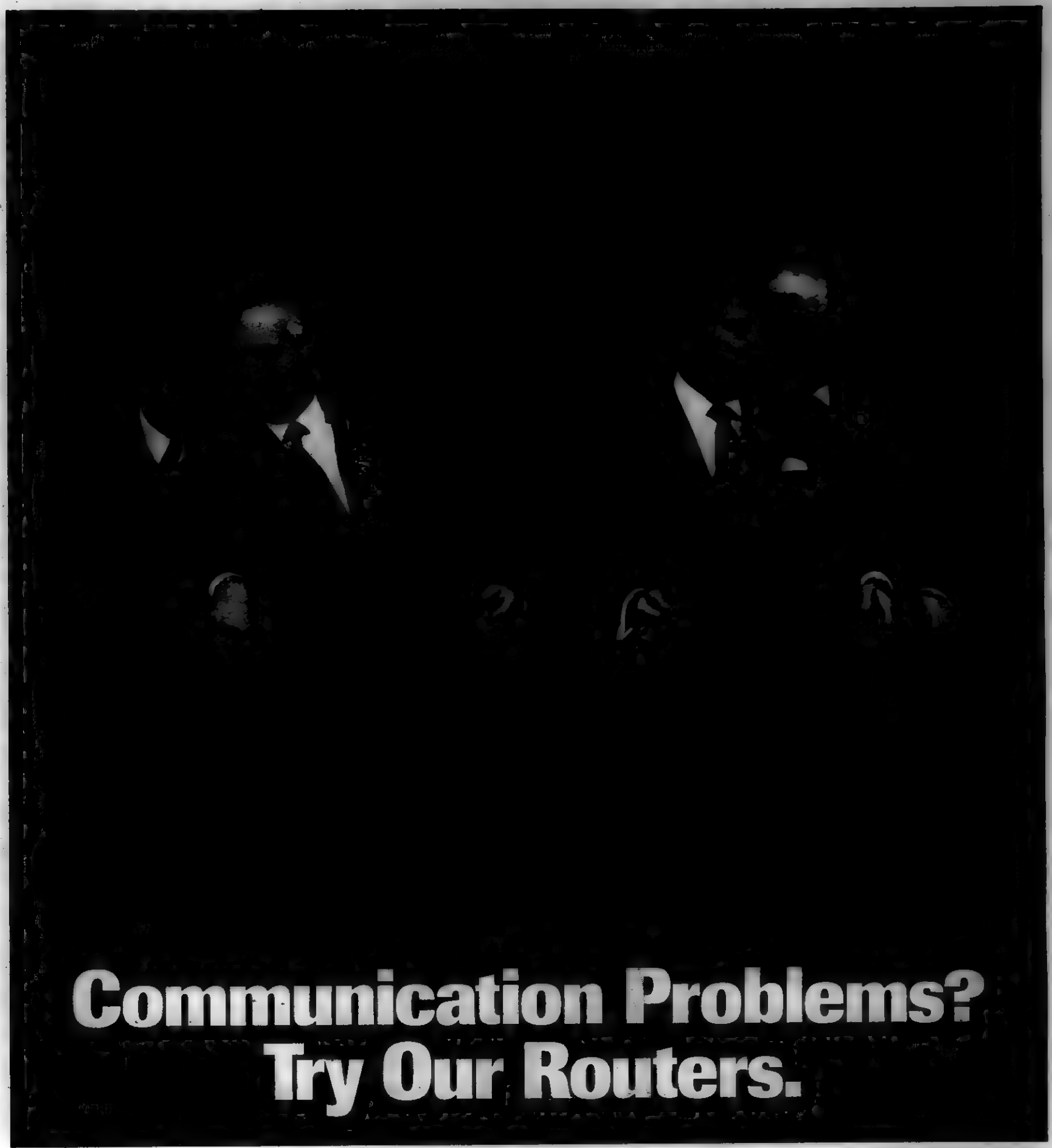

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HP bows to user gripes

Promises shorter contracts, improved order fulfillment system

By Mark Halper
SEATTLE

As users moaned about long lead times, kludgy ordering procedures and convoluted sales terms, Hewlett-Packard Co. last week outlined plans to ease their pain.

The company's program includes migrating its own order processing information technology to a client/server scheme based on HP 3000 minicomputers and a radical shortening of the sales contract to between two and three pages. Contracts can currently run up to 30 pages.

The forthcoming order processing architecture includes artificial intelligence intended to help expedite the proper mixing and matching of the myriad parts a user typically needs when installing complicated, networked, client/server solutions, said HP Americas sales chief Manuel Diaz at the International Association of HP users (Interex) conference.

Noting that HP hopes to convert its order processing system "from a significant inhibitor to a competitive differentiator," Diaz characterized HP's present order processing wherewithal as "possibly our weakest spot." He noted that the company now uses "a combination of systems that make it complicated and inefficient."

Diaz said HP will implement pilot versions of the system next month and plans to be fully operational by year's end.

As with other vendors, orders can now bog down as sales representatives sort out the idiosyncracies of the various peripherals, terminals and network products intended to work with minicomputers, workstations and PCs on any given invoice.

Shipment delays recently drove some users to switch vendors [CW, March 29].

Another gripe is that HP has become a difficult company to work with as it grows its revenue around a reduced work force.

Owning up

HP clearly acknowledged the problems last week, even though just two weeks ago a spokesman downplayed users' complaints and said all deliveries were sitting at six to eight weeks.

Addressing Interex, HP systems and servers general manager Rich Sevcik said that when it comes to order fulfillment, "we know we are not doing as well in this area as we need to be."

Users and resellers at the conference could not have agreed more.

"It's 15 years old, complicated and heavy," said Frosti Bergsson, general manager of High Performance Systems Ltd., a Reykjavik, Iceland-based HP distributor, referring to HP's ordering system.

"They wrote their system in the '70s, and it's time to change," concurred Jeppe Juhl, information systems manager at Guittard Chocolate Co. in Burlingame, Calif.

"HP as a company is fundamentally changing the way it does business," observed Jane Copeland, president of software company Holland House, Inc. and head of the Interex advocacy committee. "HP's old system didn't keep up with the company's changes."

HP's present ordering system may not discover a configuration error until several weeks into the process, forcing the customer to wait extra critical weeks while the company corrects the shipment, Copeland noted.

As for shortened contracts, Copeland described HP's planned changes as a shift in corporate philosophy, noting that HP is simplifying language.

Open MPE causing backup problems for users

HP's effort to open its proprietary MPE operating system is off to a rocky start, as users and developers complain that the new Posix-compliant version deviates from the standard MPE file structure, making it difficult to store and retrieve backup data.

Unlike earlier versions of MPE, HP's Posix-compliant MPE/iX 4.5 uses a hierarchical file structure in the Posix portion. As a consequence, backup procedures are different for files created in Posix.

"The applications are not a problem, but the system stuff is," noted Louis Mills, information technology special projects manager at Bio-Rad Laboratories, Inc. in Hercules, Calif.

One MPE developer who asked not to be identified described the move to Version 4.5 as "a migration" rather than an upgrade.

HP 3000 product line manager Pat Adamiak noted on that the move entails "a larger jump than earlier jumps" but maintained it is still easier than moving up within other operating environments.

Adamiak claimed last week that HP purposely designed Version 4.5 with different Posix backups because otherwise users might store data from Posix that would later be irretrievable on a network system where a user at a different station did not have MPE/iX 4.5.

Under the Version 4.5 design, that second user still cannot retrieve the data, but the user at least knows the data is not lost, Adamiak said.

Users also noted last week that Version 4.5 requires more disk space to support its Posix interfaces, and the Posix version supports only the C language.

—*Mark Halper*

Sun bolsters support

CONTINUED FROM PAGE 1

Thousands of support price configurations were condensed into fewer than 200 possible fees within four support categories designated as platinum, silver, gold and bronze.

"It's a different approach to maintenance and more in line with what you'd expect for a large commercial installation," said Charles Salmon, director of application development at Fingerhut Corp. in Minnetonka, Minn.

The nationwide mail-order business just signed on with Sun for a client/server project involving four SPARCcenter 2000 multiprocessor servers and 400 SPARCclassic desktop workstations.

The availability of a comprehensive support program from Sun "made a difference" in Finger-hut's choice of a Unix vendor, Salmon added.

For Nationwide Life Insurance Co. in Columbus, Ohio, news of the SunSpectrum program was also encouraging.

"We do think they need to improve their support, and we've been working on them about this," said Tim Lyons, director of Investment Products Operators' Common Systems, which manages $16 billion in Nationwide assets on a Sun network.

"We realize they can't be IBM with 20 or 30 people walking around your business, but they can do more than they've done in the past," Lyons added.

One way Sun hopes to set itself apart from its better established competitors is by offering a unique feature called "customer-defined priority setting."

This lets customers determine their own telephone and on-site response times according to how serious the problem appears — rather than having to predict it in advance and contract accordingly.

"We've always asked how severe the problem was in the past, but we never tied our [level of] response to it," said Bill Cote, Sun's vice president of worldwide customer support.

"Sun has really done some interesting things in pioneering areas of the computer industry you wouldn't think of as ground-breaking opportunities," said Laura Conigliaro, an analyst at Prudential Securities, Inc. in New York. "Now they've broken some ground on the support side, assuming they can execute it right."

With 2,000 of its 12,000 employees assigned to service and support roles, Sun cannot match Hewlett-Packard Co.'s 17,000 support personnel or IBM's tens of thousands of customer service engineers. Rather, Sun relies more heavily on third-party partners such as Bell Atlantic Business Systems, Inc. and thousands of smaller resellers.

"Sun is very hard on those resellers who are not competent, who are just box-movers," said Mike Shook, president of Strategic Technologies, Inc., a Sun service partner in Cary, N.C. "But conversely, Sun is very accommodating to high value-added resellers. Sun knows that indirect channels are vital to their growth."

Still, Sun's more technically savvy users tend to forge their own path when it comes to support.

"It sounds like Sun is making it easier for administration purposes, but we figured out the cheapest way to do support — by ourselves," said Steve Ferguson, manager of datavision and geologic applications at Amoco Production Co. in Houston.

Service medals

Sun's new SunSpectrum Support Program

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SPARCstation 10 Model 30 19-in. gray scale	$65
Solaris	$35
CD-ROM	$20
External tape drive	$10
Software base charge	$85
SPARCstation 10 Model 30 16-in. GX color	$95
Solaris	$35
CD-ROM	$20
SBus-Ethernet	$20
SPARCstation 10 Model 30 19-in. GS color	$160
Solaris	$35
SBus-Ethernet	$20
Total	$680

"Platinum" ($294 x 3 systems)	$882
Gold ($210 x 3 systems)	$630
Silver ($168 x 3 systems)	$504
Bronze ($137 x 3 systems)	$411

*Plus $5,000 annual service fee

Source: Sun Microsystems Computer Corp.

SunSpectrum offers the following four levels of support:

- **Platinum:** The premier program for complex, mission-critical operations, including 99% uptime guarantees, 24-hours-a-day on-site response and 15 days of customized coaching.
- **Gold:** More personalized service with "account advocates" and a range of extended business-hour on-site coverage.
- **Silver:** Basic on-site and telephone support weekdays from 8 a.m. to 5 p.m., plus many of the Platinum and Gold services as separately priced options.
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Enterprise Computing Conference

Apple fills out support picture

By James Daly
SAN FRANCISCO

Oracle Corp's move last week to support Apple Computer, Inc.'s high-end server marks an important milestone on the Macintosh's road to gaining respectability in corporate America, a market in which Apple has traditionally struggled.

Oracle used last Week's Apple Enterprise Computing Conference to announce that its Oracle 7 Cooperative Server database will be available next month for the Apple Workgroup Server 95 running A/UX. Pricing starts at $3,995 for one to eight users, with incremental pricing for larger shops.

The move comes weeks after Oracle pledged to support Macintosh clients as part of its Cooperative Development Environment tool kit [CW, March 15].

"Right away, Apple has a very good server database in its corner and another argument for its client/server approach," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

Similar offerings are anticipated soon from major database vendors. For example, Sybase, Inc. announced it will enhance its Deft software engineering tool to support key Apple technologies. Apple also unveiled partnerships with seven client/server tools vendors, including Blythe Software, Inc.

Both announcements are a clear sign to Macintosh users that Apple is teaming with the right people to fulfill their needs for using the Macintosh enterprisewide. "Apple is now talking about things they wouldn't have even known about two years ago," said Robert Keim, director of information management at Arizona State University in Tempe. "It's a really significant awakening on Apple's part."

Cupertino, Calif.-based Apple also teased attendees with plans for an ambitious three-part support plan, although two-thirds of it will not be available immediately. Curiously, at a show designed for corporate users, Apple left its big information systems-oriented support packages in the planning stages.

Instead, Apple unveiled its Assurance program, much of which was designed for Apple's everyday user (see chart). The company also announced seven-day, 24-hour support for the Workgroup Server 95. Later this year, Apple plans to offer its Solutions for Support Professionals for more demanding users in larger shops, as well as its Customer Enterprise Solution for users needing specific assistance.

The upcoming packages are expected to include on-site support personnel, configuration management utilities, television-based briefings for remote sites and an on-line compact disc support database [CW, March 29].

Apple officials said only that future segments of its support offerings would begin to be available this summer, but the explanation left a strange taste in some users' mouths. "It's a bit puzzling, isn't it?" one attendee asked. "I'm not sure why Apple is going for this carrot-on-a-stick approach," he said, referring to the unavailable support programs.

APPLE'S ASSURANCE PROGRAM INCLUDES THE FOLLOWING:

- All Macintoshes sold on or after Feb. 1 receive free one-year service, either on site or mail-in.
- Lifetime "up and running" assistance, including general start-up assistance and troubleshooting.
- Toll-free customer support is immediately available for all products.

Source: Apple Computer, Inc.

Others said any service and support addition is welcome. "In the past, Apple's support has not been very good," said Alistair Jacques, director of support and development at Northwest Airlines in Minneapolis. "But the signs are very good at this point that they mean to change that."

During the show, Apple also unveiled AppleScript, a System 7 software extension designed to allow tight interapplication communication. AppleScript-enabled versions of popular software such as Microsoft Corp.'s Excel have been appearing for months. A $199 developer version of AppleScript will ship this month, with a retail edition targeted at in-house developers ready to go later this year.

Offer to GE could bring Newton to life

Apple is considering licensing broadcast technologies from General Electric Co.'s NBC television network to build a far-reaching interactive communications network for its impending Newton personal digital assistant (PDA), according to sources close to Apple.

The arrangement would give Apple access to the transmission capabilities of nearly 200 NBC network affiliate stations as well as the CNBC Cable audience, thus allowing Apple to set up a national data network almost instantaneously.

Apple would reportedly use the television signal's vertical blanking interval in order to transfer data, sources said. Apple has a history of working with GE, which makes some Macintosh componentry.

The 1-pound Newton is expected to be available by midyear for less than $1,000. It will use an object-based handwriting recognition system that can read printed notes and then automatically add an appointment to a calendar, dial a phone or send a fax to anyone, anywhere.

Apple is inking deals fast and furious in a bid to make Newton the world standard for the emerging PDA market. Gaston Bastiaens, vice president and general manager of Apple's Personal Interactive Electronics Division, said Apple is also talking with companies such as Time Warner, Inc. Cable News Network and Random House, Inc. to expand the types of services available to Newton.

—James Daly

Fat DASD on way

CONTINUED FROM PAGE 1

been talked up to customers for the past few months under the code name Fat DASD or Jumbo DASD, will join the 3390 Model 3 in IBM's mainframe disk storage lineup. Traditionally, when IBM has brought out a new high-end disk device, it has been as a replacement for the earlier generation.

Capacity vs. speed

The Model 9 will hold three times the capacity of today's top-of-the-line Model 3 — up to 102G bytes per unit, according to Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn. The Model 9 will also cost about half of what the Model 3 costs — $4 to $5 per megabyte vs. about $10 for the Model 3, he added.

But there is a trade-off: Access time on the Model 9 is about triple that of the Model 3. The Model 9 is expected to be available immediately following the announcement.

And like all of IBM's optical, tape and disk storage units, the Model 9 will work under the umbrella architecture of System Managed Storage. This provides software to manage all the storage devices and move data back and forth within customer-set definitions of how long data should be kept on disk, for example, before being moved to tape.

This is not a RAID

IBM's new Model 9 magnetic storage unit will be for different purposes than the redundant arrays of inexpensive disks (RAID) units being touted by Storage Technology Corp. and others. The Model 9 is meant for information that needs to be on-line but can wait a few seconds longer to be retrieved. This could apply to historical data that has traditionally been kept on tape or is still in paper form. RAID, on the other hand, is for high-availability purposes, such as an airline or stock exchange database that can never go down.

Within IBM's storage lineup, the Model 9 will be positioned price- and performance-wise between the Model 3 and the company's family of optical devices.

While some customers welcomed the choice in high-end products, others were unsure they would ever need the Model 9. "We have no need nor interest at this point in time," said Bill Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y. "We have Model 2s under lease that are meeting our needs right now, and our total DASD is growing by maybe 3% each year. We'll wait until the prices come down, as they inevitably will."

"There is a trade-off: Access time on the Model 9 is about triple that of the Model 3."

Maybe later

Rino Bergonci, senior vice president of United Parcel Service, Inc. in Mahwah, N.J., said there might be some "future" need for Model 9s in his shop, which uses a lot of disk space, for its database that holds information about the company's package deliveries. But for now, he said, "IBM lost a tremendous opportunity. Six months ago, we could have used the Model 9, but we don't need it now."

Back then, he said, UPS was storing 18 months' worth of history in its database. Because it consumed so much DASD, he said, it is now storing only 12 months of information on-line; the rest is on tape.

"I chose other alternatives but might have selected [the Model 9] had it been available," Bergonci said. "We'd been talking to IBM about this for nine months, but they didn't come across."

Different philosophies

Likewise, industry watchers had different takes on the reasoning behind the product's introduction.

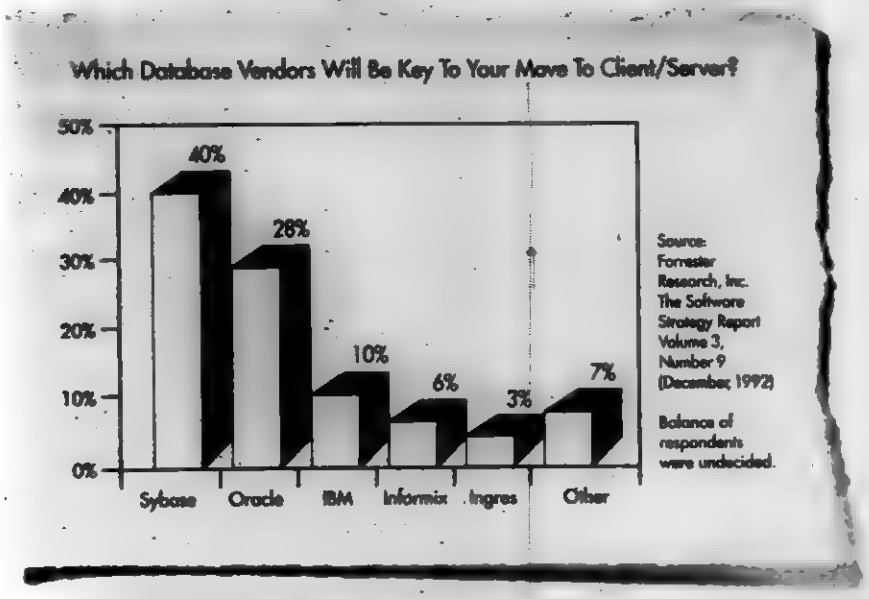
Allen said, "IBM is trying to create a discontinuity in the marketplace" and slow down the price erosion for DASD by giving customers a reason for paying more for the faster Model 3.

"Prices for vanilla DASD are dropping by 25% each year, demand is down, and there is plenty of supply," he added. "The Model 9's job is to put a floor on pricing, and IBM hopes they never sell one."

Robert Callery, an analyst at International Data Corp. in Framingham, Mass., disagreed. "I don't expect to see prices on the Model 3s holding. Competition will still drive prices down."

Callery added that he does not expect many customers to migrate data from Model 3s to Model 9s but that the Model 9's lower price may cause users to put data on-line that is currently not residing in computers at all.

The analysts have graphed the future of Client/Server computing.



And they have also spoken.

In recent issues of their ongoing reports, four of the most respected computer-industry analysts have taken an unbiased look at Sybase, and its vision of enterprise-wide client/server computing.

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Superservers

IBM, TriCord target server extremes

By Kim S. Nash

■ The superserver market heated up last week as two major players unveiled systems targeting opposite ends of the spectrum.

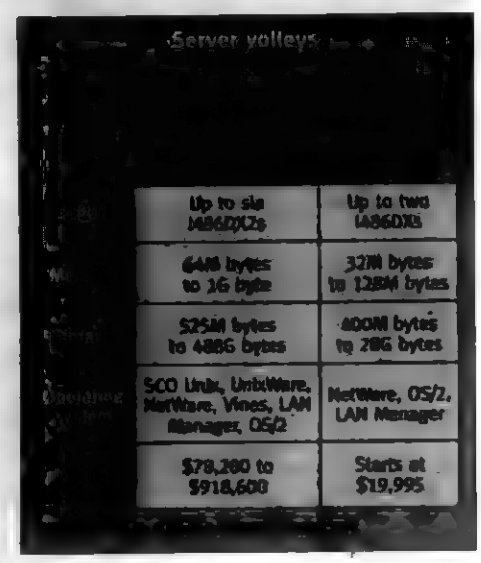
IBM rolled out the Personal System/2 Server 195, a low-end companion to its PS/2 Server 295 that observers said will go head-to-head with Compaq Computer Corp.'s SystemPro XL server. The new box, combined with a 30% price cut on dual-processor 295s, could help rouse a dormant superserver market, analysts said.

Meanwhile, early users of TriCord Systems, Inc.'s new high-end superserver, PowerFrame ES5000, said more I/O power and scalability make the box well-suited for data-intensive client/server applications supporting hundreds, even thousands, of users.

But the ES5000's large price tag, while not out of line with that of other high-end superservers, is still a hurdle for some shops (see chart).

Priced just below $20,000, IBM's Server 195 is a single-CPU system designed as a stepping-stone for IBM PC users looking to run bigger applications or consolidate existing local-area networks onto a single server. Users could then upgrade to the more powerful Server 295.

Server 195 "will definitely give Compaq a run for its money," said Brad Day, a principal analyst at Dataquest, Inc. in Framingham, Mass.



Pentium plans
The ES5000 is Pentium-upgradable, and versions are planned for OS/2 and Solaris 2.0, according to TriCord.

Day said that the Server 195 will prevent IBM PC users who previously had no stop-gap between high-end PCs and the Server 295 multiprocessor from defecting to Compaq and other rivals.

"They can use 195 to move beyond file serving to run a pretty significant database," he noted.

IBM, meanwhile, knocked 30% off the price of a two-CPU Server 295, which is now priced at less than $35,000.

For users looking for high-end servers, TriCord's ES5000 server extends the PowerFrame line upward, tripling the number of CPUs available on one box from two to six and expanding the amount of memory to 1G byte. The server started shipping in volume last week, but beta-test versions have been installed at 20 sites for a few months.

The ES5000 was "specifically designed for the enterprise," according to Walter Johnson, senior analyst at New Science Associates, Inc. in San Francisco. He said the machine's scalability is a key feature for downsizers who cannot get by with a system that is "just fast and cheap."

TriCord's lower-end systems — PowerFrame Model 30 and Model 40 — were designed as network servers geared for users expanding PC LANs. But as a six-processor application server, the ES5000 is aimed at mainframe downsizers, Johnson said.

Houston-based Enron Corp. agreed. Enron is planning a LAN consolidation project that will roll 87 Novell, Inc. NetWare LANs, now anchored by Compaq SystemPro servers, to 10 to 12 TriCord-controlled networks.

Jim Queen, director of enterprise networking, recently completed a similar project for the firm's Enron Gas Services unit and will lead the corporate overhaul.

Queen configured seven TriCord Model 40s at the unit to serve more than 200 users each. "The SystemPros started choking after 180 users," Queen said, adding that processing slowed because SystemPros could not handle the additional I/O load of up to 70 more users.

Queen said he figured that one ES5000 server, loaded with NetWare 4.0 and set up for 1,000 users, will cost Enron about $250,000, including staff salaries.

Other users were less enthusiastic. Industrial Towel and Uniform, Inc. in New Berlin, Wis., will expand a TriCord-based network via more efficient storage methods rather than spend "a lot more money on new boxes," said Steve Knauf, chief information officer.

32-bit push

CONTINUED FROM PAGE 1

Win32s, developers will still have to do some recoding.

In a separate move also designed to help ease the migration of 16-bit applications to the 32-bit Windows NT operating system, Microsoft has incorporated a facility called Working Set Tuner into the latest beta-test release of Windows NT. This facility will improve the performance of 16-bit applications that have been recompiled to run under the 32-bit Windows NT environment.

In an interview last week, Microsoft acknowledged that it is trying to get all developers to write 32-bit applications because it is there that most operating system advances will take place. "The 32-bit API is the focus for new innovation," said Cameron Myhrvold, director of developer relations at Microsoft.

According to Noah Ross, director of technology at Cap Gemini America, Inc., a New York consulting firm that is currently building Windows applications, the trade-off with 32-bit environments is that they are easier to manage and program in because they are larger. But this encourages sloppy code writing, he said. On the other hand, code written for 16-bit environments tends to be much tighter but more difficult to maintain, especially in client/server.

Developers using Win32s said the product gives them an opportunity to begin taking advantage of 32-bit functionality without having to cut all ties to the 16-bit world. Win32s allows developers to write applications that can both run on Windows 3.1 with some 32-bit functionality and run as native 32-bit applications under Windows NT, thereby giving them access to both markets with one product.

Trade-off involved

The trade-off required by the kit subset is that applications created using it will not support the multiprocessing, multithreading or security features of Windows NT.

Still, one advantage is that it "allows us to not alienate any of our customers," said David Morehead, director of research at IMRS Co., developer of the Hyperion financial information management product in Stamford, Conn. He added that his company's applications have also seen performance improvements of more than 50% using Win32s.

"We're seeing a big performance boost," added Jim Anderson, chairman and chief executive officer at Digitalk, Inc. in Los Angeles. He said a Win32s-based version of Digitalk's Smalltalk is now in beta testing and should be available in July.

There are two other options besides the Wins32 API: Running 16-bit applications under Windows NT in emulation mode or recompiling those applications to run in 32-bit environments using Win32s. Either way, users may find that their applications run slower.

Running from slowest to fastest, in general, the order of performance magnitude is as follows: 16-bit under emulation, Win32s and Win32.

"When you move from a 16-bit Windows application to NT, it's not a straight recompile. You have to do some work," said Brad Struss, Microsoft's manager of developer relations for the Win32 developer's kit.

"The tools we provide help improve a recompiled application's use of memory paging in NT," Struss explained. "When you recompile a 16-bit application on a 32-bit engine, it's going to process all 32 bits whether you need them or not," Ross added.

Microsoft provides multiple developer's kits for Windows environments, starting with the basic 16-bit version of Windows. For Windows NT, Microsoft provides a 32-bit kit, including the Win32s API and a device developer's kit.

Microsoft also provides a version of the kit that facilitates the creation of applications that will run on both Windows NT and the upcoming DOS 7.0 offering or Windows 4.0, both of which are 32-bit multitasking environments.

IBM gets aggressive

In a bid to shatter its image as a market laggard, IBM PC Co. last week unleashed 40 new Personal System/ValuePoint systems an unprecedented six months after the product's initial launch.

The announcement should lay to rest doubts about IBM's ability to aggressively compete, analysts said.

"They're responding quicker. These products seem to show that the customer is boss," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

The new ValuePoints feature Video Electronics Standards Association VL-local bus graphics, with an extra slot to attach other peripherals, and an S3, Inc. graphics accelerator. The line was expanded to include footprints with room for three slots and three drive bays. A minitower was also unveiled.

The new ValuePoints feature all Intel Corp. 1486 processors, topping out at a full 33/66-MHz DX2, with Pentium upgradability. Street pricing is expected to range from $1,088 on the low end to $3,579 on the high end.

"They're definitely coming to the plate with better stuff," said Bruce I. Linker, assistant vice president of information technology at Dean Witter Reynolds, Inc. While Dean Witter buys PS/2s, Linker said the advances in the ValuePoint might lead Dean Witter to re-examine it.

IBM is also charging a slightly higher price for the ValuePoints than it did initially. Most analysts said they think the higher prices will not hurt IBM, given the spectacular backlog it has with the initial ValuePoints, which it will continue to manufacture.

The new ValuePoints are shipping now. Medialess versions will appear next month, and the minitower will not ship until June, according to IBM officials.

— Michael Fitzgerald

AMR revamps IS

CONTINUED FROM PAGE 1

tion services, according to AMR.

For starters, Sabre Technology includes a newly minted project development and risk-assessment unit whose very designation is likely to conjure up the recent collapse of the Confirm reservation system that now has AMR locking legal horns with its former partners.

"This could certainly be seen as locking the barn door after the horses have fled," noted David Cearley, an analyst at Westport, Conn.-based market research firm Meta Group, Inc., with regard to AMR's risk-assessment addition.

Kathy Misunas *will head the new Sabre Technology Group*

And while some industry observers applauded AMR for putting Hopper in charge of an expanded territory, others saw the promotion as either a kick upstairs or a less visible way of stripping duties from Hopper, who has been criticized for his role in the Confirm project.

AMR's partners in the project — Budget Rent A Car Corp., Marriott Corp. and Hilton Hotels Corp. — have filed suits against AMR. At least one suit faults Hopper for allegedly knowing about an effort to cover up Confirm's technological problems but doing nothing to solve them.

5-to-1

AMR's newly created Sabre Technology Group spreads approximately 10,000 people among three IS units — AMR Information Systems, Sabre Travel Information Network and Sabre Computer Services — and adds two new entities: Sabre Development Services and AMR Project Consulting and Risk Assessment.

Sabre Technology's launch came only weeks after Budget became the last of the three partners to file suit against AMR and AMR Information Systems. Budget is seeking a six-figure damage claim in connection with Confirm's collapse [CW, April 5].

In a prepared statement, AMR/American Airlines Chairman and President Robert Crandall said freeing Hopper to cruise the strategic stratosphere while increasing the well-regarded Misunas' day-by-day command makes maximal use of a talented team. Neither Hopper nor Misunas, both of whom report to Crandall, was available to comment at press time.

Reaction to AMR's steps was mixed.

"Basically, I see a company in its death throes desperate to cut expenses any way it can," said Victor Janulaitis, CEO of management consulting firm Positive Support Review, Inc. in Santa Monica, Calif. AMR, he noted, has had anything but a smooth run in recent months.

"To begin with, they were hit hard by the recession and still haven't pulled out of it," Janulaitis said.

Only days before the Sabre Technology launch, American Airlines announced plans to furlough 900 pilots and engineers, shattering a 10-year no-layoff record.

"They can talk about corporate synergy and transition all they want," Janulaitis said. "But at the end of the day they're going to do exactly what their customers tell them to do — and the customer is saying 'Cut our bill.' " He predicted an early and significant round of work-force cuts at the new unit.

Overall, Cearley said, "The consolidation makes a lot of sense. When [the IS function] was split up, there was too much finger-pointing. Now, there's no 'them' — just one big 'us.' " Time once spent allocating blame, he said, can be recaptured for productive use.

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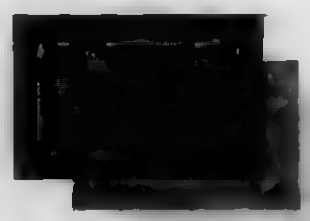

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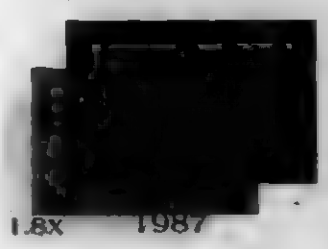

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News Shorts

CA settles user licensing suit

First Interstate Bancorp and **Computer Associates International, Inc.** last week reached an out-of-court settlement stemming from the bank's lawsuit against CA regarding the transferability of software between locations [CW, Dec. 7, 1992]. Filed last year, the lawsuit charged that CA had imposed upgrade, maintenance and new license fees against fixed-price licenses. First Interstate last year consolidated data processing operations into two data centers. Neither party discussed the terms of the settlement, though a source close to the bank said First Interstate "was able to receive the flexibility we wanted in terms of CA licensing."

CSC wins $400 million U.S. contract

Computer Sciences Corp. (CSC) last week won a 10-year, $400 million contract from the U.S. Department of the Interior's Bureau of Land Management to provide a new Automated Land and Mineral Record System. CSC will modernize and automate administrative, land and mineral records and re-engineer and reboot administrative systems for the bureau, which manages more than 272 million acres of public land.

Sun forms SPARC technology group

Determined to help its Scalable Processor Architecture (SPARC) technology go forth and multiply, **Sun Microsystems, Inc.** last week launched a new business group. The SPARC Technology Business unit will sell SPARC processor and system product designs, engineering services and hardware stripped of Sun's Solaris Unix operating system. Sun will levy up-front charges plus royalties per unit sold on selected designs and technologies. One example is the system design for the SPARCstation 10 workstation, which would cost $500,000 up front and $200 per unit sold.

DEC appoints systems integration exec

Digital Equipment Corp. last week announced the appointment of Gresham Brebach Jr. to the post of vice president of systems integration and professional services for DEC's five customer business units. Brebach's experience in information technology services includes positions as director at the New York office of McKinsey & Co.; founding and acting chief executive officer of the Information Consulting Group; and managing partner at Arthur Andersen & Co.

SHORT TAKES The **SQL Access Group** will announce three new standards for interoperability and portability this week. Documents will be available for the new specifications covering call-level interfaces, SQL and remote database access.... **Gupta Corp.** shipped SQLWindows 4.0 and Quest 2.0, major new versions of its development tools announced in January.... **Apple Computer, Inc.** cut prices on selected PowerBook models by up to 18%.... **Hewlett-Packard Co.** cut prices on its HP 700/RX family of Xstation terminals by up to $1,000.... **IBM** announced the 1993 edition of the OS/2 Development Tools Guide, a free publication that lists products from independent software developers that can be used for OS/2 programming.... **Software Publishing Corp.** extended for six months the $199 competitive upgrade promotion on its Superbase database management system. ... **Unisys Corp.** announced a national agreement with **KPMG Peat Marwick/The Alliance Group** and **Systems Consultants, Inc.** to jointly market information systems to state and local governments.... At the APPN Implementors Workshop next week, host IBM is expected to provide the first formal forum for other vendors to comment on and suggest updates to its Advanced Peer-to-Peer Networking protocol.

SynOptics backs NetView

Pact integrates Optivity and LattisWare into IBM product

By Elisabeth Horwitt

Providing yet another sign that IBM's NetView/6000 is a rising star in the Simple Network Management Protocol (SNMP)-based network management firmament, SynOptics Communications, Inc. last week announced plans to integrate its Optivity and LattisWare Solutions hub management applications into the IBM product.

"Our assessment is that NetView/6000 is one of the major competing [management] platforms, and the alliance with SynOptics is a powerful one," said Michael Howard, president of San Jose, Calif., research firm Infonetics Research, Inc.

A key differentiator between NetView/6000 and its competitors, such as SunNet Manager from Sun Microsystems, Inc.'s SunConnect division and Hewlett-Packard Co.'s OpenView, is Systems Monitor, which began shipping last month, Howard said. It lets the user set up monitors at distributed local-area network sites that either report back key events to a central NetView/6000 system or automatically respond to local problems.

By the third quarter of this year, users will be able to configure SynOptics' Optivity systems as NetView/6000 System Monitors that can pass information to NetView/6000 about hubs and attached routers, bridges and LAN devices, said Sanjiv Ahuja, an IBM product manager.

NetView/6000 will also be able to manage SynOptics cascadable workgroup hubs, as well as Fiber Distributed Data Interface networks, and forward SNMP data from the hubs to IBM's host-based NetView by the third quarter.

Currently, NetView/6000 can monitor SynOptics Ethernet hubs by running LattisViews software.

The two vendors plan to have SynOptics' RouterMan and PathMan run under NetView/6000 by the fourth quarter. RouterMan displays status and configurations of routers attached to SynOptics hubs; PathMan monitors the general health of all bridges, routers and intelligent hubs along a physical or logical path.

By first-quarter 1994, NetView/6000 and Optivity autodiscovery features will work together, enabling NetView/6000 to correlate alerts that come from a particular networking environment, such as Transmission Control Protocol/Internet Protocol, across physical devices monitored by Optivity, Ahuja said.

SynOptics hub management software currently runs on NetView/6000, SunNet Manager and OpenView. SynOptics recently announced plans to integrate the system with Novell, Inc.'s NetWare Management System.

Pricing for Optivity on NetView/6000 is expected to be less than $10,000 per user license.

Routing tiff

CONTINUED FROM PAGE 1

ent devices interoperate across the backbone, Boyle said.

While the talks have just begun, **IBM**, Wellfleet Communications, Inc. and 3Com Corp. have expressed an inclination to join the group.

The vendors would meet on the neutral turf of the Internet Engineering Task Force (IETF), the TCP/IP standards body [CW, April 5]. They would jointly develop solutions to problems that now haunt attempts to interconnect SNA devices over TCP/IP backbones, said Wayne Clark, Cisco's SNA product manager.

"The industry needs a standard way of incorporating not only SNA but also other connection-oriented protocols, such as source route bridging, into the LAN backbone," Boyle said.

One user who applauded Cisco's initiative was MultiFoods. The Minneapolis food company uses Wellfleet routers that encapsulate SNA protocols to run on TCP/IP, according to James Tretter, a telecommunications manager.

"The big advantage [of a standardized way to run SNA over TCP/IP] is that we would be able to use less intelligent communications servers or routers at the smaller sites," Tretter said.

Wellfleet routers are just too intelligent and expensive for the simple task of encapsulating SNA traffic at each site, he added.

Along those lines, standardized SNA over TCP would enable intelligent hubs to act as end-node routers that feed SNA or NetBIOS traffic directly onto the backbone without the need for a separate router box, Boyle said. This would save users even more money.

"A classic example [of a user population in need of such a standard] is the Internet, where everyone can put up a different router" to communicate over the national TCP/IP backbone, Tretter said.

Right decision

Boyle and several vendors applauded Cisco's choice of DLS. The protocol already runs on IBM 6611 routers and will be supported by Wellfleet's next version of routing software, due out in the third quarter, a Wellfleet spokesman said. In addition, DLS is already an "open" protocol, at least on paper, because IBM recently submitted DLS specifications to the IETF as a request for comment.

The group would also potentially provide some key enhancements to DLS, which even IBM said is not a finished protocol. "Yes, DLS needs enhancements; we asked as part of the [request for comment] for folks to submit comments," said Tom Danninger, IBM's manager of DLS. Improvements suggested by potential members of the group included the following:

- The ability to route IBM Synchronous Data Link Control (SDLC) traffic from an IBM cluster controller, across unlimited hops, to an IBM host.
- The ability to extend support to Ethernet.
- The ability to route transmissions by class of service.
- Enhancement of flow-control mechanism.
- The ability to handle IBM PU2.1 devices over an SDLC link.

Cisco's anointing of DLS was also perceived as a peace gesture, following a year of all-out attack against IBM's Advanced Peer-to-Peer Networking (APPN) protocol.

Indeed, the IETF working group was formed to iron out the differences between APPN and Cisco's proposed alternative, Advanced Peer-to-Peer Internetworking (APPI), Clark said. However, the IETF refused to get in the middle of the dispute, vendor spokesmen said.

Tretter said he regretted that IBM and Cisco are still not working out their APPI/APPN differences. MultiFoods is using APPN to link its IBM Application System/400s. However, he said he is "encouraged because there is so much discussion in the industry about supporting APPN over a routing network," he added. "Someone has to step up and take charge."

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HEWLETT PACKARD

Tax man gets with the program

IRS predicts big return on $8 billion Tax Systems Modernization plan

By Gary H. Anthes
WASHINGTON, D.C.

Michael Siggins

Having struggled for a quarter-century with mixed results to overhaul its antiquated tax system, the Internal Revenue Service is now taking a number of steps to fundamentally improve its systems development acumen.

In addition, the agency has belatedly acknowledged that business needs should drive technology, not the other way around. The agency is rewriting its Tax Systems Modernization (TSM) "Design Master Plan" as a user-driven "Business Master Plan," to be released next January. The plan will be the foundation on which the IRS will build the $8 billion TSM program.

"It will be owned by the key business [units] rather than by the technologists," said Bruce Pitt, deputy assistant commissioner for information systems management.

Last fall, the House of Representatives Government Operations Committee wrote in a report on TSM, "In 1992, IRS closed the gap considerably between its business and technical planning." However, the committee went on to warn of risks stemming from "the massive size of IRS and the TSM effort, the agency's culture of functional specialization and TSM stakeholders' diverse interests."

Answering the call

In response to these and other concerns, the IRS has in the past few months moved forward on the following:

•Established a federally funded research and development center — funded at $78.5 million over five years and run by the private sector — to provide high-level technical assistance and strategic planning for TSM.

•Established a high-level "architect office" to ensure the soundness of the blueprint for TSM in areas such as software, telecommunications and security. The first two of three computer scientists to be hired for the office will be announced soon.

•Embarked on a program developed by Carnegie Mellon University for assessing and boosting the sophistication of an organization's software development processes (see story below).

"TSM shows signs of moving from what appeared to be a group of weakly related developments toward a large, coordinated systems development program," said the National Research Council in a report last year.

Still, while the IRS' efforts to improve its software development practices are laudable, they remain insufficient, according to Howard G. Rhile, director of general government information systems at the U.S. General Accounting Office.

"There are some more fundamental things that need to be done to make TSM a success," he said. "These involve figuring out how they are going to do business and then how technology fits in. The technical plans are pretty far along, but the business operations concepts have not been finalized."

In congressional testimony last year, for example, Rhile called the IRS' approach to input processing "a high-tech, high-risk and high-cost venture" because the IRS had not done thorough cost/benefit analyses of the alternatives.

As a result, Rhile said, the features of one $130 million system would largely be duplicated by another $2.2 billion system; a key analysis assumed 100% error-free optical character recognition; and the IRS failed to consider a number of key factors bearing on the expected number of electronic filings (see story at right).

Hands full

The IRS has much organizational analysis and planning work to do, Rhile said.

"Taxpayers talk to one person if they have a customer service problem, to another if they have a collection problem and to yet another if they have an examination problem. Is the IRS still going to have these stovepipe functional areas? That will profoundly affect the way the system is designed," he said.

According to Rhile, the IRS is finally beginning to approach TSM from a business process point of view. "The initial round of planning for TSM was done by the technical people in good faith and with a lot of hard work. Now the business side of the house is beginning to catch up, and it's beginning to bear fruit. The problem is that it's late," he said.

Pay now, gain later

Through 2008, TSM will cost $7.8 billion above the $15.9 billion needed to keep existing systems running. Through fiscal 1992, the IRS had spent $800 million on TSM. The IRS estimates TSM will generate $12.6 billion in benefits by 2008 from reduced costs, increased collections and interest savings. Taxpayers will pocket $5.4 billion in cost savings and spend 1 billion fewer hours dealing with the IRS.

The 10-year TSM program involves 60 major projects, two dozen acquisitions and 20 million lines of new software.

The paper chase

Despite the growing popularity of electronic filing, paper returns will continue to represent most of the IRS' annual business for the foreseeable future.

In fact, the paper volume handled by the IRS' 13 tax processing centers is expected to grow from 200 million forms in 1992 to 223 million by 1995.

For this reason, electronic document imaging is a key part of the agency's massive $8 billion modernization effort.

In February, the IRS awarded its Service Center Recognition/Image Processing System (SCRIPS) contract, valued at $87.7 million, to Grumman Corp.'s Grumman Data Systems Division. Grumman plans to deploy both a development system and a pilot system in October, just in time for the 1994 tax-processing season.

The IRS said it plans to acquire as many as 13 SCRIPS during the next four years; the contract is scheduled to run for eight years.

SCRIPS will replace several incompatible recognition systems that the IRS deployed during the past decade. The new systems will also feature much improved optical character recognition (OCR) technology and will facilitate the capture of full images from tax forms. This will enable agents to retrieve questionable returns electronically.

Currently, the IRS electronically scans in just the data contained in its forms rather than the full image of the forms. The new imaging system will thus enable IRS clerks to settle questionable OCR results by accessing a claim's image instead of having to retrieve the original paper, as they do today.

Grumman is using hardware and software from NCR Corp. in Dayton, Ohio, Informix Software, Inc. in San Jose, Calif., and Recognition Equipment, Inc. in Dallas. It uses high-speed scanners from Scan-optics, Inc. in East Hartford, Conn. — *Ellis Booker*

Measuring software maturity levels

The IRS has just completed the first phase of a process to evaluate the maturity of its software development and maintenance practices.

Assisted by the Software Productivity Consortium in Herndon, Va., which licenses the approach from the Software Engineering Institute, the IRS used the Capability Maturity Model for Software to find its position on a five-rung ladder that ranges from immature, unrepeatable software development processes to mature, disciplined practices.

Having completed that step, the IRS is now preparing a set of follow-up recommendations. It will also establish permanent Software Engineering Process Groups (SEPG) to continually pursue software process improvement.

"You basically institutionalize the process of process improvement," said Fred Cole, an information systems management analyst at the IRS. "The SEPGs guide the implementation of the process improvement recommendations, but by definition, implementation is done by everyone."

The IRS refused to say at what level it found itself on the software process maturity scale but most organizations going through the evaluation for the first time end up at the bottom.

"I see them still not settled on a methodology for developing software," said Howard G. Rhile, director of general government information systems at the GAO. "Some software is being developed under the [classic 'waterfall'] concepts, some of it according to information engineering, some of it according to the [Software Engineering Institute] model. They have to settle down and figure out which way they they are going to do it."

— *Gary H. Anthes*

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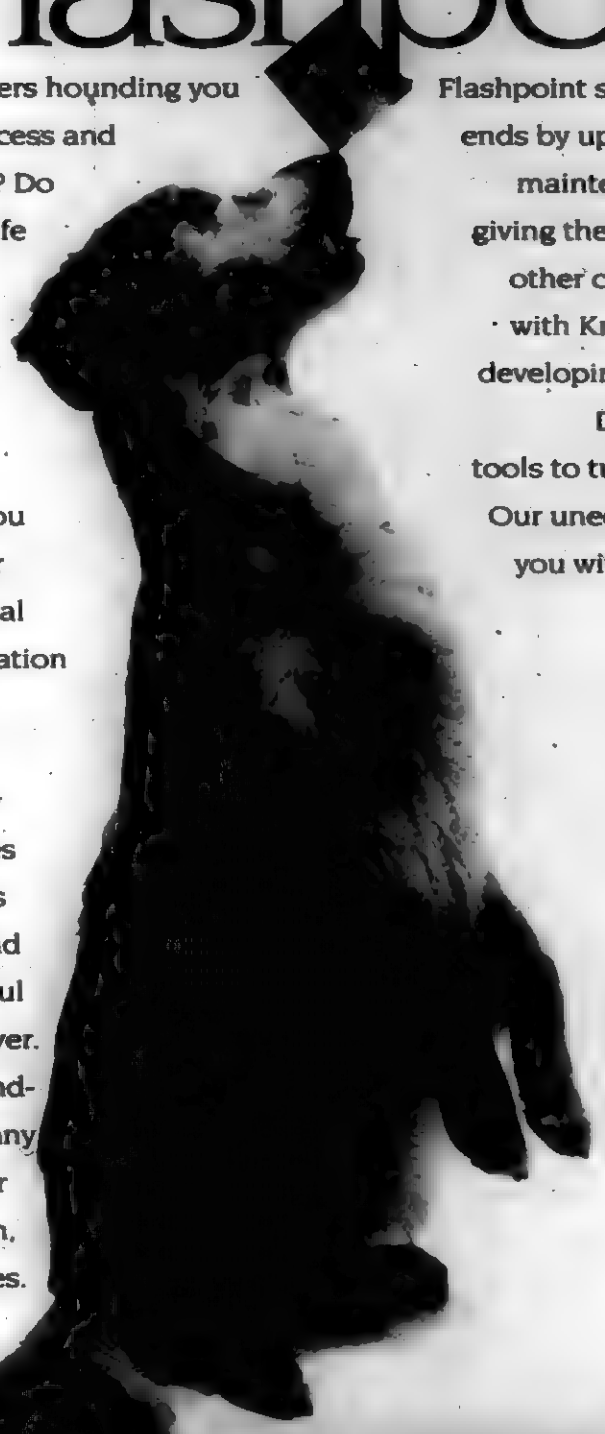

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Jim Hill, manager of order processing systems for Deere & Company, used Flashpoint to combine four legacy applications into an integrated system for dealers. Flashpoint's intuitive development environment shielded developers from the complexities of interface programming and PC-to-mainframe communications.

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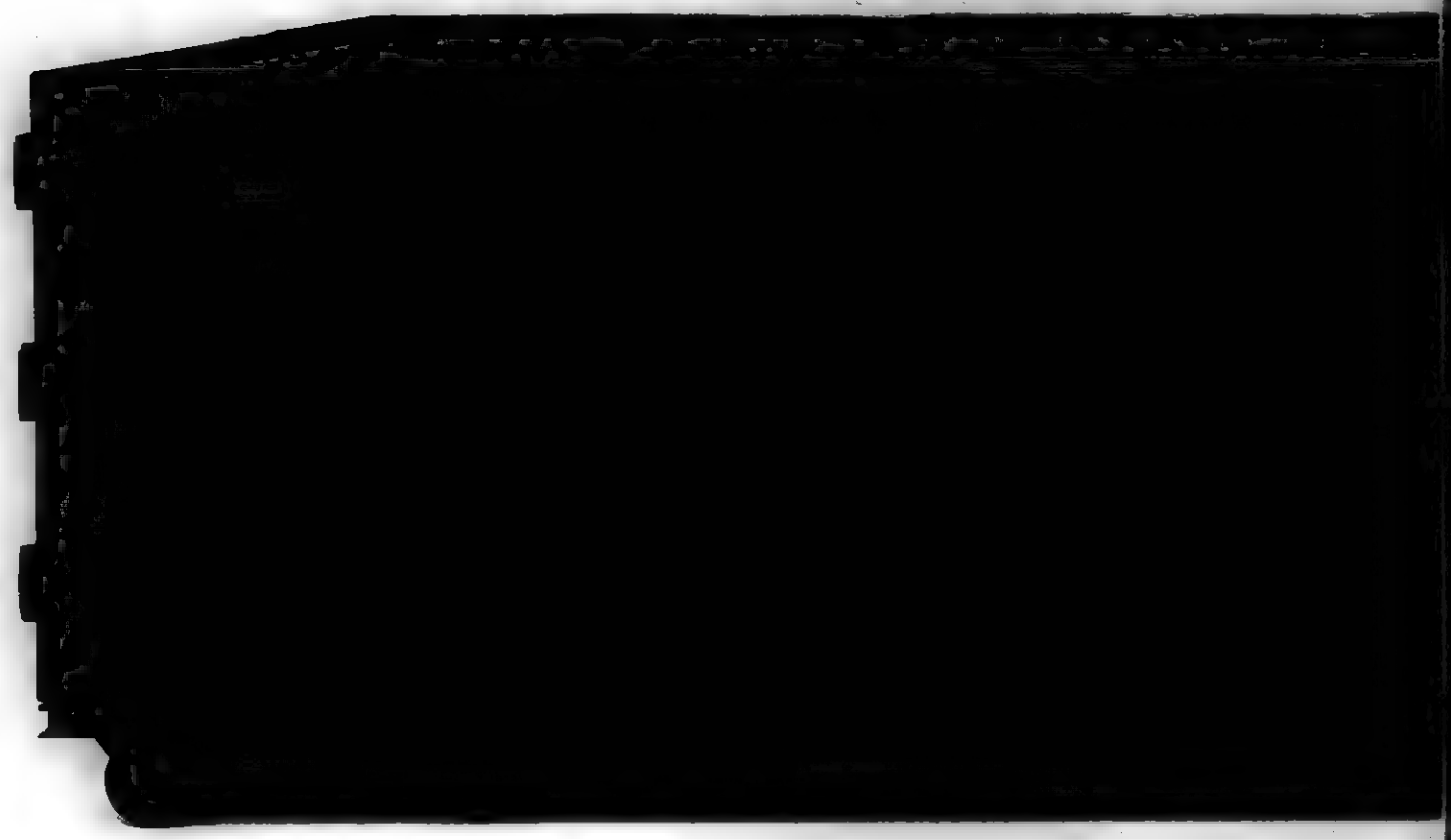

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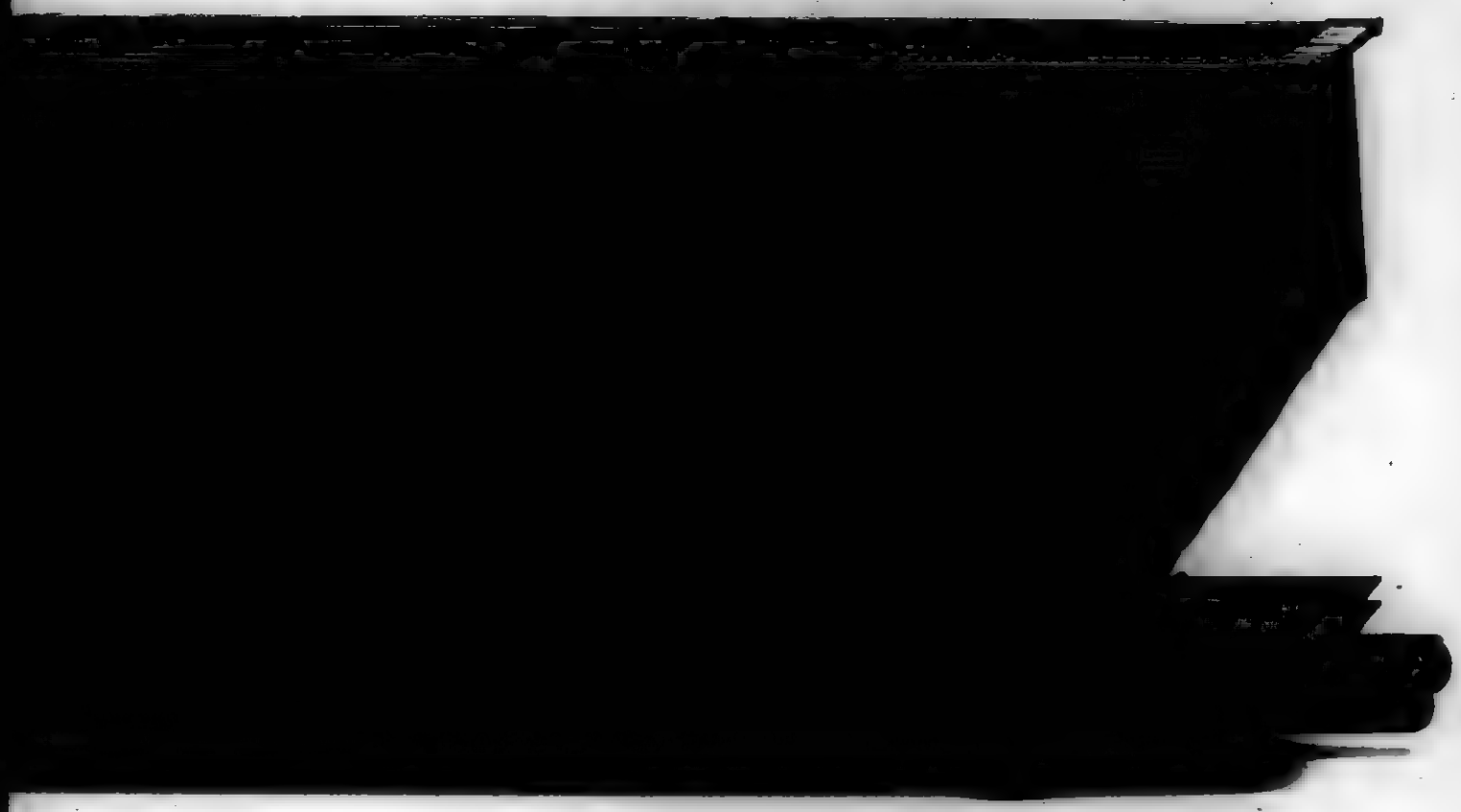

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Portable computing

Canon offers 486 notebook/printer combo in the U.S.

By Michael Fitzgerald
COSTA MESA, CALIF.

Barely a year after its U.S. debut, Canon Computer Systems, Inc. today will bring an innovative combination notebook and printer to the U.S. market.

The Canon NoteJet 486 takes Canon's bubble jet printer technology and integrates it with a 12.2- by 10-in. notebook computer based on Texas Instruments, Inc.'s 25-MHz 486SLC processor. The total package weighs 7.7 pounds, and the base model costs $2,499. Canon claims a three- to four-hour battery life.

Users and analysts found much to like about the product, though analysts cautioned that the NoteJet will likely find itself in a niche category.

"We do a lot of work in Mexico, and they don't have the same kind of software we do, so it's a real advantage to us to have a built-in printer," said Lori Wolf, president of Vocational Trends, a rehabilitation counseling firm in Los Angeles. She said her firm will buy five or six units as soon as they ship. Canon said NoteJet is shipping now in limited quantities and will ship in volume next month.

"It's an interesting concept, and we are looking for a portable printer for our notebook pilot," said Bill Bozym, information systems planning and technology assessment specialist at Pacific Bell Directory in San Francisco. However, Bozym said, the pilot uses Apple Computer, Inc.'s PowerBook.

Canon claims *that the NoteJet 486 will have a three- to four-hour battery life*

"This will have real market appeal for those who require printing, but most mobile users today can get by with using fax machines in hotels and offices," said Gerry Purdy, an analyst at Dataquest, Inc. in San Jose, Calif. Purdy said he believes the real market opportunity for Canon will come if it can build a notebook that allows users to scan in documents and fax them.

International Data Corp. said 400,000 portable printers were sold in the U.S. last year.

"For the value it offers, the price is OK, and while [Canon's] PC presence is weak, this should get them on the map," said Tim Bajarin, president of Creative Strategies Research International, Inc., a consultancy in Santa Clara, Calif.

Do not look for IBM, which co-developed with Canon the Japanese version of the NoteJet — released in January — to enter the U.S. market with such a product anytime soon. An IBM PC Co. spokesman said IBM thinks the product has a "limited opportunity" in the U.S.

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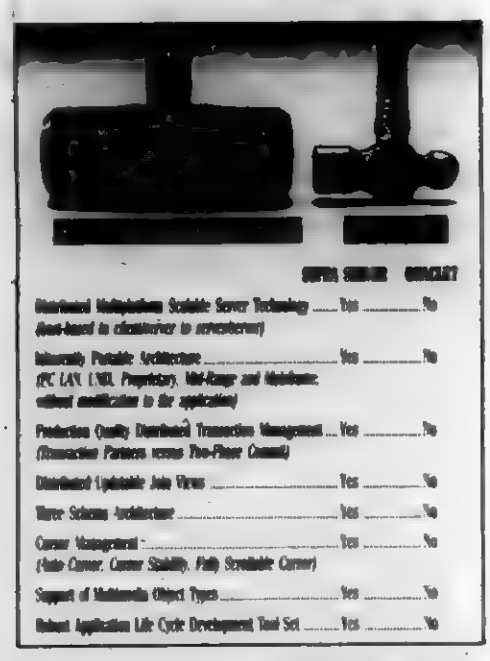

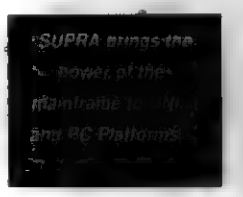

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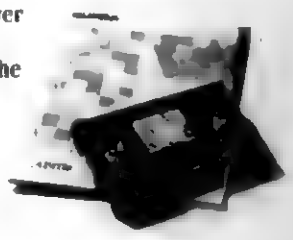

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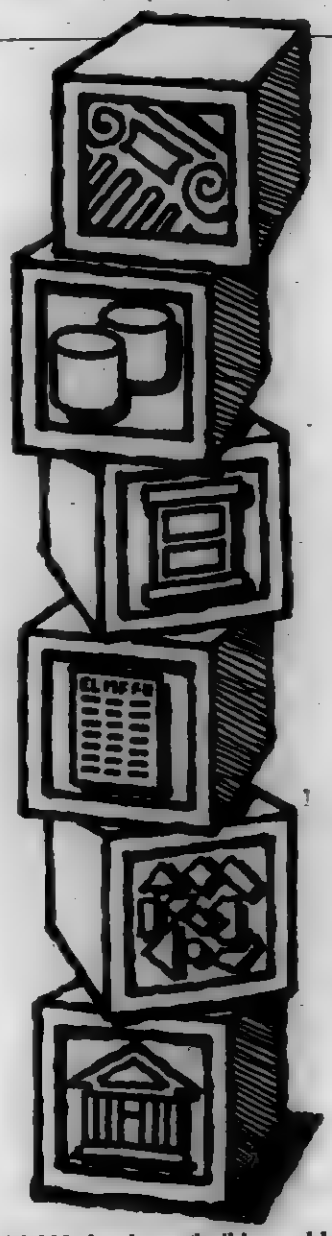

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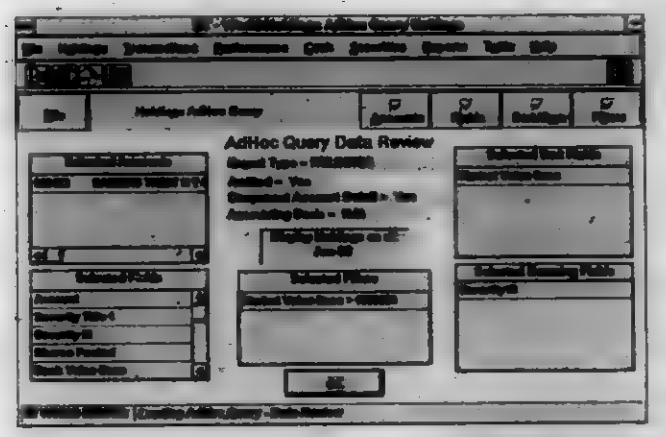
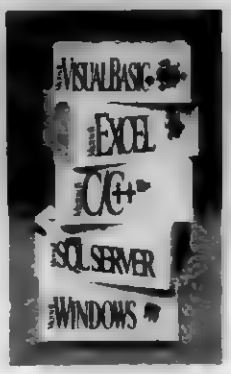


Above: BT-World makes it easy for Bankers Trust's clients to get important information on their portfolios. Right: These are the tools and applications used to create BT-World, an online solution that's giving Bankers Trust a worldwide competitive advantage.



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Testing the speed limit

$15.8 million gigabit trial networks ready to strut their stuff

By Ellis Booker

While questions about the future National Research and Education Network (NREN) are still as much political as technical, the five gigabit networking testbeds developed in advance of NREN to test the feasibility of gigabit/sec. networking are indisputably here.

What is more, information from these operational research and development networks are now being presented publicly.

A bit of background first. All five gigabit testbeds are sponsored by the National Science Foundation and the Defense Advanced Research Projects Agency under a 1990, $15.8 million contract to university supercomputer centers. Participating long-distance carriers, regional phone and switching manufacturers are providing equipment and network services at their own expense — far in excess of the government funding.

The project was started by the Corporation for National Research Initiatives (CNRI) in Reston, Va. CNRI is a not-for-profit group that promotes national communication infrastructures.

The research itself has been divided into two areas: technologies for gigabit communications networks (including switching, transmission, protocols) and applications enabled by such networks, including distributed supercomputing. At the conclusions of the tests, the best and most efficient architectures will be documented.

Sonet, speeds shared

While each of the projects focuses on a different area, they share the following basic similarities: All use backbone networks running at the Synchronous Optical Network (Sonet) transmission facilities at 2.488G bit/sec., with separate 622M bit/sec. channels.

According to Richard Binder, a principal scientist at CNRI, it is too early to make broad conclusions about the testbeds, some of which are not fully configured. "Generally, one can say that at present, a difficulty is getting the host computers to handle the I/O above 600M bit/sec.," he said. Work on computer operating systems to support this requirement is needed, he added.

The testbeds will continue through mid-1994, but it is unclear whether they will continue beyond that or whether they will be interlinked, Binder said. Next month, each of the principals in the trials will deliver a third annual report.

CASA

Connects: Cal Tech and NASA's Jet Propulsion Laboratories (JPL), both in Pasadena, Calif., with the San Diego Supercomputer Center and the Los Alamos National Laboratory. CASA is currently operational between Cal Tech and JPL. In June, the link to San Diego is expected to come on-line, to be followed later in the year by the link to Los Alamos.

Highlight: Using High Performance Parallel Interface (HippI) directly over Sonet, with a major focus on distributed computation efforts to compute in parallel for Grand Challenge applications.

BLANCA

Connects: Two segments by a transcontinental T3 line. The first 622M bit/sec. segment links the University of Wisconsin at Madison to the University of Illinois at Champaign-Urbana. Due to be operational in June, it will use the Xunet ATM switch from AT&T Bell Labs. The second link is between the University of California at Berkeley and Lawrence Berkeley Laboratories.

Highlight: Collaboration between researchers and application scientists on methods of controlling the network. Research is focused on real-time protocols for remote imaging, visualization and simulation.

AURORA

Connects: Bellcore, MIT, the University of Pennsylvania and IBM's T. J. Watson Research Center.

Highlight: Two networks, one for fixed-cell-size ATM over Sonet using BellCore prototype switching equipment, another for variable-length packet-switching, called Packet Transfer Mode, using the IBM experimental Planet switch. Bellcore has developed its packet protocol to support multimedia over these high-speed facilities. Called Multimedia End-to-end Communications Architecture, the scheme supports a variety of data within a single, digital network.

You look 'mahvelous'

Wearable PCs are the next accessory for users

By Michael Fitzgerald

Noted fashion critic Mr. Blackwell would probably be horrified, but NEC Corp. continues its efforts to create wearable PCs.

The company announced its effort late in 1991, saying the PC will become such an essential part of daily life that we will add it to our wardrobe.

At the time, researchers at the Advanced PC Design Center in Tokyo predicted that by the late 1990s, people would be wearing their PCs.

NEC said potential PC fashion plates might include paramedics, who would wear computers across their shoulders and use specialized trackballs to scan for injuries and check vital signs. They would dictate their findings into microphones and could also access CD-ROM-based medical encyclopedias.

For those who need a keyboard at all times, a notebook PC with shoulder straps is under development. Folding keyboards and display setups would allow this to become a reality.

A NEC spokeswoman said the company has not accelerated its timetable for these devices.

While NEC had promised to deliver a phone that attaches to the wrist sometime this year, the spokeswoman said that is unlikely.

NEC says wearable PCs, *including those slung from the shoulder, will be in vogue by the end of the decade for users in various professions*

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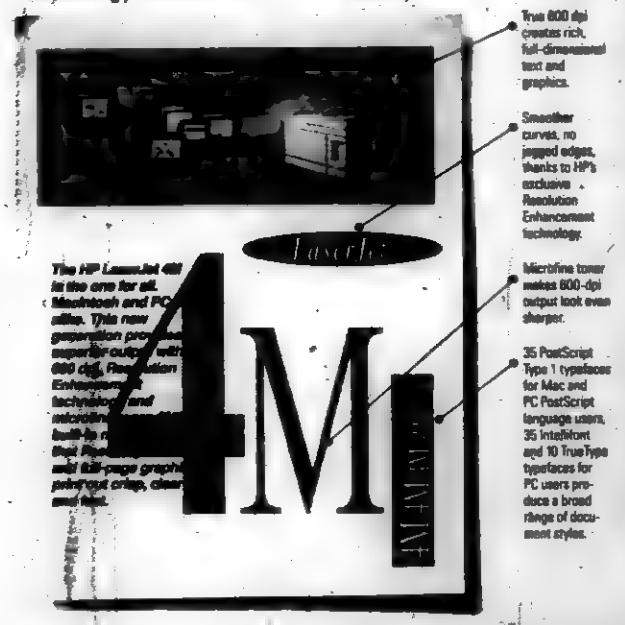

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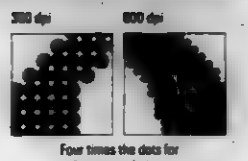

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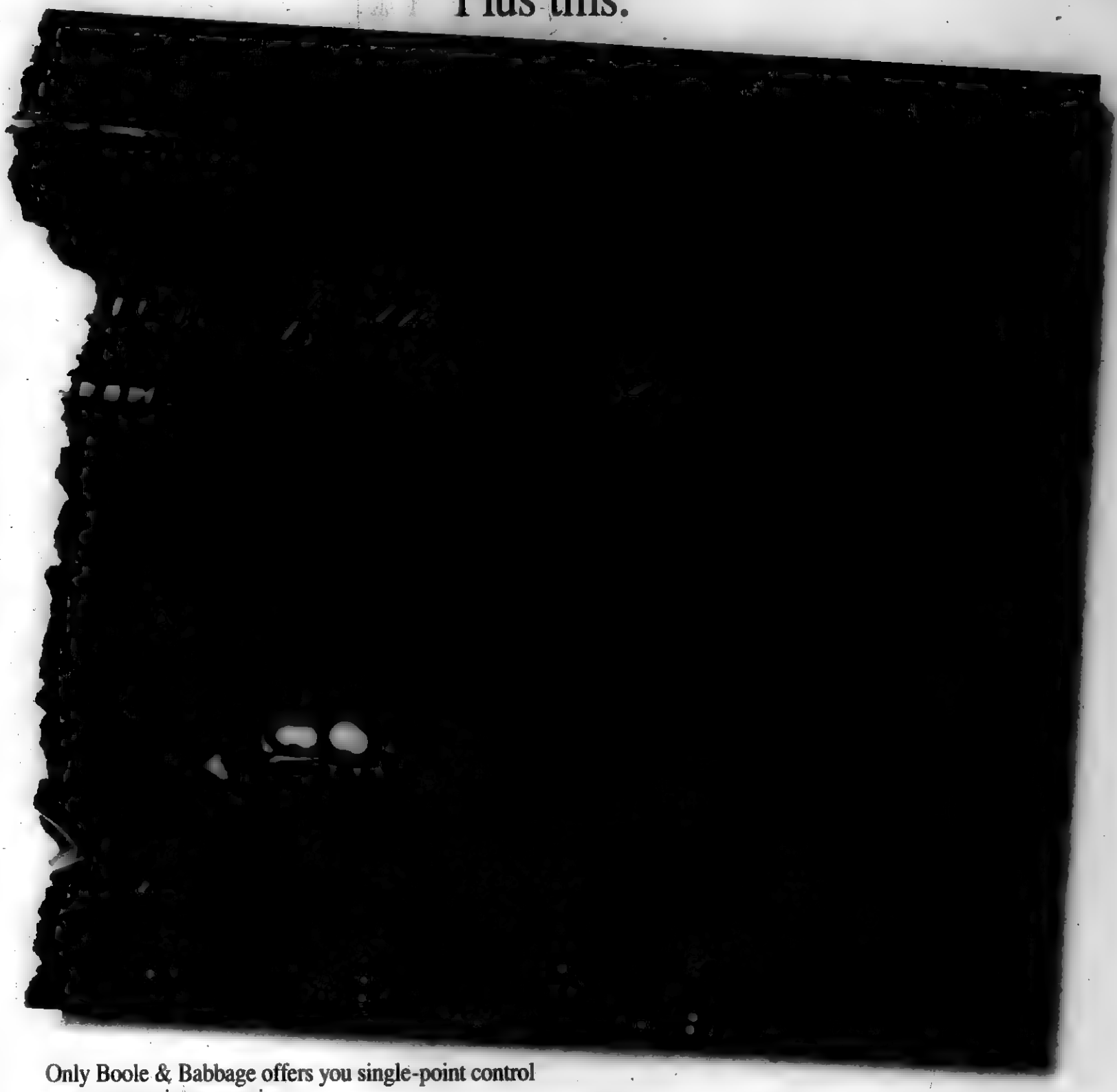

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Flame out

If I called IBM Chairman Louis Gerstner a philanderer and an embezzler in this column, he could sue me for libel and would probably win. After all, I have no justification for that statement. But if I said the same thing on CompuServe, it's by no means clear whether Gerstner would have any recourse against me.

Such are the confounding issues of free speech in this brave new world of electronic publishing. As readers, we take for granted the fact that the information in responsible publications has been double-checked by responsible editors. Unfortunately, there's no such luxury where electronic bulletin boards or public E-mail systems are concerned. As use of these electronic forums explodes during the next several years, we could be looking at a legal nightmare.

The topic came up a few weeks ago when Medphone Corp., a medical technology firm in Paramus, N.J., sued an investor over statements the investor made on Prodigy. Medphone claims the allegedly false statements caused its stock to drop. The investor's lawyer says his client was merely expressing an opinion. The case is puzzling because there is virtually no legal precedent for such a suit.

I sympathize with both sides. As a CompuServe regular, I have read hundreds of messages over the years that could be considered defamatory. In bulletin board parlance they call it "flaming," a form of blowing off steam that's sort of like mouthing off in a bar. Bulletin board users tend to be a pretty opinionated bunch, so there's a lot of flaming that goes on out there. It's generally harmless.

As a user, it pains me to think that every piece of flame mail or offhand E-mail shot could be subject to the same legal scrutiny as something written in a newspaper column. But as a journalist, I don't think it can be any other way. The number of public bulletin boards has jumped more than tenfold in the last five years and now numbers more than 44,000. Prodigy claims to have 1.75 million users and more than 80,000 messages daily. Thus, the potential audience for a defamatory statement on Prodigy is the same as for the same statement in the Sunday *New York Times*.

The problem is that Prodigy and other bulletin board services can allow the illusion of intimacy to mask the reality of a public forum. It's a fact that people write things in an E-mail that they won't say face-to-face. And when flame mail is flying, the writers tend to forget that what they're saying can be read by thousands of others.

But ignorance isn't an excuse. We are rapidly moving toward a world in which the power of the press no longer belongs only to those who own the press. Information technology is making publishers of us all, and the burden is on those of us who choose to publish to make sure we are responsible for what we say.

Paul Gillin, *Executive editor*

No train, no gain

Several recent *Computerworld* articles about migrating organizations to graphical user interface (GUI) shops have included the cost of training as a prohibitive step in the process.

It is clear that in order to have a successful implementation of a graphical environment, the IS staff must be trained to install and maintain the systems. But this training should be a function of their very existence. It should not be considered an extraordinary expense.

It seems inappropriate to include in the per-unit cost of a GUI installation the cost of training end users unless that cost is also reflected in the cost of operating a graphical-based system.

Most companies with which I am familiar do not spend the necessary time or money to get the most out of existing character-based applications.

David M. Hollis
Washington, D.C.

Staying alive

Like so many stories before it, "Hotel cans mainframes" [CW, Feb. 22] seemed to be proclaiming, "Here's another small system replacing a large one! The mainframe is dead." In reality, the Pyramid system, by today's standards, was being compared with an even smaller and less expensive system than itself.

Although some applications are rightfully being moved to the desktop, many cannot be performed without the security, reliability, availability and massive I/O and data handling capabilities afforded only by large systems.

To imply otherwise, directly or by omission, sets false expectations and is a disservice to chief information officers who must explain the realities of this downsizing rhetoric to their senior management.

There's no question that our industry is changing. However, what we're seeing is a shift toward an enterprisewide view of computing where desktop technologies, with their low-cost processing, and large systems, with their data and resource management capabilities, work in tandem to deliver the solution most appropriate for a customer's individual needs.

Joseph Francesconi
Executive vice president
Amdahl Corp.
Sunnyvale, Calif.

Political games

The article on the Clinton program for "high" technology, "Clinton plan stirs optimism" [CW, March 1], is discouraging in its empty-headed cheerleading for tax-supported industry. With any government program, the politically connected are rewarded, and the politically disconnected are punished.

This is neither some new revelation nor blind cynicism; it's hard-won wisdom from a couple thousand years of recorded history. The eager, creative energies of the young, politically naive entrepreneurs in Silicon Valley and elsewhere will now be harnessed to the bureaucrats, favor-seeking "businessmen" and vote-buying politicians of the establishment. Businesspeople ought to defend innovators in the throes of birthing new enterprises and should not suck up to their destroyers.

Cliff Styles
Culver City, Calif.

No longer objective

During the past year, I have seen *Computerworld* transform from the premier source of objective information systems news into the most anti-IBM, pro-Microsoft-biased publication around.

What is most disturbing is that this bias does not emanate from the staff editor level, but rather from the editor in chief and executive editor level and presumably with International Data Group's knowledge and blessing. The pinnacle of this bias was Paul Gillin's recent "humor" article "Your turn, Windows" [CW, March 22].

Why don't you change the name of the newspaper from *Computerworld* to *Microsoftworld*? That way, at least the subscribers would know what they were buying.

James Schneider
Worldwide Chain Store Systems, Inc.
Chicago

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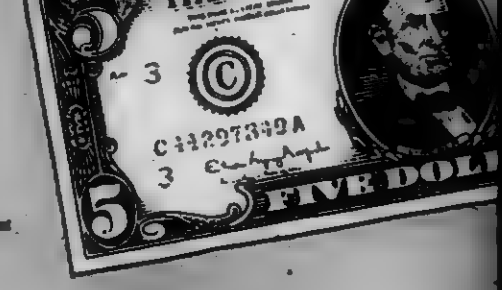

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Where CIOs went wrong

Paul A. Strassmann

The time has come for CIOs to get back to basics and clean up their noninteroperable, redundant, obsolete, overpriced, error-prone, schedule-lagging and credibility-lacking systems.

Busy pursuing power and position, the majority of CIOs have neglected the basics of information management — modernization and cost reduction — and are failing in their jobs.

How do you know when a CIO is a failure? There are usually plenty of clues. If the chairman, president or agency head is replacing the current systems head, that's a pretty good indicator.

Multiple reorganizations are also a tip-off. And you know there's trouble if information technology budgets are growing faster than income, if an organization is still pondering presentations about applications that competitors are using or if salespeople, production planners, engineers and designers are functioning as part-time systems managers instead of taking care of customers.

At many organizations, chaos reigns in the form of improvised databases and proliferating unconnected LANs. Bootleg applications, conceived by enthusiastic amateurs, have sprung up everywhere.

What happened? How did things get so bad? When I talk to involuntarily retired CIOs, they mostly fix their misfortunes on the microcomputer. They say it came too fast. They also blame IBM and DEC for not delivering an "architecture" that could put the genie of personal computing back into a confinable scheme. Well, that's like blaming the rain for water in the living room when you haven't bothered to replace missing tiles on the roof.

The vision thing

The prevailing mess and general malaise about the effectiveness of our information management are directly traceable to the writings of a few persuasive thinkers who date back to the late 1970s and early '80s. Most of these were academics who subsequently became consultants without ever managing any sizable computer operation.

The model set before an ambitious CIO was simple: Forget grubby details such as integration of LANs and WANs. Delegate data administration to "techies." Let the vendors take care of migration to client/server. And don't worry about software assets because "open systems" will take care of that.

The CIO was advised to become an "information visionary;" to stake a claim to establishing the strategic directions of the business; to engage in "re-engineering" of the entire company; and to use his position to place himself in the race for corporate presidency.

There is nothing wrong with a CIO becoming a COO or CEO, except that it almost never happens. CIOs who have succumbed to the simplistic view that they should be strategists, instead of tending to their shop, have decreased their job tenure to a half-life of less then 2½ years. The only ones who have gained are the consultants. It is time for CIOs to stop aiming at other jobs and start paying attention to their own.

If they do that, they may survive as operating managers who earn real revenue instead of living off administrative overhead.

Strassmann has served as a corporate information executive since 1982 for General Foods, Kraft, Xerox Corp. and the U.S. Department of Defense. This column was adapted from his forthcoming book *The Politics of Information Management*.

Computing by candlelight

MIS PERCEPTIONS *by* Max D. Hopper

Climbing the ever steeper technology curve, it is easy to look down and congratulate ourselves on the heights of mastery we've attained. But then we look up and see a volcanic eruption of new capabilities creating a daunting peak that puts our progress in perspective.

Innovation is outstripping assimilation. We are falling further and further behind in exploiting technology's potential for ease of use and enhanced interactivity.

We can taste the sweetness of the future, but we're not ready to pick up the dinner tab.

I am as enchanted as anyone by the promise of the PC revolution but far less certain of our methods for making the most of it. Maybe they're too evolutionary.

There is an ironic observation that if it were not for Edison, we would all be watching TV by candlelight. Lately, I've wondered whether we're using our computers by conceptual candlelight, deprived of a larger, more illuminating vision of the technology's potential.

Meet users halfway

Now that computing is democratized throughout the workplace, there's a new imperative for our machines to meet the sensibilities of the user halfway. They need to offer the kind of ease of use, visualization, experiential learning environment and multisensory, interactive communications that fits the way we think, learn and work best.

The mouse, pen computing and graphical user interfaces are clear steps in the right direction. Most of the time, though, our machines sit around "waiting at the speed of light" for us to communicate with them through a plodding input device called the keyboard. What's wrong with this picture?

I look at the intuitive, no-hassle operating convenience that users expect — and get — from all manner of home entertainment electronics, and I wonder if their makers know something our vendors don't.

Why should we have to play so patiently with our onerous workstations? As a user, I'm tired already. Give me a Nintendo "Business Boy," or maybe a Sony "Workman" with full audio and video I/O capabilities.

In my IS role, however, I realize our economic justification processes are just as much to blame as any lack of imagination or responsiveness from our vendors. IS people, and our corporate money managers, are full partners in perpetuating our own plight.

We salivate over potent new products, yet we procrastinate in purchasing them. Speech recognition systems exist, but we balk at their limitations. Multimedia is tempting, yet tough to rationalize. Full video interactive communications systems beat E-mail cold, but we can't warm up to the price. And virtual reality is pure fiscal fantasy.

We can taste the sweetness of the future, but we're not ready to pick up the dinner tab.

Maybe we're destined to dine on the morsels of modest improvement until we can divest ourselves of Gutenberg's legacy. The printing press inaugurated a mode of communicating that has served us well for centuries. We abandoned show-and-tell for read-and-write, adopting a character-based environment so intrinsic to our culture that we cannot envision how it constrains us.

Yet, perhaps now we have a new machine that will eventually illuminate our boundaries and light the way to more liberating horizons.

We'll see.

Hopper is chairman of Sabre Technology Group.

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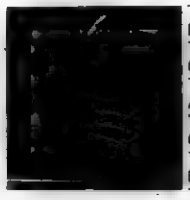

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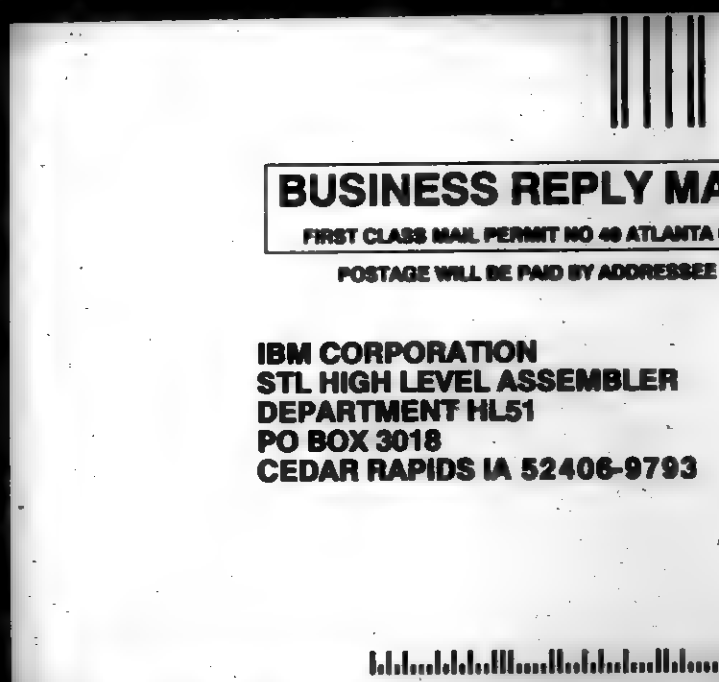

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Charles Babcock

Tool time

Be prepared for more skirmishing in the war of words between DBMS suppliers — this time on the tools front.

Tools for application development, heterogeneous database management and query monitoring are all crucial to developing distributed systems. The Gartner Group and other sources predicted that 1993 will be the year in which development for client/server systems will outweigh development for host-based systems — the beginning of a shift that will be felt for many years to come. Forrester Research in Cambridge, Mass., estimated that the market for client/server software will increase tenfold between 1991 and 1996, from $750 million to $7.5 billion.

Given those stakes, it's not surprising that another fierce rivalry is heating up between competitors on opposite shores of San Francisco Bay. At one time it was Oracle and Ingres vying for the top spot in the relational database business. This time Oracle is jockeying with two firms: Sybase and Informix.

Consolidated offerings

Oracle recently pulled its tools staff into a separate business unit and linked its offerings under the name Cooperative Development Environment. The time was ripe to take a step in this direction. Oracle's tool list had grown to 14, and with the company's application business faltering in the U.S., tools were becoming an increasingly important piece of the business.

Last week, Sybase announced its Omni SQL Gateway, which allows a Sybase customer to make use of multiple Sybase database engines on different servers as a single system. Oracle has had this capacity since the advent of Oracle 7, but Sybase upped the ante by allowing its users to treat a combination of Sybase and Oracle or Sybase and DB2 on different servers as a single system.

In addition, Informix, an upstart in the Unix market where Oracle has been finding much of its growth, announced its own set of graphical tools last month. Informix has been growing fast with desktop Unix users, and its initiative poses a challenge on a second front.

When it comes to tools, the large system database companies find themselves in the right place at the right time. They have already produced character cell-based tools to operate across different hardware labels, and now they are producing graphical versions in integrated tool sets. This places them in a pivotal position as customers look for ways to hand off the corporate data to end users while maintaining it in a centrally administered system.

At Oracle's press/analysts briefing Jan. 26 in San Francisco, Chairman Larry Ellison singled out Sybase among its competitors. He described it as the "Briggs & Stratton" of database engines. I think he was commenting on Sybase's former restriction to operating on one server while Oracle 7 could function as one system on multiple servers. It's also possible he meant to say Sybase was best on lawnmowers, while Oracle was a truck speeding down the data highway.

Why would Ellison pick on Sybase? Six years ago, when Sybase was a newcomer, Oracle's revenue was $131 million to Sybase's $6 million. In 1992, Oracle was a substantial $1.12 billion company with a growth rate of 15%, and Sybase was a $265 million company with growth rate of 65%. No one knows better than Oracle what high growth rates can do for a firm.

Users stand to benefit from the tool battle. As long as the vendors stay focused on cross-platform and cross-system functionality, the customer is likely to gain greater capability for building client/server applications and perhaps pick up a bargain or two in the process.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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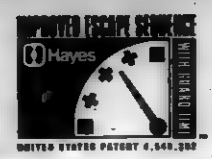

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Desktop Computing

CeBIT '93 features
personal digital
assistants, 41

Spreadsheets

Dueling for Windows

Lotus hopes Improv, new 1-2-3 will crowd Excel

By Michael Vizard

Although Lotus Development Corp. is readying a major push this summer to upgrade its installed base of 1-2-3 users to a substantially improved version of 1-2-3 for Windows, the days when the spreadsheet easily dominated its market appear to be gone forever.

The current reigning king of the Windows spreadsheet market is Microsoft Corp.'s Excel for Windows. But Lotus still commands a 90% share of the DOS spreadsheet market and is pursuing a dual Windows spreadsheet strategy: getting 1-2-3 diehards to upgrade to a much improved version of 1-2-3 for Windows or adopt a new spreadsheet format using Improv for Windows.

Version 4.0 of 1-2-3 will include much better designed graphical environments and a Version Manager feature — aimed at stunting interest in Excel's Scenario Manager facility — that makes it easy for users to link diverse cells, spreadsheet formulas, models and groups of spreadsheets to perform what-if analyses.

At the Improv

At the same time, Lotus is pushing an Improv offering that provides an even richer set of analysis tools across multiple dimensions, which can be used to allow users to easily display the same values in different models. During the last two months, Lotus has shipped more than 125,000 units of Improv as part of a special $99 introductory program.

"Improv is a real analytical tool that really stretches the abilities of 1-2-3," said Bruce Jaffe, executive vice president of Bell Industries in Los Angeles.

"I think people will use 1-2-3 for quick and dirty calculations and use Improv for presentations. Improv is a more structured environment, but ultimately I think people will switch to Improv once they become comfortable with it," Jaffe said.

But the arrival of Improv and the promise of an enhanced 1-2-3 for Windows is only going to stem the flow of Windows market share that has already moved over to Excel or Borland International, Inc.'s Quattro Pro for Windows.

New tools

The Version Manager feature in 1-2-3, which will allow users to create multiple ranges in a single cell, a block of cells or multiple spreadsheets, is an outgrowth of the Chronicle communications technology that Lotus intends to use in other products, including its Ami Pro word processor.

"Lotus really hurt themselves by coming out with a mediocre 1-2-3 Windows product," said Daniel Gasteiger, a principal at consulting firm Gasteiger & Delonas, Inc. in Cambridge, Mass.

Loyal user base

However, Gasteiger said the damage done was not catastrophic because most 1-2-3 users remain loyal to Lotus. "I think we'll finally see the 1-2-3 base move to Windows with the new release. They've been pretty content to sit back and wait for Lotus to get it right," Gasteiger said.

Gasteiger added that he does not expect Improv to become a dominant product in the spreadsheet market.

"Users like spreadsheets because you can use [them] with very little notion of where you are going to go. It's like a scratch pad. I don't think Improv will be a contender

Lotus, *page 41*

Christopher Lindquist

Human error and Internet

We all make mistakes. Unfortunately, computers don't handle mistakes very well, as anyone who tried to send me mail over the Internet using my new address found out. Yes, I confess, there was a typo. My real address is chrisl@netcom.com (not chrisl@netcom.netcom, as the last column stated).

My second mistake was telling readers that Internet tutorials existed and then not listing any. As my voice mail and E-mail attested, people want details. Sorry to leave you hanging like that.

A couple of books that interested users might want to try are *The Whole Internet User's Guide and Catalog* by Ed Kroll and *Zen and the Art of the Internet: A Beginner's Guide* by Brendan Kehoe. There are plenty of others available, but these should be a good start.

And speaking of starts, some nits are starting to get picked about MS-DOS 6.0. When it is installed, the upgraded MS-DOS installs a Tools menu item on the File Manager, not to mention on the menu bar for Symantec's Norton Desktop for Windows. That would be fine, but Norton Desktop for Windows already has a Tools item, and after you install MS-DOS 6.0, you'll have two — so much for intuitive interfaces.

Lindquist, *page 41*

IBM PC Co.'s uphill battle

How Robert J. Corrigan plans to come out on top

Robert J. Corrigan did not inherit an enviable task last October when he was named the first president of the IBM PC Co. IBM faced myriad problems in the PC hardware business; not the least of which was a steep decline in market share and an unprofitable business unit.

While it is too early to call Corrigan's efforts since a complete success, IBM does appear to have halted its market share decline and regained some of its lost image as a technology leader. Corrigan spoke recently with *Computerworld* executive editor Paul Gillin and senior writer Michael Fitzgerald.

Q. You have been here five months now. Is your job getting any easier?
A. Has it only been five months? It seems like two years. I don't know how this could be much harder, doing a restructuring.

Q. What are your top priorities at this point?
A. First, to sustain what we've done. We've created the organization and brand structures so that we can have greater segmentation and service more of the market. The first priority is to keep up the rate and pace of development and the organization. Second is to try to catch demand. My third focus is to do everything I can to get control over all the elements of cost. The fourth is to get my channels running efficiently.

Q. Where do you see yourself cutting costs?
A. I think I have opportunities in procurement and in order processing, distribution, those kind of things. I do two to three times the units of [other PC companies], and I get a lot of leverage when I make small improvements.

Q. Do you see the direct channel becoming a much bigger part of your business?
A. I don't think it will dominate it, but it is certainly a channel we weren't participating in that was taking up 15% to 20% of the business in the industry. I will compete face-to-face in the channels where my competitors are, and if you find somebody who's competing with me and I'm not there, let me know and I'll compete there. One of our problems was we were losing share in our industry, but not where we were competing. Where we were competing, we were OK.

Robert J. Corrigan: *IBM must sustain its development pace*

Q. Do you see yourself gaining market share back?
A. I'm gaining significant share in the retail channel. I think the branded players are winning unit share, and I expect to win unit share also. I think the major issue will be the relative share of the different participants.

Q. Has price cutting run its course?
A. I think you'll see continued price pressure, but since the dollar numbers are lower, the impact on buying decisions are getting [smaller]. Does a $50 difference in price make you shift from one brand to another? I think sooner or later the price of the product is not going to be the dominant variable, and you're seeing us and the major participants starting to position against the price-only competitors by offering value packs.

Q. What are your plans for Microsoft's Windows NT? Do you have difficulties dealing with Microsoft?
A. We'll support all operating systems, whether they come from IBM or Microsoft or Novell or whatever. We are involved very closely with Microsoft. We should be. We're their No. 1 customer. We are not trying to be a participant in the OS/2 vs. Other Systems war. To be a credible hardware provider, you cannot bias yourself with a one operating system solution.

Q. Do you feel pressure to use IBM technology in your PCs, such as the SLC chip?
A. My principal interest in the SLC was that it was 3.3V, and it was a way to get 3.3V into my products in 1992. If I can leverage IBM technology, I try to leverage it. . . . If the technology isn't there, I'm not trying to force it. I'm not choosing IBM just because it's IBM.

Q. How committed are you to Micro Channel Architecture?
A. I think it's still a superior architecture.

IBM's Corrigan, *page 41*

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ANN MARIE WAS LIKE MOST BUSINESS PEOPLE.

Beneath her stoic corporate persona; beneath the stylish suits

and Italian pumps, Ann Marie had a vulnerable side.

She longed for SAFETY, SECURITY and STABILITY.

She needed PROTECTION and, of course, A FULL PRODUCT LINE.

And she knew there was only one place to get it all. But someone

was out to stop her. "Over my dead body," thought Ann Marie.

IT DIDN'T MATTER THAT ANN MARIE'S DOOR WAS CLOSED, THE SCREAMING AND SHOUTING COULD BE HEARD ALL OVER THE OFFICE. Suddenly, a large thud. Then silence. Not a peaceful silence, but the kind that whispers, "Stay away, if you know what's good for you." I couldn't.

As I cautiously cracked open the door to Ann Marie's office, she was sitting on her desk, feverishly scrubbing one shoe. "You know how to get blood out of suede?" she asked. Just then, I noticed the door was stuck on something. I peered around to see what was blocking the way. It was John. His lifeless body looking like a crumpled piece of paper. "He didn't want BASF to be our primary supplier of computer media," she explained. "Is he...?" I was shaking so much my mouth couldn't form the word. "No," shot back Ann Marie, "But

he'll wish he was. BASF is the only supplier we've got that offers a

full line of computer media. Their durable

diskettes are all certified

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free.

Their computer tape has the fewest

defects in its class.

And their 3480

and 3490 DL

cartridges have the highest stability

and abrasion resistance of any

Magnetic Tape Cartridges," said

Ann Marie. "John didn't stand a chance.

But if you ask me, an idiot like John didn't deserve one.

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WHAT LUNKHEAD DOESN'T KNOW THAT BASF

INVENTED MAGNETIC MEDIA. I mean, you can tell

just by BASF looking at their products. If only John had done

that, he would have seen how their back-up cartridges use

BASF

select data grade tape, with fewer errors for greater efficiency.

And how their rewritable optical disks are formatted to ISO BASF

standards, for use in image processing, CAD/CAM and desktop

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publishing. There's no excuse for John's ignorance. If he

didn't know, all he had to do was call 1-800-343-4600

to get detailed information on BASF's complete line of computer media

BASF

products, including where to find them. John was stupid, that

much is obvious. But did he really deserve BASF a size

blue suede Italian import upside his head. Yeah, he did.

Demand It.

BASF

PDAs compete at CeBIT '93

By IDG News Service
HANNOVER, GERMANY

■ Personal communicators or personal digital assistants (PDA) continue to be one of the most talked about forthcoming technologies, even though the products themselves remain little more than prototypes.

At the recent CeBIT '93 exhibition, each of the major camps pushing to establish industry standards showed off its latest wares.

Apple Computer, Inc. demonstrated the latest beta-test version of its Newton PDA and announced a series of third-party licenses for the technology. Tandy Corp.'s Grid Systems showed its "Zoomer" personal communicator, promising a fall release. And talk of PDA plans for industry giants such as Compaq Computer Corp., IBM and Siemens/Nixdorf Informationssysteme AG created a buzz on the show floor.

Looking to bolster support for Newton, Apple announced licensing deals allowing Motorola, Inc., Siemens and Kyushu Matsushita Electric to use the Newton architecture in their products.

While Apple's push to make Newton an industry standard gained momentum, Siemens has followed Ing. C. Olivetti & Co. to become the second major European computer maker to endorse a rival technology based on the Go Corp. pen-point operating systems and the AT&T Hobbit chip set technology from EO, Inc. EO's PCN will also be sold in Japan by Matsushita Electric Industrial Co. and Marubeni Corp. Also planning Hobbit/Go-based devices are NEC Corp. and Toshiba Corp.

Not to be left out

But while Newton and Hobbit-based products have a lead in terms of being shown as prototypes, Intel Corp. and Microsoft Corp. made their presence felt by promising to make the PDA market at least a three-horse race.

Microsoft is working on a version of Windows, scheduled to debut within the next six months and tentatively called WinPad, that is based on Microsoft's core Modular Windows technology, said Paul Maritz, senior vice president of Microsoft's systems division.

Microsoft's approach is to provide a common operating system core from handheld devices up to network servers. In contrast, Apple offers different operating systems for handheld, desktop and enterprise systems.

"We think that in the initial phases of the [PDA] market, commonality with desktop machines and sharing information with desktops" will be important to users, Maritz said.

Hardware vendors eyeing Intel-compatible PDA products include Compaq and IBM. Compaq and Microsoft are planning a joint announcement on PDA technology that could be made public as soon as next month, according to one well-placed source. Meanwhile a source within the IBM PC Co. said IBM is planning a fourth-quarter release of a PDA using its own line of low-power, Intel-compatible processors.

Also in the Intel-compatible camp at CeBIT was Nimble Computers, a California start-up, which showed the NimblePad. The machine uses 386 and 486 processors from American Micro Devices, Inc. and runs Windows for Pen Computing, as well as a pen shell for DOS.

Racing these products to market is Apple's Newton, which will finally materialise from its vapor state to solid form this summer at a price of less than $1,000, according to Gaston Bastiaens, vice president and general manager of Apple's Personal Interactive Electronics Division.

"The Newton technology has been designed from the ground up, with an integrated architecture. The operating system is not adapted from some existing desktop technology. With small mobile devices it is simply not good enough to get hardware from one source, to take an operating system from another source, put them together and assume they are going to work," Bastiaens said.

"We have a different philosophy than Apple," Maritz countered. "Apple thinks this is a distinct market from PCs, but we think in the initial phase there must be a high degree of commonality with the desktop for two reasons. First, the people who are likely to buy [PDAs] also correlate highly with people who use PCs, and second, people will want to share information with their desktop system.

But while Apple and Microsoft vie over marketing prestige, EO will likely be the first out of the gate with a live personal communicator when it starts shipping its product in May.

On a roll

For all the hype they're getting, PDAs are still a twinkle in some vendors' eyes. But that is changing. While voice currently represents the major wireless growth market, data-oriented applications should take off in two years, according to The Yankee Group. The research firm estimated that there will only be about 2,000 users of PDAs this year but expects that number to swell to 1.8 million by 1998.

Lindquist

CONTINUED FROM PAGE 39

And some users are complaining that the features that would have allowed MS-DOS 6.0 machines to act as clients on a Windows for Workgroups network were removed from the shipping product. Microsoft says the functionality will be provided in a separate product and that it was removed because corporate customers didn't want users messing with it. But some beta-test users think it just wasn't stable enough by the release date.

The advent of MS-DOS 6.0 certainly won't attract everyone, and one developer noted on a bulletin board that he was looking to get a copy of MS-DOS 2.0 on which to test his new software product before shipment. A couple of people offered to help, but one person offered some advice: "If someone is using DOS 2.0 they aren't BUYING any new software. You are wasting your time."

Someone should do a study on the effect of display electromagnetic fields on the brain cells that control the sense of humor. Here's the latest word on what IBM will stand for now that Louis Gerstner is in control: Itsy-Bitsy Machine Corp. And that one came from the OS/2 conference.

One other thing: A while back I reported a (wholly unscientific) finding that the number of OS/2-related messages on bulletin boards was catching and even surpassing the number of Windows messages. That trend seems to be reversing itself. Stay tuned for more information as it becomes available.

You have to love Seattle. Seems everyone I've met, including a cabbie, knew Bill Gates "back when he ran a two-bit company." No one may know you when you're down and out, but when you're a recently engaged billionaire, everyone does — and is glad to tell people about it. If you have anything to tell, lob me a message via MCI Mail at 549-8464, CompuServe at 72360,2005 or Internet under christ@netcom.com.

Lindquist is a *Computerworld* West Coast correspondent.

IBM's Corrigan

CONTINUED FROM PAGE 39

It's used exclusively in our RS/6000, and it's one of the best ways we know to make multiple bus mastering and connections within a structure. We will continue to support it. It's clear that a lot of our customers didn't need it. Some of the things that were only able to be done in a Micro Channel environment will be done by [Intel Corp.'s] Peripheral Connect Interface, so we'll support that and support PCMCIA.

Q. Where does the information systems manager fit into your hierarchy?

A. It's our dominant customer. The role of the IS manager is a lot more critical than it was before. Companies are starting to realize how critical they are and how if you're not careful, the rightsizing environment can become a capsizing environment. Somebody needs to be the architect for the system that's being installed in a downsizing environment, and that's the responsibility of the IS manager.

Lotus challenges Excel

CONTINUED FROM PAGE 39

for spreadsheet of choice because it's very structured. It will be a handy tool for certain applications, a niche product. I couldn't see adding those same kinds of capabilities to conventional spreadsheets without creating a klunky product," Gasteiger said.

Nevertheless, a variety of add-on packages provide 1-2-3 and Excel users with many of Improv's analytical capabilities without requiring them to adopt a new spreadsheet format.

> At a rate of 125,000 units per month, it would take about 13.3 years for Improv to match the installed base of 1-2-3, which has 20 million users.

For example, Sniper Corp. in Warren, N.J., Objective Software, Inc. in Redwood City, Calif., and Arbor Software Corp. in Santa Clara, Calif., all provide databases specifically designed to integrate spreadsheets by storing values in a table on a database. These values can then be displayed in either 1-2-3 or Excel spreadsheets.

Bristol-Myers Squibb Co. uses Sniper's TM/1 Perspectives to roll up spreadsheets created across the organization into a central resource for analysts of the data. "The data is actually stored in tables on the database so sharing becomes easy. TM/1 will support up to eight dimensions, but we usually only use about seven," said Tom Boccellari, manager of budget systems.

Boccellari noted that like most sites, his company supports a variety of spreadsheets. "We're a Lotus shop, but I'm an Excel bigot," he said. Thus far, he has noticed that users who have opted to go to Windows and who favor Apple Computer, Inc. Macintoshes have purchased Excel, while DOS users overwhelmingly prefer 1-2-3.

"But we're still in the very early stages of moving to Windows, and a lot of the DOS people will probably want 1-2-3," Boccellari said.

Ultimately, Boccellari added, the need for a larger database to support the sharing of spreadsheet data may cause him to investigate replacing TM/1 Perspectives with a larger relational database engine such as the SQL Server from Sybase, Inc.

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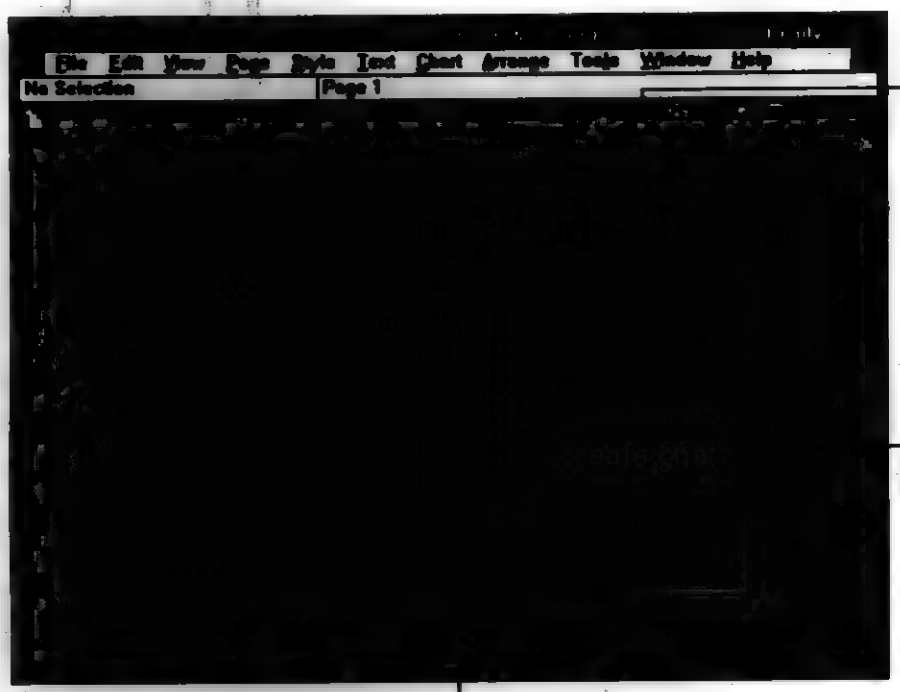

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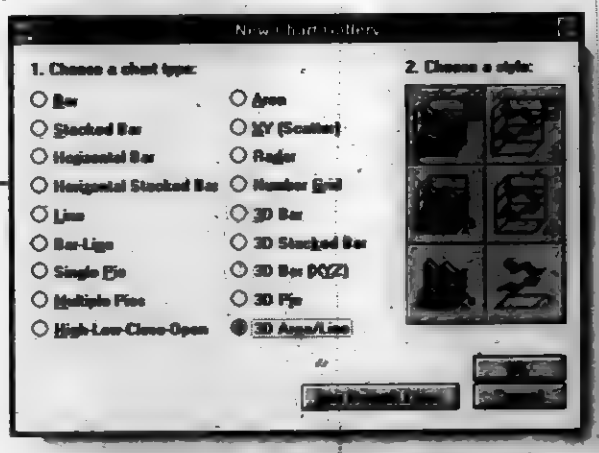

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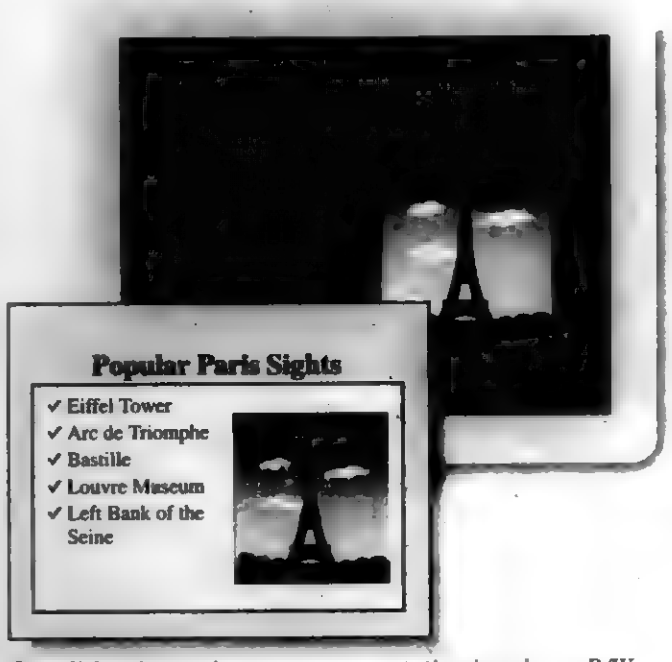

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Systems

Leading Edge Products, Inc. has introduced the N4/SLC-25, a 486-based notebook computer.

Preinstalled software includes Microsoft Corp.'s Windows, MS Works for Windows, MS-DOS and McAfee Associates' Viruscan antiviral software. Standard features include a 486SLC, 25-MHz microprocessor, 80M-byte hard drive, 4M bytes of memory upgradable to 8M bytes and a 1.44M-byte, 3½-in. single floppy drive, according to the company.

The system offers 256K bytes of video memory on the motherboard, and it has a Super VGA video controller that supports 640- by 480-pixel resolution with 64 shades of gray.

The N4/SLC-25 costs $1,799.

▶ *Leading Edge Products*
117 Flanders Road
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Software application packages

Physiotronics Corp. has introduced Sherlock 1.1, software for IBM PCs running Microsoft Corp.'s Windows 3.1.

According to the company, the software provides an intuitive and visual filing and retrieval system for both individual and network users.

Sherlock's features include automatic launching of the correct application and the selected document; eight optional fields that categorize files by document type, contact and keywords; and instant retrieval of saved files using a "best fit" look-up including string/word/sentence search.

Novell, Inc. NetWare compatibility with user-assignable network rights for files and folders is also provided.

Sherlock costs $249.99 for single users and $695 for a five-station local-area network pack.

▶ *Physiotronics*
135 W. 52nd St.
New York, N.Y. 10019
(212) 887-9555

PowerSolutions for Business has introduced PlanMaker, business plan software.

The program offers financial forecasting and word processing capabilities in addition to three completely written business plans in memory.

Sample plans can be browsed, imported, excerpted and edited into the user's own business plan, according to the company.

PlanMaker is available in both DOS and Apple Computer, Inc. Macintosh-based versions. It costs $129.

▶ *PowerSolutions for Business*
1920 S. Broadway
St. Louis, Mo.
(314) 421-0670

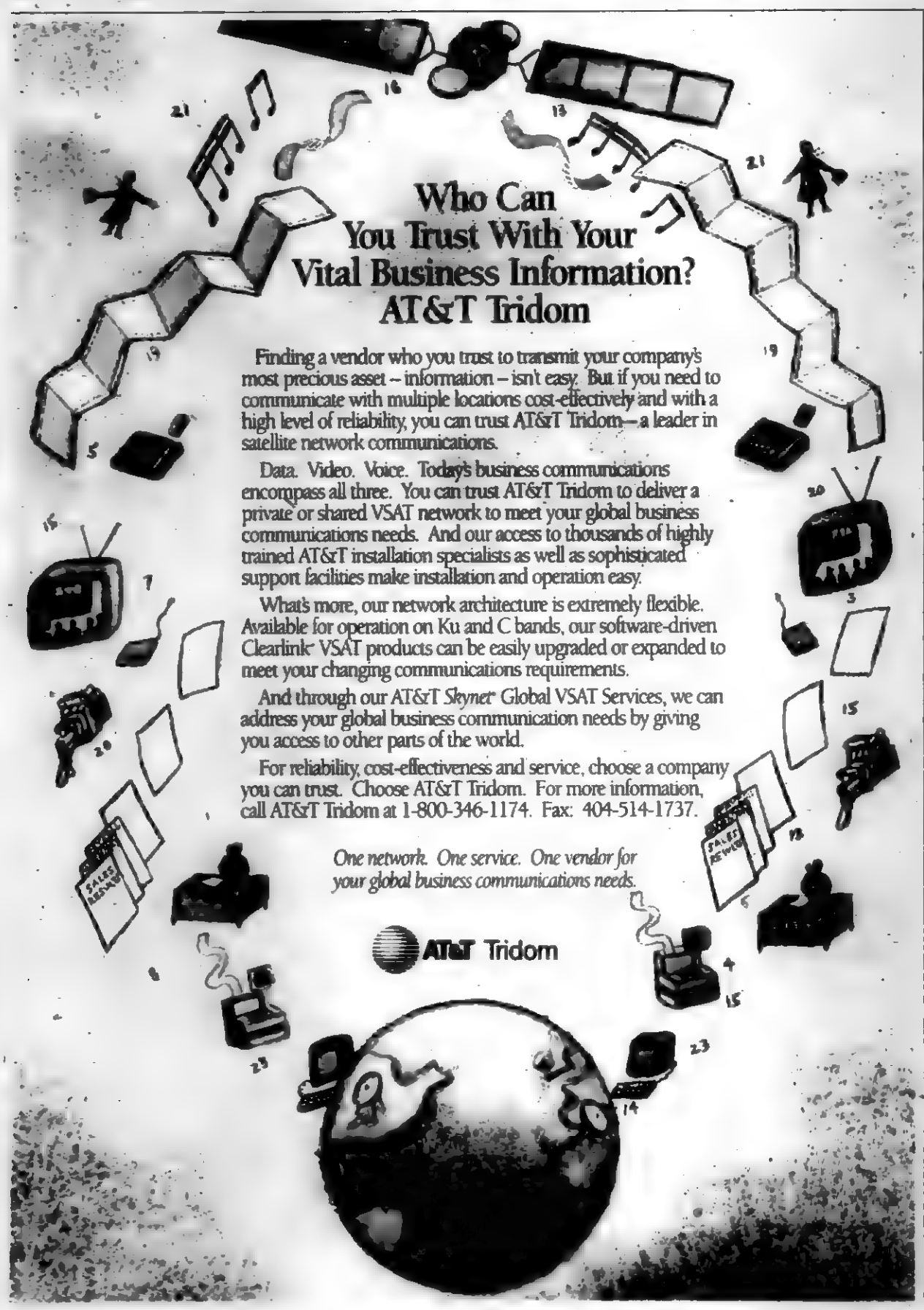
Peripherals

Fujitsu Computer Products of America, Inc. has introduced ScanPartner Plus, a desktop document imaging system.

ScanPartner Plus comes bundled with three software packages: ScanPartner Plus for DOS/Windows unites ScanPartner 10 with Compulink Management Center, Inc.'s LaserFiche MinuteFile for an entry-level desktop management system; ScanPartner Plus for a Sun Microsystems, Inc. workstation combines the Fujitsu ScanPartner 10 and Xerox Imaging System, Inc.'s ScanWorX software; and Blueridge Technologies, Inc.'s Optix software is for Apple Computer, Inc. Macintosh users.

ScanPartner Plus costs $2,495.

▶ *Fujitsu Computer Products*
Products of America
2904 Orchard Pkwy.
San Jose, Calif. 95134
(408) 432-6333



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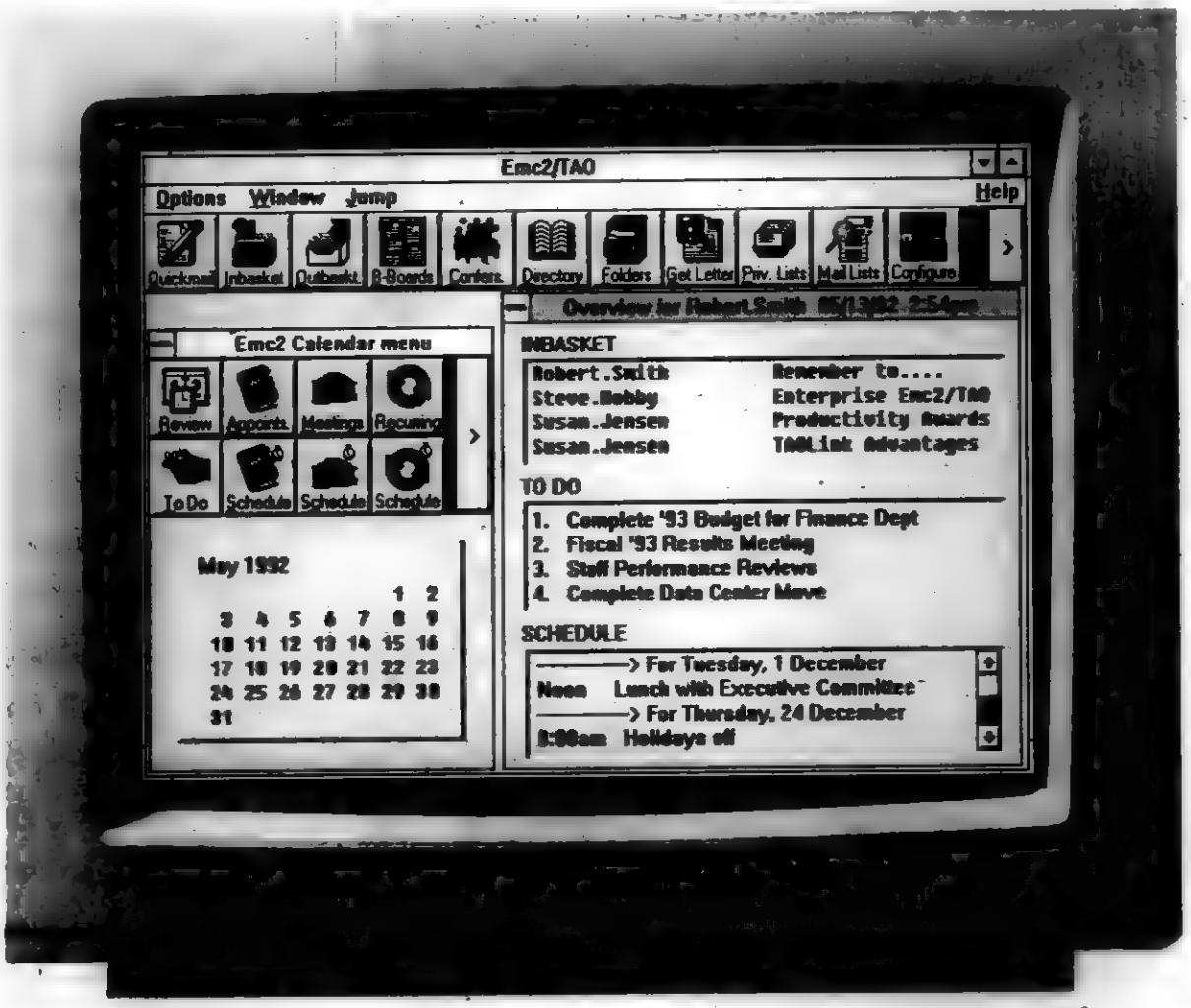
E-Mail For Both Mainframe And LAN Is A Huge Headache...



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Ethernet cards promise speed

Parallel processing enables simultaneous data transmission, reception

By Lynda Radosevich

■ Unwilling to commit to expensive and emerging high-bandwidth local-area networks, some companies are turning to the latest generation of Ethernet cards to solve a number of networking problems.

Problems solved include freeing up bandwidth by moving data packets on and off the wire faster, freeing computer memory and providing a stable, fast network for running Microsoft Corp. Windows applications.

The cards use parallel processing technology that allows an adapter to transmit and receive data packets at the same time. The result is performance increases of up to 50% for costs of approximately $200 per card.

While non-Ethernet networks such as Fiber Distributed Data Interface (FDDI) offer faster data transmission rates, costs average about $1,500 per node. And emerging networks such as 100M bit/sec. Ethernet and Asynchronous Transfer Mode are not yet stable and standardized among vendors.

The Grumman Space Station in Reston, Va., part of Grumman Corp., is using parallel tasking Ethernet cards from 3Com Corp. in its Novell, Inc. NetWare-based file servers because "we've gone to great expense to put in high-performance disk controllers and hard disks and wanted to match that performance on the network," said Terry Price, senior network engineer at Grumman.

Price said he saw typical network throughput jump from roughly 500K bit/sec. to 800K bit/sec., and end users saw their applications load faster. "In standard Ethernet technology, there is always a bottleneck because there is more than one device waiting. What we're trying to do is get packets on and off the wire as fast as possible," he said.

New Ethernet cards can transmit and receive data at the same time.

- DEC: EtherWorks 3 Turbo 16-bit adapter for Extended Industry Standard Architecture (EISA) machines. The cards work with Novell's NetWare, Microsoft's LAN Manager, Banyan Systems, Inc.'s Vines and DEC's Pathworks. Prices start at $155 per card.
- 3Com: 16-bit XT/AT bus Etherlink III card, shipping since August 1992. 3Com recently announced a combination adapter XT/AT bus card, a 32-bit EISA and a 32-bit Micro Channel Architecture card. Priced between $499 and $349, the cards come with drivers for NetWare, LAN Manager, Vines and Pathworks.

While Price said he would like to supply all end users with the new Ethernet cards, budget constraints allow him to equip only the servers. Furthermore, tight budgets also preclude his installing FDDI cards at users' desktops, although he is considering an FDDI backbone.

"It's a cost vs. return issue. If it takes a person 15 seconds to load [Microsoft] Windows vs. 30 seconds to load Windows, how do you put a price on that?" Price asked.

For Davis & Co., a law firm in Vancouver, British Columbia, installing parallel processing Ethernet cards is part of a larger effort to assure network stability before the company moves critical applications off its Digital Equipment Corp. VAX machines.

"Now the hardware is so solid in terms of stability, we've got to match that" on the LAN, said Shirin Karmali, systems manager at the law firm. "Currently, we have 99% uptime. We want to make certain that the LAN's physical performance isn't an issue because we know we will have Windows software issues, and we want to focus on those."

Karmali said she was "blown away" by the performance of parallel processing Ethernet cards from 3Com running over Category 5 unshielded twisted-pair wiring. She had considered a fiber-based network but found the costs prohibitive, she said.

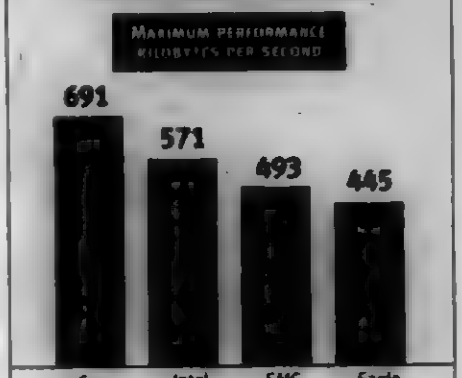
"For the time, we are going with the fastest 10M bit/sec. Ethernet we can" for a 140-person network, Karmali said.

Improved memory allocation led Texaco's Neches Chemical Plant in Port Neches, Texas, to choose parallel processing Ethernet cards from DEC. The plant will purchase the cards for 150 new installations and gradually replace older cards, according to Sam Desmond, information systems programmer.

The cards' 2K memory mode option, shared memory and dynamic buffering let Neches Chemical load network drivers in a PC's high memory, freeing up conventional memory for applications. "This affects the end user because there were a few programs that wouldn't run under Windows because of our network drivers," Desmond said.

Faster networks

Parallel processing technology in 3Com's Etherlink III adapters gets data on and off network cables faster than traditional Ethernet cards



Note: Adapters were tested in both client and server XT/AT-bus, Intel 1486 PCs running under Novell NetWare v3.11 over twisted-pair cabling at constant network loads.

Source: LanQuest Labs — CW Chart: Jonell Genovese

Chase banking on Notes to reach customer desktops

By Michael Vizard
NEW YORK

Coinciding with the release of Version 3.0 of Lotus Development Corp.'s Notes, The Chase Manhattan Bank NA has begun a project to extend the use of Notes beyond its borders by delivering financial information to its customers via Notes.

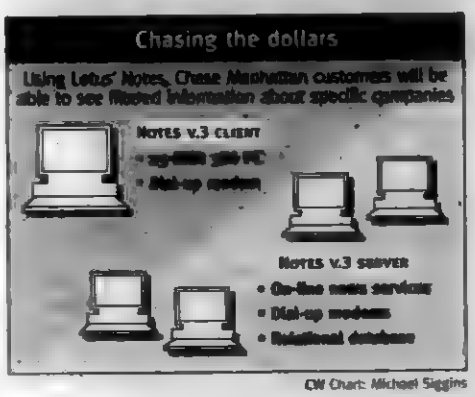
Enabling this project is the selective replication services that Lotus has added to Notes 3.0. This feature allows users to download portions of a Notes database instead of an entire copy of the database.

"Now we can have just one database for an application, rather than having to maintain multiple databases," said Michael Mandelbaum, the Chase vice president assigned to assess what it will take to implement the project.

Within Notes, replication is the primary tool for transferring documents and information. This capability merges changes made to a specific Notes database with the latest database entry serving as the main document. All other previous attachments made to a Notes database are then viewed as response documents.

Chasing the dollars

Using Lotus' Notes, Chase Manhattan customers will be able to see filtered information about specific companies



CW Chart: Michael Siggins

By adding support for selective replication, users no longer need to transfer an entire copy of a Notes database from the server to their system. As a result, it is now feasible for Chase to consider installing Notes at its customer sites as an information delivery vehicle.

"It could be quite a competitive advantage if we could get customers' information quickly in a format they can analyze," said Craig Goldman, Chase's senior vice president and chief information officer.

Notes is already used at Chase to create an environment where information is delivered directly to desktops in a timely manner.

"Notes creates a whole new attitude for the IS department. In the past, IS was always focused on the back office. With Notes, you can focus on the front office," Goldman said.

Front-office activities at Chase, where bank employees interact directly with customers, are the company's front line, and Goldman said getting information systems people on that front line alongside business executives is his primary mission.

To accomplish that goal, Chase needed an application development environment that would let its people react quickly to new business opportunities.

"With Notes, you can develop applications in days that previously, if they were at all possible to do, would have taken months and years. And it's pretty easy to learn, so you can turn around people who are used to 3270 Cobol-crunching

Chase, *page 49*

ON SITE

Chase Manhattan Bank
New York

Challenge: To decrease the time it takes financial services customers to receive information from Chase traders.

Technology: Lotus' Notes 3.0, with its selective replication feature, enables Chase to send documents directly to a customer's desktop PC. Chase has 2,700 employees on the Notes network.

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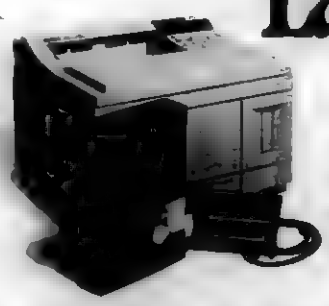

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Client/server medicine can be bitter pill

By Maryfran Johnson
FRAMINGHAM, MASS.

If all was well with *Computerworld*'s client/server conversion, this story would be written and edited on our new system.

Alas, it is not. These words were conceived and executed on a dumb terminal tethered to our old Atex publishing system, which is running on a tired Digital Equipment Corp. PDP-J11.

Computerworld's open systems migration is now many months overdue and we are still struggling, most recently with a series of inexplicable network failures that seem to be the fault of the way vendor Atex, Inc. had implemented the PC/Network File System (NFS) connection from writer clients to the pair of RISC System/6000 servers.

"This is a very frustrating time right now," said Paul Gillin, *Computerworld*'s executive editor. "We had hoped to move all the writers over in October 1992, but because of some nasty technical and reliability problems, we still can't."

There are specific problems with queue management — the way we file and keep track of stories — that are apparently related to using an MS-DOS file system in a Unix server configuration.

What's in a name

One weakness of the new file structure is that multiple files can have identical names and can be scattered throughout a variety of subdirectories. That could lead to the wrong version of a story slipping through to publication.

"We need to impose new procedures for file naming," Gillin said. "That's another training issue."

Our information systems department is also less than thrilled these days with support and service from Atex, the Billerica, Mass.-based publishing software vendor that is developing the package we are using. Atex changed ownership three months ago, and the resulting management upheaval left *Computerworld* managers feeling less than special.

"It has been interesting to live through this transition," Linda Nelson, *Computerworld*'s vice president of IS, said wryly. The engineers who were once available to answer our questions, for example, are no longer allowed to deal directly with customers, she noted. And Atex's support department was in a confused state for weeks as it awaited the appointment of a new director.

There have been delays of up to six weeks to get an answer from Atex about specific bugs or problems with the software.

"There seems to be a sense from the Atex people that once our redesign was finished and our copy desk was up on the new system that we were done," Nelson said. "But we're far from done."

The worst of our recent troubles occurred in the aftermath of a severe mid-March blizzard, which sparked concern in our IS department about power surges that could damage our database. So both of our RS/6000 servers were turned off, which provoked a peculiar dual failure in the Small Computer Systems Interface I/O controller, Nelson explained.

Once the servers were brought back up, the disk mirroring and High Availability/NFS software on the RS/6000s no longer worked. No one knows why. And while Atex and IBM have worked hard with the IS department to resolve the problem, both companies seem to feel the other vendor is ultimately responsible.

Computerworld's Linda Nelson: *'We're far from done'*

Atex officials acknowledge the obvious: There are still problems to be worked out for *Computerworld*.

Al DePalma, the new director of customer support at Atex, maintained that those problems are more in "communication and expectations" than anything else.

Some of the Atex vs. IBM finger-pointing is essentially *Computerworld*'s own version of "Welcome to the world of standard platforms," DePalma said.

Staff writer Lynda Radosevich was one of the people caught by our now-infamous "network connection lost" problem when her new 80386-based PC froze without warning during an important telephone interview.

"Working on the new system is like owning a marvelous new guitar that promises to let me create more melodious music — but the strings keep snapping when I try to play," Radosevich said.

Still, there are a few courageous staff members who persist in using their PCs for something other than playing solitaire under Microsoft Corp.'s Windows 3.1.

"What's really great for me with the new system is the ability to sit in my cubicle and log onto the Internet and also onto Decuserve — the user network for the Digital Equipment Computer Users Society," said senior writer Melinda Ballou.

James Connolly, technical sections editor, is doing about one-fifth of his work on the new system now. "But there are still significant problems with our hyphenate-and-justify function and with moving files around," he added.

No one mentions any cutover dates anymore or talks about when *Computerworld* will unplug the DEC PDP-J11 minicomputers that have anchored our data center for years. So many months have elapsed since the writers were trained on the new PCs that retraining classes are almost certain to become necessary.

"I still believe there will be big benefits in moving to open systems, but it's a colossal pain getting there," Gillin said. "The real benefit will be the choice of hardware and software you can bring in. Who's writing software anymore for PDP-11s?"

Chase Manhattan

CONTINUED FROM PAGE 47

applications," Goldman said.

"The challenge for us is: How do you turn around developers, secretaries and senior analysts and make them first-class citizens in a client/server world?" Goldman added.

One of Chase's premier Notes applications is a service that tracks reports from investment services such as Moody's and Dow Jones. If these reports on individual companies differ from the analysis created by Chase's people, the account representative is automatically flagged using code developed at Chase. Once the reports are reviewed, changes and explanations regarding those companies are then posted in a file that can be accessed by any member of the company.

Chase started using Notes in 1988, when the financial services market was experiencing a downturn. Knowing that Chase was more receptive to fine-tuning its products in a downturn, Goldman proposed retooling the bank's IS functions to give its personnel an edge over competitors by allowing them to share information easily across a network of PCs.

Chase began building the infrastructure to adopt a client/server environment that would deliver information directly into the hands of end users. And by 1990, Chase had established a "center of excellence" for Notes application development headed by Mandelbaum.

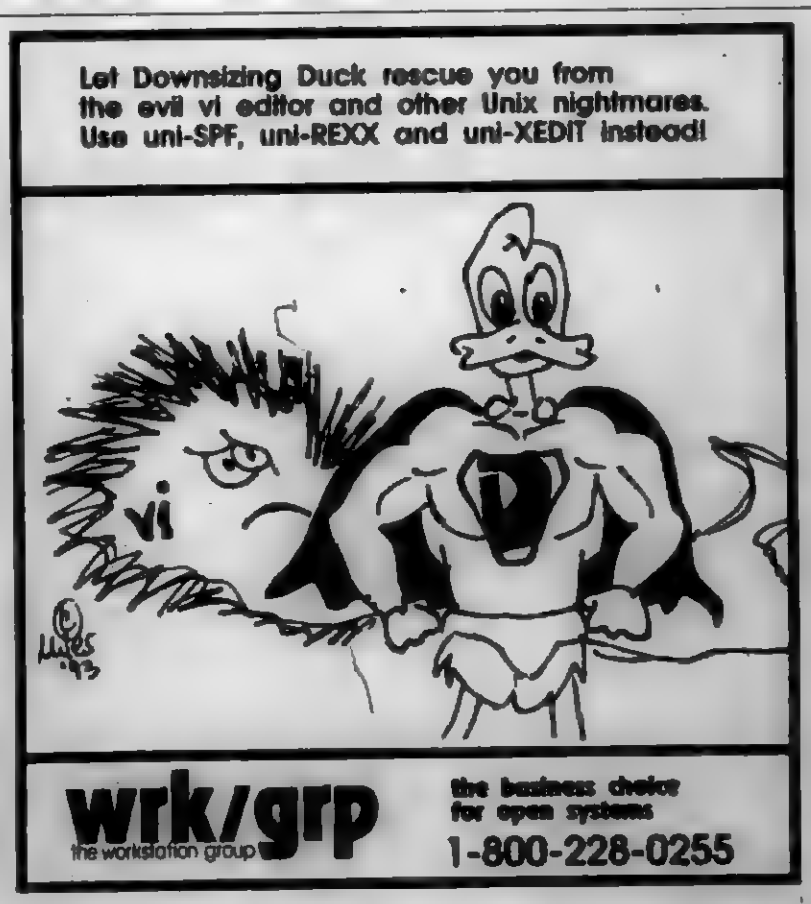
Chase has one of the industry's largest distributed networks, and 2,700 Chase employees use Notes to share information across that network worldwide.

Collaboration is key

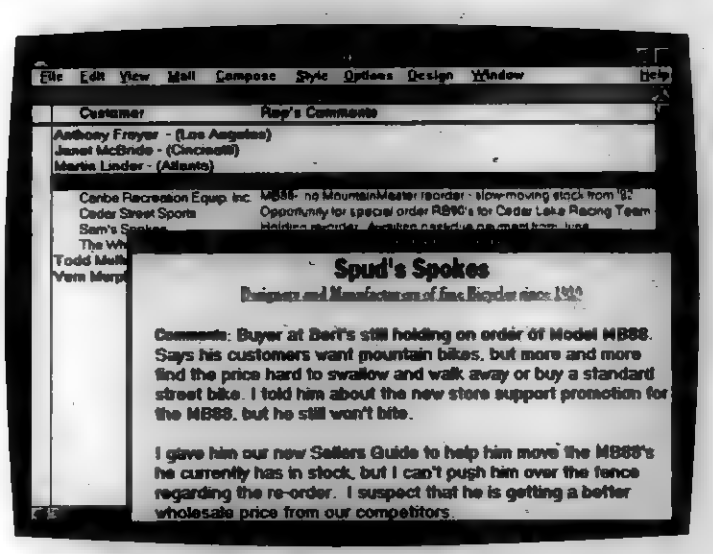
Because Notes provides a collaborative environment where widely dispersed people can interact with one another, Goldman said, Chase has come to rely on the Notes database for applications that the bank previously would have deployed on PC databases running on Novell, Inc. NetWare servers.

"The collaborative stuff gives you an incredible amount of intangible benefits from Notes," Goldman said.

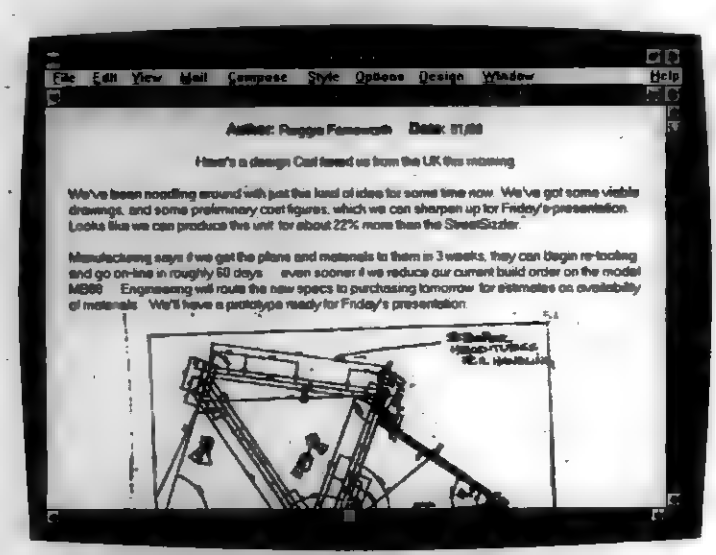
Because of these intangible benefits, Goldman said, the traditional return-on-investment analysis does not apply to Notes. "You could probably compare Notes to other systems, but how do you compare Notes applications to applications you could not previously have built?" he asked.

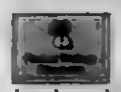


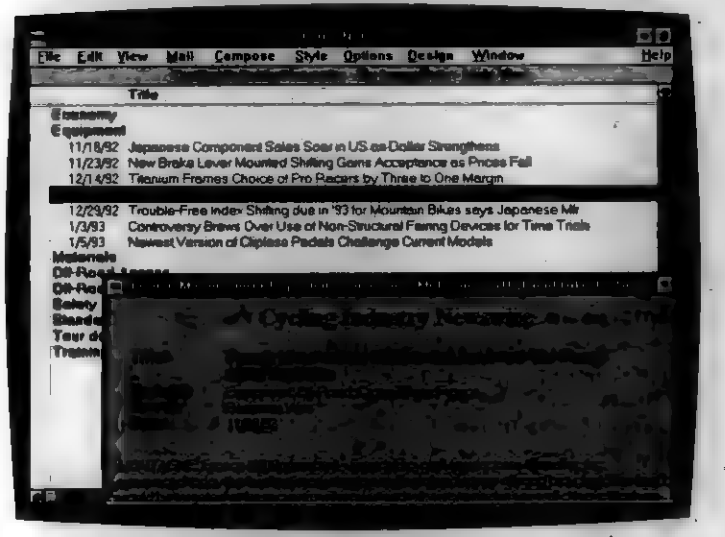
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5.  The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

See how she accesses, tracks, shares and organizes information in ways never before possible. How

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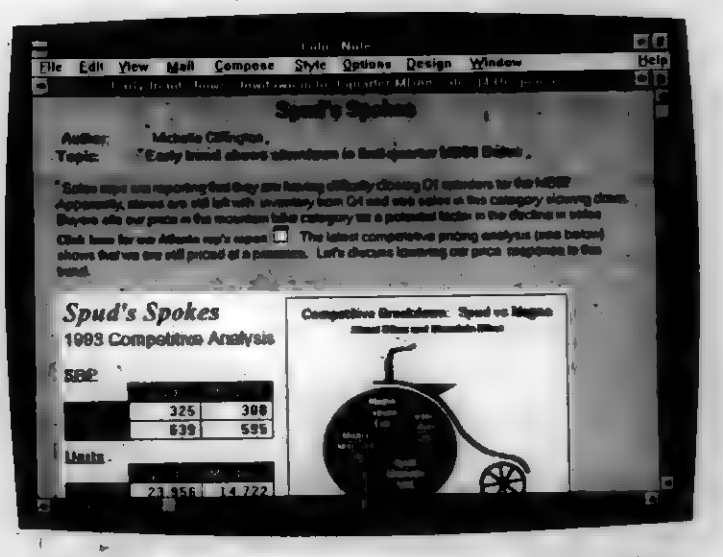
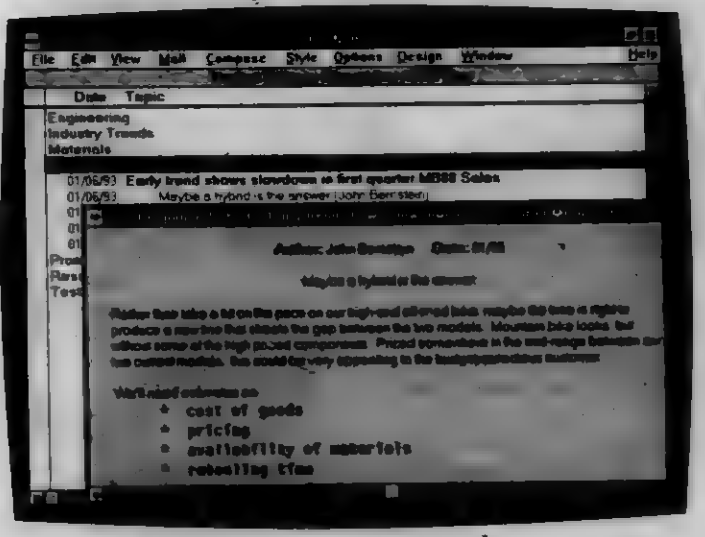
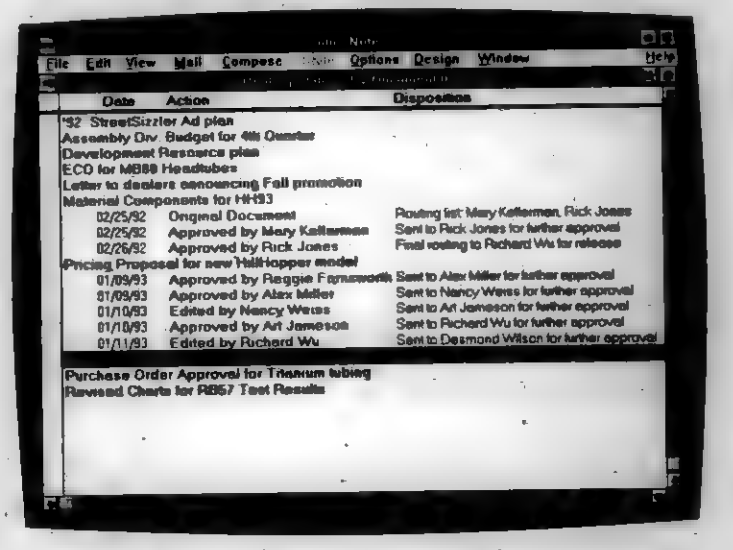


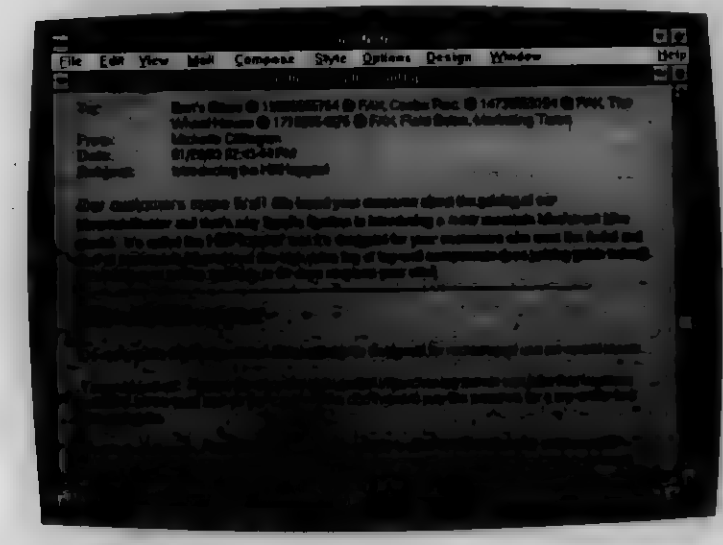
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

effortlessly people use Notes to respond and move the project forward.

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Imaging, work flow expand at JC Penney

By Ellis Booker
DALLAS

To help handle significant growth in its life insurance unit, JC Penney Co. will deploy this summer an electronic document imaging and work-flow system, *Computerworld* has learned.

The system, from New York-based Image Business Systems Corp., uses IBM RISC System/6000 Unix servers and Microsoft Corp. Windows clients. It will initially support 250 customer service representatives at the insurance group's facility in Plano, Texas.

But the installation will likely grow to nearly twice that size, said David Evans, vice president of information systems at JC Penney.

Few large imaging sites

If it reaches 450 seats, JC Penney's facility would be among the largest 100 imaging systems in the country. According to IDC/Avante, a market research firm specializing in imaging and work-flow software in Framingham, Mass., only 75 imaging sites in the U.S. last year were in the 400-workstation range.

The deal would also be one of Image Business Systems' five largest from among its 35 customers, most of which have applications supporting 30 to 50 image-enabled workstations.

Last year, the company made headlines with the announcement of a $10 million, two-year project to image-enable some 700 or 800 insurance claims clerks at Louisville, Ky.-based insurer Humana, Inc. [CW, June 22, 1992].

Evans said he visited Humana and awarded the competitively bid contract to Image Business Systems based in part on the success of that project. Humana officials reached last week confirmed that the effort to streamline

Imaging takeover

While paper is still the dominant 'work-flow' control medium at JC Penney, it is slowly being replaced by electronic imaging and software. "It's the ability to send records, to flash an image, to anywhere in the company," explained David Evans, vice president of IS at JC Penney. Imaging requirements have been a major catalyst in JC Penney's ongoing program to roll out 56K bit/sec. communications lines to its store locations across the country.

three service centers with imaging is on track, although they said only about 120 users have been put on the system so far.

"We probably won't be as big as Humana in any one place, but we might have large numbers of users in 10 or 20 locations," Evans said, adding that JC Penney plans to evaluate the July pilot with an eye toward putting Image Business Systems imaging in customer services operations elsewhere within the retailing giant.

Three of a kind

JC Penney already has two other imaging applications in production, both from TRW, Inc.

The first system, built in 1984 using a minicomputer and dedicated terminals, supports high-volume processing of credit-card remittance forms; the other application, a 2-year-old client/server system using Windows-based workstations and a Sun Microsystems, Inc. server, handles the processing of new credit applications.

According to Evans, while the new Image Business Systems application will manage a much lower volume of documents than the two TRW systems, it will offer significantly more sophisticated work-flow features.

"In the long term, we think it'll be critical to have image as part of an application and be able to control the work queues and work flow," he said.

The Image Business Systems deployment at JC Penney will be in three areas: claims, customer service and specialty insurance products. The vendor is deploying the systems in all three areas simultaneously.

JC Penney is specifically looking for an improvement in productivity to accommodate growth in business at JC Penney Insurance,

JC Penney's David Evans: *Imaging/work-flow system could reach 450 seats*

which posted income of $101 million last year, up from $79 million in 1991 and $55 million in 1990.

But JC Penney is also looking at extending the life of a series of CICS applications resident on an IBM mainframe by adding an imaging component and off-loading some portions of this application to the RS/6000 image server.

This points to the little-known fact that of all current client/server installations, the largest deployed applications are based on imaging. "IBS believes work flow will take the second position as the largest application to move to a client/server architecture," said Jim Tagliareni, IBS' senior vice president of operations.

Electronic mail

Intelligent Software Solutions, Inc. has released the Windows Pink Pad E-Mail System.

According to the company, the product will be bundled with the Windows Pink Pad Phone Messaging system. By using the Pink Pad format, incoming messages can be collected and forwarded and electronic mail can be sent across Microsoft Corp.'s Windows-based networks.

Features include automated reply to a received message, return receipt request, password protection, pop-up notification on receipt of a new message and built-in message-based backup and restore.

Seamless interconnectivity between phone messaging and E-mail messaging, drag-and-drop support, automatic deletion of old messages and the ability to track frequent callers are other features.

The Windows Pink Pad E-Mail System runs under Windows 3.1 on Banyan Systems, Inc.'s Vines, LANtastic, PC LAN and Novell, Inc.'s networks.

The product costs $199.99.

▶ *Intelligent Software Solutions*
3696 19th St.
San Francisco, Calif. 94114
(415) 552-4965

DG adds imaging options to Aviion

By Melinda-Carol Ballou

Data General Corp. announced low-priced imaging products for its Aviion family of workstations, joining vendors such as Wang Laboratories, Inc. and Digital Equipment Corp., which are also targeting this market in the U.S.

Dubbed AV Image and based on technology contributed from a range of third parties, the package includes the Win-Track Document Manager and AV Image Viewer. Two options, DB Links and AV Imagizer Toolkit, are also available.

Win-Track allows users to manage image documents or other application objects and lets them create documents and scan images. They can also index, delete, search, edit, mail and print the documents, officials said. The AV Image Viewer combines the ability to view files with tiled compression, which lets users see images without decompressing them. Users can annotate image files, although they cannot modify them, with AV Image Viewer.

AV Image is based on SQL and runs on Microsoft Corp. Windows-based PCs, Unix workstations with the Open Software Foundation's Motif or X Window System terminals linked to a relational database running on an Aviion-based server. AV Image supports Novell, Inc. NetWare or Transmission Control Protocol/Internet Protocol networks, with support for independent databases through the DB Link option. For environments with fewer than 20 users, AV Image supports a Borland International, Inc. Paradox database with file management located on the Aviion server.

DG will continue to work with Plexus and Recognition Equipment, Inc., as REI is a value-added reseller of DG equipment. Other third parties contributing to DG's suite of imaging products include TechGnosis, Inc. in Boca Raton, Fla., which provides the link to relational database management systems, for instance.

One Aviion customer who has signed on for the imaging products is Steve Di Pietro, chief of data management at Rhode Island Traffic Control.

"We're using it for all our projects at construction sites, for change orders and documentation and for correspondence to reduce paper," Di Pietro said. "Now we can track information rather than having to look all over for it. The product caught our eye because we could network across our mainframe to our Aviion systems."

One analyst said the move could be a good one strategically for DG but may not be without pitfalls.

While it is interesting that DG is providing an option for smaller numbers of Paradox users who are looking for a low-cost point of entry, the database is limited in terms of transaction throughput.

"How easy is it going to be to move to Sybase or Ingres? There's a desire to think that the world is simpler than it is. ... And it may be harder to get these products to all work together than they think it's going to be," said Scott McCready, a principal at IDC/Avante's imaging strategies group.

AV Image is priced at $695 per client/server user. DB Link is priced at $900, and the AV Imagizer Toolkit costs $900.

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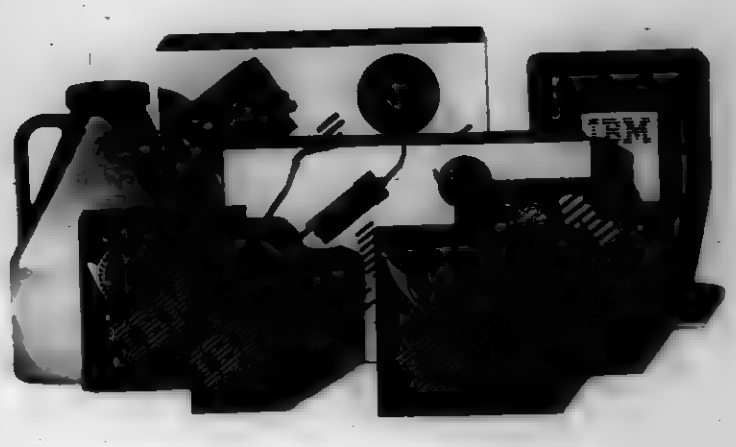

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Telecommunications

Alliance eyes global shopping

By Joanie M. Wexler

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Banks as a whole spent $2.1 billion in 1992 on telecommunications, according to Computer Based Solutions, Inc. The consultancy estimates that just 57 of the U.S.' 14,100 banks spent well over half of the banking industry's total technology dollars last year.

A worldwide alliance of telecommunications carriers is making significant strides toward its ambitious goal to erect a cohesive network infrastructure for delivering global one-stop shopping.

Earlier this month, a partnership of 12 carriers — dubbed the Financial Network Association (FNA) for the vertical market it will initially serve — chose Newbridge Networks, Inc. gear as its cornerstone technology. The installation of a consistent platform will facilitate the group's intent to deliver a single regional contact point for international voice, data and video service, as well as standard levels of global service, the association said.

The FNA was formed a year ago as the brainchild of MCI Communications Corp., and it just launched its network into alpha testing last month. Beta-test customers are slated to go on-line in June, with dedicated 56K/64K bit/sec. and T1 service to become available in September, said Ken Cownley, operational representative to FNA from Stentor Alliance, the Canadian FNA member carrier.

The FNA intends to initially target financial services companies because they make up one of the fastest globally expanding markets and run real-time applications that demand highly reliable facilities, said Joanne Hyland, FNA marketing chair.

"We do look for end-to-end connectivity in a vendor. That adds value, particularly in bringing new services to market quickly," said Jeff Marshall, senior managing director of communications at Bear, Stearns & Co. in New York.

"The real question, though, is what will be the [degree of] global connectivity and the price? Everything really ends up based on economics," he said.

John Wood, vice president of computer and network services at Royal Bank of Canada in Toronto, agreed. "The concept of one-stop shopping is real appealing, provided it is competitive cost- and service-wise," he said.

Royal Bank, an existing Stentor customer, will at least investigate the more far-reaching FNA "because we deal with multiple [telecommunications authorities] across the world, and we don't have experts in all those countries," Wood said.

And the prevailing protocols in different geographic areas vary, requiring protocol conversion and efforts that "make it hard to achieve cohesive end-to-end communications," he said.

Speaking from the bank-only perspective of the financial arena, Arthur Gillis, president of Computer Based Solutions, Inc. in New Orleans, predicted that "with a common infrastructure, banks would spend less money. Now, they're sloppy; they throw money away recklessly."

The vehicle by which FNA intends to deliver is the Newbridge equipment. The vendor's 3600 Mainstreet Bandwidth Managers — high-capacity multiplexers that conform to worldwide telecommunications standards — have been installed in each of the carrier members' central offices.

The FNA has named Stentor as the network control center of the global network. Stentor, which already cohesively manages nine regional phone companies in Canada, will use Newbridge network management software.

Other endeavors

Financial services is not the only industry with companies looking for cohesive network services and management serving several continents. Mast Industries, Inc. in Andover, Mass., the technology business unit of The Limited, Inc., communicates regularly with off-shore manufacturing sites and has been a member of the AT&T Asian Pacific Advisory Council for the past two years.

The purpose of the committee — and its European and South American counterparts — is to join AT&T with its worldwide customers in smoothing out round-the-world telecommunications service and management issues.

AT&T provides a single point of contact, said Ed Somol, chief information officer at Mast. However, management is not working very well right now "because we can see the first half of the circuit in this country, but [we or AT&T] may not have the leverage within the local phone company on the other side to see the circuit," he explained.

The Advisory Council is currently working with AT&T to provide "global account managers" with worldwide telecommunications expertise and contacts. These individuals would replace national representatives when companies begin requiring multinational services, Somol said.

—Joanie M. Wexler

Gary H. Anthes

Digital democracy

When Internet Society President Vinton G. Cerf was asked to testify at a congressional hearing on the Clinton administration's proposed "national information infrastructure," he sought advice from 150,000 colleagues.

He polled the Internet and got replies from 600 individuals in a dozen countries, and the replies formed the basis for 18 recommendations to lawmakers on the House Science, Space and Technology Committee.

Only time will tell whether any of the advice — which dealt with issues ranging from inter-

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IETF focuses on mixing TCP/IP, SNA

By Elisabeth Horwitt
COLUMBUS, OHIO

■ The recent meeting of the Internet Engineering Task Force (IETF) here saw the first steps toward the formation of IETF workgroups to figure out how to improve TCP/IP's ability to handle IBM's Systems Network Architecture (SNA) traffic.

Virtually all leading router vendors encapsulate SNA so that it can travel over Transmission Control Protocol/Internet Protocol (TCP/IP) backbones. However, such links can run into reliability, throughput and bandwidth allocation problems because TCP/IP and SNA use dissimilar methods for routing traffic across an internetworking backbone, said Cisco Systems, Inc. SNA product manager Wayne Clark.

SNA uses a connection-oriented internetworking approach that sets up an end-to-end route before sending the first packet. In contrast, TCP/IP uses a connectionless method that essentially plots the route each packet will take from one router node to the next, Clark said. Both methods have their advantages and disadvantages. For example, TCP/IP routers can change a packet's route on the fly, to avoid a link that just went down or react to changing traffic patterns, Clark said.

On the other hand, determining ahead of time the route each packet will take gives SNA internetworking devices the ability to guarantee that a packet will arrive by a given time. This is crucial for SNA, given that terminal-to-host sessions are terminated when communications are interrupted for more than a few seconds.

And unlike TCP/IP, SNA internetworking supports the ability to prioritize transmissions by type of application, ensuring, for example, that terminal-to-host sessions are not bumped off by a massive bulk file transfer.

The route of the matter

TCP/IP internetworks need the following improvements in order to handle SNA traffic effectively:

- **Route allocation** by class of service.
- **Congestion control.**
- **Ability to guarantee** transmission within a set time period.

Far from perfect

Router vendors have come up with ways to solve these problems, but there is still plenty of room for improvement, Clark said. For example, users have been complaining that prioritization schemes, which guarantee that SNA traffic gets the bandwidth it needs, can sometimes actually slow down response time, he added. This is because the schemes require

IETF, *page 57*

We've heard that someone actually paid for Microsoft e-mail.

It wasn't you, was it?

An unusual event is taking place in the software industry. The largest software company in the world is "selectively" giving away e-mail.

If you're considering buying Microsoft® Mail, you may wonder why you have to pay. If you've been offered "free" mail, you should wonder why you don't.

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Interestingly enough, a recent independent study[1] concluded that less than 10% of the cost of e-mail is the initial software investment. So before Microsoft convinces you that you're smart to make a strategic enterprise-wide decision based on 10% of the real stakes, consider what it will cost you once you've signed up.

Consider your "free" e-mail's back end. Then consider yours.

To accurately assess the other 90% of your e-mail investment, there are four key areas to consider.

First there are the back-end service costs. The design and administration tools required to run the system. The quality of these tools will impact hidden costs associated with disk storage and network bandwidth.

There are the infrastructure costs including minimum hardware configuration and platform changes.

There are connectivity costs associated with bridges and gateways to other systems.

And, of course, the people-related costs. Installation. Administration. And training.

Do the analysis yourself. Or just get some objective opinions.

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The basic idea of the mail is that it gets delivered. But Microsoft Mail is not designed to deliver efficiently across competitive operating systems. To the contrary, if anyone in your organization works, or wants to work, on anything but a Microsoft operating system, there's a potential problem.

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Bulletin boards

Federal agency becomes on-line broker

Gas pipeline companies required to post capacity information on electronic bulletin boards

By Mitch Betts
WASHINGTON, D.C.

The Federal Energy Regulatory Commission (FERC), which is radically restructuring the natural gas industry in hopes of fostering more competition and lower consumer prices, is counting on computer networks to make deregulation work.

In order for the free-market experiment to succeed, buyers and sellers of natural gas will need timely access to information about available pipeline capacity. So the FERC has required the gas pipeline companies to post that information on electronic bulletin boards.

In addition, the bulletin boards allow parties that want gas shipped from point A to point B to bid for unused pipeline capacity. Technically, the systems are more like an airline reservation system — in this case, reserving space in the pipeline — than a simple bulletin board.

Monopoly breakup

The industry restructuring was required last year by FERC Order No. 636, which substantially deregulates the industry and eliminates the monopoly that pipelines have enjoyed as sellers to utilities and other buyers. Instead, gas producers and buyers can deal directly with each other and then arrange for transport by the pipelines.

The FERC wants this whole new regime in place by October or November, in time for the winter heating season.

Parties on both ends *of the pipeline are clamoring for the FERC to mandate an information systems standard*

The big problem at the moment is that there is no standardization of the pipeline bulletin boards, so it is very difficult to electronically "troll" the boards to find the best deals.

Stuart Maudlin, an expert on pipeline bulletin boards and president of EnerNet Corp. in Houston, said each pipeline has developed different software packages for customers to use to access their proprietary bulletin boards. He said there are no standards for log-ons, data format or data content, so it is virtually impossible to automate the process of contacting all of the boards.

Standard search

Consequently, parties on both ends of the pipeline are clamoring for the FERC to mandate a standard for the information systems. The pipelines, however, told the FERC that their industry task force has nearly completed work on a standard for data content.

> Caution: Reservation systems can run afoul of antitrust laws if price fixing occurs on the network or if there is an 'architectural bias' that favors the company running the system.

That standard will be ready in time for the winter heating season, said Mike Martin, director of IS at United Gas Pipe Line, a Houston-based subsidiary of Coch Industries, Inc. The next step will be a standard access protocol, he added.

In addition, Martin pointed out that value-added network vendors such as IBM and General Electric Information Services, a Rockville, Md.-based unit of General Electric Co., are lining up to become "aggregators" of the data from the disparate pipeline systems.

To resolve the issue of standardization, the FERC recently ordered the industry to hold a series of informal conferences to nail down the standards for terminology, common data formats and communication protocols by July 1.

The Natural Gas Supply Association, a trade group for gas producers, wants the bulletin boards to not only have capacity data but also a wide variety of market data allowing parties to electronically locate supplies, arrange shipping, confirm deliveries and make payments.

Someday, such a full-fledged electronic marketplace for the natural gas industry will develop, observers said, but it may take a decade.

For one thing, it will require the natural gas industry to adopt electronic data interchange (EDI) standards, something the industry's independent-minded players have been very slow to do.

The natural gas industry is one of the last industries to embrace EDI, and actual implementation has been negligible, witnesses told the FERC at a Feb. 26 technical conference.

In addition, the industry is in such a state of turmoil from deregulation that parties will cling to person-to-person transactions they can trust, Maudlin said.

A completely electronic marketplace will have to wait until "the earthquakes subside and natural gas becomes a well-defined, stable commodity," he added.

IETF focuses on mixing TCP/IP, SNA

CONTINUED FROM PAGE 55

that transmissions go to a higher level of the protocol stack, which carries more overhead, Clark said. Cisco is revamping its prioritization scheme to deal with this, he added.

Potentially, the IETF could provide a "neutral ground" where leading router vendors — particularly IBM and Cisco — could hammer out standardized ways of providing more effective SNA-over-TCP/IP routing, Clark said.

> The IETF could provide a 'neutral ground' for leading router vendors to work on providing standardized SNA-over-TCP/IP routing.

Cisco originally invited IBM to get into such discussions within the Advanced Peer-to-Peer Internetworking (APPI) Forum, which is working out ways to support IBM SNA and Advanced Peer-to-Peer Networking (APPN) devices over an existing TCP/IP backbone. However, with APPI essentially competing with APPN and IBM routing protocols such as Data Link Switching, IBM has not joined the forum.

Cisco has proposed forming an IETF working group to develop a standard for routing SNA over TCP/IP based on IBM's Data Link Switching protocol. IBM and other router vendors are now considering the proposal.

Such a rapprochement would please many users, who were frustrated by the battle of SNA-over-TCP routing protocols that the two vendors staged at the recent Interop '92 Spring [CW, March 15].

Also at the meeting, two IETF working groups were formed to develop management information bases for managing SNA devices via Simple Network Management Protocol.

Another birds-of-a-feather session discussed how to provide TCP/IP-based quality of service that would support, among other things, "guaranteed deterministic delivery" of packets. This would enable TCP/IP networks to handle video and also make them more suitable for SNA, Clark added.

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Telephone network

Local-loop competition is here

By Ellis Booker

The debate over whether competition will come to the local-loop portion of the telephone network is over. New technologies, including wireless — along with a broad-based deregulatory impulse among federal and state regulators — has settled the question.

The real question, according to a recently released study by The Insight Research Corp. in Livingston, N.J., is "how efficiently competition comes to the local loop: Will the participants cooperate through joint ventures, for example, or fiercely compete through their lawyers?"

The seven regional Bell holding companies appear to accept the inevitability of local-loop competition, Insight suggested, pointing to their efforts to reshape themselves.

State barriers fall

Just last month, for instance, Chicago-based Ameritech issued a plan to do away with its five state-level telephone companies and replace them with 11 business units organized around customer markets and technologies.

A 12th unit will provide switching and transmission facilities to the other units and, presumably, to future competitors in the local loop.

But as the Insight study makes plain, there is no consensus among the regional companies as to the best way to position for local-loop competition.

Some are considering a strategy to split themselves into regulated and nonregulated halves, with the regulated entity providing basic transmission and switching facilities to all local-loop service providers.

In the works

Others may spin off major subsidiaries in hopes of being able to offer new kinds of services that in some cases are now closed to telephone companies. Pacific Telesis Group did this with its $1 billion cellular operation.

Yet another strategy, Insight said, is to extend cost-based pricing to all local-loop services and isolate services that are in the public interest. In this way, the cost of universal telephone service would be borne by all competitors in the loop.

According to Insight, these reorganizations are being driven by a handful of local-loop opportunities, including digital cellular radio, personal communications systems, interactive TV and video dial tone.

Insight predicted that these new services will grow 10.9% between now and 1998 compared with just 3% for traditional telephony services.

Alignment

According to Insight, a confluence of five trends is forcing competition among the telephone, computer and entertainment industries:

- Ubiquitous fiber-optic cable for low-cost wideband data services. By 1998, [illegible] will be [illegible] with video capability, and [illegible] brought directly into the home and office.
- Deregulation of the telephone industry.
- Advances in semiconductor technology, yielding new portable communication devices.
- Cable systems with 500+ channels, creating new markets and services.
- Personal wireless communications, bringing interactive and information services to millions of new users and creating markets.

In Brief

Internet navigation

Services to allow Internet users to better navigate their way around the sprawling network's resources recently emerged from **AT&T** in the form of free on-line directories and databases. The AT&T services are a component of **InterNIC**, a three-organization team providing network services to Internet, NSFnet and National Research and Education Network users. In addition to AT&T, InterNIC, announced last week, includes **Network Solutions, Inc.**, which provides registration services, and **General Atomics/CERFNet**, which provides information services.

Ericsson to resell Cisco routers

Telecommunications supplier **Ericsson, Inc.** will resell **Cisco Systems, Inc.**'s complete line of routers, as well as other Cisco internetworking products and software, in countries around the world.

NCD, Brixton Systems join forces

X Window System vendor **Network Computing Devices, Inc.** (NCD) in Mountain View, Calif., recently teamed with client/server migration software developer **Brixton Systems, Inc.** in Cambridge, Mass., to provide IBM 3270 emulation capabilities on NCD's X terminals and PC X server software.

Fore Systems ships T3 interface

Fore Systems, Inc. in Pittsburgh said the T3 interface module for its line of Asynchronous Transfer Mode local-area network switches is now shipping. The $14,900 module will allow users to link their ATM switches over T3 (45M bit/sec.) telecommunications lines.

Video channel technology coming

BroadBand Technologies, Inc. in Research Triangle Park, N.C., said at recent federal hearings on the nation's "information superhighway" that it will deliver to the phone companies in late 1994 technology that will allow them to deliver 1,500 interactive video channels for less than $500 per customer.

Xerox resells Chipcom hubs

Xerox Corp. is now reselling **Chipcom Corp.** intelligent wiring hubs throughout the U.S.

USAir taps phone/data supplier

USAir has chosen Oak Brook, Ill.-based **In-Flight Phone Corp.** to equip up to 402 aircraft with digital air-to-ground telephone and data services by year-end 1994.

Anthes

CONTINUED FROM PAGE 55

national trade policy to network protocols to rural U.S. libraries — will be heeded on Capitol Hill. But the process Cerf employed to prepare for the hearing is an extraordinary example of digital democracy — an electronic town meeting on a global scale.

Cerf sent an electronic-mail message to "Internauts and friends" on several distribution lists. A number of those receiving the message forwarded it to people on still other lists. Cerf said it is impossible to know how many on the 5 million-user Internet saw his message.

On their minds

Among the replies were the following:

- A student at the Thomas Jefferson High School for Science and Technology in Alexandria, Va., complained that there is much talk but little action on bringing national data network connections to schools.
- A U.S. military person in Somalia suggested the U.S. should leave its communication equipment, which is used to connect to the Internet, behind when it departs the country.

> "The government should keep its nose out of the private sector. There's nothing wrong with technology development or information infrastructure that government meddling won't make worse."
>
> — *Internet user*

In a similar vein, Nobel Prize laureate Joshua Lederberg noted, "You may feel like you are in a flood [of information], but people in the Third World are in a real drought."

- In a distinctly minority view, someone asserted, "The telecommunications and information infrastructure is much too important to be left up to normal market mechanisms. We never would have had the highway system, much less the Internet, if we had relied solely on the marketplace."
- But for the majority, another said, "The government should keep its nose out of the private sector. There's nothing wrong with technology development or information infrastructure that government meddling won't make worse."

Cerf said it took him just a few minutes to get his message out. The replies came in over four days, and it took him another 48 hours to read, digest and synthesize them in preparation for his testimony. He printed them all on paper to facilitate flipping back and forth among them, something he said technology cannot yet deal with effectively.

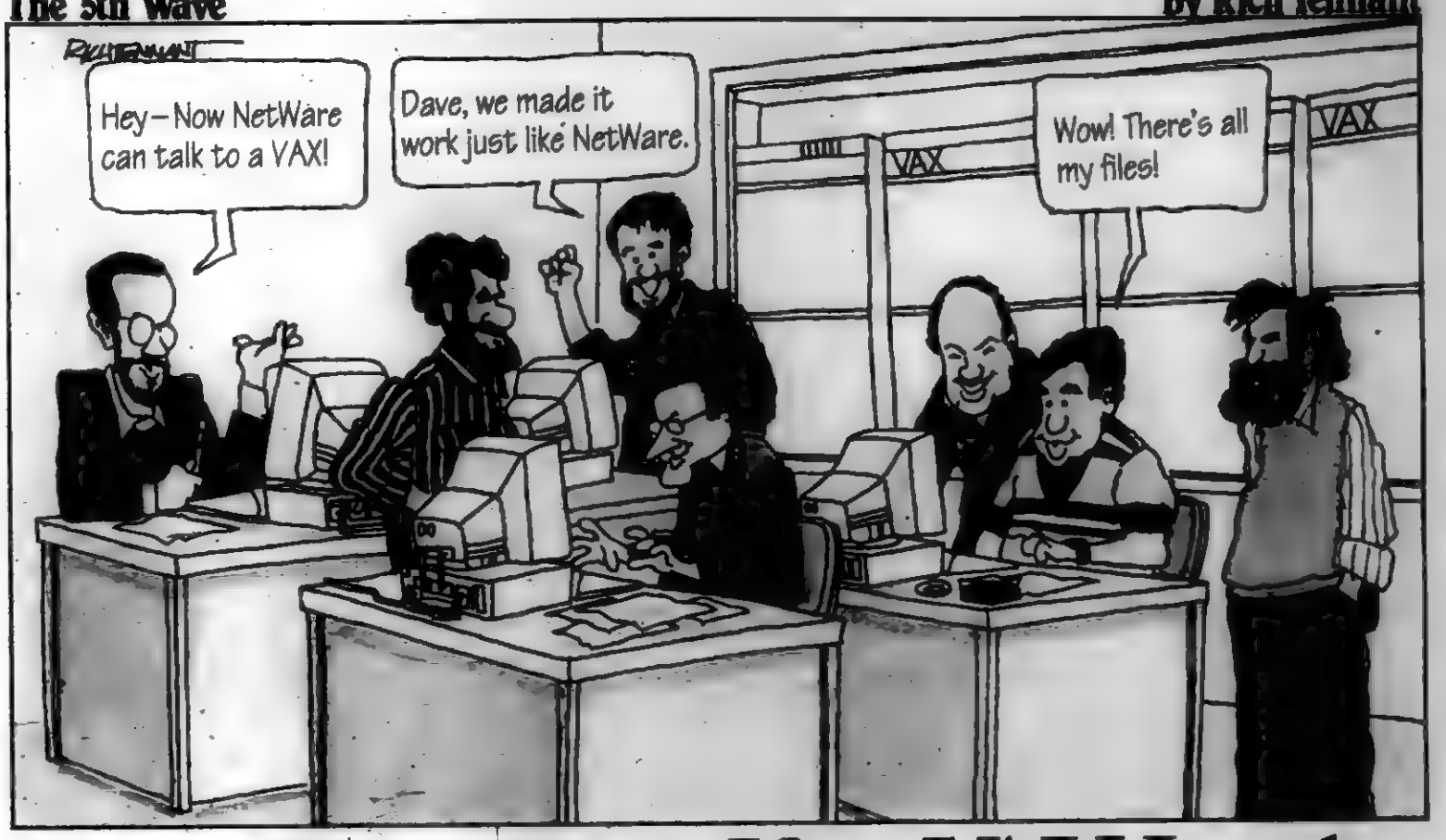
But, on balance, technology shone in this case. It is not simply that getting input from such a diverse user community would have been more difficult any other way; had Cerf been forced to rely on voice telephone or snail mail, the job would not have gotten done.

In his testimony, Cerf said an "infrastructure" is characterized by "ubiquity, expandable capacity, simplicity of use, applicability to many uses and broad affordability." That's what was so elegantly illustrated in this case and what is unique and wonderful about the Internet.

Here is a summary of Cerf's recommendations to Uncle Sam, by way of the Internet.

- Invest in the development of precompetitive information technology and standards.
- Ease restrictions on the export of encryption technology.
- Make Transmission Control Protocol/Internet Protocol coequal with Open Systems Interconnect in the Government Open Systems Interconnect Profile specifications.
- Support connection of libraries and museums to the Internet.
- Set up programs to train secondary schoolteachers in information technology. Foster the development of educational software.
- Mandate on-line access to government information; allow the private sectors to add value and resell it. Make all federal agencies accessible to the public via E-mail.
- Foster programs to support telecommuting and shared scientific databases.
- Encourage the deployment of Integrated Services Digital Network-based services.
- Avoid the creation of gaps between the information rich and poor.
- Do not subsidize network service providers; subsidize users where appropriate.
- Find a way to make advertising permissible and useful in the national information infrastructure.

Anthes is *Computerworld*'s Washington, D.C., senior correspondent.



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Product Evaluation

NetWare 4.0: Requires a lot of planning, but users say it's worth it for the enterprise management gains

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

Novell NetWare 4.0

- **NetWare 4.0 is an enterprise-oriented network operating system that departs from the single-server orientations of Versions 2.X and 3.X. As such, NetWare 4.0 requires a high level of preliminary systems planning.**
- **Evaluators were confident that NetWare 4.0 would allow them to consolidate and rationalize network administration tasks, ultimately reducing costs.**
- **Evaluators said NetWare 4.0 answers the need for enterprise networking. "The term 'local-area network' is now history," one evaluator said.**

After more than a year of anticipation, Novell, Inc. last month released its first major upgrade to NetWare, the undisputed standard in LAN operating systems.

NetWare 4.0, which underwent nearly a year of beta testing at corporate sites, is perhaps the biggest upgrade to the operating system since v3.11, which was released in February 1990. The reason? NetWare 4.0 extends the coverage of the network operating system from departmental and company-wide systems to the wider and more complex scale of enterprise networking.

For this evaluation of NetWare 4.0, *Computerworld* interviewed four information systems managers charged with testing and implementing Netware 4.0 throughout their enterprises. Prototypical users of the network operating system, these evaluators collectively manage nearly 37,000 NetWare nodes at more than 160 sites. Over time, they will oversee the deployment of NetWare 4.0 on about 1,000 servers.

But deployment will not come quickly. Despite the benefits that NetWare 4.0 offers to enterprise networking, these managers said the overhead of planning and implementing the network operating system is far more complex than a single-server installation and requires a substantial conceptual departure from NetWare's "bindery" concept of allocating network resources. Replacing it will be the hierarchical, enterprisewide NetWare Directory Services (NDS), the heart of NetWare 4.0.

All of this structural reorganization will take a great deal of time and planning, the evaluators said, especially at decentralized companies with large numbers of 2.X and 3.X servers.

This evaluation was conducted in mid-March. All the evaluators said they were working with the final best-test version of NetWare 4.0. The evaluators were drawn from the *Computerworld* product evaluation council. The survey was developed with Howard Rubin Associates and Technology Investment Strategies Corp.

Facts about NetWare 4.0

- NetWare Directory Services provides single-site management of multiple servers.
- Integrated network administration utilities.
- Built-in file and data compression.
- Embedded support for CD-ROM and optical storage.

Reliability

The evaluators said NetWare 4.0 has been stable since the October release of the beta-test version. With a variety of testbed environments, evaluators said there were no significant problems with the later beta-test versions of NetWare 4.0.

Accounting firm: "There were no failures that were show-stoppers."

Banking firm: "As we reported problems [with the beta-test version], they were cleared up very quickly."

Performance

Even with the addition of a new directory structure and real-time file compression, evaluators said NetWare 4.0 ran at about the same speed as v3.11. One evaluator reported that the initial log-on process was a bit slower, but applications ran at approximately the same speed on equivalent network servers.

Accounting firm: "It doesn't make sense to compare it to anything but itself because it's a whole new ball game."

Hospital: "We tested performance the old-fashioned way: a 3.11 server next to a 4.0 server. It took [NetWare 4.0] 20% less time to invoke the same application."

Insurance firm: "Better performance may be masked by the overhead [of new features]."

Banking firm: "We expected it to be slower than 3.11 in log-ons and because of the data encryption. There are things being done in the background that aren't done in 3.11."

Support

NetWare 4.0 beta-test users were provided with unusually rich support by Novell: Each was given access to a single Novell engineer to handle technical questions and problems. For typical NetWare 4.0 users, new on-line documentation and better technical manuals should answer many questions.

Accounting firm: "They sent out the NetWare 4.0 architecture manuals, which contain everything

NetWare 4.0, *page 62*

Installation descriptions for users who evaluated Novell's NetWare 4.0

	Insurance Cost Management	Banking	Hospital	Accounting
Platforms	Compaq SystemPro, ProSignia, DeskPro	IBM Model 95, Compaq SystemPro	Compaq SystemPro, AST Manhattan, Everex	Dell, Compaq ProSignia
Installed since:	Sept. 92	Oct. 92	July 1992	Oct. 92
NetWare 3.x users	1,200	7,000	4,700	25,000
Upgrades to 4.0 in 1993*	Unknown	5%	100%	40%
Total NetWare servers	24	600	86	200
Total NetWare sites	3	12	3	150

*Percent of NetWare 3.x users

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Product Evaluation

Users say NetWare 4.0 would allow them to consolidate and rationalize network administration

CONTINUED FROM PAGE 60

you never wanted to know about NetWare. It's mind-boggling what they do with this operating system."

Costs

Coincident with the release of NetWare 4.0 is the launch of Novell's Master License Agreement (MLA), which provides single-node rather then server-based NetWare pricing. Evaluators said this will help them administer the costs of a Novell network and provide better chargeback tracking.

Regarding NetWare 4.0 itself, they said support, hardware and administration costs could drop because of the consolidation of resources provided by the new network operating system. Evaluators said they expect short-term transition costs for planning, training and conversion.

Accounting firm: "We'll have to take a look at our equipment and its layout and rethink our administration. Long term, we won't be managing multiple servers anymore."

Hospital: "It's much easier to administer and definitely cheaper."

Insurance firm: "Once you're past the learning curve, there's no additional cost."

Banking firm: "The MLA allows you to add as many servers as you want. You pay an entry fee to add a workstation to the enterprise."

Installation

Installing NetWare 4.0 is a two-step process. The easiest step is the installation of the network operating system to network servers. None of the evaluators reported significant difficulty here, and they praised Novell's decision to make the upgrade available on CD-ROM (especially given the 25M bytes of on-line technical documentation included).

However, NetWare 4.0 will also impose significant planning overhead on network administrators. Evaluators said the improvement in network configuration was worth the effort, but administrators should allocate from two weeks to four months for conceptual planning of the revised network architecture.

Accounting firm: "It took a about a week to read the documentation and two days to come up with a directory structure."

Insurance firm: "The first installation went poorly until I understood the planning tree and knew the type of units I wanted."

Banking: "Planning will take at least two months. The more decentralized the organization, the bigger the nightmare."

Ease of use

The evaluators said administrators will face a short-term learning curve to understand the new consolidated NetWare 4.0 utilities and the new NDS architecture. They were divided on the impact of these new features on end users.

Accounting firm: "It's easier to use once you know the nuts and bolts of it."

Insurance firm: "The new features add complexity and a new learning curve."

Banking firm: "It's much easier to administer once you make the paradigm shift from the single server to the directory service."

Compatibility

No compatibility problems were reported for off-the-shelf programs. However, some in-house and NetWare-specific applications that directly use NetWare 3.X bindery services will have to be rewritten. Some third-party utility programs will either be replaced by new NetWare 4.0 utilities or will have to be rewritten to accommodate NDS.

Hospital: "Off-the-shelf applications are ignorant of the change [to NetWare 4.0]."

Insurance firm: "Some of our internal applications will require adjustment."

Banking firm: "All of our [NetWare v3.11] in-house applications will have to be recompiled because the [NetWare 4.0] bindery emulation doesn't cut it."

Enhancements

All evaluators ranked NetWare Directory Services as the most valued enhancement to NetWare 4.0. Indeed, NDS and its "object-oriented" architecture are the primary reasons that the evaluators will move to the new network operating system. Other valued features are data compression and encryption, centralized and integrated administration utilities, on-line documentation and a new graphical interface.

Hospital: "We'll be using the document imaging hooks for a gigabyte per day of patient care forms."

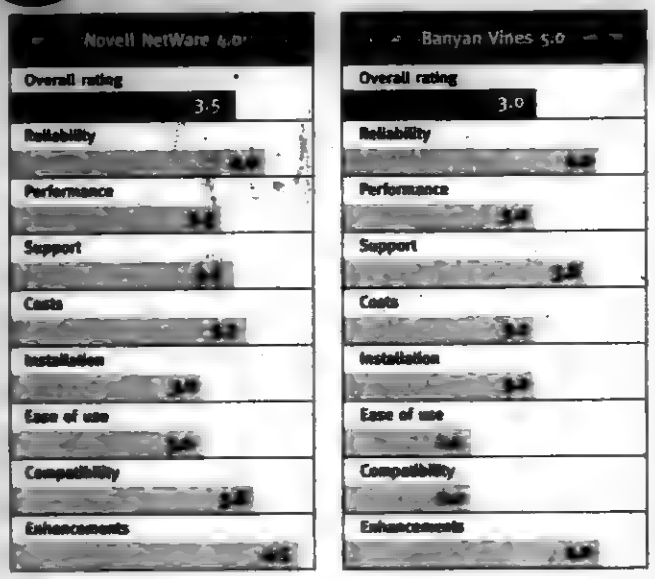
Insurance firm: "A lot of third-party utilities have been replaced, which can only be an improvement."

Banking firm: "We're getting killed [with administration] right now, and this will cost us less."

Written and compiled by senior editor Garry Ray.

RATINGS

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance. Banyan Systems, Inc.'s Vines 5.0 is based on a separate Aug. 10, 1992 evaluation.



Novell responds

Bob Young, Novell's vice president of marketing, responded to some of the issues raised in this evaluation:

Recommended upgrades: Companies with more than 10 servers, depending on configuration and use, should migrate to NetWare 4.0. People who are using NetWare 3.X today should continue to use it if it is meeting their needs. We will continue to enhance Version 3.X.

Technical support for network planning: We spent a lot of time and energy preparing for this product. We have resellers that we believe are very good in handling this type of technology. We also have Alliance Partners who are experts in this type of solution. We believe the support infrastructure is in place.

Migration: From a technical standpoint, migration is very simple. We have the technology in place to make it easy. The second issue is organizational in nature. An enterprise network requires a lot of planning. Groups and departments will have to cooperate and work on these issues.

Bindery emulation: Companies whose in-house applications use bindery services and demand high performance should upgrade those sections of the code that use the bindery. They should instead use NetWare 4.0 directory services.

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- SCM Office Supplies Group
- Sprint Corp.
- Tribune Broadcasting
- Unum Life Insurance Co.
- Wilson Industries
- Worldcorp

Users seen winning from merger

Sterling Software, Systems Center team up to strengthen complementary products

By Gary H. Anthes

When the acquisition of Systems Center, Inc. by Sterling Software, Inc. becomes final this summer, customers are likely to see a stronger, broader array of products for storage management and data transfer, including electronic data interchange (EDI), according to analysts and the companies' chief executive officers.

Two weeks ago, the companies said they will join to form the third largest independent systems management software company, with annual sales of $300 million.

"There is a great deal of synergy between [Systems Center's] VM business and our storage management business," said Sterling L. Williams, president and CEO of Sterling Software. "We [offer] storage management products for MVS. They cover the other niche [VM] that we have long avoided."

Williams said an even better fit is between Systems Center's Network Data Mover for data transfer among disparate environments and Sterling Software's SuperTracs product for data communications. He said the Sterling Software offering is "more powerful and versatile" for intercompany data moves, while Systems Center's product holds the edge for intracompany transfers. "I can see us going forward with multiple versions of a single, powerful file transfer product," Williams said.

Sterling connections

One-third of Sterling Software's revenue comes from professional services for the federal government, especially for NASA and the U.S. Department of Defense. Sterling Software said that know-how will boost government sales of Systems Center's products when Sterling Software acquires the company.

He also said Systems Center's Advanced Systems Management line of systems and network management products — for things such as console management and configuration management — extends Sterling Software's product line into areas the company had planned to go into anyway.

Hard times

Bruce Allen, vice president of services and systems management strategies at Meta Group, Inc. in Westport, Conn., cited a recent history of financial difficulties at Systems Center and said the merger is "extremely good news for both Systems Center and its customers." Of Sterling Software, he said, "Now they have more of a critical mass in terms of annual revenues to compete against Legent and [Computer Associates International, Inc.] in the overall systems management game."

Systems Center Chairman Robert E. Cook, who will join the Sterling Software board of directors, acknowledged that added funds from the Sterling Software side of the ledger would enable Systems Center to speed the development of its products for problem management, change management and configuration management.

Williams said more acquisitions are likely, particularly in EDI, which the company is trying to expand into a broad business in "electronic commerce."

But Williams said the firm confronts a paradox as it evaluates acquisitions. "Users want to deal with fewer vendors and fewer contracts on the one hand. But we're running into customers who feel they've been victimized by past consolidations in the industry."

Despite the strengths both parties bring to the marriage, the new Sterling Software has its work cut out for it, Allen said.

"They are now in the top tier in terms of revenues, but they are still niche-oriented. They are out of touch with distributed systems management, with standards and with having a common architecture underlying all their products," he added.

Tough times
The combination of Sterling Software and Systems Center could create a potent force.

Sterling Software, Dallas
1992 sales: $259 million.
1992 profit: $13.8 million.
Employees: 2,246.
Major product lines: EDI, storage management, applications development, information management, data communications.

Systems Center, Reston, Va.
1992 sales: $39 million.
1992 profit: $5.8 million.
Employees: 500.
Major product lines: Systems and network management, VM operating system utilities and software distribution.

Re-engineering plan preserves mainframe role

By Rosemary Cafasso
ALBANY, N.Y.

In 1991, Key Corp., a $23 billion bank holding company, launched a corporate re-engineering effort dubbed Vision 2001 and targeted its loan processing operation as a top priority.

With good reason. The company had been relying on a mix of outdated host-based applications and manual procedures to handle its loan processing operation. According to Jay Ward, Key's chief information officer, the approach "wouldn't meet the goals we had for going into the future."

Today, Key staffers are up to their eyeballs in the loan operation overhaul. Pilots on five major applications are concluding, and Key is ready for the implementation phase, said Michael Quinn, a project manager for Vision 2001.

Ward would not reveal the actual cost of the project, other than to say "it's millions of dollars." He said he expects it to be completed in mid-1994.

Both Ward and Quinn said the loan project is a success so far because of common sense and practical decisions when it came to new technology.

For starters, the firm populated the project team with users. Quinn comes from the user side, having spent 23 years in the commercial and consumer loan business. "You need to bring the end user into the development process as early as possible," he said. "You need to listen to what they tell you about how they perceive what they are getting, and you need to respond to that."

Second, Key elected to keep its mainframe platform in a central role. While the team was interested in a client/server architecture, it decided that its mainframe provided the security and integrity that is essential to loan processing. In addition, keeping the existing platform would be less expensive and less risky.

"Everything we do involves a mainframe because we have to use

Key, *page 68*

Marcam sculpts new architecture

By Johanna Ambrosio

Playing to the growing audience of large users with multiple IBM Application System/400s, Marcam Corp. has announced a new enterprise-oriented architecture for its Prism family of financial and manufacturing software.

At the heart of this distributed architecture is the Enterprise Manager, which is essentially a communications facilitator. It lets applications collect and disseminate data from multiple AS/400s in a corporation, Marcam said.

The first Marcam application to adopt Enterprise Manager is Customer Order Management (COM). The new version of COM allows users to receive and process orders at a central location and then distribute information to different plants and other facilities.

HULS America, a Piscataway, N.J., manufacturer of chemicals and plastics, is an early adopter of Enterprise Manager and Enterprise COM. "We have a number of plants throughout the U.S., and we wanted to customize to each plant's requirements without losing the enterprisewide view of data," said Fred Straughn, general manager of information services.

In-house didn't cut it

HULS America is downsizing from a mainframe to an AS/400 and swapping from an in-house-developed system to Marcam packages. "The homegrown system didn't meet our business requirements," Straughn said. "We wouldn't have bought Enterprise COM without these [new] capabilities."

Eventually, he said, HULS America will move some processing out to the plants. But during the initial implementation, "we didn't want to change too much at the plant level."

Tom Ebling, senior vice president of development and support at Marcam in Newton, Mass., said that with Enterprise COM, a customer with multiple AS/400s will have increased flexibility over what was available before.

"You could take an order in Philadelphia for a plant in Los Angeles, and the application will pass the information over to Los Angeles without anyone having to intervene," he said. "Before, someone would have to know which AS/400 had the information."

Enterprise Manager and Enterprise COM will be available in September. Prices for Enterprise Manager start at $16,000, based on the size of the processor and the number of machines in the network. Enterprise COM is an upgrade provided free to current users.

Ebling said the next modules to incorporate Enterprise COM will be reporting software and an interplant ordering package. With the reporting module, users can gather information from across the network and print it centrally or distribute it electronically. The interplant ordering software, Ebling said, will allow plants within one company to order parts from one another.

Ebling declined to provide availability dates.

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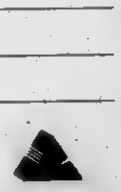

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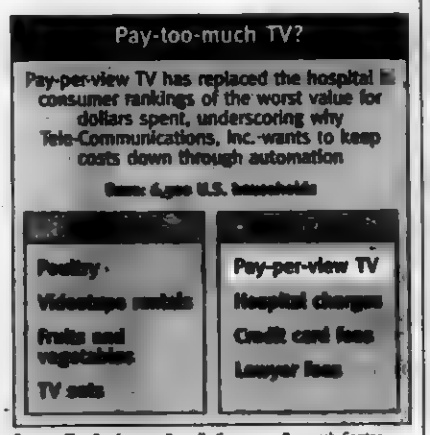
Transaction processing

Cable TV orchestrates pay-per-view

By Mitch Betts
DENVER

Whether it is WrestleMania, the Olympics or a movie, people sign up for pay-per-view cable television events at the very last minute. That kind of impulse buying requires a speedy transaction-processing system, especially because cable companies are planning to offer hundreds of channels in the near future.

Tele-Communications, Inc., the largest cable TV conglomerate in the world, has decided to handle this challenge by installing command-and-control software that can process 180 pay-per-view transactions per second on a sustained basis, said Terry Wolf, director of addressable technologies. "To the best of our knowledge, this is the largest simplex, or one-way, network in the world," Wolf said.



Source: The Conference Board's Consumer Research Center

The custom software was developed by Probita, Inc., a small software house in Boulder, Colo., that specializes in real-time, peak-load transaction processing. The core of the software developed for Tele-Communications is a "main memory-resident" database running on a cluster of Digital Equipment Corp. VAXs.

A memory-resident database is especially lean and fast — somewhat like a memory-resident program on a PC — in part because there is no waiting for the platters in disk drives to spin, explained Donald V. Burt, president of Probita.

For Tele-Communications, the software controls the delivery of more than 60 events daily to about 300 cable systems from a central data center outside Denver. When a program is purchased, the software sends a command to the customer's set-top converter to descramble the signal.

Previously, these transactions were handled on PCs at the local cable systems, but Tele-Communications has decided to centralize the increasingly complicated task of orchestrating the pay-per-view offerings, Wolf said.

A key reason for the central command-and-control architecture is the coming explosion in cable TV offerings. Tele-Communications recently announced it will begin rolling out "compressed digital video and data services" next year, which will permit as many as 500 channels of TV and data services.

Another reason for centralization is that it "allows us to more economically deliver and manage our pay-per-view programming," Wolf said, which may put downward pressure on consumer prices.

Customers will still call their local cable office to order pay-per-view programs because local managers decide which of Tele-Communications' pay-per-view programs they will carry.

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information in a data warehouse is stored as a series of "snapshots" of operational activity. These snapshots can provide years of integrated historical information which make analyzing business trends and statistics much easier. Without such a perspective, accurate forecasting is virtually impossible.

minutes to complete, depending on file sizes.

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Bill Inmon, creator of the data warehouse.

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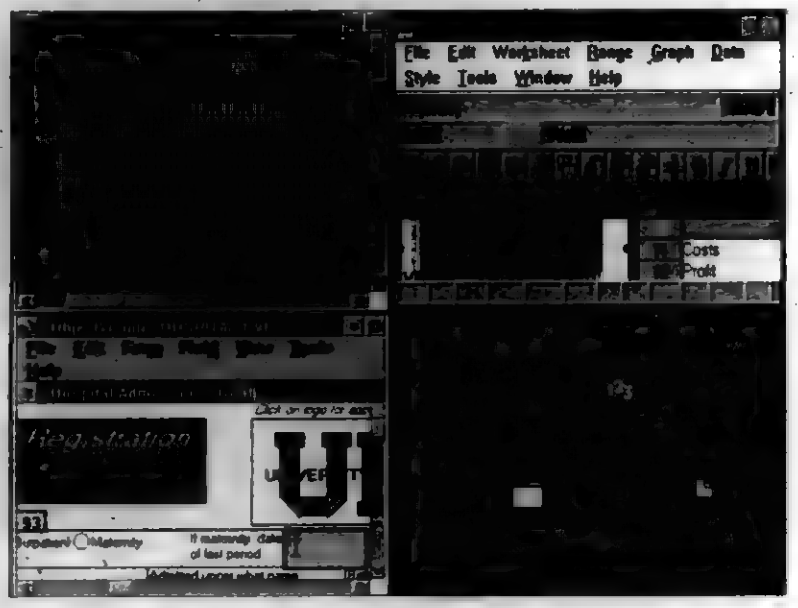

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Low-cost imaging abounds at AIIM

Association learning to accommodate industry change

By Ellis Booker

The document imaging industry's major event, the annual Association for Information and Image Management (AIIM) show, took over Chicago's largest venue last week and once again set attendance and new product introduction records.

But some observers said they believe the 50-year-old trade association, which claims more than 650 corporate and 8,000 individual members, is at a crossroads. Specifically, they said that for AIIM to remain relevant, it must decide how to accommodate the pace of change in the imaging market, especially now that standardized, low-cost hardware platforms have paved the way for a plethora of suppliers offering low-cost PC and local-area network-based systems.

As one analyst put it: "AIIM historically isn't used to the jolt and pace of change in the computer industry, which is very different from its records management tradition."

A secondary challenge for AIIM is how to embrace and educate users about work flow. Work-flow software, generically understood as systems that automate the routing of image documents between individuals and applications, has become a key software component in imaging, with vendors racing to provide more sophisticated work-flow systems capable of modeling a range of business processes.

Imaging and work flow

Setting the standard for low-cost imaging was Watermark Software, Inc. in Burlington, Mass., with its $149 Microsoft Corp. Windows-based document management system. Watermark uses the Object Linking and Embedding (OLE) feature of Windows to append image objects (received from a scanner or though a fax card) to other applications or electronic-mail messages. Watermark can embed image objects in any Windows program that is an OLE client.

Available in the second quarter, Watermark's basic software will sell for $149. An enhanced program, called Watermark Professional, will sell for $395 in the third quarter. Watermark also promised image server and optical storage support later this year.

In the past two months, Watermark has established several high-level partnerships. Last month, it became a Novell, Inc. development partner for image-enabled NetWare; in February, it announced alliances with Borland International, Inc. and Beyond, Inc. to integrate image objects into Borland's Paradox for Windows and BeyondMail.

FileNet Corp. in Costa Mesa, Calif., announced plans for Visual WorkFlo, an object-oriented application development environment for modeling and automating business processes. The first components will be commercially available in first-quarter 1994.

Blueridge Technologies, Inc. in Flint Hill, Va., announced what it called the first work-flow system for the Apple Computer, Inc. Macintosh. A new module for Blueridge's Optix Network imaging product for the Macintosh, Optix WorkFlow, will be available this month with a starting price of $40,000.

Bell+Howell Document Management Products Co. in Chicago showed a Windows version of its Image Search imaging system.

Digital Equipment Corp. extended its DECimage product with a Unix server. The new DECimage Megadoc VI software supports Unix servers running The Santa Cruz Operation's Unix and supports Windows clients. An optional "foldering" application can manage images, ASCII text and annotated text.

Pricing for Megadoc client software starts at $4,975, or $8,500 for clients with the foldering application; server software starts at $4,200.

DEC also upgraded its DECimage Express software for OpenVMS servers, adding support for Windows clients and an improved interface for DECwindows users and color images.

New features

Sigma Imaging Systems, Inc., which is based in New York, added a high-volume rasterized computer output capability to its OmniDesk imaging system. The OmniDesk Rasterized Image Output (RIO) server allows up to 100,000 pages per night of mainframe-generated Metacode and AFP print streams to be downloaded and converted to rasterized image documents, stored and indexed in the OmniDesk system. Sigma also announced a new release of OmniDesk.

LaserData, Inc. in Tyngsboro, Mass., unveiled GroupFile for Windows, a PC-based software for building multiformat document management applications in a Windows environment.

Adaptive Information Systems in Laguna Hills, Calif., introduced the AdaptFile 5000 series. The product uses OS/2 at the network level and offers a choice of either Windows, OS/2 Presentation Manager or DOS workstations.

Lanier Worldwide, Inc. in Atlanta added SQL database support to Version 4.0 of its PC-based imaging product, Information Management System 2020.

Peripherals

Cygnet Systems, Inc. announced what it called the first 12-in. optical-disc jukeboxes able to directly interface Novell's NetWare 4.0.

U.S. Design in Columbia, Md., announced the first member of its Turbo Mass family of optical storage accelerators and storage systems using a superscalar reduced instruction set computing-based controller designed for high-speed, multithreaded I/O control.

Key banks re-engineer

CONTINUED FROM PAGE 63

it," said Ward. "We haven't found a way around that yet."

Quinn said Key is "still comfortable with our ability to operate successfully in the environment we are in. The issues of control and security suggest that there is still a lot of value in the mainframe environment."

Third, Key did not consider in-house development to create the new loan processing applications because it would have been too costly and time-consuming, Ward said Key has a long history of selecting off-the-shelf applications because, typically, that is the cheaper route.

Finally, Key is delivering ease-of-use features to users for those pieces of the loan processing system that require user interaction. For example, an interface was designed to link the new loan origination program with an existing branch automation system, Quinn said. The branch automation system uses PCs and local-area networks that are linked to a host application. The interface allows staff members to work with a PC as the gateway to the loan origination system.

High hopes

Ward and the Vision 2001 crew are counting on big benefits from the project, including overall user productivity boosts of 20%. But Ward said he expects the real change to occur in customer relations, and he is predicting a 50% improvement in customer service processes. The loan origination system, for example, will replace a manual process that included filling out loan application forms and contacting credit bureaus.

In addition, loan processing applications will be standard across Key, which comprises 10 banks and approximately 850 branches. Key has a history of acquisitions, and the banks it acquired did not share the same software.

With the new system, "we can more quickly change policies or revise products" across the company, Quinn said.

New software lineup

- Consumer loan origination system from American Management Systems, Inc. (AMS) replaces manual system.
- Consumer loan processing from AMS replaces 15-year-old application.
- Commercial loan processing from Automated Financial Systems, Inc. replaces 15-year-old application.
- Recovery Management System from Stockholder Systems, Inc. tracks progress on charged-off loans and replaces manual system.
- Student Loans System from Charter Account Systems, Inc. had been used by one Key bank and will be extended to entire company.

In Brief

Mutual satisfaction

Management Information Technology, Inc. has reached an agreement with **Sybase, Inc.** to port Sybase's SQR report writer product to **Oracle Corp.**'s Oracle 7 database. Sybase said last month that it was unable to obtain an Oracle 7 license from Oracle, its database rival. Management Information Technology is an Oracle value-added reseller. The SQR product works with databases from Oracle, Sybase, **Informix Software, Inc.** and **The ASK Group, Inc.**

Exchange gives Tips

The Coffee, Sugar & Cocoa Exchange, Inc. (CSCE) and the **New York Futures Exchange** (NYFE) are negotiating an agreement that would let the NYFE use CSCE's Trade Input Processing System (Tips) to process its trades. The NYFE board of directors accepted the proposal earlier this month, and the two exchanges are now formalizing operational specs and systems enhancements. CSCE's Tips lets trading floor brokers and clearing members input trade data directly to an on-line trade matching process. NYFE is expected to begin trade input with Tips by the fourth quarter of this year.

Building contacts

SHL Systemhouse, Inc. said it won a $7 million systems integration contract from the City of Los Angeles to develop and implement a client/server system design to help with issuing permits and monitoring inspections.

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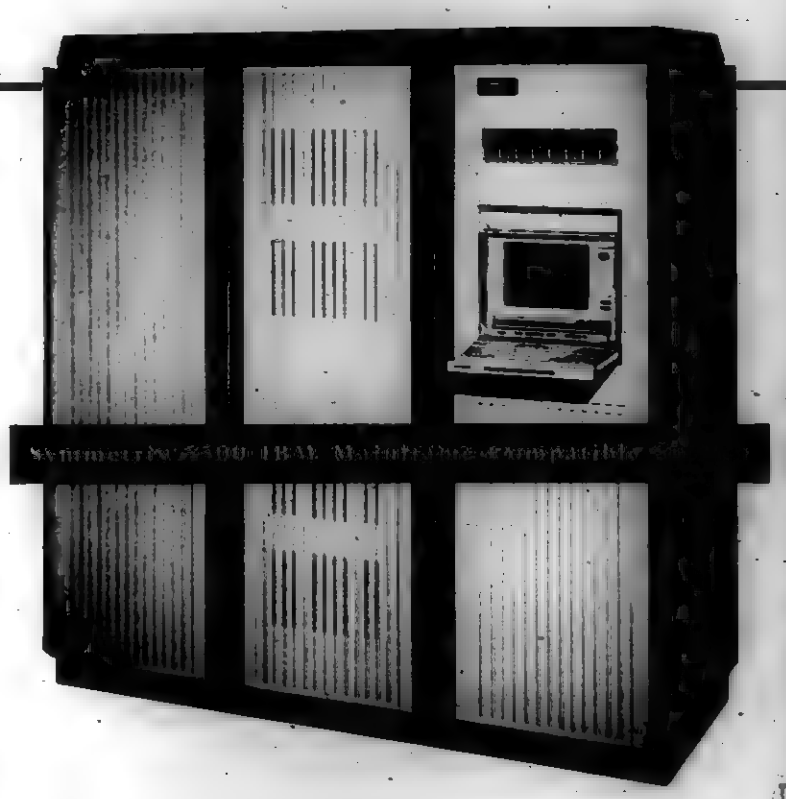
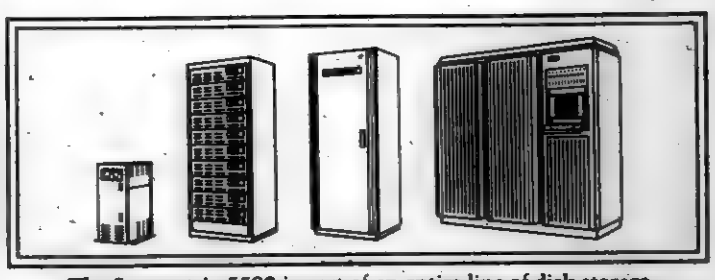


The Symmetrix 5500 is the latest evolution of the high performance Symmetrix Series of Integrated Cached Disk Arrays (ICDA™), and



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Gupta on downsizing with DB2.

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Tool tackles database download bottleneck

Trinzic's InfoPump simplifies data migration

By Gary H. Anthes

The biggest challenge of downsizing is sometimes simply getting the data off the mainframe and onto the workstation. Trinzic Corp. in Palo Alto, Calif., has a solution that customers say can take much of the pain out of that process.

InfoPump, sold by Channel Computing, Inc. before Channel was acquired by Trinzic recently, is a middleware product that shields application developers, operations staff and end users from many of the complexities of moving data across dissimilar environments. It automatically schedules data transfers and processes the data as it is pumped by. It also includes tools that speed the development of distributed applications (see chart).

International Flavors & Fragrances, Inc. in New York has InfoPump on a dedicated server to move product and customer data every night from flat files on an IBM 3090 mainframe to 10 servers on local-area networks in New York, New Jersey and Chicago. As it is pumped, the data is summarized, filtered and tailored for decision support by users at each individual site, said Lou Seigal, manager of distributed systems.

The company also uses InfoPump weekly to update databases on laptop computers used by mobile executives and salespeople. Both detailed operational data and summarized decision-support data are loaded, Seigal said.

He said end users had no good way to get at data before InfoPump was installed. "This is a godsend for us; to [develop it] ourselves would have taken a couple of man-years of effort," he said. "The users don't see it, but for the people supporting these systems, it provides tremendous relief."

In the design

InfoPump was designed for sharing data across dissimilar environments, staging data for decision support, monitoring time-sensitive applications and integrating, downloading and uploading data.

Corporate Software, Inc., a Canton, Mass., value-added reseller, uses InfoPump to automatically move 10,000 invoice and customer records every night from an IBM Application System/400 to a SQL Server running under OS/2 on a Novell, Inc. LAN. Sales and accounting staff use Microsoft Corp.'s Access to retrieve the data, which is information about the sale of some 40,000 software products.

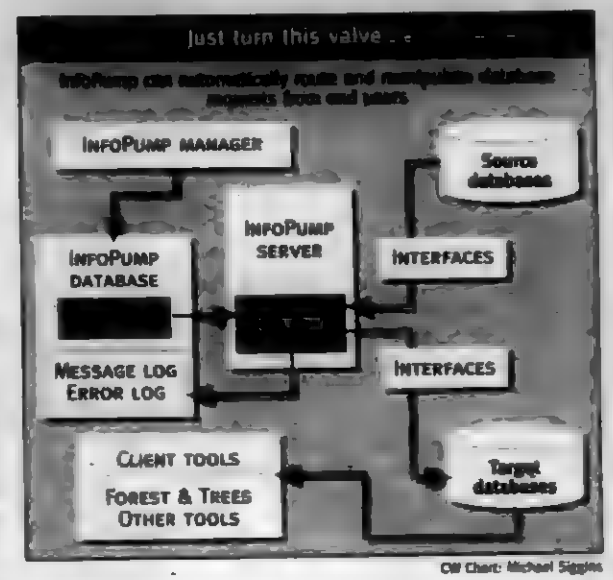
Paul Barron, senior programmer analyst at Corporate Software, said InfoPump replaces a multijob, labor-intensive and error-prone process to join tables and convert and download data. He said it takes about four minutes to do what once took up to 1½ hours. "Now it's a hands-off process," he said.

Barron also praised the ease of using InfoPump's Script language, saying the process of joining AS/400 tables holding invoice header, invoice detail and customer data was coded in a single instruction.

Yvonne Cekel, marketing vice president for Channel products, said InfoPump is not always used to pump data from one database to another. For example, she said, Bankers Trust Co. uses it to monitor SQL Server databases holding pending trade information. In near real time, InfoPump looks for incomplete records and notifies traders by sending messages to them via Lotus Development Corp.'s Notes.

"InfoPump supports a concept we call the 'datamart,'" said Stuart Woodring, a software analyst at Forrester Research, Inc. in Cambridge, Mass. "The idea is the quickie mart on the corner; you just go there when you want something — no hassle, no overhead."

InfoPump costs $25,000 per server, including two database interfaces and two development environments.



CW Chart: Michael Siggins

Pump It up

The InfoPump Server is an OS/2-based query server that does the following:
- Pulls the internal database and follows request instructions.
- Deletes unwanted rows, changes column names, converts data formats and does mathematical operations.
- Combines data from multiple sources.

The InfoPump Manager is a Windows-based development environment that performs the following:
- Defines data sources and destinations, including log-in, password and server names.
- Helps build and debug data routing requests.
- Monitors and logs server activity.

The InfoPump Database stores information about data routing and transformation, scheduled requests, error and message logs and user permissions.

Are you treading on someone's software patent?

By Garry Ray

Did you know that your developers may be breaking the law? Probably not. But a wave of software patents issued by the U.S. Patent and Trademark Office since the 1980s may put your company at risk.

According to experts in the field, more than 10,000 outstanding software patents may exist. Many are sweeping in their coverage, such as a notorious patent owned by a New York firm for natural order recalculation in spreadsheets. The company, REFAC International, filed suit in 1989 against Lotus Development Corp. for violation of the patent.

Although no one really knows how many software patents have been granted, or how sweeping they may be, there are some clues. A recent study presented by Electronic Data Systems Corp. in Dallas to the State Bar of Texas said that more than 1,500 software patents were issued in 1992. These include grants for a "software performance analyzer" — issued to Hewlett-Packard Co. — and a method to "recover objects in an object-oriented computing environment," which was issued to IBM.

Patent plethora

In 1992, the U.S. Patent and Trademark Office issued 97,958 patents in all categories. Of those, 1,510 are thought to be software patents. More than 10,000 software patents have reportedly been issued since 1972.

Out of control

But no one knows the actual number of outstanding software patents or how wide their scope may be, said Glen Self, EDS vice president of research and development and the author of the study. "The problem is that [software] patents show up all over the place," he said. Because the Patent Office has no distinct category for software patents, filings generally show up in categories for medical, electronic and mechanical devices. That makes it difficult to determine whether a patent has been issued for a specific software process, Self explained.

Image builder

Multimedia and imaging technologies dominate the top categories of software for which patents were issued in 1992

Top 10 software patents 1992

		Number issued
1	Color imaging	121
2	Data/Video images	112
3	Image processing	95
4	Character processing	71
5	Document display	69
6	Data/File access	68
7	Display processing	64
8	Document processing	62
9	Interactive systems	57
10	Probability functions	57

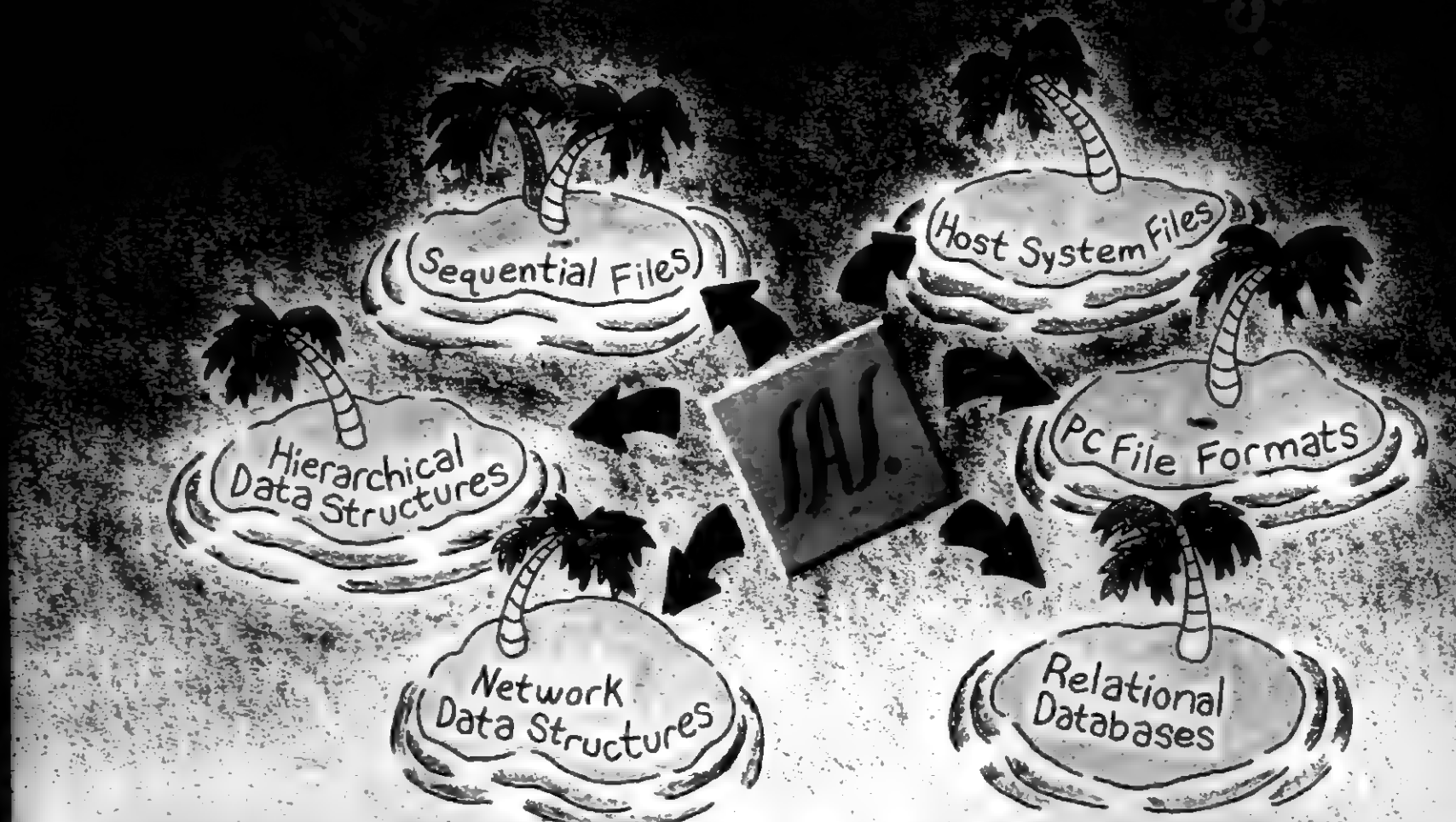
Source: Electronic Data Systems Corp.

But the Patent Office does not plan to make the search any easier. The hair-splitting stance of the agency is that "we don't issue software patents," said group director Gerald Goldberg. However, patents can be granted when "a program forces a computer to operate in a certain way," he said.

Under current law, a patent cannot be granted if "prior art" has been published or otherwise disclosed in public. That means a software process already disclosed in a textbook, technical journal, newsletter or classroom handout cannot be patented.

But the Patent Office has very limited access to the enormous range of printed materials produced by the software industry. "There's not much information available to us," Goldberg said.

Patents, *page 76*



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Study sees long life for mainframe apps

By Jean S. Bozman
SANTA CLARA, CALIF.

Even the quickest re-engineering efforts will not remove all applications from most large corporate mainframes for five to 10 years, according to a recent Gartner Group, Inc. study.

Rather, users will get maximum benefit by re-engineering certain classes of applications that provide the biggest potential paybacks. These include decision support, office automation and interactive applications, Gartner Group said. They constitute about 37% of all MVS applications, most of which Gartner Group said would run less expensively on other platforms.

The remaining 63% are batch or transaction-oriented programs, most of which will be used for 10 years or more, said Roy Schulte, a vice president of Gartner Group's Software Management Strategies service.

About 20% of all existing on-line transaction processor and batch applications can be easily ported to other platforms, including Unix systems, where they can be run less expensively, Schulte said. The rest, about 80%, will be more costly to migrate to open systems during the next three to five years, he said. Many of those MVS applications could be rewritten when they are due for retirement, or as users depreciate the mainframes they already own.

The bottom line is that MVS mainframes will not go into oblivion anytime soon. "What we're depicting is the fade-in, fade-out school of thought," Shulte said. "That's because it's cheaper to run some of your MVS applications on the mainframe than it is to re-engineer them." However, most software development — whether for MVS or client/server systems — will be much less expensive if moved to PCs or workstations.

Users taking action

Users at some large mainframe sites appeared to agree with the Gartner Group thesis, even if they disagreed with its time frame. Some, such as Associated Grocers, Inc. in Seattle, plan to move all applications off their IBM-compatible mainframes within five years.

Other sites are redirecting new application development to open systems.

"If you take the true cost of converting those [MVS] applications to other platforms, you don't gain much," said Al Smith, deputy director of telecommunications at the State of California's Teale Data Center in Sacramento. "You'd be better off whittling down the application backlog by putting those applications on open systems platforms." Smith, whose data center houses five large mainframes, said IBM could keep mainframes viable by offering alternate systems with better price/performance.

Some other analysts said they believe users accelerated their re-engineering plans as they watched IBM's business problems grow in 1992. "I think there's been a big change very recently, as IBM's problems became pronounced," said Bob Waldman, vice president of applications at Real Decisions Corp., a Darien, Conn., consultancy. "I think that woke up a lot of companies."

The pace of re-engineering may pick up in the late 1990s, as information systems organizations recentralize distributed applications onto a new generation of open systems hosts, Waldman said. "In five years, people won't write software unless it's portable to the three or four operating systems that have survived," he said. "Things are moving now toward client/server systems, but it could take 10 years before many IMS applications are replaced."

Software Development '93 products, standards

Windows software developers were greeted at the recent Software Development '93 in Santa Clara, Calif., by a number of tools and new standards that may help them create higher quality products. Among the notables were the following:

- **Intel Corp., Borland International, Inc., Microsoft Corp., IBM** and others announced the formation of the Tool Interface Standards committee, a group that plans to promote the interoperability and portability of development tools across 32-bit Microsoft Windows, OS/2 and Unix environments.
- Microsoft unveiled Visual C++, a C++ compiler that combines traditional compiler tools with "wizards" that help step users through the initial stages of application development.
- **XVT Software, Inc.** demonstrated XVT-Design++ Release 1.0, a set of tools and a framework that allows developers to write Windows applications that are easily portable to other platforms, including Microsoft's Windows NT, Apple Computer, Inc.'s Macintosh, Unix, VMS and DOS.

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Patents

CONTINUED FROM PAGE 73

That shortcoming has not stopped the agency from following the letter of the law, "If we can't find the prior art, we issue the patent," Goldberg said.

Help may be on the way. An industry think tank in Ann Arbor, Mich., recently began asking for contributions to its online database of prior art. The group, the Software Patent Institute (SPI), hopes to collect a variety of information from programmers and computer companies and then make this database available to the Patent Office so that it can better conduct its patent investigations.

"The Patent Office is very anxious to get this stuff," said Bernard Galler, founder of the SPI and a professor at the University of Michigan. He said the SPI has been negotiating with IBM to include the company's 5,000-item "Technical Disclosure Bulletin" in the database.

But some critics of the patent process said the SPI's noble intentions will come to naught.

"The SPI says everything will be fine if we can get the Patent and Trademark Office to do what it is supposed to do," said Richard Stallman, a spokesman for the League for Programming Freedom, a software interest group in Cambridge, Mass. But Stallman said software patents are inherently bad for programmers and software designers. "We have to get rid of all [software] patents because they turn software development into a minefield at every design decision," he said.

Even those who sympathize with the SPI question the necessity of software patents.

Brian Kahin, a patent attorney and director of the information infrastructure project at Harvard University's Kennedy School of Government, said software patents are "philosophically, a bad idea" because they "impose a bureaucratic regime on the innovation of the software industry." Although he is on the advisory board of the SPI, which he hopes will rationalize the software patent process, Kahin also said that the Patent Office imposes "hidden costs on developers and customers."

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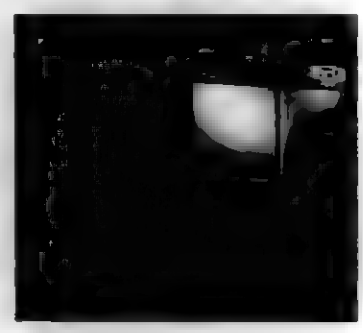

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In Brief

Tool deal agreement

Object Design, Inc. and Lucid, Inc. have co-developed tools and documentation to integrate the ObjectStore database and the Energize C programming system. The companies said the integration facilities provide better database schema generation and the ability to launch ObjectStore Browser and SchemaDesigner directly from the Energize user interface.

Partnership formed

Mozart Systems Corp. and Gupta Corp. have announced a strategic partnership to integrate the Mozart 3.1 fourth-generation language development tool and Gupta's SQLBase.

Testing tool for CASE

Interactive Development Environments, Inc. has added a new software testing tool to its computer-aided software engineering (CASE) workbench with the recent purchase of Programming Environments, Inc. The tool, T, provides automated test case generation through design specifications rather than source code, according to company officials.

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Application development tools

KL Group, Inc. has introduced the XRT/3d for the Open Software Foundation's Motif.

According to the company, the product provides Motif application users with a three-dimensional surface and a contour graphics widget that displays 3-D data in X11-based applications.

The product has the same application programming interface as the OSF/Motif, and XRT/3d can display surface data as a wireframe grid or a smooth shaded surface, the company reported. When using a linear distribution or a custom distribution method, the widget can automatically contour and zone the data.

Other features include perspective control and automatic handling of missing data values.

An XRT/3d development license costs $1,495.

▶ *KL Group*
Suite 204
134 Adelaide St. East
Toronto, Ontario
Canada M5C 1K9
(416) 594-1026

Visual Edge Software Ltd. has announced UIM/X 2.5, a graphical user interface (GUI) builder.

Enhancements in this release include GUI object-class components, UIM/X palettes, C++ code generation, 100% support of the Open Software Foundation's Motif 1.2 and a cross-platform development capability.

UIM/X 2.5 costs $5,000.

▶ *Visual Edge Software*
3870 Cote Vertu
St-Laurent, Quebec
Canada H4R 1V4
(514) 332-6430

Sheridan Software Systems has announced Version 2.0 of VBAssist, a programming tool.

The product was designed to enhance Microsoft Corp.'s Visual Basic 2.0 development environment. VBAssist 2.0 offers a variety of features, including property synchronization, control alignment and visual tab settings.

Scrollable forms and picture boxes can be made, and with Property Templates, users can visually create, edit and save customized versions of the objects within the Visual Basic Toolbox, the company reported.

New features such as right mouse button support, quick access buttons, form lock mode, code assistant and VB desktop optimization are also provided.

VBAssist 2.0 costs $179.

▶ *Sheridan Software Systems*
65 Maxess Road
Melville, N.Y. 11747
(516) 753-0985

Application Development Consultants, Inc. has announced CWM/Extend, an Extensibility Tool Set for Version 2.3 of the company's CASEware Modeller.

According to the company, the product allows for addjtions to the existing tables and definitions of new tables such as putting foreign keys into existing tables.

CWM/Extend consists of a program generator and report generator, a fourth-generation language programming environment, table creation and maintenance, link libraries for repository access in C and Cobol, plus a SQL interpreter.

Pricing begins at $4,400.

▶ *Application Development Consultants*
Suite 226
12000 N. Dale Mabry
Tampa, Fla. 33618
(813) 265-3708

Cobalt Blue, Inc. has released Version 3.4 of FOR C, Fortran-to-C conversion software.

The product is available on a variety of platforms such as Digital Equipment Corp.'s VAX/VMS, Silicon Graphics, Inc.'s Iris and IBM's RISC System/6000 AIX. According to the company, FOR C provides extremely readable, maintainable code translations for precise and natural-looking C code.

A new static analysis and error-checking capability has been added for detailed code analysis, and FOR C offers broad support for Fortran compilers from Microsoft Corp. and Sun Microsystems, Inc.

The MS-DOS version costs $775 until June 30. At that time, the price increases to $975.

▶ *Cobalt Blue*
Suite D-400
875 Old Roswell Road
Roswell, Ga. 30076
(404) 518-1116

Oracle Corp.'s Federal Division has announced Version 1.0 of GenerAda, an Ada code generator.

According to the company, the product makes it realistic for users to generate Ada code directly from system design information that is created by using Oracle's computer-aided software engineering tools. An Oracle dictionary description of a database and the modules and functions for the database are translated into Ada by the product.

A six-user license costs $50,000.

▶ *Oracle*
500 Oracle Pkwy.
Redwood Shores, Calif. 94065
(415) 506-7000

Progress Software Corp. has announced Progress/400, a fourth-generation language.

According to the company, the product is a development environment that enables users to quickly develop applications for deployment on IBM's Application System/400 by using 5250 block-mode terminals. Applications can be developed either directly on the AS/400 or on a PC workstation and then deployed in the native AS/400 or client/server environments.

Without any modifications made to the application code, the applications can be deployed across every Progress-supported computing platform.

Prices range from $3,400 for the AS/400 Model P02 to $105,000 for the AS/400 Model F95.

▶ *Progress Software*
14 Oak Park
Bedford, Mass. 01730
(617) 280-4000

Code libraries

ImageSoft, Inc. has released Version 3.0 of Object/Engineering, an enhanced version of the advanced C++ scientific class library of ready-to-use components.

Object/Engineering provides functions such as optimization, statistical tests and random generators, exception handling, signal processing and time series and numerical analysis.

Version 3.0 offers an assortment of features, including 19 new statistics distributions, four new regression techniques such as general least squares and nonlinear regressions, two new root finding methods and bidimensional interpolation.

Prices range from $499 to $699.

▶ *ImageSoft*
2 Haven Ave.
Port Washington, N.Y. 11050
(516) 767-2233

Compilers

Microport, Inc. has started shipping the optimized C Compiler.

The product is an optional ANSI C Compiler from Unix System Laboratories, Inc. for Intel Corp.'s Pentium processor.

According to the company, the optimized C Compiler has a blended-mode option for applications that will run on both 486 systems and Pentium systems and a Pentium-only mode for applications that were designed for operation only on a Pentium-based system.

The compiler costs $400.

▶ *Microport*
Suite E
108 Whispering Pines Drive
Scotts Valley, Calif. 95066
(408) 438-8649

Languages

Four Seasons Software has announced support for Cobol file structures for the SuperNova fourth-generation language.

According to the company, the support enables SuperNova to access files that had previously been maintained with Cobol programs. Users can build applications in two steps.

The first step consists of building a SuperNova application that maintains current Cobol files. Data from those Cobol files is migrated to any supported relational database management system in the second step.

Without modifying a user's program, the SuperNova application can access data in the RDBMS.

Pricing for SuperNova licenses ranges from $990 to $100,000.

▶ *Four Seasons Software*
2025 Lincoln Highway
Edison, N.J. 08817
(908) 248-6667

Now the World's Leading Mainframe C Compiler Features Some Significant Pluses

Introducing the SAS/C C++ Development System from SAS Institute. Another first from the first name in C programming tools for the IBM mainframe environment.

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C++ is an object-oriented superset of the C programming language that makes program development, use, and maintenance easier and more efficient. Now with the SAS/C C++ Development System, you can open the door to object-oriented programming on your IBM mainframes under MVS (batch and TSO) and VM/CMS while preserving your existing investment in C applications.

The SAS/C C++ Development System is fully compatible with the AT&T 3.0 release of the C++ language with the exception of template support. It implements the familiar constructs of the C++ programming language—including in-line functions, operator and function overloading, references, and free store management—providing a robust and productive applications development environment.

The enhanced SAS/C Full Screen Debugger, available with the SAS/C compiler, also supports C++, allowing you to debug C++ as well as mixed C and C++ applications.

A Plus for Portability

The SAS/C C++ Development System is an indispensable tool for migrating existing C++ applications developed in other environments. Applications built on UNIX workstations and PCs can be ported to the mainframe with minimal effort. As a result, your workstation becomes an effective platform for mainframe applications development.

Find Out More In A Free Report

To learn more about the pluses of C++ programming with the SAS/C C++ Development System, simply call or fax us today.

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HERE and THERE

Despite language barriers, time-zone tag, inflated software prices and other hassles, IS managers working in the U.S. for overseas firms are helping drive worldwide innovation

By Thomas Hoffman

Overseeing an information systems division is challenging enough when the brass and troops are just down the hall.

Imagine the difficulties faced by a single-person IS staff serving the entire West Coast for one of the world's largest banks located 6,000 miles away.

Meet Scott B. Smith, a systems analyst in the management services division of Barclays Bank PLC in San Francisco. As the British bank's only IS staff member west of the Rocky Mountains, Smith handles all systems, telecommunications and related support for Barclays' offices across California.

"Sometimes you feel forgotten when you're so far off," Smith laments. He's not alone in the sentiment.

As the business world continues to become a global village, more IS managers are finding themselves working for foreign-based firms. And that presents a whole new set of challenges, ranging from paying higher markup on hardware and software, language barriers and time-zone differences to radically different views about the role of technology.

"I sense that sometimes there's less trust in technology [in Europe] and a strong urge to do things manually," says Patrick Carney, director of IS at ABB Power Generation, Inc. The Brunswick, N.J., firm is a division of ASEA Brown Boveri, a Swedish/Swiss-owned engineering conglomerate.

Even so, spunky IS managers are not only surviving in unknown territory but in some cases also driving technology innovation and standardization for the entire company.

Hypo Bank's Joe Michael Sanchez: *Wealth of products and skilled help make U.S. an attractive spot for IS development*

■ U.S. divisions drive downsizing

That's the case at ABB Power, which is helping to introduce downsizing, groupware and Microsoft Corp.'s Windows to its Zurich-based corporation.

Carney says the unit places a top priority on facilitating communications between its 100-plus U.S. divisions and the rest of its enterprise, and the unit is now 100% Windows-compliant.

But it's taken time for the parent to catch on, Carney says. He attributes this to the firm's centralized computing philosophy and a matrix management structure that he says can be confusing.

But differing philosophies, Carney adds, don't necessarily reflect negatively on his European counterparts. Instead, he notes that much European thinking stems back to a widespread mainframe mind-set, which reflects a lower rate of PC use compared with this country.

Indeed, while U.S. companies have generally embraced downsizing, many European organizations still prefer a centralized mainframe approach.

However, Zurich-based ASEA Brown has also proven to be open-minded: Downsizing successes for U.S. divisions have convinced the parent to standardize on several leading-edge technologies, including Lotus Development Corp.'s CC:Mail and Notes software.

"They've seen the benefits we've attained," Carney adds, "so they're starting to ramp up."

The parent is also using its U.S. subsidiaries to test client/server computing.

But as these concepts begin to catch on, another problem emerges for U.S.-based firms trying to drive over-

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seen innovation: costly software.

■ Expensive software costs slow standardization

While PC software in the U.S. is often a cheap commodity, Europeans sometimes pay up to three times for the same product, which must be customized and is then slapped with stiff tariffs. A copy of Microsoft Office, which costs about $470 in the U.S., sells for more than $1,000 in Europe, Carney says.

Joe Michael Sanchez, assistant treasurer responsible for MIS at Hypo Bank in New York, knows the challenge well. As MIS chief at the first U.S. office of Munich, Germany-based Bayerische Hyptotheken-und Wechsel-Bank, Sanchez decided to use Fischer International Systems Corp.'s Watchdog PC security software.

But when the bank's European subsidiaries decided to also use the $170 package, they discovered the cost of buying through a middleman shot the price to $450 to $500 a copy.

Fortunately, Sanchez says, the parent firm was able to work out a better, more affordable deal with Fischer. "Now they're able to ship a European version from New York and bypass the middleman, who was trying to buy his new Mercedes from us," Sanchez jokes.

Purchasing problems aside, Sanchez says the language barrier can also be an issue. Many of his German managerial peers were taught to speak and understand an older, more formal brand of English, explains Sanchez, a seven-year Hypo Bank employee. That can make it tough to explain the intricacies of an IS project.

"Sometimes you have to change your vocabulary around for them to understand you," he says. "This is one of the greatest challenges."

Plus, Germans typically ask fewer questions than most Americans would, he says, and are proud. That sometimes tempts them to voice more understanding than actually exists, Sanchez adds.

■ Nuts of the world, unite

But as is the case at ABB, standardization and networking are helping to smooth global differences at some corporations.

Barclays, which now has a worldwide Digital Equipment Corp.-based network, is slowly evolving toward PC local-area networks connected over an X.25 backbone.

"It's a slow process, but it will happen," Smith says. "These improvements will increase communications, and in this day and age, communications can really make or break a company, especially on an international scale."

Hypo Bank is also developing a global wide-area network. Although the bank's head office is in Germany, most systems testing is conducted in New York under Sanchez's supervision. He says the bank prefers to do most of its IS development in the U.S. because both technology and skilled technologists are more readily available than in Europe.

The approach seems promising: Last March, for example, Hypo Bank installed IBM Token Ring LANs supporting Compaq Computer Corp. notebooks running IBM's OS/2 2.0 network operating system and Microsoft's Windows and MS-DOS on workstations.

The success of the beta-test site in New York helped Sanchez convince German management to install the same equipment in London, a project completed last October. German branches are currently being linked together under the same architecture, and Sanchez is flying to Hong Kong this month to start networking installations at locations there.

"Once the Hong Kong link gets put in place, we'll can probably tie them all together," Sanchez says. Most likely, the WAN will use 64K-byte or T1 connections, he adds.

■ Different ways to keep in touch

IS managers working for overseas firms have also had to learn to adapt to unfamiliar organizational structures.

Barclays' holding company, for instance, splits its IS function between two groups: network services — which supports networking and telecommunications — and computer operations, which handles systems management and mainframes.

Smith, part of the first group, says the structure can be baffling. "There are a lot of gray lines," he says.

Companies take different approaches to managing the IS hierarchy. At ABB, Carney says, several IS managers from around the world meet each quarter to discuss standardization and coordination issues and to do some brainstorming. No such meetings occur at Osaka, Japan-based Minolta Corp., according to Gary Gould, director of MIS at Minolta's U.S. data center in Ramsey, N.J.

However, Gould says communications between divisions in the U.S. and Japan are good, facilitated by electronic mail. A Japanese executive was sent to Minolta's Ramsey facility to serve as a liaison between this site and headquarters in Japan, he adds.

Moreover, Gould says Minolta's U.S. divisions are given a good deal of autonomy in their IS directives. "Basically we install whatever technology will support our business needs, but we keep them very well-informed," Gould says.

Smith says the nine-hour time difference between London and San Francisco can be a problem. "Sometimes, our folks in the UK will forget and call me at some ungodly hour thinking I'll be in the office," he says. Fortunately, Smith and his British peers often use the New York offices as an communications middleground.

■ Europeans challenged, too

Of course, overseas problems work both ways: Dateline differences also plague European IS executives who work for U.S.-based companies.

Just ask Jean-Pierre Salib. As director of systems at Los Angeles-based Twentieth Century-Fox Film Corp., Salib works out of Paris and is responsible for all IS activities for the filmmaker's foreign subsidiaries.

"There are challenges in dealing with suppliers who are far away, and there are different norms in each country," Salib says. He points to difficulties in working with multiple IBM subsidiaries in Europe because the computer giant assigns a separate division to each country there.

But Salib licked that problem by routing all hardware and software procurement through International Computer Group, a European systems integrator with offices in Paris. "It makes it easier to deal with suppliers because we're all in the same time zone," Salib says.

That approach has proven beneficial, he says, because working with a single point of contact for all IS requirements allows him to work with a vendor who knows his company's hardware and software needs.

■ Global needs, local sensitivity

Once standarization occurs, the problems are far from over.

One big challenge, says Ian Butterworth, senior vice president of information technology at Holiday Inns, Inc., is sticking to a uniform approach when delivering information technology around the world.

"We have to be sensitive to our approach in applying information technology while being able to reflect on regional needs," says Brussels-based Butterworth, who is charged with coordinating his firm's international IS efforts. "We try to apply the same standard systems throughout the enterprise."

Holiday Inns is now rolling out a private, two-way satellite network in Europe for point-to-point communications between its hotels in Europe and its primary data center in Atlanta, Butterworth says. The project, which started last July, will include the installation of 100 to 150 satellite earth stations in Europe and should be completed by this summer.

Some of the challenges Salib and Butterworth face in Europe, such as dealing with different telecommunications tariffs and standards between countries, are far different than those they would face in the U.S.

"You read a lot about 1992 and the unified Europe," Butterworth says. "The reality is there's a little way to go before this is a seamless continent." •

Euro-gloom continues

While U.S. and European firms continue to link and expand, the European market is hardly booming. A new report by International Data Corp. says 1992 was as dismal as 1991 for the European computer industry.

The Framingham, Mass.-based market researcher says 1993 looks only slightly better, if that. IS growth in Europe this year is forecast at 3.3% to 4.4%.

A weak European economy, especially in Germany, unstable currency and more vendor competition accounted for the lackluster performance, according to the February 1993 *IDC Eurobrief*.

For the journey...

Dealing with technology and management is tricky enough. Add unfamiliar business customs and cultures to the mix and things can really get wild. If you need to know, for example, that table pounding is considered OK in America, embarrassing in the UK, uncouth in Germany and rude in Luxembourg, consider grabbing *When In Rome: A Business Guide to Cultures & Customs in 12 European Nations*, published by the American Management Association. Call (212) 586-8100 for details on the book.

Published a couple of years ago at the peak of Euro-curiosity but still very relevant today, this concise (less than 200 pages) and well-organized paperback leads you on a tour of business and work ethics, corporate etiquette, organizational structures, sense of humor, meeting and leadership styles and attitudes toward women, elders and outsiders — even the drinking preferences of a dozen of the largest countries in Europe.

You'll learn, for example, that when doing business in Germany you'll need to work around an average of 39 paid holidays and be able to distinguish extroverted, beer-drinking Bavarians from quieter, more sober Swabians.

If you're planning business travel or dealings in France, Germany, England, Italy, the Netherlands, Spain, the UK, Belgium, Denmark, Greece, Ireland, Luxembourg or Portugal, consider this low-cost, cross-cultural crash course.

A new manual for travelers of a very different kind has just been published by Meckler Publishing: *Internet Primer For Information Professionals: A Basic Guide to Internet Networking Technology*. Call (203) 226-6967 for information on the book.

Many users already know that there's no faster way to make global connections than through the Internet. This book can help you learn to master the basics so you, too, can speak Internet.

—*Joseph Maglitta*

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Request a free copy of "The Business Case for Pen, Mobile and Wireless Technology" to read actual case studies on leading companies, how they got started and the benefits they've discovered.

SOURCES OF PEN, MOBILE & WIRELESS SOLUTIONS:

C = See this company at Spring Comdex—Atlanta, May 24-28, 1993.

Dynamic Bytes develops applications for working with CAD/CAE files, digital photographs, GPS information and graphics in mobile and pen environments. 1-415-854-9335

Ink Development markets productivity software designed for mobile computing. InkWare™NoteTaker and other applications are available for PenPoint and PenWindows. 1-415-573-6565

Nestor, Inc.

"NestorWriter™ is an adaptive handwriting recognition system for pen computers. PenShell™ brings pen input to DOS."
1-401-331-9640

notable

Notable is a leading developer of innovative communications and productivity applications for the new generation of mobile computing / communicating devices. 1-415-312-0800

PFI PenFact, Inc.

Manufacturing applications for pen computers. Proven products and services that improve quality, simplify production reporting, and eliminate paperwork.
1-508-872-6900

PenMetrics, the technology leader of mobile GIS solutions for Windows, markets FieldNotes™ software for field data collection.
1-800-537-3322

PenStuff

Software for field data collection and processing of database, imaging, communications and GPS information. Complete services, from pilot projects to full scale production systems. 1-716-461-3182 C

PenUltimate

The Innovator in Mobile, Total Solution Software. Horizontal and Vertical Applications including SalesForce™ with SSFM™, redefining productivity and how it's managed. 1-714-476-6360

PenWare

PenWare develops compact, portable applications for mobile pen computing. PenWare's first application is the award-winning PenCell spreadsheet. 1-415-858-4920

SHARPENED

Sharpened Software is a major manufacturer of high-quality business productivity software for pen-based computers. For product information, call 1-206-283-0628.

SunSelect

SunSelect's PenTOPS and PenControl allow Penpoint-based tablet users to access file and printer resources from desktop PCs and networks. 1-800-677-6265

Thinque Systems provides high quality pen-based Sales Automation, Field Service Automation and Route Accounting Software. Available for Windows For Pen and PenRight. 1-818-752-1350

WIDE

High-level software tools utilize common APIs to develop protocol transparent connectivity to Wide-Area Public Communications Services. 1-800-DEC-INFO ext. WIRE

POWER PEN PAL

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1-415-903-3650

SuperScript

A leading vendor of pen systems, SuperScript's products include context interpretation software that improves the accurate interpretation of hand-printed input. 1-403-367-9098

ArtherDent

Transform your notebook computer into a pen computer, WriteAway!; a user-installable, transparent tablet and pen kit for $595. 1-508-858-3742. C

GRiD

The leader in pen computing, GRiD designs and markets tablet, hand-held and the award winning Convertible pen-enabled notebook computers worldwide. 1-800-222-4743 C

Inforite

Using proprietary pressure-sensitive pad technology, Inforite provides clipboard computers for field applications, and handwriting capture peripherals for personal computers. 1-800-366-4635 C

NEC

The NEC UltraLite®, Autograph™ and Versa™ are high performance, feature rich pen systems designed to provide tools for a variety of business applications. 1-800-NEC-INFO

CIC

Incorporating CIC's Handwriter Recognition System software, CIC's PenDOS pen operating environment lets users develop new applications and run existing mouse-aware DOS applications without modification. 1-415-802-7888

DAUPHIN

Dauphin Technology's products include the D5000 convertible Pentop, the D5000 Color and the 2.2 lbs., DOS/Windows compatible, 486SLC-based DTR-1. 1-800-782-7922 C

HEWLETT PACKARD

The leader in palmtop PCs. With HP's 95LX, stay in touch with e-mail, wirelessly. Receive appointment, spreadsheet and schedule updates automatically. 1-800-443-1254

SLATE

MicroSlate's extensive product line supports all available pen operating systems and includes the Datalite 400, the first 486 pen computer. 1-514-444-3680

Nimble Computers

Manufacturer of pen-based computers/communicators weighting approximately one pound and 6"X8"X3/4" in size. Available in 186/386/486 versions. 1-310-592-6200

Microsoft

Microsoft Windows for Pen Computing extends the windows environment to pen computing. 1-206-882-8080

FUJITSU

Fujitsu Personal Systems is a leader in mobile & pen-based computing. FPSI provides systems optimized for size, weight, battery life and overall portability. 1-800-831-3183

IBM

The IBM P.C. Co. offers high quality 486 based pen solutions featuring superior pen to screen feel, PCMCIA and support for multiple pen operating systems. 1-800-772-2227 C

NCR

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NCR is a leading supplier for mobile networked computing solutions for the enterprise. Contact NCR-Direct at 1-800-637-2600 for more information.

TelePad

TelePad offers custom software, wireless communications and pen computers to provide a Total Customer Solution for each client. 1-703-834-9000

PENRIGHT!

PenRight! is a pen-based, graphical user interface and handwriting recognition for MS-DOS computers. PenRight! is installed on more than 80% of the pen computers in the field today.
1-800-222-4743 C

COMP SOFT

PenNet products enable mobile pen computer users to communicate with mainframes, minicomputers, workstations and PC's over telephone and cellular networks. 1-203-531-8162

IBM

Aggressive programs for wireless communications devices, supporting networks and integration services to allow seamless connectivity to enterprise and public information.

proxim

Proxim is the leader in wireless networking of portable computers and terminals, with the industry's first PCMCIA wireless LAN adapter. 1-415-960-1630

design technology

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GENERAL PROGRAMMING INC.

GPI provides turn-key or match-up solutions to distribution companies for remote data capture and related integrated information systems. 1-214-385-0400

digital

Digital offers Network Adapters to interface to the Wireless LAN and Access Points to communicate with the wired network. 1-800-DEC-INFO ext. PEN C

PHOTONICS

Photonics' COLLABORATE™, diffuse infrared wireless networking for indoor mobile computing, facilitates groupware applications, portable-to-desktop connectivity and wired network access. 1-408-955-7930 ext. 600 C

RAM MOBILE DATA

RAM Mobile Data's networks allow wireless two-way messaging and data transmission with a portable computer and a radio modem. Call 1-800-MOBITEX C

FTG DATA SYSTEMS

FTG's PenDirect™ for Windows™ brings the intuitive input of pen computing direct to the screen of your desktop computer. 1-800-962-3900 C

WindSoft, Inc.

WindSoft, a pioneer in total system solutions with pen computers, offers customized leading edge software integrated into various hardware platforms. 1-201-586-6400

DIGITAL OCEAN

Digital Ocean manufactures Grouper, a totally portable, wire-free spread-spectrum LocalTalk connector for PowerBooks and other Apple Macintosh computers. 1-800-345-FISH

Scriptel

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Intelligence Files

Footwear blues

The U.S. footwear industry has been able to slow the erosion of its market share by using computers to integrate design, manufacturing, management and marketing functions. But the good news ends there.

The technological advancements have been limited to the larger firms. Smaller firms have been slow to adopt computerized manufacturing equipment because they do not have the volume to justify the cost.

Moreover, industry sources said they believe that no amount of high technology will be able to offset the much lower labor costs of foreign competitors. And, if foreign makers can afford to buy the technology, even that competitive edge will wither away.

Source: "Industry and Trade Summary: Footwear," U.S. International Trade Commission (publication 2572-GM-5).

Battle line: Ergonomics

The Occupational Safety and Health Administration's (OSHA) request for comments on the need for an ergonomics standard has drawn mixed, often conflicting views. Computer makers and companies that employ large numbers of VDT users contended that any standard would be premature and would lack a firm grounding in science. Labor unions disagreed, urging OSHA to move quickly to issue mandatory rules.

Opinions were sharply divided on fundamental issues such as the increasing presence of repetitive strain injuries, with labor unions pointing at them as a rapidly growing problem, and opposing groups such as the Newspaper Association of America arguing that many of the cases are unconfirmed.

Source: *VDT News, The VDT Health and Safety Report,* March/April 1993.

Stability through information

Many of today's companies are not equipped to deal with increasingly fast-paced change. Organizations must learn *dynamic stability* — in other words, to serve a wide array of customers with changing product demands while building on long process and knowledge capabilities. One of the most critical steps to achieving this state is to manage information strategically.

The three big challenges of information systems include giving managers the capability to rapidly pinpoint product and process know-how in the company, giving managers data about capability allocation amid rapid change and linking functions and organizations horizontally to increase speed and flexibility.

Source: *California Management Review:* "Achieving Dynamic Stability through Information Technology," by Andrew C. Boynton. Winter 1993.

Flexiplace works

The U.S. government's experiment with telecommuting, called the Flexiplace program, appears to be working.

A study of the pilot program shows that employees liked working at home a few days each week and felt more productive. Some colleagues felt envious. Managers continued to worry about losing control but generally supported the program.

Among the few small problem areas were the lack of available laptop computers or PCs for home use. Also, some participants reported working longer hours on their "home" days. But most of the conflicts surrounding Flexiplace were resolved in the organization within two to three months.

Source: Report No. PRD-92-15, U.S. Office of Personnel Management, Washington, D.C.

Compiled by CW staff members.

Executive Track

Former Unisys Corp. Director of Services Marketing **Woody Mewborn** has been named vice president of U.S. operations at **Esprit Consulting Ltd.** Based in the UK, Esprit specializes in teaching corporate information systems professionals to act as consultants to their internal clients.

At his new post, Mewborn is heading the newly opened Atlanta office, which will serve as a base for the company's North American operations.

President Bill Clinton has nominated **Kathryn Sullivan** as chief scientist at the U.S. **Department of Commerce's National Oceanic and Atmospheric Administration** and **Arati Prabhakar** as director of the Commerce Department's **National Institute of Standards and Technology**.

Sullivan, a seasoned geologist and oceanographer, is a NASA missions specialist. Prabhakar is currently serving as director of the Microelectronics Technology Office for the Defense Advanced Research Projects Agency.

Former Apple Computer, Inc. executive **Allan Z. Loren**, who is president and chief executive officer of **Covia**, a Rosemont, Ill., computerized reservation system, has been named a director of **U.S. Cellular Corp.** Based in Chicago, U.S. Cellular is a manager of cellular systems. In expanding its board to seven seats and appointing Loren, its chief executive cited the new director's experience with fast-growing firms and changing information and distribution systems.

Princeton, N.J.-based **IMS America** has named **Kathryn M. Cullen** to be the general manager of its Strategic Information Services Division's newly minted Information Technology group. A subsidiary of IMS International, itself a Dun & Bradstreet Corp. subsidiary, IMS America is a purveyor of marketing and sales information on health care industries. Cullen, who comes to the firm after 14 years as a partner and director of large consulting firms, will focus on IS/business linkage, re-engineering and measurement of such initiatives.

HAVE YOU, OR A COLLEAGUE IN THE INFORMATION SYSTEMS FIELD, RECENTLY BEEN PROMOTED? *Computerworld* WOULD LIKE TO SHARE THE NEWS WITH THE REST OF THE IS COMMUNITY. PLEASE CONTACT SENIOR EDITOR NELL MARGOLIS AT 1-800-343-6474 TO PASS THE NEWS ALONG.

Calendar

APRIL 25-MAY 1

Xplor International's Vendor Interaction Symposium Information Opportunity Networking '93. Denver, April 25-28 — Contact: Xplor International, Palos Verdes, Calif. (310) 373-3633.

Marketing the IS Organization Internally. Philadelphia, April 26-27 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 625-7373.

The Softool User Group. Santa Barbara, Calif., April 26-28 — Contact: Softool Corp., Goleta, Calif. (805) 683-5777.

USE/Plus/CUBE Exposition. Phoenix, April 26-28 — Contact: The Sanford Organization, Wauconda, Ill. (708) 526-2010.

National Computer Graphics Association (NCGA) Solutions Applications for Implementation '93 Conference. Philadelphia, April 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Third Sourcing Interest Group (SIG) Conference. Chicago, April 27-28 — Contact: SIG, Sherman Oaks, Calif. (818) 784-7755.

Distribution/Computer Expo '93 — Exhibit and Seminar. Chicago, April 27-29 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 458-8826.

Incotek '93. Warsaw, Poland, April 27-30 — Contact: Global Technologies, Inc., Washington, D.C. (202) 797-3782.

MAY 2-MAY 8

Information Systems Audit, Control and Security Conference. Lake Buena Vista, Fla., May 2-7 — Contact: The EDP Auditors Association, Rolling Meadows, Ill. (708) 253-1545.

The Workflow Conference on Business Technology. Boston, May 3-5 — Contact: The Workflow Institute, Alameda, Calif. (510) 769-9627.

LotusWorld '93. Boston, May 3-6 — Contact: Danioli & Keefe Associates, Sudbury, Mass. (508) 443-3330.

James Martin World Seminar. Boston, May 3-7 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

DB/Expo '93. San Francisco, May 3-7 — Contact: NDN Enterprises, Inc., Mountain View, Calif. (415) 966-8440.

Digitalk's Developers Conference. Costa Mesa, Calif., May 4-6 — Contact: Digitalk, Los Angeles, Calif. (310) 645-1082.

The National On-line Meeting. New York, May 4-6 — Contact: Carol Nixon, Learned Information, Inc., Medford, N.J. (609) 654-6266.

Unix Reseller Show and Conference. Dallas, May 4-6 — Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Process for Using Quantitative Data to Manage Information Technology Projects and Activities. San Diego, May 6-7 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

MAY 9-MAY 15

Advanced Topics in DB2. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Eastern Communications Forum (ECF). Washington, D.C., May 10-12 — Contact: ECF, Chicago, Ill. (312) 938-3500.

Micro Focus Users Conference. Orlando, Fla., May 10-12 — Contact: A&R Partners, Redwood City, Calif. (415) 363-0982.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

SunWorld '93. San Francisco, May 11-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

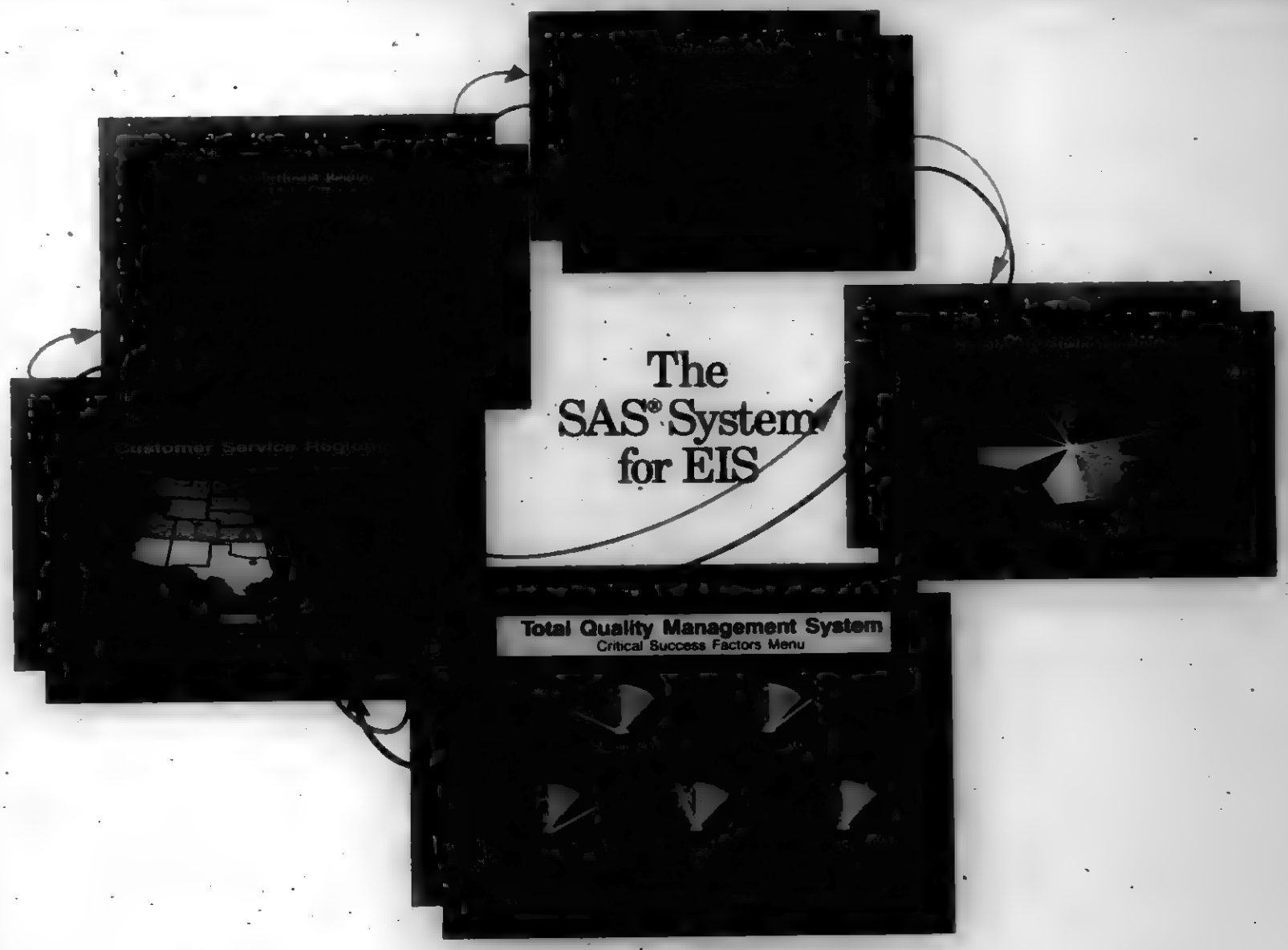
UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles, Los Angeles, Calif. (310) 825-1879.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

MAY 16-MAY 22

ICA ComNet Dallas '93. Dallas, May 16-20 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Wireless DataComm '93 Exposition and Conference. San Jose, Calif., May 18-20 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.



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GO CONFIGURE

As teams of developers work on bigger and more complex programs at the same time, they can inadvertently misplace, overwrite or change each other's code. Configuration management can prevent these slipups.

By H. Ronald Berlack

It's easy to see the importance of parts tracking and inventory control in auto manufacturing. If workers grab the wrong part or put in one too many, the result might be a minor rattle or a mid-

freeway breakdown. Customers will certainly be annoyed.

Software doesn't clang, but when one of its "parts" is incorrect or misplaced, it won't work right either. Oversight and control in the software process is just as important as it is in manufacturing if you don't want unhappy users.

While manufacturing companies use materials resource planning and engineering change orders to keep tabs on work in progress and changes, in the software development world, tracking is increasingly being handled by software configuration management (SCM) technology. SCM is a process, implemented through automated software systems and tools, by which information systems can keep tabs on a software system's "parts" — its interconnected programs, modules, objects and related items such as documentation.

SCM systems help developers manage features, such as bug fixes and enhancements, as a single unit even if the lines of code are scattered among several files.

There is a burning need for this kind of automated oversight and control as software programs increase in size, development becomes more complex and companies use concurrent engineering methods. In concurrent engineering, IS develops all aspects of a product (software design, mechanical design and electrical design) simultaneously.

Error control

When tens or hundreds of developers are working with bigger, more complex and modular programs at the same time, they are more likely to misplace, accidently overwrite or inappropriately change software. SCM can prevent these kinds of clashes. With SCM, multiple development teams are less likely to step on one another's code and more likely to work cooperatively.

Because developers aren't introducing mistakes, the quality of development and the software itself improves.

And SCM helps developers create these better quality programs in less time. That's because programmers will spend more time writing new code than rewriting old code they can't find or have to fix. Today's SCM technology helps eliminate the manuals and paper forms (see story page 92) needed to track everything from file versions, bug fixes and product enhancements to change histories. Gone, too, is the expense of a staff needed to do this paper-based tracking. Programmers' time is spent programming, not doing clerical work.

Rather than being one more wall to climb over, SCM has become the path of least resistance for groups looking to build good code fast.

Take the task of tracking changes, for instance. To handle changes in software in the past, a programmer would have had to fill out a form indicating the author and purpose of the change and the software affected. Current SCM systems enable developers to record that type of information automatically, or they will prompt developers to record the information before accepting the change.

Later, when a developer is looking for the code segments that implement the change, he can even ask for them by name (for instance, "tax withholding update"). He does not have to hunt through source files looking for the right subroutine headings.

SCM also helps lessen the possibility of overwrites through conflict detection features. These features — in which developers are warned of a possible overwrite — come in handy when merging two files into one. For instance, two de-

Configuration management, *page 92*

THE DYNAMIC Ws

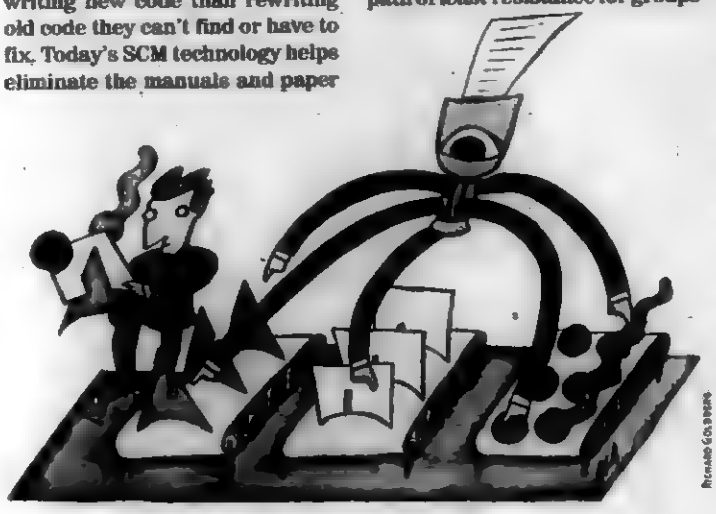
Configuration management takes care of the what, where and when of software development. It lets developers know:

WHAT changes have been made to the code (bug fix or enhancement).

WHERE changes were made (which file or program).

WHEN changes were made (revision).

WHEN changes were implemented (version).



Berlack is founder and a principal consultant at Configuration Management International, an Amherst, N.H., consultancy. He is also author of the book *Software Configuration Management* (John Wiley & Sons, 1992).

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Configuration management

CONTINUED FROM PAGE 89

velopers might be working on the same program, one implementing a bug fix and the other inputting an enhancement. If one developer's change is in danger of overwriting the other's, conflict detection kicks in. The system highlights the affected lines on screen, prompting the coder to resolve the conflict before the merge goes forward.

writing and managing software according to that process.

The more powerful a command language, the easier it is to use, the easier it is to adapt to a company's specific process and the more control it can bring to software development in general.

A command language is powerful to the extent that it can do the following:

- Accommodate both a command and a graphical user interface (and the user's preference for one or the other).
- Include a macro scripting facility (the SCM product's programming language) that is English-like and intuitive so that IS can easily adapt the the SCM product to a company's particular style of operation.
- Provide easy automation of SCM administrative procedures.
- Enforce policy decisions on software development, such as a decision not to allow two developers to change the same file at the same time.
- Provide separate developer work areas, yet allow for collaboration. For instance, it might enable different private versions of the same file to exist simultaneously.
- Facilitate development over a network.
- Automate complex tasks, such as operating on lists of objects.
- Migrate a change among alternate development paths.
- Perform incremental builds if coders add new product features to an existing executable.

20 questions

Software configuration answers questions such as: Which software parts belong to which release? Which hardware? Which documentation set? Which windowing system? Which features? Who made which changes and why? Which changes conflict with other changes?

Nyuk, nyuk, nyuk

Three stooge engineers find it tough going without SCM

Without an SCM system, developers can run into problems. Here's how things went wrong for three stooge engineers, Larry, Curly and Moe, who are hard at work on BioProject, a new biorhythm-driven project manager.

Larry is responsible for the module that does the biorhythm calculations. He has developed a module that calculates how many days have elapsed since a given date. Moe is developing a module to produce Gantt charts; he needs a date calculation module and sees what he needs in Larry's biorhythm module. Moe copies Larry's routine and makes minor changes to the interface.

After BioProject goes out to users, they find that the system incorrectly calculates dates when a Friday falls on the 13th of the month. Larry fixes the problem in the module and releases a new version of BioProject.

However, BioProject users find that while the system calculates dates correctly for biorhythm, it doesn't for Gantt charts. Because Larry is unaware of Moe's plagiarism, BioProject gets another costly, unnecessary bug fix. Users are irritated.

Curly finds that a bug in his data input routine causes the system to substitute the name "Freddy Krueger" for the real names of project participants who live on streets named after trees. Curly chases Freddy out of his module, BioProject gets rebuilt and developers issue another bug fix release.

Users start complaining that some nodes on the Program Evaluation and Review Technique (PERT) charts are attacking and slicing up other nodes. Now Larry, who is responsible for the PERT chart module, has to chase Freddy out of *his* module.

Meanwhile, Curly is pretending to be working on the speed of the BioProject printer drivers. Moe discovers a small bug in the reverse-leading routine of the driver and fixes it, storing the fixed code in the BioProject library. The next day, Curly saves his copy of the module (to which he has made no changes of consequence). Curly's new copy of the original driver overrides Moe's fixes.

With a management program that controlled source code, the three stooge engineers could have avoided these problems:

- **Double maintenance:** Larry and Moe had more than one copy of the same (or very similar) module on the system.
- **Shared data:** Curly's fix to one module caused side effects in Larry's module.
- **Simultaneous update:** Curly and Moe inadvertently stepped all over each other during the development process.

Based on "Controlling the Source" by Warren Keuffel in Computer Language *(January 1993). Copyright Miller Freeman, Inc.*

In the "old days," both developers would have made their changes, only to find out later that, mysteriously, the program no longer looked (or worked) the way either thought it would.

What makes good SCM

A good SCM tool, whether bought or created, requires both a powerful command language and a powerful repository.

A command language is important because it enables companies to control the management of their software on two levels: the project administrator level and the developer level. The project administrator defines the overall process for software management, while the developer actually goes about

Repository issues

SCM users will also want a rich repository, one that can accommodate the various software (files, objects, programs) and nonsoftware (hardware platform names, documentation sets) items likely to be important in the user's environment. The repository stores the names of SCM processes defined in the command language.

A repository is rich to the extent that it can do the following:

- Handle a mix of data types, including binary, source code and computer-aided software engineering (CASE) drawings.
- Provide links between dissimilar objects, such as between a segment of source code and its binary representation or between a binary and CASE drawing.
- Represent a number of multiple changes to multiple files as a single logical change (e.g., all the code changes that make up one bug fix).
- Enable the system to associate logical tags with physical objects (such as the name of product features with the source code that implements those features).
- Enable multiple views of the same software.
- Show relationships between software entities, such as all the files included in a C module.
- Store files as differences (deltas) to a base version, rather than as complete copies of all versions. This saves disk space.

The features and functions of the command language and the repository are closely interdependent. There is no way, for example, for the command language to operate on lists of objects if there is no way to tag objects logically in the repository. Likewise, if there is no way to show relationships between objects, a developer would find it difficult to use the command language to define a report that displays an object's relationships.

Beyond having a powerful command language and repository, other qualities a good SCM tool should have include the ability to integrate with other development tools. For example, is the SCM system compatible with recognized CASE backplanes? If not, it may be difficult to pass data back and forth between the SCM systems and other tools.

This kind of barrier makes SCM systems harder to use and may limit the amount of information an SCM system can manage as well as the SCM system's operation.

As SCM systems grow in sophistication, they will provide more security and control over a company's valuable software assets. For IS managers, that security and control will become increasingly important as the amounts and complexity of software continue to explode.

As for developers, good SCM means they can feel safe knowing the software they spend hours perfecting today will still exist when they come to work tomorrow. •

Additional reading

Software Configuration Management: Coordination for Team Productivity. By Wayne A. Babich (Addison-Wesley Publishing Co., 1986).

Software Configuration Management: Identification, Accounting, Control and Management. By Steve J. Ayer and Frank S. Patrinostro (McGraw-Hill, 1992).

Toss out the paperwork

In recent years, configuration management has grown in popularity, helped by SCM tools that spruce up what has been, until recently, primarily a manual process.

In the past, companies invested many man-hours in SCM, beyond the time needed to work on the software development process itself.

Older SCM tools, for example, often required developers to fill out a paper form every time they wanted to change a software module. They had to keep long lists of directory and file names, tracing which versions of which files belonged to which release. Coders maintained journals on which version of which tool edited, debugged, linked and compiled each specific component of the software product.

For each product under development, they had to list which files, subroutines or programs called, contained or included files, data sets, subroutines or other programs in the inventory and where those were located.

Needless to say, a lot of SCM didn't get practiced. SCM proved more painful than the poorly controlled development environment it was supposed to fix.

It is unlikely that today's IS managers, given the pressures of application backlogs, would allow their developers the luxury of filling out all these forms, even if developers were willing to do so. Nor are current budgets able to handle the cost of the clerical staff needed just for IS recordkeeping.

But today's in-house and commercial offerings have become easier for a non-SCM specialist to use and can reduce the effort needed to track things such as file versions, bug fixes and change histories.

You can manage it

An SCM tool's 'personality' depends on what it has inside

By H. Ronald Berlack

Going outside for a software configuration management (SCM) tool rather than creating it yourself doesn't have to be complicated. Most SCM products are built on one of four models developed by Carnegie Mellon University's Software Engineering Institute. Once you know which model a product uses, you will know what functionality to expect. Following is a description of the Software Engineering Institute's models to guide your product selection:

▶ The check out/check in model.
Two of the oldest SCM systems available are based on the check out/check in model. The Source Code Control System (SCCS) is a utility shipped free with several versions of Unix, including Unix System Laboratories, Inc.'s Unix System V. The Free Software Foundation in Cambridge, Mass., puts out the Revision Control System (RCS).

Products that use the check out/check in model manage software as individual files or file versions. These systems enable developers to create new file versions as they make changes to existing versions. But while changes may cause new versions to evolve, there is no way to extract those changes automatically.

The benefits of products based on check out/check in are twofold. First, these products control access to a specific file; therefore, only one developer can check out a file at a time. Secondly, check out/check in-based systems can reconstruct specified releases as preselected versions of files. That means developers don't have to keep manual track of which version of the file belongs in which release.

SCCS and RCS have a major limitation: Developers can include only named file versions and entire file versions in a release. That means coders must pull the whole file to extract code segments from the database.

To accomplish version selection, developers must write their own Unix shell macros.

Thus, although these tools are free and fairly flexible, they impose a burden on developers: They must know how to use fairly arcane Unix shell commands.

Pluses and minuses of configuration management models

Model	Software unit managed	Pluses	Minuses	Sampling of products
Check out/check in	Versions of files	• Free software • Unix-like • Conceptually familiar	• Limited functionality • Requires Unix macros for version selection	Source Code Control System (Unix utility); Revision Control System (Free Software Foundation, Cambridge, Mass.)
Compositional	Collections of files	• Version selection automatic	• Handles physical objects only • Only files, not changes, extractable	CCC (Softool Corp., Goleta, Calif.); CaseWare/CM (CaseWare, Inc., Irvine, Calif.)
Long transaction	Entire releases	• Tight control over release contents	• Release components not directly accessible	Smartsystem (Procase Corp., Santa Clara, Calif.); Rational Rose (Rational, Santa Clara)
Change sets	Change sets	• Mix-and-match changes • Handles logical objects (features)	• Not conceptually familiar	Aide-de-Camp (Software Maintenance and Development Systems, Inc., Concord, Mass.)

Source: H. Ronald Berlack

CW Chart: Janell Genovese

What's the difference?

SCM addresses the software process and the product.

•The process includes all life cycle phases, from requirements specifications to maintenance. SCM aids maintenance by helping programmers move bug fixes from software targeted for one kind of computer to software targeted for another.

•Product is the content of the software project inventory, including specs, design diagrams, source code, executables and documentation.

▶ The compositional model.
The compositional model is an extension of check out/check in; however, products based on the compositional model don't rely on the user to write macros for selecting which files go to which release.

Instead, compositional-based products have mechanisms — the system model and version selection rules — built into their repositories that automate the process. The system model lists all files that make up a system, while the version selection rules indicate which version goes with which component in a particular system configuration.

The point of virtual files is to collect scattered code segments into one neat package.

A recent variation on the compositional model uses so-called virtual files. Virtual files provide the appearance of a typical file to the developer but are actually composites of code segments from several files plus new code.

The downside of virtual files is that developers are managing files that don't exist. Until a developer writes a virtual file's contents to disk, these files are unaccounted for on the system and unprotected from loss or changes.

▶ The long transaction model (LTM).
The chief difference between LTM and the previous models is that developers manage the software as a version of an entire release.

With LTM-based products, the system collects dozens or hundreds of changes from multiple programmers as a single transaction and applies it to the existing release. This results in a new release.

The premise behind LTM is that IS management wants visibility and control over the creation of entire configurations. That control occurs because the system consolidates all updates as one comprehensive transaction. LTM-based systems free IS from deciding which files go with which configuration because the only components in a database are entire releases.

Because transactions can be nested, IS can have intermediate levels of control over which software gets selected for release. Developers can handle software updates in smaller batches — an important consideration when ferreting out the conflicts that arise whenever there are numerous simultaneous software changes. LTM-based tools identify conflicts among updates so the team can resolve them before completing the transaction and creating a new configuration.

The downside is that because developers can't access release components using the SCM system, these components are difficult to rearrange, migrate between development paths and use in future development.

▶ The change set model.
A change set is a collection of code changes that moves software from one state to another. IS shops can identify every change set in the repository by name (e.g., "tax rules updates") and by the list of objects (e.g., "subroutine 123," "file ABC") that use it. Every object, in turn, is identified by the change sets that created it.

Change sets as a software management unit offer two advantages over files, file configurations and whole releases. First, developers can extract any object from the database by specifying the change sets that created it. Coders can even extract software that has been "deleted" by selecting change sets that do not include the deletion.

Secondly, objects (that is, lists of change sets) do not necessarily have to correspond to discrete physical items such as files. For example, if the order-entry enhancement a developer wants consists of 56 lines from File A and 97 from File B, the coder can add or subtract the enhancement from a purchasing application by selecting or deselecting the object "order-entry fix."

Change sets give IS the chance to mix and match software from the database at will. If an IS department has its company's cost accounting program on a Digital Equipment Corp. VAX and wants to move it to the DEC Alpha platform, it can deselect VAX-dependent features and migrate what is left to the new release. Change sets also offer users the security of knowing a developer can recover any release, feature, file or bug fix with a name from the database. •

The quality connection

SCM techniques are playing a more vital role in quality standards. Companies complying with international standards such as ISO 9000 must prove they can ensure the customer is getting what it wants and what is in its best interest.

Standards requirements not only imply the existence of an SCM system to provide reports and demonstrate appropriate control but also call for SCM.

ISO 9001, for instance, says there should be a development plan for software, including the following:

•Rules, practices and conventions for development.

•Tools and development techniques.

•Configuration management.

Another section of the international quality standard says "special attention should be paid to . . . areas impacted by any modifications."

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Computer Careers

Job-hunting tactics

Creativity key to getting your foot in the door

By Kelly E. Sewell

YOU'RE GETTING DOWN to the bottom of your box of resumes, and you've only received a few responses to the countless inquiries you've sent out. Before you print another 500, you might want to take a look at your approach. What are you doing to get the attention of information systems hiring managers? How are you networking for contacts?

Most IS managers we spoke with say the typical applicant for a computer position is of the "plain vanilla" variety, sending a tidy one- to two-page resume on white bond paper.

But some IS managers say a few applicants take unusual routes to getting noticed. While these approaches haven't resulted in jobs, they definitely stick out in the memories of hiring managers.

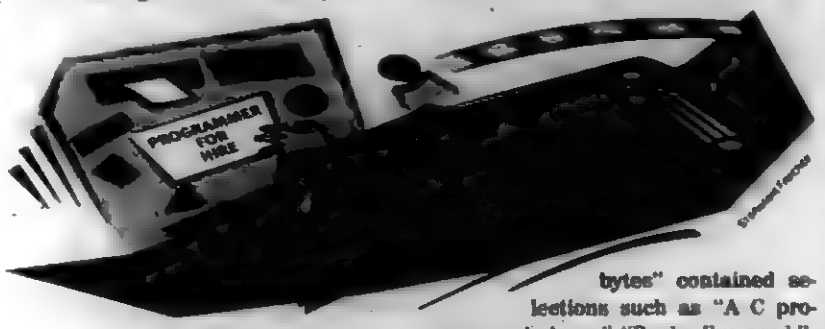
If the shoe fits

One applicant at an athletic shoe manufacturer tried to "get his foot in the door" by sending in his resume written on a brand new athletic shoe. Unfortunately, he wasn't the first to do so.

"From time to time, people will send in athletic shoes, but it rarely leads to an interview," says Sue Puretz, a senior human resources adviser at Nike, Inc. in Beaverton, Ore. "Systems people are pretty straightforward. They either have the skills or they don't."

Puretz says gimmicks won't work at Nike because it selects its systems personnel from an in-house database. Applicants' resumes are scanned into Resumix, a skills-based database. "When we're looking for a programmer analyst with Cobol experience, we'll plug in key words and get a list of names."

Other managers are more receptive to



a creative approach. Richard J. Hock, the director of MIS at Echlin, Inc. in Branford, Conn., says he was so impressed with a Windows programmer's resume that he would have hired the applicant if there had been an opening.

The applicant had written a Windows program with his resume on it. "It was rather unique," Hock recalls.

Hock popped the disk into his PC, brought up the program manager and selected "run." The program started off by displaying the applicant's name, address and telephone number in the middle of the screen. Then across the top, several pull-down menus were listed, including categories such as "General information" and "Bits and bytes."

Under the general information category, you could select, "Who am I?", "Work history" and "Education." "Bits and bytes" contained selections such as "A C programmer is born," "Books I've read," "C++ and the move to Windows," "How this program was written" and "Plans for the future."

"I haven't seen anything this clever," Hock says. "If I'd had an opening, I would have hired him."

In another case, an applicant tried to take advantage of the heavy concentration of computer firms in eastern Massachusetts. Gary Wortzman of Westboro, Mass., posted his qualifications where would-be employers could spot them — on a toll-ticket dispenser on the Massachusetts Turnpike. It read, "Oracle developer, 7 years' experience" and listed his phone number. He hoped it might catch the attention of an IS manager on his way to work. Unfortunately, the one call he received was from a recruiter.

Other applicants send out resumes with a regional twist. Steve Fogle, a managing director at San Francisco's The Alexander Group, recalls one Bay Area applicant who landed several interviews after sending his resume in the form of a label on a bottle of wine.

The economy

Competition for jobs is fierce in this economy. So, although unique approaches don't always work, they might get you past the first round of the selection process. One manager recalls getting a resume in the form of a newsletter. The company offered the applicant a position, but his qualifications, not his clever approach, got him the job.

"In this industry, it's who you know," says Lyle Bell, vice president of systems/data processing at Caesars Palace, Inc. in Las Vegas. "I can't recall any situations where a stunt has gotten anyone an interview."

Sewell is assistant editor, features.

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Career advice for the '90s

Too many jobs a catch-22 in interviews

Thomas S. Loane, vice president of computer and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., joins us as this week's Fast Track guest adviser. Fast Track is a twice-monthly column dedicated to answering your career questions.

Q. In 1986, I was one of thousands laid off. Since then, I've been laid off two more times due to company divestiture and takeovers. Finally, in 1990, I accepted a position as an MIS manager. I was beginning to think that hostile takeovers and layoffs were nightmares of the past. But now we're going through a divestiture and merger. Currently, I'm involved in taking down and separating the computer systems that my staff and I struggled to build.

My fate with this takeover is a position that puts my career back 10 years. At this point, my career spirit is severely wounded. What I'm most angry about is the job search.

In interviews, I come across composed and controlled, and I present the facts without emotion. The focus of the whole interview is, "And why did you leave that job?" only for the interviewer to conclude that I have excellent experience but also too many jobs. What can I do?

A. When life turns into a lemon, make lemonade. By accident, you have become an expert in combining and breaking apart systems reflecting changes in corporate objectives. You may be ready to use this as a springboard and become an independent consultant to companies planning to do what you have experienced. With business downsizing and rightsizing, you should be a valuable resource.

Alamo Rent A Car's *Thomas S. Loane*

Try calling a few companies in your area that may be going through this phase. Offer your service as an independent consultant: Be sure to be an aggressive promoter of your skills and the variety of companies you have worked with. You could build a new and satisfying career.

Q. I am a Cobol/CICS/DB2 programmer on an IBM 3090 mainframe, and I work for a retailer that is relocating and downsizing to an IBM Application System/400. I have improved my technical skills with AS/400 and RPG training; however, I don't want to relocate, and there are few other retailers in the area. How can I prepare myself for having to switch industries?

A. If you don't want to move, you need to know what industries are hiring. You can find out who's hiring from professional groups or the want ads. Then take the direct approach and call the information systems director. Otherwise, getting in through personnel is better than not getting in at all.

Before you contact a company, find out as much as you can about its products and what's important to it. That way, you can pitch yourself as someone who can fulfill those needs.

Companies hire people to make money. If you can show the company how it can make money by hiring you, you'll be hired.

Q. I am an MBA student with an emphasis in finance and marketing. I hold undergraduate and graduate degrees in electrical and computer engineering. What kind of companies should I focus on so that I can uniquely leverage my skills or contribute effectively to the organization?

A. I strongly encourage you to pick an industry that depends heavily on information systems and technology. For example, the travel-related industries (airlines, hotels, car rentals) are very heavily dependent on information systems for reservations, check-in, yield management. The medical field is becoming more technology-driven. And certainly the finance industries are well worth considering because the need to do a more cost-effective job is driving those people to really reexamine how they do things.

Very seldom do you ever use your educational skills. Don't sell yourself as an individual who simply comes with a set of skills to solve the problem. Sell yourself as a solution. You're not an MBA; you're a person who can make money for the company.

Q. I am an RPG programmer/analyst on an IBM AS/400. I am continually working to ensure that my AS/400 and PC skills remain at a high level. I am leading a project to tie a Novell, Inc. NetWare local-area network to our AS/400.

I was recently asked to head up a new PC support team. I am deeply interested in this, but I don't want to let my AS/400 skills fall behind. Am I correct in wanting to maintain both sets of skills?

A. If your objectives include leadership and management, keep a broad approach to technology and try to work with both systems by volunteering. It's amazing how much a volunteer can achieve. Ask if you can help others who are having a problem on the system.

Find out if you can help coordinate the activities between two teams. The person who volunteers is so rare, you'll floor the person you volunteer to, so you'll get the opportunity to try multiple areas.

The world needs two kinds of people: People who are absolutely expert in one area and people who look at the big picture of cross-multiple-areas. You can be whoever you want to be — just decide. You cannot be everything to all people.

Struggling to keep up with changing skill requirements? Worried about losing your way in an altered technology landscape? We'd like to help. Call your questions in using the Fast Track line at (508) 820-8522, MCI Mail them to CWCAREERS or fax them to Kelly Sewell at (508)-875-8931. If we use your question, we'll send you a gift. Letters may be edited for clarity.

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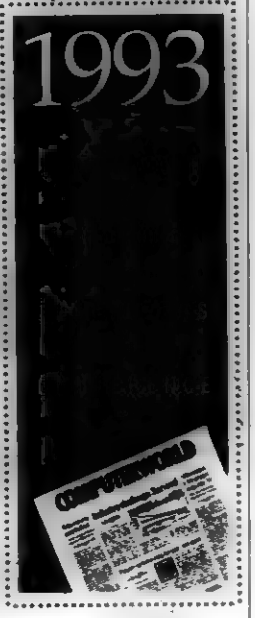

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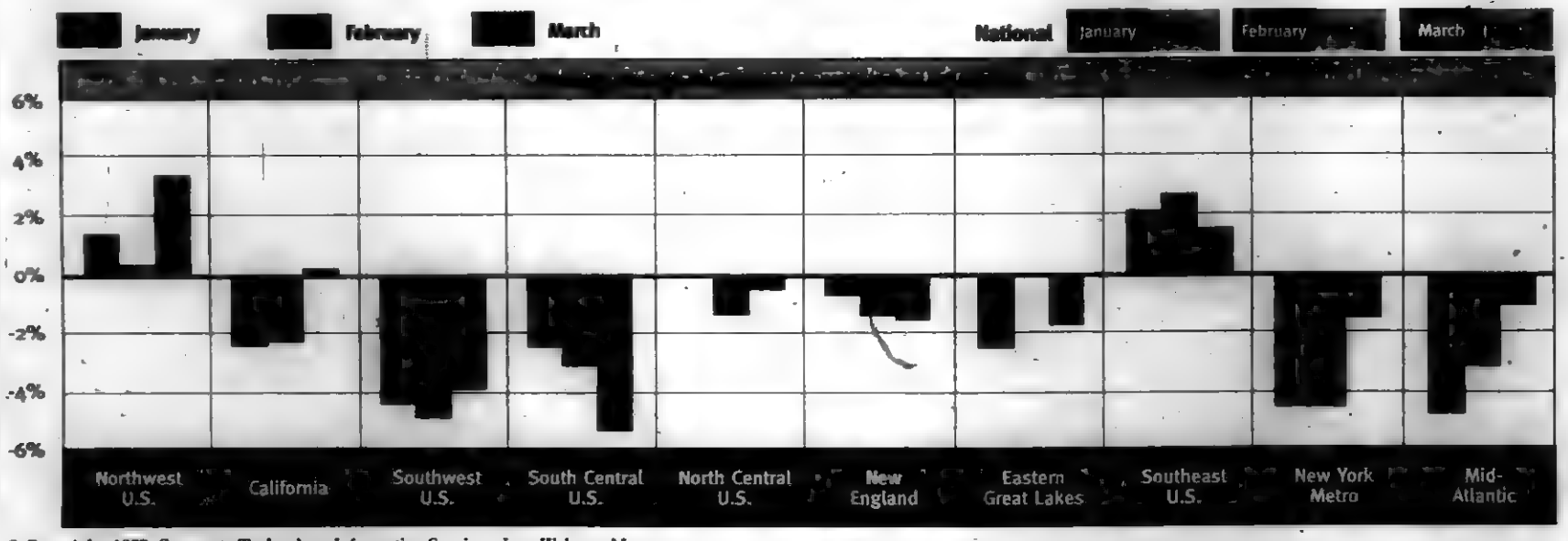

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PRESS RELEASES *don't tell you* EVERYTHING,

says one ex-marketing executive. Learn what's often conveniently left out of product literature.

By Keith Aleshire

A PRESS RELEASE IS the mainstay of the computer industry. It's the basis for product announcements and the impetus for exploration by potential buyers. After years of covering high-tech products, however, I've often seen a product's who, what, where and why substituted with vaporware, smoke and mirrors and pure strategic bluffs in a press release.

In an ideal world, a press release is supposed to mimic the news medium in which it's used: to be timely and pertinent to the reader and to intrigue with oddity (man bites dog) and conflict (dog sues man).

In the imperfect world, however, press releases can miss their mark with information that is not only useless but, worse, inaccurate. Some conveniently leave out information altogether. Make the most of what a release has to offer by keeping in mind what is often left unsaid:

WATCH FOR: The product's ship date. The Achilles' heel of many press releases is the product's ship date. Ambiguity is the result of the lack of communication among in-house groups such as marketing, sales and engineering, each of which has its own agenda. An ambiguous ship date is also used as a strategic ploy to prevent customers from buying a competitor's already available product when theirs is not quite finished. If a ship date is given, be wary if it's more than three months away.

WATCH FOR: Hidden prices. To avoid "sticker shock," product prices are not usually included in most press releases. When a price is listed, chances are it's not for a full, ready-to-use product. Instead, a bare-bones price is often given — consumables, training, consulting, integration and installation cost extra.

WATCH FOR: Comparisons between apples and oranges. Some releases make comparisons with competing products. If you're not careful, you may be duped by a release comparing the merits of a new product with the faults of an older and much slower one. Consider the IBM LaserPrinter. When the LaserPrinter was introduced, IBM's press release touted it as an "HP II-LaserJet killer." It was 25% faster, smaller and lighter and sported more resident fonts. Two years ago that general comparison would have made sense, but when the LaserPrinter came out, Hewlett-Packard Co. had already introduced a newer model, the LaserJet IIP, that was comparable.

WATCH FOR: Inflated benchmarks. Many press releases shoot for the biggest performance numbers, which may not always tell the whole story. Many chip manufacturers, for instance, use the millions of instructions per second measurement, which often varies depending on the instructions being run. Also, programmers using benchmarks such as Dhrystones can write their code to provide inflated numbers. Even some PC manufacturers still use older versions of benchmarking software, such as Symantec Corp.'s Norton Utilities System Info utility, that may provide better numbers.

WATCH FOR: Hidden bugs and capacity burdens. A press release dwells on the product's innovations and ease of use but rarely on its problems. Some products may take days to install, challenge other products you may own or simply not work. For example, the press release for a voice mail/fax card I purchased failed to mention that it would require 100K bytes of memory for the terminate-and-stay-resident software.

WATCH FOR: Non-news cover-ups. Many press releases will tout a mundane event as earth-shattering news. This happens when companies pressure their public relations staffs to get press or the agency tries to prove its value through volume. At Comdex/Spring '92, for example, IBM handed out a collection of more than 100 press releases pertaining to its plans for OS/2, even though there were only a few OS/2 applications available at the time.

A good press release depends on a good product. A press release that sticks to the technical merits of a product and speaks of the benefits to its buyer has done its job. Then, like so many others, it can be tossed.

Aleshire is an independent author and free-lance writer who has written many press releases. He is based in Eden Prairie, Minn.

Must haves

Good (and responsible) press releases include the following:

Product relevance, explaining what's special about the product and the needs it fulfills.

An exact announcement date rather than just "for immediate release."

A true ship date within a month. If longer, no date should be listed.

Retail price of the popular configurations.

Extraneous expenses such as special hardware or software that is required for full product functionality.

Realistic system requirements, not the bare minimum.

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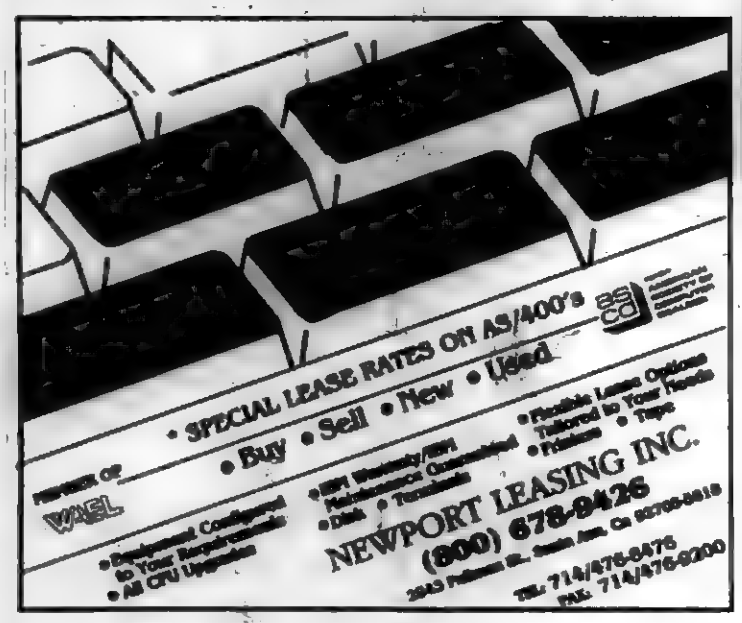

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Index of used computer prices

Week ending April 2, 1993

	Closing Prices BoCoEx	Closing Prices AmCoEx
IBM AT 339	$350	$425
PS/2 Model 30 286	$400	$450
PS/2 Model 55SX	$750	$775
PS/2 Model 60	$450*	$425
ThinkPad 300	$1,400	$1,500
PS/2 Model 95-081	$3,300	$2,850
Compaq Portable II	$225	$300
Portable III	$350	$400
Portable 386	$750	$750
SLT-286	$625	$675
LTE-286	$675	$750
DeskPro 486/33i	$1,850	$1,775
Apple Macintosh SE	$575	$600
IICX	$1,600	$1,450
IICI	$2,250	$2,150
IIFX	$2,800	$2,450
Quadra 700	$3,250	$2,600

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Specs for RFPs with a charge may be obtained by submitting a written request with correct payment. No phone requests. Valid payments are corporate checks on a MS bank, certified check or POSTAL money order made out to Central Data Processing Authority. No cash or out-of-state checks. For RFPs with no charge call Kelli Brown @ 601-359-2604. If you would like to pick up RFPs at CDPA, do so between 1:00-3:00 p.m. only. CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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Sealed bids or proposals for the procurement of an Automated Management Information System, in accordance with the specifications and other requirements therefore, will be received by the Housing Authority of the County of Monterey until 2:00 p.m. on the 1st of June, 1993, at which time and place will be publicly opened and read aloud.

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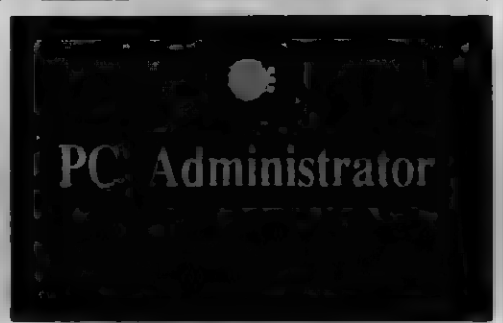

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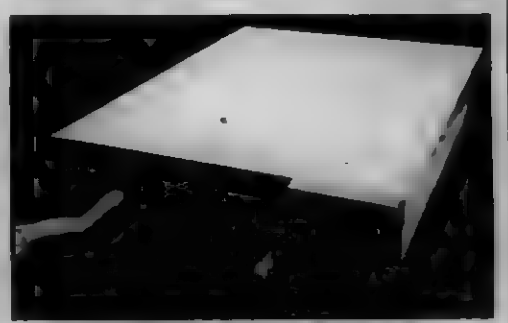

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Arthur Andersen & Co. 16
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Gastetger & Delonas, Inc. 39
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High Performance Systems Ltd. 10
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Gainers

Percent

Ask Computer Systems	27.9	Policy Management Sys.	-46.9
Microcom Inc.	25.0	Software Publishing Corp.	-36.5
Advanced Micro Devices	17.6	Cambex Corp. (L)	-31.0
Netrix Corp.	16.7	Rasterops	-21.3
Creative Technologies Inc.	13.0	Progress Software Corp.	-17.5
IPL Systems Inc.	11.5	Antel Communication Corp.	-14.3
Micron Technology	11.4	Computrad Corp.	-13.1
Struct. Dynamics Research	10.8	Cirrus Logic	-12.6

Dollar

Matsushita Electronics (H)	8.00	Policy Management Sys.	-39.75
Motorola Inc. (H)	5.63	Progress Software Corp.	-8.00
Intel Corp.	5.50	Software Publishing Corp.	-4.75
Synoptics Communications (H)	4.88	Sybase Inc.	-3.75
Advanced Micro Devices	3.75	Computrad Corp.	-3.50
Creative Technologies Inc.	3.13	Cambex Corp. (L)	-3.25
Ask Computer Systems	3.00	Cirrus Logic	-3.00
MCI Communications Corp.	2.50	Computer Sciences	-2.50

Far East slump aids U.S. firms

The U.S. economy has had plenty of company in its misery. Japan, the second largest information technology marketplace, has also been mired in a prolonged slump. Two recent reports from Wall Street indicate that certain U.S.-traded stocks can benefit from Japan's difficulties.

A Robertson, Stephens & Co. report dated March 30 indicated that Japan's recession has hurt its once-dominant semiconductor firms. Japanese advantages in cost of capital and labor costs have dissipated during the past two decades as the dollar has gained strength against the yen. Also, Japanese chip makers have suffered declining profits and have therefore delayed crucial investment decisions.

Analysts Daniel Kiesken and Ken Pearlman said U.S. firms such as Intel Corp. (INTC), Altera Corp. (ALTR) and Xilinx, Inc. (XLNX) should continue to make inroads into the Japanese market. In 1992, Intel became the largest semiconductor company in the world.

David Wu, an analyst at S. G. Warburg & Co., said Japanese end users are following in the U.S.' downsizing footsteps. Computer industry stocks that can benefit include Novell, Inc. (NOVL), which supplies a Japanese version of NetWare, as well as workstation vendors Sun Microsystems, Inc. (SUNW) and Hewlett-Packard Co. (HWP). Sun and HP both have a strong presence in the Japanese market.

In a March 25 report, Wu also noted that the two leading Taiwanese PC manufacturers are no longer able to keep up with the radical price-chopping initiated by Dell Computer Corp. (DELL) and Compaq Computer Corp. (CPQ). Both Taiwanese companies lost money last year and intend to concentrate on higher margin notebook computers, giving Dell and Compaq more room on the desktop. — *Derek Slater*

The chips are up

SELECTED SEMICONDUCTOR ISSUES AND THEIR PROGRESS THIS YEAR

Altera Corp.	12 7/8	15 3/4	22%
Applied Materials, Inc.	33 3/4	39 7/8	18%
Cirrus Logic, Inc.	35	20 5/8	(41)%
Intel Corp.	87	111 1/2	28%
Motorola, Inc.	52 1/4	66 3/8	27%
Xilinx, Inc.	25 1/4	31 1/2	25%

CW Chart: Michael Siggins

Exch	52-Week Range			April 8 Close	Wk Net Change	Wk Pct Change
COMPUTER & DATA SERVICE STOCKS						
OTC	36.75	9.63	3 COM Corp.	31.88	-1.75	-5.2
NYS	78.00	58.50	American Info Techs Corp. (H)	76.88	0.88	1.1
NYS	59.13	40.63	AT&T	58.63	2.25	4.0
OTO	3.56	0.75	Antel Communication Corp.	2.25	-0.38	-14.3
OTC	24.50	10.25	Banyan Systems Inc.	16.75	0.50	3.1
NYS	56.75	41.00	Bell Atlantic Corp.	54.38	0.13	0.2
NYS	57.50	43.88	BellSouth Corp.	55.25	-0.38	-0.7
NYS	6.25	3.63	Bolt, Beranek & Newman	5.13	0.13	2.5
OTC	18.50	9.75	Brooktrout Technology	12.00	0.50	4.3
NYS	92.25	62.13	Cabletron Systems	87.63	0.63	0.7
OTC	34.50	17.75	Chipcom Corp.	30.50	-0.88	-2.8
OTC	48.25	16.50	Cisco Systems Inc.	43.63	1.13	2.6
OTC	23.00	5.50	Compression Labs Inc.	10.00	0.13	1.3
OTC	4.63	0.88	Data Switch Corp.	3.94	0.00	0.0
NYS	22.13	13.75	Digital Comm. Assoc.	14.88	-0.38	-2.5
OTC	12.75	6.00	Digital Systems Int'l Inc.	6.00	-0.75	-11.1
OTC	29.50	4.00	DSC Communications	27.63	1.25	4.7
OTC	9.50	4.75	Fibronix Int'l Inc.	7.13	0.00	0.0
OTC	28.50	8.75	Filenet Corp. (L)	10.00	0.88	9.6
OTC	6.38	1.50	Gandalf Technologies Inc.	3.13	-0.25	-7.4
OTC	2.06	0.69	Gateway Communications	1.38	-0.19	-12.0
NYS	11.50	2.88	General Datacomm Inds.	10.00	-0.63	-5.9
ASE	6.13	2.00	Go Video	2.50	0.00	0.0
NYS	37.75	29.75	GTE Corp.	36.63	0.25	0.7
NYS	81.00	62.50	ITT Corp.	78.63	-1.25	-1.6
OTC	46.00	29.88	MCI Communications Corp.	45.75	2.50	5.8
OTC	12.00	2.25	Microcom Inc.	4.38	0.88	25.0
OTC	24.25	4.75	Netrix Corp.	6.13	0.88	16.7
OTC	19.00	9.63	Network Computing Devices	12.75	0.00	0.0
NYS	15.38	6.00	Network Equipment Tech. (L)	6.13	0.13	2.1
OTC	23.25	8.00	Network General	10.75	-0.75	-6.5
OTC	15.75	8.50	Network Systems Corp.	9.13	-0.75	-7.6
OTC	64.00	13.63	Newbridge Networks Corp.	58.25	1.13	2.0
NYS	48.00	30.50	Northern Telecom Ltd.	37.00	-0.25	-0.7
OTC	35.25	22.50	Novell Inc.	32.00	1.00	3.2
NYS	92.50	71.50	Nynex Corp.	90.00	-0.75	-0.8
OTC	30.75	14.50	Octel Communications Corp	21.50	-1.50	-6.5
OTC	7.13	3.38	Penril Data Comm Networks	4.50	0.19	4.3
OTC	40.50	10.25	Picturetel Corp.	17.25	0.13	0.7
OTC	15.75	5.75	Proteon Inc.	6.00	-0.13	-2.0
NYS	30.38	10.16	Scientific Atlanta Inc.	24.50	0.88	3.7
NYS	78.13	58.50	Southwestern Bell Corp. (H)	76.38	-0.38	-0.5
NYS	32.00	21.00	Sprint Corp.	32.00	2.13	7.1
OTC	27.00	8.75	Standard Microsystems Corp	15.38	-1.63	-9.6
OTC	18.50	6.88	Stratacom Inc.	12.50	1.00	8.7
OTC	97.25	19.38	Synoptics Communications (H)	97.25	4.88	5.3
OTC	7.13	4.25	Telebit Corp.	4.63	-0.50	-9.8
OTC	9.38	2.13	Telematics Int'l Inc	7.13	0.38	5.6
OTC	25.50	13.38	US Robotics	19.00	0.25	1.3
NYS	43.88	33.13	US West Inc.	42.88	-0.38	-0.9
OTC	46.00	12.00	Wellfleet Communications	42.38	2.38	5.9
OTC	22.00	7.00	Xircom	8.00	0.25	3.2
COMPUTER & OFFICE SYSTEMS						
OTC	7.25	2.75	Advanced Logic Research	3.00	0.00	0.0
OTC	65.25	41.50	Apple Computer Inc.	49.75	-0.13	-0.3
OTC	24.25	11.25	AST Research Inc.	13.25	-0.25	-1.9
NYS	14.25	4.75	Commodore Int'l	4.88	-0.13	-2.5
NYS	58.50	22.25	Compaq Computer Corp.	48.88	2.00	4.3
OTC	49.88	15.00	Dell Computer Corp.	32.13	-0.75	-2.3
NYS	82.88	50.25	Hewlett Packard Co.	74.63	1.50	2.1
NYS	33.00	14.13	Silicon Graphics	25.75	-0.25	-1.0
OTC	41.00	22.50	Sun Microsystems Inc.	28.88	0.00	0.0
NYS	32.13	22.25	Tandy Corp.	29.75	0.25	0.8
OTC	12.75	2.75	Zeos International Ltd.	4.88	0.00	0.0
LARGE SYSTEMS						
ASE	18.38	6.00	Amdahl Corp.	6.00	-0.13	-2.0
NYS	11.63	4.75	Convex Computer	4.75	-0.63	-11.6
OTC	6.13	1.88	Cray Computer	2.75	-0.25	-8.3
NYS	43.00	19.00	Cray Research Inc.	27.63	0.25	0.9
NYS	13.88	7.13	Data General Corp.	11.13	-0.38	-3.3
NYS	49.25	30.38	Digital Equipment Corp.	41.25	-1.63	-3.8
NYS	38.63	26.63	Harris Corp.	37.50	0.63	1.7
NYS	100.38	45.88	IBM	51.13	-1.50	-2.9
OTC	22.00	5.50	Kendall Square Research	16.25	0.25	1.6
NYS	117.50	83.00	Matsushita Electronics (H)	117.50	9.00	8.3
OTC	17.00	6.00	Pyramid Technology	12.50	-1.00	-7.4
OTC	24.00	11.13	Sequent Computer Sys.	18.38	0.13	0.7
OTC	16.38	1.38	Sequoia Systems Inc.	2.63	0.13	5.0
NYS	49.50	29.50	Stratus Computer Inc.	34.25	-1.50	-4.2
NYS	16.88	9.88	Tandem Computers Inc.	10.88	-0.75	-6.5
NYS	13.88	7.75	Unisys Corp.	13.13	0.25	1.9
ASE	5.38	0.06	Wang Labs Inc. (B)	0.44	-0.06	-12.4
SOFTWARE						
OTC	49.25	25.25	Adobe Systems Inc.	41.75	1.00	2.5
OTC	24.25	10.25	Aldus Corp.	17.75	-1.00	-5.3
OTC	16.63	5.63	American Software Inc.	7.50	0.50	7.1
OTC	28.13	9.75	Ask Computer Systems	13.75	3.00	27.9
OTC	56.50	27.75	Autodesk Inc.	41.38	-0.25	-0.6
OTC	23.00	3.50	Bachman Info. Systems	3.75	0.06	1.7
OTC	63.00	34.75	BGS Systems Inc.	37.63	-1.38	-3.5
OTC	84.13	37.25	BMC Software Inc.	44.63	0.13	0.3
OTC	28.25	17.00	Boole & Babbage	26.75	-0.50	-1.8
OTC	55.25	17.50	Borland Int'l Inc.	19.25	-0.75	-3.8
OTC	6.50	3.00	CE Software	3.75	0.00	0.0
ASE	35.00	9.38	Cheyenne Software Inc.	30.13	0.00	0.0
OTC	19.50	8.25	ChipSoft	9.75	-0.75	-7.1
OTC	9.75	5.63	Cosmos Inc.	6.88	0.25	3.8
NYS	27.38	10.88	Computer Associates	23.13	0.13	0.5
NYS	12.38	4.00	Computervision Corp.	6.38	-0.38	-7.9
OTC	34.25	23.25	Compuware Corp.	23.25	-3.50	-13.1
OTC	17.00	6.75	Comshare Inc.	6.75	-0.63	-8.5
OTC	17.25	10.75	Corel Corp.	14.88	-0.13	-0.8
OTC	33.25	6.00	Easel Corp.	9.00	-0.50	-5.3
OTC	25.25	12.00	4th Dimension	20.50	-1.50	-6.8
OTC	23.50	7.25	Frame Technology	7.63	-0.13	-1.6
OTC	20.75	12.50	Group I Software	14.00	0.00	0.0
OTC	35.25	21.00	Gupta	22.25	-0.50	-2.2
OTC	8.75	3.50	Hogan Systems Inc.	6.63	-0.25	-3.6
OTC	25.75	12.25	IMRS	12.25	-1.75	-12.5
OTC	34.75	18.50	Information Resources	29.75	0.63	2.1
OTC	42.00	12.13	Informix Corp.	30.00	-2.00	-6.3
OTC	18.50	10.25	Intergraph Corp.	10.25	-1.25	-10.9
OTC	13.63	7.75	Interleaf Inc.	8.25	-0.75	-8.3
OTC	18.00	6.75	Intersolv Inc. (L)	7.25	0.25	3.6
OTC	17.50	9.25	Knowledgeware Inc	9.75	-0.25	-2.5
OTC	54.75	28.75	Legent Corp.	37.25	-0.25	-0.7
OTC	35.50	14.75	Lotus Development	26.50	1.75	7.1
OTC	23.00	12.13	MathSoft (L)	12.38	-0.75	-2.0
OTC	23.25	5.50	McAfee Associates	16.00	0.38	6.7
OTC	10.50	1.88	Meca Software	8.63	-0.38	-4.2
OTC	15.25	5.25	Mentor Graphics	8.75	-0.25	-2.8
OTC	46.00	27.25	Micro Focus	31.00	-0.50	-1.6
OTC	20.50	4.50	Micrografx Inc.	5.38	-0.50	-8.5
OTC	95.00	65.50	Microsoft Corp.	89.00	-0.75	-0.8
OTC	37.50	12.00	Oracle Corp.	35.88	1.00	2.9
OTC	31.88	14.88	Parametric Technology	25.50	-2.50	-8.9
OTC	40.50	22.50	Peoplesoft	31.75	-0.13	-0.4
OTC	10.25	3.50	Phoenix Technologies	4.75	0.44	10.1
OTC	40.00	29.00	Powersoft	29.50	-0.75	-2.5
OTC	25.00	11.25	Platinum Technology	13.88	-0.25	-1.8
OTC	61.50	29.00	Progress Software Corp.	37.75	-8.00	-17.5
OTC	18.00	2.94	Quarterdeck Office Sys.	3.50	-0.38	-9.7
OTC	24.50	11.75	Rainbow Technologies Inc.	17.75	-2.25	-11.3
OTC	21.25	4.00	Rasterops	4.63	-1.25	-21.3
OTC	15.25	3.63	Ross Systems	12.75	-0.50	-3.8
OTC	27.25	8.50	Sapiens USA Inc.	23.25	-0.75	-3.1
OTC	19.50	6.75	Software Publishing Corp.	8.25	-6.75	-36.5
OTC	9.13	2.00	Software Toolworks Inc.	7.50	0.13	1.7
OTC	6.88	0.75	Spinnaker Software	1.88	-0.06	-3.3
OTC	14.75	3.25	State of the Art	10.38	-0.63	-5.7
NYS	24.63	13.75	Sterling Software Inc.	20.50	-1.63	-7.3
OTC	18.75	8.00	Struct. Dynamics Research	16.63	1.63	10.8
OTC	62.25	21.00	Sybase Inc.	52.25	-3.75	-6.7
OTC	47.50	5.88	Symantec Corp.	13.38	0.75	5.9
NYS	12.75	5.25	Systems Center Inc.	11.00	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	13.00	0.25	2.0
OTC	8.88	2.50	Trinzic Corp.	3.88	-0.25	-6.1
OTC	22.75	9.13	Viewlogic Systems	15.75	0.25	1.6
OTC	23.50	6.75	Walker Interactive Systems (L)	8.00	0.50	6.7
OTC	4.25	1.38	Wordstar	2.38	0.13	5.6
SEMICONDUCTORS						
NYS	25.00	7.38	Advanced Micro Devices	25.00	3.75	17.6
NYS	21.25	9.00	Analog Devices Inc.	19.75	0.38	1.9
OTC	20.13	7.63	Atmel Corp.	18.63	1.50	8.8
OTC	9.38	3.13	Chips and Technologies	3.63	-0.13	-3.3
OTC	39.75	16.25	Cirrus Logic	30.88	-3.00	-12.6
NYS	12.38	7.38	Cypress Semiconductor Corp	9.88	0.38	3.9
NYS	16.13	7.00	Dallas Semiconductor	13.25	-1.13	-7.8
OTC	121.25	46.50	Intel Corp.	113.00	5.50	5.1
NYS	14.13	4.88	LSI Logic Corp.	12.38	0.63	5.3
NYS	28.50	12.88	Micron Technology	22.00	2.25	11.4
NYS	68.75	36.88	Motorola Inc. (H)	68.75	5.63	8.9
NYS	14.13	8.25	National Semiconductor	13.13	0.63	5.0
OTC	21.25	8.25	Sierra Semiconductor	10.50	0.50	5.0
OTC	38.50	22.25	SynOptics	32.50	-0.25	-0.8
NYS	63.38	32.25	Texas Instruments	56.00	2.38	4.4
OTC	8.88	6.00	VLSI Technology	6.75	0.00	0.0
OTC	7.63	2.13	Weitek	5.50	0.25	4.8
ASE	9.63	3.50	Western Digital Corp.	4.88	-0.25	-4.9
OTC	37.50	14.50	Xilinx	32.50	1.00	3.2
OTC	27.84	12.50	Zilog Inc.	22.25	-1.75	-7.3
PERIPHERALS & SUBSYSTEMS						
OTC	33.75	10.38	American Power Conversion	29.75	0.25	0.8
OTC	20.38	13.66	Banctec Inc.	16.50	-0.63	-3.6
OTC	18.00	7.25	Cambex Corp. (L)	7.25	-3.25	-31.0
ASE	18.38	7.00	Cognitronics Corp.	7.00	-0.75	-9.7
NYS	25.50	12.75	Conner Peripherals (L)	12.75	-1.00	-7.3
OTC	38.50	10.75	Creative Technologies Inc.	27.25	3.13	13.0
OTC	39.75	14.25	Data Race Inc.	18.50	-0.75	-3.9
ASE	18.50	4.75	Dataram Corp.	9.00	0.25	2.9
NYS	28.75	8.16	EMC Corp.	24.75	0.50	2.1
OTC	10.50	5.38	Emulex Corp.	6.88	0.13	1.9
OTC	19.00	13.25	Evans & Sutherland	15.00	-0.50	-3.2
OTC	39.25	12.00	Exabyte	14.38	-0.13	-0.9
OTC	26.00	7.09	Intelligent Info. Systems	19.75	-0.25	-1.3
OTC	8.88	3.88	Iomega Corp.	4.13	-0.38	-8.3
OTC	31.00	5.75	IPL Systems Inc.	7.25	0.75	11.5
OTC	24.00	10.75	Komag Inc.	18.25	-0.13	-0.7
OTC	19.63	6.88	Maxtor Corp.	7.13	-0.50	-6.6
OTC	11.75	6.38	Micropolis Corp. (L)	6.63	0.13	1.9
NYS	131.75	87.63	3M Corp	110.88	1.13	1.0
OTC	7.75	4.00	Printronix Inc.	7.38	0.00	0.0
NYS	17.13	6.88	QMS Inc.	15.50	1.13	7.8
OTC	17.88	11.75	Quantum Corp. (L)	12.63	0.50	4.1
OTC	12.75	3.50	Radius Inc.	4.00	0.25	6.7
NYS	16.25	7.50	Recognition Equipment	12.63	-0.75	-5.6
OTC	13.88	5.50	Rexon Inc.	6.25	0.00	0.0
OTC	32.38	12.00	Seagate Technology	14.00	-0.75	-5.1
NYS	64.00	18.00	Storage Technology	23.63	0.00	0.0
NYS	27.63	16.88	Tektronix Inc.	26.88	0.75	2.9
NYS	88.88	66.75	Xerox Corp.	79.63	-1.25	-1.5
SERVICES						
OTC	23.50	12.66	American Mgmt. Systems	22.25	0.13	0.6
NYS	4.88	3.00	Analogic Inc.	3.75	0.00	0.0
OTC	35.75	16.00	Analysts Int'l	29.75	0.25	0.8
NYS	56.13	38.75	Auto Data Processing	49.88	-2.38	-4.5
NYS	17.25	9.41	Ceridian Corp.	15.63	0.25	1.6
NYS	17.38	12.50	Comdisco Inc.	15.75	-0.13	-0.8
OTC	13.00	6.75	Computer Horizons	10.50	0.00	0.0
NYS	80.50	57.00	Computer Sciences	73.50	-2.50	-3.3
NYS	9.63	7.00	Computer Task Group	7.13	-0.25	-3.4
NYS	40.50	22.00	CompUSA Inc	30.13	-0.13	-0.4
OTC	17.50	6.00	Corporate Software	13.88	0.75	5.7
OTC	28.00	7.63	Egghead Discount Software	8.25	0.38	4.8
NYS	35.88	25.25	General Motors E (EDS)	30.38	-1.63	-5.1
OTC	25.50	9.25	Inacom Corp.	18.00	-1.25	-6.5
OTC	15.75	6.25	Intelligent Electronics	13.13	-0.38	-2.8
OTC	14.38	6.63	Medisel	10.75	-0.63	-5.5
OTC	14.25	5.75	Microage Inc. (H)	13.25	-0.25	-1.9
OTC	42.00	21.75	Paychex	41.25	0.00	0.0
NYS	86.88	45.00	Policy Management Sys.	45.00	-39.75	-46.9
NYS	35.38	16.81	Reynolds and Reynolds	33.88	0.38	1.1
OTC	31.75	22.00	SEI Corp.	28.25	0.50	1.8
OTC	24.38	16.88	Shared Medical Systems	20.50	-0.88	-4.1
OTC	14.38	5.75	Shl Systemhouse	11.13	0.75	7.2
OTC	29.25	18.25	Software Spectrum Inc.	22.25	0.00	0.0
OTC	33.75	21.75	Sungard Data Systems	31.25	0.50	1.6
NYS	6.00	1.13	Ultimate Corp.	3.50	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

ICL's mixed results

ICL last week said its calendar 1992 pretax earnings fell 30% to $106 million. Revenue, however, rose 32% in the year to $4.34 billion, the London firm said. Software and services accounted for 50% of the firm's revenue.

SHL on rebound

SHL Systemhouse, Inc. posted fiscal second-quarter earnings of $1.02 million, compared with a $554,000 loss in the same period last year. Revenue in the period ended Feb. 28 increased 34% to $190.8 million, the Ottawa systems integrator said.

Cambex profits drop

Cambex Corp. saw its fiscal second-quarter profits cut in half to $1.4 million. The Waltham, Mass., disk storage maker attributed its earnings shortfall to IBM's recent mainframe announcement, which caused customers to delay purchase decisions. Revenue in the period ended Feb. 27 was flat at $12 million.

Gartner sold again

The Dun & Bradstreet Corp. has acquired a majority interest in Gartner Group, Inc. in Stamford Conn., from an investment group in which it was a limited partner. D&B paid $33 million to Information Partners Capital Fund L.P. in Boston to acquire the majority stake. The group had acquired Gartner Group from Saatchi & Saatchi Ltd. in 1990.

SHORT TAKES Intel Corp. will build a $1 billion plant in Rio Rancho, N.M., to expand microprocessing manufacturing. It is due to begin production in 1995. . . . Advanced Micro Devices, Inc. reported record first-quarter revenue of $407.4 million; net profits were $61.4 million. . . . Symantec Corp. has completed a $25 million private placement of convertible subordinated notes.

IBM to buy French CASE firm

Acquisition of CGI Informatique would further IBM's software, services goals

By Martin LaMonica
PARIS

■ IBM last week said it plans to buy French computer-aided software engineering (CASE) firm CGI Informatique in a $475 million stock-for-bonds transaction that includes CGI's 500-employee U.S. subsidiary.

The acquisition would make IBM the second-largest computer and services provider in France, behind Cap Gemini Sogeti, according to Pierre Audoin Conseil, a consulting firm in Paris.

The proposed acquisition would expand IBM's global software and services business, a key element in the company's plan to restore its financial growth. The deal would also enable CGI to get better exposure for its products and services, a CGI official said.

Users of CGI Pacbase, a full life-cycle CASE workbench sold here and abroad, should see no difference in service or product availability as a result of the deal, said Dick Ramsdell, general manager at CGI Systems, Inc., a division in Pearl River, N.Y.

"It's business as usual except that [the U.S. group has] more visibility now," Ramsdell said, adding that none of the 500 U.S. workers are expected to be laid off.

Product collaboration

A plan is under way for joint product development between CGI and IBM's Programming Systems Group, which handles the OS/2 and AIX operating systems, Ramsdell said. However, it is unclear whether CGI, which pulled in $375 million in worldwide product and service sales for 1992, will participate in AD/Cycle.

While IBM's new Chief Executive Officer Louis V. Gerstner Jr. had the final say over the deal, the particulars of the transaction had been negotiated long before he took over, according to Ramsdell.

The buyout would bolster IBM France's service and consulting operation — areas that garnered about $236 million in revenue for 26-year-old CGI last year. "I see this as a reinforcement and not a shift in IBM's services strategy," said Elizabeth de Maulde, an analyst at Pierre Audoin.

If CGI shareholders fail to put up the required two-thirds majority of stock by June 6, IBM will withdraw the offer, Ramsdell said. "But we expect the transaction to go. Even before the public announcement was made, [CGI's] senior officers in France guaranteed almost 30% of the shares necessary," he said.

Chairman Robert Mallet, Vice President Bernard Chapot and Vice President of the Board of Directors Jacques DeBuiasson committed their holdings to IBM France, according to a statement issued last week.

West coast correspondent Kim S. Nash contributed to this report.

Market value

Currently, CGI's 1.3 billion francs ($234 million U.S.) domestic revenue ranks it third in the French market, excluding hardware vendors such as IBM France, which earns 1.8 billion francs ($324 million) in services. The IBM subsidiary's bid to control 66.7% of CGI places the total value of the software company at 2.5 billion francs ($450 million), or 1.2 times its 2.02 billion franc ($363 million) annual revenue and 17.5 times its net profit of 145 million francs ($26.1 million).

LaMonica is an IDG News Service correspondent, Paris bureau.

Computervision marks new fiscal quarter with changing of CEOs

By Melinda-Carol Ballou
BEDFORD, MASS.

Seeking to accelerate a strategic overhaul of its business, Computervision Corp. unexpectedly replaced Chief Executive Officer Jack Shields last week, bringing in company Chairman Russell Planitzer to succeed him.

Shields was successful at helping the company transition from its minicomputer roots to computer-aided design and manufacturing (CAD/CAM) software and services. But a slumping European market and fierce competition had begun to undercut gains that had been made, Computervision officials said. The company turned a profit last quarter, for instance, but is expected to lose between $8 million and $10 million in its most recent quarter, which ended last month, according to analysts.

"I'm not going to change strategy," Planitzer said. "Shields took us in the right direction by unbundling software, opening up various channels of distribution and offering products on multiple platforms. But while we have been changing, the market has been changing, too, and we have to change faster."

Computervision's *John Shields helped move to CAD/CAM software and services*

Two-thirds of Computervision's $775 million CAD/CAM revenue comes from Europe. The poor economy in Europe is adversely affecting Computervision's results, leading indirectly to Shields' ouster, said IDC director Gisela Wilson.

In an attempt to become more competitive, Computervision will be taking a page from other companies and expanding its sales and distribution channels. For instance, in addition to telemarketing, Computervision will offer catalog sales and aggressively target the low-end market. It will also release a new version of the company's CADD 5 software next month, with support for Hewlett-Packard Co. platforms and standardized graphics engines across different workstations, Planitzer said.

Planitzer may be able to instill a "new sense of purpose" because of his ability to better articulate the company's strategy both to customers and investors, according to Gisela Wilson, a director at International Data Corp. (IDC), a market research firm in Framingham, Mass. But doing things better and faster in an economic climate where prices are declining and the European market is depressed will be no easy task.

Shields joined Computervision's predecessor company Prime Computer, Inc. in 1980 from Digital Equipment Corp., where he was at one time considered the heir apparent to founder and then CEO Kenneth H. Olsen. Shields oversaw Prime's exodus from the hardware business, a decision that resulted in the closure of the company — leaving Computervision as the remaining entity. He could not be reached for comment.

Slippery slope

Computervision's CAD/CAM revenue and market share have slipped as the average price per installation has declined

Year	Revenue	Percent market share
1993*	$775.7	9.6%
1992	$775.7	10.0%
1991	$894.7	12.0%
1990	$962.0	13.7%
1989	$812.9	13.3%

Source: Daratech

Wysiwyg

And The Winner Is . . .

Entertainment Data, Inc.'s computer picked its favorites for grabbing the Academy Awards this year. It was hit and miss in these categories:

Award	Computer pick	Winner
Picture	*Scent of a Woman*	*Unforgiven*
Actor	Stephen Rea	Al Pacino
Actress	Emma Thompson	Emma Thompson
Supporting actor	Gene Hackman	Gene Hackman
Supporting actress	Judy Davis	Marisa Tomei
Director	Clint Eastwood	Clint Eastwood

Michael Siggins

Lost in space

Remember that Russian cosmonaut who was stuck in space for 10 months last year while the Soviet Union collapsed below? Now we know what Sergei Krikalev was doing up there: He was taking inventory of space-station supplies with a bar-code reader hooked to a laptop computer.

Source: *ID Systems* magazine, February 1993

Overheard

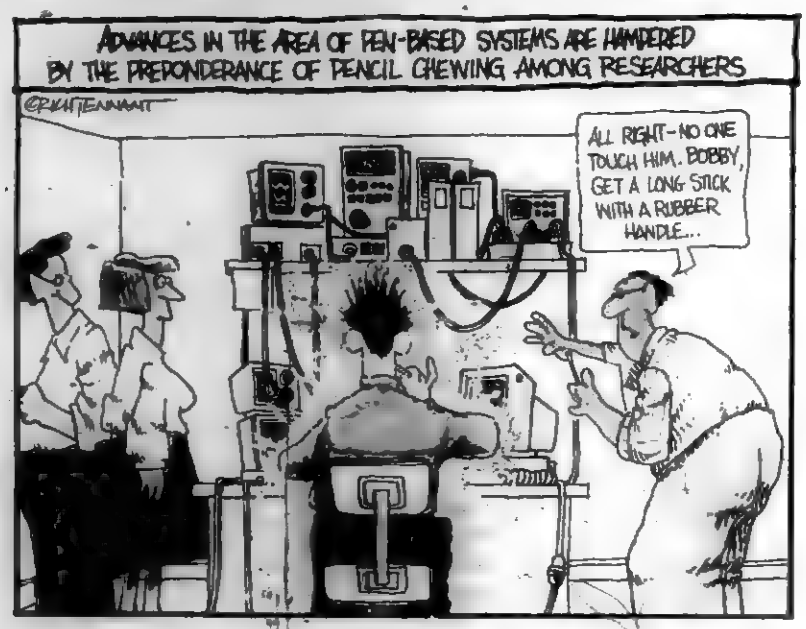
Q. Why did it take God seven days to create the world?
A. No installed user base.

Misfired E-Mail

"I once heard about someone who was having an affair with a co-worker. One morning, he sent her a message: "How about a nooner?" Unfortunately, instead of sending it only to her, he broadcast it to the entire company."

A reader in Orlando, Fla.

The Fifth Wave *by* Rich Tennant



Inside Lines

Taking stock of the situation

Negotiations between BT and General Motors concerning BT's outright purchase of or equity investment in Electronic Data Systems have bogged down [CW, Jan. 25]. Sources say the deal is mired in the complicated process of sorting out the future of GM Class E stock. The problem is that GME, as it is known, does not represent ownership; the stock trades are based on EDS' performance. The parties are discussing retiring the stock or converting it into equity if BT acquires or invests in EDS. The protracted negotiations are also believed to have hit sticking points over executive compensation. Because it is a utility, BT does not have stock to offer EDS executives, one source said. What's more, GM could have trouble paying capital gains taxes if the sale were to go through in one reported extreme form — a $20 billion deal for all of EDS. That figure would represent nearly 2½ times EDS' valuation. Any deal is expected to include a large outsourcing contract for EDS.

Unicenter spreads its wings

CA is expected to disclose plans to port its CA-Unicenter systems management suite to Microsoft's NT operating environment at this week's FOSE show in Washington, D.C. CA is already porting CA-Unicenter to a number of multivendor Unix platforms, including HP's HP/UX and Sun's SunOS. Analysts said they believe the CA/Microsoft alliance will be a coup for Microsoft because the early word on its internally developed systems management tools — called Hermes — is that the package lacks robust capabilities.

Rising Sun

At the Downsizing Japan 1993 Expo last week, Nobuo Mii, IBM vice president and general manager of Entry Systems Technology, showed a personal digital assistant (PDA) built around the PowerPC processor that IBM is developing with Apple and Motorola. IBM's PDA was shown as a long, slender device with a pen-input LCD covering the face of the unit and an antenna protruding from the top. It is planned for release by year's end. It will include a cellular phone for sending and receiving faxes and E-mail.

Unkindest cuts

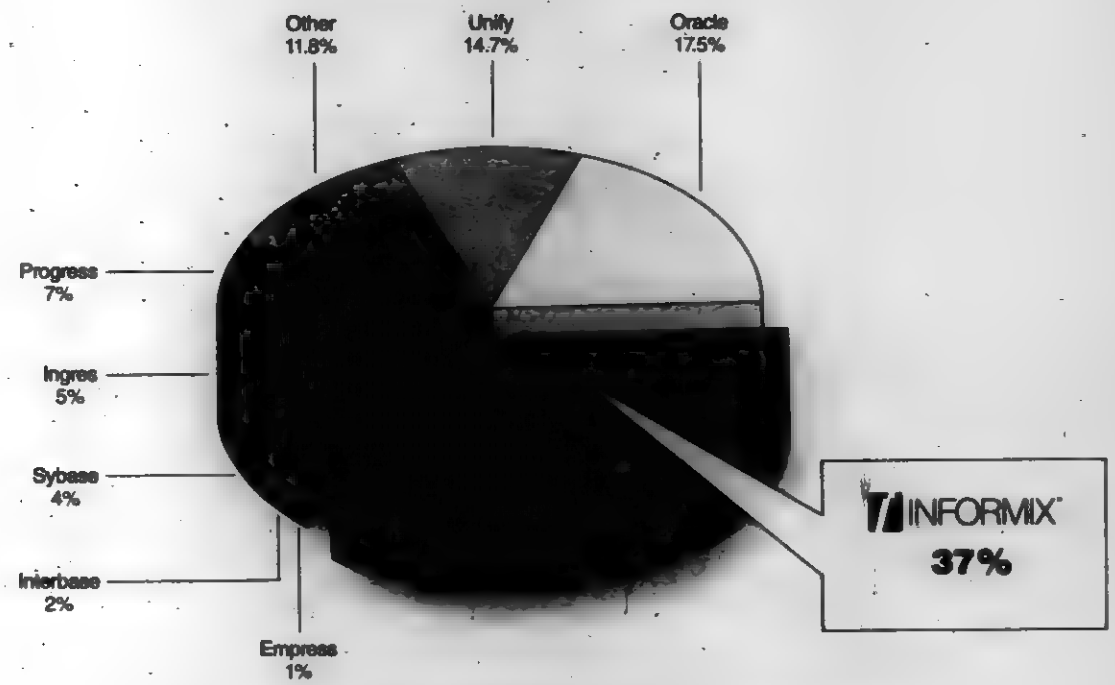
Compaq's impending restructuring of its sales force (see page 2) has sparked interesting scuttlebut. Doug Johns, who recently said he retired as head of Compaq's PC division to spend more time with his family, reportedly left because he refused to cut the PC division as much as CEO Eckhard Pfeiffer wanted. After that, Pfeiffer showed him the door. The incident is believed to have triggered the exit of four top members of Compaq's field organization. But Johns, reached at home, emphatically denied the rift, saying he is still in regular and friendly contact with Pfeiffer.

No stacked deck

Stac Electronics has pushed back the release date of Stacker for OS/2, citing "problems" with its business partners (read: IBM). The compression software, which was expected next week, will now appear toward the end of the month, Stac promised on its CompuServe forum last week. There is interest in the product from OS/2 users, some of whom said on CompuServe that they were dumping Stac because they are tired of waiting for the product.

Is IBM buying Sun? Has Intel CEO Andy Grove resigned to pursue a career as a rap singer? Yup, April Fools! The IBM/Sun rumor was a prank pulled by those wild and crazy engineers at DEC. Seems the DECsters put out a release on the firm's internal network saying Sun had been gobbled up by IBM. They went as far as to manufacture a quote from a startled Sun employee, who allegedly said: "All of us are worried that we're going to have to start wearing blue suits and ties. I hate blue suits. I don't even own a tie." Intel employees were treated to a video on Grove's resignation. The tape claimed the company was relocating to a small island off Venezuela. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

The UNIX Database Leader Now Does NetWare.



Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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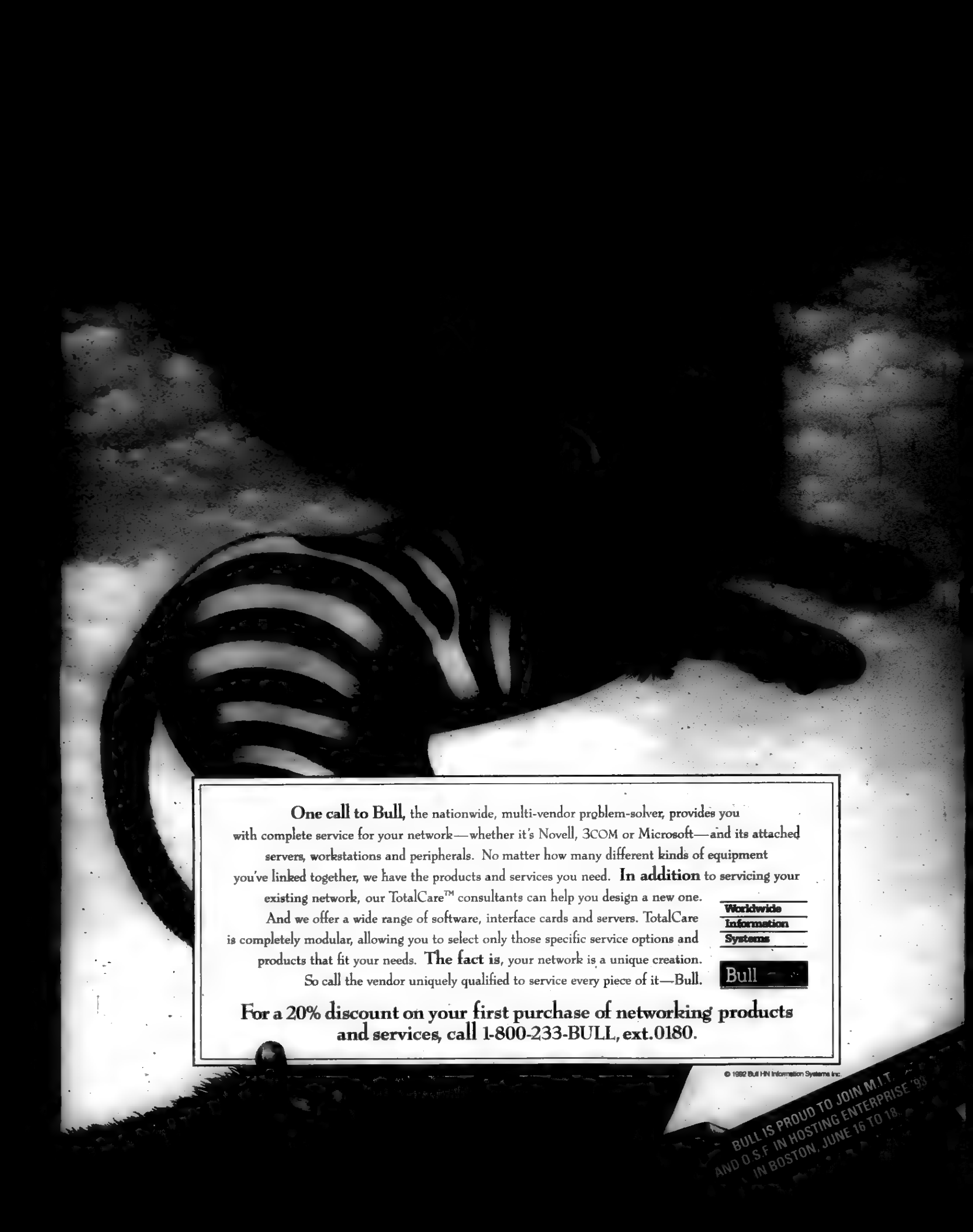
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COMPUTERWORLD

Inside

CLIENT/SERVER
Computer Associates promises a version of its mainframe systems management software for Microsoft's Windows NT operating system. *Page 2*

MIGRATION PAINS
IBM's recent decision to end support of its defunct Series/1 system is prompting users to scurry around for substitutes. *Page 6*

ADDRESSING SCHEME
Novell software helps NetWare users communicate on a public network similar to the Internet. *Page 8*

EXCLUSIVE SURVEY

ELUSIVE PAYBACK
Leaders of the nation's top corporations show new enthusiasm for what computers can do for their businesses. Nevertheless, fewer than half say they are getting their money's worth from their information technology investments. *Page 86*

Motorola extends paging

E-mail info linked to untethered users

By Joanie M. Wexler
BOYNTON BEACH, FLA.

■ Corporate America's budding fixation with employee accessibility will likely grow more acute this week when Motorola, Inc. announces a wireless system that lets on-site, pager-toting users receive messages and calls forwarded from their PCs and telephones.

WIRELESS COMMUNICATIONS

Motorola's three-module Site Connect one-way paging system aims to untether the large percentage of users who are "locally mobile" — not at their desks but somewhere in their office buildings — from the communications devices in their work areas, Motorola said.

Although some productivity gains can be expected when workers no longer miss that make-or-break call, fax or electronic-mail message, users and analysts said the so-far vaguely described mechanisms for filtering traffic are paramount to the success of the system.

"We absolutely need filtering to screen calls, but [Motorola] hasn't explained yet how that will work exactly," said Moe Mustafa, telecommunications director at Tampa Electric Co. in Florida. The utility will soon begin a 1,200-user beta test for a Site Connect module called Site Call, which forwards a telephone caller's name or phone number to a user's alphanumeric

Motorola, *page 12*

PC factions rearming

Microsoft, Compaq confront PowerPC

By Michael Fitzgerald and James Daly

Last week's public embrace between Microsoft Corp. and Compaq Computer Corp. was an outward push for new standards that will simplify computing.

However, analysts said that on a strategic level, it is the beginning of Microsoft's response to the wide-ranging technology alliance of IBM, Apple Computer, Inc. and Motorola, Inc.

"This is clearly positioned against IBM and Apple, who have gone out of their way to say Microsoft does not play a significant role in the future," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

For users, the Microsoft/Compaq strategic partnership to coordinate hardware and software development [CW, April 12] should mean PCs that are easier to use and configure (see story page 16).

"Everybody ends up with operating systems that are more tightly linked to hardware and can more efficiently use the hardware," said Jesse Berst, editor of the "Windows Watcher" newsletter in Redmond, Wash.

Sheldon Laube, national director of information technology at Price Waterhouse, agreed: "I'm happy to see more integration and cooperation between vendors."

If factional warring

PC factions, *page 16*

Users align on license demands

By Neil Margolis
RANCHO MIRAGE, CALIF.

Information systems executives from some of the largest corporations in the country last week joined under the banner of the Society for Information Management to fight what they consider to be unfair software licensing practices.

"This is a lobbying force," said Warren Harkness, Bose Corp.'s director of information services. "Until now, we've really been on our own."

In its first official position paper, SIM spelled out the terms that its 2,700-plus information technology executive members see as essential to an acceptable contract and urged vendors and users to work as partners in negotiating their individual deals.

Get up, stand up

SIM's position on software licensing includes the following:

- Unlimited site licenses, enterprisewide licenses and concurrent user licenses.
- Fair and flexible pricing.
- Unrestricted geographic scope.
- Open systems support.
- Software integration.
- Clearly defined transition and migration plans.

Source: Society for Information Management

Strength in numbers

Widespread adherence to the paper's terms could end up putting significant peer pressure on vendors that decline to comply, noted Richard Miller, director of corporate computer services at Pittsburgh-based Westinghouse Electric Corp.

Even without any formal policing procedure currently on the SIM agenda, Harkness said, "Word gets around."

"Speaking with the voice of 2,700 should make a difference," added Alan P. Haesche, director of Southern New England Telephone Co.'s Information Technology Center in New Haven, Conn.

According to SIM, software licensing and pricing practices have failed to keep pace with the commercial and technological realities that rule the IS executive's day. "It makes you want to rush to a window and yell out, 'We're mad as hell and we're not going to take it anymore,' " said William Zeitz, IS director at Wayne, N.J.-based American Cyanamid Co. and

Users align, *page 8*

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Recent events suggest the administrative burdens of your network could grow substantially.

STUART McCALL

CLIENT/SERVER

Powersoft plans to upgrade its hot-selling client/server application builder today with features designed to propel it further into the enterprise-class development tools market. *Page 10.* Client/server is the way to go, right? Not necessarily. For some IS shops with lots of terminals and low CPU demands, the answer may be to stay with the current host-based system. *Page 99*

OPERATING SYSTEMS

It may seem like a battle of The Ghost vs. Vaporware right now, but **Windows 4.0** and **Windows NT** could find themselves in a face-off in 1994. *Page 2*

HOT BOXES

DEC hopes to rediscover its roots in the technical and scientific communities this week with the rollout of its hottest Unix boxes ever, which are based on the 64-bit **Alpha** microprocessor. *Page 4.* Vendors and users hop the local bus to get better graphics performance. *Page 41.* Users and analysts say **Tricord**'s latest superservers look good but wonder if corporate IS will take a flier on such technology, particularly when it comes from a vendor that is not a household name. *Page 49*

NETWORKS

IBM opens up APPN to other vendors, as promised. *Page 12.* Wireless networks could prove useful for the travel industry, although some customers of AMR's **Sabre** system question whether that technology should have been so high on AMR's priority list. *Page 55.* **Cisco Systems** and **SynOptics Communications** have scrapped plans to physically integrate their high-end routers and wiring hubs into one superbox. *Page 15*

SOFTWARE

Software asset management has progressed from being something that people talked about to a reality that provides tangible benefits. *Page 65*

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Software licensing

Ruling hits outsourcing

By Mark Halper and Thomas Hoffman
MINNEAPOLIS

A recent court ruling could encourage prospective outsourcing customers to shift the onus of software license compliance to their service vendor, analysts said.

The U.S. Court of Appeals for the Eighth Circuit in Minneapolis reversed a lower court decision and cleared the way for Computer Associates International, Inc. to pursue its breach of contract claims against National Car Rental Systems, Inc. That claim had been invalidated by a lower district court under the Federal Copyright Act.

CA claimed National was liable for allegedly allowing National's outsourcer and affiliate, Electronic Data Systems Corp., to use CA programs licensed to National for other customers. General Motors Corp. owns EDS and holds a majority stake in National.

Analysts and legal pundits said the ruling could be fodder for CA's separate action against EDS. An EDS spokesman said it would have no bearing on CA/EDS litigation.

However, Arnold S. Mazur, executive vice president at CA, said the appellate ruling will have a substantial impact on the pending case between CA and EDS, which is scheduled to be heard later this year in Dallas. "EDS has asserted the position, which has now been rejected, that breach of license is preempted by the Federal Copyright Act."

A National spokesman declined to comment on the case.

The ruling against National sends a clear message to outsourcing customers that they share in the responsibility for complying with CA's — and other vendors' — licensing policies, according to Kidder, Peabody & Co. analyst Chuck Phillips. He characterized the decision as a "small legal victory" for CA that clearly establishes user liability.

Legal experts said the decision not only buttresses software copyright protection for vendors such as CA but also sends a signal to users to familiarize themselves more closely with the specific terms of their licenses. "I think that any company such as National that needs to use its software beyond the immediate enterprise will look more closely now at the terms of their contracts," said Barry Rein, an attorney at Pennie & Edmonds in New York.

Phillips and other analysts said users might be able to protect themselves by negotiating indemnification clauses into their outsourcing contracts. "Customers are going to say to their outsourcing vendor, 'Have you done anything illegal, and if you have, can you indemnify us?' " observed Terry Quinn, managing director of Furman Selz, Inc. in New York.

While incumbent outsourcing customers may not be able to retrofit indemnity into their contract, prospective customers may negotiate it in, Phillips noted.

"For future customers, there's no reason for them not to do that, and that could raise EDS' potential liability," he said.

Legal Hurry

National Car Rental filed a "declaratory action" against CA on May 24, 1991, after CA threatened to sue National for improper use of software. National claimed its use of the CA programs did not breach the license agreement or infringe on CA's copyrights. CA then filed two counterclaims asserting that National's use of the programs — for the benefit of two affiliates — breached the agreement and infringed on its copyrights. After the court ruled that a suit for copyright infringement preempts additional claims of breach of contract against National, CA filed an appeal on Dec. 17, 1992.

End near for Apple/Microsoft suit

By James Daly
SAN FRANCISCO

The stage was set last week for the culmination of Apple Computer, Inc.'s lengthy copyright infringement suit against Microsoft Corp. and Hewlett-Packard Co. The presiding judge set May 5 as the date to resolve three remaining infringement issues.

The three visual elements in dispute are the appearance of the gray outline of a moving window, the change in appearance of moving icons and any nonfunctional artistic touches involved with overlapping windows or icons. Judge Vaughn R. Walker will require Apple to prove that Microsoft's and HP's works are virtually identical, not just substantially similar, to Apple's, according to court documents.

Apple sued Microsoft and HP in March 1988, charging that certain audio/visual elements of the Macintosh, including overlapping windows and the manipulation of icons, were not part of a 1985 agreement that gave Microsoft the right to use some of Apple's technology.

That pact was used in the production of Microsoft's Windows 2.03 and HP's New Wave, which is based on Windows.

Stanford University economist Robert Hall estimated that Apple has lost $5.55 billion in sales as a result of the alleged infringement.

Apple originally disputed the legality of 179 elements in the Windows and New Wave screen display, but last year Walker ruled that many of the screen graphics Apple claimed the pair violated were either not protected by copyright or come under the 1985 licensing pact.

The items in question were soon winnowed to 23, then 10, most recently four and now to three.

The potential ramifications of the case have made it the most closely watched litigation in the PC industry because it will test whether Apple can copyright the "look and feel" of its widely emulated software.

An Apple victory could have a dramatic effect because the Cupertino, Calif., firm would gain control over critical computer technology and squeeze large royalty payments out of Microsoft. An Apple defeat might ultimately lower some software prices because it could encourage developers to craft applications with capabilities similar to the Macintosh.

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Network Systems

CA gets on Microsoft bandwagon

Will port CA-Unicenter to Windows NT; users remain wary

By Thomas Hoffman
WASHINGTON, D.C.

Computer Associates International, Inc.'s disclosure last week that it will port its systems management software to Microsoft Corp.'s Windows NT could give fence-sitting users a reason to consider the still unproven operating system.

The reason: CA-Unicenter addresses major shortcomings of Windows NT and other next-generation operating systems that will be used to perpetuate client/server computing across the enterprise. By some unspecified time next year, CA-Unicenter will add powerful security, control and audit capabilities to networked NT servers, which are features that mainframe users have come to expect.

Nevertheless, many users said they are taking a cautious approach to the overhyped and delayed NT operating system. Reported problems with beta-test versions of NT and user anxiety about betting the farm on an initial release are making many users skeptical about placing their mission-critical applications on the unproven system.

User will wait

"If Microsoft produces a stable product and irons it out in a few years, we'll use it. But it's going to take time to shake it out," said Doug Walker, a senior programmer/analyst at Brigham Young University in Provo, Utah, which recently completed testing CA-Unicenter on Hewlett-Packard Co.'s HP/UX Unix environment and plans to install the software when it begins shipping next month.

NT test drive

The rapid growth of interest in downsizing by CA customers during the past year leads Aberdeen Group to conclude that more than 50% of CA's Unicenter mainframe clients "would at least want to kick the tires of Unicenter on NT," said Peter Kastner, a vice president at the Boston consultancy. Analysts said they believe CA has more than 1,000 CA-Unicenter sites, most of which are in large MVS data centers. Less than 10% of the Windows NT base will require Unicenter in 1993 or 1994, Kastner said, estimating that large-scale Windows NT server deployment — in excess of 10,000 servers — will not occur until at least 1995.

CA-Unicenter on NT would make Microsoft's future operating system more attractive to Dick Kane, department head for technical infrastructure and support at ITT Hartford Life Cos. "That would be of significant interest to us. We're looking for industrial-strength systems management tools down to the PC LAN and desktop environment," Kane said.

CA's Charles Wang *(left) and Microsoft's Bill Gates agree NT will enhance CA-Unicenter*

Analysts said they liked CA's move but noted that NT still has a lot to prove before CA-Unicenter for NT ships.

"It amazes me how many people are waiting around for NT. I don't think it will be ready for prime time right out of the gate since a lot of supporting software like CA-Unicenter will be needed," said Terrence Quinn, managing director of Furman-Selz, Inc., a New York brokerage that monitors the software industry.

Both CA and Microsoft provided scant detail about delivery timetables for the port, especially because shipping dates for Windows NT products have not been set in stone. However, the consensus among analysts is that the first NT products — including the Advanced NT server rumored to be priced at $3,995 — will likely begin shipping by this fall.

If so, a beta-test version of the CA-Unicenter port may be demonstrated at the Comdex/Fall '93 trade show in November, followed by general availability of the product in the first half of 1994.

"I think we'll have a better idea when we see [Microsoft's general availability] code," said Kurt Seibert, senior vice president of strategic business alliances at CA.

Extra products

According to Seibert, follow-on ports to the NT environment will likely include products such as manufacturing control software; warehouse distribution products; financial applications such as CA-Simply Accounting and CA-Masterpiece; and CA-Realizer, a Basic application development system already available for Windows.

There are no current plans to bundle CA-Unicenter with NT, but Seibert did not rule out the possibility. Months after CA had announced Unix ports of Unicenter to HP's, Sun Microsystems, Inc.'s and IBM's respective Unix environments last year, bundling plans were announced.

However, Peter Kastner, a vice president at Aberdeen Group, a Boston-based consultancy, warned that such a move by CA for the NT environment would be "financial suicide. If CA has Unicenter on a mainframe for $150,000 to $250,000, why in God's name would they shrink-wrap it on NT for a fraction of the cost?" he asked.

West Coast correspondent Christopher Lindquist and Washington, D.C., senior correspondent Gary H. Anthes contributed to this report.

Windows

Windows success could limit NT

By Christopher Lindquist
BELLEVUE, WASH.

■ Call it a vaporware tornado. Microsoft Corp.'s Windows NT will not ship for at least a couple more months, and Windows 4.0 may not be available for more than a year, but some people are already beginning to wonder just what impact the next version of Windows on DOS will have on the NT market.

Windows 4.0 is being described as a bootable version of Windows that will still run on a 32-bit, preemptive multitasking, multithreaded version of MS-DOS referred to as MS-DOS 7.0. This updated Windows/MS-DOS combination will reportedly not contain some of the security, portability (including symmetric multiprocessor support) and networking features of Windows NT, but it will be able to run on a lower end machine with only 4M bytes of memory, according to sources at Microsoft.

At what cost success?

Some analysts are beginning to wonder if the success of Windows 4.0/MS-DOS 7.0 may come at the expense of Windows NT, at least on the desktop.

"I don't think many people have noticed that Microsoft is really competing with itself with NT and DOS 7.0," said Chris LeTocq, an industry analyst at Computer Intelligence/Infocorp in Santa Clara, Calif.

Others agreed. "I really think the biggest competitor for Windows NT is going to be Windows 4.0," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash.

Berst noted that if Windows 4.0 can do much of what Windows NT claims it will be able to, a user's urge to move to Windows NT could be lessened. "I think Windows 4.0 could prove surprisingly strong," he added.

Users are certainly interested in the idea of a 32-bit environment other than Windows NT, but they are still going to have to wait some time to see what the fruits of Microsoft's labors will be.

Nancy Smith, manager of system development at Florida Power & Light Co., said her company is currently working on an application that would benefit from preemptive multitasking.

Developers at Florida Power & Light are using OS/2 to create the application, but Smith said it will be deployed on Windows NT desktops because the firm anticipates that Windows environments will ultimately have the broadest array of software.

However, Smith added, Florida Power & Light might opt to deploy its application on Microsoft's other 32-bit environment, depending on what level of multitasking support Microsoft provides for DOS 7.0.

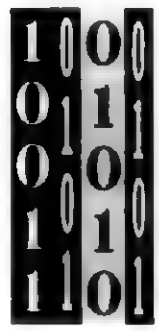
For its part, Microsoft seems unconcerned with the potential overlap. "We don't try and dictate who should move to what," said Microsoft Chairman and Chief Executive Officer Bill Gates at the recent MS-DOS 6.0 announcement in San Francisco. "We'll let people choose."

Microsoft is also reportedly spending considerable time talking with home users, who would be less concerned with the higher end features of Windows NT, about where Windows 4.0 should be headed.

Some analysts said they feel there is certainly room for both Windows NT and Windows 4.0 in the future market.

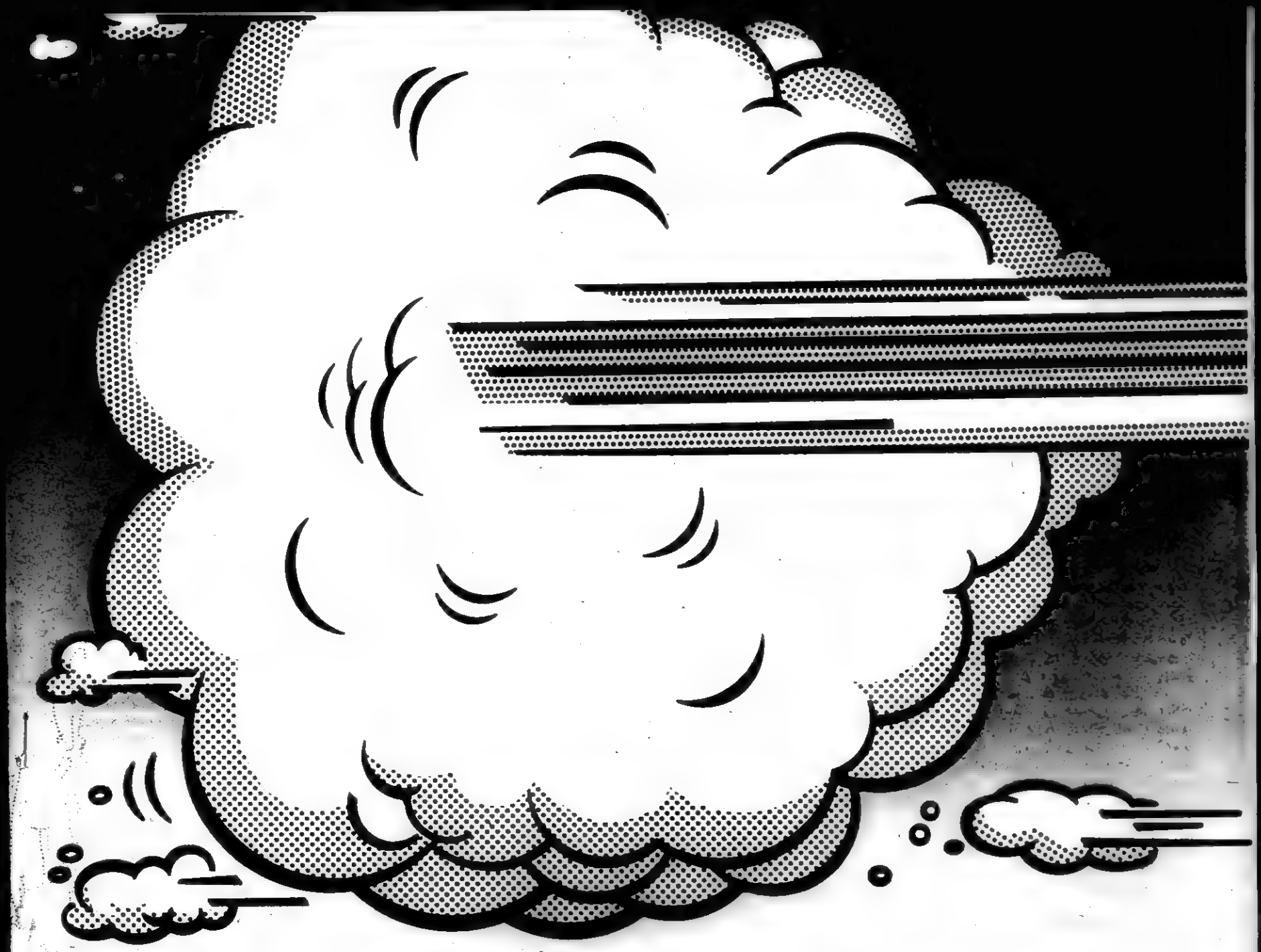
Noah Ross, director of technology at Cap Gemini America, Inc. in New York, said there could be a place for an "NT Lite." If it "doesn't require the horsepower that NT does, it will be welcome," Ross said. In particular, he noted, a 32-bit Windows platform with fewer hardware requirements than Windows NT could make an ideal platform for developing client-side applications for NT servers.

Senior editor Michael Vizard contributed to this report.

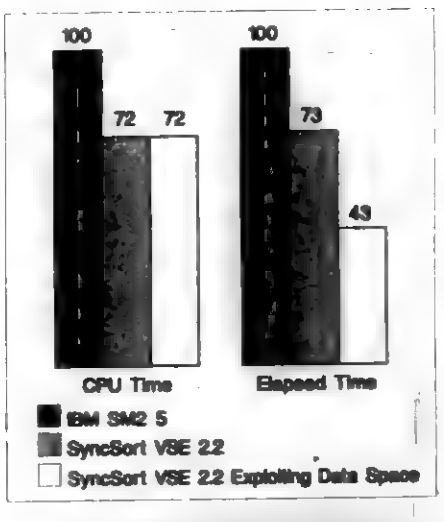


Deluxe features

While Windows 4.0 and MS-DOS 7.0 are both due to have preemptive multitasking and multithreading in 1994, Novell has announced that its Novell DOS will contain those features when it is released sometime this summer.



HERE'S WHERE WE LEAVE THE COMPETITION.



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Workstations

Alpha trumps rivals, for now

By Maryfran Johnson
MAYNARD, MASS.

As Digital Equipment Corp. leapfrogs its competitors this week in the Unix workstation price/performance race, users and analysts are watching closely for signs of a competitive comeback in an arena where DEC has always floundered.

With the introduction tomorrow of a trio of Alpha AXP Unix workstations, DEC is returning to its roots in the technical and scientific markets where Hewlett-Packard Co. and Sun Microsystems, Inc. have elbowed it aside in recent years.

DEC is billing its $70,000 Alpha AXP 500X workstation as the "fastest in the world," a claim analysts said will be true for at least the short term because the machine does knock HP off its leadership perch in processor speed and performance.

"For the first time in a long while, DEC's technology will clearly be at the top, fighting with the leaders," said James Brennan, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Still an open question, however, is whether hotshot performance numbers can sufficiently dazzle customers while DEC catches up on the software side. Currently, only 100 DEC OSF/1 Unix applications are available for the Alpha AXP workstation. And while DEC has vowed to have 500 DEC OSF/1 applications available by July, that still compares poorly with the several thousand applications offered by Sun, HP and IBM on their Unix-based systems.

"Even in the technical workstation market, DEC is going to be greatly challenged to regain a significant share," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "But for people who want hot rods, DEC is selling them now."

Lack of plan a hindrance

Yet DEC's inability to articulate a clear, convincing Unix strategy has long been its Achilles' heel, some users pointed out.

"Whether DEC focuses on technical people or tries to grab market share across the board, it becomes immaterial if they don't know how to market Unix," said Robert Granvin, a user services specialist at the University of Minnesota's School of Statistics, which is currently comparing DEC Alpha systems and Silicon Graphics, Inc. workstations.

"They will have to manage to miss their foot when they pull the trigger, and it's not clear whether DEC's aim is that good," quipped Tony Carrato, an official at the Digital Equipment Computer Users Society and a principal consultant at Mile High Information Services, Inc. in Denver. Carrato added, however, that his own consulting clients are paying close attention to Alpha price/performance numbers and starting to include DEC in project evaluations once again.

Other important factors for Alpha's success in the workstation market will be user acceptance of DEC OSF/1 Unix and DEC's unfolding strategy with Microsoft Corp.'s Windows NT operating system, industry observers said. An Alpha PC running NT will be introduced next month, but DEC officials said last week they will gauge customer demand for NT before committing to availability dates on the workstation line.

The three new Alpha AXP workstations, all available next month, include the following:

- **DEC 3000 Model 300L:** an entry-level desktop workstation that DEC claims offers twice the performance at 20% less cost than a Sun SPARCstation 10 LX. The 300L has a 100-MHz CPU, costs $4,995 for a diskless version and performs at 44 SPECint92 and 59.3 SPECfp92.
- **DEC 3000 Model 300:** an expandable desktop system with a 150-MHz CPU. It is priced from $7,880 and rated at 64 SPECint92 and 89 SPECfp92.
- **DEC 3000 Model 500X:** the "flagship" deskside system offers what is currently the fastest workstation uniprocessor in the industry, at 109.7 SPECint92 and 163.4 SPECfp92. It has a 200-MHz CPU and is priced from $69,995.

Top of the heap

DEC Alpha workstations vs. leading competitors

	DEC Alpha AXP 300	IBM RS/6000 Model 355	HP 9000 Model 715/50	Sun SPARC-station 10 Model 30
SPECfp92	77	81	72	49
SPECint92	67	40	37	45
Configured price*	$12,995	$15,995	$13,995	$20,495

SPECfp92 characterizes floating-point performance.
SPECint92 characterizes computer-intensive integer performance.
*19-in. color monitor, 16M or 32M bytes of memory, at least 400M-byte disk

Source: Digital Equipment Corp.

Falling behind

DEC's place in the $9 billion workstation market has been declining since 1991, when its 14% market share put it in third place behind Sun and HP. Then IBM surged to third place in 1992, according to International Data Corp., while DEC fell to fourth place with a 9% market share.

DEC closes in on profitability

Resurgent third quarter offers reason for optimism

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. exceeded expectations and announced significantly smaller losses for the company's fiscal third quarter last week. The results are likely to pave the way toward a profit by July, according to industry analysts.

But, observers said, full and lasting recovery will depend on DEC's ability to increase product sales. While the PC business was strong during the third quarter, VAX sales were flat, and revenue from Alpha AXP will only begin to make significant revenue contributions during 1994, DEC officials said.

Revenue in the period was up 6%, to $3.45 billion, from the comparable quarter last year. DEC reported a net loss of $30 million, compared with a $311 million deficit for the year-ago quarter.

"This is much better than we thought they might do," said Peter Kastner, a vice president at Aberdeen Group, a Boston market research firm.

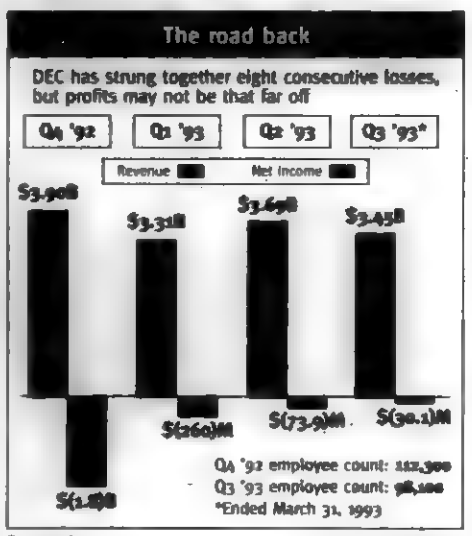
Users "are gradually thinking that DEC is worth looking at again, whereas previously they might have just lived out the life cycle of their purchases and moved on," added Bill Mayhew, chairman of the Digital Equipment Computer Users Society Business Practices Special Interest Group.

DEC cut research and development expenses by 19%, and general and administrative costs declined 8% from the same period last year. Head count fell by 4,000 this quarter.

"I was extremely impressed with their ability to get their operating costs down. When Alpha kicks in later this year, we could see some impressive growth from them," said John Jones, analyst at Salomon Brothers, Inc., an investment firm in San Francisco. Jones raised his estimates from a projected DEC profit of $62.3 million to a "conservative" $99.3 million.

The road back

DEC has strung together eight consecutive losses, but profits may not be that far off



Source: DEC — CW Chart: Michael Siggins

Developing approach

Paving the way for a release of DEC's Alpha AXP-based PC running Windows NT right after Microsoft Corp. ships the operating system, DEC will unfurl an NT developer's early access program for the Alpha-based PC this week.

DEC will ship an Alpha-based developer's platform running a beta-test version of NT. Code-named Jensen, the PC will sell for about $6,995 with 32M bytes of memory, a CD-ROM, a 245M-byte Small Computer Systems Interface drive, support for Compaq Computer Corp.'s Q Vision graphics and a 17-in. color monitor, sources said.

DEC officials refused to confirm these details but said the NT developer's program would debut this week.

"We're very excited about it, and it is much bigger than an attractively priced developer's system, though there will be one very similar to the numbers [that industry sources] rattled off," said Edmund Muth, DEC's worldwide manager of Windows NT application programs.

He said a C compiler for generating optimized Alpha code, debuggers, other tools and Microsoft's Software Developer's Kit will ship with the platform.

Developers can, however, run DOS binaries on Jensen with Insignia Solution, Inc.'s SoftPC emulation product, sources said. And programs written to Win32 application programming interfaces should be easy to optimize for the Alpha-based PC, Muth said.

DEC will also offer "Portathan" centers with access to machines, special services and technical sessions for developers and a toll-free number for information. Also included will be media replication and documentation services for developers seeking to outsource production.

"The pricing is going to be very attractive to developers and is in line with the anticipated ballpark for Pentium systems of $5,000 to $7,000," said Chris Christiansen, a director at International Data Corp.

—Melinda-Carol Ballou

"Why's Apple talking to me about UNIX?"

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Apple

News Shorts

NetWare 4.0 due out today

Novell, Inc. is expected to begin shipping NetWare 4.0 today, almost three weeks after its originally scheduled ship date of March 31. A Novell spokesman said the delay was caused by "minor problems in moving the product from development into the manufacturing process" and not by any problems with NetWare 4.0 itself.

Grid cuts prices, adds models

Grid Systems Corp. cut by almost one-third the price of its Grid Convertible, a combination notebook and pen-based computer announced in the fourth quarter last year. Grid dropped the price from $3,495 to $2,499. The Convertible comes bundled with Slate Corp.'s Pen Essentials as well as Microsoft Corp.'s Windows for Pen Computing. Grid also introduced its 4025 notebook family, which is based on Intel Corp.'s 25-MHz 486SL processor. The base price is $2,099. Grid also jumped into the direct market with Grid Direct.

Lockheed probed in N.Y.

New York Mayor David N. Dinkins has suspended contract negotiations with **Lockheed Information Management Services Co.** on a proposed $200 million project to provide computer systems to the New York City Parking Violations Bureau pending a city inquiry into possible bribery attempts by Lockheed officials. A spokesman for the New York City Department of Investigation said the agency is looking into allegations that executives at Lockheed IMS, known as Datacom Corp. until 1987, were implicated in a bribery scandal in the mid-1980s.

Lucente joins DEC

Former IBM executive Edward Lucente joined **Digital Equipment Corp.** as vice president of worldwide sales and marketing. Lucente, who recently left **Northern Telecom Ltd.**, will spearhead a commission-based sales force likely to go into effect this July and the restructuring of DEC's sales and marketing force.

SHORT TAKES **Apple Computer, Inc.** reported a 15% increase in second-quarter revenue with $2 billion in sales, but profits of $111 million fell short of the $135 million Apple earned in the second quarter of last year.... Aided by a $40 million catch-up tax benefit stemming from its mid-1980s losses, **Storage Technology Corp.** posted first-quarter profits of $6.4 million on sales of $333.5 million to turn around from a fourth-quarter 1992 loss of $7.7 million.... Local-area network software vendor **Artisoft, Inc.**'s third-quarter earnings fell from $3.6 million in 1992 to $333,000 for the period ended March 31. Revenue slipped by $1.2 million, to $19.1 million.... **Alpha Microsystems, Inc.** reported an annual loss of $3.7 million despite a $260,000 fourth-quarter profit.... **Advanced Micro Devices, Inc.** and **Fujitsu Ltd.** announced a joint venture under which they will manufacture flash memory.... **Unisys Corp.** has tapped **Kaiser Associates, Inc.**, **Mercer Management Consulting** and **Mealtor Co.** to provide benchmark analysis, statistical analysis and business strategy consulting services, respectively, to its clients [CW, March 22].... **Conner Peripherals, Inc.** agreed to sell its Cipher line of nine-track tape drives and IBM 3480 format cartridge drives to **Overland Data, Inc.**.... **Cincinnati Bell Information Systems, Inc.** said its federal subsidiary won a five-year, $41 million contract with the U.S. **Department of Transportation** for support of the **Federal Transportation Computer Center** in Washington, D.C.

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Series/1 migration no easy task

By Elisabeth Horwitt

Two years after Series/1s stopped rolling off IBM production lines, about 50,000 are still chugging away at Fortune 500 sites. Many information systems managers, however, are busy figuring out the most painless way to replace them.

IBM's withdrawal of Series/1 support, coupled with the cost/performance benefits of standard microprocessors and operating systems, has accelerated the exodus.

At Alberta Wheat Pool, for example, IBM's discontinued support "was the last straw," said Larry Morrison, network analyst. The Canadian company has since migrated to AT&T 386-based PCs running Unix, which "do everything the Series/1 could do" but whose standard software and hardware components are a lot easier to maintain and support, Morrison said.

However, uprooting the Series/1 is often difficult, users reported.

Since their introduction in 1976, Series/1s have spread their tendrils across retailing, airlines, hotel chains, credit-card companies, financial services, supermarket chains, fast-food companies — any industry that needed an easily configured, inexpensive transaction processor to install at hundreds of sites.

This was because, for its time, the Series/1 was a breakthrough in scalability, configurability and real-time transaction processing. By writing a little code and a feature card or two, the system could become anything from a protocol converter to a point-of-sale (POS) system to a factory-floor communications controller.

"I always referred to the Series/1 as an a la carte computer," said Jeff Schoff, manager of store systems at Giant Food, Inc.

However, the latest 486 and reduced instruction set computing systems couple comparable versatility with "a lot more bang for the buck," Schoff said.

Alberta Wheat Pool "couldn't just migrate code" to its new system and avoided conversion services because "we wanted to keep things in-house," Morrison said. The firm spent about a year rewriting applications to the PC environment, "which was more complex by about a factor of 10," he added.

His only complaint about the new systems was, "PC hardware is not as durable. It is built to last a couple of years, and hard drives need to be replaced fairly regularly."

Visa International, Inc. has also encountered some difficulties during its migration from Series/1 machines to Personal System/2s, according to Barry Pearlman, vice president of VisaNet engineering. In the course of migrating, "words we never used were 'seamless' and 'transparent.'"

The credit-card company expects by year's end to finish its migration off Series/1s, which it uses to connect member banks to Visa's host-based settlement and credit-card authorization services.

The migration process is doubly hard when Series/1s support business-critical applications. JC Penney Co. began two years ago to look at alternatives for some 850 Series/1s that act as protocol converters, POS systems and time and attendance processors at its stores, according to Lee Stockard, senior project manager. The Dallas-based company has set no time frame for reaching a decision.

On the other hand, JC Penney's business services unit has already started putting in IBM PS/2s to replace Series/1s performing the comparatively simple task of giving customers access to the company's credit-card authorization services, Stockard said.

Series/1 facts

- **First shipped 1976;** production ended July 1991.
- **IBM stopped** software support Dec. 31, 1992.
- **Total shipped:** About 100,000 in the U.S.
- **Currently installed:** 46,300 in the U.S.; 90,950 worldwide (including U.S.), according to Infocorp.

One more option

If code conversion and application rewrites are out of the question, companies have one more option: emulation. Kmart Corp. subsidiary Payless Drug Stores Northwest, with hundreds of thousands of lines of Series/1 code, went with Hummingbird from CIE Communications Enterprises, which enables PCs to emulate Series/1s, systems analyst Gary Smith said.

The advantage of such a system is that Series/1 applications needed no conversion to run on the new PC systems, Smith said, although it did take Payless about 18 months to move all 500 stores over.

The need to continue programming in EDL, the proprietary Series/1 language, does not bother the firm: A recently hired C programmer took about two weeks to pick up enough EDL to do maintenance and some programming, Smith said.

Giant operation

For Giant Food, Series/1 migration has been a mammoth task.

The Landover, Md., food and drug chain was using 160-odd Series/1s for everything from processing prescriptions and drug interaction queries at the pharmacies to interfacing with smart scales at delicatessen and meat counters, according to store systems manager Jeff Schoff. "We had almost a million lines of source code and over 1,400 programs developed over 10 years."

Rewriting the applications would have taken too long, and Giant Food could not find packaged software to meet its needs. The chain hired Datatrend, Inc., an Eden Prairie, Minn., Series/1 migration services company, to help convert all of the code to run on an IBM RISC System/6000 AIX machine with an Informix Corp. database.

The conversion process took between 12 and 18 months.

While Schoff would not give cost figures, Datatrend President Mark Waldrep said, "100% turnkey conversion of existing Series/1 EDL-based applications to AIX and C" costs between $500 to $5,000 per CPU, depending on the size of the application and the complexity of the code.

Giant Food, which is now in the process of switching users over to the new systems, expects its investment to start paying off rapidly in terms of better performance, lower maintenance costs and the ability to buy off-the-shelf software, Schoff said.

Early conversion sites have been a "resounding success," primarily because of the RS/6000's quicker response time, Schoff said. "The Series/1s were never fast enough for our pharmacies." — *Elisabeth Horwitt*

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NetWare addressing unified

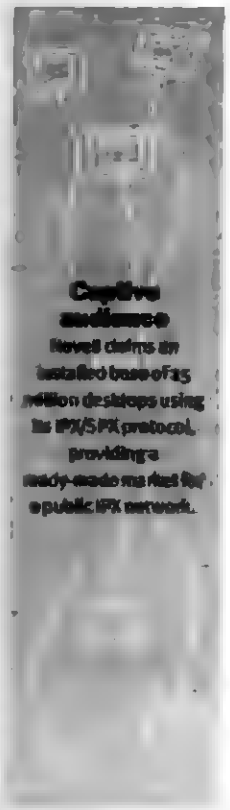
Network Registry first step to building public IPX net

By Michele Dostert
PROVO, UTAH

■ Novell, Inc. wants to unite users of its NetWare local-area network operating system in one networked "community." To that end, it unveiled last week an address and naming service that will form the basis for an "internet" of NetWare users in the future, the company said.

Novell's first goal with Novell Network Registry is to help network administrators eliminate address conflicts on corporate internetworks, said Navindra Jain, vice president of Novell's internetworking products division. "Many geographically dispersed LANs have adopted their own address scheme. When these LANs are connected to a corporate network, address conflicts are common."

In the long term, Jain said, NetWare IPX users will be able to use their unique network addresses to access a planned IPX-based public network, similar to the internet currently accessed by Transmission Control Protocol/Internet Protocol (TCP/IP) users. "We are planting some seeds, of which this is one," Jain said. "We are also working with private carriers, and you'll see some announcements coming on this in the next year."



Captive audience
Novell claims an installed base of 25 million desktops using its IPX/SPX protocol, providing a ready-made market for a public IPX network.

Novell envisions a host of possible uses for a public IPX network, including messaging, electronic data interchange and remote network management.

Varied interest

Users held differing views on a public IPX network.

"I would love to be able to use NetWare to reach suppliers, other hospitals, insurance companies and the like," said Wayne Robertson, network administrator at St. Agnes Medical Center in Fresno, Calif. "Access to a public IPX network would be a real value-add to NetWare."

But some NetWare users who have selected TCP/IP as their protocol of choice and who intend to run NetWare over TCP/IP as soon as Novell fully supports it as a native protocol were uninterested.

"We're moving all of our wide-area traffic to TCP/IP and will only use IPX/SPX locally," said Joseph Kalus, a communications consultant at John Hancock Mutual Life Insurance Co. in Boston. "So an IPX public network doesn't hold much appeal for us."

Sensitive to such concerns, Novell has been stressing compatibility with TCP/IP when discussing its IPX plans. According to Jain, the Novell Network Registry will offer a utility for translating TCP/IP addresses into IPX/SPX addresses; he said he also expects that a gateway to the TCP/IP Internet would be an integral part of any IPX public network.

Look up the number

Novell Network Registry can provide the following:

- Unique IPX addresses.
- Unique organization name for use with NetWare 4.0 Directory Services.
- Algorithm to generate unique IPX addresses from IP addresses.

In the meantime, NetWare users can contact the Novell Network Registry to reserve a range of network addresses or an organization name or both. Users will receive a unique range that fits their need for network addresses of machines using Novell's IPX/SPX networking protocol. Network managers can then subdivide the range and assign individual numbers to servers, routers and network segments.

Lorie Mouklas, a project leader at Hoechst Celanese Corp. in Bridgewater, N.J., said the address service will be valuable for those organizations that have not already worked out their own internal addressing scheme.

"We already have our own system for allocating addresses, so we'll have to see if our addresses can be easily mapped over to a Novell-supplied range before we ask for one," he said.

By also choosing and reserving a single top-level organization name for use with NetWare 4.0's directory service, customers can ease the administrative work load for network managers while laying the groundwork for a messaging connection to an eventual IPX-based public network, Jain said.

The Novell Network Registry is available now starting at $100, depending on the range of addresses desired.

Users align on licensing

CONTINUED FROM COVER 1

chairman of the task force that has spent the past year forging the position paper.

Both the manifesto and its authors steered clear of singling out specific vendors for criticism or lambasting the vendor community. "In many cases, they're having as hard a time as [the users] are" dealing with the new paradigms, Zeitz noted.

"For instance, most vendors seem willing to offer concurrent user licenses or, at the very least, user-based agreements, but they're concerned about their inability to monitor them," he added. "One vendor said, 'We'd be glad to consider concurrent use, but we can't figure out what it is.'" Zeitz concluded: "There are technical issues that need to be resolved."

One vendor, Computer Associates International, Inc., was supportive of SIM's stance. "We support any initiative that makes it easier for clients to license software," noted Arnold S. Mazur, CA's executive vice president.

Many choices

During the last year, CA has replaced strict tiered pricing with a number of flexible licensing plans, including enterprisewide and usage-based approaches. "We have more license plans than Carter has pills," Mazur noted.

Nevertheless, many users can easily reel off examples of the practices they hope the SIM manifesto will help defeat.

"We always get hung up on issues of globalism," said Pepsico, Inc. Chief Information Officer Allan Deering. In licensing software for a huge, multinational and highly decentralized company, he noted, pricing across national boundaries "is always an issue — and support is, obviously. Maybe [the vendor] has a help desk, but do they speak Egyptian?"

Harvey Shrednick, Corning, Inc.'s senior vice president of information services, recalled his firm's dismay at discovering that moving an application from an IBM Application System/400 B to an AS/400 D would trigger a $396,000 relicensing fee. In the final analysis, Shrednick said, he leveraged his long-standing relationship with one of the vendor's top executives to knock the bill down to "what amounted to a nuisance fee. But I shouldn't have had to do that." And, Shrednick noted, not every user has that option.

Shrednick said last week's paper will not calm the troubled licensing waters overnight, "but I think it's a valuable start." SIM, he said, "feels strongly about this. That's why we're playing it into the marketplace."

Next on the agenda, Zeitz said, is disseminating the paper in the vendor community, a step that SIM hopes will lead to a vendor/user focus group sometime this summer. Several SIM members, however, cautioned against expecting a clash that has festered for the past several years to clear up in the next several months.

"Third-party vendors may be a little reluctant to get involved," Harkness noted. "They could be giving up large margins. The question is, what's in it for them?"

Senior editor Rosemary Cafasso contributed to this report.

While some software suppliers have made strides toward more flexible licensing, many users still claim vendors' pricing and licensing practices have failed to keep up with these trends: the fast pace of technology, the surge toward multivendor platforms, the rush to desktop computing, enterprisewide corporate interaction, globalization and rightsizing.

Such a deal

Brigham Young University has worked out a precedent-setting software licensing pact with CA. The school is free to use all licensed CA software under any operating system for 500 concurrent users.

CA plans to offer this option to other users, according to Arnold S. Mazur, executive vice president at CA.

The contract allows the school to use CA-Unicenter, CA-Datacom and other CA products on any multivendor, distributed server platforms that the school chooses, said Doug Walker, a senior programmer/analyst at Brigham Young. That will come in handy next month, when the university begins to integrate CA-Unicenter for Unix with its Hewlett-Packard Co. HP/UX financial services environment.

The major benefit, Walker said, "is that we don't have to go back and relicense Unicenter or other products for different servers."

The deal also provides the school with the flexibility to swap servers in and out of its enterprise. Plus, the contract is fixed for 500 users, so Brigham Young does not have to license platform-specific software for a certain number of users.

Walker said the school is still in the early stages of downsizing from its IBM MVS environment, and while it may decide on HP/UX, IBM's OS/2, Novell, Inc.'s NetWare and Data General Corp.'s DG-UX Unix architecture are also being considered.

"Fortunately, the new licensing agreement doesn't restrict our ability to choose" hardware platforms, Walker noted.

Walker would not disclose the financial details of the licensing agreement, although he said CA "gave us a competitive price." There is no specific length of time to the license, "as long as we pay the maintenance," Walker added. — *Thomas Hoffman*

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Client/server

PowerBuilder to expand features

By Kim S. Nash
SAN DIEGO

Powersoft Corp.'s enhancements to its PowerBuilder client/server application generator, due to be announced today at the company's user group conference, were designed to appease user demand for better front-end query and development features.

PowerBuilder 3.0, now in beta testing, sports two new reporting modules, analysts said.

A formal announcement that Powersoft in Burlington, Mass., is working on a link to Intersolv, Inc.'s PVCS version control software is also expected this week [CW, April 12]. Powersoft officials declined to comment on the impending announcements.

The improvements will help cover PowerBuilder's "obvious deficiencies," said Judith Hurwitz, president of The Hurwitz Consulting Group in Newton, Mass.

Moreover, by expanding project management and organization functions, Powersoft is gunning for corporate users seeking tools for major client/server migration efforts. But more work must be done before PowerBuilder will be a fixture at enterprise-level planning sessions, Hurwitz said.

Links to other vendors' front-end analysis and design modules are not enough, Hurwitz said. Powersoft and client/server brethren such as Gupta Corp. have suffered from a "big weakness," she explained. "They don't allow you to do development at the enterprise level."

Like Powersoft, Gupta is taking steps to resolve this shortcoming, analysts said [CW, Jan. 18].

Peggy Ledvina, an analyst at Meta Group, Inc. in Westport, Conn., agreed with Hurwitz's assessment. For example, adding a significant number of users to enterprise applications can cause heavy transaction processing slowdowns, Ledvina said.

Those kinds of obstacles have kept many PowerBuilder projects in pilot stages at Fortune 500 companies such as Merrill Lynch & Co. and Chevron Corp., Hurwitz noted.

Among the new pieces to PowerBuilder 3.0 are PowerMaker, a database query and reporting tool for developers, and PowerViewer, a similar tool aimed at end users.

Separately, Powersoft is expected to unveil a scaled-down version of PowerBuilder aimed at end users. This version will consist of graphical user interface tools bundled with relational database products from Watcom International Corp. This slimmed PowerBuilder/Watcom combination is poised to do battle with PC database and development frameworks, such as Microsoft Corp.'s 5-month-old Access.

The Intersolv deal addresses PowerBuilder's lack of change management and version control features. Gupta, too, is expected to partner with front-end tools makers, a spokesman said.

Powersoft's Watcom agreement may provide a needed PowerBuilder repository in the future, analysts said, but for now it appears to be a deal targeted at low-end development.

At a glance

- Powersoft's impending deal with Intersolv is the most recent in a string of technology agreements with front-end computer-aided software engineering vendors, including LBMS, Inc. and Bachman Information Systems, Inc.
- Attendance at this year's PowerBuilder user conference is expected to triple 1992's total of about 400, a Powersoft spokeswoman said.
- PowerBuilder users numbered 2,000 at the end of 1992.

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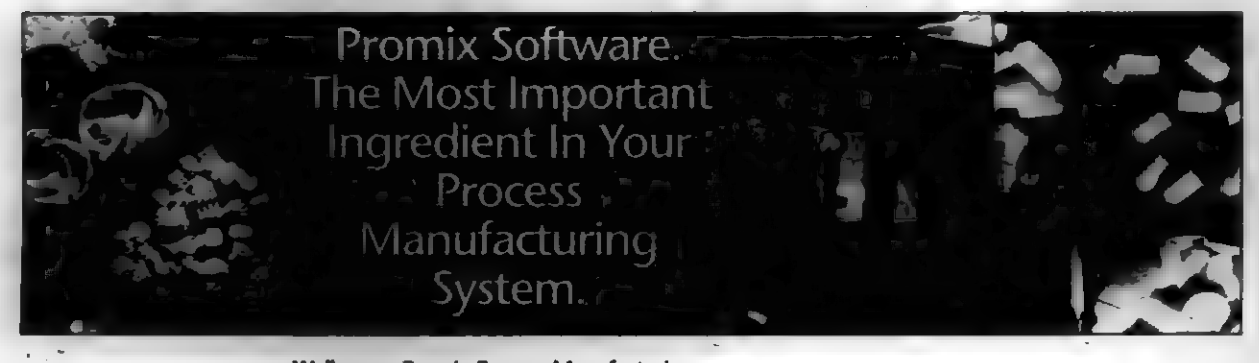

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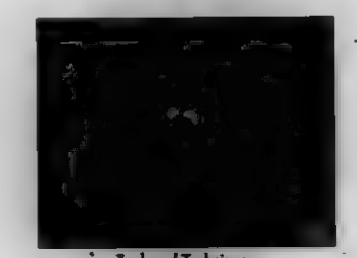

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Internetworking protocols

IBM to open APPN to third parties

By Elisabeth Horwitt

CHAPEL HILL, N.C.

■ At the first meeting of the APPN Implementors Workshop last week, IBM may have convinced even the most skeptical vendors of its intentions to open up Advanced Peer-to-Peer Networking (APPN), its strategic internetworking protocol.

IBM presented 37 vendors with the complete APPN Network Node document. That should give vendors enough to develop against, said Lynn Nye, Sync Research, Inc.'s director of IBM programs.

IBM also said it would make specifications for key upcoming APPN features available to vendors early so that they could provide input into the specifications and get a jumpstart on incorporating them into products.

"The more information they give to vendors and customers, the better," said Ken Smith, a manager of systems software at Canada Mortgage and Housing Corp. and an early APPN user who attended the meeting.

In particular, the Ottawa firm would like to see implementation of full APPN capabilities on the Cisco Systems, Inc. routers it is now implementing, Smith said. Cisco has announced plans to support APPN Network Node by the second half of 1994.

Also at the meeting, IBM and 11 other leading router companies formed a working group to develop a standardized way for Transmission Control Protocol/Internet Protocol (TCP/IP) internetworks to route IBM Systems Network Architecture (SNA) traffic, as well as other link-level protocols such as NetBIOS and source-route bridging [CW, April 12]. The basis of the protocol will be IBM's Data Link Switching.

The group will operate within the APPN Implementors Workshop, rather than within the Internet Engineering Task Force, as originally proposed by Cisco.

Promises, promises

Among the APPN specifications that IBM promised to release to workshop vendors are the following:

- **The Dependent LU Requestor**, which would allow traditional SNA printers and 3270 terminals to communicate over a multihop APPN network, instead of just over direct links to an IBM mainframe. IBM said workshop members will get the specifications by the next Implementors Workshop meeting in June. IBM said it plans to ship VTAM Version 4 Release 2, with Dependent LU Requestor, in 1994.
- **The next version of APPN**, with High Performance Routing. APPN Version 2 will run three to seven times faster than the current protocol and also gain the ability to route sessions dynamically, said Jane Muns, IBM manager of networking architectures at IBM.

High Performance Routing should be a big help to APPN "in the fight [against TCP/IP] for the hearts and minds of the user community" because TCP/IP has dynamic routing, said David Passmore, a vice president at Gartner Group, Inc.

IBM will make a draft specification available to workshop vendors in the third quarter, Muns said. Commercial release of APPN Network Node Release 2 is due out in the IBM 6611 router early next year.

- **Management of APPN networks.** IBM demonstrated a prototype of a management system based on Common Management Information Protocol, which graphically depicted APPN network topology and collected accounting information. IBM plans to release a commercial version within a year, Muns added.

Patent problem

The only sour note at the APPN Implementors Workshop was IBM's announcement that the intellectual property rights pertaining to APPN Network Node also apply to APPN End Node and Low Entry Networking (LEN).

The announcement shook up vendors that recently began working on PU2.1 products "on the understanding that IBM put it in the public domain last August," said Proteon, Inc. spokesman Bill Donovan. The Advanced Peer to Peer Internetworking Forum, for example, formulated APPI around LEN on the assumption that no IBM patents were involved, he added.

However an IBM spokeswoman said it was up to vendors to find out what patents applied to the protocols.

IBM recently announced that a $35,000 yearly fee gives vendors the right to develop and market APPN Network Node products. However, IBM is working on a strategy that will probably involve charging a small separate fee, or no fee, for the rights to End Node and LEN, the IBM spokeswoman said. IBM said it will announce its plans at the next workshop in June.

End Node and T2.1 protocols define how a device can communicate over an APPN network.

—Elisabeth Horwitt

Motorola extends paging

CONTINUED FROM COVER 1

pager while the caller stays on the line.

Tampa Electric's interest is twofold, according to Mustafa: "We want to combat the perception of people hiding behind voice mail, which gives a bad signal about customer service. Also, in a typical voice-mail environment, you'd usually need a live-body bailout [to answer the phone] to the tune of $20,000 to $30,000 a year," Mustafa said.

Communication concerns

Others expressed concern about the political impact that user-designed "priority lists" for screening calls and messages might have on their business environment, as well as the effect of frequent disruptions while conversing in a peer's office or attending a meeting.

"It sounds nice, but I don't know if our company is ready for this culturally," said an information systems analyst at a large Midwestern utility who asked not to be identified. "For example, some people use voice mail to screen their calls and take control of their workday. Also, we don't run fax boards in our PCs; workgroups share fax machines. So that kind of communication wouldn't work."

However, "in today's world, there are things that must get done quickly in order to win business," noted Andy Seybold, publisher of the "Outlook on Computing" newsletter and an analyst following the wireless market. "So there is an absolute need for accessibility."

On the other hand, "the shorter electronic leash" companies are binding their employees to "could wind up being counterproductive because if you're on your way to get something done, you're interrupted," Seybold said.

The Site Connect system, pieces of which are slated to ship in the third quarter, would capture filtered telephone, E-mail, PC-based fax, calendaring and other traffic on a dedicated PC running The Santa Cruz Operation's Unix operating system and one or more Site Connect software packages.

The PC in turn ships data or voice caller information to a wandering user's alphanumeric pager. A key goal of the system is to eliminate frustrating and expensive phone tag, said Steve Spiro, director of Motorola's Customer Owned Paging operations group here.

Other options

There may be other ways to achieve similar functionality, users said.

For example, while the Boca Community Hospital in Boca Raton, Fla., already uses a Motorola paging system, it is looking at getting Site Call-esque functionality through auto-attendant software from another vendor for its telephone switch, said Launa Pahula, telecommunications manager.

One reason is that when the hospital bought into the Motorola PageBridge II-based paging system two years ago, Motorola indicated that the system could already do the things Site Connect is promising, said Marvin Newman, a network technician.

The hospital "has long had big dreams about sending all kinds of traffic and data to individuals carrying pagers all over the hospital," he said.

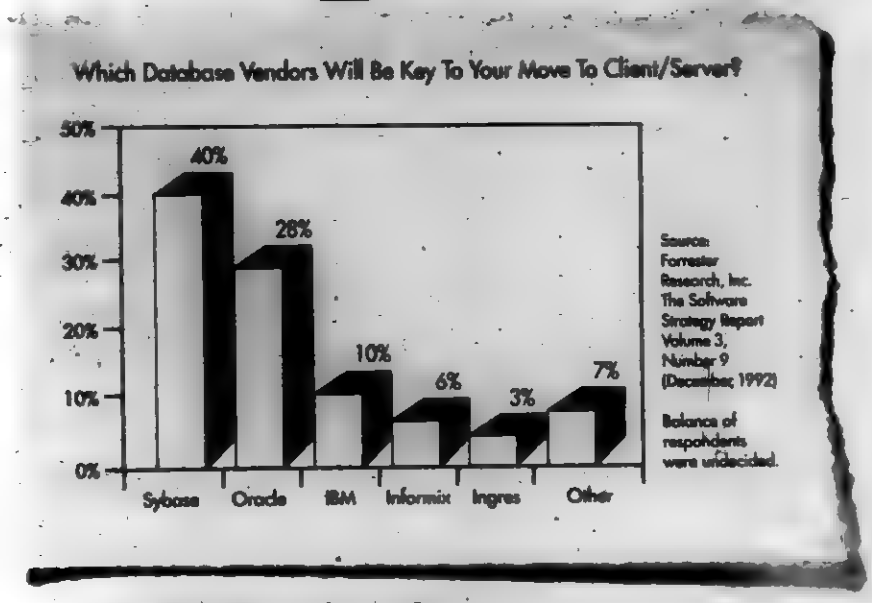
Just the facts

Site Call
What: Module that allows telephone system to send in-building users with pagers the phone number and/or name of a waiting caller.
How: Users install Motorola software on SCO Unix system that connects to phone switch.
When: Due to ship in the third quarter for several manufacturers' phone switches. Centrex-based system scheduled to roll out in the fourth quarter.
How much: About $500 per user for a 500-user system. Includes a dedicated PC with Unix and Site Call software, a $20,000, 2,500-user capacity, an on-site paging system and a $125 to $300 alpha pager for each user.

Site Message
What: Module that allows downloading of critical E-mail, calendaring, PC-based fax and other data.
How: Same basic setup as Site Call but with application-specific Site Message software and specialized application programming interface (API) added to a dedicated PC.
When: Initial Microsoft Corp. Windows- and Windows NT-based applications to ship within three months; Motorola's goal is to roll out a suite of 50 to 100 applications within the next year.
How much: Cost of applications ranges from $29 to $250 each. The API, which gets applications to speak paging protocols, costs from $99 to $149 per PC or $495 for a server version.

Site Alert
What: Notifies security, troubleshooting, engineering and other personnel if there is a security breach.
How: Site Alert installs on a dedicated PC alongside other modules or by itself.
When: Available now.
How much: $7,500 for application software for 5,000-user system.

The analysts have graphed the future of Client/Server computing.



And they have also spoken.

In recent issues of their ongoing reports, four of the most respected computer industry analysts have taken an unbiased look at Sybase, and its vision of enterprise-wide client/server computing.

They were impressed.

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WordPerfect, Microsoft set for E-mail forms war

By Michael Vizard
SEATTLE

WordPerfect Corp. and Microsoft Corp. are racing to deliver products that allow small workgroups to easily create forms that can be attached to electronic mail. Both companies are scheduled to deliver products in this arena in the next two months.

This week, Microsoft is expected to introduce forms software for Windows that will allow users to easily attach forms to Mail beginning in June. This offering will go head to head with WordPerfect's InForms for Windows software, which unlike the Microsoft package will support a wide variety of mail protocols. The WordPerfect package, announced late last year, is also due in June.

Electronic forms are not new; they have been available for some time in offerings such as Digital Equipment Corp.'s All-In-1 system, Lotus Development Corp.'s Notes environment and Oracle Corp.'s SQLForms.

Unlike these products, however, the Microsoft and WordPerfect packages were designed to make it easy to inexpensively create forms for Windows users that can then be transported across mail transport protocols. This differs from the Oracle and Lotus approach, which requires a database for transport, or DEC's approach with All-In-1, which requires programmers to create forms.

"We basically went with the WordPerfect InForms package to get rid of as much paper as possible," said Arnold Dixon, a senior systems analyst at Hoechst Celanese Corp. in Charlotte, N.C., who is beta-testing the WordPerfect offering.

Dixon said the WordPerfect strategy is attractive because it supports WordPerfect's Office, Lotus' CC:Mail and Microsoft's Mail while providing hooks to 17 databases to store historical data.

"The typical Microsoft pattern is to build for their own applications first and ultimately support other environments. Rivals tend to pound Microsoft about being open, but Microsoft counters that [they] have the volume," noted Brent Williams, an industry analyst at International Data Corp. in Mountain View, Calif.

Flexibility issues

Dixon added that Hoechst Celanese also went with WordPerfect because InForms will be available on DOS, OS/2 and Unix.

InForms is available in two components: a $199 filler package that diplays the form on each client system and a $1,495 designer package that is needed to actually create the forms.

Microsoft declined to comment on its forms product, code-named Calvin, pending the product's launch at the Microsoft Mail Developer's Conference this week.

Users make move to Oracle 7

By Jean S. Bozman
REDWOOD CITY, CALIF.

■ Users are migrating to the new version of Oracle Corp.'s database management system in stages. They report an immediate performance boost after a weekend conversion but have continued to activate new Oracle 7 features for weeks afterward.

The migration from Oracle 6.0 has been much easier than expected, some users said, requiring only a fraction of the effort of moving from Oracle 5.0 to Oracle 6.0, which shipped in 1989.

Industry analysts said they believe the move to Oracle 7, which shipped in January, will proceed gradually.

"I don't think this is a snap-your-fingers migration," said John Morrell, research manager for Unix software at International Data Corp. in Framingham, Mass. "People will take the database engine first and then the application logic, and then they'll start to build in distributed [database] features. You just can't do it from scratch."

Complex systems that fully exploit Oracle 7's distributed database features could take months or years to build, he said.

Users who have moved to Oracle 7 report an initial performance boost of about 10%.

"At the engine level, I would say that Oracle 7 is only about 8% to 10% faster in our environment," said Michael Higgins, technical support manager at Byer California, a San Francisco firm that manufactures women's clothing. "But when you apply the Version 7 features, it can be as much as 35% faster."

Among those features, Higgins said, are speedy execution of business rules stored in the server and "packages" that group related database queries together.

Last month, Byer put a mirrored 5G-byte Oracle 7 database into production on two Sequent Computer Systems, Inc. Symmetry 2000/750 machines. Performance has been reliable so far, he said.

Step by step

The first step in converting to Oracle 7 is to start modifying Oracle 6.0 applications by using the character-based SQLForms 3.0 application development tool. Business "rules" that used to be stored in Oracle 6.0 applications can be moved to the Oracle 7 server for speedier execution and consistent enforcement.

The conversion can be done in a weekend, some users reported. By running in a Version 6.0 emulation mode, users will be able to control how many Oracle 7 features are activated.

"You end up with a Version 7 database running with Version 6.0 rules," said Jim Raper, a database administrator at BASF Corp. in Anderson, S.C.

More effort required

The conversion from Oracle 5.0 to Oracle 6.0 took more effort, users said, because data had to be exported from the old database and imported into the new one.

Users will have to pretest Oracle 7 functionality for each converted application.

"The rules you have written don't get turned on automatically," said Raper, who is preparing Version 6.0 applications for migration to Oracle 7 in 1994. "You turn them on rule by rule."

Still missing from the Oracle 7 environment is SQLForms 4.0, a new tool that supports graphical user interfaces such as Microsoft Corp.'s Windows for client/server applications.

Even after SQLForms 4.0 ships this summer, some sites will be waiting for a graphical version of Oracle's computer-aided software engineering tools, which analysts said they expect to ship by 1994.

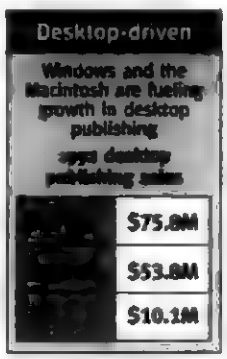
Many users will continue using Oracle 6.0 this year, waiting for others to put Oracle 7 through its paces in production applications. "I still have the sense that there's a fair amount of business being done under Version 6.0," said Charles Phillips, a vice president at Kidder, Peabody & Co. in New York.

Electronic documents

Adobe to offer SGML translation tool

By Michael Vizard
BOSTON

In what amounts to a truce of sorts in the battle over electronic document formats, Adobe Systems, Inc. last week said it will provide a conversion software package that will translate Adobe file formats into the Standard Generalized Markup Language (SGML) format.



Source: Software Publishers Association

Thus far, SGML, an International Standards Organization standard that defines a format for exchanging documents across diverse publishing systems, has garnered support from high-end document publishing suppliers such as Interleaf, Inc. in Waltham, Mass., Frame Technology Corp. in San Jose, Calif., and Xyvision, Inc. in Wakefield, Mass.

But developers of PC application software have provided only lukewarm support at best.

Last week's announcement, made at the Seybold Seminar here, calls for Mountain View, Calif.-based Adobe to team up with Avalanche Development Co. in Boulder, Colo.

Avalanche will provide software to convert documents created using Adobe's Portable Document Format (PDF) into an SGML-compliant format. But Adobe's primary solution for document interchange will remain PDF, which is the cornerstone of Adobe's forthcoming Acrobat products.

Scheduled to ship this June, Acrobat is a series of products that allow documents created with Adobe fonts to be converted into a common file format. This format can be accessed by any software that supports Adobe fonts.

The SGML conversion software from Avalanche is not due until the first half of 1994.

While Adobe is taking a somewhat conciliatory attitude toward SGML, other suppliers of PC application software said they see no need to make SGML a major focus of their product efforts.

More than 30 vendors belong to GML Open, a consortium designed to promote SGML interoperability. The Boulder, Colo., group plans to promote a tighter SGML specification later this year to boost document interchange.

"We have no SGML product under way at Quark," said Tim Gill, senior vice president at Quark, Inc., in Denver. He added that most sites will limit the number of publishing packages they support to minimize the complexity of file format translation.

Plan of action

Executives from Aldus Corp., Microsoft Corp. and WordPerfect Corp. said their strategies will be to provide filters rather than editors that work directly against an SGML format.

"SGML is a top-down sell. You tend to see it in government sites or corporate sites where it is mandated by decree," said Mike Cockrill, desktop applications program manager at Microsoft.

Although PC application vendors are slow to support SGML, a number of user and industry organizations now specify SGML as a standard, including the Air Transport Association, the Society of Automotive Engineers, the U.S. Department of Defense and the CAD Framework Initiative.

Internetworking

Cisco, SynOptics kill integration plan

By Joanie M. Wexler
REDWOOD CITY, CALIF.

A decision made public last week by Cisco Systems, Inc. and SynOptics Communications, Inc. to scrap plans to physically integrate their high-end routers and wiring hubs into one superbox can be partly chalked up to ever-spiraling advances in networking technology and fickle user attitudes.

The two industry bigwigs announced their intentions for what they dubbed the RubSystem 18 months ago. At that time, according to a Cisco spokesman, high-speed networks such as Asynchronous Transfer Mode and emerging 100M bit/sec. Ethernet were not factors.

"Though our customers are still entranced by the integration concept, the real trade-off would be freezing new technology for the sake of the integration," he said.

> SynOptics revealed that it has a new hub under development aimed at network control center applications. The hub, to be introduced this year, will include internetworking technology and ATM network support.

Some of the original intentions of the RubSystem were to save space and cost per rack unit, explained Kevin Woods, hub product marketing manager at SynOptics. "But we learned during development over the past few months that we weren't going to achieve the cost benefit, and there was so much technology involved, users would likely have to buy two chassis anyway," he said.

Meanwhile, at least some customers' thinking has changed as well. "At first, [the RubSystem] didn't sound like a bad idea," said Victor Bojorquez, senior network engineer at Advanced Micro Devices, Inc. in Sunnyvale, Calif., a Cisco and SynOptics shop. "But as time went on, we decided the concept was counterintuitive to a distributed computing environment because there is too large a central failure point."

Enthusiasm for the RubSystem may also have waned as users became intrigued by the concept of the collapsed backbone — a network configuration idea kicked off largely by router vendor Wellfleet Communications, Inc.

In a collapsed backbone scheme, a large, high-end router might sit in the basement of a building and interconnect local-area network segments on multiple floors that are linked by fiber cabling running through an elevator shaft. In fact, John Hart, 3Com Corp.'s vice president and chief technical officer, said that as a maker of both hub and router products, the company looked into a similar type of integration around the time of the RubSystem announcement. But 3Com was discouraged in its efforts by user interest in collapsed backbones.

"Our users said it was cheaper to buy more ports on one big router than many smaller boxes or router cards distributed throughout the organization," Hart said.

Cisco and SynOptics, which claim a large, overlapping customer base, intend to continue their endeavors to tightly couple network management of their devices. But Bojorquez said that in his case, "just being SNMP-manageable, which the devices are today, is probably enough. But I haven't yet really seen what they are offering."

Another key goal of the Cisco/SynOptics joint effort — on-the-fly router port connections — will still be part of the two companies' endeavors, Woods said. A special hub module that interfaces to an external Cisco router will allow LANs needing to communicate at a given moment to do so dynamically, he explained, rather than having predetermined, fixed connections.

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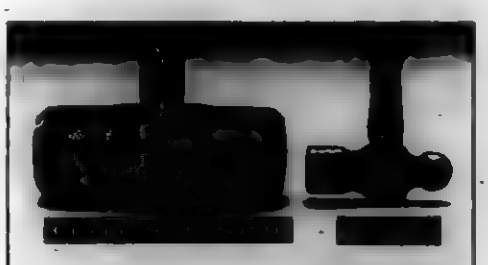

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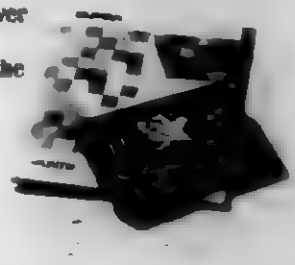

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News Shorts

Author joins CA ranks

Heah Kestin, author of last year's *21st Century Management: The Revolutionary Strategies that Have Made Computer Associates a Multibillion-Dollar Software Giant*, is now a salaried employee at **Computer Associates International, Inc.** Kestin said he was not a paid consultant or employee of CA's at the time the book was written. However, he admitted he negotiated with CA over editing. "They had blue-pencil rights on technical information and personal information on Charles [Wang, CA's chairman]," he said. Kestin, whose job description includes helping to write some of Wang's speeches, said he's working on an unspecified "business/software project."

Nynex unveils flexible local service

New York Telephone has introduced Nynex Enterprise Services, which are said to provide corporate users with more flexible bandwidth allocation on fiber-based metropolitan-area networks. Enterprise Services will support bandwidth of 64K bit/sec., fractional T1 speeds of up to 768K bit/sec. and T1 speeds. The company will offer 45M bit/sec. and 100M bit/sec. Fiber Distributed Data Interface services within local access and transport areas and standard features such as no-charge installation and service restoration within four hours.

IBM chases Apollo users

IBM is joining the pack racing after **Hewlett-Packard Co.**'s Domain user base from the former **Apollo Computer, Inc.**, which HP acquired in 1989. Together with Atlanta-based **Enabling Technologies Group**, IBM last week announced a collection of specialized software migration tools and services to help Apollo/Domain users migrate to IBM's Unix-based RISC System/6000 line.

New QuarkXPress on display

Quark, Inc. in Boulder, Colo., previewed the next release of QuarkXPress for Windows at the Seybold Seminar last week. Version 3.2 for Windows, which adds 20 features and runs substantially faster than the previous release, will give Microsoft Corp. Windows version users of the electronic publishing package the same capabilities as the Apple Computer, Inc. Macintosh version. Both the Macintosh and Windows updates are slated to ship this quarter.

Feds release new encryption method

The Clinton administration last week announced a new encryption technology developed by the **National Institute of Standards and Technology** and the **National Security Agency** for secure transmission of voice and data communications. A microcircuit called a Clipper Chip employs a unique encryption key split into two parts and stored in two separate "key-escrow" databases, one maintained by a federal agency.

SHORT TAKES **Walker Interactive Systems, Inc.** rolled out Windows and OS/2 versions of its financial applications to compete with products from **PeopleSoft, Inc.** and **Dun & Bradstreet Software.**... **Sterling Software, Inc.** in Rancho Cordova, Calif., has announced Hypertraks, a suite of automated data-transfer management products aimed at electronic data interchange and other applications that involve multiple sites and companies.... **Micro Focus** and **Apple** have agreed to port the Micro Focus Cobol compiler, Micro Focus Toolbox and Micro Focus Dialog System to Apple's A/UX operating system.... **The ASK Group, Inc.**'s Ingres Products Division announced a secure database management system, the Ingres/Enhanced Security database.

Compaq, Microsoft aim high

Seek standards in plug-and-play PCs and portable computing

By Michael Fitzgerald
WASHINGTON, D.C.

Microsoft Corp. and Compaq Computer Corp. last week formalized a long-standing working relationship.

The partnership has lofty aims — specifically, to foster new standards in the PC world, such as "plug-and-play" PCs, pen computers and handheld devices, and Microsoft Corp.'s Windows NT [CW, April 12]. Still, as Kimball Brown, analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., said, "there wasn't much there."

Brown did say that if Microsoft were to build a single driver in Windows for something like the Small Computer Systems Interface (SCSI), which was made available to all hardware and software vendors, it could drive a new market for SCSI and flailing new technologies such as infrared communications or Personal Computer Memory Card International Association cards.

> Compaq and Microsoft began their allegiance in 1987, when Compaq was the first PC vendor to build an 80386-based PC and Microsoft developed Windows 386.

Analysts gave the standards effort a shot at success, although it snubs the IBM PC Co.

"IBM is increasingly irrelevant in terms of defining things these days," said Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

Eckhard Pfeiffer, Compaq's president and chief executive officer, and Microsoft Chairman Bill Gates said their partnership would bear fruit within six months. They said the products they developed would be made available to other PC makers.

"Our intent is not to throw rocks in each other's way [but] to support an open industry standard," Pfeiffer said.

Some questioned why Microsoft would set one hardware vendor above others.

"This is a bonehead move on Microsoft's part," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. "Why pick a vendor when you're trying to be hardware-independent?"

PC factions rearming

CONTINUED FROM COVER 1

begins, however, it could bog down the move to open systems. Roger Bender, manager of operations at Deloitte & Touche's New York office and a past president of the Microcomputer Managers Association, warned against the repercussions of such divisiveness. "The marketplace won't accept half a solution," he said. Bender added that he expects vendors to protect his current investment.

Microsoft and Compaq officials carefully ducked the issue of whether they were drawing lines in the sand with Apple and IBM.

"You might see a battle initially," said Compaq Senior Vice President Ross A. Cooley. He said he expects few vendors to adopt an either/or approach. "Within six to 18 months, though, you'll more than likely see a lot of manufacturers behind both," Cooley said.

Mum on war

Microsoft Chairman Bill Gates and Compaq President Eckhard Pfeiffer stopped short of saying the two companies planned war with IBM and Apple.

The pact represents Microsoft's most extensive agreement with a PC hardware maker in five years and comes after its long-term partnership with IBM dissolved caustically last year. Microsoft has also worked closely with Digital Equipment Corp. to ensure that Windows NT runs on DEC's Alpha chip.

The Microsoft/Compaq agreement arrives just as the IBM/Apple/Motorola triumvirate begins to show results. A PC using the trio's PowerPC microprocessor is expected to be demonstrated at next month's Comdex/Spring '93, while IBM is expected to begin shipping PowerPC-fueled machines by year's end. Apple and IBM are also developing an object-oriented environment called Taligent and a new Unix operating system called PowerOpen that will be able to run Macintosh software on either Apple or IBM computers.

Seamless envy

Analysts said Microsoft is feeling the heat from these moves and is particularly envious of the alliance's ability to integrate hardware and software seamlessly.

"Microsoft can work all they want on software, but unless they are assured that certain hardware standards will be met, Windows will continue to have that jury-rigged feel," said Pieter Hartsook, editor of "The Hartsook Letter," a newsletter in Alameda, Calif.

If a pitched "battle of the bands" shapes up, it is anyone's guess who will win. Some analysts do not believe Microsoft and Compaq can keep PowerPC from building momentum.

Battling PowerPC "is a very strong part of this announcement, but Microsoft and Compaq pale in comparison to PowerOpen," said John Dunkle, president of market research firm WorkGroup Technologies, Inc. in Hampton, N.H.

Others gave Microsoft and Compaq a fighting chance, depending on how the partnership develops. "If Compaq really pushes this, they're absolutely powerful enough to bring the rest of the [PC clone] horde along, but it probably won't work real well unless IBM jumps in," said Kimball Brown, analyst at Computer Intelligence/Infocorp, a Santa Clara, Calif., market researcher.

Partner in Pit

Dell Computer Corp.'s G. Glenn Henry, senior vice president of the product group, said Dell views the partnership as a public relations move and that Dell is working with Microsoft on many of the same goals already.

Analysts said it was probably unrealistic to expect a vendor love fest on the road to open systems. "You are seeing the end of the AT bus architecture and vendors splitting into two camps behind the CPU and microkernel architectures of the future, and the industry is only going to be as open as the alternative you choose," Dunkle said.

If vendors have listened to users, the battle may simply turn into a question of which operating system and hardware platform will supplant the Intel Corp.-based hardware/Microsoft-based software oligopoly of the 1980s. Intel and Microsoft may well continue their market dominance.

Analysts said Microsoft may hedge its bets by putting Windows NT on the PowerPC architecture, while the various hardware clone makers will look closely at reduced instruction set computing architectures, such as PowerPC, in case Intel's Pentium chip falters.

West Coast correspondent Christopher Lindquist contributed to this report.

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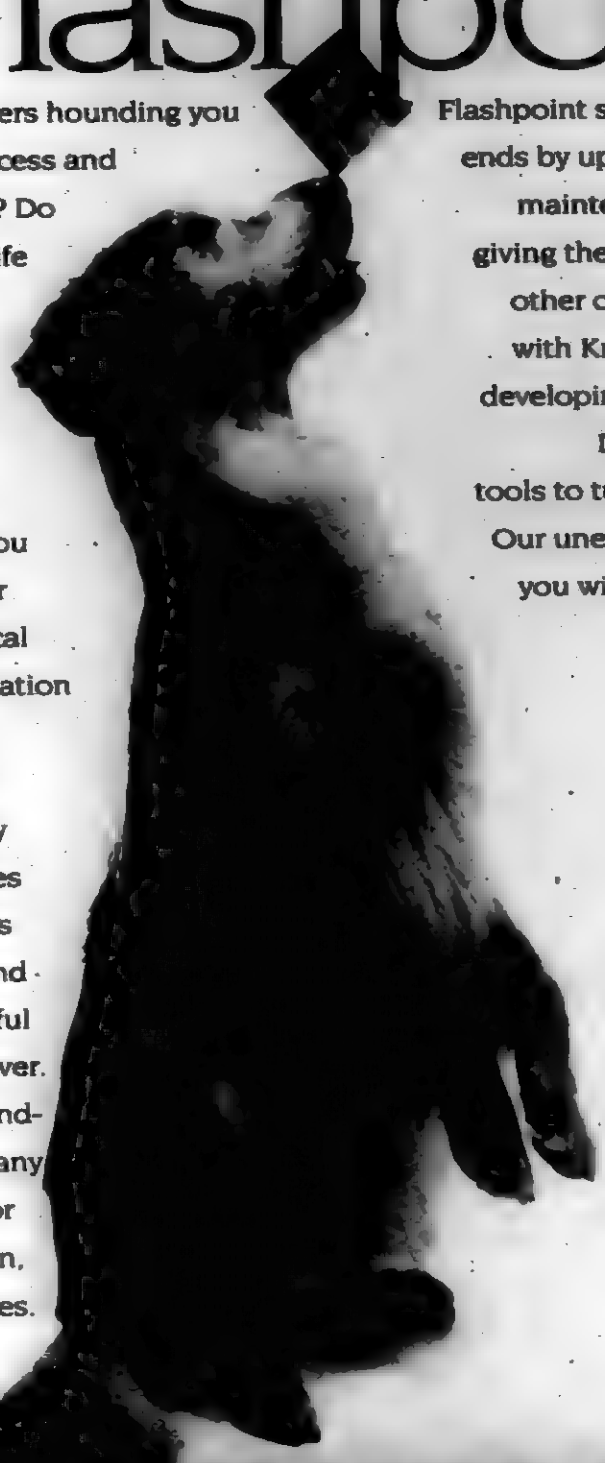

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HEWLETT PACKARD

Kiosks redefining public service

CONTINUED FROM COVER 1

mation technology. But the EBT system is just one example of the trend toward providing citizens with 24-hour access to routine government services at dispersed locations.

The most innovative state and local agencies are deploying networks of multimedia computer kiosks and teller machines in shopping malls, libraries and other public areas. These self-service terminals can handle such chores as car registration, job matching and information referrals.

In Colorado, the governor's office is using kiosks for an experiment in participatory democracy. The interactive computers ask citizens — who approved a tax-limitation measure last November — exactly where the state budget should be cut.

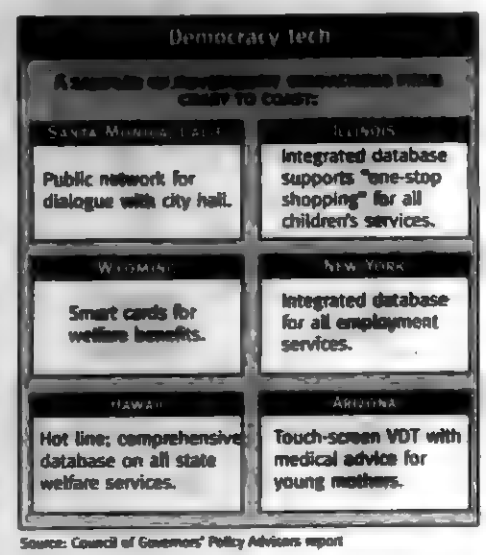
Some projects are now emerging from the pilot phase and are on the verge of becoming full-scale production systems. New Jersey Motor Vehicle Services, for example, has completed a pilot test of teller machines for vehicle registration and hopes for a statewide rollout later this year, a spokeswoman said.

A classic example is Info/California, a network of 15 IBM touch-screen kiosks that allow state citizens to find job opportunities, order birth certificates and locate a wide variety of government services. For security, the machines read the magnetic stripe on driver's licenses.

Last year, the California Health and Welfare Agency stationed nine multilingual kiosks in riot-torn Los Angeles to provide data on disaster assistance. "They've been so popular, we had a hard time getting them back.... So we'll leave them there," said Russell Bohart, director of the agency's data center in Sacramento.

Now the agency is evaluating bids for 100 more Info/California kiosks. "Of course, I recognize we're building a dinosaur. Someday, we really want to deliver this information to the home," Bohart said.

Pioneers in this field said self-service terminals should be used only for ultrasimple transactions, and they may never replace the need for government employees to deal with complex situations. But the terminals do allow agencies to handle routine transactions and reduce lines without adding more staff.



Source: Council of Governors' Policy Advisors report

A prime motivation for Maryland's EBT project was cutting administrative costs. Maryland officials said the traditional system costs the state $5.10 per client each month, including salaries, facilities, mailing and computer expenses. The electronic system shaves 75 cents off that figure, they said.

The state outsourced the operation to Milwaukee-based Deluxe Data Systems, Inc. under a six-year, $37.6 million contract. Even with that price tag, the EBT system is expected to produce net savings of $1.2 million a year, a spokeswoman said.

Some states, however, are not looking for dollar savings. The Pennsylvania Bureau of Motor Vehicles wants to deploy 10 teller machines throughout the state simply to provide better service through decentralization, said Norine Goss, manager of the bureau's Self-Service Terminal project.

Under the state's current system, all residents have to register their vehicles at the central office in Harrisburg — Pennsylvania has no regional motor vehicle bureaus — or they can mail or messenger their registration to the capital. Last-minute filers, however, must show up in person, where they face exceedingly long lines. As a result, people in outlying areas are clamoring to get teller machines in their regions, Goss said. The agency is evaluating a prototype system from NCR Corp.

Remember the basics

But information systems consultant Sheldon Cohen is less than enamored of the move toward government by kiosk. Cohen, vice president of MMA Consulting Group, Inc. in Boston, which advises state and local governments, said there is a danger in getting distracted from more basic systems. "It doesn't make much sense to have a kiosk if your financial, revenue management and public safety systems are not in order," Cohen said.

In addition, there is a variety of policy issues that must be addressed, according to a report published by the Council of Governors' Policy Advisors in Washington, D.C. For example: Will greater public access to government services translate into greater demand — perhaps more than the state can afford? Will individual privacy rights be protected if information is shared across program lines?

Maryland's EBT program faced lengthy delays while new federal regulations were written to accommodate this "uncharted territory," said Karen Walker, EBT project director at the Maryland Department of Human Resources.

"The federal agencies had to be careful because the decisions made for the Maryland program would be precedent-setting," Walker said. Now that the regulations are written, other states should encounter fewer hurdles and delays, she added.

Info-central

Experts said federal, state and local agencies should cooperate and combine their data for self-service kiosks so people looking for information on small-business loans or child services, for example, could get information in one place. Otherwise, there may be a confusing overpopulation of government kiosks.

Resources:
- "New Alliances in Innovation," a report published by the Council of Governors' Policy Advisors, Washington, D.C., (202) 624-5386.
- "Service to the Citizens," report No. KAP-93-1 from the U.S. General Services Administration, Washington, D.C., (202) 501-4860.
- The Alliance for Redesigning Government, Washington, D.C., (202) 347-3190.

Reinventing government

The trend toward government kiosks and teller machines is just one part of a larger movement known as "reinventing government," a concept that rolls re-engineering, quality management and customer service into one buzzword.

The pioneers of this bureaucracy-busting effort include the state of Arizona and the city of Sunnyvale, Calif. And now the federal government is jumping on the bandwagon.

"We intend to redesign, to reinvent, to reinvigorate the entire national government," President Bill Clinton declared last month as he launched a six-month performance review of federal agencies.

A key goal of the review is to "find ways to improve services by making better use of information technology and by making government programs more responsive to the customers they serve," a White House statement said.

At a time when businesses are streamlining, focusing on customer service and exploiting new technology, "government is virtually the only sector of American society that has yet to reinvent itself for the information age," said David Osborne, co-author of the 1992 book *Reinventing Government*.

Actually, some federal agencies are already experimenting with service-enhancing technologies, albeit cautiously. The Internal Revenue Service is piloting Touch-Tone tax filing [CW, March 1], for example, and the Food and Drug Administration wants to accept electronic filings from the drug industry. However, it must first rewrite 132 regulations that require handwritten signatures [CW, Sept. 14, 1992]. — *Mitch Betts*

Passing grades

If high-tech government can work in the rotten economy of Tulare County, Calif., it can work anywhere.

The Tulare County Department of Public Social Services has 25 IBM Personal System/2 multimedia computers that patiently explain the county's welfare services in any of six languages to the rural area's neediest citizens and lead them through the application process.

Citizens use the touch-screen PCs to answer questions that will determine whether they are eligible for public assistance. Each PC is linked to an IBM Enterprise System/9000 mainframe running an expert system that determines whether they are eligible. The expert system was written using IBM's Expert Systems Environment software.

Why the expert system? Because there are roughly 6,000 constantly changing rules and regulations covering welfare in California, said Anita Scrams, manager of the Tulare project. Therefore, it is virtually impossible for county employees to apply them all correctly.

In a test of 200 cases processed the old way and 200 processed by the expert system, the error rate for the manual system was 38%, while the computer made zero errors. The system is expected to save $20 million a year.

In the end, the system prints out a completed eight-page application — a vast improvement over the previously handwritten and often illegible applications — and a list of the documents needed to verify eligibility.

The $3.2 million system has enabled the agency to handle a growing number of cases without increasing staff, Scrams said. This is no small accomplishment in a county with chronically high unemployment (18.5% at last report) and approximately 30% of its population on welfare. — *Mitch Betts*

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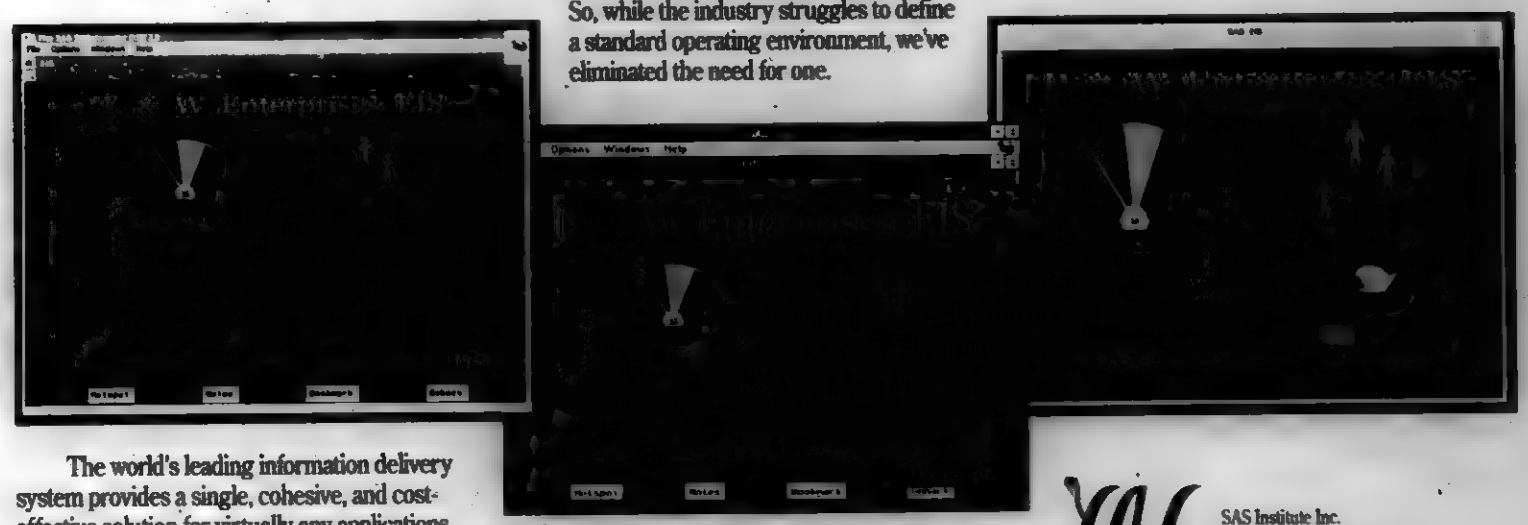

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BYTE 9/92

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Home Office Computing 1/93

Software Digest RATINGS REPORT
The Independent Comparative Ratings Report for Selecting IBM PC Business Software
Vol.9, #5, September 1992

Advanced Word Processors for Windows	
	Overall Evaluation
1ST Ami Pro 3.0 for Windows	**8.7**
2ND Word for Windows 2.0	8.1
3RD WordPerfect 5.1 for Windows	6.1

"Ami Pro 3.0 takes the le as the Windows wo

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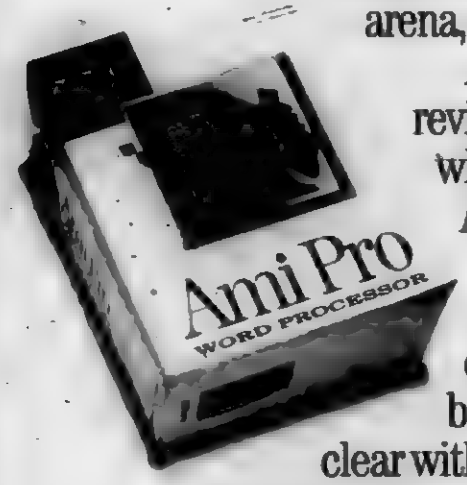

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Forbes 2/93

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InfoWorld 9/28/92

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NextWorld preview

PC vendors step up to NextStep 486

By James Daly
REDWOOD CITY, CALIF.

Next, Inc. last week began to unveil the big guns it needs to survive by announcing that a cadre of important PC manufacturers will soon ship their high-end machines with the NextStep 486 operating system preinstalled.

By the May 25 opening of NextWorld Expo in San Francisco, NextStep will be available on Intel Corp. 1486- and Pentium-based machines from Dell Computer Corp., Data General Corp., Epson America, Inc., NEC Technologies, Inc. and Siemens/Nixdorf Informationssysteme AG, said Chairman Steve Jobs. Hewlett-Packard Co. will allow bundling at the reseller level, while IBM is reportedly close to a similar arrangement.

NextStep 486 will also be demonstrated running on more than 100 different PCs at the show, including models from Digital Equipment Corp., AST Research, Inc., NCR Corp., Zenith Data Systems, Toshiba America Information Systems, Inc. and Gateway 2000 Ltd.

The enlistment of the manufacturers is needed for the survival of Next, which in February scrapped its slow-selling workstations in order to focus solely on its highly regarded NextStep software.

NextStep has been available for more than four years and is well-regarded as an object-oriented application development system, but its proprietary nature has made it a difficult sell. Analysts said the release of a version for Intel platforms — NextStep 486 — will widen its appeal to users looking to develop custom in-house applications quickly.

According to International Data Corp., Next shipped slightly less than 70,000 workstations last year, compared with 217,000 by market leader Sun Microsystems, Inc.

NextStep users have long praised NextStep's design as one that makes it easier to reuse large chunks of software code. They said it delivers today the kind of object-oriented programming environment that potential rivals such as the Apple Computer, Inc./IBM joint venture, Taligent, Inc., and Microsoft Corp.'s Cairo project will not deliver until 1994.

"NextStep is a superb way to build apps quickly, so if they can make NextStep [486] fly, that would be a great thing," said Charlee Mayer, manager of computer systems and services at Mobil Corp.'s offices in Fairfax, Va.

May not lead for long

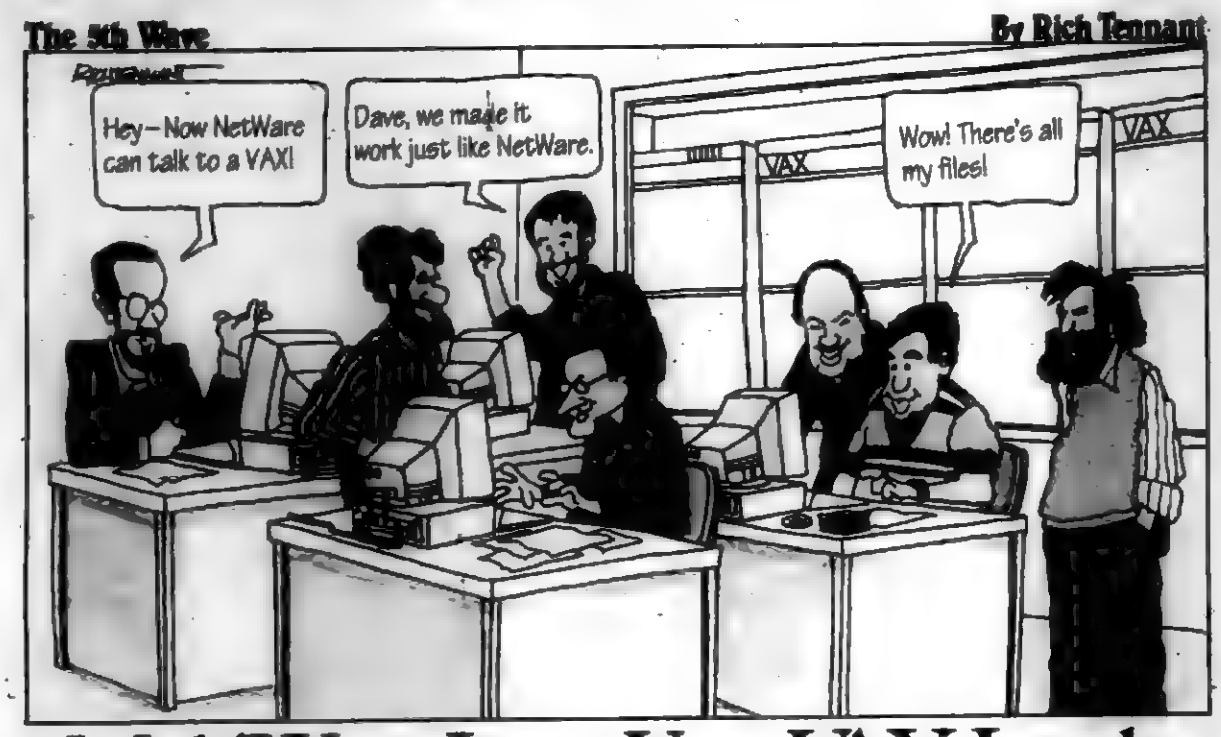
But analysts said the chances of Next's taking over the object-oriented development market are slim and that Microsoft and Taligent will likely be the real operating system powerhouses in the future.

"At best, Jobs can hope to gain a loyal following where creating custom apps fast is a priority," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

Next also faces competition from smaller competitors. Already, companies such as ParcPlace Systems, Inc. and Digitalk, Inc. offer similar well-regarded platforms for crafting customized applications.

NextStep 486 also presents significant financial hurdles. In addition to shelling out $795 for NextStep 486, users may need extra circuit boards, memory and disk drive capacity to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next machine. That could potentially add several thousand dollars to the cost.

At stake is nothing less than the survival of the company. "If they do not make money with this [software] strategy, it could be tough to survive," Bajarin noted.



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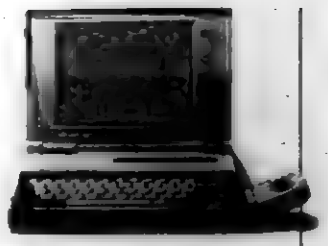

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Tech Talk

Crowd control

A neural network program developed to help military pilots deal with enemy threats could soon be used to ease traffic congestion around stadiums. Computer researchers at the Georgia Institute of Technology in Atlanta have adapted the military software to a traffic control program that monitors congestion and regulates traffic signals to optimize the flow of vehicles.

A light touch

AT&T Bell Laboratories and Harvard University researchers said last month they had succeeded in pushing individual atoms with a photon beam. The technique, which uses a large number of photons to deflect a slow-moving atom, might someday replace current lithography systems, which now produce lines on integrated circuits one-half a micron wide. The technique also helps construct even tinier devices.

Worth a picture...

NEC Corp. reported last month it will begin selling this year a speech-recognition system capable of recognizing approximately 1,000 words of naturally spoken Japanese.

'What's on channel 1376?'

BroadBand Technologies, Inc. announced last month a technology for providing up to 1,500 interactive video channels over an Asynchronous Transfer Mode network. According to the Research Triangle Park., N.C.-based company, its system, which will use the Motion Picture Experts Group's digital video compression standard, will be available in late 1994 to coincide with telephone company plans to begin large-scale video dial tone platforms. Broadband's current fiber-based distribution system has already been deployed at five of the seven regional Bell operating companies, GTE and Puerto Rico Telephone.

L.A. awaits 'smart' highway

Toll road will use computerized sensor to help drivers avoid jams

By James Daly

THE UGLY, SNAKING TRAFFIC jams that are as much a part of life in Southern California as palm trees and beach boys may soon become a thing of the past.

With bumper-to-bumper cars tying up major thoroughfares and funds to build new roadways scarce, technicians are concocting new "smart highways" to make existing roads work harder.

The most ambitious project yet began early this year in suburban Los Angeles, where the California Private Transportation Co., MFS Network Technologies, Inc. and Texas Instruments, Inc. began creating a 10-mile toll road that uses a sophisticated computerized sensor and communications system to help drivers avoid jams.

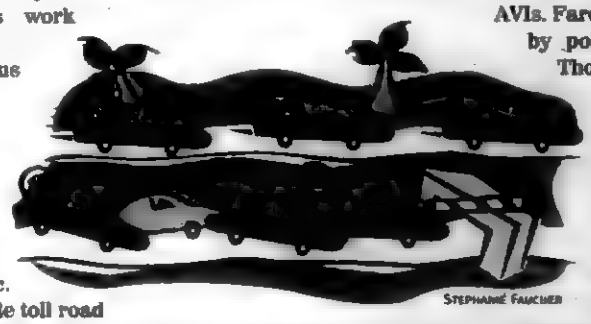
Toll (plaza) free

Best of all, the road can operate without toll plazas, which are often a source of both backups and pollution from idling cars. A similar system is planned near Washington, D.C., to retrofit the toll road that connects Northern Virginia's Dulles International Airport with the capitol. Other projects are on the drawing board in Florida and Texas.

"It's ironic that we've been in the toll collection business for about 200 years and it still works the way it always has, with a collector taking money from each vehicle," said Kevin P. Moersch, president of Omaha-based MFS Network Technologies.

The $100 million, two-year California project was designed to link California's Orange and Riverside counties. The target road is State Route 91, which today handles an average of 225,000 vehicles each day. That number is expected to grow to nearly 340,000 by 2010.

Under the privately funded plan, four express toll lanes will be built where a median strip now exists. While Route 91's existing eight lanes will continue to be toll-free, investors are betting that commuters will pay a typical $1.50 toll to travel on the less crowded addition and cut their commuting time.



STEPHANIE FAUCHER

The increase in volume the roadway can handle is expected to be dramatic. While 800 cars usually pass through a toll lane in one hour, 2,500 cars could pass through the Route 91 system each hour.

Here's how the system works:

•Commuters choosing to participate in the new tollway are issued an automatic vehicle identification (AVI) tag, which they clip to a rear-view mirror, place on a dashboard or attach to a license plate. The tag is about the size of a thick credit card and incorporates an antenna, microchip and lithium battery. It costs the driver about $30.

•As a car approaches the toll road, sensors in the pavement let the tollway computer know a car has entered. A transceiver overhead makes radio contact with the AVI tag and reads the data stored there. That information is then relayed via fiber-optic lines to the highway's control center computers, which charge the toll against the driver's prepaid account.

•Surveillance cameras record the license numbers of cars without AVIs. Fare beaters can be nabbed by police or fined by mail. Those same cameras also enable managers to keep tabs on traffic and decide whether to raise or lower tolls.

•To prevent rush-hour jams from spreading to the toll lanes, planners have formulated a "congestion pricing" scheme that ups the tolls along the road as traffic increases. Tolls of up to $9.99 can be implemented.

The AVI scanning process takes about 1/50th of a second and has been tested at speeds of up to 160 miles per hour, Moersch said. Through each tag's unique code, the reader can distinguish vehicles traveling within 30 centimeters of each other. It can even identify individual motorcycles riding side by side in a single lane.

Because the new tollway is still two years away from completion, the particulars of the computer machinery have not been finalized.

The group putting together the project is tentatively considering hooking up IBM RISC System/6000 workstations to a Digital Equipment Corp. VAX at the computer control center.

Tech hybrid produces offspring

By Ellis Booker

The marriage of two promising computer technologies, fuzzy logic and neural networking, has begun to breed products for the computer industry.

The appeal of merging the two is this: A neural network can be used to create a fuzzy rules generator. Once the neural network "learns" the rules underlying a particular application or system (based on its behavior or input parameters), the fuzzy logic generator takes over to create the fuzzy rules.

According to Mountain View, Calif.-based Frost & Sullivan Market Intelligence Research Corp. (MIRC), the market for such hybrid products is set to explode. In its 1992 report, the firm predicted that the combined market will more than double from $1.2 billion this year to $2.54 billion in 1994, for a revenue growth of 110%. By 1998, MIRC said, it expects the worldwide market to be nearly $10 billion.

MIRC also predicted that these products, now overwhelmingly proprietary engineering development tools, will shift to standard software and microchips.

Last month, National Semiconductor Corp. in Santa Clara, Calif., announced what it called the first user software product to combine neural network learning to generate fuzzy logic rules for programming a microcontroller chip.

Called NeuFuz4, the software lets systems designers develop, test and implement fuzzy logic solutions for National's COPS, an 8-bit embedded microcontroller.

The $10,000 NeuFuz4 Development System includes Microsoft Corp. Windows, COPS development tools, documentation, consulting and technical support.

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Sound bytes

On the plane en route to the Society for Information Management's Institutional Member Conference for CIOs of very big companies last week, I had the pleasure of chatting with Kathleen Taylor, senior vice president of Cigna. I asked her to characterize the pace of technological change today with that of the previous two decades.

She said something like this: "You can take the changes from the late 1960s to the mid-1980s, and they pale in comparison to what took place in the last six years. And the scary thing is, the rate of change is increasing."

So it is a little surprising that the pendulum between the CIO's business acumen vs. his technology know-how appears to be swinging decidedly back to a greater emphasis on pure technology issues. That is also one of the key findings in the third *Computerworld*/Andersen Consulting survey of senior corporate executives (see story page 86).

These senior non-IS execs are becoming more computer literate and clearly want their IS chiefs to have a greater balance between business and technology skills.

And why not? Just a few short years ago, roughly 86% of all application development took place in IBM or DEC environments that had taken root 30 years before. But by 1995, the vast majority of application development will take place in some yet-to-be-determined environment that is utterly alien to the old VMS/MVS world that is fading fast.

Are the CIOs, many of whom recently spent no more than 10% of their time on technology issues, ready to lead the mass migration to the brave new world of distributed computing? They'd darn well better be.

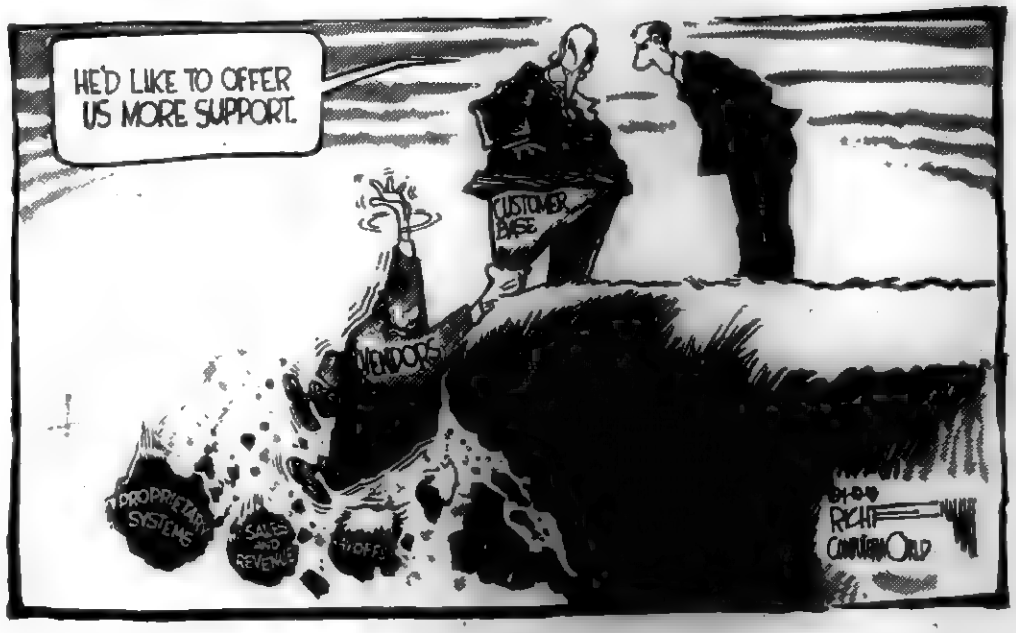
The problem is, many information chiefs have become very comfortable in the role of CIO as businessperson almost exclusively. They cut their teeth on the basic architectures of the 1960s that endured for so many years. The world of pure management must have had a tremendous allure.

Then the continental plates that are the technological underpinnings of the profession shifted dramatically, and today the CIO has to reacquaint himself with a very different set of constructs. This has to be as jarring as the changes themselves.

As Paul Strassmann wrote on the opposite page last week, it is time for CIOs to stop aiming at other jobs (such as the COO or CEO) and start paying more attention to their own.

Bill Laberis

Bill Laberis, *Editor in chief*



Back on track

Regarding "How to get 'runaway projects' on track" [CW, March 15]: The experts missed the essential reason that overruns occur. Most large, complex projects were designed to deliver all of the functionality in one implementation, following the conventional wisdom of the 1970s-era development methodologies. When this happens, documentation and training become significant issues, as the article points out.

Overruns occur because the project team and its customers have not learned enough to deliver the system effectively, including real business needs, enabling technology and the customer/provider working relationship.

The most effective way to climb the three learning curves is to carve out a subset of the functionality and deliver it early. The remaining functionality is then delivered in releases, much the same as commercial software is developed. The later releases go much more quickly because the learning has taken place with a smaller piece of the system in a shorter time.

All of the points mentioned in the article, such as proper sponsorship, better estimates and proper plans, are also important, but the best project managers cannot succeed with these alone unless they design their projects for maximum learning effectiveness.

W. B. Foss
Stamford, Conn.

Salute to the Army

The article about the Army's Reserve Component Automation System, "Army enlists client/server" [CW, March 29], in which Maj. Gen. Gary Stemley repeatedly mentions the many benefits of using Ada, is a great piece of reporting on one major success story with Ada.

This is the first time in about four years that I have seen Ada mentioned so prominently in a *Computerworld* article.

Kudos to Stemley for doing something that no one else inside the Department of Defense is willing to do.

Greg Aharonian
Belmont, Mass.

Windows 3.1 is OK by him

Paul Gillin is to be congratulated for being able to make Microsoft Windows 3.1 look as bad as IBM OS/2 really is ["Your turn, Windows," CW, March 22].

Windows 3.1 is a superior product, considering that it has to live with DOS. I am running Windows as a base in a multiuser environment for the purpose of accessing commercial and in-house applications on Novell local-area networks as well as emulating our IBM 3090 mainframe.

The benefit of Windows is that if the system is planned carefully, it will work very well while allowing one to have many applications open simultaneously and almost instantaneous switching among them.

I am anxiously awaiting the release of Windows NT. Soon there should be no reason to even consider IBM OS/2.

Gerald I. Shkarovsky
Chicago

Step ahead

I read with great interest and enthusiasm Charles Babcock's article "The Next direction" [CW, March 22]. I found it to be an excellent affirmation of Next, Inc.'s strongest feature—its amazing technology.

But I wanted to highlight a major point that he missed. NextStep's lead over other object-oriented development architectures is not because of the icon shelf capabilities he saw but the immense library of objects that Next offers.

NextStep provides its developers with 4 million lines of reusable object code. This code is categorized in NextStep's seven object kits.

It is these kits, the large number of third-party objects and soon-to-be-announced object kits from Next that give NextStep its immense lead over other development environments. While Cairo and Taligent may copy NextStep's architecture in two years, they will need five years to write and debug all of the code that you can already get with today's NextStep.

Garrett Rice
Boulder, Co.

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Open systems: A bad idea even if they were possible

E. Ted Prince

So the future of computing is open systems — systems that fit together and communicate seamlessly? I don't think so.

Even if this were desirable, which I don't believe it is, I doubt it would be possible. This, of course, means a lot of people may be wasting a whole lot of time.

We wise old people of computing recognize a law that says once a core system becomes "open," our clever vendors immediately find something highly proprietary to add to it. So an operating system, once "open," is "enhanced" with a proprietary database system and, after it is cloned, a proprietary user interface or communication system. As systems become smarter, the potential for adding more closed, proprietary software increases.

This is not a knock on vendors. They are simply doing what they have to do to survive. What we technical professionals tend to forget is that for vendors, "open" means clones and competition, lower margins, even death. The only way for them to have a future is to continue to differentiate, which means closed and proprietary systems.

"But what about Unix?" you all cry. To this I say, "Which one?" Are we talking about AIX, Ultrix, System 5, Berkeley, OSI, NextStep, SCO, Solaris, USL or Unix flavor Y with Novell?

Unix folks may be technological idealists, but they haven't even got it together at the operating system level. And that's just as well,

really. If they did, and we could all get it for free from our local bulletin board, there wouldn't be money for support. We'd all have to migrate to something proprietary and supported.

Besides Unix, which is clearly not open or likely to be, where is our open system? Will it be OS/2, PowerOpen, NextStep, Taligent, Windows NT or an as-yet-unannounced Windows Plus? Don't bet on it.

Maybe open systems should not be viewed from a purely technological level but as cooperation among vendors on standards. From where I sit, though, the best cooperation seems to come from vendors building proprietary (as opposed to closed) systems. Cooperation at the standards level seems kind of tame by comparison.

Our economic system rewards genius, and international standards committees are not renowned for that. Committees such as these stand for the lowest common denominator.

The true software revolutionaries do not sit on committees, and they cock their snoots at standards. SAA was supposed to be open. R.I.P. Sematech is going the way of all flesh. International standards seem to be honored in the breach. Why? Because competition and survival are the name of the game, and no one ever earned their bonus bringing their competitors up to the same standard as their own.

The future will belong to proprietary systems created by entrepreneurs who refuse to be bound by logicians' schemes. These systems will encompass ideas and functions we can scarcely dream of and that no standards architect can prepare for. They will generate wealth that would make Bill Gates blush.

Then eventually, inevitably, the imitators and cloners will jump in to suggest "open" systems based on these products, and we will start again.

Prince is managing partner of Prince Consulting, Inc. in Hawley, Pa. He was formerly president of a national computer services company.

How Microsoft fell: A look back

COUNTER-INFORMATION *by* Michael Schrage

The following article comes from an anticipated April 2000 issue of The Economist *via the transtemporal Internet node called "ScenarioNet."*

Yes, Microsoft's Bill Gates is still a billionaire, but his wealth and influence have dwindled dramatically. The entrepreneurial enfant terrible who once confided that his greatest fear was to become the Armand Hammer of software is now being humiliated by a midlife crisis of market forces beyond his grasp. Gates' many enemies are virtually wiggling with glee. No one roots for Goliath.

To be sure, Microsoft and its middle-aged master are still forces to be reckoned with. The company retains its market share in multimedia operating systems and enterprisewide infranetworks, but it has effectively lost the ability to command a premium for its services. As a septibillionaire, Bill Gates is a charismatic visionary; as a mere duobillionaire, he's just another really clever competitor.

As with most tales of corporate decline, the most grievous wounds were self-inflicted. Microsoft's lust for market share consistently led the company to sell its systems before the kinks had been worked out.

For years, this practice yielded an optimal blend of preemptive competitiveness and revenue. However, when the company shipped its Baghdad operating system in 1996, it had more bugs than a Manhattan brownstone. Catastrophic data losses resulted, and furious customers sued.

In its historic 1998 *Aetna* v. *Microsoft* ruling, the appeals court noted: "While competitive zeal is essential in a market economy, it does not excuse innovators from exercising appropriate standards of professional care. Microsoft's willful disregard of its own internal standards and generally accepted software industry practice not only makes it liable for actual damages but also, in the opinion of this court, provides essential justification for punitive damages."

The decision ultimately required Microsoft to set up a mere $500 million reserve, but the company's market value dropped by nearly one quarter, and legendary white knight investor Warren Buffet resigned from the board.

Even as the company was recovering from litigation, innovation struck at the heart of Microsoft's technical eminence. NEC, Hitachi, Samsung and a clutch of entrepreneurial U.S. silicon firms introduced the first generation of "inferential microprocessors" in 1996.

Using fuzzy logic and neural network design techniques, these chips could effectively "infer" an operating system from the software's object code. In other words, these microprocessors could "grow their own" operating systems on a program-by-program basis. This development completely undercut Microsoft's lucrative operating systems business and badly hurt the Apple/IBM multimedia joint venture. Of course, Microsoft sued, but it lost in both Japan and the European Community.

This lethal combination of liability and technical superprocessing has more than halved Microsoft's market value from its 1991 high and undermined the company as a perceived market leader.

Can an intense but seemingly tired Gates rekindle his company's competitiveness? Most observers are skeptical.

Say, didn't the U.S. Federal Trade Commission once try to dismember Microsoft at the beginning of this decade?

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990).

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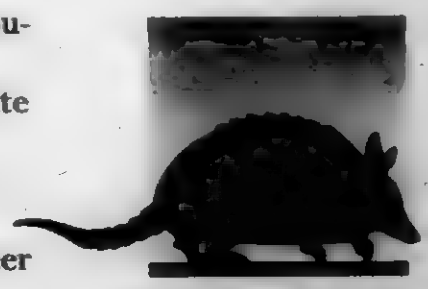

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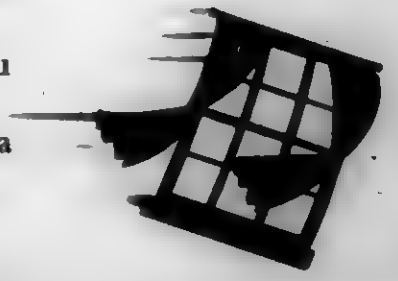

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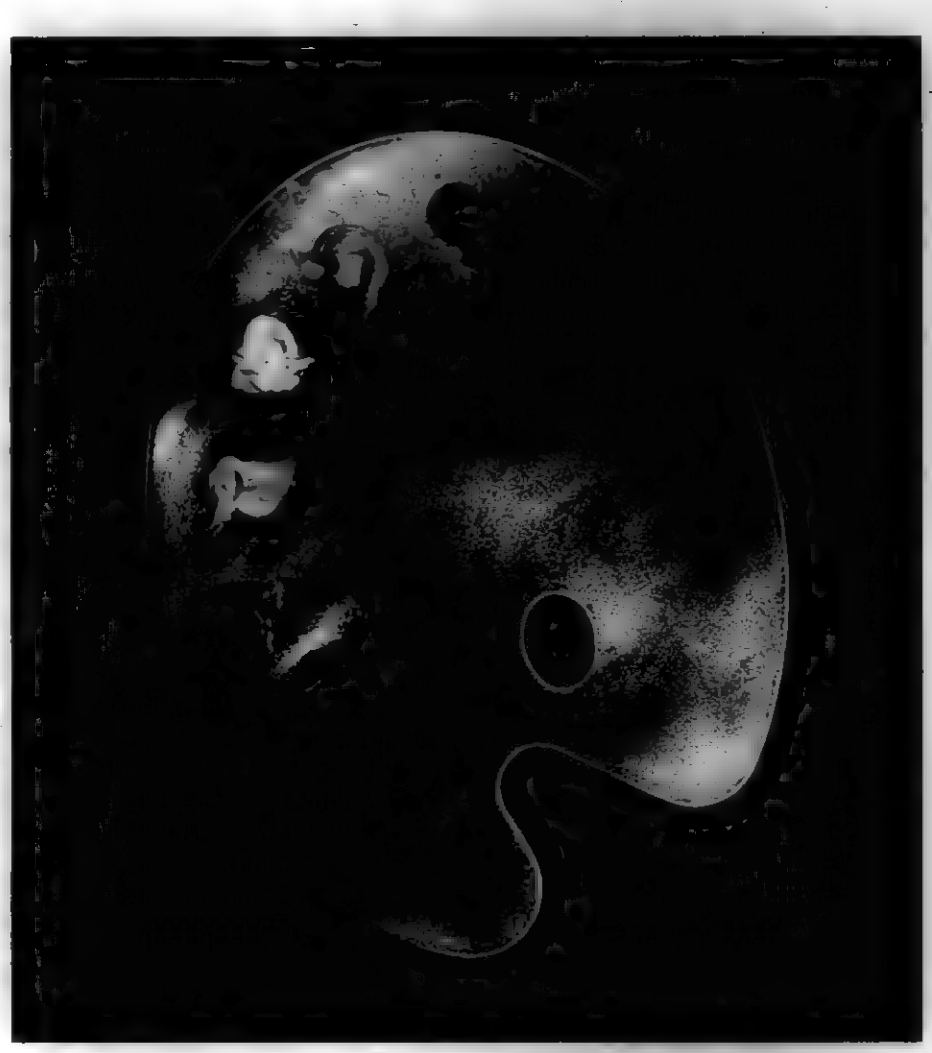

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Charles Babcock

Mainframe mainstay

At a time when everyone knows the mainframe is going the way of the dodo, I would like to submit a dissenter's brief.

I believe the mainframe will be around past the year 2000.

Where it survives, I believe, the mainframe will take on an increasingly important role. I believe many organizations have already concluded that, no matter how powerful desktop machines get, their business won't function without a mainframe.

And I believe that, in the end, the rapid growth of desktop computing will create a demand for more mainframe MIPS.

These, of course, are very unPC statements — neither PC-oriented nor politically correct. But if I were wrong about this, the number of MIPS on mainframe processors wouldn't still be increasing.

Increasing?

That's right. Despite all the stories about "we phased out our mainframe," the number of MIPS on mainframes is increasing. Computer Intelligence says the number grew to 467,000 in 1992 from 399,000 the year before, an increase of 14.6%. This is lower than the historic rate of increase but respectable, considering the mainframe's presumed demise.

This is not to say that the number of IBM 3090-ES/9000 family mainframes isn't decreasing. It is. Computer Intelligence pegs the U.S. mainframe population at 24,000 at the end of 1992, compared with a peak of more than 27,000 at the end of 1989. But the decline in absolute numbers doesn't necessarily disprove my point.

Better than ever

Many of the survivors represent consolidated machines in consolidated data centers. Today's high-end mainframe represents the equivalent of 20 machines of a decade ago. *Of course* the number is decreasing.

The mainframe's primary distinguishing characteristic is its ability to move massive amounts of data, not just through the CPU, but in synchronized fashion in and out of the machine. Main memory, buffers, caching, external storage and CPU all run in balance as the operating system prefetches instructions and data to feed them through the CPU the instant it is available.

Theoretically, four Pentium PCs will soon be stitched together to equal the CPU power of a mainframe, but each will be constrained by the single 1½M- to 2M-byte data path between its microprocessor and storage.

A mainframe coordinates 256 channels, each capable of carrying 17M bytes per second. To achieve the PC equivalent I/O, 2,176 PCs would have to be networked together in a closely coupled fashion and coordinated to work on the same task at the same time. Needless to say, it's a feat far beyond existing LANs.

So what is all this coordinated power good for? Right now, most corporations still depend on their mainframes to do the time-sensitive batch processing that makes up their core business processes. If the mainframe is busy interacting with end users and managing the network by day, it must perform data collection and update routine processing tasks in payroll and accounting, etc., through a constrained window at night. Most firms are trying to offload new applications from the mainframe because they don't have a comfortable margin of error as it is.

Eventually, these core applications will be migrated to lower cost computing systems, but right now there is a degree of security and control on the mainframe, thanks to its well-documented user-unfriendliness. And because of these characteristics, the mainframe will eventually become a central repository for data, able to take it in and farm it out at massive rates under the firm control of IS.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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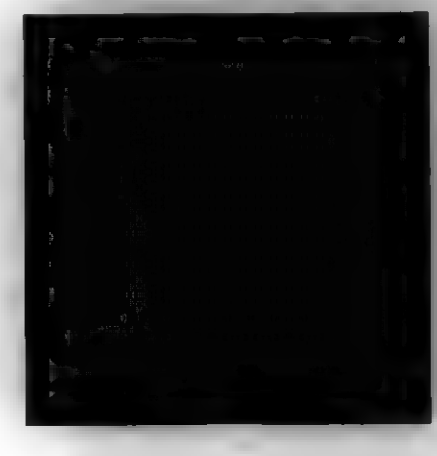

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Graphics performance

Vendors hop on local bus

By Michael Fitzgerald

The move to datahog graphical user environments such as Microsoft Corp.'s Windows, and thus much slower screen refresh and data transfer rates, has users and vendors hopping on the local-bus bandwagon.

"I love local bus," said Joseph Anello, MIS director at the University of Pennsylvania Medical Center's John Rheabarton Surgical Associates in Philadelphia. Anello said that as a test of a new local-bus system, he opened four major presentation packages at once and started applications, with no degradation in performance.

The reason is that in a system with a local bus, the graphics instructions bypass the data bus and run at the speed of the microprocessor, greatly increasing the screen refresh rate for users running large, Windows-type programs.

Weak link

Today's graphical user software has exposed a weakness of the AT bus and its follow-ons. The AT bus and the Extended Industry Standard Architecture (EISA) buses run at 8 MHz, while the Micro Channel Architecture (MCA) bus runs at 10 MHz. However, internal processor speeds are up to 66 MHz.

New local-bus standards, such as the VL bus from the Video Electronics Standards Association (VESA) or Intel Corp.'s Peripheral Component Interconnect (PCI), run at 40 MHz and 33 MHz, respectively.

"We did some internal testing of local-bus machines from Gateway vs. nonlocal-bus machines from Gateway and Compaq, and there was a fourfold increase in speed with the integrated local-bus technology," said Michael J. Henderson, PC coordinator at James River Corp.'s Neenah Technical Center in Neenah, Wis.

Henderson said that his shop has since installed VL-bus systems from Gateway 2000 Ltd. for its Windows users "and improvement was definitely noticeable."

With IBM PC Co.'s recent announcement of ValuePoints with local bus, all the major corporate hardware vendors have announced local-bus systems.

According to analysts, it is the wave of the immediate future, particularly because local bus can also be used to speed data transfer rates from hard drives or Small Computer Systems Interface devices. "We're surprised any time we hear a new product announced without at least accelerated video," said Ted Julian, an analyst at International Data Corp. in Framingham, Mass.

Vendor scuffles

But the local-bus phenomenon is complicated by vendor battles. Intel, although a VESA member, does not support the VL bus. It instead touts its own PCI as the way for vendors to go, particularly as they roll out Pentium-based systems. Dell Computer Corp., another VESA member, approved the VL specification, then sent a letter to selected vendors informing them that systems using it infringed on a Dell patent.

The variety of vendor approaches also complicates things. While IBM PC Co., Gateway and a number of smaller companies have chosen the VL bus, Dell, Compaq Computer Corp. and AST Research, Inc. have adopted proprietary local-bus approaches.

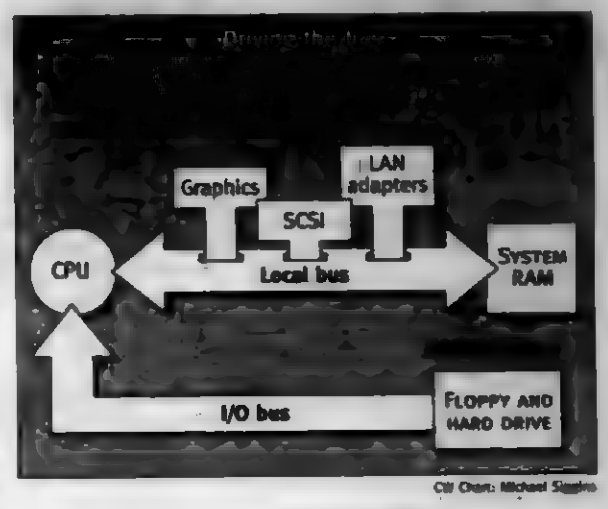
The battle lines remind some users of MCA vs. EISA.

Vendors "should shut up and stop putting proprietary equipment out — all that squabbling does is mess things up for the end user," Anello said. His company's systems use the VL bus, and he said his ideal future would be systems that support both the VL and the PCI bus.

Analysts said costs make this unlikely, and most expect PCI will win the battle with VL in short order.

All the major PC makers are expected to support PCI.

"The real question is: If I'm going to have on-motherboard video, which is the other trend [in hardware design], then what do I really need a local-bus slot for?" asked Andrew M. Seybold, editor-in-chief of "The Outlook on Professional Computing," an industry newsletter in Brookdale, Calif. According to Seybold, local-bus slots give vendors and users an insurance policy for new developments in hardware.



CW Chart: Michael Siggins

The bus: Ready to depart?

In time, the local bus will die, as more and more functionality gets moved to the motherboard or to the central processor.

"The overall concept of local bus will eventually be irrelevant," said Will Strauss, analyst at Forward Concepts Co., a Tempe, Ariz., market researcher. Strauss said this would take at least two more product cycles, though.

IBM's future rests in new technology, IS managers say

By Michael Vizard

While IBM has embarked on a course to compete with Microsoft at every level of the desktop, information systems managers are advising Big Blue that it should focus on creating new technologies such as the Taligent object-oriented operating system rather than re-engineering commodity products like DOS.

"We don't want to hear about infrastructure battles. A new version of DOS or a new API is not what I would call adding value. We need to get out of my dog is bigger than your dog comparisons," said Craig Goldman, senior vice president and chief information officer of The Chase Manhattan Bank NA in New York.

"I think customers are happier when they have fewer choices. Choice can be useful, except when you're talking about commodity products. I think they are tired of the fighting between vendors," said Esther Dyson, president of EDventure Holdings, Inc. in New York.

Focus on next generation

Instead, IBM should focus on adding value by providing integration services that will make it possible to build applications that are not currently possible.

In particular, IS managers said IBM needs to focus on the next generation of desktop computing technologies, rather than compete with Microsoft Corp. products such as DOS and Windows.

IBM, *page 43*

DEC series a worthy effort

By Christopher Lindquist

While Digital Equipment Corp.'s launch into IBM-compatible PC hardware may have been slow in PC industry terms, it has certainly tried to make up in enthusiasm what it lacked in timeliness.

The latest round of PC products to come from DEC's Taiwan-based manufacturing plant is the DECpc MT series, a line of processor-upgradable Intel Corp. 1486-based systems in "micro-tower" cases that can be used either on the desktop or deskside. But DEC's machines are less "bleeding-edge" than they are high-quality, solid-performance systems.

PRODUCT test DATA

Our test system was a DECpc 466d2 MT with a 486DX2/66 processor, 128K bytes of cache memory (expandable to 256K bytes), 8M bytes of random-access memory and a 245M-byte integrated drive electronics (IDE) hard drive. Standard systems come with 4M bytes of memory that can be expanded to 64M bytes and a 122M-byte hard drive. The DECpc MT line has a built-in local-bus video with 512K bytes of video RAM (upgradable to 1M byte) and Windows acceleration (the motherboards have no local-bus slot), an integrated IDE/floppy drive controller and on-board serial and parallel ports.

The result of all this functionality being built on the motherboard is that all six 16-bit XT/AT bus slots are available. Five drive bays, a monitor, a mouse, MS-DOS 5.0 and Microsoft Corp.'s Windows 3.1 complete the package.

The MT systems are touted by DEC as being "ergonomically designed" and "compact." While the latter is certainly true, I differ with the former. The press release talks of the "bold ideas" in the system, but the minitower case has been available as an option on many "second-tier" PC vendor systems for years, and just how "ergonomic" it is remains up for debate.

The 7- by 17- by 17-in. cases are indeed smaller than traditional tower cases and fit quite well on a desktop. However, you no longer can place the monitor on top of the case, so the amount of desktop real estate used (unless you invest in a monitor stand) is similar to the

DEC series, *page 45*

James Daly

DOS 6.0 under fire

Germ warfare...
Only weeks after its debut, the antivirus features in Microsoft Corp.'s newly released DOS 6.0 are coming under heavy fire. First off, get your hands on *Inside MS-DOS 6* (New Riders Press; $39.95), which puts the operating system's antivirus features through the paces. The result: In a scan of 1,500 viruses, Microsoft's antivirus scanner detected only 1,009 — or about 63%. Of the 1,009 it detected, it could not remove 978. Not good.

Users have also lambasted the scanner for being too slow and having a clumsy interface. To make matters worse, Microsoft promises upgrades via its electronic bulletin board, but it does not promise that they will be free. An angry user said: "DOS 6.0 [virus protection] is insufficient, and Microsoft wants extra money to make it right [through upgrades]. I, for one, cannot take this offering from Microsoft seriously."

Just the fax, ma'am...
It wasn't just luck that led investigators looking into the World Trade Center bombing to discover that the source of the explosion was a Ryder rental van. Through the computer technology of the National Insurance Crime Bureau (NICB) in Palos Hills, Ill., a partial vehicle identification number found in the rubble was recreated. It ultimately led to the identification of the van and the driver.

The NICB offers an insurance-crime fighting, IBM DB2 network that collects and exchanges information on more than 200 million records. The system allows users to interactively search for signs of insurance fraud and vehicle theft data. NICB is in turn hooked to other crime-fighting networks, like the National Law Enforcement Telecommunications System and the FBI's National Crime Information Center. Nice work.

Sticky fingers...
The thing that makes portable computers so beneficial — their easy transportability — also makes them tempting targets for thieves. But if your portable is pilfered, there's still hope. IDX Technologies, Inc. in Setauket, N.Y., has recently released the $49 Computer Owner Protection (COP) for Macintosh, which gives each system a unique identification code and records that code at various locations around the hard drive. After a missing computer is retrieved, police can activate the software, read the code and learn where to return the computer. The company has a similar system for DOS.

Old dog, new trick...
Micah Development Corp. in Cambridge, Mass., has come out with a new security package with an interesting twist. The security program, called Full Armor, is not memory resident, which means it does not slow down system performance or conflict with resident programs.

Switch hitter...
A reader asks, "Are there any viruses that can propagate across platforms?"

Good question, considering the number of mixed platforms out there. So I asked an expert — specifically, David Stang, director of research at the International Computer Security Association in Washington, D.C.

Stang says no, he does not believe any viruses can spread from an IBM to a Macintosh or vice versa. Such a virus would be too big and would probably be easily detected.

Plus, he says, there are no cross assemblers that will write code that will run on two platforms. More importantly, "most people probably only know one computer language really well. To find one who knows several would be rare. To find one who knows both, is not gainfully employed making a huge salary and spends his days making computer viruses would be rare indeed."

Daly is a *Computerworld* West Coast senior correspondent.

As Unilever added new divisions,
As their brands multiplied,
As the growth factor unbalanced
their MIS equation...

IBM's future rests in new technology

CONTINUED FROM PAGE 41

"They need to move forward with Taligent and the PowerPC," said Sally Atkins, a consultant at John Hancock Financial Services in Boston.

Currently, IBM's desktop strategy calls for offering a DOS alternative to Microsoft's DOS product, positioning OS/2 against Microsoft's forthcoming DOS 7.0 system, lining up AIX and a portable version of OS/2 against Windows NT, while also competing against Microsoft in a race to beat that company's Cairo object-oriented system to market.

It is the race to market between Cairo and Taligent, which IBM is developing with Apple Computer, Inc., that may ultimately determine IBM's success.

In general, object-oriented operating systems will provide a much richer, seamless environment where the network, the kernel and the applications are well-integrated, compared with the discrete tools that make up computing environments today.

"Every major vendor is talking about implementing some kind of object technology," said Liz Barnett, vice president of market research at New Science Associates, Inc. in Westport, Conn.

"Object-oriented systems will be one of the key technologies for the next century, and IBM has the internal resources to help people constructively dismantle their 15- to 20-year-old systems as they move to client/server systems that will use object technologies," said Natasha Krol, a vice president at Meta Group, Inc. in Westport, Conn.

Specifically, Krol said, IBM needs to provide the tools to help encapsulate existing applications in objects, while creating new tools that will help companies develop new applications that will re-engineer their business processes.

"IBM has a lot of clout that they should use to help consolidate the various competing technologies in the market. For example, IBM recently did a very good job working behind the scenes to help end the Unix wars," Krol said. And that ability to provide services across multiple technologies may also be the key to competing successfully with Microsoft.

"IBM should stress its open system approach, like its support for DCE, while Microsoft is trying to push their own standards," Atkins said.

Apple beefs up Performa line

Apple Computer, Inc. has expanded the breadth of Macintosh offerings for the home and first-time buyer with the introduction of three new models in its Performa line.

The Performa 405, Performa 430 and Performa 450 will fill out the middle of the line while the Performa 200, Performa 400, Performa 600 and Performa 600 CD will remain unchanged. Apple officials said they expect retailers to charge between $1,299 and $1,799 for the new models.

Apple plans to sell the new additions as a complete one-box solution. Included in the package will be a color monitor, bundled software and at least one integrated application — either Claris Corp.'s ClarisWorks or WordPerfect Corp.'s WordPerfect Works, depending on retail location — that provides word processing, spreadsheet, database, graphics and communications functions.

The Performas will also come bundled with a modem and two on-line services. All three new models use the Motorola, Inc. 68030 microprocessor.

— James Daly

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Roy Linley, Company Systems Development Manager, Elida Gibbs

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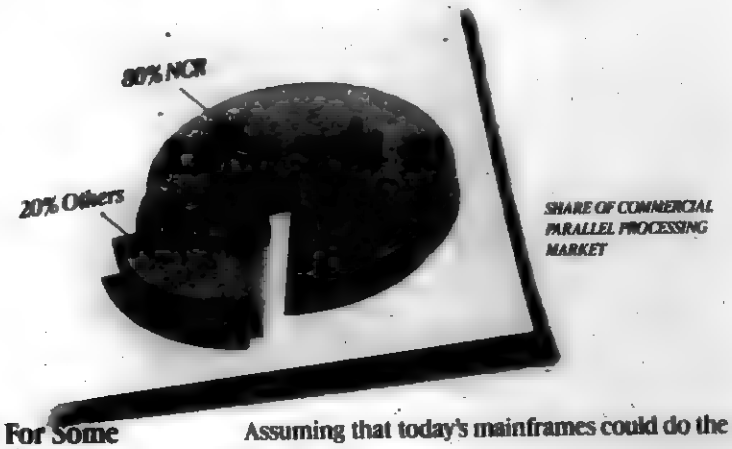

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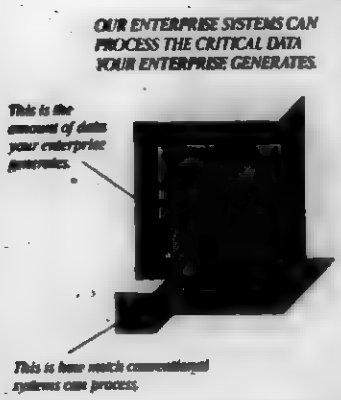

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Spreadsheets

New way to play Excel data

By Michael Fitzgerald
PORTLAND, ORE.

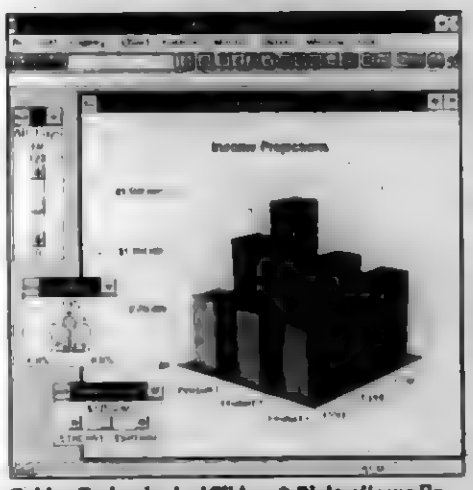
Excel jockeys may have a new way to ride their spreadsheets, thanks to Golden Technologies, Inc., a start-up that recently began shipping its Sliders & Dials add-on for Microsoft Corp.'s Excel for Windows.

Sliders & Dials is an interactive tool designed to give Excel users the ability to immediately see the impact of changing numbers in given cells. For instance, by defining a cell for interest rates, a user could incrementally gauge a variety of payment schedules.

"We're evaluating it because it has the potential for more flexibility and quicker interaction with adjusting variables and doing 'what if' kind of analyses," said Ted Blank, MIS manager at Cellular One Corp.'s Oregon operations here. Blank said Sliders & Dials might give his users "ways to think outside the box and be a little more productive."

However, he added that "it presents a new way of doing things, and finding an immediate application for that kind of product is sometimes a challenge."

Portland-based Golden Technologies' founder and President Beverlea Kramlich said Sliders & Dials was a step toward giving desktop spreadsheet users the kind of interactive visualization tools currently found on high-end Unix systems and mainframes. Initially, Sliders & Dials takes advantage of drafting and drawing capabilities in Excel. In the future, visualization tools will be added. The product retails for $99.95.



Golden Technologies' Sliders & Dials *allows Excel for Windows users to immediately see the impact of changing numbers in cells*

DEC series

CONTINUED FROM PAGE 41

amount taken up by a standard desktop PC. And if you place the MT on the floor, its lower height forces you to reach further to insert disks and turn the system on and off than you would with a standard tower.

As for other "ergonomic" considerations, the MTs come with low-radiation Super VGA monitors, a plus in these electromagnetic frequency-conscious times. The mouse is a copy of the pre-Mouseman Logitech, Inc. three-button mouse and uses Logitech drivers. The 101-key keyboard appears to be high quality with a firm key action that I found quite usable. However, none of these features makes the MTs radical standouts in the ergonomic PC market.

That is not to say that the MTs should not be considered for power-user desktops or even low-end server operations. The test machine felt consistently snappy, and the speed of the local-bus accelerated video was apparent. One other convenient feature was the MTs' use of a key-locked sliding panel on each side of the case, which allowed easy access to all components, slots and drive bays. This arrangement is superior to many desktop systems that require the entire housing to be removed.

One caveat: This feature caused my most serious problem with the system. The panel on the side that allows access to the motherboard was jammed on arrival, and it took several minutes of judicious prying, prodding and tapping before I could remove it. I was not able to determine the exact cause of the jam, but several of the spring clips that help guide the panel into place had come unattached and were dangling when I first opened the system.

In all, however, the MT systems are well-built, price-competitive PCs that are certainly worth consideration for high-end desktops. But if you're looking for anything even remotely radical in the way of ergonomics, you'll have to look elsewhere.

The MT series of PCs ranges in price from $2,349 for a 486DX 33-MHz model to $2,799 for a 486DX2 66-MHz model.

Multimedia databases

Network makes movie debut

Everlink on-line multimedia database eases preproduction headaches

By Matthew Mandell

Computers are invading a new aspect of filmmaking. Long before the cameras roll, countless hours are spent location hunting, budgeting and casting during the purgatory known as preproduction. But no longer must this be the bane of a producer's existence.

Enter Everlink, the newest of two on-line multimedia database networks designed for the entertainment industry. Using Informix Software, Inc.'s Informix relational database system in combination with the Natural language user interface, "anyone with a Mac or PC-compatible can access our system," said Howard Gollomp, chief executive officer and co-founder New York-based Everlink.

> "Everlink's potential is tremendous. They just have to get more people signed up . . ."
>
> —*Jack Freedman, producer*

Conceived four years ago by Gollomp and partner John Kelly, a former *Saturday Night Live* producer, Everlink came on-line in October, and it has been making a stir in the industry. Companies such as Ron Howard's Imagine, Francis Ford Coppola's American Zoetrope and Rob Reiner's Castle Rock have all beta tested the system.

Smaller production companies and independents are also being targeted.

"We studied many architectures and systems," Kelly said, "and decided on Unix for its openness." Set up on a Sequent Computer Systems, Inc. S2000/200 with 128M bytes of random-access memory, 5.6G bytes of mass memory and four Intel Corp. 1486 multiprocessing CPUs running in parallel, Everlink is poised for the future. Using Infonet, anyone who has paid a onetime $199 fee can make a local call and access the database for $1 a minute.

"Our only problem," Gollomp said, "is the 'chicken or the egg' syndrome. People don't want to sign up until more people are on-line. As more professionals sign up, the database will become more robust and useful," with members being able to list their credits and abilities on the system for a small fee.

Peter Giuliano, first assistant director for such movies as *Avalon* and *Bugsy*, used Everlink extensively for Barry Levinson's *Toys*. "Everlink is a powerful tool, and once the phone company puts in optical lines, Everlink's ability to transmit better and quicker graphical information will be a plus. Being on-line and not having to wait for a fax back on information requested is quick, private and convenient," Giuliano said.

"Everlink's potential is tremendous. They just have to get more people signed up and the data entered," said Jack Freedman, producer of *Body Parts*, *Toy Soldiers* and *Mother's Boys*. "I have 12 different directories [cinematographers, production managers, art directors, etc.] on my shelf, which are essentially out of date when I get them. Everlink will keep the data up-to-date (including resumes, which the directories don't include."

Rapid search

There are 145,000 commercial productions — film, television, industrial — researched worldwide every year, according to Everlink founder Howard Gollomp. For $1 per minute and using the Natural language interface, a producer can search for specific information such as the name of a blond actress who speaks French or a sound stage's schematic in Arizona.

"Everlink seems to save so much lost time in tracking down people such as cinematographers by just giving you their phone numbers," said Clarisse Perritte at Sharona Productions, an independent production firm in San Francisco.

As the newcomer, Everlink has been aiming at Baseline, which went on-line five years ago. Baseline, according to Vice President Linda Brown, has "2,000 users."

Asked if she sees Everlink as a threat, she said, "It all comes down to data, not retrieval. We have archival information, periodicals and current credit information that Everlink does not. They are more into services than we are. Anyway, with their arrival we are getting an increase in media attention. I don't see a problem."

Giuliano added, "The two systems do not do the same thing. Baseline will give you grosses on productions and credits that Everlink doesn't, but that's not the information I need for an upcoming production, such as union information."

Everlink expects to have a graphical user interface ready within a few months. Once it is in place, users will be able to select a parameter for a list of actors, receive their photos on screen, get their biographies and statistics and even manipulate their hair color if desired.

Films and commercials are just the beginning for Everlink. "We intend to extend the service to legitimate theater and even the music industry. Anyone who needs to set up a production or just wants to investigate the industry will be able to use our service," Gollomp said.

Mandell is a New York-based writer/filmmaker.

Utilities

Claris Corp. has started shipping the FileMaker Pro Translator, a utility.

According to the company, the product enables users of Symantec Corp.'s DOS-based Q&A 4.0 database program to transfer their database to FileMaker Pro 2.0 for Windows.

Replicating the Q&A 4.0 fields, forms and data, FileMaker Pro Translator places them into the files of FileMaker Pro 2.0 for Windows.

The newly created Windows files offer Windows capabilities and are identical to the original Q&A files.

Details of the conversion are documented on a log that the FileMaker Pro Translator composes.

The trade-up and/or retail price for the product is $99.

▶ *Claris*
5201 Patrick Henry Drive
Santa Clara, Calif. 95052
(408) 987-7000

Peripherals

Advanced Retail Technologies, Inc. has introduced the Direct Order Terminal System.

The product consists of an integrated and customized system that includes software and product catalogs. It was designed for the specific needs of each sales organization, the company reported.

Users can scan orders into the system and, with a built-in modem, can transmit the order back to the host. An integrated printer provides a hard-copy record of the order, and the system has a real-time ability to calculate sales demographics and inventory levels.

Prices start at less than $500.

▶ *Advanced Retail Technologies*
540 Madison Ave.
New York, N.Y. 10022
(212) 888-5590

Adobe Systems, Inc. has announced that Apple Computer, Inc. has incorporated Adobe's PostScript software into the Apple LaserWriter Select series of 300 dot/in. midrange laser printers.

LaserWriter Select 300 has a base configuration with 512K bytes of random-access memory expandable to 4.5M bytes.

It was designed for users with machines that can be upgraded to Adobe's PostScript software, according to the company.

LaserWriter Select 300 has a base price of $819, with the PostScript software option costing $349.

▶ *Adobe Systems*
1585 Charleston Road
Mountain View, Calif. 94039
(415) 961-4400

Product shorts

DataEase International, Inc. is shipping Version 1.1 of DataEase Express for Windows, which features improved access to SQL engines and interoperability with DataEase 4.53 for DOS. Cost: $395. DataEase, Trumbull, Conn., (203) 374-8000.... **Iris Graphics, Inc.** has released SmartJet Tools, a set of two printing utilities that provide direct output to an Iris SmartJet printer from an Apple Computer, Inc. Macintosh. Cost: $500. Iris Graphics, Bedford, Mass., (617) 275-8777.

Modular Software Systems has introduced Bootcon 2.0, a boot-time configuration utility designed to be easier to use than its predecessor. Cost: $79. Modular Software Systems, Kent, Wash., (206) 631-5781.... **XTree Co.** has introduced Version 1.5 of XTree for Windows, a file and disk management utility providing the XTree Command Center shell as a replacement or enhancement for the Microsoft Corp. Windows Program Manager. Cost: $99. XTree, San Luis Obispo, Calif., (805) 541-0604.

Horizons Technology, Inc. has announced that additional city map data sets, covering more than 20 metropolitan areas, are available for use with SureMaps, the company's desktop map software. Cost: $49. Horizons Technology, San Diego, Calif., (619) 292-8331.... **Golden Technologies, Inc.** has introduced Sliders & Dials, a spreadsheet subapplication for Microsoft's Excel for Windows. The product is said to simplify and streamline data manipulation in linked charts and worksheets. Cost: $99.95. Golden Technologies, Lake Oswego, Ore., (503) 620-2201.

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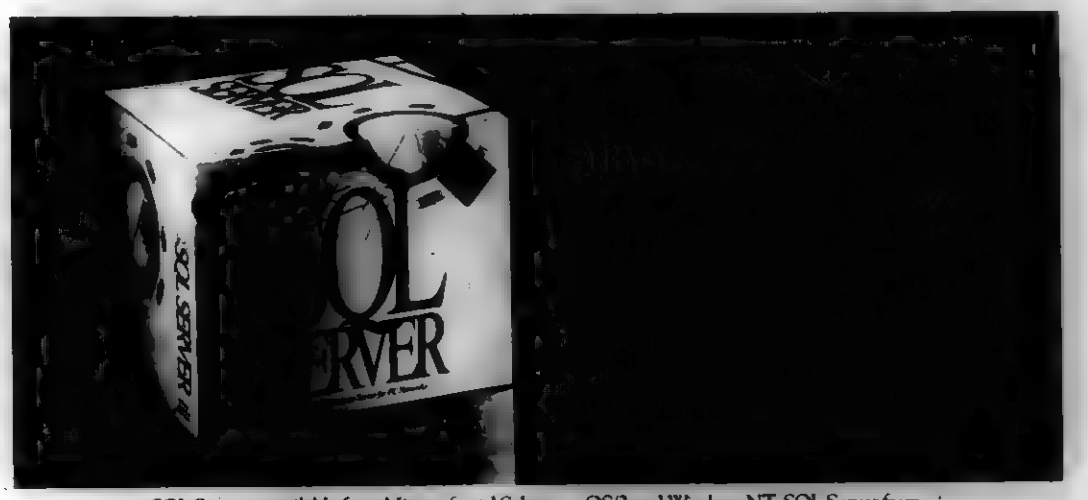

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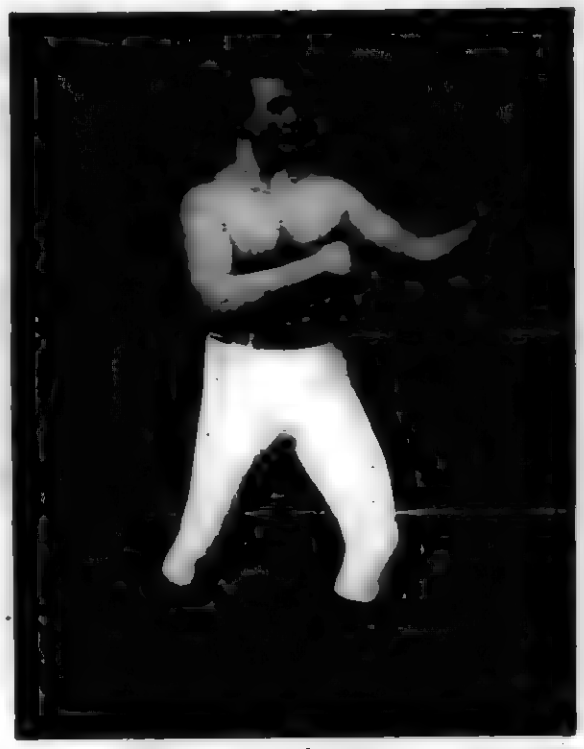

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Tricord server seeks IS role

ES5000 may fit the bill for some, but it faces tough sell into corporate mind-set

By Kim S. Nash
PLYMOUTH, MINN.

■ Tricord Systems, Inc.'s big, expensive new superserver — the PowerFrame ES5000 — is not for everyone. The multiprocessing machine sports up to six CPUs, offers greater networking features and the ability to support hundreds of users, all of which equip the box for enterprise-level computing, observers said.

But the PowerFrame ES5000 is pricey, and, like superserver brethren such as NetFrame Systems, Inc., Tricord faces an uphill climb into the corporate lap, analysts said.

"IS people are reluctant to bring in another vendor, especially a small one like Tricord," said Walter Johnson, senior analyst at New Science Associates, Inc. in Palo Alto, Calif. "They have to prove they have something different from the PC vendors who are trying to grow up into the server world."

The PowerFrame ES5000 is intended to answer the corporate call for mainframe alternatives with improved scalability and security, said Mark Garver, vice president of corporate strategy at Tricord. The machine, which ranges in price from $78,200 to $918,600, offers the following features:

- Up to six CPUs.
- 1G byte of memory.
- 290G bytes of storage.
- Support for The Santa Cruz Operation's SCO Unix; Novell, Inc.'s NetWare and LAN Manager; Banyan Systems, Inc.'s Vines; and Univel, Inc.'s UnixWare.

The range of operating system support is key to Chicago & North Western Transportation Co. (C&NW), a national freight railroad based in Chicago. C&NW already had about 12 Tricord servers in place before it tested a couple of PowerFrame ES5000s. Several existing PowerFrame Model 40s run IBM's OS/2 Version 1.3 and Microsoft Corp.'s SQL Server, an atypical combination that presents "interesting challenges," said Jeff Johnson, network administrator.

The company first installed Tricord systems in November 1990, when it downsized freight billing and accounts receivable applications from an IBM 3090 mainframe to a group of Tricord Model 40s. Although the superservers still access 3090-housed data, the mainframe is now in the background of C&NW's data center, according to Johnson.

At migration time, the company weighed Tricord against Compaq Computer Corp.'s SystemPro servers, Johnson said. Tricord could accommodate C&NW's more than 17G bytes of data — 36 months of customer history, combined with $3 million worth of bill processing per day, he explained. "And back then, Compaq wasn't giving us any information about enhancement plans." But, he added, Compaq boxes were not passed over completely. Several SystemPros act as servers for small NetWare local-area networks.

Now, plans to upgrade the Model 40s to a bigger ES5000 stem from an ever-growing user base on C&NW's mission-critical freight application. Plus, the firm wants to go to NetWare 4.0 from NetWare v3.11 and upgrade to OS/2 2.0. "You cannot — just cannot — do all that with simple PCs," Johnson said.

Industrial Towel and Uniform, Inc. agreed but claimed that a big, expensive enterprise-level server is not necessarily needed. The New Berlin, Wis.-based firm has opted to expand a Tricord-based network using more efficient storage techniques rather than spend "a lot more money on new boxes," said Steve Knauf, chief information officer.

Knauf said he plans to upgrade from a 33-MHz to a 66-MHz system but will get the bulk of a processing boost from a redundant arrays of inexpensive disks (RAID) device.

Tricord, *page 50*

Tricord tidbits

While the ES5000 server ranges in price from $78,200 to $918,600, beta-test users spent an average of $98,700 for each test system.

Tricord recently filed for an initial public offering (IPO) of 3 million shares priced between $10 and $12. NetFrame and Pansino Computer, Inc. also recently filed for IPOs.

Visualization system aids brain surgery

By Maryfran Johnson
STANFORD, CALIF.

Brain surgery never looked so easy — to the average layman, that is.

But what Dr. John Adler set out to do with the Neurosurgical Operating Arm System — a workstation-based visualization tool — was to enable his fellow neurosurgeons to peer deep into the brains of their patients during surgery.

"The whole thrust of this is to take medical imaging directly into the operating room and do surgery more efficiently and safely," said Adler, an assistant professor at the neurosurgery department of Stanford University Medical Center. It is the first such system to put interactive image processing into a surgeon's hands while he is operating on a patient.

The system is based on a Silicon Graphics, Inc. Unix workstation, Stanford's own customized graphics software and a specially constructed operating "arm" designed by another neurosurgeon and Radionics, Inc. in Burlington, Mass. The data loaded into system memory comes from CT, or CAT, scans of the patient's skull, allowing the surgeon to call up three-dimensional "slices," or views of the brain's interior, on the workstation screen.

"The surgeon can basically ask the computer 'Where am I now?' That enables us to work through a smaller opening [in the skull] and do more radical and complete removal of tumors," Adler explained.

The system will be one of the featured topics this month at a meeting of the American Association of Neurologic Surgeons in Boston.

This leading-edge surgical aid is still in the prototype stage, awaiting approval by the U.S. Food and Drug Administration. So far, it has been used in more than 60 operations at Stanford and the George Washington University Medical Center. When it is eventually offered for commercial sale by RSA, Inc. in Brookline, Mass., it will be priced in the $150,000 range.

"This is a tool designed by surgeons for surgeons," Adler emphasized. "We've been real sticklers about making this as moronically simple to use as possible."

The traditional approach to brain surgery involves the doctor's examining X-rays and CT scans of the patient's head, which during the operation is secured in a large metal frame that screws into the skull. Once an operation is under way, the surgeon must work around the cumbersome mechanical frame, relying on his mind's eye view of the tumor's exact location.

By employing the graphical and processing power of the workstation, the operating arm system "essentially takes the spatial guesswork out of neurosurgery," Adler noted. "The beauty of this is that it also does away with the mechanical frame."

By using the system during an operation, the surgeon can call up interior 3-D images of the patient's brain by touching the probe end of the operating arm to certain places on the patient's head. Then, by pressing a foot pedal attached to the system, the doctor can navigate through the menu, examining other images as needed.

Each 3-D image eats up about one-half a megabyte of data, which must appear on-screen instantly.

"One of the technical challenges in developing this system was rendering up to 30M bytes of data in a heartbeat," said Paul Hemler, a research associate at Stanford who helped develop the software. "It took us about nine months to develop fast rendering techniques."

Using standard "brute force" rendering would require up to 30 seconds to process 20M to 30M bytes of data, Hemler explained. To streamline that process, the Stanford team wrote an algorithm that figures out exactly which voxels (3-D versions of pixels or picture elements) will be displayed in the surgical views.

Another challenge still facing the researchers is figuring out how to use magnetic resonance imaging (MRI) data in the operating arm system. "MRI images make pretty pictures, but they're not geometrically corrected, so they don't translate well into real space," Hemler said. "We're trying to understand the causes of the distortion now and correct for them, but it's a hard problem."

System *allows surgeons to view 3-D images of the brain's interior during an operation*

Brain tools

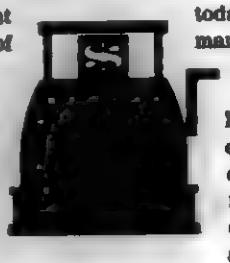
"Computers haven't really been very helpful to doctors yet, in actually doing their jobs," said Dr. John Adler, a neurosurgeon at Stanford University Medical Center. "Anyone can make a complex tool that no one wants to use. But we're trying to do this with no engineers in sight."

Retail

Windows, LANs meet up

By Elizabeth Heichler
COLOGNE, GERMANY

When Germany's second-largest retail firm first envisioned an in-house network that would link everyone in the company and put information at their fingertips, it embarked on a path that seven years later has resulted in a customized desktop environment that pushes the frontiers of technical innovation.



Kaufhof Holding AG operates 249 large department stores throughout Germany, with 42,000 employees and annual sales of more than $11 billion. Its current information systems infrastructure, largely the brainchild of chief information officer Ralf-Rainer West, is the result of early implementation of what have become today's key technical trends, including downsizing to client/server systems using Intel Corp. microprocessor-based hardware, high-speed local-area networks and a Microsoft Corp. Windows-based graphical user interface.

In the process, West has groomed a mainframe-oriented IS staff with the help of Microsoft Consulting Services Germany, a team of crack programmers skilled in graphical interface and client/server design.

That Windows-based desktop, extensively customized for 3,000 users on the network, is the keystone of Kaufhof's IS philosophy.

"We want to make everything available to people — and understandable. That's why we chose the Windows graphical environment and created our own applications," West said. He added that the most important nontechnical issue was how to motivate users to take advantage of the tools at their fingertips.

Kaufhof built its own desktop manager on Windows because West said that even today, no commercial desktop managers are really comfortable for end users.

When users sign on, the Kaufhof network shows in color a nearly full-screen, three-dimensional picture of an office with a man sitting at a desk fitted with items such as a printer, calculator, pen and paper, filing cabinets and telephone. Clicking on these pictures launches applications such as word processing and electronic mail.

A whiteboard image is used to launch a variety of corporate and external information services. For example, users can open a window showing pages of video-text with continuously updated news or weather reports, or they can access the German on-line service BTX for air and train schedules.

The possibilities for bringing information to users via the desktop are almost endless, according to West. For example, the company's internal magazine is now available via the network and is no longer limited to a given number of pages or any particular frequency — whenever the group responsible for the magazine is ready with another page or piece of information, it notifies users via a flag on their mailbox.

In the future, West's focus will be on multimedia. For example, he is exploring the use of video for distributing information. "If I have a memo that's 20 pages long, no one will read it. But if we make a five-minute video spot and put it up on the server, people will watch it," he said.

One innovative function that will soon be brought on-line is Windows-based telephony. Kaufhof's goal here is to control its telephone system from the Windows desktop. Just as users can click on calculator icons, they will soon be able to click on a telephone icon to place calls.

The benefits are increased productivity, West said. "We have found out that 15% of a day is wasted trying to get hold of people on the phone." A dedicated telephony server will connect Kaufhof's Novell, Inc. LAN gateway to its Siemens Hicom Integrated Services Digital Network private-branch exchange.

Two important client/server database applications that are helping purchasing executives with analysis and decision-making can be reached via the desktop by clicking on a wall chart pictured in the desktop "office." Both query applications were written in Microsoft's Visual Basic, use SQL databases ranging from 2G to 6G bytes and contain information that is regularly downloaded from IBM DB2 on the company's IBM mainframe.

West credits Microsoft Consulting Services with being a "mother" to Kaufhof's Visual Basic projects. Now, he said, his programmers — roughly 100 of the 380 IS staff members — are so advanced in using Visual Basic that there is little Microsoft can teach them.

Heichler is IDG News Service's European correspondent.

Tricord server

CONTINUED FROM PAGE 49

Tricord promises 40% faster access to data with its RAID system, which Knauf said will let him add 12 more users to the network with no degradation in processing time.

In general, superservers are becoming more attractive as their networking features grow, users and analysts said. For example, improvements in switching and hub technology helped make possible a $3.1 million mainframe downsizing project at American General Life Insurance. The Syracuse, N.Y.-based firm has been testing two ES5000s since last November. The firm moved 13 million 100-byte records off an IBM 3090 mainframe and System/36 minicomputer to a client/server setup of two ES5000s, one older PowerFrame Model 30 and about 150 PCs from Dell Computer Corp.

American General weighed "several" server alternatives, but "with that kind of volume, PowerFrame was clearly it for us," said Gerald Osborne, vice president of administration.

Osborne declined to specify which other vendors he evaluated. He added, however, that the project would not have been a success if Ethernet switches and hubs had not improved in recent years to be able to direct and keep moving the intensive I/O requests the server put forth — no matter which brand of server was implemented.

American General expects to save $14.3 million during the next decade by cutting the costs of maintaining proprietary mainframe software and reducing IS staff. "The combined power of servers and networking equipment is the future here," Osborne said.

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Versant claims easy-to-use OBDMS

By Melinda-Carol Ballou

Versant Object Technology Corp. shipped a new version of the company's Versant Object Database Management System (ODBMS) earlier this month with support for large databases, new administration utilities and other facilities.

These features were designed to make the database easier to tune and maintain while extending its object-oriented capabilities, company officials said.

To ease administration of the database, ODBMS Version 2.0 offers a set of graphical utilities, an automatic self-tuning system and full on-line Help.

One of the most significant features to the release is the graphical administration tools, according to Versant.

"A big impediment to using object databases is administration — people don't want to move to an object database if it means increased headaches in terms of maintenance. They want the same easy-to-use tools that RDBMSs have, and up until now, they haven't had those," said Matt Miller, Versant's director of corporate marketing.

An object archival system gives support for very large databases that was previously not available. With this system, data that is not frequently accessed can be stored on tape, optical disc or other media and archived off-line.

When an application seeks to access the archived data, a message is generated to enable users to mount the appropriate device. This allows off-line data to be maintained without consuming more expensive on-line resources, officials said.

Users upbeat

Users spoke positively about the advantages of larger database support and easier administration via the new tools.

Mark Woyna, section manager at Argonne National Laboratories in Argonne, Ill., has one application that involves the use of large image objects of approximately 170M bytes each. He currently has about half a gigabyte of this data — or three of these images — but said he expects to eventually have 50 images or more.

"The ability to scale up in an unlimited way [in terms of archiving data off-line] is very important to us," Woyna said. "We have several other projects looming in the horizon with initial sets of 10G bytes scalable up to 10T bytes of data or more."

He added that "ODBMS is DBA-intensive, and the graphical tools will help us to manage things."

Version 2.0 of ODBMS also supports nested transactions, superclass schema evolution, new tutorials, a serial number generator and better performance.

"We need nested transactions to be able to reuse code as subcomponents of larger transactions," Woyna said.

Versant Release 2.0 is available now on platforms from Sun Microsystems, Inc. and will ship on IBM's RISC System/6000 and Hewlett-Packard Co.'s 700 series during the second quarter. Prices start at $7,500 for development versions of the database.

At a glance

Relational database management system users are beginning to experience problems managing complex data such as images, long text and strings of data, said analyst Richard Finkelstein. However, the hassles of converting to object-oriented databases are likely to deter most companies from making the switch for several years, he added, because many only recently made the leap to relational databases; also, there are no defined standards for accessing and storing data across object-oriented environments. Graphical tools such as Versant's are a necessary preliminary, he said.

Briefs

CD-ROM transfers

Meridian Data and Eastman Kodak Co. will market Netscribe 1000, a system that lets users transfer data into ISO9660 CD-ROMs over a network. The partners said the system, which operates on Novell, Inc.'s NetWare and peer-to-peer networks, reduces the cost of a recordable CD system to less than $600 per user in a 25-user network. The system is made up of the graphical user interface-based Netscribe Access software and the Kodak PCD Writer 200 peripheral.

Price cuts

Frame Technology Corp. has unveiled a promotional price reduction on FrameMaker for Sun Microsystems, Inc. and Hewlett-Packard Co. workstations. Under the promotion, the products can be purchased for $595, less than half the original $1,495 retail price. The offer will continue until June 30.

Locus layers

Locus Computing Corp. is demonstrating its Transparent Network Computing (TNC) layered software technology for massively parallel and clustered systems. Locus, a supplier of distributed computing services, claims TNC is the first portable single-system image software technology in the open systems market.

Tatung touts color

Tatung Science & Technology, Inc. is hawking its Unix-based color workstations in a special promotion that ends May 31 and offers discounts of up to $2,800 on its Super COMPutation 7/30 series. Based on the SuperSPARC microprocessor developed by Sun and manufactured by Texas Instruments, Inc., the Tatung Scalable Processor Architecture system comes with a 19-in. color monitor, 520M-byte hard drive, 32M bytes of random-access memory and an on-board GX graphics accelerator for $13,490.

APC unveils power supply

American Power Conversion Corp. (APC) has announced an uninterruptible power supply (UPS) for midrange systems and multiple local-area network servers whose modular design can be configured to support a variety of installations and backup needs, the company said.

Called Matrix, the product consists of different functional units, such as battery backup and a DC-to-AC inverter, in separate modules. This enables users to add redundancy incrementally and to pinpoint incipient component failures more easily, APC said.

Both battery backup and inverter units provide notification of incipient failures both on the front of each unit and as an alert sent to a Simple Network Management Protocol management system, APC said.

The modular design also enables the user to swap out the defective "block" without having to bring the whole system down, an APC spokesman said.

The block can then be sent to the vendor via overnight courier, fixed and returned without any downtime, he added.

When the inverter fails, cutting off normal power from a utility, Matrix is said to automatically switch over to the backup battery.

A new inverter unit can be hot-swapped by the user in five seconds so there is no interruption in power, the APC spokesman said. Typically, the UPS unit must be shipped to the vendor for repairs, which can take about a week, he added.

Matrix can support up to 99 battery units, so the unit can run up to two days without power, APC said.

The unit can also be programmed to manage file server shutdowns during a power outage so that, for example, a key application such as electronic mail is saved before the system goes down, the spokesman said.

Matrix is expected to ship in the second quarter.

The 3,000 VA version is priced at $3,499; the 5,000 VA version is $5,199.

▶ *American Power*
132 Fairgrounds Road
West Kingston, R.I. 02892
(401) 789-5735

Applications

EcoSystems Software, Inc. has started shipping Version 1.1 of EcoTools, client/server systems management software.

According to the company, EcoTools is the first product to allow users to monitor and manage all of their computing resources from a centralized, graphically based management console.

EcoTools has an assortment of features including console management, security management and job/process monitoring.

Users can perform automated operations, configuration management, capacity planning, management reporting and fault and performance management.

Oracle Corp.'s Oracle Version 6, Oracle 7 and Oracle Applications and Network File System monitoring management support is also provided.

Prices start at $16,000.

▶ *EcoSystems Software*
Suite 201
10055 Miller Ave.
Cupertino, Calif. 95014
(408) 252-3801

Epoch Systems, Inc. has announced that its EpochBackup software is now available on SunSoft, Inc.'s Solaris 2.0 and 2.1 operating systems.

According to the company, EpochBackup is the first product to bring mainframe-class automated backup capabilities to Unix network environments.

Files that are located on heterogeneous Unix workstations and servers are backed up and restored automatically to a designated server.

Sun client licenses start at $90 per client.

▶ *Epoch Systems*
8 Technology Drive
Westboro, Mass. 01581
(508) 836-4300

Storage

Alphatronix, Inc. has introduced the 10G-byte and 20G-byte Inspire II jukeboxes.

The products were designed for Unix platforms and for users whose future needs include a migration path to larger jukebox storage.

According to the company, the 10G-byte jukebox has a footprint of less than 2 sq ft and offers the benefits of robotic jukebox retrieval.

The jukeboxes include the Inspire high-speed optical drives that have digital servos for maximum speeds and an ultralightweight split head design.

Alphaguard, a data integrity feature that double-clicks each data bit every time it is written to or read from the disk, is also included.

The jukeboxes are available for the IBM RISC System/6000 and Sun Microsystems, Inc., Digital Equipment Corp. and Apple Computer, Inc. systems.

Prices begin at $14,900.

▶ *Alphatronix*
Suite 315
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Durham, N.C. 27713
(919) 544-0001

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LOTUS cc:MAIL

Awards (1992-1993)

ComputerWorld I/S Brand Preference
Winner, February 1992

•

Windows Magazine WinAward, February 1992

•

LAN Times Reader's Choice, March 1992,
January 1993

•

InfoWorld Product of the Year, March 1992

•

BYTE Magazine Reader's Choice, June 1992

•

BYTE Magazine Award for
Cross-platform E-Mail, March 1993

•

Network Computing's Certified Interoperable
Application Award, December 1992

•

Network World's Enterprise
Technology Award, December 1992

•

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

•

MacUser Editors' Choice Award, 1992

•

MacWEEK 1992 Editors' Choice
Diamond Award, December 1992

•

UNIX World's Best Product of the Year for
1992, January 1993

MICROSOFT MAIL

Awards (1992-1993)

PC Magazine Editor's Choice Award
October 27, 1992

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Lotus cc:Mail

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Enterprise Networking

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SPREAD SPECTRUM, 58

Elisabeth Horwitt

Is cooperation at hand?

Some of us have grown cynical about vendor-driven standards efforts since those wide-eyed days when OSI was going to be the single, ultimate networking standard.

We've seen the battle of the proprietary networking protocols segue into the War of Openness, where everyone was supporting several standards, and no two vendors' implementations could talk to each other.

What's going on now is different. Potentially, it's exactly what users have been waiting for.

In the old era, standards bodies such as the ISO could never seem to work through the bu-

Horwitt, *page 56*

Reservation systems

Sabre wireless applauded

By Lynda Radosevich

A number of travel agency information managers said they are enthusiastic about American Airlines' recent announcement of a wireless local-area network option for its massive Sabre Travel Information Network reservation system.

However, some expressed concerns ranging from uncertainty about wireless LAN technology's maturity to questions about American Airlines' priorities for the Sabre network.

The wireless choice will let Sabre subscribers use its reservation equipment in hard-to-cable places such as temporary sites and trade show demonstrations, Sabre said.

Wanting wireless

That is a capability that Dick LePave, vice president and chief information officer at Thomas Cook Travel's corporate headquarters in Cambridge, Mass., said would be ideal for use in trade shows — once wireless technology is proven to be reliable.

"In a trade show, you have critical need to have performance. Telling people that the system is down doesn't work when you are trying to sell to someone," LePave said. "I don't have a burning need right now, but we are interested in the technology," he added.

For a onetime charge of $250 per card, Sabre will install and lease to customers NCR Corp.'s WaveLan wireless network adapter cards. The wireless network requires one card for a server station and one card for each end node, and it can transmit as far as 400 feet in an open space using spread-spectrum wireless technology.

NCR's list price for the same equipment starts at $799 per card.

"The pricing is reasonable and it certainly would cut down cabling costs when moving CRTs from one place to another," said Christine Sikes, director of MIS/accounting at McGregor Travel, Inc. in Stamford, Conn. "We have many locations across the states, and it would fit beautifully at our smaller sites where the transmission speeds would be sufficient."

Some users raised concerns about the increased possibility of interference and data transfer rates that are much

Sabre, *page 58*

It pays to dial up router savings

By Joanie M. Wexler
SAN FRANCISCO

When Fritz Cos. got into the business last fall of tracking shipments for companies purchasing goods from around the world, the $142 million service provider moved off a modem-based backup communications network to one constructed of dial-up routers.

The goal was simple: to save serious chunks of change on the company's global phone bill, said Richard Stern, manager of enterprise networking. The savings were to come largely from equipment that maintains dial network connections — which automatically kick in when a leg of the firm's worldwide leased-line network fails — only while traffic is being transmitted, he said.

Fritz is hitting its savings mark to the tune of up to a 70% monthly drop in network usage charges. Prior to the new network, Fritz was spending about $36,000 in overall monthly network fees.

The savings is due in part to Cisco Systems, Inc.'s latest software release for its routers, Stern said. Version 9.0, delivered last fall, has a cash-conserving "dial-on-demand" feature that minimizes network connection time. Fritz, which did not previously operate a router network, chose Cisco because "it was the only router vendor with this feature," Stern said.

Fritz's primary line of business is in import/export customs brokerage: Companies shipping goods across country borders "outsource" the complicated administrative task of getting items cleared by customs to a company such as Fritz.

Fritz expanded its business in November to include logistics services for companies such as retail stores purchasing goods from overseas, which need just-in-time information to plan inventory loads, pricing and sales events, Stern said.

Follow-through

To that end, Fritz established a dedicated or dial-up communications link with its customers, which forward Fritz a copy of all their purchase orders electronically. Fritz then appoints a representative in the manufacturer's (seller's) region to take charge of a customer's purchase order and stay on top of information such as its whereabouts, how much of it is in stock and whether the order was subcontracted to another manufacturer.

"Previously, companies just ordered items like clothing, and they showed up whenever they showed up," Stern said.

ON SITE

Fritz Cos.
San Francisco

Business goal: To save money on the global tracking service provider's telecommunications bill, an endeavor with big-dollar potential because the firm's business hinges on network-based service.

Technology: Cisco CGS and 4000 dial-up routers, Hewlett-Packard HP 9000 workstations, Oracle interactive databases.

Results: As much as a 70% monthly decrease in phone bill; network response time improved two- to threefold; equipment savings in modems and router ports.

The account representative keeps this data active in the Fritz internetwork of service sites, which consists of Hewlett-Packard Co. HP 9000 workstations running Oracle Corp. interactive databases and Cisco dial-up routers. Customers, whether at the office or on the road with a laptop, can log onto the Fritz network and find out the status of their shipments.

To sustain the business, Fritz needs "reliable communications over sometimes unfriendly communications environments. That primary line will go down. You can't control a guy on a back hoe [breaking a cable] in Texas," Stern acknowledged.

With Cisco's Release 9.0, the routers not only automatically switch traffic from a leased-line network to a dial-up connection, but they also disconnect when no traffic is flowing and establish a new connection only when traffic arrives. Previously, Cisco (and other dial-up routers) established and maintained a single connection until the leased-line link was re-established.

In that scenario, users paid for the connection whether or not any data was being transmitted, much as an individual would ring up a big phone bill if the parties at both ends of a toll call fell asleep for several hours and did no talking.

Meanwhile, Fritz, which previously used 9.6K bit/sec. modems and the communications capabilities embedded in the HP 9000 Unix-based workstation, discovered that response time "is at least two to three times faster," Stern said. He explained that this is because "the communications capabilities in Unix couldn't keep up with the modem."

The payoff

Stern said he expects a 19-month payback on his "six-figure" investment in approximately 20 Cisco CGS and Cisco 4000s, a population of devices he expects to continue growing.

At high traffic hub sites, the company is running a half-dozen Cisco AGS+ routers. Stern decided against the high-end Cisco 7000 "because it doesn't yet offer much in terms of serial connectivity."

In addition, Fritz has discovered equipment savings in modems and expensive central router ports. Phone numbers are now stored in the Version 9.0 software, no longer in the modems.

This means the firm no longer has to dedicate a router port and modem for each site it is communicating with because the modems can dial any number.

"Now, instead of having 10 modems and 10 slots in a main router to talk to 10 sites, I can just use a couple to cover, say, two simultaneous line outages," Stern explained.

NetWare shortcomings addressed

By Michele Doster

If you want to play with the big boys in corporate computing, you have to play by their rules. Novell, Inc. appears to be taking that maxim to heart; in sessions at its recent Brainshare developers' conference, Novell engineers described development efforts aimed at improving NetWare 4.0's wide-area, local-area network-to-mainframe and messaging efficiency.

NetWare users have long complained that IPX/SPX, Novell's proprietary networking protocol, performs poorly in wide-area networks. While NetWare server software includes a Transmission Control Protocol/Internet Protocol (TCP/IP) stack, it cannot be used to access the NetWare core protocols that are the guts of NetWare without first being tunneled through IPX/SPX.

Managers who use TCP/IP to access remote minicomputers and Unix hosts must load both TCP/IP and IPX/SPX protocol stacks on their client PCs and support both protocols on their cable.

"It would simplify my life considerably if Novell would accept TCP/IP on a par with IPX/SPX, so we only had to run one protocol," said Ron Boeving, assistant vice president of information systems at HealthCare Compare, a Downers Grove, Ill., health management company that runs both protocol stacks on its PCs.

WIDE area network

At a Brainshare session, Novell engineers gave details on the company's long-awaited NetWare/IP product, a set of NetWare Loadable Modules (NLM) and a TCP/IP stack that will give TCP/IP equal access with IPX/SPX to NetWare core protocols, thus eliminating the multiple-protocol headache.

The NLMs will provide TCP/IP host and routing information to the NetWare server and provide a central repository of TCP/IP network information that will compensate for TCP/IP's inability to broadcast that information. Novell has not set a date for the product's announcement.

Robert Davis, Novell's vice president in charge of Unix connectivity, stressed that Novell is not planning to phase out IPX/SPX. "We expect customers will continue to use IPX/SPX for their local traffic; NetWare/IP will just make their wide-area connections easier," he said.

On the mainframe connectivity front, Novell executives promised that its NetWare for SAA product would be revised and re-released to take advantage of NetWare 4.0's directory services. Other promised additions to NetWare for SAA include logical unit to logical unit support, integration with IBM's LAN Network Manager and 1,000-user support. Novell also plans to revise its NetWare Asynchronous Communications Services product to support the NetWare 4.0 directory services.

"Writing applications that use both NetWare and IBM mainframes is currently a real pain," said John Galvin, a software engineer at Swiss Colony, Inc., a mail-order house in Monroe, Wis. "If Novell can make NetWare and SAA easier, it would help us a lot."

On the messaging front, Novell announced plans for a new release of its Global Message Handling Service (MHS), scheduled for release in the third quarter. In the new version, Global MHS will be fully "aware" of the NetWare 4.0 directory services and will include improved security, data storage and wide-area connectivity.

Horwitt

CONTINUED FROM PAGE 55

reaucracy and vendor bickering to deliver a workable networking standard.

Now we have vendors' network engineers getting together in back rooms to come up with a common set of code that ideally will mesh existing network and network management standards with vendors' best value-added features.

Examples of truly open, user-beneficial alliances include several working groups within the Internet Engineering Task Force (IETF), the TCP/IP and SNMP standards body. Founded by Internet networking engineers, IETF has a tradition of developing working networking and network management protocols unhindered by a lot of PR nonsense or vendor dominance games.

At the IETF meeting this month, Cisco started a working group to develop standards for routing IBM's SNA, as well as source-route bridging and NetBIOS, over TCP/IP (CW, April 12).

This effort is quite different from Cisco's other SNA routing protocol initiative, the Advanced Peer-to-Peer Internetworking Forum, which was formed to challenge IBM's dominance of the SNA internetworking arena. This time, Cisco is asking IBM to come in right at the start. Furthermore, Cisco is proposing that the new standard be based on IBM's Data Link Switching protocol. IBM has said it is likely to join, as are most other router vendors whose devices handle SNA. Hats off to Cisco.

Now if only the IETF and the ISO can overcome their differences to work together on a single set of internetworking standards, we'd really get somewhere fast. During the recent IETF meeting, a representative met with Internet's Advisory Board to discuss how this can be done.

The potential benefits to users are obvious: Instead of having two internetworking standards bodies, they'd have one. Potentially, the IETF's TCP/IP would take on some of the best features of OSI, such as X.400 E-mail and X.500 directory services. Indeed, IETF working groups are already hard at work on specifications for putting those OSI applications on top of TCP/IP.

However, there are barriers in the way, the biggest being the vast differences in the cultures of the two organizations.

The Internet board tried to downplay the traditional animosity that IETF engineers feel toward the ISO, which many see as a fuddy-duddy bureaucracy. However, the resistance is definitely still there; a representative from an OSI software vendor complained that he still gets funny looks at informal IETF breakouts.

And IETF members expressed concern that liaisons with the ISO will cost them their consensus-driven, free-flowing standards development process, which involves anyone in the Internet community who wants to propose a new feature or comment on someone else's.

This process has enabled the IETF to come out with working internetworking and network management standards a lot faster than the ISO has. However, it doesn't always work; for example, the IETF has spent more than a year debating how to fix TCP/IP limitations such as an addressing protocol that will shortly run out of addresses.

Indeed, the IETF's very success as a standards body means it has to deal with an increasingly complex and unwieldy set of standards that involve a lot of different vendor and user niches. As one Internet board member pointed out, the ISO does have experience getting various international standards bodies to work together.

Furthermore, the IETF needs that status as an international standards body in order for its protocols, particularly TCP/IP, to gain credibility among commercial, multinational corporations.

Keep talking, guys.

Horwitt is a *Computerworld* senior editor, networking.

In Brief

Sprinting faster

Another chunk of America's information highway got wider recently when **Sprint Corp.** upped the dedicated access speeds of its SprintNet X.25-based global data network. The upgrade's main objective, Sprint executives said, is to rev up the links between corporate hosts and SprintNet so they can better handle the influx of aggregate dial-up traffic from remote users.

Buying it all up

U.S. Robotics, Inc. has acquired 100% of the common stock of **P.N.B.SA**, a maker of portable PCs and networking products for IBM desktop computers, in Suresnes, France.

Speeding up Ethernet

CNet Technology, Inc. in San Jose, Calif., has begun developing "fast" Ethernet network adapter cards, hubs and routers. The firm said it will ship the interfaces as soon as the IEEE 802.3 committee finishes the 100M bit/sec. Ethernet standard later this year.

Native agreement

Powercore International in Manteno, Ill., and **Isocor** in Los Angeles announced a joint technology agreement that will enable Powercore's Network Scheduler 3 — slated to ship in late 1993 — to operate as a native client over Isocor's suite of X.400 messaging products.

Which switch

Switched digital service access provider **Ascend Communications, Inc.** in Alameda, Calif., has signed marketing agreements with phone switch maker **Northern Telecom, Inc.** and **AT&T**'s network services group. Ascend will develop an ISDN Basic Rate Interface for Northern's Meridian 1 private branch exchanges; AT&T will jointly promote its Switched Digital International Service with Ascend's inverse multiplexers. Inverse multiplexers provide one or more applications with dial-up access into a variety of switched long-distance services.

Token Ring meets X

Token Ring adapter card maker **Olicom USA, Inc.** in Plano, Texas, has partnered with X terminal vendor **Tektronix, Inc.** in Wilsonville, Ore., to render Tektronix's new XP10T series of X displays Token Ring-ready upon shipping.

Tariff pursued

Bell Atlantic Corp.'s **New Jersey Bell** operating company recently filed a tariff to provide users with access to Primary Rate (1.5M bit/sec.) Integrated Services Digital Network (ISDN). Most regional Bells to date have offered only Basic Rate (144K bit/sec.) ISDN access. The New Jersey Bell tariff calls for a typical installation fee of $1,500, with monthly recurring charges of approximately $600.

HP offers carrot

Hewlett-Packard Co. recently announced that current customers of **Lexcel, Inc.**'s Lance+ can get a 35% discount if they trade in the local-area network monitoring system for the HP equivalent: OpenView Network Node Manager and OpenView Probe Manager. Users can also trade in **Microsoft Corp.** Excel's LanceTap or **Novell, Inc.**'s LANtern and receive a 35% to 48% discount off the price of HP LANprobe, HP said.

Satellite shopping?

Chicago-based retailer **Montgomery Ward & Co.** has awarded a multimillion-dollar contract for satellite networking equipment and services to **Hughes Network Systems, Inc.** Hughes will install a very small-aperture terminal at each of Montgomery Ward's 350 retail outlets nationwide for such applications as check and credit authorization, inventory management and pricing changes.

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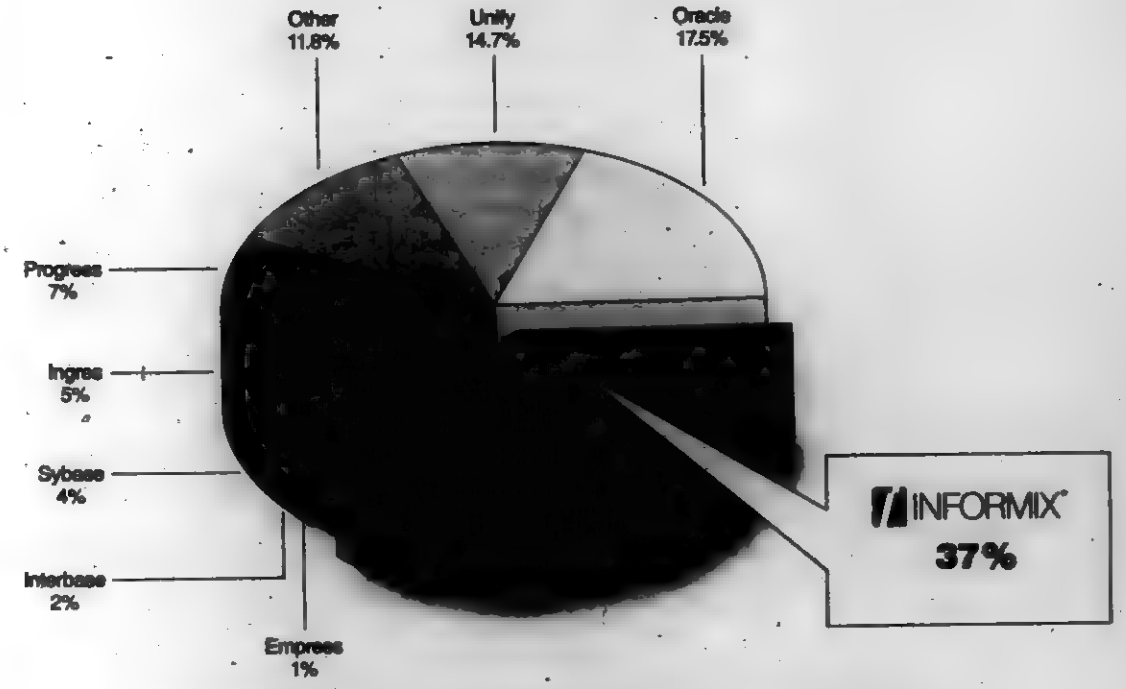

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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Spread spectrum finding its niche in hard-to-reach places

By Lynda Radosevich
CEDAR RAPIDS, IOWA

Norand Corp. is shipping a new wireless option in its line of wireless data collection and communication hardware and software.

Using spread-spectrum radio transmissions, Norand's new devices and software let manufacturing, delivery, transportation and retail companies collect data from areas unfriendly to cabling, such as plant floors, and pipe the data to host systems.

Currently, Norand's wireless customers, such as Merry-Go-Round Enterprises, Inc., a national clothing retailer in Joppa, Md.; must license a narrow piece of Ultra High Frequency bandwidth from the Federal Communications Commission (FCC). In the new Norand products, as in general, the spread-spectrum bandwidth is licensed to the vendor, and customers do not have to obtain their own FCC licenses to use the frequency. In addition, spread spectrum is said to speed data transmission rates and increase security because it splits transmissions and sends them over a broad frequency range.

Scanning for details

Merry-Go-Round uses wireless handheld devices to scan bar-coded palettes of merchandise and locate the palettes in its 1,070-sq-ft distribution center. The information is sent instantly to 64 radio frequency terminals, from which detailed information about all inventory is available.

While the spread-spectrum option might be interesting in the future, the technology is still new to the commercial world, and problems with it may yet surface, said Alan Loberstein, distribution manager at Merry-Go-Round. The federal government has used spread spectrum since the 1960s.

"We'd rather see those problems finished out, and then we'll consider it," Loberstein said.

Norand's new line includes a network controller, base transmitter, mobile radio frequency terminal, handheld terminal and a terminal for vehicle mounting. A new capability checks for the fastest transmission route for data traveling between the host computer application and a terminal, keeping response times to less than one second, according to Norand.

The system's software works with host systems, such as IBM's Application System/400 and System 3X family of minicomputers, and Unix and OS/2-based applications with an asynchronous link. In addition, the system can reroute the signal if a network component fails, and the network automatically switches the transmission of a terminal from one base station to another when the mobile terminal roams out of range, according to Norand.

Sabre wireless

CONTINUED FROM PAGE 55

slower than the wired networks.

However, for Dan Bohan, chief operating officer at Omega World Travel's headquarters in Fairfax, Va., the question is not whether Sabre's wireless network is stable. He is concerned that Sabre is offering new technology options instead of attacking more important deficiencies.

"I can think of 100 enhancements to Sabre that would be better than this," Bohan said. For instance, reservation agents cannot see schedules and fares on one screen at the same time. All information is presented in uppercase letters with no punctuation, and the communications software is limited to the system's 7-bit network, which limits programming options, he said.

Sabre is installing wireless LANs for customers in the U.S. now and will begin installing wireless LANs for customers in Europe, Japan, Australia, Latin America and the Caribbean by the end of 1993.

SynOptics smoothly inte into your exist

An enterprise network is one of your business' strategic assets. And with the constant arrival of new network technologies, you need a partner to help you merge and manage both the old and the new. That partner is SynOptics.

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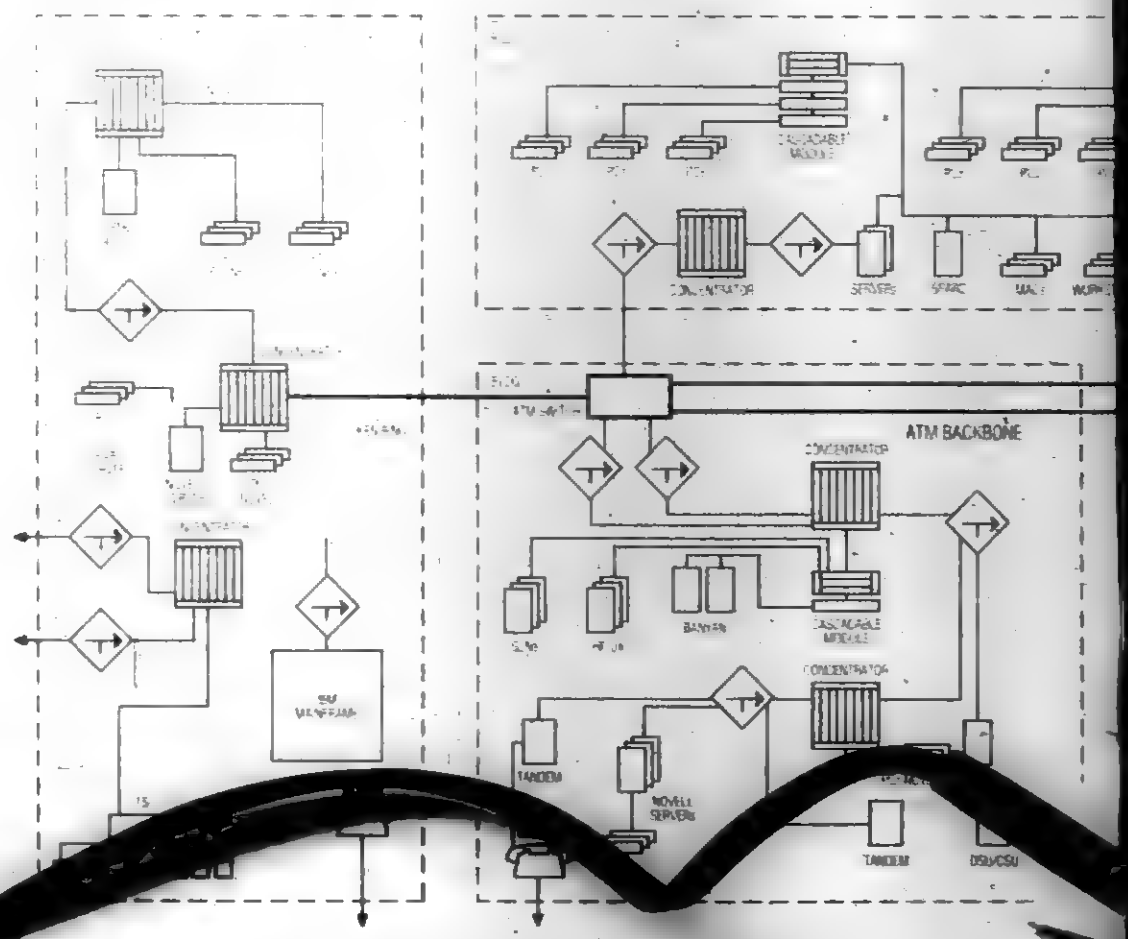

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Tools monitor host/LAN response time

By Elisabeth Horwitt
MINNEAPOLIS

BlueLine Software, Inc. has extended its IBM VTAM performance monitoring tools to monitor response time on links between LAN clients and an IBM host.

BlueLine's Vital Signs for LANs is said to identify bottlenecks and response time problems across links between Novell, Inc. NetWare local-area networks and IBM mainframes. Software running on a dedicated DOS PC monitors traffic on the LAN portion of the link, sending alerts up to BlueLine's host-based Vital Signs for VTAM software. Vital Signs for VTAM can monitor traffic levels all the way down to a LAN gateway that emulates an IBM 3174 cluster controller, a company spokesman said.

Together, the two software modules provide centralized network control centers with information such as application use levels, file server activity, user activity and Novell IPX/SPX traffic on LANs, BlueLine said. Vital Signs for VTAM includes a database for storing traffic and usage information, as well as applications for generating reports.

Vital Signs for LANs targets companies that want a way to monitor LAN-to-host links, as well as overall LAN traffic, without installing a LAN monitoring system and LAN administrator at each LAN site, the BlueLine spokesman said. The system currently supports Novell NetWare LANs on Ethernet or Token Ring and IBM 3270-based LAN-to-host links. Future releases of the product will support LAN-to-host connections based on IBM's Advanced Peer-to-Peer Networking and LU6.2 protocols, as well as Transmission Control Protocol/Internet Protocol, BlueLine said.

Vital Signs for VTAM is priced between $10,000 and $50,000, depending on mainframe CPU class. Vital Signs for LANs prices start at $7,500. DOS 5.0 or above or Microsoft Corp.'s Windows 3.1 or above is required.

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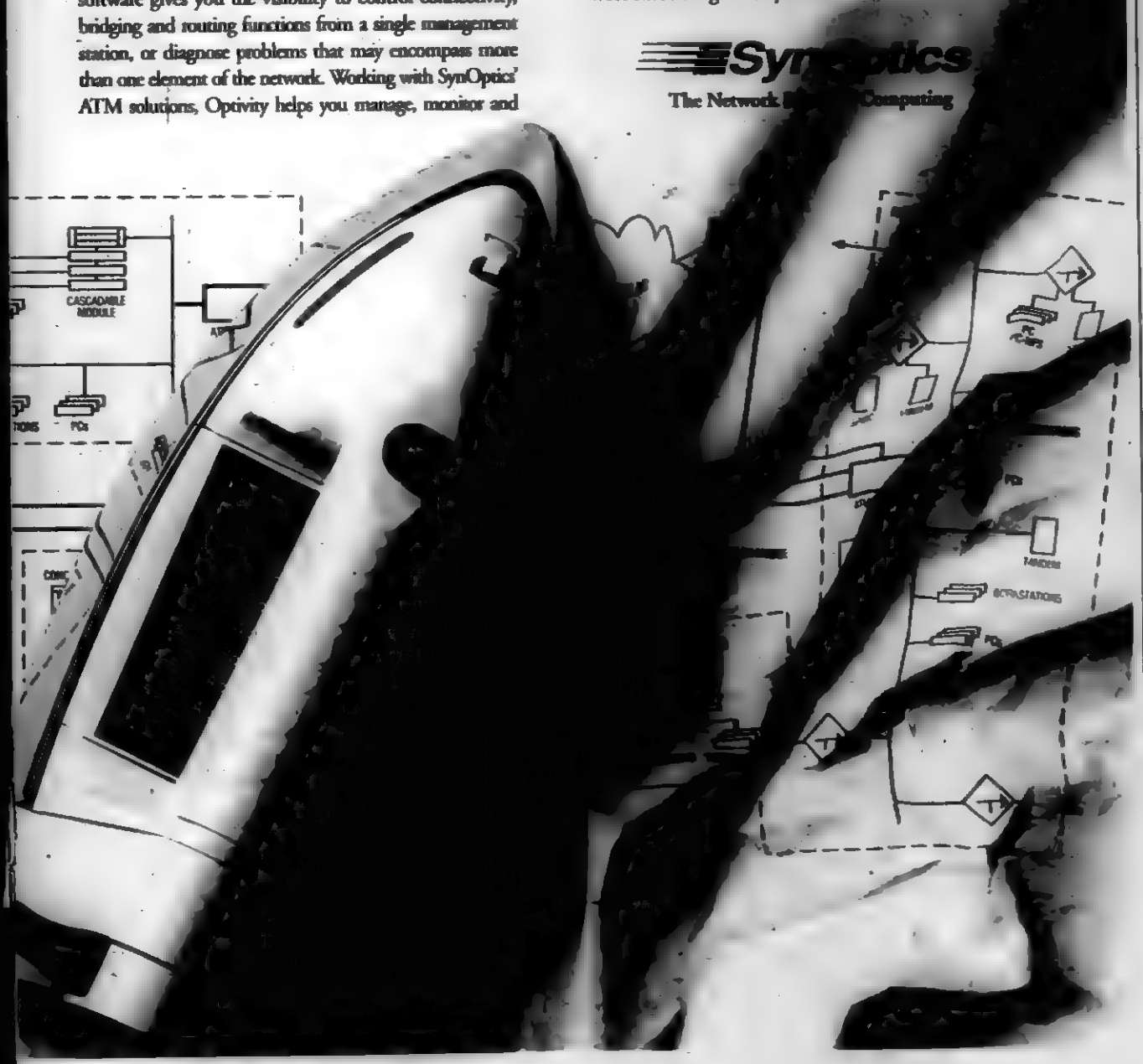

3Com enhances router line

3Com Corp. has enhanced its mainstream router line with support for the 3Com remote site-oriented Boundary Routing Architecture, which offloads most of a remote device's complexity to a central router for easier remote site management.

Supporting the neophyte Boundary Routing across the 3Com line means that higher end 3Com routers can now function as central router "hubs" in the Boundary Routing design scheme. That topology requires Boundary Routing remote nodes to feed directly into a central router, creating "star clusters" of devices and precluding a mesh network topology.

3Com has also added data compression, X.25 gateway and other capabilities to the router line. It has also begun shipping its LinkBuilder Multi-Services Hub, which it announced last October, priced at $180 per port and up.

In addition, the company recently rolled out three Ethernet cards that use its high-performance parallel tasking technology. Shipping now are a $225, 16-bit adapter for XT/AT-bus PCs with three standard media connectors; a $349, 32-bit adapter for Extended Industry Standard Architecture-based PCs; and a $349, 16/32-bit adapter for PCs with the IBM Micro Channel Architecture bus.

—Joanie M. Wexler

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Systems Network Architecture

Rabbit Software Corp. has introduced Version 5.5 of Open Advantage Unix for Novell, Inc.'s NetWare for SAA.

The product provides Systems Network Architecture (SNA) emulation for Unix users who want to use Novell, Inc. NetWare for SAA. Access to multiple hosts via multiple NetWare for SAA servers is available, and the product has the ability to use both network connections and Unix Transmission Control Protocol/Internet Protocol communications.

Features include automated file transfers, High-Level Language Application Program Interface, hot-keying between 3270 sessions and printer support.

Prices range from $495 for a single-user version to $2,500 for support of up to 254 SNA sessions.

▶*Rabbit Software*
7 Great Valley Pkwy. East
Malvern, Pa. 19355
(215) 647-0440

Network management

Equinox Systems, Inc. has introduced Equiview, a network management tool for the firm's ELS Terminal Server line.

The product is a Microsoft Corp. Windows-based application that enables Equinox terminal servers to be configured and managed quickly and easily, according to the company.

A graphical interface is provided that offers pull-down menus and selection boxes to set all parameters. The product also has the ability to save the configuration on a disk.

Equiview is included with ELS Terminal Servers. Prices for the terminal servers range from $1,695 to $5,400.

▶*Equinox Systems*
6851 W. Sunrise Blvd.
Fort Lauderdale, Fla. 33313
(305) 255-3500

Security Dynamics, Inc. has announced the ACE/Server for OS/400, an integrated software security server.

The product centrally manages and administers user access to network resources through remote dial-up, direct connection or gateway. The ACE/Server for OS/400 uses two-factor authentication, providing access to authorized users and blocking out would-be trespassers. The product's software monitors every network attempt and never exposes passwords on the network.

Prices start at $2,000.

▶*Security Dynamics*
1 Alewife Center
Cambridge, Mass. 02140
(617) 547-7820

Empirical Tools & Technologies, Inc. has introduced Dr. Watson, the Network Detective's Assistant, a network analysis tool.

Dr. Watson comprises two software modules that can be loaded on any PC or notebook equipped with an Ethernet adapter. The modules assist users with installation and maintenance of multiplatform computer networks.

The Detective module is a network surveying package that can be configured to maintain an accurate, real-time portrait of each network node. Users can examine the network to find out where each node resides, how it can be reached and how it responds to standardized queries with the second module, Detective's Toolbox.

The product costs $995.

▶*Empirical Tools & Technologies*
517C Mission St.
Santa Cruz, Calif. 95060
(408) 427-5280

Desk Talk Systems, Inc. has announced Trendsystem, a network management system that collects and usee all network data. The product provides enterprise-wide network management capabilities that support data collection from multiple management applications, the company reported.

The product, a SunConnect SunNet Manager-based application, is composed of seven software components: Trendbase, Trendgate, Trendstart, Trendview, Trendanalyzer, Trendstart and Trendlink.

Prices begin at $2,750.

▶*Desk Talk Systems*
19401 S. Vermont Ave.
Torrance, Calif. 90502
(310) 323-5998

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EMC²
THE STORAGE ARCHITECTS

Keeping track of software

By Thomas Hoffman

Like many multinational user firms, Joseph E. Seagrams & Sons, Inc. is trying to leverage its technology assets on a global basis. The New York arm of The Seagram Co. in Montreal has 32 primary information systems centers that support operations in 150 countries around the world.

The liquor distributor is negotiating global agreements with its suppliers for volume discounts on software without impacting local support, according to Jack Cooper, Seagrams' chief information officer.

The challenges facing Cooper and his staff reflect a trend among IS shops — to develop sound software asset management practices. As hardware continues to become commoditized and easier to figure into IS budgets, user shops are working to reduce their expenditures on the licensing and maintenance of their software.

"You kind of know what the hardware prices will be, but software prices tend to bounce all over the place," noted Woody Woodard, director of operations and technical services at The Home Depot, Inc. in Atlanta.

Users said the benefits of software asset management programs include simplified budgeting, protection against use of redundant or obsolete software, reduced maintenance fees, improved record keeping and efficiency from automated handling of contracts and inventory.

The software asset management program deployed by The Chase Manhattan Bank NA in New York has substantially reduced the number of programs it had been using. During the past 14 months, Chase has reduced the types of spreadsheets used throughout its operations from 17 to two, according to Eugene H. Friedman, a Chase vice president.

The program, Friedman said, has helped Chase coordinate its software purchasing and improve its record keeping.

Insurer's interest

Connecticut Mutual Life Insurance Co. began developing its software asset management program in late 1992. M. Nicholas Lovelace, the IS review officer who is overseeing the program for the Hartford-based insurer, said the firm recently began using Computer Associates International, Inc.'s CA-Netman to manage its hardware and software inventories and to handle its change management functions.

One of Connecticut Mutual's greatest software asset management challenges, Lovelace said, is to track the migration of its software from centralized to distributed operations. "We've always had an inventory of our software assets," Lovelace noted, "but because systems are moving down to the LAN environment, we're trying to keep them well-patrolled." Connecticut Mutual is evaluating several local-area network-based software inventory tools, including Legent Corp.'s Endeavor PC and CA's LAN LCM, he said.

The insurer plans to eventually funnel its mainframe and PC-based software inventories into one repository "so that all changes are communicated in a timely manner and to see how both environments impact each other," Lovelace said.

Facilitating monthly audits

Home Depot has developed in-house tracking programs to help the home improvements retailer keep monthly audits on all software used at its 222 U.S. stores. To hone its strategy, Home Depot brought in managers from its legal, purchasing and IS departments to determine the best and worst aspects of previous software licensing deals. "As we got into it, the problem was much deeper and larger than we had anticipated," Woodard said.

To better educate managers and staff, Home Depot in February joined the Gartner Group, Inc.'s Software Asset Management interest group, a user-only conference group that meets

Software, *page 68*

Mainframe-class printers, 4GL offered for HP users

By Mark Halper
SEATTLE

The recent semiannual outpouring of Hewlett-Packard Co.-related product introductions included a fourth-generation language (4GL) refinement for HP's SQL databases and a series of HP minicomputer printers that are compatible with IBM mainframe applications.

The unveilings came at a management conference held here by Interex, an HP user group. It was one of two annual Interex gatherings that serve as new product forums.

Uniface Corp. in Alameda, Calif., said it has added interface drivers to transparently link the Uniface 4GL client/server development environment to HP's Allbase/SQL and Image/SQL databases (see story page 79).

HP introduced four HP 5000 printers that are intended to produce up to 210 page/min. on its HP 3000 and HP 9000 minicomputers, the company claimed.

HP is positioning the printers for operations including billing, invoicing, financial statements, direct mail and other uses "that typically produce hundreds of thousands to millions of pages per month."

New software introduced by I-Data International, a Bagsvaerd, Denmark-based HP channel partner, allows the new printers to print any application formatted in IBM's Advanced Function Printing code, HP said.

HP, *page 68*

Minis cheaper than PC network, study says

Client/server computing may have its benefits, but saving money is not one of them, according to a study by International Data Corp. (IDC).

Based on IDC's "cost-of-computing" model, complex networked applications running on Novell, Inc. NetWare PC local-area networks can cost more than those on the IBM Application System/400, Digital Equipment Corp. VAX and Hewlett-Packard Co. 9000 minicomputers during a five-year life span, IDC said. And where PC LANs are less expensive, it is because the applications running on them are simpler than those running on minis.

Therefore, the study concluded, "We believe that many NetWare LAN-based applications in networked enterprises will require significant and very costly reworking in the 1993-1995 time frame."

Costs covered in the model included hardware, systems software, application software, development staff, operations staff and overhead for remote systems management, during a five-year period.

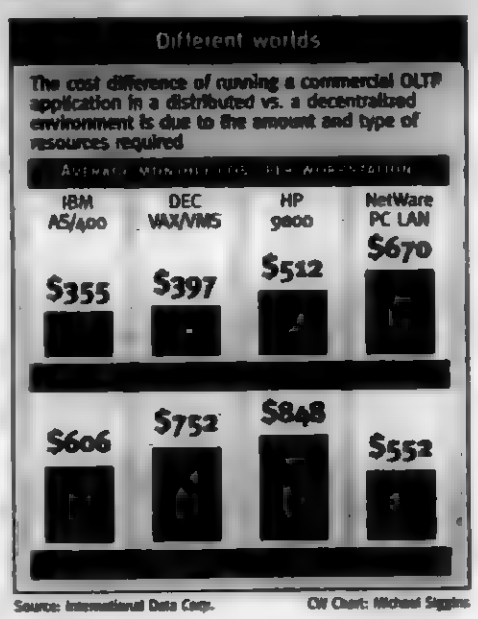
For the study, IDC surveyed 150 user shops — commercial environments with revenue typically more than $250 million, an emphasis on sophisticated on-line transaction processing applications and a high proportion of remote processing relative to the central host.

The primary differences in the costs were accounted for by systems management software and the number and amount of central information systems resources required, the study said.

There is a difference in the costs to run a distributed vs. a decentralized environment, the study said. IDC defined a distributed enterprise as one where there are many relatively small systems that are configured pretty much the same way.

A decentralized enterprise, however, has a smaller number of systems running more unique work loads. In the distributed environment, the AS/400 is much less expensive than any other platform, IDC said, despite the fact that it and the VAX are "much more sophisticated" platforms than NetWare and the HP 9000. Findings in this kind of environment included the following:

- Hardware costs were similar across the board, ranging from $106 to $133 per workstation per month.
- Systems software costs are very different: $9 per workstation per month on the AS/400 and $109 per workstation per month on the HP 9000.
- The greatest variance is the operations staff required for the different platforms. The AS/400 and VAX systems require about $36 per workstation per month vs. about 10 times that amount for the NetWare applications.



Source: International Data Corp. CW Chart: Michael Siggins

—*Johanna Ambrosio*

Hotel chain integrates systems via Unix

By Mark Halper
BOSTON

ITT Sheraton Corp. knows what a headache it can be when computers in individual hotels speak a different language than the hotel chain's central reservation system.

While the 430 hotels in the Sheraton chain all access the same Amdahl Corp. mainframe-based Reservatron 4 system, each hotel runs its own system for handling guest-related operations such as check-in, check-out and room expense tabs.

These systems, known as property management systems (PMS), often have to share data with Reservatron 4 and its IBM DB2 database. Yet for the most part, the PMSs are on platforms other than the Hewlett-Packard Co. HP 9000 Unix-based minicomputers that serve as reservation front ends at each hotel and are connected via X.25 networks to the mainframe.

Hello Unix

Now, however, Sheraton said it has found an efficient replacement for this patchwork approach: a massive integration project that will replace the diverse PMS platforms with a common HP/UX-based system.

"There's a plethora of incompatibilities in both data forms and definitions," said Sheraton's chief information officer, Richard Nauman, noting that the systems are at odds over how to describe room types, rate structures, guest name formats and group bookings. The result: Hotel clerks waste time jumping back and forth between reservations and the PMS.

A hotel clerk often has to run through a task on one program and then go into the other "and do something totally redundant," noted Dave Ashcroft, Sheraton's manager of property systems development.

Richard Nauman: *System will save much more than it costs*

ON SITE

ITT Sheraton
Boston

Challenge: To eliminate redundant work processes caused by system incompatibilities at local hotels.

Technology: HP 9000s, ECI Computer, Inc. property management system.

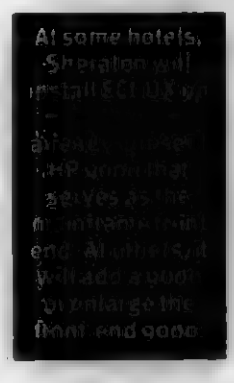
Goal: More efficient use of hotel clerks' time, faster guest check-in/check-out.

"Any architecture you can imagine is out there," Nauman said, noting that some hotels run proprietary systems, others run Unix platforms, and still others are PC LAN-based.

New hardware, software

Under the integration project, Sheraton will replace the diverse PMS hardware and software with a PMS program called ECI/UX from ECI Computer, Inc. in Santa Ana, Calif. ECI/UX will run under HP's HP/UX operating system.

The ECI program runs on the HP 9000 and, according to Nauman, provides a screen common with the reservation screen. Because it operates on HP/UX as does the reservation front end, it eases Sheraton's task of integrating data between the two programs.



At some hotels, Sheraton will install ECI/UX on the already-present HP 9000 that serves as the mainframe front end. At others, Sheraton will add a 9000 or enlarge the front-end 9000.

The ECI/UX system, chosen in part because of Sheraton's familiarity with it, is already in place at about 25 of Sheraton's hotels and will be added to about 50 more by the end of this year, Ashcroft said. If all goes as headquarters hopes, all of the chain's 430 worldwide properties will eventually cut over to it. About half of those hotels are owned by franchisees, so central IS cannot be certain when or if they will make the switch. Ashcroft said about 75% of Sheraton's hotels should change by the end of 1995.

Common OS not enough

Although the ECI PMS and Sheraton's reservation front end both run on HP/UX, the hotel must still create integration techniques that allow the two to share data, according to Ashcroft.

For example, while ECI/UX uses a Microsoft Corp. Windows-like menu format, Sheraton's reservation front end uses traditional pull-down menus, he noted. And while ECI/UX counts each individual in a group as a separate reservation, the reservation front end registers the individuals together as one reservation.

By the first quarter of 1994, Sheraton expects to have integration techniques that will allow the two programs to share rate schedules, room status and inventory and guest history. Their development will include building in triggers in ECI/UX that automatically transfer data to the reservation front end.

Ashcroft conceded that the job "will not be an easy task all along the way," noting that some functions will be more difficult to integrate than others. The major challenge will not be the technology itself, he said, but "straightforward, hard-working systems analysis."

And in the never-ending process of evolution, Ashcroft noted that the hotel will eventually support other functions as well.

Nauman said the system will cost the hotel chain "several million" dollars but that it expects to save "multiples" of those millions through improvements in efficiencies, information access and guest service.

The actual savings figure, he said, "is totally dependent on how many hotels implement" the HP/ECI system. The 200-plus franchises in the chain may decide on different technology, Nauman noted.

Micro-to-mainframe links

Sterling tool moves data to Windows

By Jean S. Bozman
CHATSWORTH, CALIF.

In the rush to tap into relational mainframe data with client/server software, the information stored in old-style hierarchical databases often gets left behind. But now Sterling Software, Inc. is delivering a solution: Its Journey product extracts IBM VSAM data and presents it to PCs on Microsoft Corp. Windows screens.

Journey, which became generally available late last month, is an add-on product for micro-to-mainframe links from Sterling's Dylakor division. Those mainframe servers include the Dylakor 280 II, Audit Excel, IQ Express and Answer/Server products. Journey costs $4,000 to $39,800, based on the size of the mainframe that hosts the server software.

Compared with most client/server software, Journey is a low-cost alternative that takes little time to set up. "If you compare it with a client/server tool like Gupta [Corp.'s] SQLWindows, you're still ahead because you don't have to develop anything," said Mitch Kramer, an analyst at Patricia Seybold Group in Boston. "There is a bit of preparation involved, but the IBM 3270 link lets you get at mainframe data easily."

Starter set $12,000

One beta-test site added a starter Journey setup for $12,000. "We're trying to find an inexpensive way to leverage our mainframe data and to put it onto Windows," said Steve Graham, senior director of systems development at $3.6 billion PC distributor Ingram Micro, Inc. in Santa Ana, Calif. Eventually, he said, the firm will pursue some client/server solutions, including one planned Unix database decision support system that will cost about $250,000.

A key benefit is that Journey end users can access mainframe data or database extracts directly, without waiting for information systems programmers to create custom database reports. "We'll eventually have up to two dozen power users making use of Journey," Graham said. "They will be able to do things for themselves without tying up a lot of MIS resources."

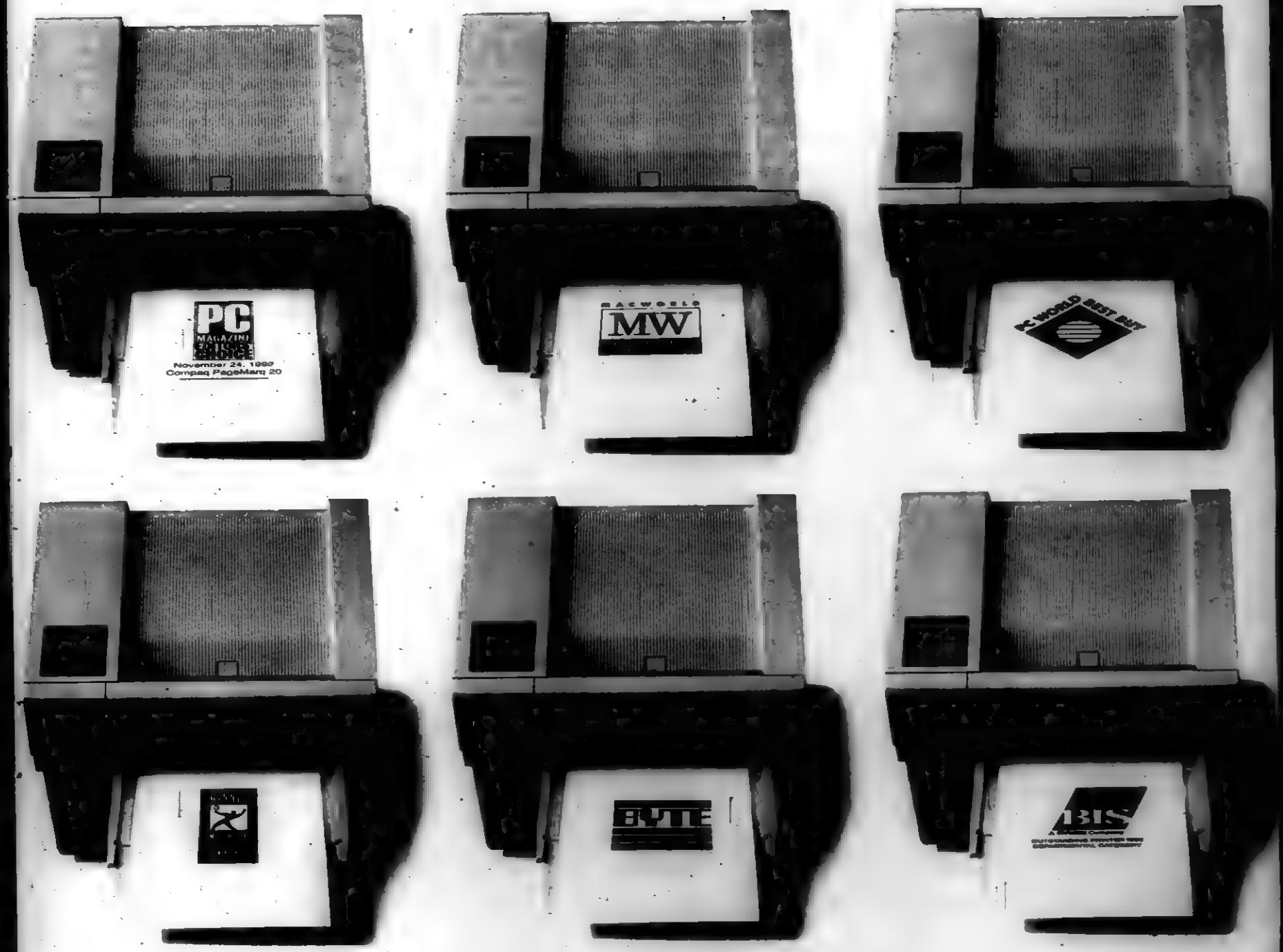
Journey works with IBM MVS systems but does not yet work with IBM's VM. Sterling says Journey can also access data from IBM's DB2 using its Dylakor 280 II Relational Link. It does not yet work with IMS files, but the company said it is working on IMS support.

Journey does not require any knowledge of relational databases or SQL, Sterling said. Instead, users create their own reports using a Windows spreadsheet, and Journey imports the relevant data. However, IS administrators first have to create database extracts and assign log-ons and security clearance to end users, according to early Journey sites.

"It's working off the extracts and letting the users do their own ad hoc reports," explained Mike Benner, a computer specialist at the Department of Transportation's Office of the Inspector General. The office uses Sterling's Audit Excel to create audit reports, but about 20 end users are expected to try Journey to speed access to mainframe data this spring.

Ed Glagola, data center manager at the inspector general office, said data will come from IBM/MVS mainframes in Washington, D.C., and Plano, Texas. Without Journey, the alternative is to download large amounts of raw data into a PC spreadsheet. Benner said users then analyze the data by using a PC database.

Sterling, which announced Journey last year, said the product's purchase price includes client software for five PCs, communications software and the mainframe portion of Journey. It does not include the cost of Sterling's mainframe servers, such as Dylakor 280 II or Audit Excel, which are needed to access the mainframe data.



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SWAMI speaks

With its clientele facing an increasingly uphill battle against spiraling software costs, Gartner Group formed the Software Asset Management (SAM) service two months ago. But do not let the group's relative infancy fool you: Gartner has been hip-deep in software asset management consultation for the past three years, according to Bill McNee, vice president and general manager of SAM.

McNee said SAM was an "outgrowth" in direct response to customers' requests for broader and deeper coverage of software asset management. Gartner sponsors the Software Asset Management Interest, or SWAMI, user group. The group, which meets semiannually, was designed to provide users with "a multiplatform perspective on software asset management," McNee said.

From desktop to host architectures, SWAMI offers its members guidance on how to optimize the discounts available in relicensing software, to protect themselves against the terms and conditions of long-term contracts and to select the proper licensing models for their shops.

—Thomas Hoffman

Tracking software

CONTINUED FROM PAGE 65

semiannually to discuss software asset management issues (see story at left).

So far, the crash courses have proved helpful, Woodard said, because Home Depot's software assets continue to evolve. Because its revenue has been growing by more than 35% annually for the past four years, Home Depot has been forced to upgrade its CPU capacity once a year. In fact, it plans to upgrade from an IBM 3090 600J mainframe to a model 860 next month. "The costs are enormous," Woodard said, "but we're trying to negotiate with [software] vendors to protect against those upgrades."

During the past two months, Home Depot has shifted to a million instructions per second (MIPS)-based pricing model on the mainframe software it licenses from CA and Candle Corp., Woodard said. In addition to a similar deal it recently worked out with Boole & Babbage, Inc., Home Depot plans to renegotiate terms with CompuWare Corp. and Platinum Technology, Inc. by the end of 1994 when those licenses come up for renewal.

Home Depot's strategy, Woodard said, is to procure MIPS-based licensing agreements with its independent software vendors, with 400 MIPS as the outward target.

HP printer tools

CONTINUED FROM PAGE 65

As such, they are intended to offload mainframe printers and assist in HP's general thrust into the data center, noted Rich Sevcik, general manager of HP's systems and server group.

The printers are compatible with HP's LaserJet printers, he said.

The high-end model, the F135XP, prints 210 page/min. and uses a 17-in.-wide print format. Prices range from $200,000 for the F100/Turbo to $300,000 for the F135XP.

In another printer development, Multiview Corp. in Burlington, Mass., added a function to its accounts payable software that lets HP LaserJet users cut checks on multiple bank accounts without reloading or realigning special paper and check forms.

Multiview President John Leslie said one beta-test customer, whom he did not identify, decreased check processing time from three "person days" to one half-day.

Prices for the function, called LaserCheck, range from $2,500 to $7,500, depending on the user's requirements. Users must have Multiview Accounts Payable Version 6.10/7.10 or above and an HP LaserJet Series 3 or higher, the company said.

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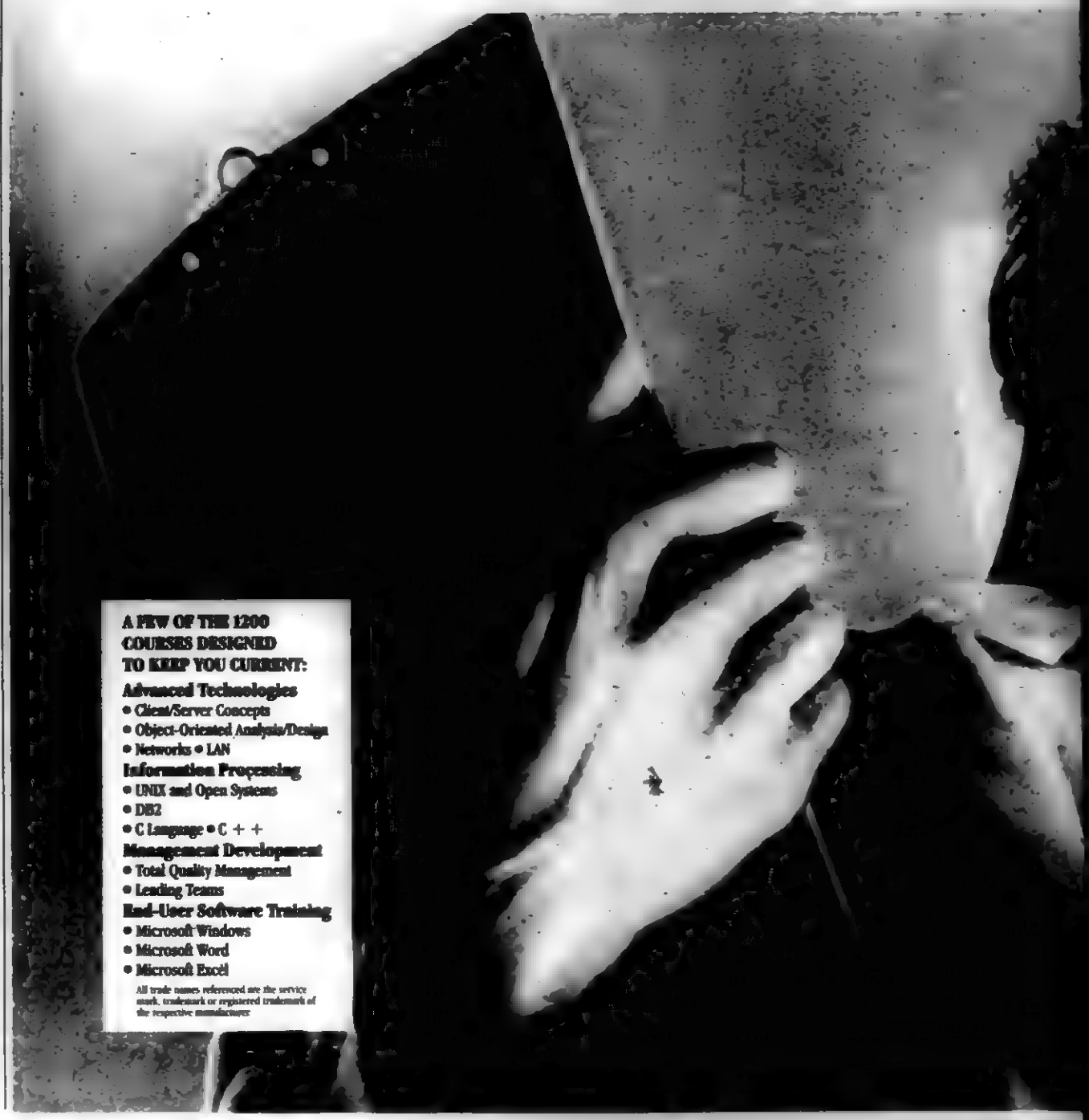

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Mainframes

Analysts applaud A series

By Thomas Hoffman

Industry analysts have given Unisys Corp. high marks for the recent additions that the Blue Bell, Pa., vendor made to its A series mainframe product line.

Earlier this month, Unisys introduced several new models to its A series line, including the new low-end A-7 machine, two new midrange A-11 computers and 12 more A-16 processors [CW, April 12].

But what analysts said they liked most was the vendor's continued strides in making the proprietary machines more interoperable with multivendor platforms. "They have created an exceptionally standards-compliant environment," noted Rich Schreiber, president of ATB Associates, a consultancy in Wellesley, Mass. The adoption of the Transmission Control Protocol/Internet Protocol Release 3.1, along with Open Systems Interconnect, BNA and Systems Network Architecture protocols, allows users to transfer files and share applications between the A series and non-Unisys platforms.

That move was further facilitated by the expanded Unisys Cooperative Computing Environment's (CCE) Release 4 software, which provides enhanced A series client/server integration with multivendor Unix and IBM's OS/2 operating system environments.

Beginning with the A-7 introduction, the low-end mainframe can now be linked in a parallel computing environment with a Unisys U6000/65 server running Unix or OS/2 by running CCE over an Extended Industry Standard Architecture bus, according to Frank G. Brandenberg, vice president and general manager of Unisys' computer systems group.

That configuration, Brandenberg said, marks the vendor's initial entry into developing the Massively Parallel Processing strategy that Unisys intends to expand during the next three to five years.

CCE "moves users to an area where they can defend maintaining mainframe applications as they move to new topologies," said John Logan, executive vice president at Aberdeen Group, a market researcher in Boston. By "opening up" its A series mainframes, Logan said, Unisys has been able to achieve what few if any mainframe vendors have been able to accomplish during the past three years: increased sales.

Brandenberg said the vendor's A series revenue was approximately 20% higher in 1992 than it was in 1991. In addition, he said, Unisys landed 250 to 300 first-day orders for the new machines.

Included with the CCE Release 4 program is an automatic PC file backup utility that permits both full and incremental file archiving between an entire PC network and the A series host.

Furthermore, Unisys has ported Novell, Inc.'s NetWare for Unix (also known as Portable NetWare) to the A series environment.

Bob Sakakeeny, director of midrange systems at InfoCorp in Westboro, Mass., noted that Hewlett-Packard Co. and IBM had already announced native versions of NetWare to run on their respective HP 9000 and RISC System/6000 Unix platforms. Unisys, Sakakeeny said, "might have to do some scrambling there."

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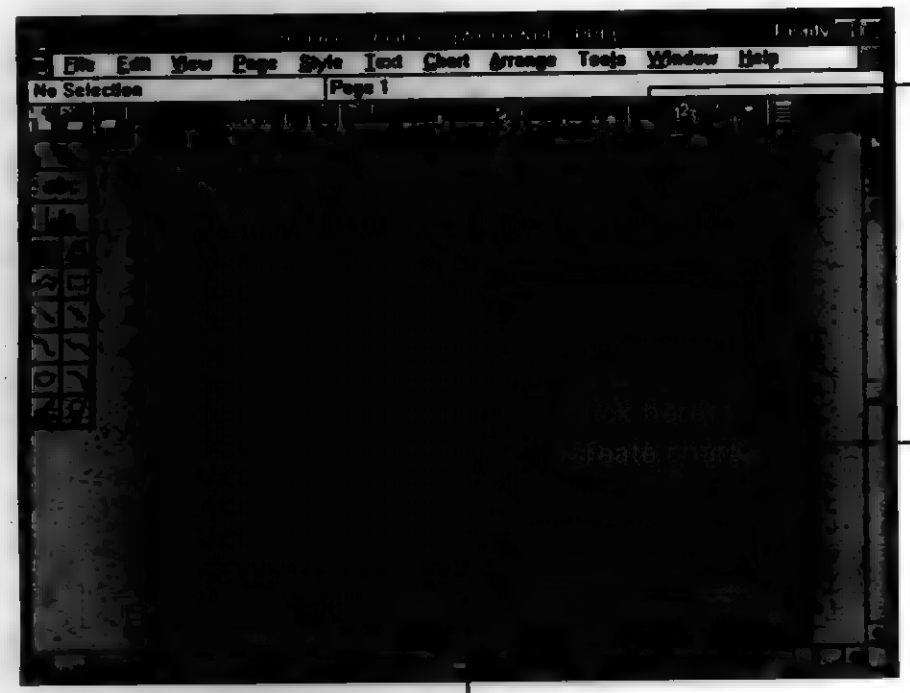

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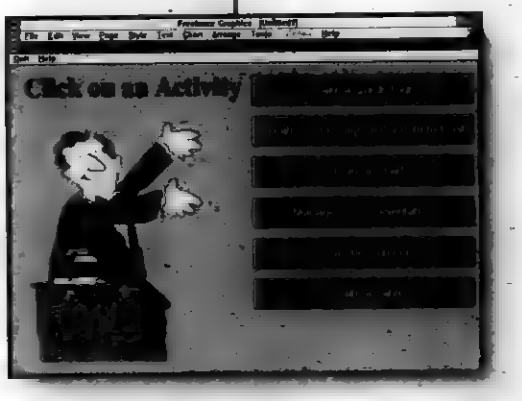

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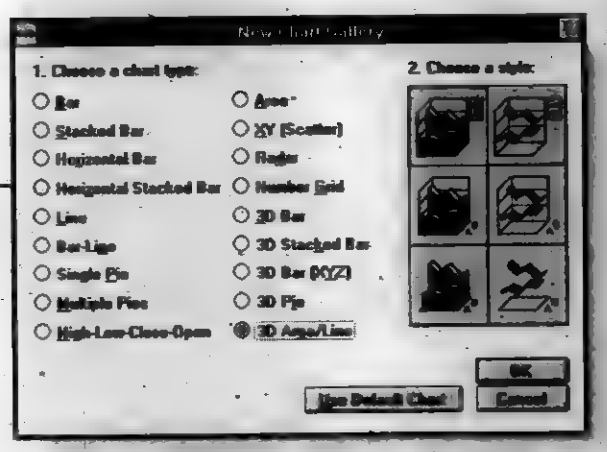

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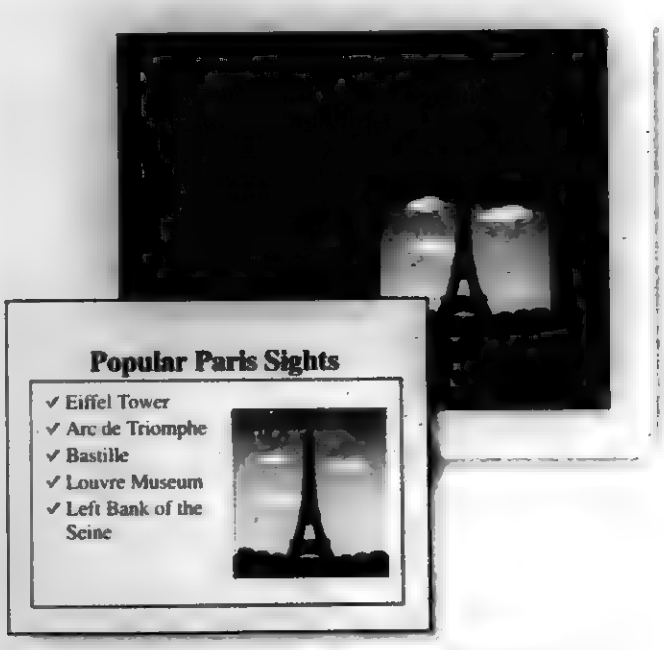

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AIIM show

Taking an inside look at imaging introductions

While lacking a single blockbuster announcement, the Association for Information and Image Management (AIIM) trade show in Chicago earlier this month did offer an array of new products and plans from the exhibiting vendors. Here is a sampling:

Digital Equipment Corp. and Unix: Executives from DEC, which introduced a Santa Cruz Operation Unix server imaging product at the show, acknowledged that they were behind the market with their first Unix offering. Six months ago, DEC's "disjointed" imaging products and efforts were clarified.

More on Unix: Plans to bring imaging to Unix clients on Univel, Inc. UnixWare local-area networks were announced by **Recognition International, Inc.** and Univel, the **Novell, Inc.** and **Unix System Laboratories, Inc.** joint venture.

Under the agreement, Recognition, which markets the popular Plexus XDP imaging software platform, will resell the UnixWare operating system with XDP and its work-flow product, Plexus FloWare. FloWare will be supported first and will be ported initially as a UnixWare Application Server product using the Informix OnLine relational database management system for UnixWare.

Consortium: A group of vendors announced a venture joining their complementary technologies into a standard approach to Unix-based imaging. Companies in the consortium include **Access Graphics, Excalibur Technologies Corp., Frame Technology Corp., Fujitsu Computer Products of America, Laser Magnetic Storage International Co., Sun Microsystems Computer Corp.** and **Xerox Imaging Systems, Inc.**

Set 'em up: Hoping to establish a new sales paradigm in the industry, imaging integrator **GTE Vantage Solutions** is now offering to design, configure and test a whole imaging configuration at its manufacturing facility in Chantilly, Va., before potential customers spend a dime.

The total process takes nine to 12 months. GTE's approach apparently appealed to **Microsoft Corp.**, which hired it to develop an imaging solution for its accounting departments.

The LAN Manager-based system, which will use Microsoft Windows NT SQL servers, is scheduled to roll out in August.

IBM figures: In its press briefing, **IBM** executives stated that the company has some 1,000 ImagePlus installations to date, for a total of 30,000 seats. Its Top 10 customers have an average of 1,000 seats, IBM said.

Winner: JBS Imaging, Inc., a subsidiary of Chicago-based government auction firm JBS & Associates, took this year's Gold Award for Imaging Excellence at AIIM. JBS developed an auction document system using FilePower software from Optika Imaging Systems running on a Novell network with 150 Microsoft Windows workstations [CW, Dec. 7, 1992].

AIIM gave Silver Awards to **Aetna Life and Casualty Co., Epson America, Inc., Pizza Hut, Inc., Scotiabank** and **Sears, Roebuck and Co.**

Career move: Roger Sullivan joined **Keyfile Corp.** in Nashua, N.H., to head a newly formed Professional Services Division, the company announced.

Sullivan joins Keyfile from **BIS Strategic Decisions** in Norwell, Mass., where he was vice president for the Systems Portfolio of Continuous Information Services. He was previously the director and program manager for **Wang Laboratories, Inc.**'s document imaging products.

Scheduling faux pas: Several vendors voiced unhappiness over the scheduling of this year's AIIM, which opened on April 5, the first night of Passover. Conference organizers said the date was picked out of necessity when AIIM grew too large (200 booths on 10,000 sq ft) to fit into its originally scheduled Boston venue.

Attendance at this year's AIIM was more than 35,000, breaking last year's record of 33,500.

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In Brief

PCs no bargains

If you are thinking about downsizing from a mainframe to PCs to save money, think again. That is the message of a recent study conducted by **Xephon**, a London-based consultancy that determined the five-year cost of ownership on a mainframe is a maximum of $10,200 per user vs. a minimum of $15,640 and a maximum of $23,500 per user on PCs.

These figures comprise the costs for hardware, systems software, applications software and personnel for training and support.

Cincom for correspondence

Two life insurance companies have chosen **Cincom Systems, Inc.**'s mainframe text-processing package for customer and other correspondence. They are Western-Southern Life in Cincinnati and Columbus Life in Columbus, Ohio.

TPC adds results

The **Transaction Processing Performance Council** (TPC), a nonprofit organization in San Jose, Calif., has released the results of its benchmarking studies of 213 computer systems from 25 vendors.

The TPC also said it is developing additional benchmarks that will measure effectiveness in decision support and client/server environments, to join the three it already has. The group can be reached at (408) 295-2613.

Taking care of business

Bachman Information Systems, Inc. has announced a workstation tool that helps DB2 administrators make changes. Called the Bachman/Production DBA, it runs under OS/2 and links with **BMC Software, Inc.**'s Change Manager on the mainframe.

BMW goes client/server

BMW North America, Inc. in Woodcliff Lake, N.J., will implement a client/server suite of financial applications from **SAP America, Inc.** in Philadelphia. The project is expected to go into production by the end of the year.

High-speed semiconductor

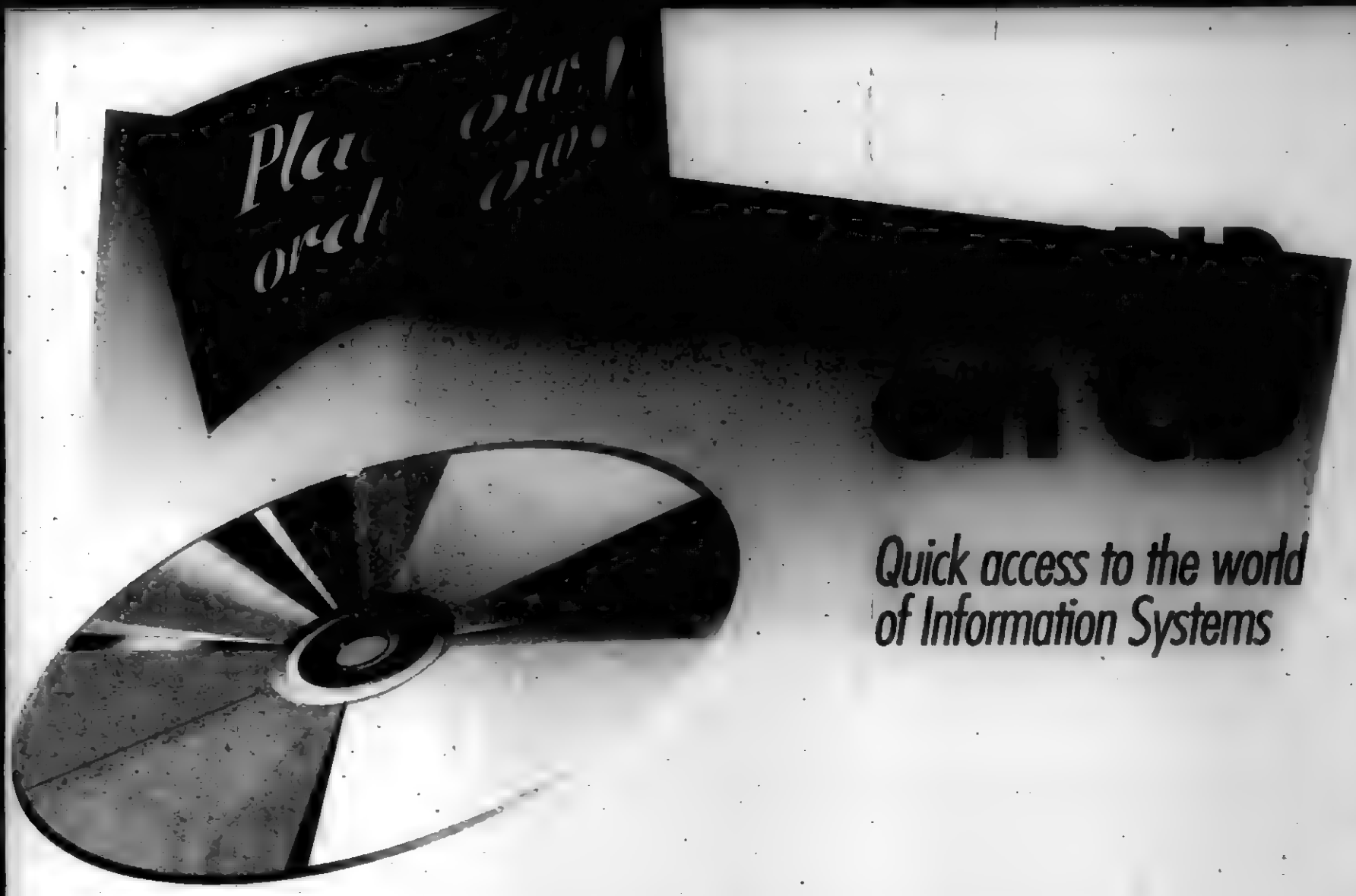
IBM's Technology Products Division, **Motorola, Inc.** and the **Center for High Performance Computing** (CHPC) have agreed to jointly develop a high-speed semiconductor set for commercial use. The CHPC, a research group under the auspices of Worcester Polytechnic Institute in Worcester, Mass., will use the chip set in its Lynx massively parallel processor.

Red Brick names CEO

Red Brick Systems, a vendor of data warehouse software in Los Gatos, Calif., has named Christopher Erickson its new chief executive officer.

Erickson previously worked at **Tandem Computers, Inc.**, where he was vice president and general manager in charge of the company's telecommunications business.

He replaces Ralph Kimball, who left Red Brick to form his own consulting firm.



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Database management

Compuware Corp. has introduced Release 2.2 of File-Aid for DB2, a self-contained DB2 data management and testing tool.

The product was designed to help users comprehensively test their DB2 applications before putting them into production, the company reported. An audit trail capability and new SQL and plan analysis capabilities are also included.

Prices start at $29,500.

▶ *Compuware*
31440 Northwestern Highway
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BMC Software, Inc. has announced Pointer Checker Plus Version 3.0.

The product is an IMS utility that, according to the company, ensures IMS data integrity and increases availability by analyzing, validating and repairing IMS/VS databases.

New statistical gathering and space monitoring capabilities are included as well as expanded database monitoring features.

User-defined database and space thresholds can be monitored, and users are informed on-line if any deviations have occurred.

Perpetual licenses begin at $13,500.

▶ *BMC Software*
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Sugar Land, Texas 77487
(713) 240-8800

DBopen, Inc. has announced DBmanager for DB2, a database management tool.

According to the company, DBmanager for DB2 has the ability to simplify the complex set of control facilities found in DB2 — data statistics gathering, file reorganization, object creation, system control such as buffer sizes and system checkpoint frequencies and utility programs such as backup and recovery, among others.

DBopen's products run on PCs connected to mainframes with IBM's 3270 emulation.

DBmanager for DB2 costs $995 for a single PC copy and $8,950 for a site license.

▶ *DBopen*
610 River Terrace
Hoboken, N.J. 07030
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Software application packages

Sotas International, Inc. has introduced Accountable Solutions, a line of accounting and human resource software systems designed for IBM's Application System/400 computers.

According to the company, Accountable Solutions offers user-controlled applications with features such as fixed assets management, financial reporting, inventory management, accounts payable, accounts receivable, general ledger and property control, among others.

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System Support Products, Inc. has announced Release 4 of DeskWorks, an interactive spreadsheet program for IBM's Application System/400.

This version offers more than 30 new features. A Quick Chart feature provides a display of graphics charts on a graphic-capable display, plotter or printer and can be used to display histograms, surface charts, line graphs, bar charts and pie charts. Additional graphics software is not required.

A Point mode enables cells and ranges to be chosen by using the spreadsheet cursor movement keys to highlight specified cells.

Performance enhancements have also been made. Spreadsheet calculation, sorting, column/row insert and delete and printing are two to five times faster, according to the company.

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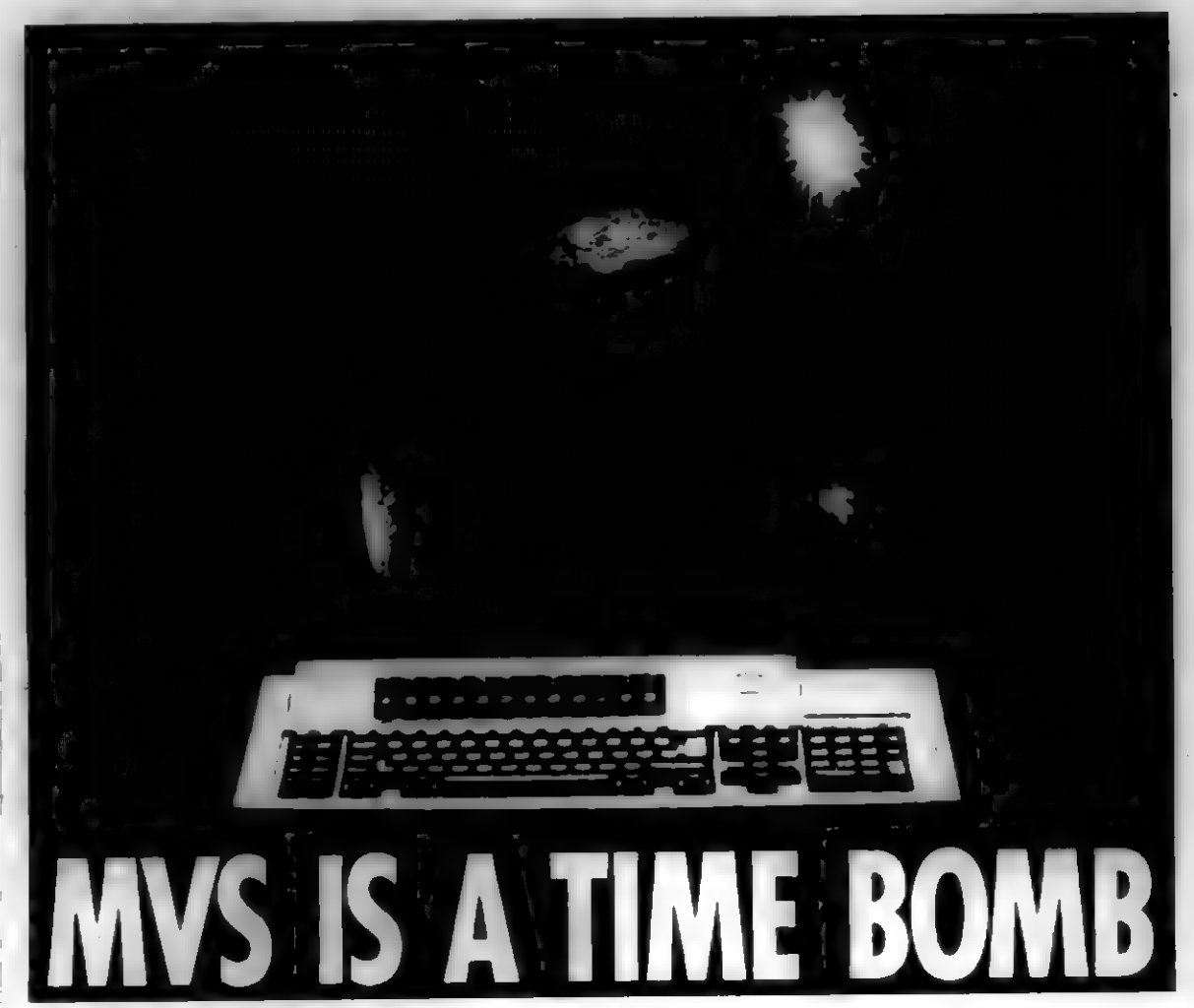

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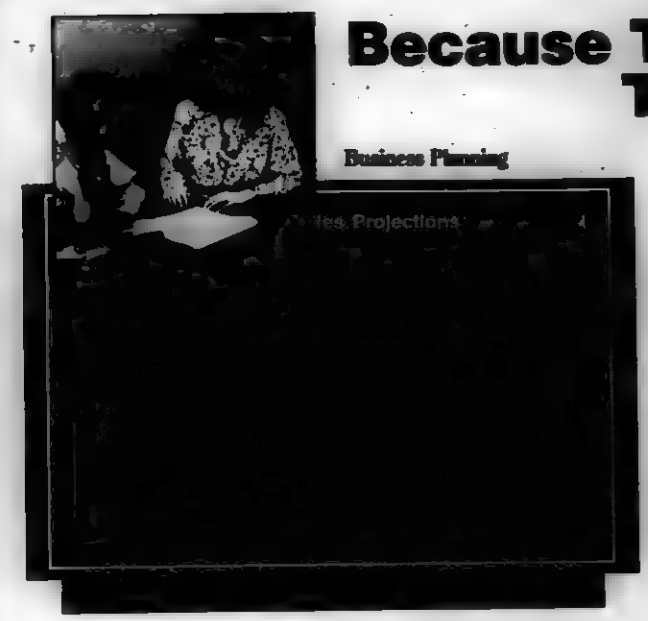

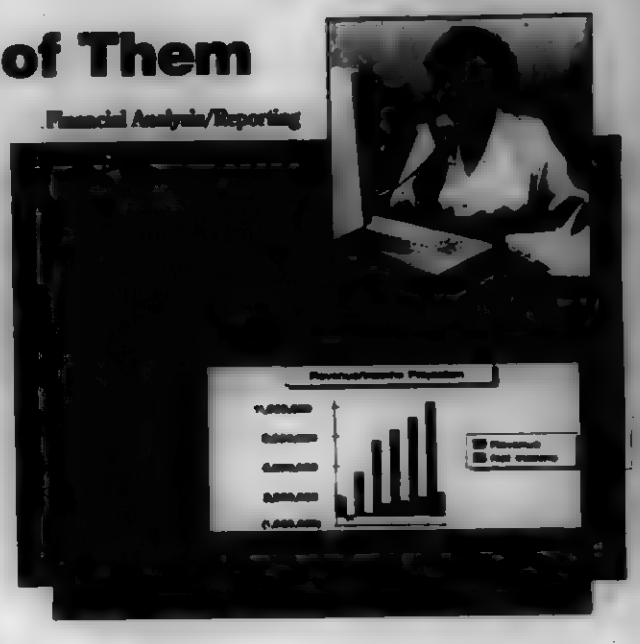

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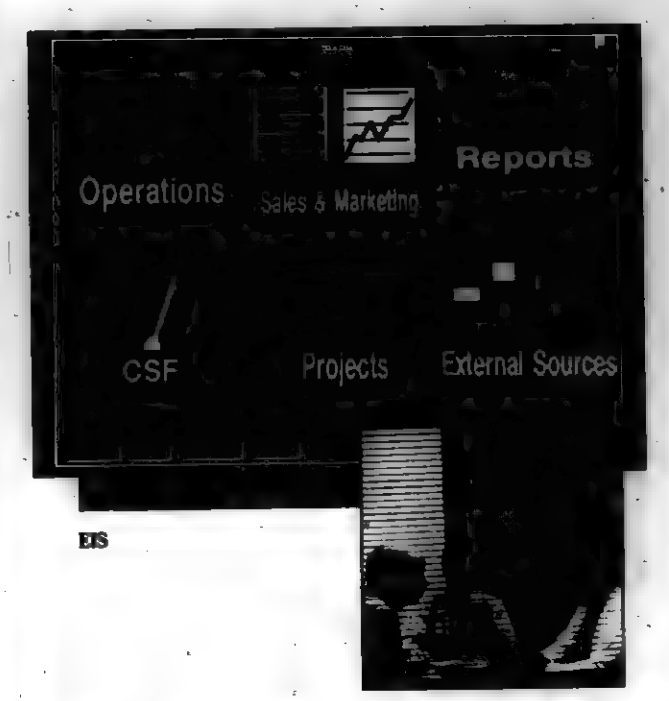

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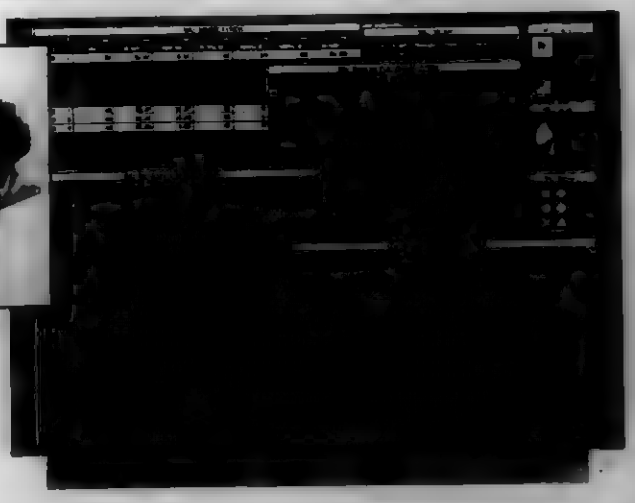

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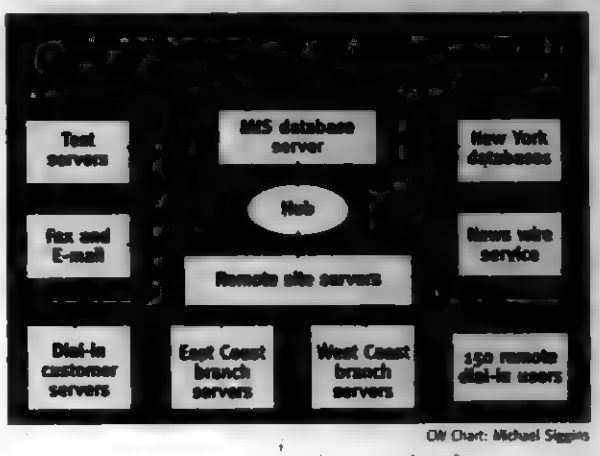
Notes speeds app arrival

By Michael Vizard
NEW YORK

Although Notes from Lotus Development Corp. is widely seen as a tool for facilitating communication, some organizations have discovered its value as an application development platform.

Consider Johnson & Higgins, a private New York-based corporate insurance broker.

To support its varied insurance activities, Johnson & Higgins has built about 100 applications, including an executive tracking system and a range of custom applications requested by individual business units, using the Command functions provided in Notes. About 40 of those applications are what Vice President William W. Wilson III called "solid, major applications."



Oli Chart: Michael Siggins

Wilson maintained that it is the business units, rather than information systems, that drive the use of Notes because Notes applications can be developed quickly.

"MIS people tend to think in terms of large databases and power tools. A power-hungry programmer wouldn't think to develop an application using Notes," said Wilson, who, rather than having a traditional IS background, actually served as a broker in a remote office before moving over to the IS department in New York.

But because Johnson & Higgins went with Notes, applications that would take months to build in another system can now be done in a matter of days and weeks, Wilson said.

"Notes is a formula-based system much like Lotus 1-2-3. To really make it work, you need programmers who understand GUIs like Windows and databases. And if the programmer also understands 1-2-3, then you have a big head start, Wilson said.

Johnson & Higgins currently has six full-time developers plus two consultants creating applications. The company intends to double the size of its staff as it deploys Notes in 50 remote offices spanning four countries.

But while Johnson & Higgins programmers are generally happy with the functions in Notes, they said they hope that Lotus or another third-party vendor will provide a more robust set of programming tools.

Wilson said there is no editor within Notes, which means Johnson & Higgins cannot place all of its application development code in one place in order to search and replace objects. Instead, Notes code resides in a field within the application. When Johnson & Higgins wants to change that code, it has to access every field. However, a field dictionary function is available to allow developers to share code across applications.

Wilson added that he would like to see some more flexible tools, with capabilities similar to those in Microsoft Corp.'s Visual Basic. With this capability, Wilson said, he could create forms, which would greatly enhance his ability to eliminate paper-based systems at Johnson & Higgins.

Wilson said that maintaining Notes applications can also be hazardous because Lotus does not provide any tools to examine and repair database files. Instead, he has to turn to Lotus personnel to use proprietary tools, which Lotus will not distribute to customers. As a global company, Johnson & Higgins finds this arrangement somewhat disturbing.

"We once had an office tied up for an entire weekend because Lotus was closed. I want Lotus to either give us the tools or stay open 24 hours, seven days a week," Wilson said.

Because of these caveats, Wilson said he has to restrict who can create Notes applications. Individual offices can create Notes databases for internal use, but any application that will be shared across servers has to be approved by the New York headquarters.

Despite these issues, Johnson & Higgins, which is expanding its New York facility to add more servers, will continue to invest in Notes.

Headache cure

In the near future, Version 3.0 of Lotus' Notes should greatly simplify a lot of the administrative headaches associated with creating and running Notes applications, according to Johnson & Higgins officials.

"Administration is very complicated and intensive in Notes. A lot of people underestimate this when they move to Notes. You have to realize that all the communications paths must be predefined. You have to program which server is going to replicate to which server, and when," said William W. Wilson III, Johnson & Higgins' vice president.

In Version 3, which Wilson said he will deploy by August, there are more than 300 new settings designed to make this process much simpler to implement. The arrival of these settings will also mean that he can add notification services to Notes in case of a server failure. "Right now you have to do what I call proactive server log searches to find out what's wrong," Wilson said. —*Michael Vizard*

On Site

Johnson & Higgins
New York

Challenge: To decentralize IS structure.

Technology: Lotus' Notes.

Benefits: Elimination of New York headquarters as information bottleneck.

Uniface to port tools for Mac, HP 3000

By Jean S. Bozman
ALAMEDA, CALIF.

Uniface Corp. announced that it plans to port its independent database management system tools to the Apple Computer, Inc. Macintosh for the development of client/server applications by year's end. At the same time, the $50 million company said it had moved to support Hewlett-Packard Co.'s Allbase/SQL database on HP 3000 computers.

The announcements came on the eve of last week's Uniface user conference in Dallas, which several hundred top users were expected to attend. Many of the users bought Uniface to write database-independent applications for large corporations, industry analysts said.

Uniface was set to outline its plans for Version 6.0 of the Uniface tool set to the user conference, according to sources. The company's fourth-generation language is used to create applications that run against many brands of relational databases.

Uniface said earlier this month that the Apple Macintosh version, which will ship by the end of this year, will support the native Macintosh graphical user interface. The Macintosh version will support Apple's System 7 operating system and Novell, Inc. networking software for the Macintosh. Uniface did not disclose the price of the Macintosh software.

The HP version for Allbase/SQL and TurboImage databases running on HP MPE/IX machines will be available in the third quarter of 1993. The new version complements earlier Uniface products for HP Unix machines, Uniface said.

The HP-compatible Uniface tools range in price from $2,500 to $250,000, depending on the computer configuration used. The database-specific software drivers for HP machines are priced from $750 to $40,000.

Garry Ray

In simple terms

Recently, I had a talk with some of my *Computerworld* colleagues about the term "client/server." It's probably a discussion you've had in your own office. It may have left you with a similar feeling of deja vu and exasperation. No, not exasperation with your colleagues, mind you, but exasperation with the onerous task of discussing the universe.

That's the problem with the buzzterms of the 1990s. They mean so much but explain so little. High-wire consultants seed the lingua franca with terms such as "client/server," "object-oriented" and "re-engineering." But the terms, which are sufficiently vague and all-encompassing to ensure repeat consulting contracts, leave much to the imagination.

That's great if you're a consultant because solutions to the ineffable have always been hot commodities with us humans.

But none of this goes over too well in a business office, where people tackle enigmas such as the

Ray, *page 82*

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Apple writes script for developers

By James Daly
SAN FRANCISCO

One of the more widely anticipated introductions at Apple Computer, Inc.'s recent Enterprise Computing Conference was the announcement of a $199 developer's tool kit for AppleScript, the System 7 software extension designed to allow tight interapplication communication.

AppleScript enables the creation of sets of automatic functions through written instructions known as "scripts." Applications can then be used as building blocks and tied together to link services and create new customized applications, according to Kirk Loevner, vice president of Apple's Developer Group.

One example could be the automatic linking of applications to retrieve inventory data from a server, generate a formatted report, compare the data to predetermined inventory levels and then automatically generate a purchase order for items in low supply. A custom front end would make the connections transparent to the end user.

AppleScript can thus be used to control an organization's information and work flow, simplifying many tasks that are difficult in a distributed environment.

Although AppleScript was designed for users at all levels of experience, Loevner said developers, systems integrators and consultants creating customized applications will probably take the greatest advantage of the scripting capabilities.

AppleScript-enabled versions of such favorites as Microsoft Corp.'s Excel, Claris Corp.'s Filemaker and Aldus Corp.'s PageMaker have been appearing for months, with dozens more expected soon. A retail edition aimed at in-house developers will appear later this year.

The developer's tool kit includes runtime software, a script editor and an editing and recording utility for creating and changing scripts. It also includes a prototype of the Japanese script dialect.

Acquisition opens door to client/server

By Garry Ray

Who said you can't teach an old dog new tricks?

On the heels of its recent entry into the client/server middleware business, Trinzic Corp. in Waltham, Mass., followed early this month with a new line of "business process automation" tools for Microsoft Corp.'s Windows and IBM's OS/2 Presentation Manager.

The tools, AionDS/Win, AionDS/PM and KBMS for Windows, have been available for IBM mainframes and a variety of midrange systems since the mid-1980s.

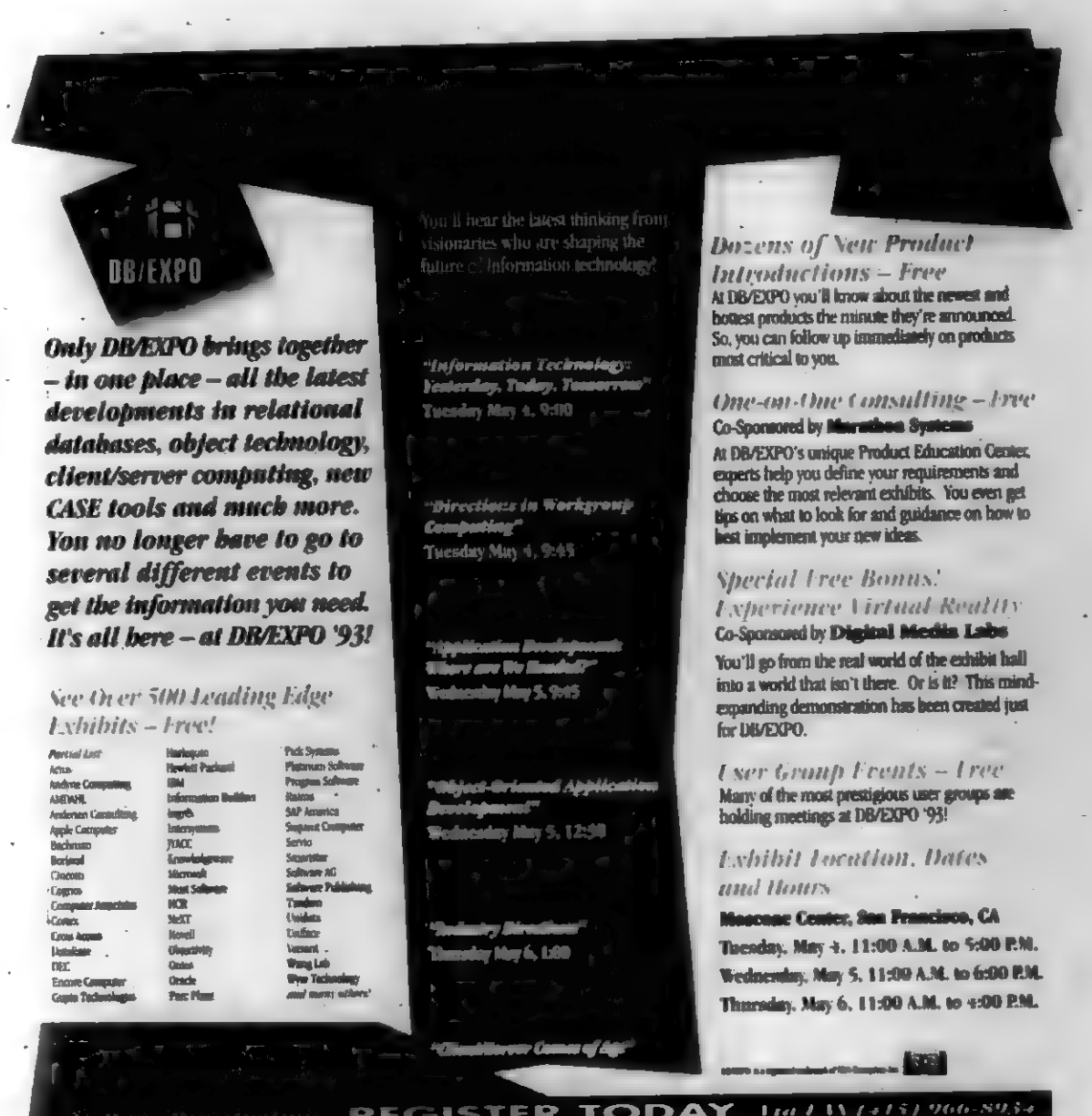
Trinzic, formed by the merger of expert systems firms AICorp and Aion Corp. in 1992, has been moving steadily into the emerging business process automation area since last year.

Business process automation generally allows complex business rules and methods to be included in an application through a high-level language. For example, a credit approval program would include a number of business rules suitable for business process automation.

Trinzic's tools, derived from the mid-1980s heyday of artifical intelligence and expert systems, have been revamped to work in the client/server world. The company signaled its interest in client/server development with the April 1 acquisition of Channel Computing, Inc., vendor of InfoPump database middleware and Forest & Trees, a front-end database query tool.

Trinzic Vice President Fred Lizza said InfoPump will fit in with Trinzic's new business process automation offerings. "InfoPump applies equally to KBMS and AionDS, as well as the broader range of client/server tools," he said.

Analysts said Trinzic's move will satisfy existing customers, but "it remains to be seen [if others] will move to expert systems technology" in the client/server world, said Andrew Ware, a product analyst at International Data Corp.



Ray

CONTINUED FROM PAGE 79

potential utility of straightened paper clips.

"So you're saying that everything is client/server, and everything should be object-oriented? And we'll have to destroy the company before we start using this stuff? Right."

Hey! Don't kill the messenger. I'm just telling you what these consultants have been promoting.

If you want to get low-level, try the "angels-on the heads of pins" discussion over in Internet's comp.object conference. There, core object-oriented concepts — such as inheritance, polymorphism and encapsulation — are interminably debated with religious fervor. That's why I thought it was open season and that "object-oriented everything" would succinctly cover the topic in everyday conversation. Not.

OK. So we all agree that the "everything is everything" approach probably won't get your point across. It may get you a promotion to the marketing department or impress your colleagues with your "strategic" vision, but it won't boost your technical image.

So, you take another tack, this time harkening back to those wild and woolly days of 1982, when the computer was *Time* magazine's "Man of the Year."

Being in the computer biz, you remember how grandma, the babysitter and the grocery store bagger began pestering you with questions like "What's a CPU? What's a floppy? What's a RAM?" The year 1982 may have ended for you with sudden bouts of amnesia, unusual mental maladies, burning pots on the stove. "Sorry, I can't answer that. Gotta go!"

As for "client/server," I've reduced that to the microwave oven analogy. "You put your food in the oven and shut the door. That's the 'server.' Then you punch in the heat setting. The control panel is the 'client.' When the bell rings, you open the door. That's 'middleware.'"

The mid-1980s saw the release of the "analogies to everyday objects" approach to technology education. With this technique, you compared computer technology to, say, a toaster oven. "The heat in the oven is like the 'RAM' in your computer. And the heating element is like the 'CPU.' When you turn on the oven, the memory gets loaded with 'heat.'"

Sometimes it worked, sometimes not.

Where it will work is with the massively vague terms of the 1990s. Think of it. Isn't everything "object-oriented?" "Object-oriented is like heavy metal music: You take two chords and "reuse" them in different songs. The music is "polymorphic" because only the most vile heavy metal lyrics can be sung to the hideous chord combinations. The lyrics won't respond to, say, a Bach oboe concerto.

As for "client/server," I've reduced that to the tried and true microwave oven analogy. "You put your food in the oven and shut the door. That's the 'server.' Then you punch in the heat setting. The control panel is the 'client.' When the bell rings, you open the door. That's 'middleware.'"

I haven't tried this on anyone yet, but I'm sure it will be a hit with my mailman. Well, maybe with a bit of fine-tuning.

If it doesn't do the trick, I have the ultimate solution: I'll just "re-engineer" it. That's like blowing it up with dynamite.

Whoops. I think that's getting too technical, don't you?

Ray is a *Computerworld* senior editor, application development.

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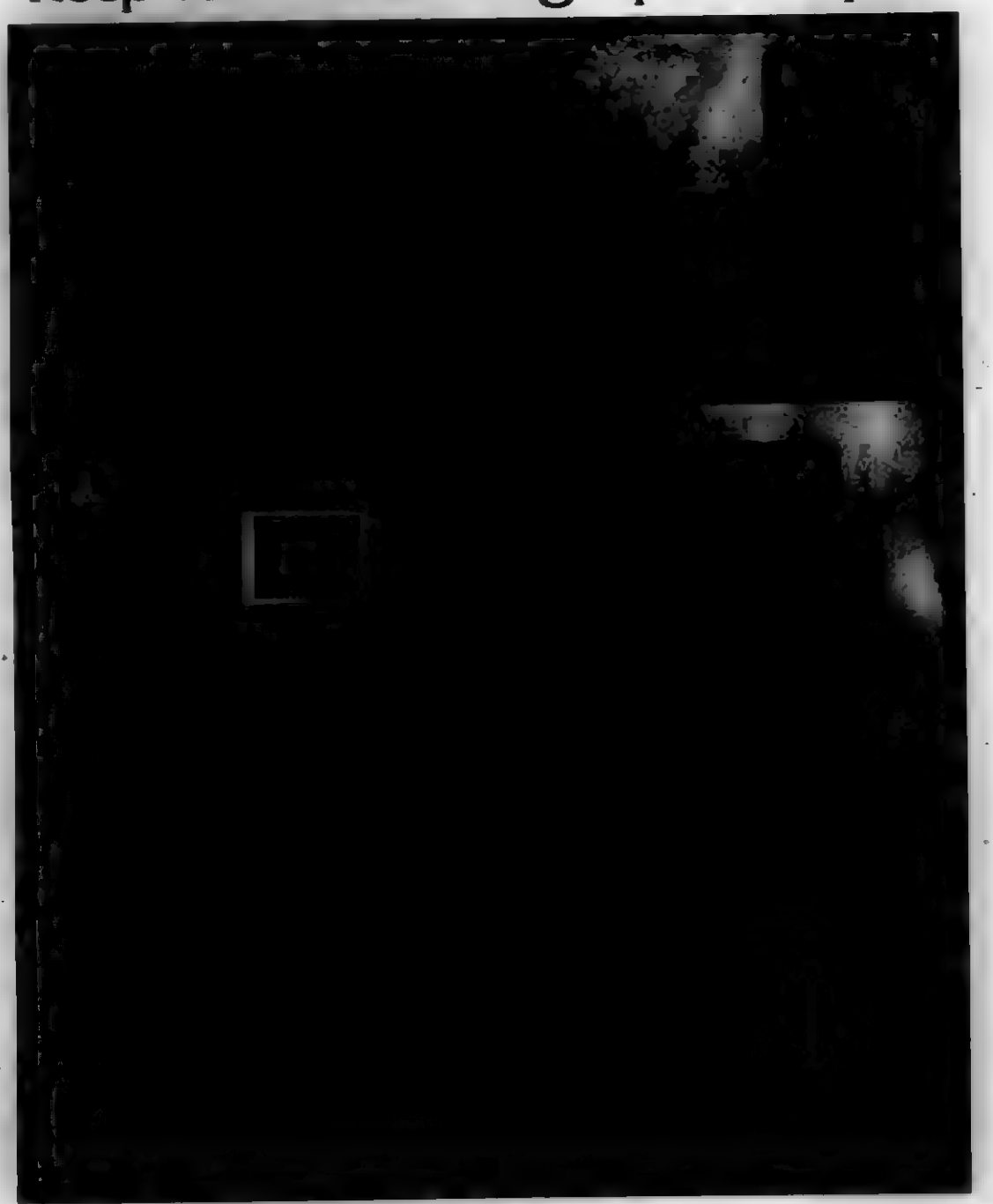

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Languages

Computer Innovations, Inc. has introduced C++ Version 3.0, a development environment designed for Intel Corp.'s x86 platforms running Unix System Laboratories, Inc.'s (USL) System V Release 4.2.

The environment comprises a windowing editor, dynamic source debugger and USL's C++ Language System Release 3.0. According to the company, the product can significantly reduce the operations needed to develop quality C++ programs.

Computer Innovations' C++ supports templates and uses a new compiler technology designed for the Intel I486/Pentium platform.

A single-user license for C++ Version 3.0 costs $695.

▶ *Computer Innovations*
980 Shrewsbury Ave.
Tinton Falls, N.J. 07724
(908) 542-5920

Computer-aided software engineering

Michaels, Ross & Cole Ltd. has released Version 4.0 of the MRC-Productivity Series fourth-generation computer-aided software engineering tool for IBM's Application System/400. Enhancements have been made to the rapid application development, application integration, template programming and report formatting capabilities, the company said.

Users can integrate MRC-generated applications, including inquiries and graphics, reports and non-MRC routines and programs. The product offers a batch job stream facility, improved runtime performance for several report applications and context-sensitive User Interface Manager Help support.

Prices range from $4,000 to $65,000.

▶ *Michaels, Ross & Cole*
Suite 203
450 E. 22nd St.
Lombard, Ill. 60148
(708) 916-0662

Application development tools

Data Access Corp. has released DataFlex for OS/2 2.0, an application development system that includes an object-oriented fourth-generation language and a relational database management system.

Features such as application generators, an event-driven user interface and a complete set of tools and utilities to build mission-critical applications are also provided, the company said.

A multiuser license costs $1,450.

▶ *Data Access*
5753 Miami Lakes Drive, East
Miami Lakes, Fla. 33014
(305) 238-0012

Software Eclectics, Inc. has announced SE/One Version 3.2, a Cobol re-engineering, enhancement and understanding tool.

New features include PC Cobol processing and the ability to highlight date operations in a program with a D-RAY feature.

SE/One works within Microsoft Corp.'s Windows interface and can be used on batch or CICS programs, the company reported. The product also provides the capability to be used for Quality Assurance for new Cobol programs and for conversion and maintenance for older programs.

SE/One costs $290 per user and requires a PC running Windows 3.0 or greater.

▶ *Software Eclectics*
730 Starcrest Lane
Marietta, Ga. 30066
(404) 926-3331

Product shorts

Pure Software, Inc. has announced PureLink, a stand-alone incremental linker designed to reduce build times by more than 90% and speed software development in C and C++ environments. Cost: Starting at $10,000. Pure Software, Sunnyvale, Calif. (408) 720-1600. . . . **Videotex Systems, Inc.** has introduced Version 3.5 of T-Base, an imaging library that allows users to add document images and pictures to database management applications written in C, C++ and most Xbase dialects. Cost: $495. Videotex Systems, Dallas (214) 343-4500.

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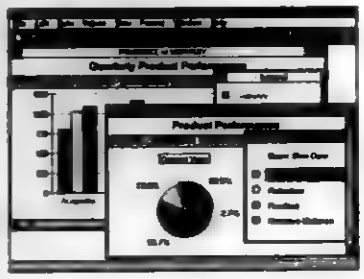

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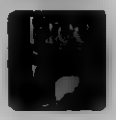

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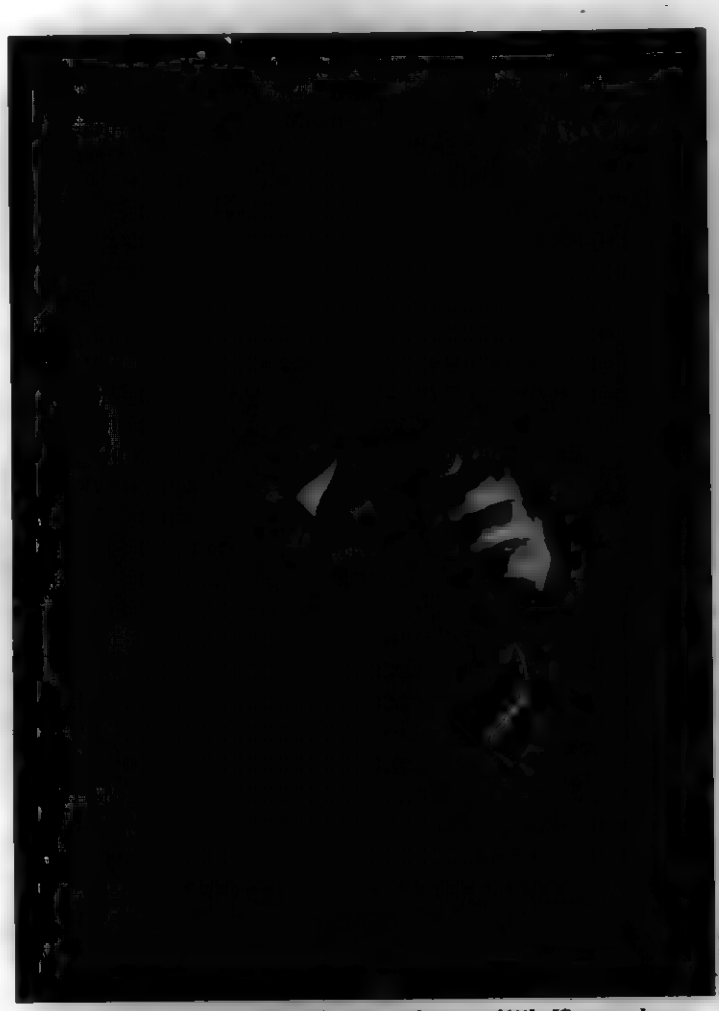


▶ **Stanley Pharmaceuticals' David T. Howard** *says a little IS goes a long way: 'You don't orient yourself to traditional solutions'*

STUART MCCALL

"OK, IS pros, listen up. Some of you are looking pretty decent out there. But I don't need to remind you that it's a new ball game, the competition is murder, and it's a long way to the top. The organization has a lot of money tied up in you and your equipment, so we need you to keep making those clutch hits.

"You're gonna need to work on the fundamentals, especially technology. And it wouldn't hurt if you brought some new paying customers into the ballpark and kept them happy. But remember: We want solid team players, not superstars.

"I assure you that anyone who ignores me will not be invited back next spring. If you have any questions, I'll be in the dugout with the laptop. Now get out there and PLAY BALL!"

By Joseph Maglitta

THE PEP TALK MAY BE IMAGINARY, BUT THE message is all too real: Top corporate bosses want more bang from technology, and soon.

Pressured by cost-conscious boards and customers, encouraged by a taste of success and enthused by a new hands-on interest in computers, top executives are more excited about — and more demanding of — information technology than ever before.

EXCLUSIVE SURVEY

A new *Computerworld*/Andersen Consulting survey of 203 chief executive officers, chief operating officers and chief financial officers found a growing belief that information systems should play a bigger, more potent role in U.S. corporations, especially in boosting market position and profitability.

"The faster you go, the faster you want to go, and the less forgiving you are when you're not going," says John B. McCoy, chairman of Banc One Corp., a 63-bank holding company based in Columbus, Ohio. "Some of our deals are pure technology."

Indeed, the most dramatic increase in this year's survey was among those who strongly agreed with the statement: "IS holds the key to competitive advantage for my organization in the 1990s." That percentage more than doubled during the past two years, to 57%.

Yet many top executives remain dissatisfied with huge IS investments, which now total hundreds of millions of dollars or more each year for the largest organizations, and are accelerating efforts to wring more zing from carefully targeted technology projects.

IS "has spent the last decade very aggressively selling us on the value of their functionality and purpose," says Luther F. Carter, executive director of the South Carolina State Budget and Control Board. "My role is to continue to ask them to push that envelope."

Fewer than half (48%) of the respondents said they are getting their money's worth from their organization's IS spending. While that's a slight improvement over 1989, it's all but unchanged since our last survey on the topic in 1991.

But wait, you say. Hasn't management been howling about performance and the high cost of computers since ENIAC? That's their job, for Pete's sake.

What's new is an unprecedented urgency to turn technology into dollars, or at least to have IS play a big — and growing — role in advancing

key corporate goals, promoting change and staying ahead of the pack.

"We're in an industry that is increasingly commodity pricing-driven," says Shawn Poole, CFO at Carolina Freight Corp. in Cherryville, N.C. "One of the differentiators is the technological support and information that we can provide to our customers."

IS gets good grades

The push to make IS a heavier hitter is understandable. This year, U.S. corporations will spend more than $200 billion on computers, telecommunications and related services, making technology by far the largest capital expense for business.

Despite this staggering outlay, clear payoffs are often maddeningly difficult to measure and achieve. No wonder top bosses are hesitant to pour unrewarded money into a technology black hole, especially when other departments are gasping for breath. A recent Deloitte & Touche survey of 500 companies found that IS budgets were expected to grow a paltry 1% in 1993.

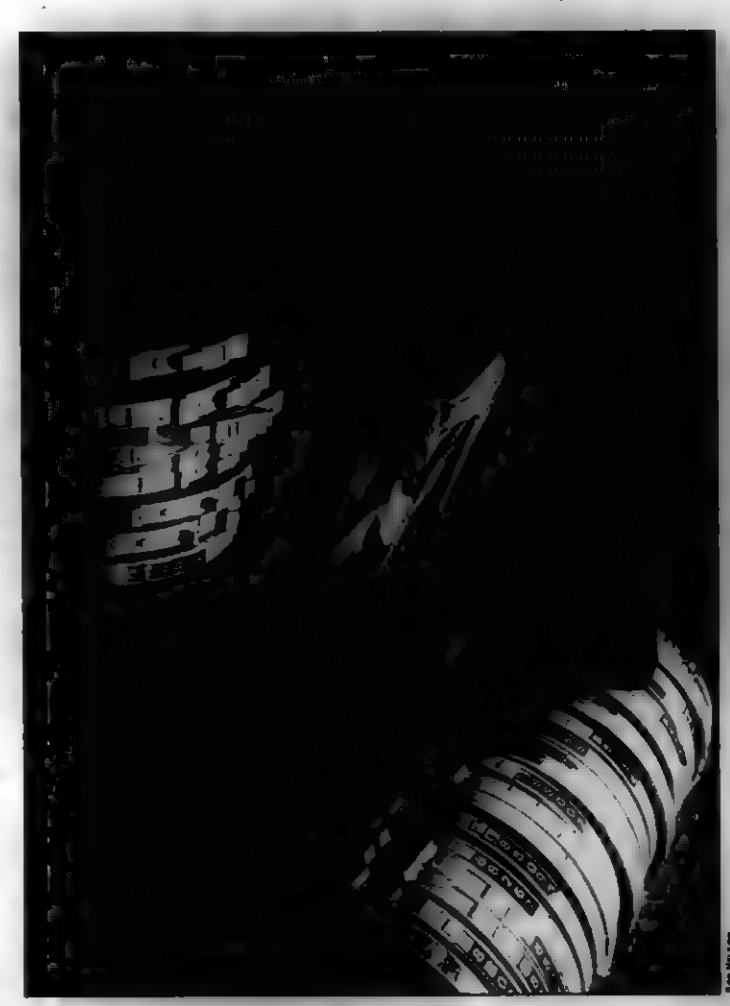
Not that IS professionals are doing such a bad job. On the contrary, nearly two-thirds of respondents rated their organizations' IS functions as "very good" or "good." Add "average" rankings, and the figure climbs to 91%.

Bosses surveyed applaud the solid job IS is doing in raising responsiveness to external customers, shoring up company financial soundness, improving the quality of products and services and even driving innovation. Many acknowledge that technology is a must-have for mere survival.

"You need to have state-of-the-art application systems and capabilities just to stay in the game," says Belinda Morgan, head of operations at Bank South Corp. in Atlanta.

Still, a definite if sometimes fuzzy conviction persists that IS should be doing *more* to help the bottom line and grow the business. (Whether that's realistic is another matter, of course.) So corporations are pushing ahead to find the unique approach that will help turn their millions of instructions per second into dollars and market leadership.

It's no exaggeration to say that the outcome of these efforts will deeply impact not only IS managers and their profession but also entire companies and the computer industry itself.



▶ **Bank South's Belinda Morgan:** *'You need to have state-of-the-art application systems and capabilities just to stay in the game'*

ROB NELSON

New technology zealots

Ironically, until very recently, corporate heads were among the last big technology holdouts, especially CEOs in large companies. Many talked a good game but stubbornly resisted computers for themselves as too secretarial and time-consuming.

But top bosses aren't afraid of computers anymore. Our poll found 81% of top executives now regularly use PCs and/or terminals. That's nearly double the figure of four years ago.

Some executives, such as Finn M. W. Caspersen, CEO of Beneficial Data Processing Corp., a division of Beneficial Corp. in Peapack, N.J., are nearly inseparable from their machines. "I average about 200 [electronic-mail] messages a day," Caspersen says.

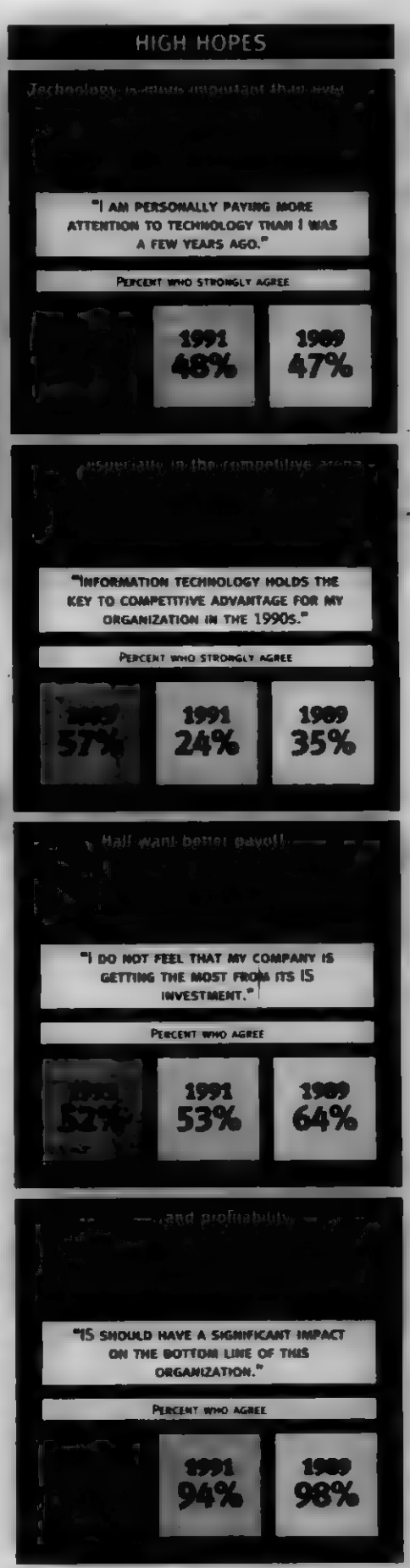
Another telltale sign: The number of executives with a "strong" interest in information technology rose 10% since our 1991 survey and now stands at 58%. Two years ago, 21% of executives could not even name a technology they considered key to corporate success. Today, that number has dropped to 7%.

Exactly how this growing hands-on use will affect future corporate technology direction is difficult to say right now. But it's surely another sign that the technology genie has fled the computer room forever.

Indeed, many nontechnical executives can now discuss groupware, client/server, imaging, rightsizing and other hot topics pretty smoothly. They may not know all the details, but they've got the buzzwords — and the message.

"You'd have to be brain-dead not to know the importance of technology," says the CEO of a booming Florida hospital chain now install-

Squeeze play, *page 88*



Source: *Computerworld*/Andersen Consulting telephone survey of 203 chief executive, chief operating and chief financial officers. Results represent percentage of all respondents surveyed.

Squeeze play

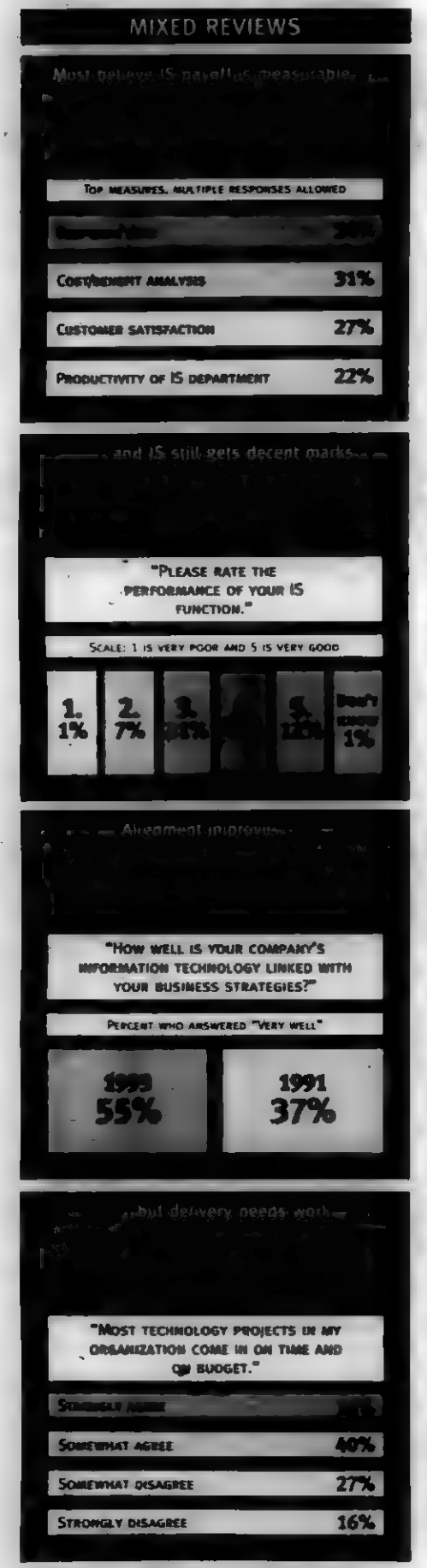
CONTINUED FROM PAGE 87

ing a 1,000-station clinical information system. Besides heavy spending and more hands-on use, several other factors are making technology hot in boardrooms, including a taste of success.

Many top executives speak proudly of past or current IS projects that speed customer services, slash turnaround times or simplify order entry and shipping, to name some favorites. In some cases, results have been dramatic.

At Beneficial, Caspersen boasts of speedy service enabled by IS. "If a customer calls up, we can make a credit check in about 60% to 75% of cases within 90 seconds," he says. Similarly, a joint venture between Beneficial, H&R Block, Inc. and the Internal Revenue Service uses CompuServe to process tax returns cost-effectively.

The bottom line, according to Caspersen, is this: "We are able to deliver products that we couldn't before and our competitors cannot now."



Source: Computerworld/Andersen Consulting telephone survey of 203 chief executive, chief operating and chief financial officers. Results represent percentage of all respondents surveyed.

How they're pushing ahead

So how are corporate leaders parlaying stronger interest in technology into a nice, flashy highlight for the company's annual report? Many are pushing aggressive actions that both embolden and terrorize IS departments and managers.

Among the key tactics for bringing more potent IS into the corporate mainstream are the following:

■ **Applying the payoff test.** The belief is stronger than ever that technology projects should have a definite payoff if they are to get funded. Bruce Marlow, COO of Progressive Insurance Co., typifies the new, tougher stance. "We're not going to do things because they look exciting any more," he explains. "If it doesn't improve service and reduce cost, it's not a good idea."

At Citgo Petroleum Corp. in Tulsa, Okla., CFO Steve Berlin says the trend is to reduce and maximize — not increase — computerization. "In some departments, instead of PCs-per-employee, we keep an eye on employees-per-PC."

Some executives have become pretty adept at making a little technology go a long way. Two years ago, for example, Stanley Pharmaceuticals Ltd., Canada's largest retail brand drug maker, scrapped an 8-year-old minicomputer and IS department in favor of a local-area network-based approach.

Today, David T. Howard, company president and general manager, credits the move with helping the North Vancouver, British Columbia, firm triple annual sales. Stanley's tiny two-person IS staff is now tackling forecasting and electronic data interchange systems.

■ **New metrics.** Bosses are also showing more interest in new ways to gauge technology's payoff. Three-fourths agreed that IS benefits are measurable; nearly all say they use a blend of "soft" and "hard" factors.

Many companies continue to search for better yardsticks to determine whether technology dollars are well spent. Instead of traditional cost and speed methods, they seek new metrics to assess the effect of IS on key areas — notably, customer satisfaction, user-friendliness, return on investment, data accuracy and information exchange among departments.

But there's a growing sense that IS should be judged as part of the whole project, not strictly on its own.

"When you try to measure the IS product in isolation," Marlow says, "that's an impossible task. But if you measure its impact on the total business process, it becomes fairly simple to see. Either your transaction cost went down or it didn't. Either your service level went up or it didn't."

▶ **Citgo's Steven Berlin** *says smart, mature companies are moving to decrease the amount of computer equipment that rolls in the door*

EXCLUSIVE SURVEY

■ **Outsourcing.** While interest in farming out some or all of a company's technology functions seems to be leveling off, it's far from dead, especially in big organizations.

Forty-one percent of firms polled now do some IS outsourcing — a modest 7% rise from 1991. One-fourth of the companies not currently outsourcing say they plan to do so.

By hiring out mundane, resource-gobbling tasks such as payroll, billing, maintenance and even programming, executives say they hope to free costly IS staff members for higher payoff work. But there's an even more basic and compelling reason: saving money.

Bank South has outsourced computer operations to IBM's Integrated Systems Solutions Corp. unit since July 1989. "It's worked wonderfully," Morgan says. She declines to enumerate savings but says outsourcing lets the bank's 80-person IS staff focus on strategic IS planning, telecommunications and applications development.

■ **Re-engineering.** Undoubtedly the biggest hope of transforming IS from utility player to an all-star rests with business process redesign, or "re-engineering."

Through the high-profile proselytizing of consultant Michael Hammer and glossy articles in *Business Week*, *The Harvard Business Review* and elsewhere, "re-engineering" has become a familiar word in many corporate boardrooms. Some 71% of respondents said their organizations are now engaged in business process redesign. Few expect technolo-

Title tales

Executives usually saw eye to eye, but there were some differences.

■ **PC use:** CEOs averaged only about 64% use, roughly 20% less than other titles.

■ **Linkage:** CEOs (64%) thought IS alignment was "very closely linked" with business, compared with COOs (51%) and CFOs (52%).

■ **Measuring IS:** More CEOs (82%) and COOs (86%) said IS could be measured, compared with only 64% of CFOs.

Almanac

IS performance: Wholesale firms had the most "very good" ratings for IS (50%), followed by transportation (42%) and insurance (34%).

Competitive advantage: Most agreement was in transportation (86%), followed by health care (69%) and consumer products and government (66%).

gists to lead, but most bosses want IS to show up early and play hard the whole game.

These diverse efforts have done much to promote widespread popularity of "cross-functional" teams — groups of professionals from sales, human resources, marketing, IS and other disciplines that unite for specific projects. Many executives and consultants say such teams offer the brightest hope yet for finally fusing IS with business goals.

Carolina Freight now uses the team approach and loves it, Poole says. "It's not one of these things where operational guys dump the problem onto the data processing guys and they go back into the laboratory and work on it for awhile and come back and say, 'Here's your solution.'"

For this kind of collaboration to work, executives insist that IS pros must be solid team players, not oddballs or prima donnas. "I don't like superstars," declares Guenter Rohrmann, CEO of Air Express International Corp., echoing a popular sentiment. "Superstars are people who come up with ideas and then give you something you can't use." Like most chiefs, Rohrmann says he values solid day-to-day performance above all.

■ **More control of IS.** Management in many firms is also trying to better harness corporate technology by taking more direct command of IS functions. Today, nearly as many departments (36%) reported to CEOs, COOs or business unit heads as to CFOs.

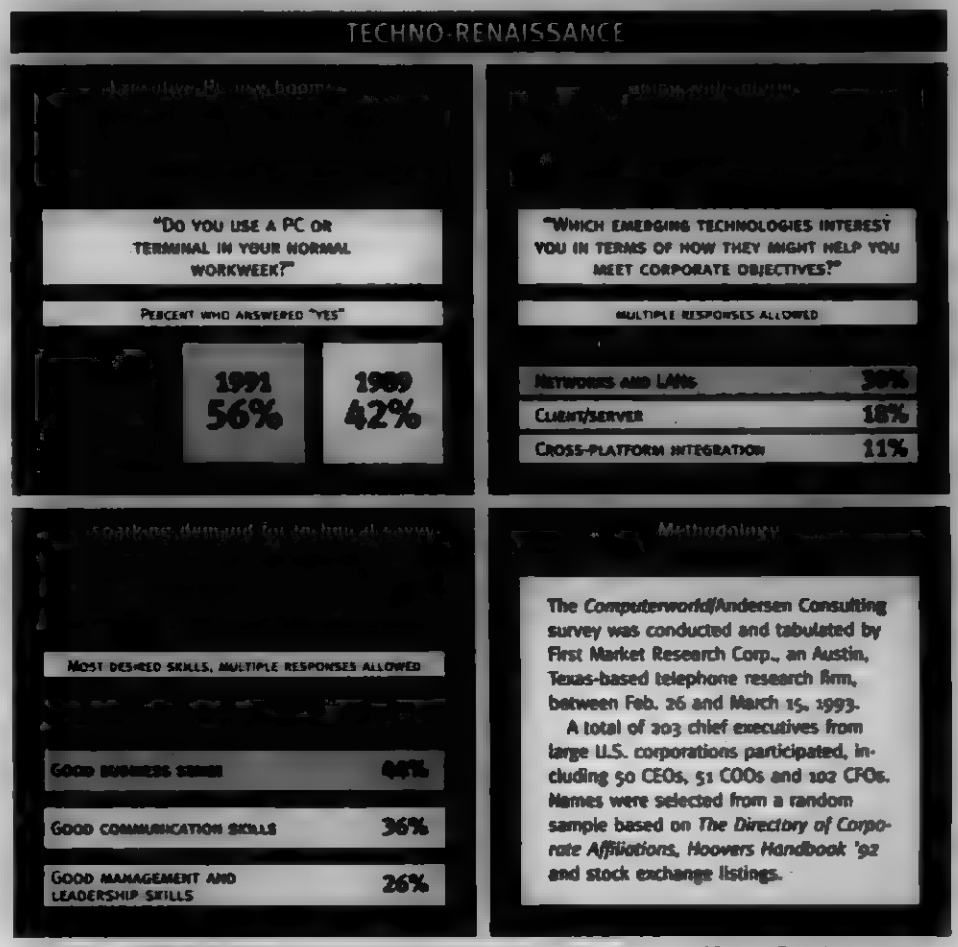
In some cases, including 3M Co. and Citgo, CFOs have replaced CIOs who retired, were fired or were reorganized out of jobs. Berlin says, "Some of that is the reaction to the realization that [IS] not the be-all and end-all." The trend is expected to continue.

■ **Firing CIOs.** Executives aren't shy about taking their final recourse: firing CIOs.

Four years ago, the big question in IS circles was whether CIOs would make it to the executive suite. Today, it's whether they'll make it to the end of the year.

In case you need reminding, top technology executives are being booted in record numbers. Accord-

Squeeze play, *page 91*



Source: Computerworld/Andersen Consulting telephone survey of 203 chief executive, chief operating and chief financial officers. Results represent percentage of all respondents surveyed.

Computer industry chiefs: 'Don't give up yet'

■ Computerworld recently asked the heads of the some of the world's largest computer companies to address top executives' concerns about the payoffs of the billions of dollars in information technology spending.

Charles B. Wang, chairman and CEO, Computer Associates International, Inc.

"I think there's a fundamental disconnect between CEOs and CIOs. It's an issue which the business community is starting to address. CIOs as technology people don't think they're an integral part of the business. If that's the case, you end up with a disconnect. CEOs don't draw in CIOs to make business decisions, and CIOs don't draw in CEOs to make technology decisions.

"I think there's really one benefit [of IS]: The ability for a business to have a competitive advantage. Certainly computers have changed the way we process and use information. With that, obviously, you have a better bottom line."

Interview by Thomas Hoffman.

James Ambras, chairman, Oracle Corp.

"CEOs who have been around have seen an ever-increasing requirement to invest. Their budgets are going up, but they are unable to relate that budget directly to better IT systems. They don't see a direct correlation and are asking, 'Can someone show me that this extra million dollars is going to earn me a cost savings somewhere else?'

"Second, every chief executive feels, these days, that he has to do quantifiable strategizing. They feel they can get better data and better strategy with all this automation, but the problem is that the information is not available quickly from their systems. It's easy to get data but hard to get information. They're not able to transform data and apply it to strategic decision-making.

"As people downsize, they can see that going from two data centers to one saves X

Charles Wang

number of dollars. But while other kinds of IS payoff should be measurable, they aren't, always. To make measuring easier, companies have to define what they want out of the systems and enforce discipline. Adopt zero-based IS budgeting, where a CEO says, 'You show me the impact of this spending or we're not going to spend more next year.'

"There's another [benefit]: strategic thinking. This isn't very measurable, but there is other fallout from good IS. For example, using IS effectively might allow a company to discontinue what it discovers is an unprofitable line of business. Or, a company might find new products or services that are only enabled by information services. *That's* where the big payoffs can occur, in the right combination of human thinking and IS."

Interview by Kim S. Nash.

Jim Manzi, chairman, CEO and president, Lotus Development Corp.

"To get the most from their intelligent technology investment, organizations must reexamine their concepts of business systems and redefine what is strategic. The focus must be on developing business systems which will increase market share, retain customers and increase market leadership.

"The promise of this reevaluation is that it can meet fundamental needs in new ways, ways that bring greater coordination and information sharing even in a disconnected world and that ultimately lead to real, tangible gains.

"I believe that payoff is measurable, especially for cases in which information technology adds value by applying itself to do entirely new things: In other words, to do entirely new things rather than downsizing old things.

Jim Manzi

"To gain a measurable payoff from information technology, companies must take a hard look not just at the cost of their technology investments, but also at whether the cost can be justified by real, tangible economic gains."

Interview by Jodie Nass.

Reto Braun, president and COO, Unisys Corp.

"A lot of sales over the past 20 years have been made because of the buzzword 'technology.' User companies are watching their spending carefully, and buzzwords won't cut it anymore.

"What we have done is measure the savings of labor for customers, but that is not the measure of the future. The savings in the future will be time savings and reductions in time to market [as IS applies to end-user products and services]."

Interview by Thomas Hoffman.

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Squeeze play

CONTINUED FROM PAGE 89

ing to the new Deloitte & Touche study, CIO turnover at companies with revenue of $5 billion or more hit 25% in 1992. One out of every three CIOs, according to the firm, took over for a predecessor who was fired.

Fortunately, steering committees, long-range planning and other efforts to better align IS and business seem to be paying off: A full 91% of those executives polled said their company IS and business strategies are "very or somewhat" linked.

Top executives may not know exactly what they want or how to get it, but their expectation of you is clear: Be a technology expert.

The ability to understand new products and technology directions was cited by 59% of respondents as *the* most desirable skill for IS managers, followed by specific knowledge of the company business.

General management skills, such as good communication, leadership ability and organization, were a strong third.

This renewed focus on technology represents an important change in direction from the mid-1980s, when IS people constantly exhorted staff to "learn the business!" While that's still a necessity, executives say neck-snapping changes such as client/server, object orientation, groupware, mobile computing and others have swung the pendulum back to basics. "You're not looking for textbook- or cookbook-type solutions or solutions that are in the ads from computer makers," Marlow says. "You need somebody who can say, 'I can understand what you're trying to do here with these customers and these workgroups, and here's a unique combination of technologies that might really work for you.'"

In the trenches

Direct report: The CFO is still the most popular choice for a CIO's boss, with 39% of the respondents holding that position. Overall, 15% report to the CEO and 17% to the COO.

Leaders: Wholesale companies lean more toward having IS report to the CEO (50%) than many industries; transportation and financial services have the next highest amounts, with 43% and 36% of IS divisions, respectively, reporting to the CEO. Government comes up last, with only 6% of their IS heads reporting to the CEO.

The message is clear: Top IS managers must become switch hitters, equally adept at technology, business and general management.

Game over?

Say you're an IS manager who's smart and motivated enough to evolve into a new kind of techno-brilliant team player. What then?

Better straighten your cap because executives say they have no intention of easing up. In fact, many warn that pressure will rise as technology becomes a bigger and more important part of corporate strategy.

"Anything we can come up with is pretty easily duplicated within six months to a year," says Carolina Freight's Poole. "So you've got to continue coming out with more innovations."

It's the dustiest truism in business and sports, but some observers say that situation offers huge challenges and possibilities for IS professionals.

Banc One's McCoy notes there are worse places to be than in a highly pivotal function such as IS. "If I could be on any side of the business, I'd rather be on that side than saying, 'Gee, I don't think they need us anymore — they never call.'"

Still, troubling trends loom. A growing number of organizations, including Air Express, Banc One and Progressive, say it's easier to train nontechnical people in IS, and they have chosen technology chiefs from operations ranks. Others are likely to follow suit.

"We can take line people and make them technology people," McCoy says. "It's harder to take technology people and bring them into the line." Some observers suggest IS will split into two classes: business specialists and what one COO termed "technical barbarians."

One thing is clear: IS professionals have no future if they don't learn to think like the state of South Carolina's Carter. "IS sees the process [of building a system] as an end," he says. "I see it as a means to an end."

After years of hard work, IS pros have finally made it to the major leagues. Whether they become Hall of Famers or has-beens will be decided in the next few seasons.

Batter up. ■

Carol Hildebrand, associate editor of management, and Ellis Booker, senior Midwest correspondent, contributed to this report.

Don Monaco

The CIO's new clothes

Clawing a competitive edge out of today's extremely challeging marketplace isn't easy, and the last people to deny that should be CEOs.

But they still want more. The *Computerworld*/Andersen Consulting survey finds that less than half the respondents believe they are getting their money's worth out of their IS investments.

Yet more than half agree that "IS holds the key to competitive advantage," and nearly all agree that "IS should have a significant impact on the bottom line of this organization."

While this disparity may be discouraging, it also opens wide the doors of opportunity for those creative executives who grasp their crucial role in re-engineering their organizations — and who have the creativity and ability to take their role beyond its typical boundaries.

Perhaps before you begin to think about redefining or expanding your role, it would make sense to step back and consider how you define "value." It would not be uncommon for most CEOs, without giving the question extensive thought, to relate value to their organization's bottom line.

But the bottom line cannot always be dissected and analyzed as a solely financial element. Successful organizations realize that their customers hold the key to the company's bottom line. This may be among the reasons why more than 70% of the survey respondents said they are re-engineering to make the drastic improvements necessary to succeed in today's volatile marketplace.

And this is where you, the IS executive, enter the picture. No one else is better positioned to assist CEOs in ensuring that technology is applied innovatively so that an organization's re-engineering efforts result in the integration of its strategy, business processes and people.

If an organization is considering re-engineering, or if it has already begun the process, the time is ripe for IS executives to help their CEOs realize that IS performance should not be gauged solely on traditional speech and cost measures. Instead, it should be gauged on a more intangible element — how technology can be used to help better serve the customer.

It is also the most opportune time to start changing the long-held perception that IS executives lack crucial skills — business knowledge, interpersonal communication skills and the ability to apply current technology to address business.

Redefining the CIO role

How do you tell if re-engineering is being considered? Several sure tip-offs include significant changes in customer demands, rumors of rightsizing or downsizing and significant turmoil or upheaval in the organization's industry.

If any of these indicators are obvious, you must take the initiative to familiarize yourself with your organization's position on re-engineering by talking with senior executives and others in the know.

You must go beyond the typical boundaries associated with IS and investigate what re-engineering projects are in the queue or are being conducted in the organization.

You must ask questions such as: "How will these plans/actions ensure that we gain the ability to achieve continuous improvement? What abilities do we have in-house that could be put to use on true re-engineering activities vs. day-to-day operations?"

The next step is to become an adviser to the CEO, providing sourcing guidance and options, helping to determine where focus should be placed and how value can be added to the organization — to its products, services and customers. How? Finding the answer to this is unique to each company. But some of the following suggestions may help guide the way:

- Involve yourself in ongoing planning and implementation processes, specifically in regard to how the most appropriate technologies can be implemented across the organization.
- Become heavily involved in deciding on any outsourcing — be it IS or a line business unit.
- Actively begin to build relationships with current and future customers and suppliers.
- Become more aggressive in sharing expertise by speaking in layman's terms about customer demand, increasing productivity and improving flexibility.

In effect, you must become a judge of where the organization should turn to ensure access to the necessary skills and capabilities that are not found in-house.

You can help bring an organization's business processes into focus and determine how best to eliminate or outsource what falls out of the frame. This will close the process gap by forcing organizations to manage their business processes in a new way.

By recognizing and accepting that drastic improvements can be made by changing the focus of strategy, organizations will be better able to see how they can compete in the global marketplace, maximize their return on investment and productivity and keep their clients happy.

Monaco is managing partner at Andersen Consulting.

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70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./Retailer
99. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
18. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
99. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/ communications systems?
(Please check only one)
☐ YES ☐ NO

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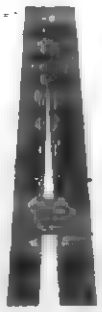
CEO Interview

'Oz' Nelson

Count on technology

After a long decade, the chairman of United Parcel Service makes technology pay off big



fter watching rivals Federal Express Corp., Roadway Express, Inc. and others use information technology to erode what was once nearly a monopoly, United Parcel Service, Inc. spent much of the last decade getting its technological ship in the air.

Between 1986 and 1991, the Atlanta-based carrier invested more than $1.5 billion in information technology. Installed PCs skyrocketed from 750 in 1985 to more than 56,000 now; CPU capacity jumped sixfold.

The payoff is starting to show up on the bottom line. The $16.5 billion, privately held carrier has watched its profitability continue to rise — even in a sluggish market. Net income last year was $765 million, a 9% increase over the previous year.

In February, Nelson — nicknamed Oz by a childhood friend in Kokomo, Ind. — was awarded the 1993 Excellence in Technology Award by Gartner Group, Inc. and The Conference Board.

Nelson spoke recently with Computerworld *Mid-Atlantic correspondent Thomas Hoffman.*

Rob Nelson

Kent 'Oz' Nelson, *55, joined UPS in 1959 and entered its executive ranks in the 1980s. He has been chairman and CEO since November 1989*

■ On IS budgets

We don't have a budget. Each project comes in individually, and it has to stand on its own merit. If it stands and we've got money, then I don't mind affording it. You have to have enough of those payback projects and efficiency projects or business development projects to get that revenue in to allow you to continue to grow.

As we find those, we'll keep adding people. If we don't find those, we'll hunker down and do the things we need to do to run a business and to keep competitive.

■ On project paybacks

We went through a period in our change to information technology where we could drum up so many projects easily that had paybacks. Now our corporate capability is so much that we can drum up more than what we can afford to do.

Now we're going through with a finer tooth comb and saying, "Yeah, that's a good project, and it will save us money," but we can't keep adding 20% to 25% more IS people forever. We've got a capability now; now, we've got to get smarter. We've knocked out a lot of the easier ones. The [IS projects] now are much tougher.

> "There was a time when it was just us and the Postal Service. Now there are a lot more people out there."

■ Impact on profitability

[We've focused on] developing the kinds of projects that are important to the company, ones that either had strong customer/business development motives, cost savings or efficiency motives behind them. There weren't any projects that went through there that didn't pass that test.

■ IS and competitive advantage

Federal Express market share has dropped for the past several years. And that's not because they aren't doing things well; it's because of the increased competition. There was a time when it was just us and the Post Office for ground services. Now there are a lot more people out there. The thing we had to do to grow in air was to convince the shipping public that we could provide all the services that the leader — Federal Express — has been able to provide. And that can only be done through technology.

We already had an efficient operation with reliable service. They weren't any faster or any more reliable than us, but their information system was more extensive.

■ Characteristics of a solid manager

You like to have a hands-on manager, not somebody who sits in his office and plots and schemes, but someone who is regarded by the organization as someone who knows what the heck is going on, knowing what our business is.

I don't lean toward a heavy technology guy. People can learn that. I think it's got to be a person who's hands-on and knows the business. And it has to be someone who can work well with other top people. It's a team system. It has to be somebody who's flexible because technology keeps changing.

That person has to know that he has the support of top management, from the chairman and CEO. They have to have the confidence to go out there and make decisions.

The [business divisions] can have a tremendous effect on what projects we're going to do, but when we get down to doing them, there's only one gatekeeper.

■ IS compared with other functions

It's hard to put anybody under more pressure than sales and marketing right now, but if there is anybody, it's probably IS. I think they're under more positive pressure. They're doing more, and they're getting more help doing it from the different functions. I think it adds up to more pressure, but I think it's the right kind of pressure.

Re-engineering: just first step

By Rosemary Cafasso
CAMBRIDGE, MASS.

Chances are, you are up to your ears in a re-engineering project that's one of the most grueling efforts your company has undertaken.

So brace yourself: One of the consulting firms that originated the concept is saying that business process re-engineering might not be enough.

"There are a lot of companies that embark on an aggressive re-engineering effort and then find the customer still isn't happy," said Fred Wiersema, vice president of CSC Index, Inc. based here. "Analyzing things to death and task forces aren't going to get you there."

There is a more competitively focused organization that zeros in on what value they can deliver customers, according to Wiersema and collaborator Michael Treacy, president of Treacy & Co. and a CSC Index associate.

Both delivered this message earlier this month at CSC Exchange, an annual executive conference sponsored by Computer Sciences Corp., which owns CSC Index and other services businesses. And both consultants said too much focus on re-engineering could be a mistake. "The cure is not re-engineering alone," Treacy noted in a CSC Exchange presentation. "It is a component to a solution."

Shining stars
According to Jim McKelvey, vice president and controller of Springs Industries, in researching the competitive focus issue, CSC Index determined that about 40 companies in the Fortune 1,000 are truly stellar examples of highly focused organizations, including Coca-Cola Co. and Wal-Mart Stores, Inc.

Treacy said that when it comes to defining a company's competitive focus, there are really only three lines of attack from which to choose: operational excellence, in which a company focuses on efficiencies and producing its product as cheaply as possible; customer intimacy, which calls for premium service and establishing relationships with customers; and product leadership, in which a company produces the most superior product in its market.

The goal: Select a priority, focus on it and create an organization that supports it.

Take The Home Depot, Inc., a retailer of home supplies and improvement products that is based in Atlanta. CSC Index cites Home Depot as an example of a success in the so-called "customer intimacy" category.

Each Home Depot store has autonomy, and store managers make decisions on customer issues and market changes. Andrew McKenna, senior vice president of information services, said his staff focuses on providing tools to help individual stores work with their own market data and customer trends.

As an example, information systems has installed a customer traffic system in each store that tracks customer volume and then allows managers to schedule staff based on that data.

Yet, some CSC Exchange attendees said that while the theory of a sharp competitive focus sounds sensible, it may not be so easy to implement. Everyone wants to be focused, attendees said, but sometimes companies must tackle competitive issues on a number of fronts.

Jim McKelvey, vice president and controller of Springs Industries, Inc., said companies often have no choice but to address multiple issues at once. "It is hard to do because they are somewhat in conflict," McKelvey said. "We want to be a low-cost producer and a leader in customer service. You've got to run manufacturing efficiently and keep costs down, and that can be in conflict with customer service."

Practical projects praised

By Neil Margolis
WASHINGTON, D.C.

When the National Managed Healthcare Congress handed out its second annual MIS Summit Awards for Information Technology Excellence recently, pragmatic technology emerged as the big winner.

Overall systems design and implementation laurels went to Kaiser Permanente's Ohio Region's Encounter System. The 20,000-member health maintenance organization office bought a coding software package, married it to underused technology already on board and built a database of diagnoses, medications, allergies and immunization information primed for easy access and minimal cost.

Kaiser's Allan Khoury: *Avoid the glitz and go for the guts*

"There are two schools of thought here, and one favored an everything-at-once, workstations-for-everyone implementation," said Dr. Allan Khoury, associate regional medical director at Kaiser and one of Encounter's spearheads. "But that's sort of a leap of faith — everybody's talking about it or in the middle of doing it, but has anyone really *done* it?"

Harvard Community Health Plan walked away with the Clinical Applications honors for its Integrated Practice System (IPS), a fully automated clinical system centered around an on-line medical record that allows every person who interacts in any way with a patient to have up-to-date data and computer-aided guidance and advice. While IPS was designed for maximum portability across platforms, the initial implementation has doctors using Apple Computer, Inc. Macintosh II workstations, hosted by a Digital Equipment Corp. VAX 6000 minicomputer.

Southern California Edison Patient Services topped the innovation category with a Macintosh software program that supports all aspects of SoCal Edison's Managed Care System — utilization review, case management, bill audit and quality assurance — across a 22-user local-area network.

"The technology that links doctors together or automates clinical records — functions that will make huge differences in the availability, quality and cost of health care — has been around for a long time," said Joe Miller, a principal at Wakefield, Mass.-based health care information systems consultancy Charles J. Singer & Co. But there have been some hefty obstacles in its way: "One of the biggest of which is that only about 60% of all the doctors out there even have computers."

Khoury is among that 60%. Nevertheless, he is an outspoken advocate of the view that medicine will best be served by technology if health care professionals resist the lure of the cutting edge and concentrate on the possible.

"We needed a flexible, multifunctional database . . . but we also needed a system that doctors were going to be able and willing to use. And we simply could not consider systems that would cost millions of dollars and conceivably increase our rates by 2% to 3% for several years."

That's why Kaiser avoided the glitz and went for the guts, Khoury said. Among other decisions, "We limited our collection of data to diagnoses, medications, allergies, procedures and aspects of preventative care," he said. Free text was bypassed as too costly for the limited use it would get. Similarly, the Encounter team opted for a paper-based system; the familiarity, Khoury said, made for "optimal physician acceptance."

Taking what some techno-enthusiasts are likely to see as the low road not only is the quickest route to getting medical personnel up on the system, Khoury said, but it also most immediately serves the greatest number of critical patient needs. For instance, he said, tracking and messaging features long taken for granted in business offices stand to make giant strides in the health care arena.

Expect to hear Khoury's sentiments echoed frequently in the coming year, Miller said. He foresees health care organizations increasingly coming to perceive baby-stepping into technology as the most effective way to achieve meaningful results.

Executive Track

John R. Crary recently took over as vice president of information systems and services at Southfield, Mich.-based aerospace and automotive manufacturer **AlliedSignal Automotive**. Crary, who formerly served as group director of ITT Automotive's IS operations in Auburn Hills, Mich., is charged with leading his new company's efforts to provide world-class manufacturing and information systems and services. He replaced AlliedSignal IS Vice President Martin LaBrecque, who left the company.

At publisher **Houghton Mifflin Co.** in Boston, **John E. Tyler** is in place as new senior vice president and chief technology officer. Tyler most recently served as vice president of IS at *The Seattle Times*. In his new position, Tyler is responsible for internal data management as well as for integrating technology into Houghton Mifflin's publishing operations.

Robert A. Manson, who has served as **Stop & Shop Supermarket Co.**'s vice president of IS since 1985, has been promoted to the position of senior vice president of IS. A 20-year IS veteran of the Quincy, Mass.-based supermarket chain, Manson will continue to report to Senior Vice President of Administration Donald J. Comeau.

New York City-based information technology consulting firm **Automated Concepts, Inc.** has appointed **John M. Jaugilas** to the post of senior managing consultant of the Chicago region's Client/Server Enabling Group. Jaugilas, a distributed systems specialist, most recently plied his talents for seven years at **American Airlines**, where he worked on the Apollo reservation system.

William Sumner has been named senior vice president of IS at Culver City, Calif.-based **Sony Pictures Entertainment**. A two-decade veteran of the information technology industry, Sumner most recently served as senior vice president of information systems at **Bullock's** and **R. H. Macy and Co.** At Sony, he will be responsible for worldwide information systems as well as working closely with top management to develop strategies for furthering the use of computer technology.

When Less

Is MORE

Let Digital's Computer Downsizing Solutions Give You More **POWER** *over Your Information*

The business environment of the '90s challenges organizations to work faster, better, and at a lower cost than ever before. Styles of computing that suit large, monolith, routine batch jobs cannot sustain the free flow of information and resources required by businesses today.

Companies need the freedom to provide their employees with access to information when, how, and where they require it. Fortunately, this need coincides with a dramatic increase in performance and a downward turn in the price of computers. Digital helps you take advantage of this price/performance — enabling you to put powerful information tools into the hands of your business professionals.

Our strategy is to provide you with a more flexible and open future. We'll help you plan, design, implement, and manage information environments that are cost-effective — from initial purchase through ongoing management and change.

Enabling Your Company to Work as It Wants to Work

Providing your professionals with the freedom to access information when, where, and how they need it requires the foundation of a disciplined, standards-compliant environment. Whatever your current starting point, Digital can help you quickly and efficiently achieve a standards-compliant environment that is open to the best components now and in the future.

Your professionals use desktop units and applications of choice, benefiting from behind-the-scenes disciplines that enable transparent data flow across multiple vendors' clients, servers, and applications. Digital delivers open computing environments that provide mainframe levels of performance, functionality, reliability, security, and integrity — but with far more flexibility and at much less cost.

Digital offers you the freedom not only to choose the best information tools and products, but also to orchestrate and adapt these into a whole that best suits the way your company wants to work. Take advantage of our unrivaled depth and breadth of connectivity and integration tools, products, and services. We provide:

- **Worldwide consulting, training, and systems integration professionals**
  Our experts work with you to manage and balance the people, business, and technology dimensions of distributing information throughout your business.
- **Multivendor integration**
  You choose the best components to serve your business — from desktop to data center. We can integrate and support almost any client or server your company is likely to own now or in the future. Plus, we have packaged these capabilities into products that deliver integration and interoperability right out of the box. For example, Digital's Network Application Support (NAS) capabilities, such as PATHWORKS, enable you to interconnect multivendor systems and achieve a free flow of information across platforms, sites, and groups.
- **Unbounded capacity at far less cost**
  Utilizing the world's fastest 64-bit RISC microprocessor, our Alpha AXP family of open server and desktop systems give you unbounded capacity — at a fraction of mainframe cost.

Take Advantage of Our Experience

Digital pioneered moving information out from the data center to work groups — whether they're in the same office or around the world. We'll help you achieve the most flexible and cost-effective approaches to your information requirements — today and tomorrow.

For more information on Digital's computer downsizing solutions, call 800-332-8228. ■

What drives companies to move to more cost-effective computing environments?

Two reasons.

Not only do you want to **increase the payback** *of your information technology dollar, but you're also looking to* **increase the productivity** *of your frontline professionals.*

Digital helps you do both.

Libbey-Owens-Ford Profits from Digital's Downsizing Solutions

Libbey-Owens-Ford Company's Auto Glass Replacement (AGR) Business Unit has added 69 service centers since 1988, and plans to establish 100 by the end of 1993. This continent-wide service network — including AGR's three giant depots — supplies local auto glass replacement shops that serve customers throughout the U.S. and Canada.

Building market share with this fast-growing service challenges AGR to meet market demand for quick response and competitive pricing by dramatically cutting distribution time-to-market and cost.

These goals drive AGR's move from an in-house application on an IBM mainframe to a Digital client/server environment — an environment that provides nationwide, distributed, real-time inventory management.

Connecting the service centers, depots, and headquarters, the Digital environment integrates and distributes AGR's preferred application packages: Distribution Management from McHugh Freeman Associates, for real-time inventory control throughout the supply chain; and DAI from Distributed Architects Incorporated, for integrated resource planning and order processing in all service centers.

VAX 4000 systems, the field office servers, will link to an Alpha-ready VAX 6620 system at AGR headquarters. "The power of Alpha AXP provides the right, high-performance match for our business strategy ... at a far lower cost than a mainframe approach," says Rick Wagner, Senior Manager, IT, Libbey-Owens-Ford.

Digital Helps The Brookings Institution Save over $1 Million

With the help of Digital's computer downsizing solutions, The Brookings Institution's Social Science Computation Center (SSCC) has saved a total of $1.7 million over a six-year period. It spends less annually in areas such as computer maintenance, software, and peripherals.

Digital has been providing Brookings with computing power since 1970 — with the SSCC adopting VAXcluster system technology. But, as PCs assumed an increasingly important role at Brookings, the organization was faced with a dilemma. PC and VAX users needed to collaborate and communicate. Brookings needed to maintain both systems and cut costs at the same time.

The solution? Lower-cost and higher-performance Digital computers are servers to the growing base of PCs and Macintosh systems at The Brookings Institution. These desktop units are integrated with each other and the Digital server via Digital's PATHWORKS networking.

The SSCC has upgraded the VAXcluster system that functions as the server several times, moving smoothly from the VAX 8650 computers down to VAX 4000 systems. Now, with the lower maintenance and electricity costs, Brookings will recoup its equipment costs in two years.

States SSCC Director Jarte Fishkin, "The SSCC accomplished this computer downsizing without endangering or impairing the flow of Brookings' most important asset: information."

The ALPHA AXP ANGLE

Digital's Alpha AXP Solutions Take the Worry out of Computer Downsizing

If you're nervous about the prospect of computer downsizing — relax. Digital's Alpha AXP solutions give you the performance of a mainframe at a fraction of the cost. Plus, you can breathe more easily for a long time to come. These no-risk solutions will pay off today and tomorrow.

Business pressures — they surround you. Pressure to find more cost-effective, flexible computing environments that will improve your bottom line. Pressure to increase IT impact but reduce cost. Pressure to implement a computer downsizing solution that won't sacrifice the security, reliability, and management disciplines of your mainframe. Is there any good news? Yes — Digital's Alpha AXP systems take the pressure off.

Take Advantage of 21st Century Computing Today

Offering the fastest performance and the best price/performance in the industry, Digital's Alpha AXP systems utilize the world's fastest single-chip microprocessor, and are the first to take advantage of 64-bit RISC design. This new generation of systems enables you to run today's applications dramatically faster at lower costs and allows you to access very large databases.

Plus, unprecedented performance and capacity make the Alpha AXP architecture the platform of choice for next-generation applications employing such user-oriented technologies as video imaging, artificial intelligence, and multimedia.

A Universal, Open Platform Gives You Freedom and Choice

The design of the Alpha AXP platform makes it easy for you to downsize using the best operating systems available today — as well as the best systems of the future. Specifically, this 64-bit platform offers you a choice of the three most significant software environments in the industry for distributed computing, including:

- Microsoft's Windows NT, an emerging operating system standard for Windows, on the fastest, most scalable platform in the industry
- DEC OSF/1, the first and only 64-bit unified UNIX operating system, supporting all major UNIX implementations
- OpenVMS, the highest-functionality operating system in the world, with leadership data integrity, availability, and scalability for distributed production systems.

Our open technology isn't the only pathway to freedom. Digital's open business practices are key in enabling us to provide comprehensive Alpha AXP solutions. We have formed strategic business partnerships at all levels — including hardware, software, peripherals, and applications — to assist the many leading vendors worldwide who are making Alpha AXP computing the new industry standard.

See the Value of Your IT Resources Increase

You can choose a solution for any size task or job from Digital's family of scalable Alpha AXP systems — from desktop to data center.

Select the Alpha AXP processor that will allow you to enhance your current computing investment. Unlock your mainframe by offloading dynamic data to faster, lower-cost Alpha AXP servers. Increase user access to critical information and defer costly mainframe upgrades. Or transform your standalone PCs into clients within an enterprise information system. Use Digital's Networked Application Support (NAS) products to turn your multivendor environment into a single, distributed system.

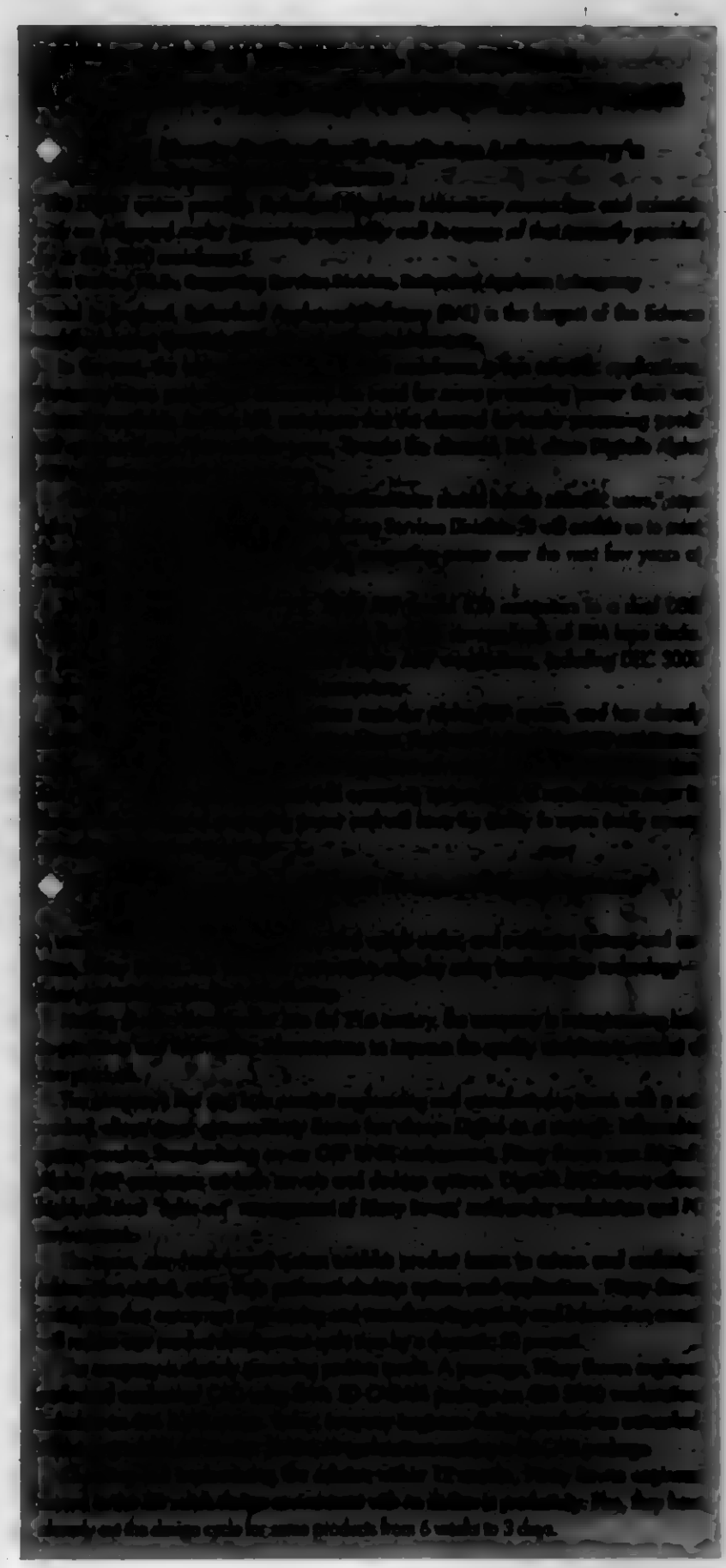
Balancing Business, People, and Technology Issues

Digital offers distinct advantages in making the process of downsizing to distributed computing work for you.

We have the experience. In one sense, Digital pioneered the computer downsizing movement. From early on in our history, we've moved information from the mainframe to minicomputers to desktops — and we've been helping other organizations take advantage of our experience in distributed computing ever since.

We provide a comprehensive family of services worldwide, including business consulting, outsourcing, and systems integration capabilities. These services make the transition to the open environment of Alpha AXP fast, easy, and complete — balancing the business, people, and technology that make your business competitive. Our unique NAS capabilities in multivendor networking and systems management lead the industry. And, with the in-depth applications expertise of our business partners, we provide you with complete business solutions.

For more information on Digital's computer downsizing solutions, call 800-332-8228. ■



Digital's ESE50 Solid State Disk

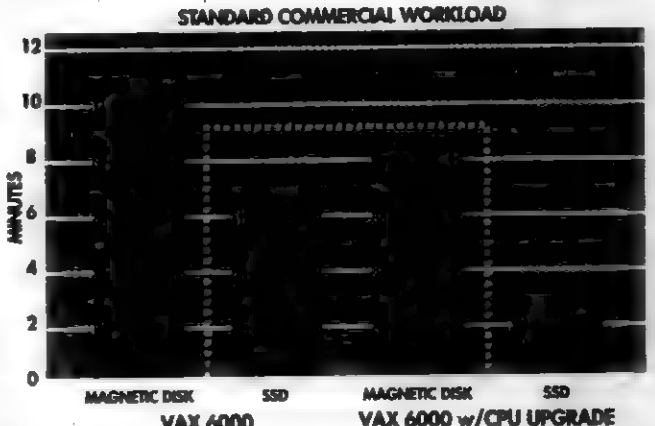
For proof of Digital's ongoing commitment to supply industry-leading price/performance solid state disk drives, look no further than the ESE50. The price of our highest-performance mass storage device has been reduced up to 27 percent.

No special deals. No limited-time offer. Just an ongoing commitment to good business practices. Digital continues to answer your solid state disk price/performance needs by finding ways to drive technology prices down — and pass those savings on to you. Our new, lower prices are proof of our success. Take a look at these ESE50 solid state disk price reductions:

Old Price	$55,000	$165,000	$138,000	$215,000
New Price	$40,000	$130,000	$110,000	$180,000
Percent Savings	27%	21%	20%	16%

Lower entry prices allow ESE50s to be used in a wider range of I/O demanding applications — good news for many industries. From financial trading and telecommunications to manufacturing, retail, pharmaceutical, and scientific environments, the ability to achieve consistently fast access to expanding sources of data is a competitive necessity. Designed to meet this need, the ESE50 offers the ability to access your most time-critical data in 0.25 ms — up to 100 times faster than magnetic disk.

So, what does all this mean for your business? Faster I/O access can dramatically speed up productivity, accelerate product time-to-market, increase revenues, and reduce organizational operating costs.



When slow access to data impedes performance, look to the benefits of solid state disks. Benchmark results show that the addition of solid state disks provides more improvement in I/O wait.

Easy to Use, Easy to Implement

Digital's ESE50 lets you achieve maximum system performance by matching the accelerated power of today's Alpha AXP, VAX, and VAXcluster SDI systems with exceptionally fast access to your system's time-critical data.

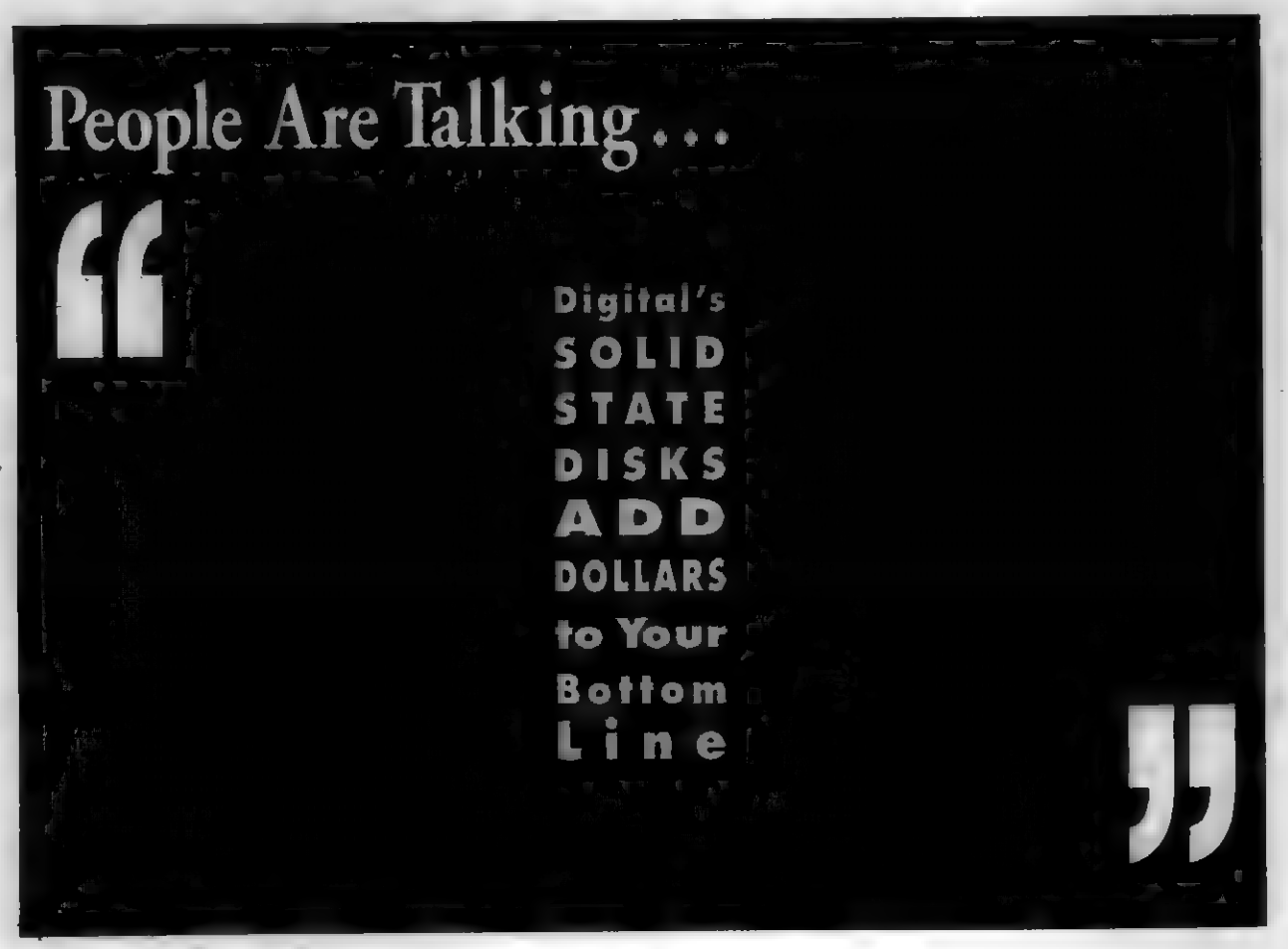
And, just like a magnetic disk, these solid state disks "plug and play" in any SAxx storage array cabinet — without application or operating system modifications. What's more, the ESE50 provides the highest data availability of any solid state disk through the use of its unique integrated Data Retention System and dual power supplies, all within the magnetic disk-sized enclosure.

For all your I/O needs — today and tomorrow — depend on Digital's family of solid state disk products for industry-leading performance and price/performance. For your FREE copy of Digital's 1993 edition Solid State Disk handbook, call 800-DEC-INFO (800-332-4636), ext. 985. ■

Making the Right SSD Choice

Feature	ESE50	EF5x
Interconnect	SDI	DSSI
Access Time	0.25 ms	0.25 ms
Maximum I/O Throughput	1,800 I/O	800 I/O
Capacity	120 MB–1 GB	107 MB–267 MB
Availability	Highest	Exceptionally High
Form Factor	8-inch, half-rack	5¼-inch

Before choosing a solid state disk, identify your most critical business application needs. Then, use this chart to help you select the solid state disk that's best suited to answer those needs.



Digital Update: Now, It's a Two-Way Street

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When client/server *isn't* right

YES, THERE ARE SITUATIONS IN WHICH CLIENT/SERVER WON'T DO. IF YOUR COMPANY HAS LOTS OF USERS AND MODEST COMPUTER POWER NEEDS, DON'T WASTE YOUR TIME AND MONEY.

By Michael Kennedy and Andrew Gurbaxani

You'd never be able to tell this from advertisements and conference speeches, but client/server isn't the correct answer to every question. It doesn't save you as much over mainframes as you might think (see chart below), nor is it necessarily your best bet for enterprise connectivity.

This is not easy news for information systems executives to carry back to business managers who are hoping for a panacea, but someone has to be the voice of reason amid the hoopla.

Mainframe costs on a par with client/server? Hardly seems possible, given the fervor with which vendors are selling downsizing as a way to cut, cut, cut costs. But for some, mainframes may certainly be the economical way to handle information.

If your organization has lots of terminals and low computer power requirements, staying with a mainframe makes sense (see chart page 101). For example, an airline reservation system with thousands of agents and relatively modest computing requirements works well in a mainframe environment, as does a customer service center that uses computer power to answer billing questions.

Conversely, client/server wins out when computing power requirements are high and the number of terminals (workstations) is small, as in the case of a computer-aided design and manufacturing operation employing a handful of engineers with huge computing requirements.

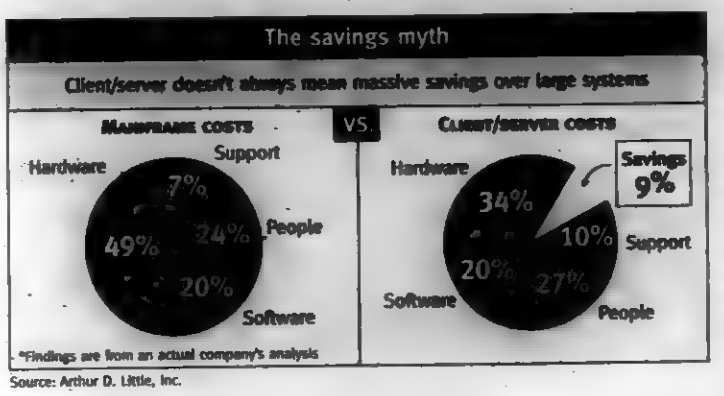
It all boils down to numbers (hardware and MIPS numbers, that is). Specifically, a dumb terminal costs about one-third as much as a workstation ($500 vs. $1,500, respectively), while mainframe million instructions per second (MIPS) cost about 100 times more than workstation MIPS ($50,000 vs. $500).

Keep in mind that mainframe MIPS tend to be more productive than server MIPS because mainframe processors are typically in use 24 hours a day, while companies confine server use to business hours. (If you'd like to do your own calculations, see page 101.)

If the decision based on these costs is too close to call, storage requirements and maintenance/support costs can be tiebreakers. The rule of thumb here is that client/server gets the edge with storage (client/server storage, at $2,000 per gigabyte, is about half the cost of mainframe direct-access storage devices). Mainframe computing, for its part, tends to do better in the support cost area.

However, even with its lower cost per gigabyte, storage in the client/server world is not always a best bet because the technology is not yet sophisticated enough to exploit the cost advantage. While mainframe disk management systems let companies implement databases that reside on tens or even hundreds of disk drives, server technology requires the entire database to reside on a single disk drive. Essentially, the data is there but can't be used very easily.

Client/server, *page 101*



Source: Arthur D. Little, Inc.

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Client/server

CONTINUED FROM PAGE 99

In terms of support, client/server is going to take about 20% to 30% more out of IS' pockets. Client/server costs tend to be higher than those of mainframe computing for three reasons:

- Because client/server pushes computing out to end users, many companies find they need more troubleshooters and graphical user interface experts to provide on-site assistance at disparate locations. Often, support costs are hidden because end users actually do the support, to the detriment of their primary jobs.

Companies spending approximately $3,000 per user for client/server hardware and software shell out five times that for intangibles such as peer and help desk support.

In contrast, mainframe end-user support is minimal, consisting typically of a help desk or dumb terminal replacement/upgrade.

Face-off

What mainframes have over client/server:
- They cost less in environments with a lot of terminals and modest computing needs.
- Greater security.
- Easier enterprisewide communications.
- IS can more easily manage centrally controlled environment with available software.
- Support and disaster recovery is simpler.
- Network management is easier and more secure.
- Skilled mainframe staff is available.

What client/server has over mainframes:
- Computing power (MIPS) costs less.
- Access to computing power is easier.

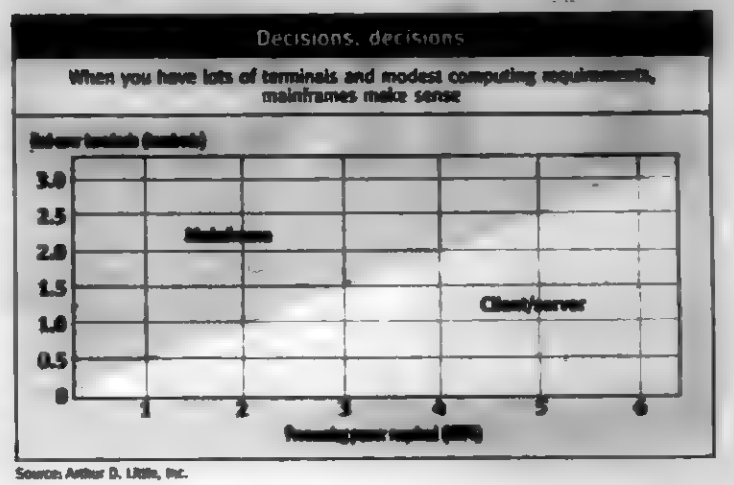
- Client/server systems software is layered and has a variety of interfaces. Companies have to make provisions for lots of communications/connectivity packages. Network and communications links cry out for management. Hardware and software products need technical and staff support.

So, while annual lease costs of mainframe software can be steep, depending on the size of the platform and upgrade fees, they aren't necessarily higher than costs in client/server. Client/server software racks up support costs that diminish its monetary advantage over large systems.

- Client/server is a new area, so there are few professionals experienced in managing and supporting client/server operations. Training costs to bring people up to speed are immense.

Because mainframe technology is mature, it is easier to hire people experienced in handling that environment. And these staff members get a hand from the variety of management tools for mainframes. There are existing products that handle areas such as system automation, performance monitoring/capacity planning, scheduling/rerun control, print management, library management, tape management, disk management and security.

In the client/server world, such tools are nonexistent or too young to be very effective.



Source: Arthur D. Little, Inc.

Enterprise connectivity

Costs aren't the only reason why IS managers stay with large systems. They also rely on the mainframe's central control, standards and security measures for their mission-critical applications.

For instance, IBM's Systems Network Architecture, with its features for central oversight and control, has been one way in which large IS shops provide uninterrupted information flow. Employees in different functional areas can share information without hassles.

Client/server can sometimes clog the information pipe because of the number of computing elements it requires. One recent demonstration of interoperability among four different computing platforms required 50 communications software packages!

Companies want to reduce complexity, not create it. Besides staying with mainframe computing, they also try the following if client/server doesn't cut it:

- Departmental computers (mid-range systems) that store data primarily used in each department. If another department has occasional demand for data, its computers initiate the request via a data link to the departmental computer containing the target data.
- Data on a series of specialized database servers connected by local-area networks.

. . . . . .

IS chiefs are looking for ways to balance out the picture usually tilted in favor of client/server NOW and EVERYWHERE. They don't want to avoid client/server; they only want to avoid using a good technology for all the wrong reasons. •

Kennedy is a senior consultant who manages the corporate networking practice at Arthur D. Little, Inc. in Cambridge, Mass. Gurbaxani is a consultant in the corporate networking practice at Arthur D. Little.

Do your own number-crunching

An electric utility wanted to figure out its hardware costs for operating a customer information system that produces 5.4 million electric bills per month, 5 million notices per year and 2 million customer work orders per year. The system requires 9.1 MIPS and 40G bytes of DASD. There are 1,300 terminals.

It used the following equation:

(Cost of MIPS) + (cost of DASD) + (cost of terminals) = Total

Working under the assumption that dumb terminals cost one-third less than workstations, mainframe MIPS cost about 100 times more than workstation MIPS and mainframe storage costs twice as much as client/server storage, the organization figured its mainframe hardware cost would be the following:

($30,000 x 9.1) + ($4,000 x 40) + ($500 x 1,300) = $1,265,000

Its cost in client/server would be the following:

($500 x 3 x 9.1) + ($2,000 x 40) + ($1,500 x 1,300) = $2,043,650

Please note the adjustment in the cost of MIPS ($500 x 3 x 9.1) reflects the fact that mainframes are typically in use three times longer than workstations—24 hours a day vs. 8 hours a day, respectively.

IN THE REAL WORLD

Flying in the face of *client/server* computing

The story is familiar: The weak economy has put a company under extreme cost-cutting pressure. Management approaches the information systems department because it has "heard" something called client/server would decrease costs by X percent right away.

That's the situation facing IS at an electric utility serving one of the U.S.' largest urban areas.

The target application? A customer information system used to prepare bills for its 3.4 million customers and handle customer billing and service inquiries.

But when it came right down to it, IS found, client/server wouldn't do much in terms of cutting costs. For instance, the company would take a hit replacing its 1,300 terminals with workstations that were twice as expensive.

The mainframe was in its element: The organization had lots of terminals and low processing needs (the database uses CICS and consumes 11% of the mainframe's 83 MIPS).

IS' decision to stay with the mainframe, however, is not carved in stone. It has pledged to revisit client/server when business needs dictate changes to the functionality of the customer information system applications.

Preserving investments, *defusing* revolt with *gradual downsizing*

The nightmare for the university's IS group started with a few end users working on Apple Computer, Inc. Macintoshes. Before IS knew it, end users were moving off the mainframe and into workgroups of Macintoshes at their own expense. Departments were building their own systems, storing redundant copies of mainframe data and generating paper reports that had to be rekeyed into the mainframe.

Users were doing this for easier data access, screens they could navigate and quick return on printed reports.

At first, the administrative computing group was going to dump the 76-MIPS IBM 3090 mainframe and migrate applications to client/server platforms. Unfortunately, that move would have required a massive amount of resources: new hardware/software platforms, major application rewrites and staff training, recruiting and outplacement. It would have meant operations disruption (including compromising data security, backup and disaster recovery) and systems incompatibility. Of most concern was the lack of capacity planning and performance monitoring plaguing the client/server world.

How could they give users what they wanted without dropping a bomb into the IS shop? By selective and phased-in migration to client/server platforms. In this way, IS could preserve the mainframe investment and avoid the maintenance and operational risks involved in a wholesale changeover. But it could also ready itself for downsizing in the future.

The school is in the midst of a pilot to improve end-user reporting and provide better end-user tools, including GUIs.

The Results

Computerworld congratulates in the 1993 IS Brand on Local-Area Networks

Computerworld's IS Brand Preference Study on LOCAL-AREA NETWORKS

UPS

Best Technology	Best Power Technology
Best Price/Performance	American Power Conversion
Best Service/Support	Best Power Technology
Best Documentation	Best Power Technology
Prefer to Do Business With	American Power Conversion & Best Power Technology

PC Communications Software

Best Technology	Microsoft Corporation
Best Price/Performance	Datastorm Technology
Best Service/Support	Microsoft Corporation
Best Documentation	Microsoft Corporation
Prefer to Do Business With	Microsoft Corporation

Backup Hardware/Software

Best Technology	Exabyte
Best Price/Performance	Mountain Network Solutions
Best Service/Support	Mountain Network Solutions
Best Documentation	Mountain Network Solutions
Prefer to Do Business With	Mountain Network Solutions

RAID Storage Systems

Best Technology	Compaq
Best Price/Performance	Compaq & EMC Corp.
Best Service/Support	Hewlett-Packard
Best Documentation	Hewlett-Packard
Prefer to Do Business With	Hewlett-Packard

Electronic Mail/ Messaging Software

Best Technology	Lotus cc:Mail
Best Price/Performance	Lotus cc:Mail
Best Service/Support	IBM
Best Documentation	Lotus cc:Mail & WordPerfect Corp.
Prefer to Do Business With	IBM

Gateways

Best Technology	Novell
Best Price/Performance	Novell
Best Service/Support	Novell
Best Documentation	Novell
Prefer to Do Business With	Novell

Servers

Best Technology	Compaq
Best Price/Performance	Dell Computer
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Bridges/ Routers

Best Technology	Cisco Systems
Best Price/Performance	3Com
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Portable PC Network Adapters

Best Technology	Xircom
Best Price/Performance	Xircom
Best Service/Support	Xircom
Best Documentation	Xircom
Prefer to Do Business With	Xircom

Ethernet Adapters

Best Technology	3Com
Best Price/Performance	3Com
Best Service/Support	3Com
Best Documentation	3Com
Prefer to Do Business With	3Com

Token Ring Adapters

Best Technology	IBM
Best Price/Performance	3Com
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Intelligent Wiring Hubs

Best Technology	IBM
Best Price/Performance	Synoptics Comm.
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Network Analyzers

Best Technology	Novell
Best Price/Performance	Novell
Best Service/Support	Novell
Best Documentation	Novell
Prefer to Do Business With	Novell

Cabling Systems

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Terminal Emulation

Best Technology	IBM
Best Price/Performance	Novell
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Groupware/Integrated Office Systems

Best Technology	Lotus Notes
Best Price/Performance	WordPerfect
Best Service/Support	WordPerfect
Best Documentation	WordPerfect
Prefer to Do Business With	WordPerfect

Client-Server Operating Systems/ PC LAN Operating Systems

Best Technology	Novell Netware 3.x
Best Price/Performance	Novell Netware 3.x
Best Service/Support	Novell Netware 3.x
Best Documentation	Novell Netware 3.x
Prefer to Do Business With	Novell Netware 3.x

Peer-to-Peer Operating Systems

Best Technology	Microsoft Windows for Workgroups
Best Price/Performance	Microsoft Windows for Workgroups
Best Service/Support	Microsoft Windows for Workgroups
Best Documentation	Microsoft Windows for Workgroups
Prefer to Do Business With	Microsoft Windows for Workgroups

Are In...

these top ranking companies Preference Studies and Wide-Area Networks.

IS Brand Preference Study on WIDE-AREA NETWORKS

Common Carriers

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Value-Added Carriers/Services

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Satellite Carriers

Best Technology	AT&T Tridom
Best Price/Performance	AT&T Tridom
Best Service/Support	AT&T Tridom
Best Documentation	AT&T Tridom
Prefer to Do Business With	AT&T Tridom

V.32/V.32bis/V.42/ V.42bis Modems

Best Technology	Hayes Microcomputer
Best Price/Performance	Hayes Microcomputer
Best Service/Support	Hayes Microcomputer
Best Documentation	Hayes Microcomputer
Prefer to Do Business With	Hayes Microcomputer

Facsimile Machines

Best Technology	Canon USA
Best Price/Performance	Panasonic
Best Service/Support	AT&T
Best Documentation	Panasonic
Prefer to Do Business With	Canon USA

Facsimile Boards/ Gateways

Best Technology	Intel
Best Price/Performance	Hayes Microcomputer & Intel
Best Service/Support	Hayes Microcomputer
Best Documentation	Hayes Microcomputer
Prefer to Do Business With	Intel

T1/T3 Multiplexers

Best Technology	AT&T Paradyne
Best Price/Performance	AT&T Paradyne
Best Service/Support	AT&T Paradyne
Best Documentation	AT&T Paradyne
Prefer to Do Business With	AT&T Paradyne

Channel Extenders

Best Technology	IBM
Best Price/Performance	IBM
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

PBX Equipment

Best Technology	AT&T
Best Price/Performance	Northern Telecom
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Diagnostic/Test Equipment

Best Technology	Hewlett-Packard
Best Price/Performance	Hewlett-Packard
Best Service/Support	Hewlett-Packard
Best Documentation	Hewlett-Packard
Prefer to Do Business With	Hewlett-Packard

Packet Switches

Best Technology	Motorola/Codex & Northern Telecom
Best Price/Performance	Motorola/Codex
Best Service/Support	Northern Telecom
Best Documentation	Telematics
Prefer to Do Business With	Motorola/Codex & Northern Telecom & Sprint International

The 1993 IS Brand Preference Studies on Local-Area Networks and Wide- Area Networks were conducted among Computerworld subscribers to determine which brands of products are preferred among information systems professionals.

A brochure on each study is available. Contact your Computerworld sales representative for a copy or call Patty Faherty at 800-343-6474 ext. 169.

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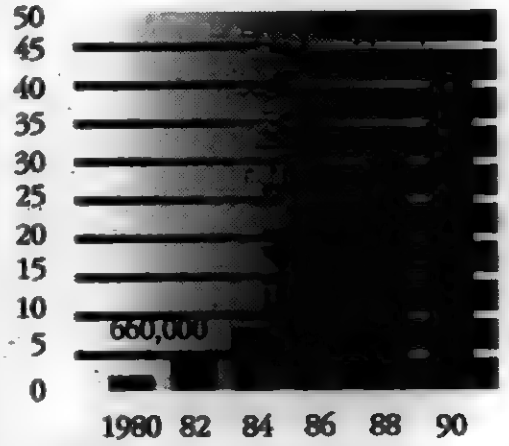
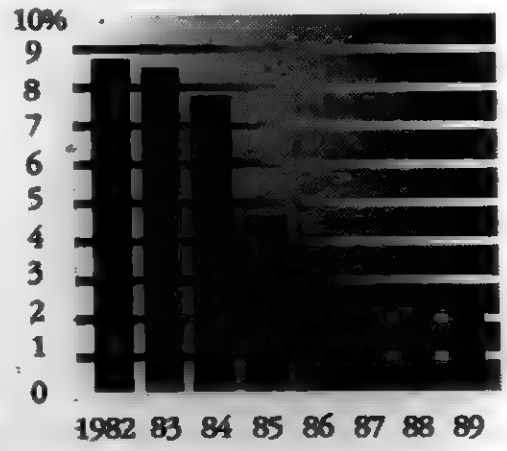


Fewer campus freshman are choosing computer careers**



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Sources: *International Data Corporation **American Council on Education

Communication key to user relations

shooting TACTICS

By Leslie Goff

CERTAIN PROBLEMS seem to permeate many information systems/client relationships. Among them: the client's failure to assume ownership of a system or the IS department's failure to manage user expectations. Either can lead to myriad problems. But some user-support managers have found ways around such situations. The following strategies can help prevent these problems from recurring.

[redacted], *director of information technologies, Rogers [illegible]*

PROBLEM
The research organization refused to use a system it asked for.

"We got a request from one of the higher-ups in research to find a chemical structure drawing and cataloging system. We located one that would run on our platform — PCs and Macintoshes. The vendor was moving the package to PCs from the mainframe, so it seemed to fit us well. The user group assembled by the research department to select the system liked it and rushed it. But once it was installed, the project fell on its face because the users refused to use it."

PROBABLE CAUSE
Failure to assign the right people to the system selection group.

"We had this self-managed team trying to find a solution, but no one was ultimately accountable for the decision. They looked to us for final accountability, but we're just a service organization. We'll set it up for them, but they have to make time for it and use it."

SOLUTION
Involve IS in choosing the users who will work on the project.

"The team was formed solely from the research side. Now we're working to identify the members of the research group who have the functional expertise, the computer aptitude and the time to be on the team. The next team will comprise higher level employees, so that when they make a decision, it will be respected by the users."

■ **RICHARD DYKEMAN**, *user support services supervisor, city of Riverside, Calif.*

PROBLEM
Users in personnel are frustrated by a departmental local-area network that keeps crashing.

"The problem has been isolating the cause. It just intermittently locks up. It will slow down, then drop users. Even if it's only down a half hour, their work is all automated, so they can't just regroup and go back to manual processes."

PROBABLE CAUSE
A faulty network card.

"It seems to be a jabbering network card — one that broadcasts jibberish over the network. That takes up bandwidth so other units on the net lose throughput."

SOLUTION/PREVENTION
Respond to the situation immediately and keep users informed throughout the diagnostic process.

"Never ignore requests, and get visibility with the department as soon as it reports a problem. We should [also] follow up in writing — 'This was the problem and here's how we resolved it.' Now we do that verbally, but we should do it officially so they can keep track of things, too."

■ **DAVID COULBOURN**, *director of MIS, Abrams Bentsch Riker, Inc./Colliers International Property Consultants, New York*

PROBLEM
User claims a critical file is lost.

"That can be a sensitive situation depending on the user. If you challenge them, you are challenging their competence."

PROBABLE CAUSE
Lack of training.

"Getting users to training is probably the hardest thing to do, especially with administrative assistants, whose bosses don't want to part with them, or salesmen, who prefer to be out selling. People don't view training as their job."

SOLUTION/PREVENTION
Offer incentives to attend training.

"We used to offer classes. Now we're scheduling two daily one-on-one training sessions. [It's] working better because it allows for flexibility to cover whatever a particular user needs — how to use E-mail or how to use a particular feature their boss wants them to use. Users are more likely to show up for a one-on-one."

■ [redacted], *program [illegible] administration information division, Columbia University, New York*

PROBLEM
Resolving crises without creating hostility.

"When a user calls, they may be upset. They can say things they don't mean."

PROBABLE CAUSE
User may have unreasonable expectations of IS.

"Their expectation often is that the system should be up and running all the time. You can't always guarantee the system will be up 24 hours, but we want goodwill and [them] to come to us rather than go to an external provider."

SOLUTION/PREVENTION
Manage user expectations by instituting service-level agreements.

"If we know what they expect of us, and they know what we expect of them, it helps eliminate finger pointing. Get together with the user, discern what happened, get the problem in the hands of the right specialist and follow through. Problems will always happen, and we want to have an open environment."

Goff is a New York-based free-lance writer.

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- CD-ROM
- SYBASE
- POWERBUILDER
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- MICROFOCUS WORKBENCH
- WINDOWS, C or C++
- IBM ASSEMBLER/APPLICATIONS
- IBM, IMS or DB 2
- IBM, IDMS, FOCUS
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- BUSINESS BASIC
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Job outlook positive for POS professionals

career life

By Alice Bredin

Some retailers have hired systems integrators or value-added resellers (VAR) to create packages that handle cash register functions, debit transactions and inventory. But for retailers writing their own software or customizing an off-the-shelf package, the demand for point-of-sale (POS) professionals who can program, analyze and manage is strong.

When companies say they need POS professionals, they are referring to those who provide support services to stores for the development, operation and maintenance of POS systems. Their efforts are showing up in many retail locations, including gas stations or grocery stores where customers can make purchases without cash by simply sweeping their bank card through a debit machine.

All of this automation, along with many back-room functions, indicates that POS systems are firmly entrenched in retailing.

The POS arena historically was burdened with a stigma that it pigeonholed information systems professionals because of limited technology. But retailers, like other businesses, are moving away from cumbersome mainframe systems toward systems that use PCs as controllers and are based on reduced instruction set computing all the way up to complex solutions using Sun Microsystems, Inc. machines. Vendors such as NCR Corp., IBM, CompuAdd and Siemens AG provide the bulk of systems to retailers.

"I would say anyone interested in POS should be proficient in C programming and networking implementation," says Thomas Friedman, editor of "Retail Systems Alert," a Newton, Mass.-based newsletter on retail automation, products and strategies.

However, POS executives say that as the retail industry becomes more sophisticated this is no longer true.

Where the jobs are

The growth areas for POS jobs are grocery stores, discount stores and operations that deal in a specific category of merchandise, such as The Home Depot, Inc., which specializes in hardware. These stores are transaction-intensive and need sophisticated systems such as POS debit cards, wireless, handheld price-auditing machines and automatic reorder capabilities to get customers out of the store as quickly as possible and to keep inventory stocked.

A retail background is not essential to obtaining an IS job developing POS systems.

Kathleen Dahlberg, vice president of worldwide restaurant systems at Burger King Corp. in Miami, joined the fast-food chain after working at companies as varied as Honeywell, Inc. and Rand McNally & Co. She says many of her staff have come from and gone to departments such as finance and local-area network integration.

But some managers say they want staff who have worked with POS systems behind the scenes and gained an understanding of what users need. Wearguard Corp., a mail-order firm for work clothing and uniforms in Norwell, Mass., creates the same kind of inventory reporting and sales information that traditional retail operations gather, even though its sales are done through the mail.

Wearguard has only one person supporting its in-house-developed system. But this person has worked in a store and as an operations person for a retailer. "It's important to understand the needs of the users because they are pretty computer-illiterate and can't always explain what they need," says Lynne D'Anbrea, project manager at Wearguard.

D'Anbrea is responsible for explaining inventory reports, billing reports and other reports to users.

Store experience lends an understanding of what store needs are and, ironically, adds to the pressure of the job. Some managers say that because some POS professionals started off as retail clerks and have experienced an in-store crisis when POS equipment fails, they feel tremendous responsibility to keep the system going, says Mike Hayden, manager of systems and programming of POS systems at Giant Food, Inc., a grocery chain in Landover, Md.

Bredin is a free-lance writer in New York.

The other market

Systems integrators and VARs that sell custom software and hardware configurations to retailers make up a growing area for POS jobs. These companies tend to have smaller staffs and require highly honed technical skills or a combination of retail and technical expertise.

At Business Systems Communications, a Pemberton, N.J., systems vendor for retailing that provides complete store-controlling environments for POS and back-office systems, there are three levels of personnel. Managers plan projects and set deadlines, programmers help plan and create packages, and testers make sure that the programs function. Because systems integrators' POS operations are smaller than POS departments at traditional retailers, job responsibilities tend to overlap. — *Alice Bredin*

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Telecom firms rising high in Lone Star State

By Emily Leinfuss

DALLAS AND AUSTIN, TEXAS, ARE sporting new names: The Telecom Corridor and The Silicon Prairie, respectively, in response to growing demand in these industries.

The overall market in Dallas is sluggish, but the city has earned the moniker The Telecom Corridor as a result of the influx of telecommunications firms there, including Northern Telecom, Inc., Intertel Telecom, GTE Telecom Network and Metropolitan Fiber Systems.

Telecommunications companies are moving to Dallas because it has no state tax and a lower cost of living than most major East and West Coast hubs.

Difficult search

But finding a job in Dallas is difficult due to a slow economy and a trend toward rightsizing technology and whole organizations, although there is action in the "client/server" area, according to John Stevenson, vice president of MIS at Dr Pepper/Seven-Up Cos. Information systems professionals in the area agree, claiming the hottest position in Dallas is a local-area network administrator.

A case in point is Great North American Cos., a direct marketer of computer and office supplies in Dallas. Harry Page, manager of applications programming at the company, says the proliferation of LANs has re-created a lot of the old mainframe security problems, and good LAN professionals are needed to resolve them.

But David Sisk, manager of information services at Campbell Taggart, Inc. in Dallas, the parent company for national wholesale bakeries, says, "There are a lot of people in the job market and not a lot of jobs to accommodate them." The city is still suffering from cuts made by its large employers, including Texas Instruments, Inc. In addition, he says, the impending layoffs at Dallas-based American Airlines don't bode well either.

Tale of two cities

While they're both hotbeds for high-tech employment, Austin and Dallas offer very different job markets. Metropolitan Dallas houses 18 Fortune 500 headquarters, according to the chamber of commerce. In comparison, the largest employer in Austin is the state and federal government, according to the Greater Austin Chamber of Commerce.

Austin is similar to Dallas in that it is also advertising for people with LAN skills, says Sally Quereau, manager of applications programming at the Texas State Treasury Department in Austin.

Jim Steele, IS director at the Lower Colorado River Authority in Austin, says he has a tough time finding people with good network skills, especially "someone who really understands capacity planning and how local-area networks are put together."

However, Austin's needs are different because it has many developer jobs at software companies, as opposed to the more traditional IS jobs in Dallas, says John O'Keefe, a partner at the Austin IS placement firm, O'Keefe and Associates.

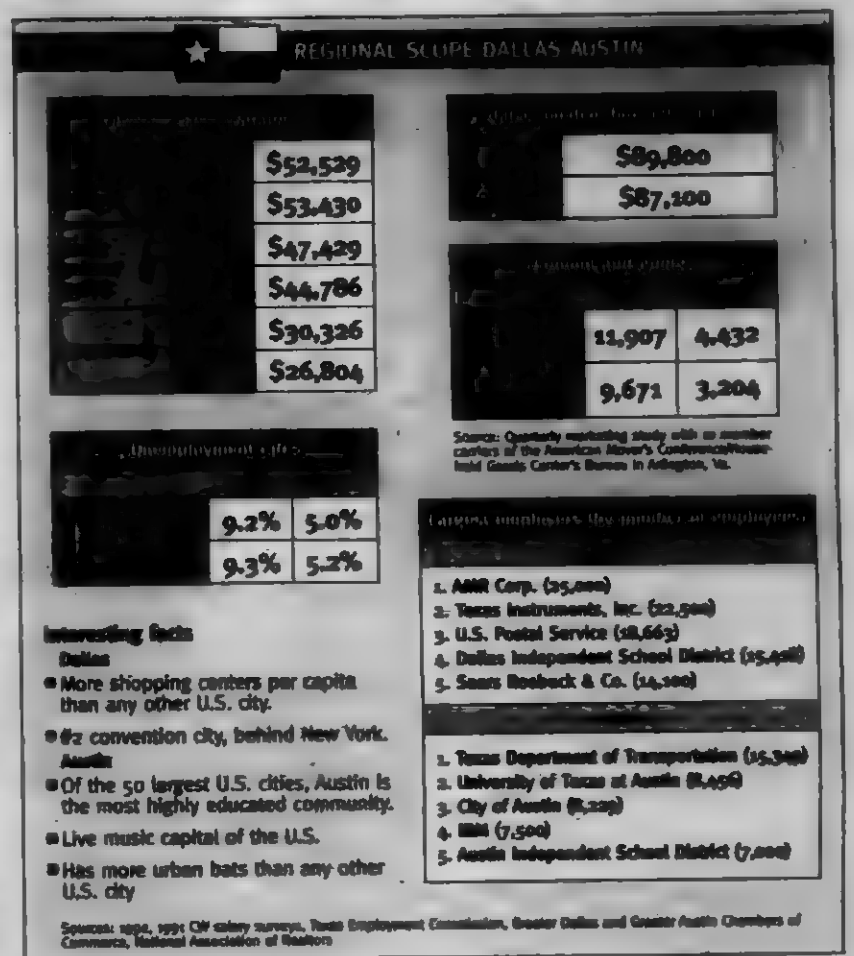
The Silicon Prairie is a growing research, development and high-tech area spawned by the presence of development laboratories that manufacture parts of IBM's AIX and OS/2, the vendor consortium Microelectronics Computer Corp. and Dell Computer Corp. The emerging firms employ 65% of Austin's manufacturing workforce.

"There are not a lot of jobs for people in data processing in Austin, but the software vendors are doing development in Unix, Windows and object-oriented technologies, creating a demand for professionals with those skills," O'Keefe says.

Austin's economy seems to be recovering faster than Dallas', but it is a much smaller job market and has far less turnover.

"Austin is not a business center like Dallas, but it is a difficult market to get into. Competition for jobs in Austin is very tough due to the desirability of the city," says Donna Schuback, vice president of IS placement firm Datapro Personnel Consultants, Inc. in Dallas.

Leinfuss is a free-lance writer based in Sarasota, Fla.



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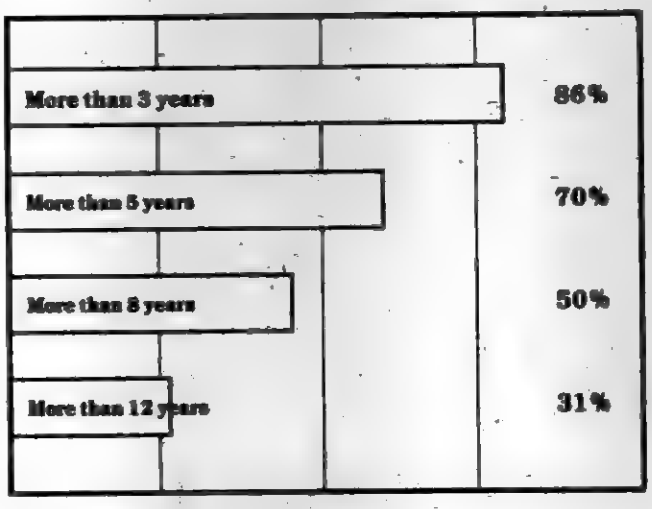

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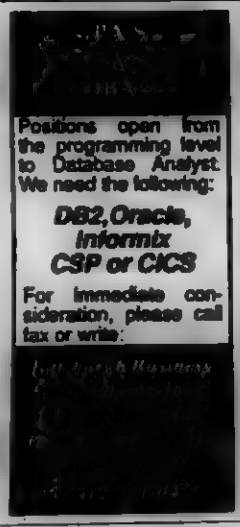

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Software Vendor	218,027
for large-scale systems	90,605
for medium-scale systems	68,763
for small-scale systems	58,422
for personal computers	97,695
for technical workstations	33,217
Non-CPU Computer Products Manufacturer	42,051
VAR/Dealer/Retailer	27,772
DP Service Bureau/ Contract DP Services	71,293
Consulting/Planning	76,848
Manufacturer (not computers)	202,131
Insurance	91,117
Healthcare	48,866
Banking/Financial Services	116,696
Government Federal/State/Local	114,677
Business Service (except DP)	63,793
Communications Systems	55,744
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SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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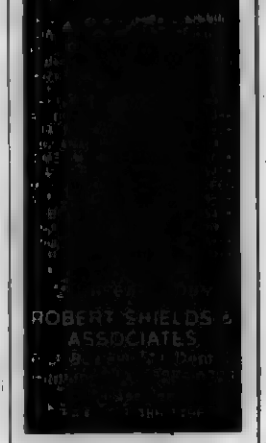

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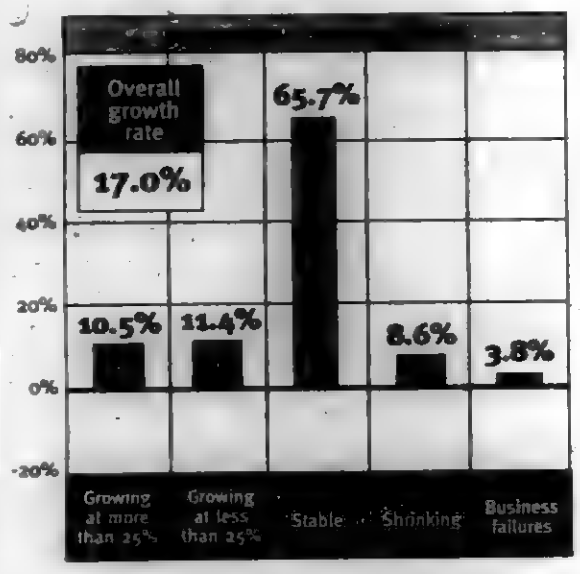

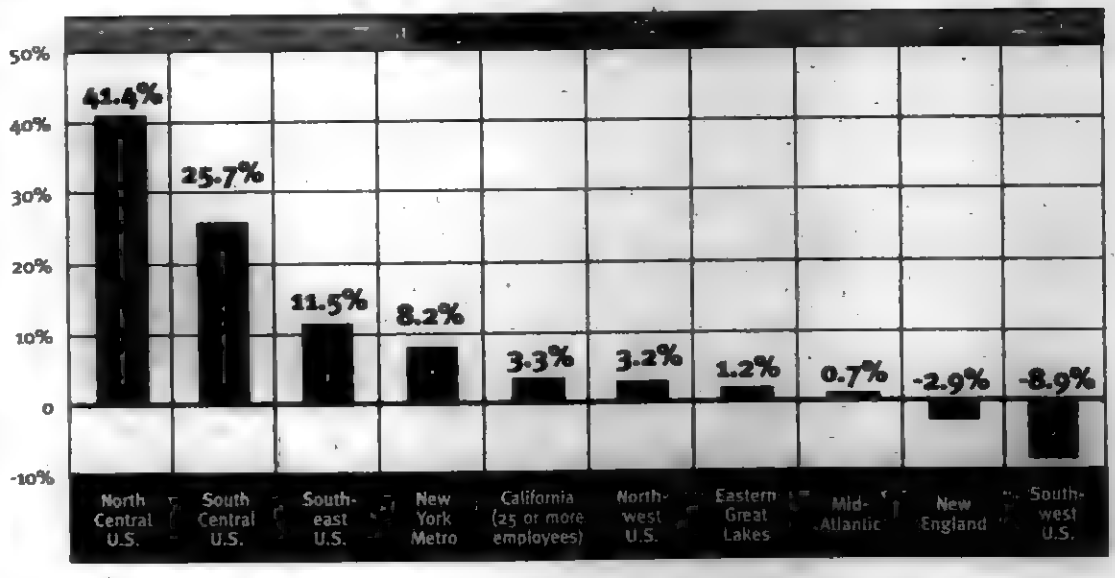

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SURVEY PERIOD: SEPT. '92 – MARCH '93

Mainframe leases DON'T WORK for PCs

Leased PCs require a flexible agreement. Adding the following provisions to a lease will increase your rights.

playing it SAFE

By Timothy E. Duncan

"DON'T DO IT" IS THE advice that one Fortune 500 chief information officer would give to anyone considering leasing PCs or workstations. His company, like many others in recent years, has had several costly leasing experiences and now purchases almost all of its PCs and workstations outright.

Unfortunately, purchasing isn't always possible, especially if your capital budget is running on empty or if your company considers leasing a valuable financing tool. Leasing PCs can work for you, but only if potential problems are recognized and dealt with before a lease is signed.

What creates trouble for a lot of companies is that, while the leasing business has changed, the contracts have not.

Ten years ago, about 90% of high-tech leases were for mainframes and peripherals. These large systems were kept in climate-controlled glass houses, and when the lease was up, the equipment was easily located and returned to the lessor in the same condition it arrived.

Now, PC leasing is on the rise, and users treat these machines as if they own them — adding memory and video cards, or reconfiguring them to suit their needs. Unfortunately, most lessors don't tolerate modifications, unless they're specifically provided for in the lease.

If you've decided to lease PCs, the best advice is to review the lease with your attorneys and consider adding the following provisions. Remember that the entire leasing transaction is defined in the lease agreement and nowhere else. If it is not in the lease, it is not part of the deal.

Right to purchase. At the end of a lease, it is often almost impossible to retrieve PCs from users and return them to the leasing company. In fact, one major independent leasing company's return rate is lower than 1%. When equipment is not returned, you are at the mercy of your lessor, which can potentially charge you any amount for the PCs or even sue you.

If you anticipate having a difficult time rounding up your leased PCs, insist on adding a lease provision that gives you the right to purchase the equipment at the end of the lease or at periodic points during the lease.

All purchase options should be for the lower of a previously agreed price or fair market value and apply to all or part of the equipment.

Right to modify. Most lease agreements restrict equipment modification. However, as long as it does not materially diminish the value of the equipment, the lessee should have the right to add cards, change configurations and do anything else to keep the equipment functional.

Right to relocate. Most agreements don't allow the equipment to be moved from the original location stated in the lease. Negotiate a lease that gives you the right to freely move the equipment anywhere in the country as long as the lessor is notified. This should also allow portables to be moved anywhere, provided they are returned to a central location at the end of the lease.

Right to return identical equipment. Normally, PC leases involve many identical or nearly identical units, and often, a large project may involve owned equipment and equipment that is leased from several companies.

For maximum flexibility, request that your lessor accept equipment that is identical to the original equipment at the end of a lease.

Right to replace. If leased equipment is lost, stolen or destroyed, most leases require the lessee to either replace the equipment or pay a stipulated loss charge.

When leasing PCs, the lessee should always insist on the right to replace the equipment because prices for older PCs will almost always be less than stipulated loss amounts.

JUST ASK

When researching a lease, most companies are concerned only with the lease rate. Asking lessors for the following information, however, will help in evaluating different requests for proposals:

1. Monthly or quarterly lease rates expressed as a percentage of the equipment cost.
2. Purchase option prices at the end of the lease and for quarterly or semiannual points during the lease.
3. Restrictions that will be imposed when upgrading or relocating the equipment.

Duncan is an attorney and president of Duncan Resource Group, a Boston-based advisory firm that assists companies with purchasing, leasing and financing high-tech equipment.

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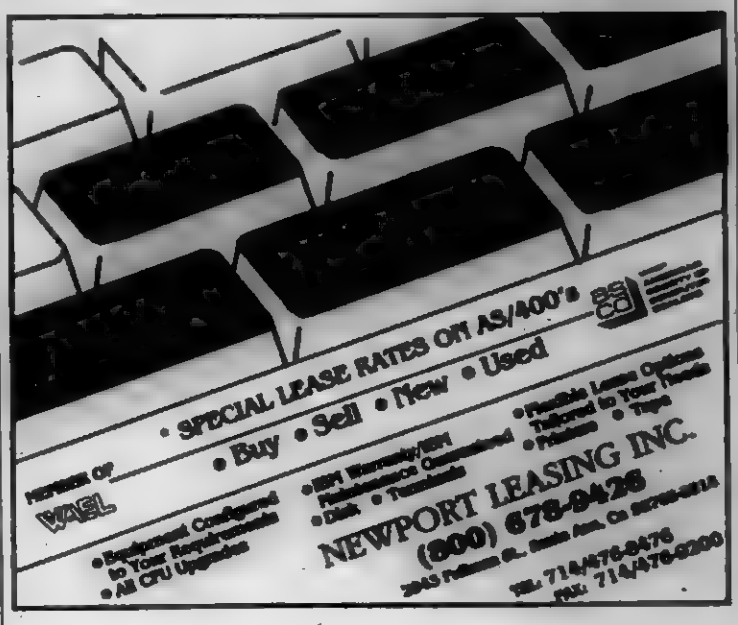

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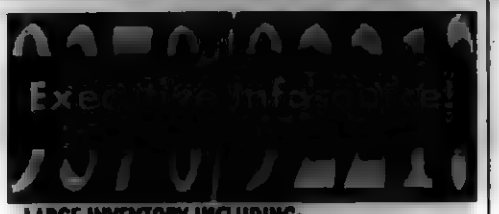

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Index of used computer prices

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	Closing Prices	
	BoCoEx	AmCoEx
IBM AT 339	$350	$450
PS/2 Model 30 286	$400	$450
PS/2 Model 55SX	$750	$775
ThinkPad 300	$1,400	$1,475
PS/2 Model 90-081	$1,700	$2,050
PS/2 Model 95-057	$3,000	$3,050
Compaq Portable II	$225	$300
Portable III	$350	$400
Portable 386	$650	$750
SLT-286	$625	$650
LTE-286	$675	$750
DeskPro 486/33i	$1,850	$1,750
Apple Macintosh SE	$625	$600
IICX	$1,600	$1,500
IICI	$2,250	$2,150
IIFX	$2,800	$2,450
Quadra 700	$3,250	$2,600

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Utilities, Communications Systems, Transportation Services	58,516
Mining, Construction, Petroleum & Refining	17,618
Manufacturers of Computers & Peripherals	63,550
Systems Integrators, VARs, Computer Service Bureaus and Consulting	100,673
Computer Dealer, Distributor, or Retailer	16,989
Other	28,313
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RFP #	DATE/TIME
2-01-93052-0	5/20/93, 4PM

FOR: Development of Technical Standard Operating Procedures Manuals

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2-01-93033-0	5/26/93, 4PM

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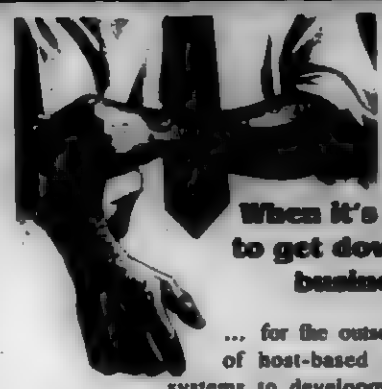

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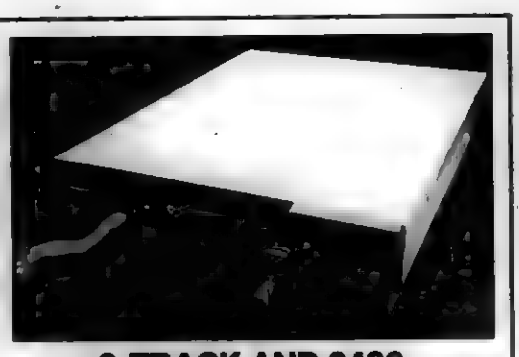

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Gainers Losers

Percent

[illegible]	50.3	MathSoft (L)	-25.4
Cadmus Corp. (L)	24.5	Network Computing Devices	-23.6
Pharmetrix Technologies	18.4	Group I Software	-21.0
Performsoft (L)	16.6	Gateway Communications	-18.2
Computer Horizons	14.5	Lotus Corp.	-16.1
Wang Labs Inc. (H)	14.2	Worldtalk	-15.8
Autodesk	14.1	Microcom Inc.	-14.3
Tandem Computers Inc.	13.8	Computervision Corp.	-14.3

Dollar

[illegible]	9.50	Adobe Corp.	-6.75
ITT Corp. (H)	4.88	MathSoft (L)	-4.38
Southwestern Bell Corp.	4.38	Analysts Int'l.	-4.00
Performsoft (L)	4.29	Network Computing Devices	-3.75
3M Corp (H)	4.13	Group I Software	-3.50
Matsushita Electronics (H)	3.50	Progress Software Corp.	-3.00
Sybase Inc.	3.25	Oracle & Ramtek	-2.75
Micro Focus	3.00	Peoplesoft	-2.25

[redacted]

Still going. . . .

The volume of computer industry companies going public remained steady in the most recent quarter, according to Houston-based Sommers & Associates, Inc.

Nineteen computer companies rendered their initial public offerings (IPO) in the first quarter, the same number as in the last quarter of 1992. The IPOs yielded $508 million, 7% less than the previous quarter's $549 million total. The largest single first-quarter offering belonged to Wall Data, Inc. (WALL) at $57.6 million. The previous quarter featured Compuware Corp.'s (CPWR) $144.3 million IPO.

High-tech offerings benefited from continued IPO momentum across all markets, according to Thomas Sommers, president of the investor relations firm. IPOs netted a record $11.6 billion in the quarter. Many firms jumped into the market to stay ahead of possible unfavorable market reactions to new budget and tax plans, Sommers said.

Caution flags should be raised for investors, however, because of several recent crashes. Networking vendor NetWorth (NWTH), which has been public since last November, dropped more than 40% last Wednesday. NetWorth joins software companies McAfee Associates (MCAF) and MathSoft, Inc. (MATH) as recent IPOs that zoomed up and subsequently took a nosedive.

Several other issues that debuted in the first quarter are trading well below their highs.

—Derek Slater

Trading down

Selected first-quarter initial public offerings (IPO) in the computer industry with their high-water marks and current values

MathSoft, Inc.	$13	23	7 3/4
Powersoft Corp.	$20	40	32 1/2
Gupta Corp.	$18	35 1/4	21
Boca Research, Inc.	$10	13 3/4	12
Avid Technology, Inc.	$20	27 1/2	19 3/4
Intuit, Inc.	$20	33	25 1/2
Wall Data, Inc.	$20	26	18 1/4
Tricord Systems, Inc.	$11	15 1/4	15
Parallan Computer, Inc.	$12	14	12 1/2
Brock Control Systems, Inc.	$11	13 3/4	13 3/8

Source: Sommers & Associates, Inc.

Exch	52-Week Range			April 16 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT						
OTC	36.75	9.63	3 COM Corp.	30.88	-1.00	-3.1
NYS	79.25	60.13	American Info Techs Corp. (H)	79.25	2.38	3.1
NYS	60.25	40.63	AT&T (H)	59.88	1.25	2.1
OTC	3.56	0.75	Artel Communication Corp.	2.31	0.06	2.8
OTC	24.50	10.25	Banyan Systems Inc.	16.75	0.00	0.0
NYS	56.75	42.13	Bell Atlantic Corp.	54.63	0.25	0.5
NYS	57.50	45.13	BellSouth Corp.	56.75	1.50	2.7
NYS	6.25	3.63	Bolt, Beranek & Newman	5.13	0.00	0.0
OTC	18.50	9.75	Brooktrout Technology	11.50	-0.50	-4.2
NYS	92.25	62.13	Cabletron Systems	89.13	1.50	1.7
OTC	34.50	17.75	Chipcom Corp.	32.50	2.00	6.6
OTC	48.25	16.50	Cisco Systems Inc.	44.50	0.88	2.0
OTC	22.00	5.50	Compression Labs Inc.	9.13	-0.88	-8.8
OTC	4.63	0.88	Data Switch Corp.	3.94	0.00	0.0
NYS	22.13	13.75	Digital Comm. Assoc.	13.75	-1.13	-7.6
OTC	12.75	6.00	Digital Systems Int'l Inc.	6.00	0.00	0.0
OTC	29.88	4.00	DSC Communications	29.88	2.25	8.1
OTC	9.50	4.75	Fibronix Int'l Inc.	6.75	-0.38	-5.3
OTC	28.50	8.75	Farnet Corp.	10.25	0.25	2.5
OTC	6.38	1.50	Gandalf Technologies Inc.	3.00	-0.13	-4.0
OTC	2.06	0.69	Gateway Communications	1.13	-0.25	-18.2
NYS	11.50	2.88	General Datacomm Inds.	9.13	-0.88	-8.8
ASE	4.13	2.00	Go Video	2.31	-0.19	-7.5
NYS	37.75	30.63	GTE Corp.	36.00	-0.63	-1.7
NYS	83.25	62.50	ITT Corp. (H)	83.25	4.63	5.9
OTC	69.25	29.88	MCI Communications Corp. (H)	47.00	1.25	2.7
OTC	12.00	2.25	Microcom Inc.	3.75	-0.63	-14.3
OTC	24.25	4.75	Netrix Corp.	6.00	-0.13	-2.0
OTC	19.00	9.00	Network Computing Devices	9.00	-3.75	-29.4
NYS	15.38	5.75	Network Equipment Tech. (L)	5.75	-0.38	-6.1
OTC	23.25	8.00	Network General	10.75	0.00	0.0
OTC	15.75	8.50	Network Systems Corp.	9.13	0.00	0.0
OTC	64.00	13.63	Newbridge Networks Corp.	59.25	1.00	1.7
NYS	47.63	30.50	Northern Telecom Ltd.	34.75	-2.25	-6.1
OTC	35.25	22.50	Novell Inc.	31.88	-0.13	-0.4
NYS	92.50	74.00	Wang Corp.	89.88	-0.13	-0.1
OTC	30.00	14.50	Octel Communications Corp.	20.63	-0.88	-4.1
OTC	7.00	3.38	Pemtel Data Comm Networks	4.25	-0.25	-5.6
OTC	40.50	10.25	Picturetel Corp.	16.00	-1.25	-7.2
OTC	15.75	5.75	Proteon Inc.	5.75	-0.25	-4.2
NYS	30.38	10.16	Scientific Atlanta Inc.	24.75	0.25	1.0
NYS	80.75	59.38	Southwestern Bell Corp.	80.75	4.38	5.7
NYS	32.75	21.00	Sprint Corp. (H)	32.75	0.75	2.3
OTC	27.00	8.75	Standard Microsystems Corp	14.75	-0.63	-4.1
OTC	18.50	6.88	Stratacom Inc.	11.50	-1.00	-8.0
OTC	107.50	19.38	Synoptics Communications (H)	106.75	9.50	9.8
OTC	7.13	4.25	Telebit Corp.	4.63	0.00	0.0
OTC	9.38	2.13	Telematics Int'l Inc.	7.13	0.00	0.0
OTC	25.50	13.38	US Robotics	21.00	2.00	10.5
NYS	44.00	34.13	U S West Inc. (H)	43.50	0.63	1.5
OTC	46.00	12.00	Wellfleet Communications	42.25	-0.13	-0.3
OTC	21.50	7.00	Xircom	9.13	1.13	14.1
COMPUTER MANUFACTURERS						
OTC	7.25	2.75	Advanced Logic Research	2.88	-0.13	-4.2
OTC	64.25	41.50	Apple Computer Inc.	48.50	-1.25	-2.5
OTC	24.25	11.25	AST Research Inc.	13.38	0.13	0.9
NYS	13.63	4.38	Commodore Int'l (L)	4.50	-0.38	-7.7
NYS	58.50	22.25	Compaq Computer Corp.	51.13	2.25	4.6
OTC	49.88	15.00	Dell Computer Corp.	31.75	-0.38	-1.2
NYS	82.88	50.25	Hewlett Packard Co.	73.75	-0.88	-1.2
NYS	53.00	14.13	Silicon Graphics	27.50	1.75	6.8
OTC	61.00	22.50	Sun Microsystems Inc.	27.00	-1.88	-6.5
NYS	32.13	22.25	Tandy Corp.	29.38	-0.38	-1.3
OTC	12.75	2.75	Zeos International Ltd.	4.50	-0.38	-7.7
COMPUTER SYSTEMS						
ASE	18.38	5.88	Amdahl Corp.	5.88	-0.13	-2.1
NYS	10.63	4.25	Convex Computer (L)	4.63	-0.13	-2.6
OTC	6.13	1.88	Cray Computer	3.13	0.38	13.6
NYS	40.75	19.00	Cray Research Inc.	27.75	0.13	0.5
NYS	13.88	7.13	Data General Corp.	10.63	-0.50	-4.5
NYS	49.25	30.38	Digital Equipment Corp.	41.13	-0.13	-0.3
NYS	38.63	26.63	Harris Corp.	37.63	0.13	0.3
NYS	100.38	65.88	IBM	68.88	-2.25	-3.4
OTC	22.00	5.50	Kendall Square Research	16.13	-0.13	-0.8
NYS	122.00	83.00	Matsushita Electronics (H)	121.00	3.50	3.0
OTC	17.00	6.00	Pyramid Technology	13.00	0.50	4.0
OTC	24.00	11.13	Sequent Computer Sys.	17.13	-1.25	-6.8
OTC	16.38	1.38	Sequoia Systems Inc.	2.50	-0.13	-4.8
NYS	49.50	29.50	Stratus Computer Inc.	32.75	-1.50	-4.4
NYS	16.88	9.88	Tandem Computers Inc.	12.38	1.50	13.8
NYS	13.88	7.75	Unisys Corp.	13.25	0.13	1.0
ASE	5.13	0.06	Wang Labs Inc. (H)	0.50	0.06	14.2
SOFTWARE						
OTC	49.25	25.25	Adobe Systems Inc.	44.25	2.50	6.0
OTC	22.25	10.25	Aldus Corp.	17.00	-0.75	-4.2
OTC	16.63	5.63	American Software Inc.	7.00	-0.50	-6.7
OTC	28.13	9.75	Ase Computer Systems	13.25	-0.50	-3.6
OTC	56.50	27.75	Autodesk Inc.	41.25	-0.13	-0.3
OTC	15.00	3.50	Bachman Info. Systems	3.50	-0.25	-6.7
OTC	43.00	34.75	BGS Systems Inc.	38.75	1.13	3.0
OTC	84.13	32.25	BMC Software Inc.	44.25	-0.38	-0.8
OTC	28.25	17.00	Boole & Babbage	24.00	-2.75	-10.3
OTC	55.25	17.50	Borland Int'l. Inc.	19.75	0.50	2.6
OTC	6.50	3.00	CE Software	3.50	-0.25	-6.7
ASE	23.34	6.25	Cheyenne Software Inc.	21.88	1.79	8.9
OTC	19.50	8.25	ChipSoft	10.00	0.25	2.6
OTC	9.75	5.63	Cognos Inc.	6.50	-0.38	-5.5
NYS	27.38	10.88	Computer Associates	23.13	0.00	0.0
NYS	12.38	3.75	Computervision Corp.	3.75	-0.63	-14.3
OTC	34.25	19.25	Computware Corp. (L)	24.00	0.75	3.2
OTC	15.75	6.50	Consware Inc. (L)	7.63	0.88	13.0
OTC	17.25	10.75	Cobol Corp.	14.75	-0.13	-0.8
OTC	30.00	6.00	Easel Corp	8.00	-1.00	-11.1
OTC	25.25	12.00	4th Dimension	20.25	-0.25	-1.2
OTC	23.50	6.63	Frame Technology	6.63	-1.00	-13.1
OTC	20.75	10.50	Group I Software	10.50	-3.50	-25.0
OTC	35.25	21.00	Gupta	22.63	0.38	1.7
OTC	8.75	3.50	Hogan Systems Inc.	7.13	0.50	7.5
OTC	25.75	11.25	IMRS (L)	12.38	0.13	1.0
OTC	34.75	18.50	Information Resources	29.13	-0.63	-2.1
OTC	42.00	12.13	Informix Corp.	29.75	-0.25	-0.8
OTC	18.50	10.63	Intergraph Corp.	10.63	0.38	3.7
OTC	13.63	7.75	Interleaf Inc.	8.88	0.63	7.6
OTC	18.00	6.75	Intersolv Inc.	7.00	-0.25	-3.4
OTC	16.75	9.25	Knowledgeware Inc.	9.25	-0.50	-5.1
OTC	54.75	28.75	Legent Corp.	30.50	-6.75	-18.1
OTC	33.75	14.75	Lotus Development	25.50	-1.00	-3.8
OTC	23.00	8.00	MathSoft (L)	8.00	-4.38	-35.4
OTC	23.25	5.25	McAfee Associates	5.25	-0.75	-12.5
OTC	11.50	1.88	Mecca Software (H)	11.50	2.88	33.3
OTC	15.25	5.25	Mentor Graphics	8.25	-0.50	-5.7
OTC	46.00	27.25	Micro Focus	34.00	3.00	9.7
OTC	20.50	4.38	Micrografx Inc. (L)	5.13	-0.25	-4.7
OTC	95.00	65.50	Microsoft Corp.	87.25	-1.75	-2.0
OTC	37.50	12.00	Oracle Corp.	33.38	-2.50	-7.0
OTC	31.88	15.38	Parametric Technology	26.00	0.50	2.0
OTC	40.50	22.50	Peoplesoft	29.00	-2.75	-8.7
OTC	10.25	3.50	Phoenix Technologies	5.63	0.88	18.4
OTC	40.00	28.50	Powersoft (L)	33.75	4.25	14.4
OTC	25.00	13.25	Platinum Technology	13.25	-0.63	-4.5
OTC	61.50	29.00	Progress Software Corp.	34.75	-3.00	-7.9
OTC	18.00	2.94	Quarterdeck Office Sys.	3.63	0.13	3.6
OTC	24.50	11.75	Rainbow Technologies Inc.	18.25	0.50	2.8
OTC	19.25	4.00	Rasterops	4.63	0.00	0.0
OTC	15.25	3.63	Ross Systems	11.63	-1.13	-8.8
OTC	37.25	8.50	Sapiens USA Inc.	25.75	2.50	10.8
OTC	19.50	6.75	Software Publishing Corp.	8.13	-0.13	-1.5
OTC	9.13	2.00	Software Toolworks Inc.	7.88	0.38	5.0
OTC	4.88	0.75	Spinnaker Software	1.63	-0.25	-13.3
OTC	12.75	3.25	State of the Art	10.00	-0.38	-3.6
NYS	24.63	13.75	Sterling Software Inc.	20.88	0.38	1.8
OTC	18.75	8.00	Struct. Dynamics Research*	16.00	-0.63	-3.8
OTC	62.25	21.00	Sybase Inc.	55.50	3.25	6.2
OTC	44.25	5.88	Symantec Corp.	13.25	-0.13	-0.9
NYS	12.50	5.25	Systems Center Inc.	11.00	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	12.25	-0.75	-5.8
OTC	8.88	2.50	Tenzic Corp.	3.94	0.06	1.6
OTC	22.75	9.13	Viewlogic Systems	14.75	-1.00	-6.3
OTC	29.50	6.75	Walker Interactive Systems	7.50	-0.50	-6.3
OTC	3.38	1.38	Wordstar	2.00	-0.38	-15.8
MISCELLANEOUS						
NYS	26.00	7.38	Advanced Micro Devices (H)	23.75	-1.25	-5.0
NYS	21.38	9.00	Analog Devices Inc. (H)	20.00	0.25	1.3
OTC	20.50	7.63	Atmel Corp. (H)	20.38	1.75	9.4
OTC	9.38	3.13	Chips and Technologies	3.13	-0.50	-13.8
OTC	39.75	16.25	Cirrus Logic	20.50	-0.38	-1.8
NYS	12.38	7.38	Cypress Semiconductor Corp	10.00	0.13	1.3
NYS	16.13	7.00	Dallas Semiconductor	13.63	0.38	2.8
OTC	121.25	46.50	Intel Corp.	110.75	-2.25	-2.0
NYS	14.13	4.88	LSI Logic Corp.	11.88	-0.50	-4.0
NYS	28.50	12.88	Micron Technology	20.63	-1.38	-6.3
NYS	74.88	37.13	Motorola Inc. (H)	71.50	2.75	4.0
NYS	14.13	8.50	National Semiconductor	12.88	-0.25	-1.9
OTC	18.50	8.25	Sierra Semiconductor	11.38	0.88	8.3
OTC	38.50	22.25	SynOptics	32.50	0.00	0.0
NYS	63.38	32.25	Texas Instruments	54.50	-1.50	-2.7
OTC	8.88	6.00	VLSI Technology	6.63	-0.13	-1.9
OTC	7.63	2.13	Weitek	5.63	0.13	2.9
ASE	9.63	3.50	Western Digital Corp.	5.13	0.25	5.1
OTC	37.50	14.50	Xilinx	31.88	-0.63	-1.9
OTC	27.84	12.50	Zilog Inc.	23.00	0.75	3.4
PERIPHERALS AND BUSINESS SYSTEMS						
OTC	33.75	10.38	American Power Conversion	30.00	0.25	0.8
OTC	20.16	13.66	Banctec Inc.	16.75	0.25	1.5
OTC	18.00	6.25	Cambex Corp. (L)	9.00	1.75	24.1
ASE	18.38	6.50	Cognitronics Corp. (L)	7.13	0.13	1.8
NYS	25.50	12.50	Comdisco Peripherals (L)	12.50	-0.25	-2.0
OTC	38.50	10.75	Creative Technologies Inc.	29.00	1.75	6.4
OTC	30.75	14.25	Data Race Inc.	20.00	1.50	8.1
ASE	17.00	4.75	Databasics Corp.	8.88	-0.13	-1.6
OTC	28.75	8.16	EMC Corp.	25.00	0.25	1.0
OTC	10.50	5.38	Emulex Corp.	6.25	-0.63	-9.1
OTC	19.00	13.25	Evans & Sutherland	16.00	1.00	6.7
OTC	58.25	12.00	Exabyte	13.13	-1.25	-8.7
OTC	26.00	7.09	Intelligent Info. Systems	19.25	-0.50	-2.5
OTC	8.88	3.88	Iomega Corp.	4.13	0.00	0.0
OTC	26.00	5.75	IPL Systems Inc.	6.25	-1.00	-13.8
OTC	24.00	10.75	Komag Inc.	17.25	-1.00	-5.5
OTC	19.63	6.88	Maxtor Corp.	6.88	-0.25	-3.5
OTC	11.75	6.25	Micropolis Corp. (L)	6.25	-0.38	-5.7
NYS	115.00	92.00	3M Corp (H)	115.00	4.13	3.7
OTC	7.75	4.00	Printronix Inc.	7.00	-0.38	-5.1
NYS	17.13	6.88	QMS Inc.	16.25	0.75	4.8
OTC	17.88	11.75	Quantum Corp.	12.13	-0.90	-6.9
OTC	12.75	3.50	Radius Inc.	3.88	-0.13	-3.1
NYS	16.25	7.50	Recognition Equipment	13.88	1.25	9.9
OTC	13.00	5.50	Relisys Inc.	6.25	0.00	0.0
OTC	22.38	12.00	Seagate Technology	13.50	-0.50	-3.6
NYS	59.75	18.00	Storage Technology	25.63	2.00	8.5
NYS	27.88	16.88	Tektronix Inc. (H)	27.38	0.50	1.9
NYS	88.88	66.75	Xerox Corp.	80.38	0.75	0.9
SERVICES						
OTC	23.50	12.66	American Mgmt. Systems	23.13	0.88	3.9
NYS	4.75	3.00	Analogic Inc.	3.88	0.13	3.3
OTC	35.75	16.25	Analysts Int'l.	25.75	-4.00	-13.4
NYS	96.13	38.75	Auto Data Processing	48.38	-1.50	-3.0
NYS	17.25	9.41	Cadidian Corp.	15.13	-0.50	-3.2
NYS	17.38	12.50	Comdisco Inc.	15.38	-0.38	-2.4
OTC	8.66	6.50	Computer Horizons	8.00	1.00	14.3
NYS	80.50	57.00	Computer Sciences	73.13	-0.38	-0.5
NYS	9.63	6.88	Computer Task Group (L)	7.50	0.38	5.3
NYS	40.50	22.00	CompUSA Inc.	30.50	0.38	1.2
OTC	17.50	6.00	Corporate Software	14.00	0.13	0.9
OTC	26.00	7.63	Egghead Discount Software	7.63	-0.63	-7.6
NYS	35.88	25.25	General Motors E (EDS)	32.00	1.63	5.3
OTC	25.50	9.25	Inacom Corp.	17.50	-0.50	-2.8
OTC	15.38	6.25	Intelligent Electronics	12.75	-0.38	-2.9
OTC	14.38	6.63	Keane	11.13	0.38	3.5
OTC	14.25	5.75	Microage Inc.	14.25	1.00	7.5
OTC	43.00	21.75	Paychex (H)	42.75	1.50	3.6
NYS	87.25	37.00	Policy Management Sys.	45.63	0.63	1.4
NYS	35.38	16.81	Reynolds and Reynolds	35.00	1.13	3.3
OTC	31.75	22.00	SEI Corp.	28.50	0.25	0.9
OTC	24.38	16.88	Shared Medical Systems	20.50	0.00	0.0
OTC	13.88	5.75	SNL Systemhouse	10.88	-0.25	-2.2
OTC	29.25	18.25	Software Spectrum Inc.	23.38	1.13	5.1
OTC	33.75	21.75	Sungard Data Systems	31.00	-0.25	-0.8
NYS	6.00	1.13	Ultimate Corp.	3.50	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Intel results soar

Riding a strong uptick in PC sales, Intel Corp. last week posted fiscal first-quarter net income of $547 million, an increase of 198% from the comparable period last year. Revenue in the period ended March 27 grew 68% to $2 billion, the Santa Clara, Calif., company said.

SynOptics growing

Net earnings at SynOptics Communications, Inc. rose 30% to $21.8 million in the first fiscal quarter ended April 2. Revenue at the internetworking company was $152 million, a 123% increase over the like period last year. The Santa Clara, Calif., firm attributed its growth to strong Token Ring and Ethernet sales.

ADP results up, again

Automatic Data Processing, Inc. posted fiscal third-quarter net earnings of $92.4 million, an increase of 14% from the comparable period last year. Revenue rose 12% to $612.9 million in the period, the Roseland, N.J., computer services company said.

Loss predicted

Bachman Information Systems, Inc. said that its revenue for the third fiscal quarter ended March 31 will fall below analysts' expectations. The firm also said the operating loss for that quarter will be greater than expected. Those results will be reported the week of April 26.

SHORT TAKES IBM has acquired Catapult, Inc., a Bellevue, Wash., provider of PC software training services. Catapult will operate as a separate subsidiary reporting to IBM's Skill Dynamics education and training company. . . . As expected, Digital Communications Associates, Inc. posted a $66.6 million fiscal third-quarter loss, on revenue of $55.7 million.

Coalition opposes FASB decision

By Gary H. Anthes
WASHINGTON, D.C.

■ The computer industry is gearing up for a trip to Capitol Hill in the wake of a tentative decision by the Financial Accounting Standards Board (FASB) to require companies to deduct from earnings the estimated value of stock options granted to employees.

The Coalition for American Equity Expansion (CAEE), a group of computer and biotechnology companies, argues that the change in accounting practice — which the FASB said would take effect in 1997 — would curtail the use of stock options, thereby inhibiting the firms' ability to attract and retain the best talent in risky ventures.

CAEE — a coalition of 19 companies including Apple Computer, Inc., Compaq Computer Corp., IBM and Oracle Corp. — is drafting a bill it hopes will be introduced in Congress this month.

The companies claim that stock options are vital for the competitiveness of U.S. industry. They are challenging a perception that stock options are reserved mostly for executives with six- and seven-figure incomes (see chart).

"We remember when we were in a garage," said Eric Ryan, director of taxes and economic development at Apple. "The people we were attracting — from Hewlett-Packard Co., Intel Corp., Fairchild and National Semiconductor Corp. — would not have joined the company but for the opportunity to participate in the equity side of the business."

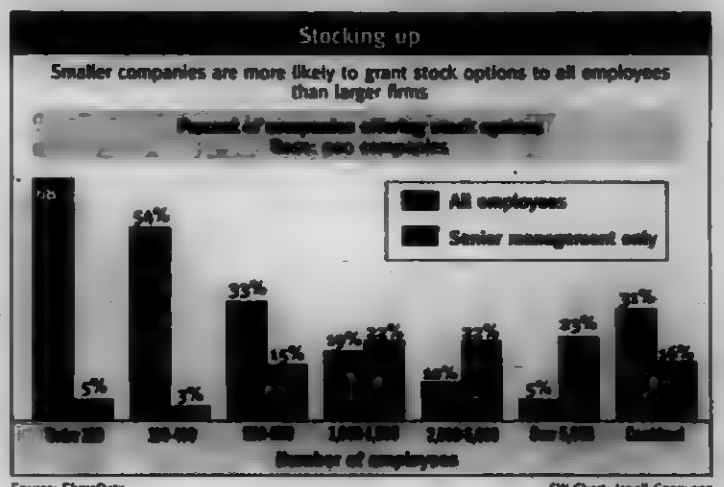
Ryan said about 75% of all Apple employees now have stock options. He explained that the company evaluated various ways of accounting for stock options and found they would cut corporate earnings from very little to as much as 50%.

Ryan noted that Apple has no objection to an interim FASB requirement for greater financial disclosure by companies that grant stock options to executives.

CAEE's draft bill would include the following:

•Create a new form of stock option not taxable to employees at the time of grant or exercise and taxable at 50% of ordinary rates if sold two or more years after exercise.

•Direct the U.S. Securities and Exchange Commission to retain the current accounting treatment of fixed stock options and remove the charge to corporate earnings now required on variable stock options — those where the amount of the option is pegged to preset employee performance goals.



In a nutshell

The CAEE bill is intended to head off a bill from Sen. Carl Levin (D-Mich.) that, like the FASB proposal, would require firms to treat stock options as a cash contribution. Levin's bill is partly the result of public outcry over lavish executive compensation.

IMRS to push client/server

By Michael Vizard
STAMFORD, CONN.

Following its acquisition of financial accounting software from MAI Systems in February, IMRS, Inc. last week detailed a plan to become a player in the emerging client/server financial accounting market.

IMRS, which builds business reporting tools for DOS and Microsoft Corp. Windows, hopes to parlay MAI's client/server accounting software into a suite of accounting packages that include PC end-user tools packaged with a transaction-oriented accounting system.

The MAI package, which uses Sybase, Inc.'s relational database management system as a server, puts IMRS in competition with accounting software providers such as PeopleSoft, Inc., Computer Associates International, Inc., Dun & Bradstreet Software, Dodge Group and Ross Systems, Inc., according to Craig Bickley, director of product marketing at IMRS.

However, the MAI software supports only DOS clients, a shortcoming IMRS intends to resolve by adding Windows support in early 1994. IMRS said it will add Windows client support to the MAI suite of accounting modules and add SQL support to its Windows-based Hyperion reporting software at the same time. In addition, IMRS is working on porting Hyperion to Microsoft's Windows NT on both Intel Corp. and Digital Equipment Corp. Alpha AXP platforms sometime this year.

IMRS unveiled

Fiscal 1993 six-month sales: $25.2 million.

Fiscal 1993 six-month earnings: $2 million.

Employees: 350.

Founded: 1981.

Key Customers: Pepsico, Paramount Publishing, American Express Co., Bristol-Myers Squibb Co., Bally Manufacturing Corp., Burger King.

Wide open

Industry analysts said IMRS stands a decent chance of leveraging its installed base of PC software — 1,000 corporations — in its bid to become a force in the emerging client/server financial accounting market.

"The client/server application market is wide open. A lot of companies haven't delivered products yet, and the reality is that purchases won't be made until 1994," said Peter Kastner, a vice president at Aberdeen Group in Boston.

For example, Paramount Publishing in Englewood Cliffs, N.J., looked at replacing an accounting system from CA that runs on an IBM mainframe with a client/server package that supports Windows. However, all the packages Paramount looked at were missing some major components. Therefore, Paramount decided to augment its existing CA system with IMRS' Hyperion tool. That gave users a Windows tool to analyze data that is downloaded into Hyperion in an ASCII text file.

Pepsico, Inc. in Purchase, N.Y., also uses the Hyperion tools to provide users with a graphical view of data that is gleaned from 30 different general ledgers.

"We use Hyperion to consolidate data that is rekeyed from the different general-ledger packages. When IMRS adds the SQL interface to Hyperion, we'll probably move to standardize on general ledgers that support SQL," said Tim Calkins, senior systems analyst at Pepsico.

At that time, the IMRS offering will be evaluated alongside other general-ledger packages, Calkins said.

What was your first computer experience?

Ellen Gordon

President, Tootsie Roll Industries, Chicago

Ellen Gordon's first computer came from Radio Shack. At the time, she did not really know what it was, let alone the difference between hardware and software. She trained herself to use it by reading the manuals and even taught herself how to type. Back then, she didn't know anyone who owned or even used a computer. Now, she's addicted to technology.

Charles Darnell

Senior vice president and general manager, Lithonia Lighting, Conyers, Ga.

The first computer Charles Darnell programmed and maintained was the Univac 1107 in 1960 at the Warner Robins Air Force Base in Georgia. It was the largest machine of its kind under one roof — measuring almost 20,000 sq ft — and was used for the inventory, maintenance and flights of B-52 bombers. On hot summer days, Darnell and his co-workers played chess and ate lunch inside the water-cooled machine.

Gwen Bell

President of the Association for Computing Machinery, founding president of the Computer Museum, Boston

When Gwen Bell was a student at the University of New South Wales in Sydney, Australia, in 1958, she was invited into the computer lab by Fulbright scholar Gordon Bell. When she approached her computer — an English Electric Deuce with a CRT and keyboard — she found an unusual program. She worked the keys and punched a few codes and discovered that the unknown program was a marriage proposal crafted by Gordon Bell.

Compiled by Stefanie McCann

The Fifth Wave *by* Rich Tennant

Inside Lines

A Novell approach

Novell is about to buy its first application development company: Software Transformation, Inc., a 5-year-old, objected-oriented tools maker in Cupertino, Calif. Vendors Central Point Software and Power Up use Software Transformation's Universal Component System to build Microsoft Windows, Apple Macintosh and Unix systems. Novell, which has bought stakes in other development companies but has yet to buy such a firm outright, wants to use Software Transformation's productivity for users into the NetWare 4.0 fold, according to a Software Transformation source. NetWare 4.0 is really aimed at big client/server users, but users need applications to run in client/server mode. It's in Novell's interests to help people build this stuff," the source explained. Final papers are expected to be completed within a week, he said; then the deal is subject to government and shareholder approval. Novell did not respond to inquiries.

Wireless routers?

In response to a customer investigating the feasibility of interconnecting 50 nationwide LANs via wireless networks, Cisco is developing wireless interfaces for its routers. Whether the interfaces are cellular- or packet data-oriented remains a mystery, as does a Cisco spokesman's enigmatic response to whether the products are actually in the works: "We don't want to confirm or deny technologies that we may or may not be developing."

Another kind of voice mail

Octel Communications plans to put yet another "option" on its voice-mail systems: fax notification. The Milpitas, Calif., firm plans to announce a "fax processing" capability this week, sources said. Although users won't be able to hear their faxes read aloud, they will receive notification of a fax arrival on their voice mail. Then they can press a telephone button to get the fax printed, preventing their faxes from falling into the wrong hands. Looks like the voice-mail queue will be getting a little longer.

Getting graphic

Dell will push the local bus down to its consumer-oriented Precision line this week, sources close to the company said. Dell will use its own proprietary local-bus design. The Precision line will also start selling through mass merchant channels, including Sam's warehouses. The new Precision lines will all have Intel i486s in them, and pricing will start at $1,800, including a monitor.

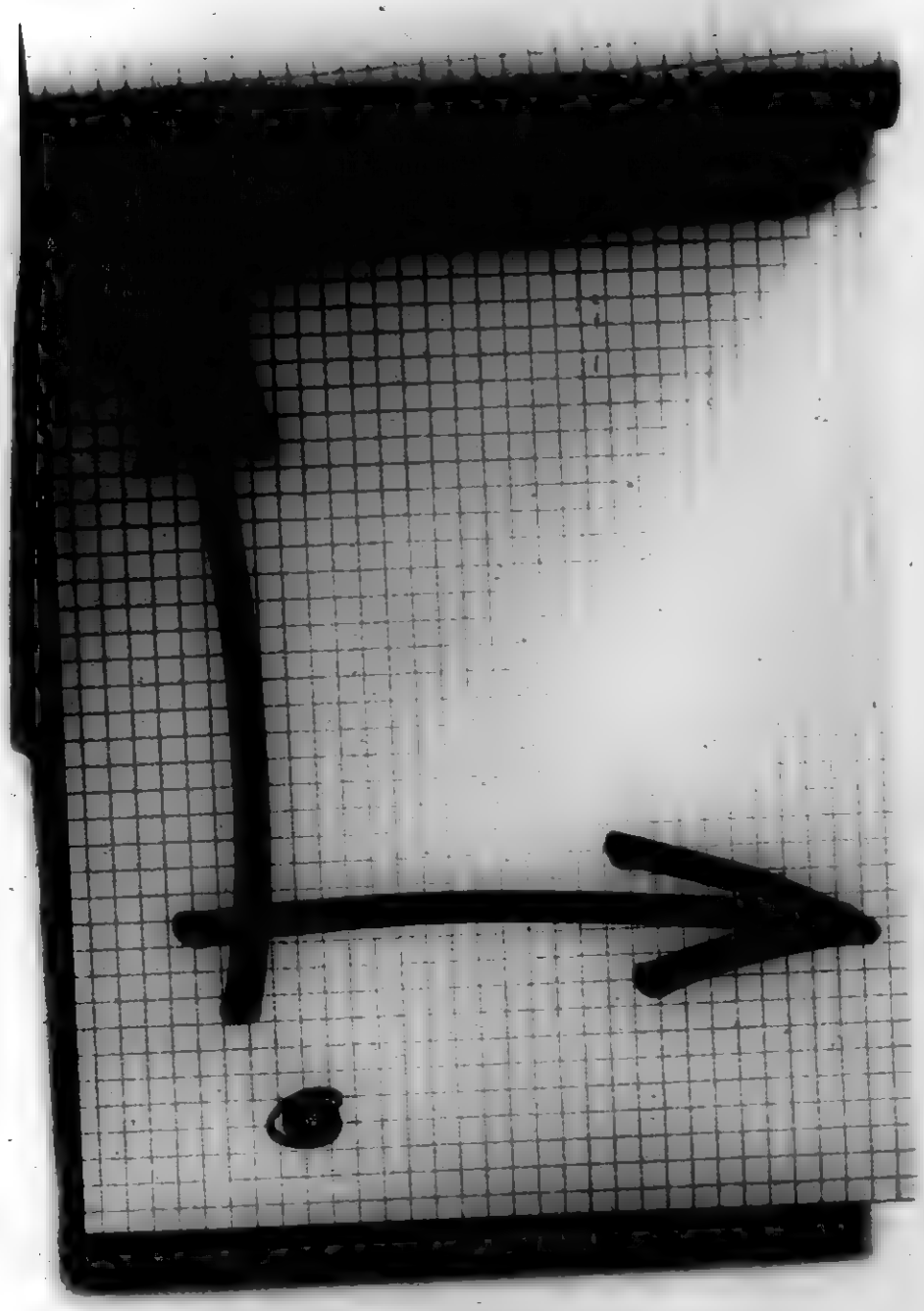
PSST! Pen systems for sale, cheap!

No, it's not true that there were guys in the streets of Boston selling pen-based systems and real gold jewelry. But since NCR decided to dump its original pen-based systems, the once pricey ($3,000-plus) 3125 Notepad is available for $800 from JEM Computers, Inc., a Boston-based factory outlet. JEM is running ads in Pen Magazine, and a company representative said it has hundreds of units. He cautioned that one customer has asked for 500 of the version with 4M bytes of RAM, which would clean JEM out, but that there are plenty of models with 8M bytes of RAM.

Across the universe

DEC is currently testing a gateway to heterogeneous databases, which is likely to ship by the end of the year, according to DEC sources. Comparable to AEX/Ingres' Ingresfilter, DEC's database connector is built on the remnants of the Edbfilter project, which was gutted last year.

Reporters on the line during a teleconference last week had to stifle laughs when Microsoft Chairman Bill Gates prefaced an answer to a question by saying, "We're not in the business of preannouncing products." How else did the market find out about Access, Windows NT, Chicago and Cairo long before they were more than code on a PC in Redmond? Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-8474, (508) 875-8931 or 76037,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 830-8555.



On The Excitement Scale, Where Does Managing Data In A Client/Server Environment Fall?

Okay, we'll admit data management lacks the sex appeal of GUIs and LANs. But we know how important it is to building successful client/server applications. In fact, the way you manage data ultimately determines both the integrity of your information and its availability. And isn't putting accurate information at your users' fingertips what client/server is all about?

To help you address the complex issues of data management in a distributed environment, we've developed a useful guide that's yours free. For your copy, return this coupon or phone us at **1-800-BACHMAN. In Canada, call 1-800-445-0854.**

Managing data in a client/server world may not be the most exciting thing you can do. Just one of the most important.

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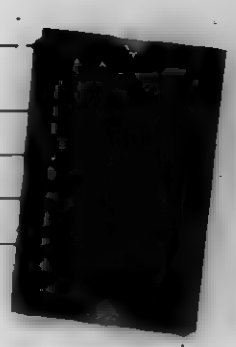

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COMPUTERWORLD

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EARTH DAY
GreenDisk Co. reveals a novel approach to recycling. *Page 14*

AT&T casts virtual net

Deals with McCaw, others extend user reach

By Joanie M. Wexler
BASKING RIDGE, N.J.

As AT&T nears the final *t*-dotting and *t*-crossing of its $3.7 billion deal with McCaw Cellular Communications, Inc. for 33% ownership, the telecommunications giant is quietly nourishing the rest of a multitentacled integration strategy for ushering customers into the world of "virtual" networking.

Gordon Bridge *envisions EasyLink as 'glue' for SDN links*

AT&T's stated goal is to give customers myriad wired and unwired access and service options for data, voice, video, messaging and other applications connectivity to worldwide resources from wherever they happen to be. The game plan involves several key components, at the heart of which is AT&T's Software Defined Network, a "virtual private network" service in use by thousands of companies.

Enter AT&T's EasyLink Services, a wired messaging network that EasyLink President Gordon Bridge said will serve as the main "glue" between SDN and separate wired and unwired packet networks from AT&T and other providers. The interconnection of SDN to EasyLink, slated for the third quarter, is an as-yet-unannounced AT&T endeavor.

There are about 2,800 virtual private networks in place today among the three major carriers, nearly half of which are AT&T accounts, according to TeleChoice, Inc., a consultancy in Verona, N.J.

EasyLink already connects with 40 wired messaging networks supporting 15 million users; SDN users could communicate with those users once the integration takes place, Bridge noted. In addition, he said, EasyLink will connect SDN users to the wireless RAM Mobile Data packet-based messaging network this year, and the firm is working on a similar arrangement with the Motorola, Inc./IBM-owned Ar-

AT&T, *page 12*

Software giants extend suite deal

By Michael Vizard
SCOTTS VALLEY, CALIF.

■ After seriously underestimating the demand for suites of PC application software, Borland International, Inc. and WordPerfect Corp. last week announced a bundle to counter inroads made by Microsoft Corp. and Lotus Development Corp.

Borland said it intends to begin marketing by the second half of June a software suite that includes WordPerfect for Windows word processing software, the Quattro Pro for Windows spreadsheet and Paradox for Windows relational database.

Priced at $595, Borland Office will be the first suite from a major PC software vendor to include a database.

"Neither WordPerfect nor Borland has the ability to offer a full suite like Microsoft on their own, and I think this will be the first in a series of alliances for both Borland and WordPerfect with other companies," said Krystyna Fillistowicz, director of business applications research at Dataquest, Inc. in San Jose, Calif.

"Global success will be depen-

Software giants, *page 7*

Sweetening the mix

The Borland/WordPerfect suite package includes a database and is cheaper than Microsoft's or Lotus' bundle

✓		✓	✓	✓	$795
✓		✓	✓	✓	$750
✓	✓	✓	*	**	$595

*Included in spreadsheet **Will be available at extra cost

NT apps to trickle out

Analysts predict wait of six months from launch

By Michael Vizard
BELLEVUE, WASH.

Microsoft Corp.'s Windows NT may be the most popular undelivered operating system since IBM first began talking about OS/2 in the mid-1980s, and it is likely to travel the same application-light path for the near term.

For example, organizations awaiting Windows NT's arrival can expect at least a six-month wait after its launch next month before a large number of off-the-shelf 32-bit applications become available.

Windows NT installations are expected to hit 1.2 million by the end of 1994, according to analysts at IDC Strategic Decisions.

Analysts said they expect only about a dozen software vendors to have delivered 32-bit applications by the time Windows NT ships. Moreover, Microsoft now says it will have only two of its desktop applications, in addition to its SQL Server database [CW, Feb. 22], available for NT before the end of the year.

"You'll probably see about a dozen [independent software vendors] with deliverable product and a whole host of people with greeting card announcements about how they'll support NT," said John Donovan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "It makes you wonder what people have been doing for the past year with their NT developer kits."

Windows NT, *page 15*

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Users, feds push EDI as part of health care cure

By Lynda Radosevich
SAN ANTONIO

Pending reforms to cut costs and simplify administrative procedures in the $900 billion-a-year health care industry have providers, insurers and suppliers turning to industry-wide standards for electronic data interchange.

Political pressures are adding urgency to the health care move. Next month, President Bill Clinton's Task Force on National Health Care Reform is expected to present Congress with recommendations to make over the health care system.

And starting in October, the Health Care Financing Administration will require Medicare intermediaries to use the

EDI, *page 14*

No panacea

ALAN LEVENSON

CLIENT/SERVER

Client/server development tools for Windows are often less capable in complex, cross-platform environments. *Page 73. Computerworld*'s Buyer's Scorecard survey gives **Uniface** the top user satisfaction ratings among market-leading tools. *Page 80.* Firing Line users rate **KnowledgeWare**'s ObjectView as competitive but lacking in Windows Object Linking and Embedding features. *Page 82.* Avoid poor performance by making sure your network bandwidth can expand at least 30%. *Page 89*

PC SOFTWARE

Microsoft unveils new messaging products, including scheduling and forms routing packages for Mail. *Page 4.* Work-flow software vendors are keeping an eye on Microsoft to see when and how the software giant plugs **work-flow components** into Windows NT. *Page 45*

PCs AND WORKSTATIONS

AMD is cleared to enter the 486 market, but don't expect a big impact on system prices this year. AMD will ship only about 5% of all 486s in 1993. *Page 8.* Don't look for the dramatic early-1993 **price cutting** to continue in the PC market as the year progresses, market researcher Infocorp warns. *Page 39.* Sun announces additions to its **SPARCstation 10** line of desktop multiprocessing-capable workstations. *Page 16*

SOFTWARE LICENSING

Software vendors are supporting the **Society for Information Management**'s call for improved licensing practices, but observers warn that communication problems will hobble efforts to arrive at a middle ground anytime soon. *Page 8.* **Perot Systems** signs a multiuser, multiproduct license agreement with CA that provides the outsourcer with unparalleled flexibility in software licensing options for its clients. *Page 8*

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Workgroups

Notes to get development boost

By Michael Vizard
CAMBRIDGE, MASS.

■ Lotus Development Corp. plans to deliver later this year an interface that will make it easier to create a more robust development environment for its Notes database.

Dubbed Notebook, the Lotus tool will allow Lotus and third-party vendors to integrate graphical development tools with Notes. Notes currently requires application developers to use @Command functions similar to the commands Lotus provides with its 1-2-3 spreadsheet.

These @Commands are relatively easy to master, but they do not provide developers with robust graphical tools that speed and simplify development.

The arrival of Notebook, which is still in alpha testing, is intended to give developers more flexibility in terms of handling screen design and application logic, said Cliff Conneighton, Lotus' director of marketing for communication products.

"Notebook will make it easier to integrate something like Visual Basic, per se," Conneighton said.

Among other things, Notebook will allow developers to create applications that can perform joins across Notes and SQL databases.

Developers working with Notes said they would welcome the arrival of more robust development tools. "It would enable people to pull stuff from other databases and tie Notes into other systems," said Norman Weizer, president of Weizer Associates, Inc., a consulting firm in Lexington, Mass.

Conneighton said Lotus is debating whether it should make it easier for developers to deploy applications by providing a runtime license for Notes.

The debate, Conneighton said, centers on the trade-off associated with making runtime applications available that do not allow end users to create applications.

"A runtime license would make it less expensive to deploy a lot of clients, but Notes is a lot like 1-2-3, and we want uninhibited end users creating applications," Conneighton said.

"Since a Notes client is $495, I can see some value in a runtime license. There's definitely a catch-22 for Lotus, but I would love it," said Randal Zahora, president of Workgroup Productivity Corp., a Notes reseller and developer of Notes applications in Oak Brook, Ill.

Lotus' earnings fall 41%; 1-2-3 for Windows blamed

Lotus Development Corp. said last week that first-quarter earnings dropped 41% to $12.3 million on flat revenue of $227 million.

While a mix of new products has helped Lotus maintain revenue during the bruising PC software price war, the drop-off in earnings was attributed to costs incurred when Lotus misjudged the initial impact of Microsoft Corp.'s Windows on the spreadsheet market.

Lotus' current 1-2-3 for Windows, which the company developed following the dissolution of the Microsoft/IBM alliance on OS/2 in 1990, has drawn lukewarm reviews. A new version, codenamed Darwin, will be announced May 11.

"Microsoft's Excel and Borland's Quattro Pro are fine products, and then there are people who ride around on Greyhound buses," said Dan Atkins, a consultant at Northwest Airlines.

Overall, Lotus' Windows-based products, which include its Ami Pro word processor, 1-2-3, CC:Mail and Notes offerings, account for 49% of Lotus' revenue. However, DOS application sales have fallen 42% on a year-to-year basis.

Shipments of DOS spreadsheets fell from 4.4 million units in 1991 to 2.9 million units in 1992, according to International Data Corp. in Framingham, Mass. Shipments of Windows spreadsheets rose from 2.3 million to 4 million in the same period. —*Michael Vizard*

Corrections

- A story in the April 19 issue incorrectly cited the price of the developer's edition of WordPerfect Corp.'s WordPerfect Informs. The product lists for $495.
- Because of an editing error, research results on Fortune 1,000 companies in the April 19 issue were attributed to Jim McKelvey at Spring Industries. The comments on the CSC Index, Inc. research should have been attributed to Fred Wiersema, a CSC Index vice president.

Computerworld honored

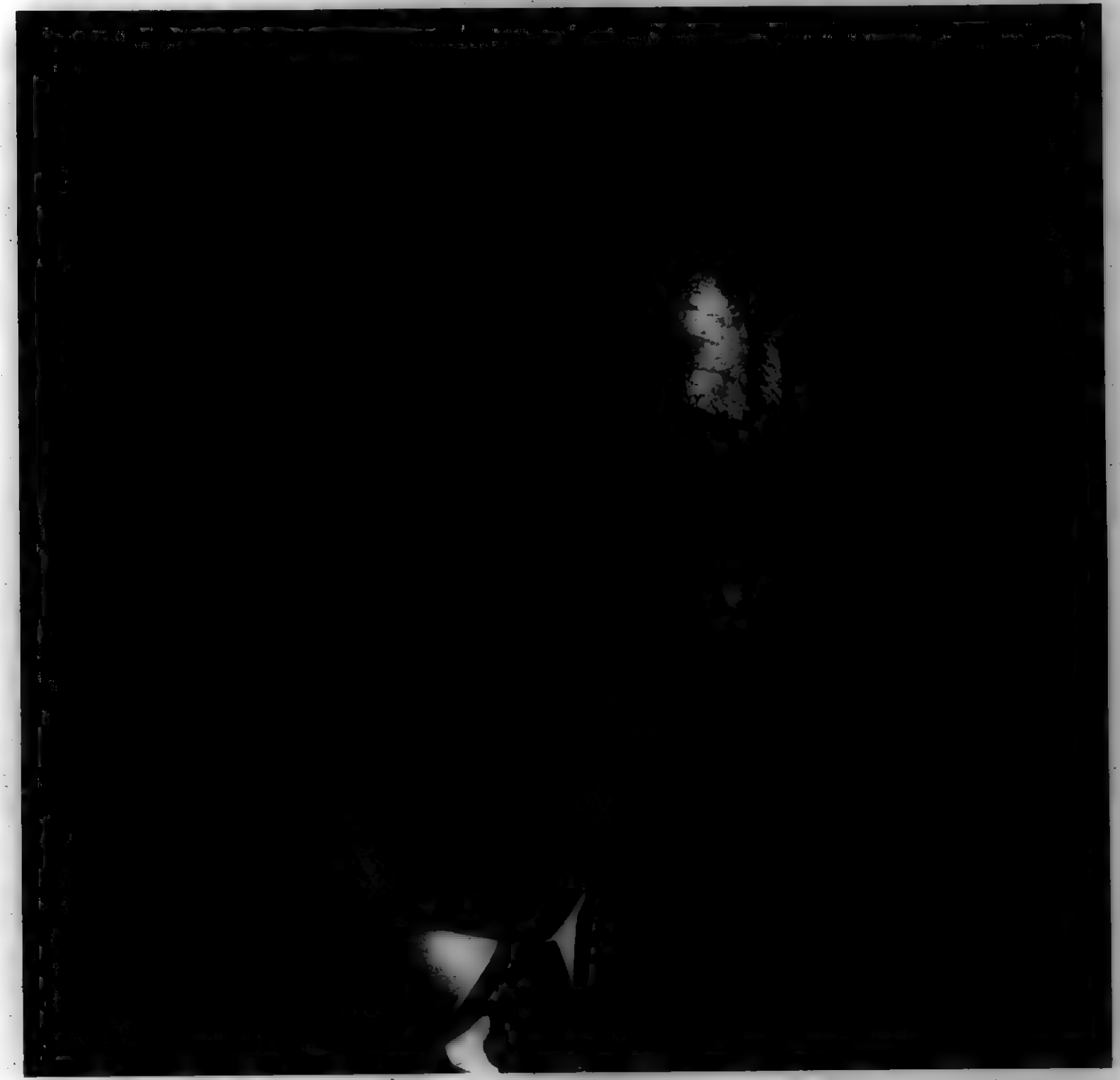
Computerworld was named best computer newspaper of its size last week by the Computer Press Association.

Computerworld won in the category "Best computer newspaper—circulation more than 100,000" in the annual awards.

In addition, senior editor Johanna Ambrosio was one of two runners-up in the category "Best news story in a computer publication" for her March 2, 1992 story "CA business policies anger some large shops."

The judges called *Computerworld* "a well-rounded weekly blend of news, trends and service pieces in an attractive package. *Computerworld* is well-written, to the point and distinguished by its sense of humor. Both the feature writing and commentary are lucid and entertaining. *Computerworld* proves that you can deliver timely information and services with wit and style."

The Computer Press Association is a nonprofit organization that promotes excellence in computer journalism. Its eighth annual awards drew a record 1,100 entries, the association said.



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DOS word processing rivalry flares

By Michael Vizard
SEATTLE

■ While Windows remains the fastest growing area for word processing software, WordPerfect Corp. and Microsoft Corp. continue to slug it out in the DOS arena.

Microsoft next month will release Version 6.0 of Word for DOS, which should arrive at about the same time as WordPerfect's expected delivery of Version 6.0 of its DOS namesake word processing package.

While WordPerfect currently rules the DOS word processing market, Microsoft has been able to leverage some of its dominance of the Windows market in the DOS arena because sites have to support the same word processing software package across both platforms.

In contrast, WordPerfect stumbled with its first Windows implementation, a situation only recently rectified by the arrival of Version 5.2 for Windows.

"We use the DOS version of Word because not everybody here has a PC that can run Windows. We still have a lot of people with XTs," said Gina Chabot, who provides support services for approximately 3,500 PCs at Unum Life Insurance Co. in Portland, Maine.

Favorite features

After beta-testing Version 6.0, Chabot said Unum plans to make both Version 5.5 and 6.0 of Word available. In particular, Chabot said, users at Unum were most impressed with some of the Word for Windows features that have been added to the latest DOS release. They include drag-and-drop editing, tables, TrueType fonts, automatic bullets and an improved print preview mode.

"Word is our corporate standard," Chabot said.

Version 6.0 of Word will run on MS-DOS 3.0 or higher and requires a minimum of 384K bytes of memory.

WordPerfect's expected delivery this spring of Version 6.0 of WordPerfect for DOS will be the company's first 32-bit implementation.

The new WordPerfect release seeks to bring Windows-like features to DOS users by providing a choice of standard text mode, graphical mode or full-page mode [CW, March 22].

Microsoft seeks mail solutions

By Lynda Radosevich
PORTLAND, ORE.

Microsoft Corp. touted new scheduling and forms routing software at a Microsoft Mail user conference last week and laid out its vision for client/server computing based on Microsoft products, including Mail.

While users reacted favorably to the messaging products, many came to the conference trying to solve current Mail problems rather than looking for new technologies.

"I'm looking for Mail to [IBM's] OfficeVision/MVS gateway," said Jerry Dale, a programmer/analyst at the Public Service Company of Colorado, the state's largest utility.

Mail routes

Bulk of E-mail messages are sent within workgroup, and only 20% are sent across a wide-area network, according to AT&T's EasyLink service.

Using SoftSwitch, Inc.'s Central to integrate Mail and IBM's Professional Office System messaging does not allow users to use their calendaring and scheduling programs, a problem that a good gateway might alleviate, Dale said. (Microsoft has an OfficeVision/VM gateway but does not have plans to provide an MVS gateway.)

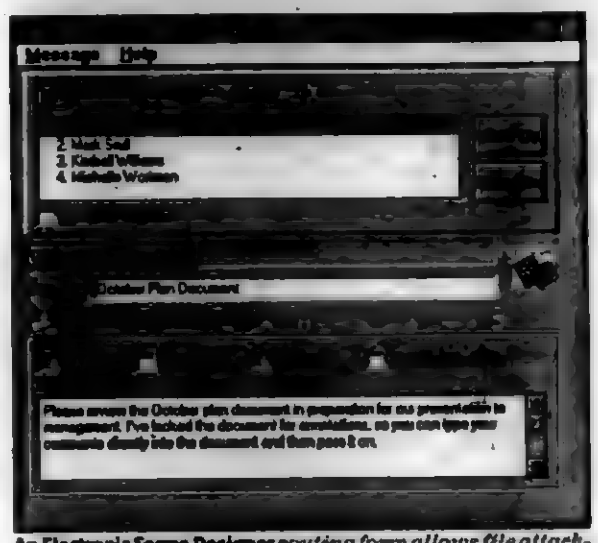
In the conference's keynote address, Daniel Petre, Microsoft's Workgroup Division vice president, noted that scheduling is likely to be the biggest application for electronic mail immediately but that Microsoft envisions E-mail as the invisible infrastructure for transporting all types of data.

"Mail might be a better, more secure platform for remote data communications than copying data from one server to the next," Petre suggested, setting the stage for a demonstration of Schedule Plus and Electronic Forms (E-forms) Designer (see box below right).

Despite Microsoft's general salute to "openness," both packages run exclusively on Microsoft's Windows operating system, a fact that E-forms beta-test user Dan Lim, supervisor of electronic information exchange at Unocal Corp. in Anaheim, Calif., said would exclude some users.

However, for Windows shops such as Perkins Coie, a 700-employee law firm in Seattle, the products could meet their needs. "E-forms was cool," and the $395 price tag is "cheap," said systems analyst Chris Steele.

Microsoft also laid out plans for future Mail developments. The firm said it will consolidate the features of all its Mail clients and, with operating systems developments, will introduce rules-based message sorting and filtering.



An Electronic Forms Designer *routing form allows file attachments to be routed serially to a list of users*

Product managers demonstrated the next Windows Mail client, expected next year. It will let users see messages from the Windows file manager, include a tool bar that enables rich text formatting and allow people to link files to messages rather than embed them to save disk space.

Also on the burner is a graphical DOS version of Mail with pull-down menus and other Windows-style goodies.

On the server side, Microsoft's unannounced Enterprise Messaging Server (EMS) will feature X.400 transport and X.500 directory services and will require NT-based hardware. After the keynote, Petre said Microsoft will begin using the EMS internally in October and hopes to ship it in the second quarter of 1994. Petre also said Microsoft hopes to ship a Unix client for Mail at the same time.

In the mail

Microsoft Mail products debuting this week included the following:
- Microsoft Electronic Forms Designer, an electronic forms designer and routing based on Microsoft's Visual Basic.
- New gateways to IBM's Profs, Novell, Inc.'s Message Handling Service and fax.
- Software from Link-Age Office Information Solutions, Inc. in Ottawa that links Mail and IBM's OfficeVision/MVS mail directories (see story page 52).

DOS, System 7 blend eyed

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. engineers are reportedly experimenting with a modified version of System 7.1 that would run on DOS-based machines using Intel Corp.'s 1486 microprocessor, sources close to the company said.

Apple's implementation would reportedly sit atop an upcoming release of Novell, Inc.'s DR DOS and be positioned as an alternative to Microsoft Corp.'s DOS and Windows. Sources said the pair could also offer the DR DOS and Macintosh interface combination as a client to server-based applications running Unix.

Apple engineers have kicked around ideas like this in the past, but there is no certainty that the effort will ever see the light of day. Regardless, Apple's move to build a version of its operating system for another platform represents a fundamental shifting of gears for the once fiercely proprietary company, where even two years ago anyone suggesting such an idea would have been branded a heretic.

In the works

Apple's engineers are reportedly also working on a native version of AppleTalk networking software on the 486 platform. Macintosh applications, however, would have to be recompiled to run on the new operating system.

Neither Apple nor Novell would comment on the prospect of a 486-based version of the Macintosh operating system.

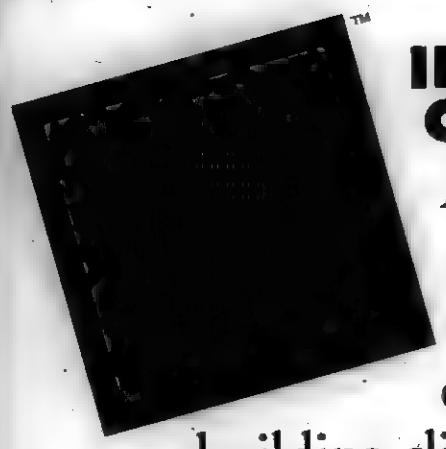
If the implementation comes to fruition, it could potentially help Apple gain market share, especially in mixed environments. "I have a lot of users running DOS who'd love to be able to use the Mac interface," said an information systems director who works in a mixed environment. "Users love choices."

Some analysts questioned the efficacy of such an effort, unless it is a simple exercise in porting the Macintosh operating system to other platforms.

"If something like this had arrived four or five years ago, I would say it would be brilliant, but right now it seems kind of screwy," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif. "I'm not sure if there is any advantage to going out and buying a Dell PC, loading it down with extra software and hardware, then trying to make a Mac out of it. Especially since the prices of Macs have dropped."

End users also had reservations about whether such a half-breed system would be worth the headache.

"Part of the magic of the Mac is that you have the hardware and software so tightly linked," said Dave Lustig, manager of technical services at Bose Corp. in Framingham, Mass. "So the question becomes whether they can make an Intel configuration and operation as easy and intuitive to use as a Mac. If it was kludgy, it wouldn't add a whole lot of value."



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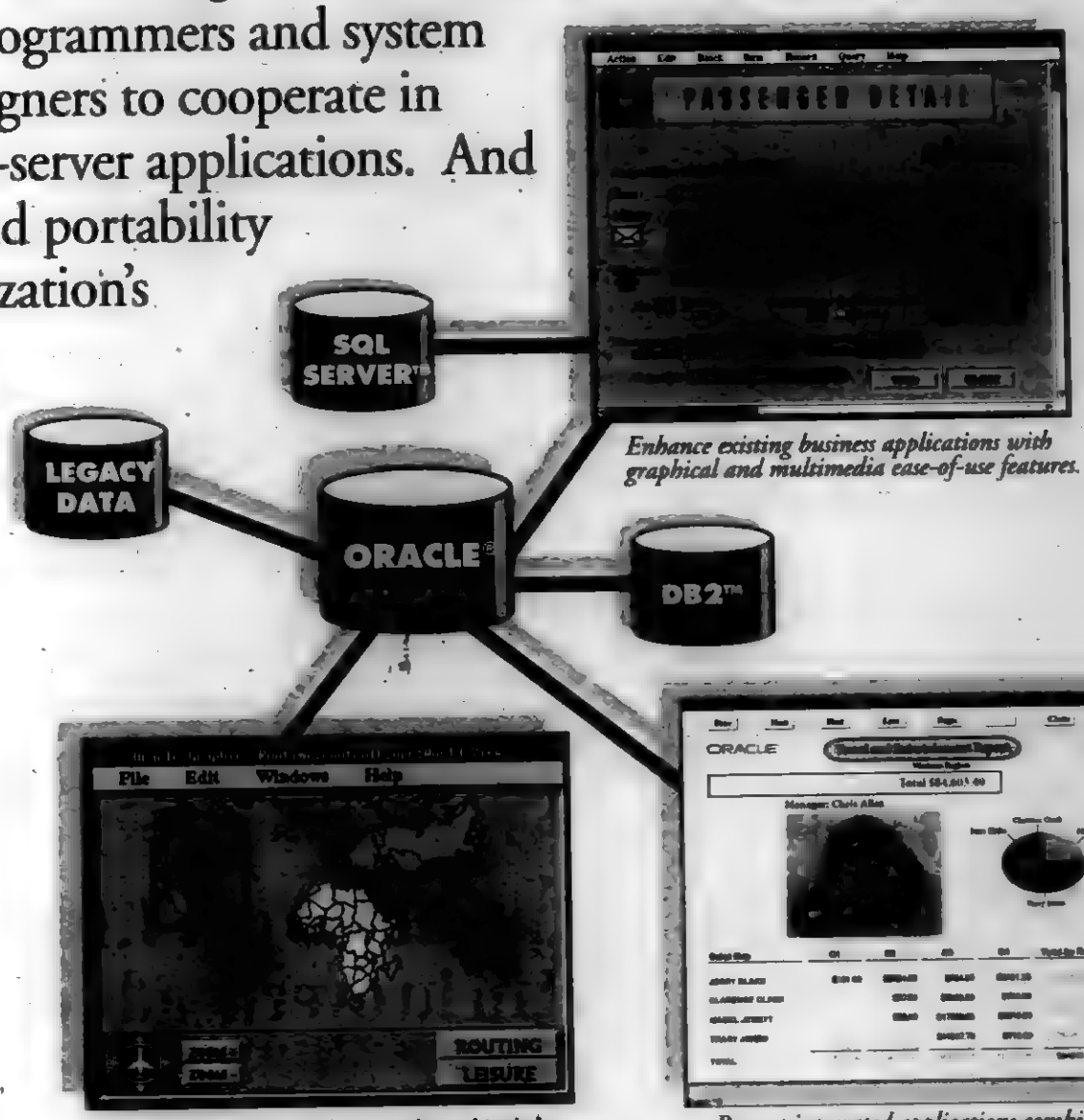

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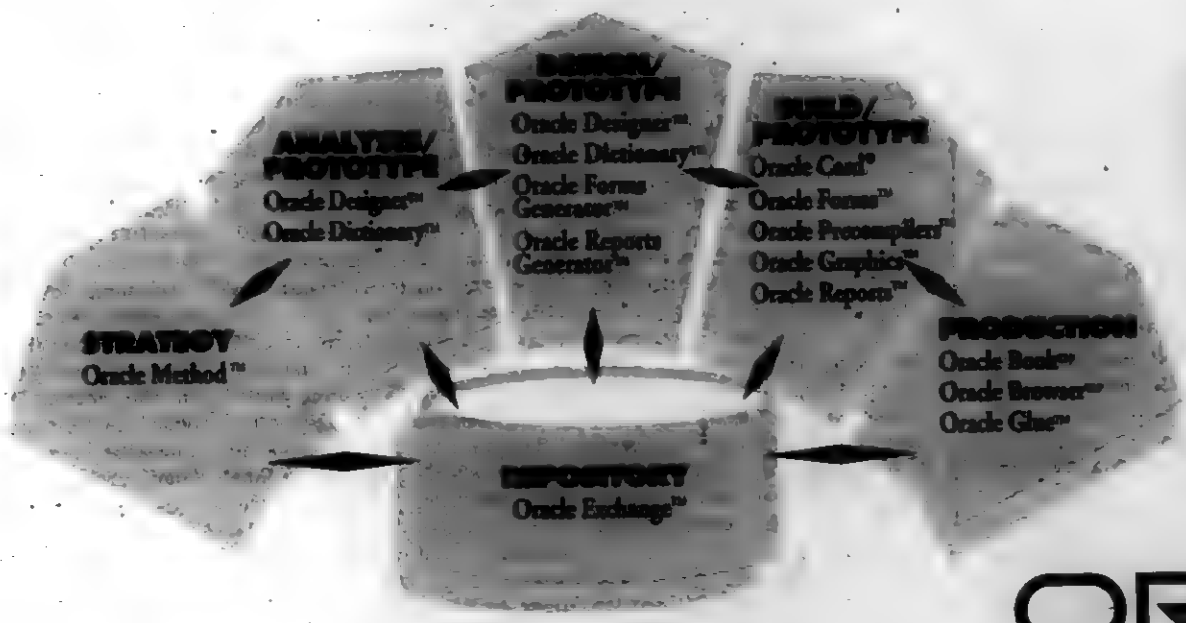

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News Shorts

IBM makes Adstar independent unit

IBM turned its $6.1 billion **AdStar** storage line of business into a full-fledged independent subsidiary last week and named storage entrepreneur and 1980s-era Congressman Ed Zschau as its chairman and chief executive officer. IBM Vice Chairman Jack Kuehler said the chief objective of the 14,000-employee unit will be to boost OEM sales, since 90% of its peripherals are sold to other IBM units. "Within a five-year period, 30% to 40% of our revenues should be coming from outside of IBM," said Ray AbuZayyad, AdStar's president and chief operating officer, who has managed the unit since December 1991.

IBM, Object Design align

Object Design, Inc. this week will announce a deal with **IBM** to jointly develop and integrate its ObjectStore database with IBM's evolving Application Development Platform. The deal, which will also include an equity stake by IBM, is expected to result in $25 million in sales to Object Design, a company spokeswoman said. IBM is also working with object database vendor **Versant Object Technology** on a separate AIX computer-aided software engineering effort that is under way in Toronto.

EDS signs deal

Electronic Data Systems Corp. last week bagged a $1 billion deal and launched a new buzzword when it signed a 10-year "cosourcing" agreement with Swedish business conglomerate **Kooperativa Forbunder** (KF). Under the arrangement, which is expected to gel by early summer, EDS will take over KF's information technology company — **Apiron Information** — as well as provide information technology-related services to the retail-oriented cooperative societies that KF represents.

Management interoperability shown

Eleven firms participated last week in the first demonstration of interoperability between the two rival network management standards: Simple Network Management Protocol (SNMP) and Common Management Information Protocol (CMIP). The demonstration, which took place at the International Symposium on Integrated Network Management in San Francisco, used the Network Management Forum's Omnipoint protocols for interconnecting SNMP and CMIP systems. Also, **NetLabs, Inc.**, **Control Data Systems Corp.** and **Breakaway Software** cooperated in a demonstration of what are said to be the first products to manage electronic-mail systems via SNMP. NetLabs provided the network management platform; the other two vendors provided the E-mail products.

SHORT TAKES Frank Gaudette, executive vice president of operations and chief financial officer at Microsoft, lost his fight against cancer late last week. The 57-year-old Gaudette began his tenure at Microsoft in 1984 and organized the firm's successful public offering in 1986.... **Legent Corp.** reported earnings of $18.4 million for its second quarter ending March 31, almost double the amount from last year's comparable period. Revenue remained flat at $102.6 million and the company said it "clearly fell short of our new license revenue expectations."... **KnowledgeWare, Inc.** started shipping ObjectView 2.0, a new version of a Microsoft Windows-based client/server development tool from **Mateasys Corp.**, which KnowledgeWare bought out in February.... Object-oriented tools vendor **Easel Corp.** reported a first-quarter loss of $480,606 on revenue of $6.7 million, $2.4 million behind its first-quarter 1992 sales figures.

News shorts, *page 16*

AMR unit poised for flight

Move to IS services outside travel niche viewed as risky

By Nell Margolis
FORT WORTH, TEXAS

AMR Corp.'s newly sculpted information technology unit is poised to target clients outside the AMR/American Airlines fold, including those in the suddenly sizzling health care arena, group President and Chief Executive Officer Kathy M. Misunas said last week.

Sabre Technology Group's debut early this month sparked industry speculation that AMR might have cobbled five information systems businesses together into one highly autonomous unit that it could spin off or sell. Whether or not such a scenario unfolds is irrelevant, Misunas said: Sabre Technology does not need an independent corporate charter to serve external customers.

"All we need," she said, "are the right skill sets to handle the kinds of business we're going after and a team-type approach" that blends technology and business skills and goals from the ground up.

Industry observers, however, greeted Sabre Technology's creation [CW, April 12] and its outward-seeking agenda with more than a dollop of skepticism. AMR has spent the past several years battling a ruinous economy and the past several months scrambling to shore up its coffers and image after the collapse of a once-promising business venture that now has AMR embroiled in lawsuits with its former partners.

Moreover, several analysts noted, internal IS shops have tended to fare poorly in the ruthlessly competitive independent commercial market. The list of firms that have stumbled on the IS-as-profit-center route includes such notables as Kimberly-Clark Corp., Sears, Roebuck and Co. and Mellon Bank Corp.

AMR and Sabre might have the right mix of skills and savvy to make a go of it.

Yankee Group analyst Susan McGarry, who usually takes a jaundiced view of firms' attempts to turn their successful IS shops into independent profit centers, said AMR and Sabre Technology might have the right mix of technology skills and management savvy to make a go of it.

"What makes it such a bad idea is that even the most sophisticated companies grossly underestimate the marketing skills needed to make it outside the protected [intracorporate] atmosphere," she said.

In its first several weeks of formal existence, Sabre Technology has been divided into two parts, said Misunas, a 20-year American Airlines veteran who served as president of Sabre Travel Information Network until it was folded into the approximately 10,000-person business she now heads.

A team-run development department will be at the exclusive technological service of customers. The remainder of the group will market a broad array of technology services to information- and networking-intensive businesses that could benefit from the same mix of talents that run an airline and travel services business.

In fact, Misunas said, other travel- and transportation-oriented firms will rank among Sabre Technology's early target clients. "But I can also see us in industries like retail and health care," she added.

Initially, she said, Sabre Technology will limit its sights to businesses needing automation services. "Then, for instance, we might acquire a company that has, say, health care automation strengths but needs a network."

Amdahl to cut 1,100 to rein in overhead costs

By Jean S. Bozman
SUNNYVALE, CALIF.

For the third time in six months, Amdahl Corp. has announced wide-ranging layoffs to bring overhead into line with declining profits from IBM-compatible mainframe sales.

Last week, $2.5 billion Amdahl said it would lay off 1,100 employees by the end of May. By June it will employ a total of 7,400 — down from 9,700 in the fall of 1992.

Amdahl said it moved to cope with an anticipated first-quarter loss expected to be disclosed this week. Manufacturing and development will be affected most.

While a company spokesman tied the layoffs to erratic demand for mainframes, industry analysts chalked up the pink slips to a combination of cutthroat price competition among IBM, Amdahl and Hitachi Data Systems Corp. and high inventories of new machines by all three vendors.

"Amdahl is sending out the message that there is skepticism for long-term demand," said Bob Djurdjevic, president of Annex Research in Phoenix.

Djurdjevic said all three mainframe vendors are waiting several months while large users evaluate dozens of models announced in the first quarter.

Interest slipping

A recent International Data Corp. (IDC) global survey of 7,000 sites showed that projected growth for installed IBM mainframe MIPS in 1993 dropped below 10% for the first time in 10 years. In contrast, growth had been running over 35% before 1991 and then dipped below 20% in 1991 and 1992.

IBM last week reported a $285 million loss for the first quarter, stemming from slumping mainframe sales (see chart page 109).

Longtime Amdahl users took the news of layoffs calmly. "Any time that your primary mainframe vendor starts laying people off, it's a concern," said Steve Bishop, assistant information services manager for the city of San Antonio, which has an Amdahl 5990 machine. "As long as they can continue with R&D and field-engineering support, it shouldn't impact us," he said. Amdahl said support levels would be unaffected.

But future information systems plans may hinge on Amdahl's market perception.

"I am concerned with the viability of all mainframe vendors," said Ron Kriegel, resource manager for the state of Illinois' Central Management Services data center in Springfield, which supports 80 state agencies with Amdahl and IBM mainframes. "I do not want to see just one competitor out there because that will cost us a great deal of money."

Amdahl has roughly 15% of the total IBM mainframe market, analysts said.

Declining profits left Amdahl few alternatives, analysts said.

"I think they are taking responsible cost-cutting measures based on the current market conditions," said Steve Josselyn, a senior analyst at IDC's Worldwide Commercial Systems Group. "The biggest challenge for any mainframe vendor is to reduce price/performance costs to levels competitive with alternative platforms such as LAN and Unix servers."

Software giants extend suite deal

CONTINUED FROM PAGE 1

dent on alliances that provide the best products. This will be done by creating virtual corporations as an alternative to mergers," said Borland Chief Executive Officer Philippe Kahn.

Kahn added that the arrival of Borland Office will solidify an informal alliance that has been in place between Borland and WordPerfect for the past year [CW, June 1, 1992]. The two companies also agreed to share development resources.

Kahn said Microsoft and Lotus have sold more than 1 million suite packages and that Borland misjudged the impact of suites since Microsoft began selling Microsoft Office two years ago.

"What can I say, I was wrong," Kahn said.

"I told Borland a year ago that the thing that was hurting them most was Microsoft Office, which has a street price of $450. Borland Office should be priced well below that so they should kick butt on Microsoft," said Dan Atkins, a consultant at Northwest Airlines in Minneapolis.

Tough sell

Nevertheless, the alliance between WordPerfect and Borland does not appear to be enough to get users who have already committed to Microsoft Office to switch to Borland.

"The people who need a database are a distinct group from the people who use other desktop applications," said Glen Jurmann, section manager for office technology at Baxter Healthcare Corp. in Deerfield, Ill.

Complementing Borland Office will be a separate Workgroup Extension Pack from WordPerfect, scheduled to be available in the third quarter, that will include WordPerfect Office, WordPerfect InForms and WordPerfect presentation graphics software.

Different strokes

The strategy being taken by Borland and WordPerfect differs greatly from that of Microsoft and Lotus. While not offering databases in their suites, Microsoft and Lotus have added electronic mail and presentation graphics to the word processor and spreadsheet core.

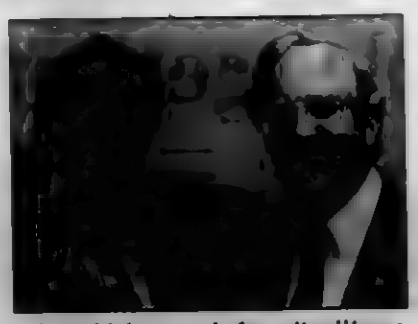
"Borland does not want to tie itself to one E-mail package, and it thinks the graphics in Quattro Pro are comparable to Microsoft's PowerPoint graphics package. Meanwhile, WordPerfect does not want to jeopardize its messaging strategy, which is going to be the core of a range of products," Filistowicz said.

Lotus countered that while it does not currently have a database, less than 15% of Windows customers need a database. As a result, Lotus is not overly threatened by the Borland move, said Paul McNulty, director of product marketing at Lotus.

Microsoft, however, struck a more ominous tone. "The inclusion of a database in a suite represents neither a short-term nor long-term advantage," said Hank Vigil, director of marketing for applications at Microsoft.

"Clearly, we've been thinking about this and it's an obvious direction for us," he added.

Vigil said the company expects that more than 50% of Excel spreadsheet and Word word processing shipments will come through Microsoft Office in 1993.



Kahn and Ashton *ready for suite alliance*

Microsoft and Lotus stressed that suites require the tight integration of multiple software packages, which they suggested will be difficult for two companies with diverse cultures to accomplish.

WordPerfect Chairman Alan Ashton countered that WordPerfect users will be able to import Quattro Pro spreadsheets into WordPerfect and that the two companies will be working together on implementing support for Version 2 of the Object Linking and Embedding protocol.

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Licensing plea gets mixed reviews

By Nell Margolis

Leading software vendors last week enthusiastically endorsed the Society for Information Management's (SIM) plea for improved licensing practices, but observers warned that arriving at an equitable middle ground could take some time.

Their reasoning: An already awkward process — trying to balance users' wishes to pay only for value derived from software and the supplier's need to reap a profit — will be hobbled by the difficulty forging accords in an area where the paradigms are so new and the terms so vague that vendors are not sure what users are demanding and users cannot tell when they have gotten what they want.

No disguising it

Moreover, said International Data Corp. analyst Ed Acly, neither users' display of unity nor vendors' acclaim for it disguise the fact that contracting — for software licenses or otherwise — is basically adversarial in nature.

Vendor moves

Recent vendor efforts to revamp software licensing include the following:

IBM opened up rigid tiered pricing and embraced multiple operating systems pricing.

Digital Equipment Corp. has begun initiatives in response to eight of the 10 licensing concessions demanded in SIM's recent position paper.

Lotus Development Corp. offers concurrent licenses and a license management facility to track them.

While the SIM paper envisions a user/vendor "partnership" that is grounded in mutual understanding and trust [CW, April 19], "I'm not sure that's possible today," Acly said. "The discomfort factor is simply too high. Vendors don't feel that their business is on a comfortable basis, and why should they? We don't yet have any mechanism that assures them that they won't be taken advantage of."

No bellyaching

John Burton, president of Vienna, Va.-based Legent Corp., hailed the document as a sign of users bellying up to the task of detailing their needs rather than bellyaching about them. "For years," Burton said, "we've been saying to our customers, 'Tell us what you want,' and we've heard as many answers as we have customers. One of the best things about the SIM position paper is that it's a two-way valve."

IBM, Digital Equipment Corp. and Computer Associates International, Inc. were quick to voice support for the SIM initiative, as were a host of other software houses and industry associations, including the Software Publishers Association and the Information Technology Association of America (ITAA).

In fact, many of them observed, the SIM manifesto codified a relaxation of once-rigid licensing moves already under way.

Several analysts noted that, ironically, the trend was kicked into high gear by CA, the firm whose allegedly abusive contracting practices are widely viewed as spearheading the user solidarity reflected in a recent rash of position papers, including SIM's.

With the software giant in the vanguard and the winds of technological and economic change gusting at their backs, every software firm "will eventually get aboard" the licensing flexibility express, added Fred Joy, senior research analyst at Westport, Conn.-based Meta Group, Inc.

Similarly, executives from all of the software companies and organizations who spoke to *Computerworld* last week declared themselves eager candidates for the user/vendor focus group on licensing that SIM hopes to schedule within the next few months.

The desire to reach an accord, however, may not translate into success. For starters, parties on both sides of the negotiating table are still struggling simply to define the debate.

Take the SIM manifesto, said Douglas McIntyre, chief executive officer of Hyannis, Mass.-based Software 2000, Inc. and head of ITAA's quality council. "Words like 'software integration' — one of the 10 [concepts] SIM says must be included in licensing agreements — are meaningless. And what's a 'clearly defined migration path' in a world of discontinuity?"

CA offers flexibility to Perot Systems

By Thomas Hoffman

ISLANDIA, N.Y.

■ Perot Systems Corp. has signed a multiuser licensing agreement with Computer Associates International, Inc. that allows Perot — and its outsourcing clients — the flexibility of choosing between several software licensing arrangements CA offers.

The Perot agreement illustrates CA's willingness to work cooperatively with outsourcing vendors, observers said, which is especially important given the image problems that have arisen following CA's legal entanglements with Electronic Data Systems Corp. [CW, Feb. 3, 1992] and EDS clients such as National Car Rental System, Inc. [CW, April 19].

The multiuser licensing agreement calls for Perot to standardize on a broad range of CA's systems management, resource management, applications development and security packages under IBM's MVS environment. CA's planned mainframe product ports to Unix, Microsoft Corp.'s Windows 3.1 and Windows NT and IBM's OS/2 operating environments will eventually become part of the Perot agreement.

Customer applause

Perot's standardization on CA software was well-received by Volkswagen of America, Inc.'s Stephen Pickett, director of information systems. The Auburn Hills, Mich.-based carmaker, which had outsourced its computer operations and application development to Perot last May, wants to ensure that the outsourcer will continue running its operations on CA software.

"We were a heavy CA customer before outsourcing, so I view this agreement as good news since it reduces the possibility of Perot converting any of our applications to other [vendor] platforms," Pickett said.

A senior IS executive at NationsBank, which outsourced its mainframe operations to Perot in November 1991, applauded the CA/Perot agreement. "The more agreements Perot lands with software vendors, the less expense that's incurred to us. It should give us greater flexibility in outsourcing as we move forward," he said.

Stephen T. McClellan, an analyst at Merrill Lynch Global Securities in San Francisco, said the CA/Perot deal reflects a compromise between software vendors and outsourcing firms willing to meet halfway on licensing agreements.

One problem remains

CA Executive Vice President Arnold Mazur claimed EDS is the only outsourcing vendor with which CA has experienced licensing snafus. During the past few years, CA has signed agreements with outsourcers MCN Corp. and Andersen Consulting, Mazur said. The agreement with Perot differs in one important way: It allows the Reston, Va., outsourcer to resell CA's CA-Unicenter systems management package for Hewlett-Packard Co.'s HP/UX Unix environment and other Unix ports.

Perot and its clients have the option of licensing CA software three different ways. Perot clients can either continue their existing licensing agreements with CA or allow Perot to assume the licenses.

Additionally, Perot has the option of licensing CA software to run operations for multiple clients from a single data center.

Should Perot decide to invoke multiuser licensing for any of its customers, the outsourcer would not have to pay CPU upgrade fees and would be eligible for reduced maintenance fees, Mazur said.

AMD's entry into 486 market will not affect PC supply, prices much

By Michael Fitzgerald

AUSTIN, TEXAS

Users will be disappointed if they expect a PC price windfall from a judge's recent decision to grant Advanced Micro Devices, Inc. (AMD) a retrial in the 287 microcode case it lost to Intel Corp. late last year.

The retrial decision gave AMD the impetus to announce last week that it will ship its 1486 clones, which it had shelved last December after losing the initial trial.

The clones are 33- and 40-MHz 486DX parts and a 25/50-MHz DX2 part. AMD is also sampling a 33/66-MHz DX2 and a 33V, 33-MHz part to ship in July.

Despite AMD's immediate entry into the 486 market, the company is not underpricing Intel much, so "we don't think it will have a significant impact on system prices this year," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

Analysts agreed with a comment by F. Thomas Dunlap, Intel's general counsel, that "the biggest impact this case has had is already over. They had parts ready to ship in December, and they didn't."

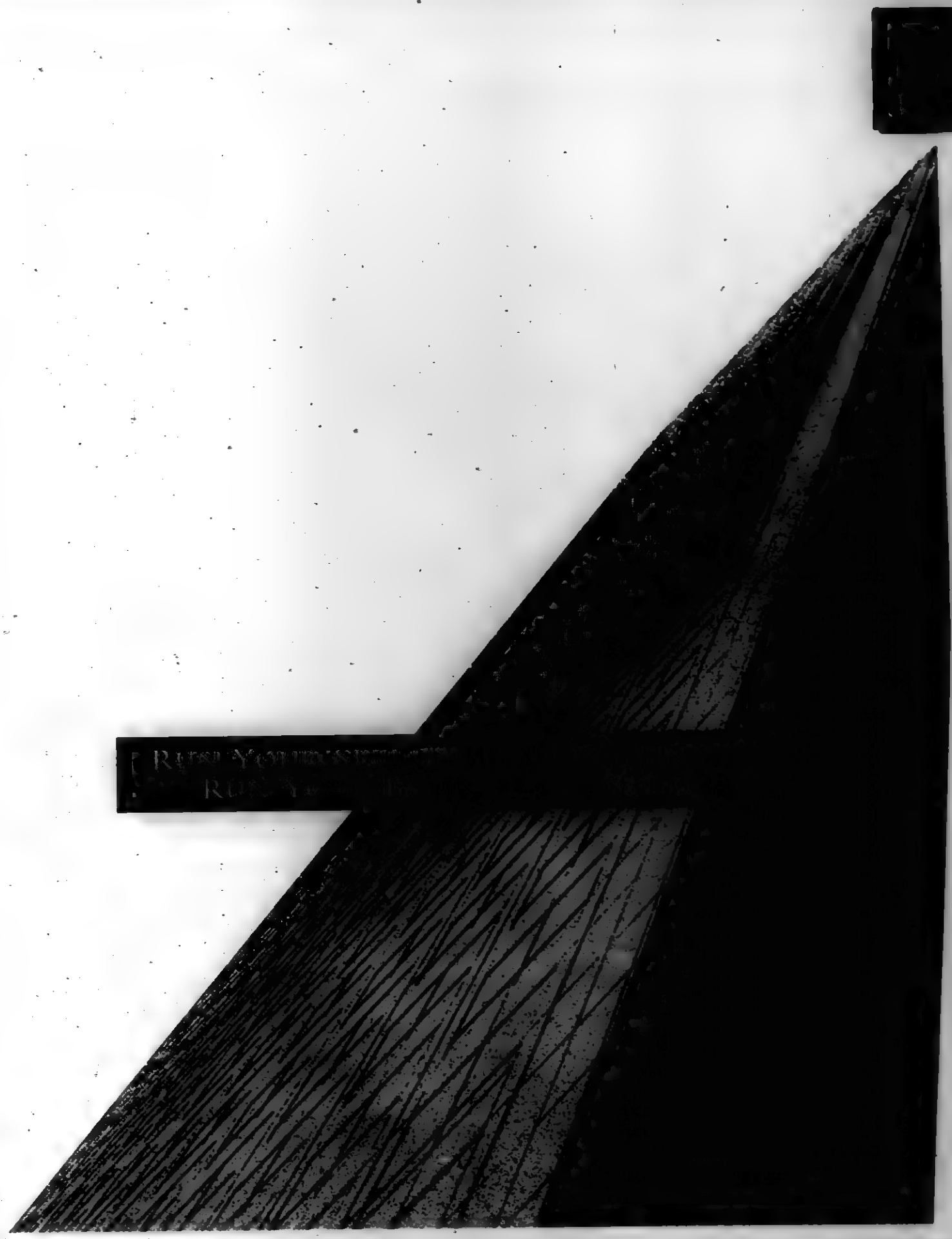
AMD also lost ramp-up time and therefore will produce less than 10,000 of its clones this quarter and only 400,000 by year's end — less than 5% of Intel's 486 production. AMD officials said they did not expect to garner even as much as 20% of the 486 market until the fourth quarter of 1994.

Production break

However, some analysts suggested that its initial legal setback may have given AMD a break on production schedules by giving the company time to work out the kinks in a new submicron development center. The three-layer metal process employed there caused slower-than-expected ramp-ups when first used by other manufacturers.

In the meantime, AMD plans to continue developing its clean-room 486 clones, which do not use Intel's microcode. AMD said it will announce these chips on July 4 and will gradually phase out 486s with Intel microcode inside them. The license that is the source of the vituperative legal disputes between the two chip makers expires in 1995, by which time all of AMD's microprocessors will have to be clean-room-developed.

The decision to ship clone chips based on Intel microcode is risky. If AMD loses again, it will be forced to give up all its profits on these chips as damages. It is likely that Intel will sue AMD for patent infringement on its clean-room 486 clones as well.



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Notebook market

IBM PC Co. readies new ThinkPads, subnotebook

By Michael Fitzgerald
SOMERS, N.Y.

Continuing its efforts to refresh products every six months, IBM PC Co. is expected to release two additions to its ThinkPad notebook line early next month, according to internal documents obtained by *Computerworld*.

The new ThinkPad 720 and 720C are redesigned versions of the existing Models 700 and 700C that feature a faster processor, better battery life and Personal Computer Memory Card International Association (PCMCIA) support. A subnotebook is expected to follow in the summer, other sources said.

IBM declined to discuss the releases.

"I would have liked to see the weight and size shrink slightly, but with the faster processor and PCMCIA, they're going to sell more ThinkPads with this announcement," said Randal Giusto, an analyst at WorkGroup Technologies, Inc.

The ThinkPad line has been a runaway success, and IBM has found itself battling a billion-dollar backlog. Having additional products may help it do that. Customers said supply has begun to loosen up recently, and they commented that the 720 products sounded attractive.

"We have to get the equipment to see, but IBM generally has made great strides in getting closer to the market," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. Nelson said he would like to see 200M-byte and larger hard drives on notebooks.

IBM will announce a new marketing program called Value Coupon Book, which features discounts on a variety of items.

The new ThinkPads come with IBM's 25/50-MHz 486SLC2 and support either two Type II PCMCIA cards or one Type III PCMCIA card. According to the documents, IBM has also added a 160M-byte hard drive and a so-called "intelligent" battery to its list of features, as well as a port replicator. The intelligent battery boosts battery life to as much as 7.75 hours on a monochrome notebook and to 4.8 hours on the color version.

IBM is expected to bring in the new 720 and 720C at close to the same current base price of $4,350 for the active-matrix color version. It was not clear whether IBM will cut prices on its existing ThinkPads, given the massive backlog on the products.

Keeping up with the Joneses

IBM will see its upcoming subnotebook — which sources said is being marketed to potential customers, though it will not be announced for some time — reach market around the same time as most of its competitors' products.

For instance, Zenith Data Systems, which has not yet shipped its Z-Lite subnotebook in volume, is expected to upgrade the product by putting in an Intel Corp. I486SL-based Z-Lite in early July, sources close to Zenith Data said.

Hewlett-Packard Co. is also expected to enter the subnotebook market in June.

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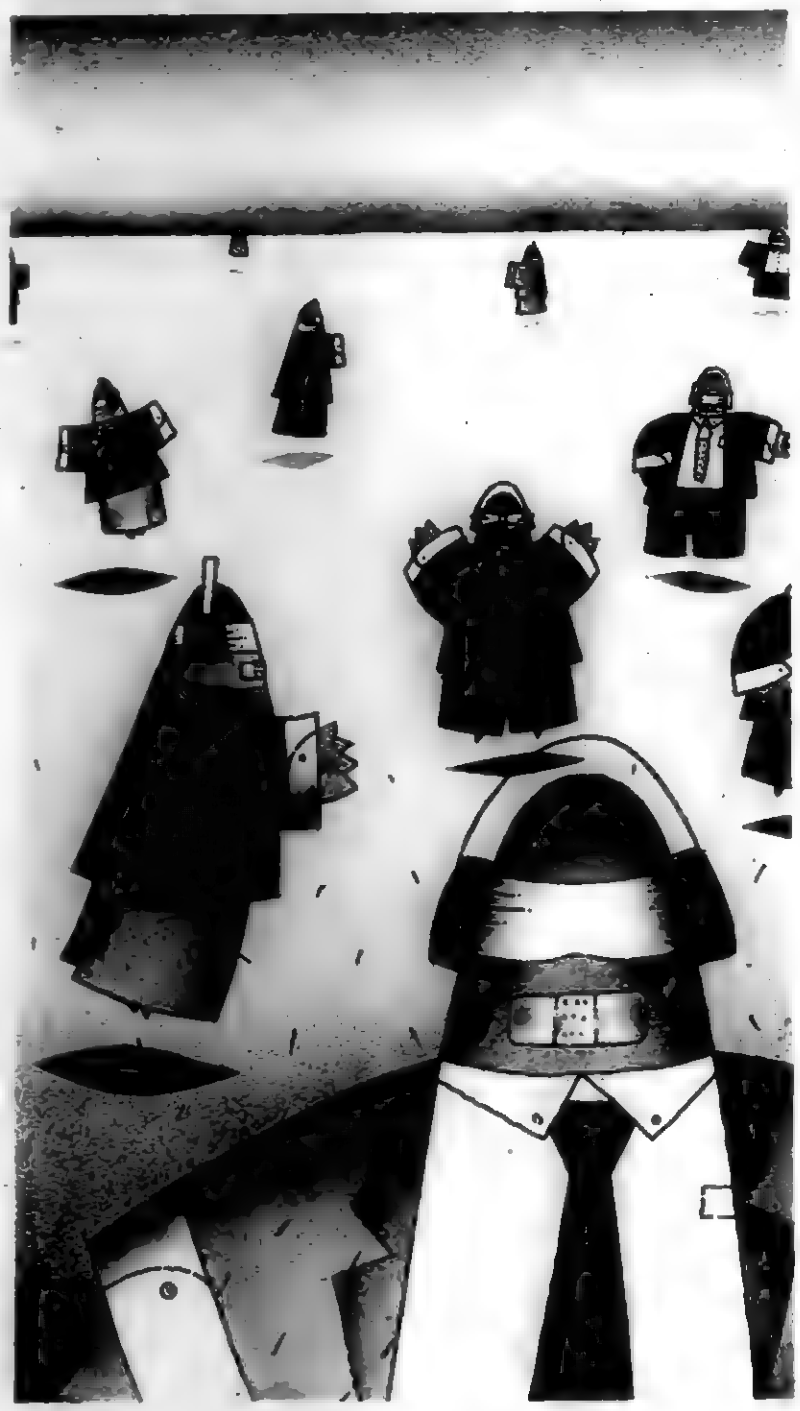

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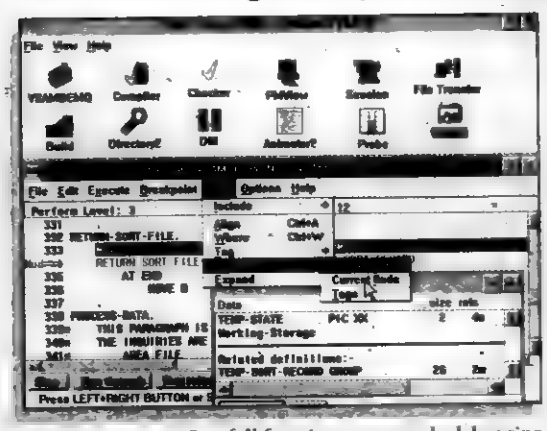

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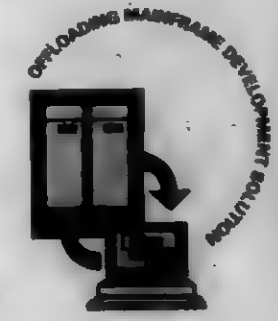

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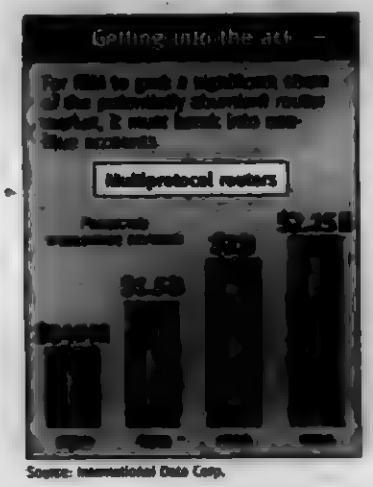
IBM details plan to boost multiprotocol router

By Joanie M. Wexler
RESEARCH TRIANGLE PARK, N.C.

IBM last week opened its internetworking kimono to reveal its short-term agenda for enriching the company's struggling entrant in the multiprotocol router arena: the 6611 Network Processor.

IBM's plans through 1994 for honing the 6611 (see itinerary at right) call for doubling its network connections, boosting performance, adding new protocol and interface support and distributing its processor architecture. These goals are sitting well with the IBM-faithful.

However, others contend that the company's 6611 itinerary represents an unimaginative, copycat strategy that does not bode well for IBM's breaking ground with fresh customer accounts — a key challenge for the "new IBM."



Source: International Data Corp.

"IBM is just not that important of a player in the LAN market," shrugged Charles W. Gerstner, systems manager at Evanston Hospital in Evanston, Ill. The facility is planning to add local-area networks to its homogeneous Systems Network Architecture (SNA)-based computing environment.

Anura Guruge, a consultant in New Ipswich, N.H., added, "The 6611's current Achilles' heel is that IBM is obsessed with playing catch-up to [market leader] Cisco."

Guruge said IBM knows how to build extremely mission-critical, reliable networks, "which in today's internetwork is an oxymoron. IBM should exploit its expertise into distributed networks. Now the 6611 looks fated to be very much a 'me, too' box that doesn't lead in anything but its graphical configuration" scheme, he said.

While observers are divided about the accuracy of IBM's self-assessed leg up in routing SNA and NetBIOS protocols — traffic notoriously uncooperative in distributed internetworks — analysts agreed that IBM has more of an image challenge to overcome than specific product problems.

IBM recently postponed delivering support for its Advanced Peer-to-Peer Networking (APPN) protocol on the 6611 from last month to the second half of this year.

While the delay is not likely to affect many network installations, "the 6611 slipping is the story of its life," Guruge said, in that aside from the 6611 being a latecomer to the router market, its initial delivery date was rescheduled twice.

"The core IBMers won't be fazed by the APPN slippage, but some potentially new customers will be turned off, as they were with the initial holdups," predicted Fred McClimans, program director of the local-area communications group at Gartner Group, Inc., a Stamford, Conn., consultancy.

IBM 6611 shops attest that the APPN delay is largely irrelevant. Brian Spears, manager of information technology at Konica Business Machines U.S.A., Inc. in Windsor, Conn., said he intends to be a heavy APPN user. And while he looks forward to the "6611 as the ideal point in the network for APPN Network Node support to simplify network design and directory structures," his company is too engrossed in getting its 48 U.S. branch sites up and running on the 6611 to notice for a while.

Still waiting

Other users voiced similar opinions, though many expressed concern that "hot swappability" — a capability emerging on competitors' routers that allows users to replace a network interface card while the device remains running — is not yet on IBM's to-do list.

"When you run multiple types of networks through the 6611 and something goes wrong with one of them, the whole internetwork is affected because you have to take the router down," explained Wayne Wilson, teleprocessing manager at Universal Underwriters Group in Overland Park, Kan.

However, the firm has been running the 6611 for about six months, and Wilson described its operation as "plenty stable."

"I would like to bring just one port down when I have to reconfigure something and not turn off the whole box," agreed David Johnson, network services coordinator at the Missouri Highway and Transportation Department in Jefferson City. "Today, unfortunately, we have to."

IBM's itinerary

Highlights of IBM's agenda for honing its 6611 router, according to Noel L. Butzke, senior product planning manager at IBM Networking Systems:

To ship May 28:
- Support for DECnet Phase IV protocols.
- The 6611 low-end Model 120 (announced at Interop '93 Spring in March).
- Data Link Switching (DLS) across Ethernet.

To ship second half 1993:
- APPN Network Node protocol support (slipped from last month).
- Support for Banyan Systems, Inc.'s Vines; DECnet Phase V, Open Systems Interconnect protocols.
- Internet Protocol (IP) traffic prioritization; dynamic reconfiguration of IP routing.

To ship in 1994:
- SDLC enhancements, including PU2.1 support. This will allow all IBM nodes to attach to a 6611 directly, without gateswaying through a Token Ring LAN.
- Doubled number of per-adapter network connections.
- Performance boost, flow control and "Class of Service-like" enhancements to DLS.
- Prioritization across all supported protocols.
- Visibility of the 6611 through LAN Network Manager management system; additional 6611 applications for NetView/6000 platform.
- Support of APPN+ protocol.
- Dial-up capabilities.
- FDDI modules.
- High-Speed Serial Interface for linking router to T3 lines.
- Asynchronous Transfer Mode wide-area support in the form of a channel service unit/data service unit or a full-blown switch.

AT&T eyes virtual network

CONTINUED FROM PAGE 1

dis network.

"SDN has until now been a closed network environment because it was originally designed to serve a given enterprise," Bridge explained.

The McCaw component, slated to be official by midyear, calls for direct hooks from SDN networks to cellular voice networks, Bridge said. Cellular-over-SDN services are slated to become available in the third quarter, said Glenn Starr, AT&T product director for SDN services.

"Over the next two to three years, we will be pushing our SDN customers toward being 'more virtual,'" with such efforts as mobile identification numbers, universal mailboxes and a common SDN/McCaw directory database, Starr added.

Positive force

SDN users are all for integration, but mainly from the standpoint of leveraging volume discounts and consolidating billing.

"Once you're on an SDN platform with a cellular option, you get a much better long-distance cellular rate because it looks like [calls are] being switched off the regular network," said Cari Wood, operations and communications manager at Hudson Foods, Inc. in Rogers, Ark., and a member of the SDN Users Technical Advisory Committee.

Also, "the more products the SDN network can carry — voice, cellular, whatever — the bigger the advantage to customers who have committed to SDN," Wood said. This is because SDN customers contract for a certain number of minutes on SDN with price based on volume.

Similarly, the importance of SDN getting access to wireless networks "represents more of a financial advantage in billing," said a network planner at a large East Coast health care products maker. "Once wireless comes under the SDN umbrella, it counts toward the aggregate, so it is cheaper" than buying separate services, he explained.

"Customers want integrated cellular and mail access to SDN," affirmed Danny Briere, president of TeleChoice. "AT&T truly got ahold of a unique industry resource [with McCaw], in that no other nationwide cellular company has such a wide coverage area," he said.

Wireless possibilities

While wireless links to SDN are "very important because many emerging applications, particularly for the sales force, have wireless possibilities, our main push with SDN has been to make it more integrated with other AT&T services," said Jay Ritterskamp, director of telecommunications at Monsanto Co. in St. Louis. "We want a larger menu to pick from and more cohesive management with SDN."

Strategy in a nutshell

The following are key components of AT&T's virtual enterprise strategy:

- AT&T's existing SDN. It allows customers to "rent" chunks of the public network at the guaranteed speeds they would get with a private network, while paying for bandwidth only when they use it and sidestepping hefty equipment investments.
- Buying one-third of McCaw to link wireless voice communications into SDN. McCaw has the most far-reaching wireless service coverage to date.
- The merging of AT&T's wired EasyLink messaging, telex and fax service with SDN so that companies not of Tariff 12 stature can also buy "packages" of services, leverage volume discounts and receive integrated bills.
- The acquisition of NCR Corp. for provision of video/multimedia services and broad network management.
- Relationships with providers of wireless packet data networks, such as the RAM Mobile Data and the Motorola/IBM Ardis networks.

—Joanie M. Wexler

Other reviews of the strategy emphasize the business potential for AT&T.

"I personally haven't seen much demand for wireless data access through SDN yet, though it is the next logical step," said Berge Ayvazian, senior vice president of communications at The Yankee Group, a Boston consultancy. "I think a stronger force at play is AT&T's desire to cross-sell lots of EasyLink" and other strategic, integrated products.

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Start-up recycles floppies

GreenDisk Co. reformats obsolete disks for resale at lower cost

By James Daly
REDMOND, WASH.

Being a "green" member of the computer industry has not always meant that you conducted your business in an environmentally responsible way. More often you were just rolling in money.

That perception is starting to change, however, as last week's annual Earth Day celebration pointed out. While vendors such as Texas Instruments, Inc. and Apple Computer, Inc. reavowed their support for the Environmental Protection Agency's Energy Star program (see story at right), a newcomer from the Northwest is taking environmental activism one step further.

The start-up, GreenDisk Co., is recycling some of the mountains of used floppy disks that would otherwise end up in landfills. GreenDisk has targeted a very sensitive part of end users' anatomy: their wallets. For a "gently used" floppy, users pay approximately $4.50 for a box of 10 disks vs. $5.50 or more for brand-new floppies.

According to GreenDisk founder David Beschen, software manufacturers annually throw out hundreds of thousands of packages that are in the sales channels when updates arrive. Some are sold at discount, but most are returned for updated versions. The result is heavy disposal costs. "Basically, I'm getting rid of their trash," Beschen said.

Beschen's plan is to gather the obsolete disks, demagnetize and reformat them and then resell the freshly cleaned media at a fraction of the cost of new floppies. Because the disks have been written to only once but have passed quality control as many as three times, the resulting product is of excellent quality, he said. And nearly 95% of the software packaging material is also reclaimed.

GreenDisk has already received and is in the process of preparing more than 750,000 disks from companies such as Autodesk, Inc. and Central Point Software.

Ecological appeal

GreenDisk's appeal is to end users — especially those who are already ecologically conscious. "In a society where everything is instantly disposable, recycling makes me feel very good," said Nancy Wong, manager of computer operations at Pacific Gas & Electric Co. (PG&E) in San Francisco. PG&E has already built some very aggressive paper recycling programs in-house, so using recycled software "would be very much in line with what we've been doing," Wong said.

Others said they look more favorably on companies using recycled products. "It says something very positive about a company to show that they can act responsibly," said Trey Thompson, a systems analyst at Citgo Petroleum Corp. in Tulsa, Okla.

Beschen said GreenDisk will keep millions of cubic feet of recyclable materials out of landfills — while turning a tidy profit. "For every 100,000 packages we recycle, we can reduce landfill from what could be up to 50,000 cubic feet down to less than 50 cubic feet," Beschen said. He said they have even found uses for the tyvek disk holders that were previously considered unrecyclable.

Analysts said the symbiotic monetary relationship between software manufacturers and GreenDisk could make the effort click.

"Like many industries, the computer industry is still reactive when it comes to the environment; sometimes they need a little push," said Lenny Siegel, director of the Pacific Studies Center, a public interest information center in Mountain View, Calif. "But a chance to save a little money can be a very convincing little push."

We are the world

Last week's celebration of Earth Day offered an opportunity to reflect on the information technology industry's environmentally sound and savvy practices.

Green finalist

- The EPA's Energy Star program has enlisted a slew of manufacturers committed to building energy-efficient computers and laser printers, including Hewlett-Packard Co., Compaq Computer Corp., Unisys Corp., Digital Equipment Corp., Intel Corp. and NCR.
- IBM's San Jose, Calif., manufacturing facility ended its use of chlorofluorocarbons (CFC) more than a year ahead of schedule and five years after the site was declared the country's worst CFC emitter.
- The chemical coating of fax paper prevents it from being completely recycled. Partially recycled thermal fax paper, however, is made by TechRite Unlimited in Marblehead, Mass. And it promises to match the price of paper made from virgin pulp.

Green barbs

- Microsoft Corp. has launched an alarmingly wasteful 10th anniversary celebration of its Word application by mailing thousands of instantly disposable heavy-duty folders, each devoted to the news of a single year of Word's decade-long run.
- The Silicon Valley remains one of the biggest Superfund toxic cleanup sites in the country. The worst offenders: semiconductor companies.
- Laser printers and photocopiers gobble up the equivalent of about 238 million trees a year, according to estimates from the Conservatree Paper Co., a San Francisco-based recycled paper distributor.
- The energy drain caused by PCs that are always on is becoming substantial. According to the EPA, PCs consume more than 5% of the commercial electricity output in the U.S.

Compiled by West Coast senior correspondent James Daly.

EDI cure

CONTINUED FROM PAGE 1

American National Standards Institute's X.12 EDI interface standard to process claims.

Spearheading the health care industry effort is the Workgroup for Electronic Data Interchange (WEDI), a coalition of government and private health care organizations created under the Bush administration.

The WEDI proposal calls for the largest payers and providers to be EDI-compliant by the end of 1994 and the remainder to be compliant by the end of 1995.

At the Electronic Data Interchange conference held here recently, WEDI co-chairman Joseph Brophy said the group proposed that the president's task force include expanded use of X.12-based EDI in its recommendations.

"My estimate is that we can probably save using EDI $35 [billion] to $50 billion [annually]," said Brophy, who recently retired from his post as president of Travelers Insurance Co. However, the real payoff "is that we are going to have good information to make better decisions that will lead to better health."

Healthy choices

Other WEDI recommendations:

- **Uniform, nationwide** identifiers for patients, providers, payers and employers.
- **Interconnected EDI** networks.
- **A national** clearinghouse to accredit EDI programs.
- **A 15-day payment** ceiling for electronically submitted claims.
- **Confidentiality** in electronic transmissions.
- **Small business loans** for EDI development.
- **Small health care** software vendor financing.

Savings will come from reduced manpower needed to rekey information, increased accuracy, less fraud due to better data tracking and reduced postage costs, according to Lee Barrett, assistant vice president of Aetna Life and Casualty Co. and a WEDI member.

Craig Castro, vice president and chief information officer of St. Agnes Medical Center in Fresno, Calif., said he supports the WEDI proposal. The hospital currently uses proprietary EDI. However, "if we could move to standard claims forms and an electronic method to submit and remit claims, that would significantly reduce our administrative costs," he said.

Although EDI already has a presence in the health care industry, 60% to 70% of EDI users print and rekey information because they are using nonstandard forms and proprietary, unintegrated technologies, according to Rachel Foerster, EDI services market manager at Baxter Healthcare Corp., a distributor of health care supplies in Deerfield, Ill. The WEDI proposal would resolve this issue by mandating a standard form and supporting integrated EDI.

Many users agreed bigger savings will come from processing claims using EDI and said a government push can make it happen.

Although there will be long-term savings, hospitals hit by hard economic times have had trouble digging up money to cover EDI start-up costs. A government mandate would help many get started, said Judy Anderson at the Hospital Council of Southern California.

For example, the University of Texas Medical Branch at Galveston is making plans for X.12 EDI, but costs are an impediment. The medical center must consider the costs of additional communications hardware, leased phone lines, translation software and in-house programming to interface data systems to the translation software before moving to EDI, said Bobby Medina, programmer and analyst. However, he said he expects the move to happen in one to three years because of longer term costs savings.

Major suppliers, such as Baxter, are also supporting increased use of standards-based EDI. Baxter, an EDI user since the late 1970s, has seen a shift toward X.12-based EDI among its 4,000 hospital trading partners, according to Daniel Browning, director of EDI. This shift will prepare hospitals to use X.12 for claims processing in compliance with the WEDI recommendations, Browning said.

Whether Clinton's task force accepts the WEDI proposals will become clear next month, when the tight-lipped committee is expected to make its recommendations public. But health care participants contacted were certain the industry will move the bulk of its claims processing to EDI.

While EDI will help the health care industry save money, it is only one piece of the computerization puzzle, said John Page, executive director of the Healthcare Information and Management Systems Society in Chicago.

"I think the big bang will come from good clinical systems," Page said. For example, computer-based patient records will help doctors in different clinics know what tests a patient has received.

Windows NT apps

CONTINUED FROM PAGE 1

The imminent arrival of NT has not spurred Microsoft to accelerate its plans to deliver 32-bit versions of its desktop software, which will run on Windows NT and the coming version of Windows 4.0 due out early next year [CW, April 19].

Microsoft declined to say which applications it will deliver for Windows NT this year, but it has been demonstrating a 32-bit version of Excel, said Microsoft Senior Vice President Pete Higgins.

Windows NT will pretty much mirror OS/2's track.

In the meantime, WordPerfect Corp. said it has no plans to deliver a 32-bit version of its word processing software for graphical environments until the end of the year, and Lotus Development Corp. is evaluating whether it will port its application software to Windows NT. "We see NT as a server platform for Notes, but we're not sure that its current size of 16M bytes will make it a high-volume client," a Lotus spokesman said.

"Microsoft only expects to ship about one million NT units in the first year, which is about what Windows currently does in a month," Donovan noted.

At that pace, Windows NT will pretty much mirror the track taken by IBM's OS/2, which has been deployed mostly as a server and custom application platform at large information systems sites.

In the meantime, users are forging ahead with custom applications and server implementations for Windows NT. Thus far, more than 60 application development tools have become available. Microsoft intends to deliver Visual C++ for NT 90 days after NT's launch.

"We are going to deploy NT for an in-house proprietary application as soon as it's stable," said Tom Daly, manager of trading systems at the Midwest Stock Exchange in Chicago.

As for desktop applications, he said, the exchange will either run them in 16-bit mode under Windows NT or maintain existing PC systems to run them.

Other customers said they see Windows NT as a natural extension to OS/2 because NT was derived from the work IBM and Microsoft had been doing their alliance in 1990.

"We see NT as Version 3.0 of OS/2 that was promised before the Microsoft alliance with IBM broke up," said William Wilson III, vice president at Johnson & Higgins in New York. The insurance brokerage plans to start migrating its Notes environment to NT by year's end.

On the third-party vendor side, among the applications that should be available with the arrival of Windows NT are business reporting tools from IMRS, Inc. in Stamford, Conn., and document publishing software from Frame Technology Corp. in San Jose, Calif.

IMRS intends to support NT on both Intel Corp. platforms and DEC's Alpha AXP; Frame Technology will confine its initial effort to support Intel platforms.

"We see NT really starting to happen in 1994 when the engineering applications that are now on Unix and VMS are available for NT," said Siva Kumar, vice president of marketing at Frame Technology. "NT provides a good compromise for end-user needs for Windows and IS needs for a robust operating system."

IMRS' decision to support Alpha AXP platforms in addition to Intel hardware is driven by DEC's large installed base for accounting software. IMRS has yet to see a PC system based on Intel's Pentium processor, but IMRS tests show that 10M to 12M bytes of floating point data takes 58 seconds to execute on 16-bit Windows 3.1 running on a 50-MHz Intel 1486 platform, compared with 17 seconds using an NT operating system on the same Intel hardware, said Dave Morehead, IMRS' director of research.

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News Shorts

Doing even more time?

Kevin Poulsen, a notorious computer hacker already in jail awaiting trial on federal charges, was last week charged with using computers to rig promotional contests at three Los Angeles radio stations in a scheme that netted two Porsches, two trips to Hawaii and $20,000 in cash. Poulsen and two other hackers were allegedly able to seize control of the phone lines so that only their calls could get through. He was also charged with illegally hacking into computers owned by the **California Department of Motor Vehicles** and **Pacific Bell** to obtain information about undercover businesses and wiretaps run by the **FBI**, according to the 19-count indictment.

Bedrock takes shape

Symantec Corp. plans to add **Rational**'s C++ Booch Components to Bedrock, an object-oriented development framework being built by Symantec and **Apple Computer, Inc.** The Rational product is a class library designed to help programmers build and manage object-based applications quickly with reusable pieces. The first release of Bedrock, aimed at software developers, is due out late this year.

AT&T inks big deals

AT&T last week said it has signed $60 million worth of network service contracts with **America West Airlines**, **Ashland Oil, Inc.** and **Oracle Corp.** Ashland and Oracle have inked multiyear deals for AT&T's Software Defined Network, a set of "virtual" private services (see story page 1), and America West and Ashland have contracted for 800 voice services.

WordPerfect outsources some support

WordPerfect Corp. last week announced that it will outsource some of its service and support responsibilities to **National TechTeam, Inc.** in Dearborn, Mich. Some of the support calls concerning releases of WordPerfect prior to 5.2 will now be routed to National TechTeam via the same standard WordPerfect support numbers. WordPerfect Chairman Alan Ashton has previously noted that as support calls become more complex, particularly in an era of networked applications, users can expect WordPerfect to outsource more support functions.

Sun expands ISDN line

Sun Microsystems Computer Corp. extended its Integrated Services Digital Network (ISDN) offerings last week: A $95 single-user license or a $495 100-user license for the SunLink ISDN-Basic Rate Interface Enabling Kit buys software that sends Transmission Control Protocol/Internet Protocol applications across public ISDN networks; it is for use with Sun SPARCstations that are equipped with ISDN functions and capabilities.

SHORT TAKES **3Com Corp.** and start-up **Cascade Communications Corp.** said they will jointly market 3Com's routers and Cascade's frame-relay feeder switches and will co-develop interoperable network management, congestion control schemes and frame relay.... **Informix Software, Inc.** announced first-quarter revenue of $77 million, up 43% over the first quarter of 1992; quarterly profits for the database vendor were $11.5 million.... The **Software Publishers Association** has begun distributing to law enforcement officers a 150-page manual of software copyright regulations.... **Ungermann-Bass, Inc.** said it will ship late this quarter a smaller (eight-port) version of the 16-port DragonSwitch Ethernet switching hub it announced in February. The 16-port version is expected to ship in the third quarter.

Workstations

Sun boosts SPARCstation 10 line

By Stephen P. Klett Jr.
BOSTON

In a move to boost sagging credibility caused by delays in product ship dates and below-par uniprocessor performance levels, Sun Microsystems Computer Corp. (SMCC) last week announced several additions to its SPARCstation 10 line of workstations.

The Sun Microsystems, Inc. subsidiary unveiled four new models, new price points for several machines and volume shipment of the SuperSPARC CPU.

The new models, which all begin shipping next month, range from the Model 30LC, an entry-level, multiprocessing-capable machine, to the high-end Model 51 (see chart). Sun claimed that users could expect 10% to 20% gains in performance by running their existing applications — without modification — on the multiprocessing machines.

While analysts agreed that the multiprocessing power of the SPARCstation 10 machines would improve the performance of most applications, some were skeptical of customers' need for dual processors on the desktop at this time.

Tom Kucharvy, president of Summit Strategies in Boston, said, "Multiprocessing certainly has its advantages if the need is there to run several apps at once. However, right now you can achieve the same effect with a powerful server and an inexpensive network of workstations, such as [Silicon Graphics, Inc.] is doing."

On target

Industry observers said Sun still needs to boost uniprocessor performance, but they believe it is taking a timely step in the right direction.

George Weiss, vice president of computing services at market research firm Gartner Group, Inc. in Stamford, Conn., said, "This is a good move for Sun, considering the limitations it was under," which included delays in the delivery of the SuperSPARC chips and Solaris 2.2, the latest version of Sun's operating system. "It will help recoup some of the credibility Sun has lost in the market," he added.

Despite misgivings, for their part, users were upbeat in their response to the announcements and said plans to move to multiprocessing were in the works.

Dan Minior, MIS director at Pratt & Whitney in East Hartford, Conn., which has approximately 2,000 Sun workstations spread throughout its operations, said the capabilities of the 50-MHz machines are "very attractive." He said the company will move to the multiprocessing machines within a year, and he does not foresee any problems with the transition.

Mark Factor, MIS director at Boston-based Au Bon Pain, Inc., a chain of bakery cafes, said he purchased a SPARCstation 10 Model 41 in January to replace an overburdened SPARCstation 2. With company growth of 40% a year, Factor said, the SPARC 2 could not keep up. The Model 41, which is currently running as a single-processor machine, "has cut processing time by one-third and is really working out well for us."

Factor said he plans to add a second processor by the early part of next year, depending on the company's growth rate.

SMCC announced volume shipment of its SuperSPARC chip and took the wraps off its next-generation SuperSPARC processor, the 50-MHz SuperSPARC+. Manufactured by Houston-based Texas Instruments, Inc., the SuperSPARC+ is also shipping in volume and is rated at 65 to 88 SPECint92 and 80 to 85 SPECfp92. TI officials said they had ramped up chip production to produce 100,000 SuperSPARC chips per quarter.

The 50-MHz chips are available as plug-compatible upgrade modules for the SPARCstation 10 line starting at $4,000.

Also announced were the Model 40, which has a single 40-MHz processor and starts at $19,745, and the Model 402MP, which comes with dual 40-MHz processors and starts at $23,745.

SMCC also updated its yet-to-ship Model 52, which it unveiled in November. The $33,745 dual-processor machine, renamed the Model 512MP, will now include the SuperSPARC+ rather than the 45-MHz CPUs previously specified. Sun also cut the price of its mid-range Model 41 uniprocessor machine 18% to $21,745.

Seeking a spark

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* Uniprocessor/multiprocessor-ready systems

CW Chart: Nancy Kowal

First PowerPC chips ship

By Michael Fitzgerald
AUSTIN, TEXAS

Motorola, Inc. will today begin shipping the first member of its PowerPC family, heralding the beginning of what may be the most serious challenge to Intel Corp.'s lock on the processor market.

Motorola struck an aggressive pricing stance with the MPC601 processor, the first of four announced PowerPC processors designed with IBM. The 601 will be available at 50- and 66-MHz speeds and will sell for $280 and $374, respectively, in lots of 20,000 units.

By contrast, Intel's 33/66-MHz I486DX2 sells for $542, and even 33-MHz and 40-MHz 486 clones from Advanced Micro Devices, Inc. will sell for $306 and $417, respectively, in lots of 1,000.

"If I were Intel, [PowerPC] would be highest on my list of products I don't want to have on the market," said Dean McCarron, an analyst at MicroDesign Resources, a Scottsdale, Ariz., market research firm. "Realistically, this is the most viable architecture next to the X86."

Part of the reason for this is that the two largest vendors in the industry, IBM and Apple Computer, Inc., are committed to the architecture. This gives the PowerPC a shot at generating enough volume to attract software developers. PowerPC hardware is supported by IBM's AIX and OS/2, Apple's System 7, and Solaris from Sun Microsystems, Inc.

Motorola's Dave Mothersole, director of engineering at the RISC Microprocessor Division, said the company is aggressively pursuing other operating system vendors, including Microsoft Corp. Many analysts said they expect Microsoft to port NT to PowerPC.

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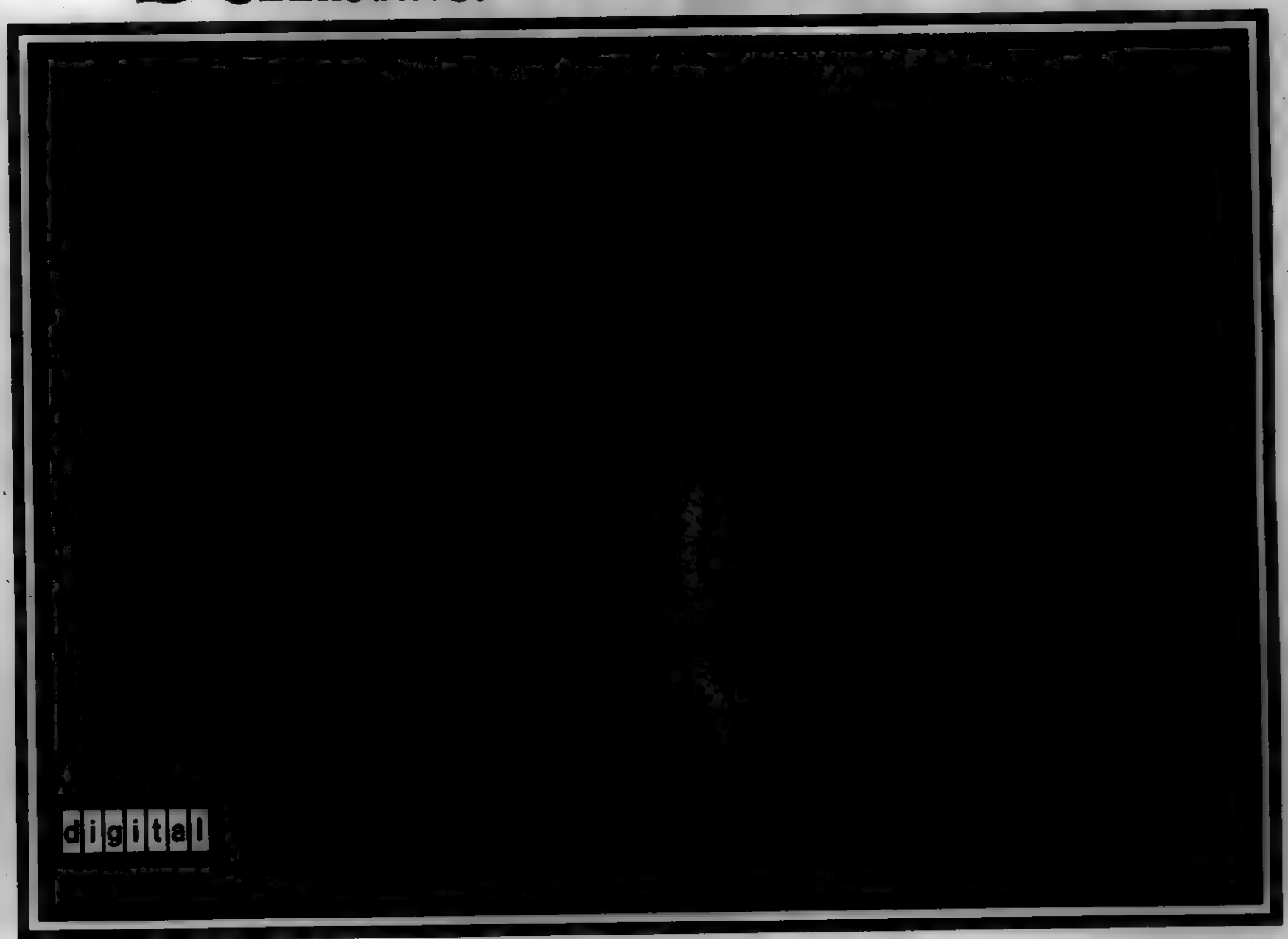

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Network management

Cabletron SNA manager delayed

By Elisabeth Horwitt
ROCHESTER, N.H.

Cabletron Systems, Inc. will be a few months late delivering software said to provide integrated management of IBM Systems Network Architecture (SNA) and multivendor local-area network and internetworking installations.

The company is holding off delivering Spectrum/BlueVision until it can also ship Version 2.0 of Spectrum, its Simple Network Management Protocol-based network management system.

Cabletron is still collecting feedback from beta-test sites. Indeed, one site said it has yet to get its implementation up and running.

Version 2.0 enables Spectrum to run for the first time on an IBM RISC System/6000 platform, which is also the initial platform for BlueVision.

Announced last fall and originally slated for general availability in March, Spectrum/BlueVision is now due in June, a Cabletron spokesman said.

Co-developed by Cabletron and NetTech, Inc., BlueVision is said to allow Spectrum and IBM's NetView to exchange key alerts and other information about the network installations they are managing. Spectrum users will be able to monitor an SNA network from the familiar Spectrum graphical user interface, while NetView users can monitor the status of the LAN hubs, cards and internetworking devices that Spectrum manages, the vendor said.

Any way you look at it

"It's what we've been looking for: to look at our SNA network elements the same way we look at everything else on Spectrum," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co., which is beta-testing the product.

Delmarva Power is still working with IBM, Cabletron and other assorted vendors to get BlueVision up and running, Scoggin said. The delays are not due to the system itself. Rather, they stem from Scoggin's unwillingness to pay $8,000 to upgrade an old 3174 Token Ring controller with microcode that would enable it to handle IBM LU6.2 traffic. BlueVision uses LU6.2 as the pipeline for passing network management data between an IBM NetView host and Spectrum on an RS/6000, The company is now trying to accomplish this through Ethernet and McData Corp.'s new 6200 controller, he added.

> Version 2.0 enables Spectrum to run for the first time on an IBM RISC System/6000 platform, which is also the initial platform for BlueVision.

With Version 2.0, Spectrum will run on Sun Microsystems, Inc.'s Solaris, Digital Equipment Corp.'s Ultrix and IBM's AIX systems for the first time, the Cabletron spokesman said. Currently, Spectrum runs on Sun's SunOS and Silicon Graphics, Inc. systems.

Among the other enhancements slated for Version 2.0 are improved performance in collecting and processing network management data and an enhanced ability to discover and map nonstandard network devices, the spokesman said.

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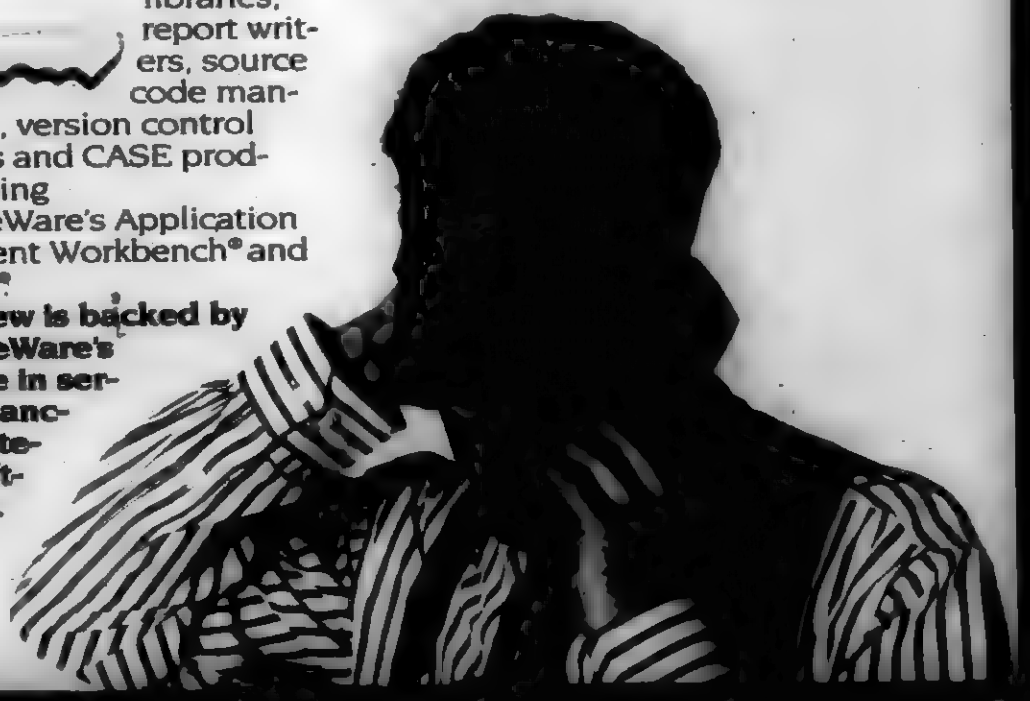

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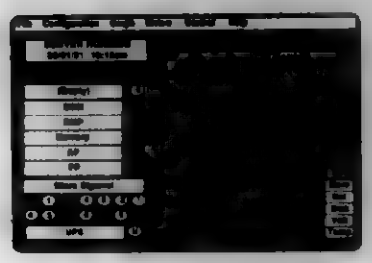
It even tolerates

and recovery capabilities. MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



The MASS/2 option has a user-friendly GUI that lets you distribute computing power across your organization from a central location.

Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
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MASS/2	optional	standard	standard

Like all PS/2s, the Server 195 is backed by IBM HelpWare™—a range of service and support so complete, it's hard to find fault with. You get a three-year on-site warranty with four-hour average response time*, around-the-clock set-up, usage and service assistance on IBM hardware and software during warranty;** a 30-day money-back guarantee** and more. For more information or an IBM certified dealer near you, call our Personal Systems HelpCenter™ at 1 800 772-2227 or TDD ASCII 1 800 426-4238. In Canada, call 1 800 465-7999.

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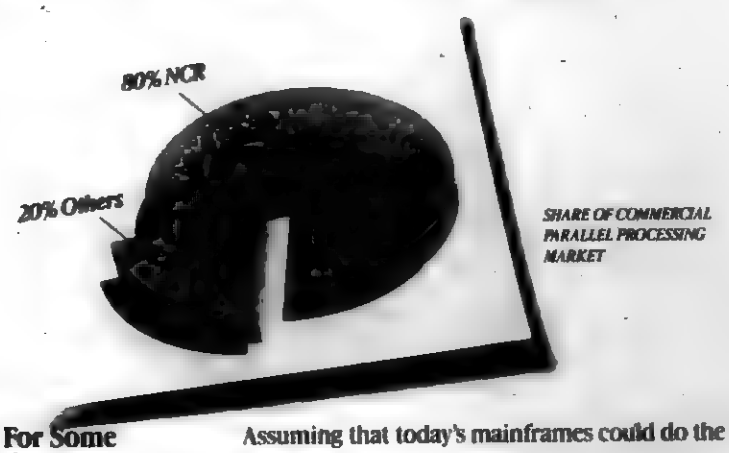

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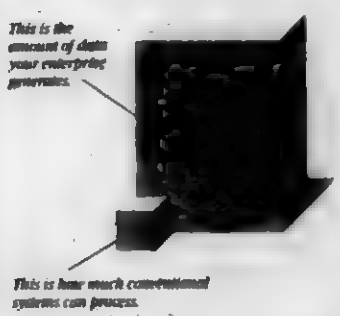

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CPWLD

Banyan to add platform, tool kit for Vines

By Michele Doetert
SAN FRANCISCO

Keeping with tradition, Banyan Systems, Inc. will kick off its user conference this week with moves that will generally please its loyal user base but are unlikely to woo throngs of new customers.

At the Association for Banyan Users International meeting here, the company will add Hewlett-Packard Co.'s Precision Architecture-RISC workstation to its stable of server platforms. It will also roll out a developer's tool kit to accelerate use of the recently released, well-received Version 5.5 of its Vines network operating system, a Banyan spokeswoman confirmed. No projected release dates have been announced.

The PA-RISC server version will expand Banyan's presence in the "open" Unix market, where it staked a claim last fall by porting Vines to The Santa Cruz Operation's Unix. Vines servers have historically been Unix kernel-based but modified to the degree that they were considered proprietary.

"Since Banyan is targeting the high-end corporate network marketplace, RISC machines are a natural move for them," said Stan Schatt, director of network services at Computer Intelligence/Infocorp in Santa Clara, Calif.

New addition

Banyan released Vines Version 5.5 in January. It combines Apple Computer, Inc. Macintosh support of Vines 5.0, the broad device support found in Vines 4.X series and enhancements in directory services, file systems and intelligent messaging in one product.

Vines 5.5 has been uniformly praised by early adopters, most of whom plan to migrate their entire systems to it.

Although Banyan has only 8% of the overall local-area network market, it has more than 28% market share in LANs with more than 35 users, according to Dataquest, Inc. Nonetheless, industry watchers believe that the company's window of opportunity for market share expansion in the fast-growing application server arena has largely passed.

"I think third-party application vendors will be very busy writing to Microsoft Corp.'s NT, IBM's OS/2, Novell, Inc.'s UnixWare and NetWare and Sun's Solaris. Writing to the Banyan platform will come way down the list, which will hurt Banyan," Schatt said.

"The intelligent messaging alone is enough to make us upgrade," said Cathy Graham, manager of technical services at Cooperative American Physicians in Los Angeles.

Yvette Fleming, a network administrator at National Medical Enterprises in Santa Monica, Calif., said she was impressed by Vines 5.5's remote server control. "Now I can fix a problem at a remote site without having to get in my car and drive over there," she said.

Eric Dickstein, a lead development analyst at Continental Grain Corp. in New York, was enthusiastic about new administrative capabilities, better printer support and the support of object attributes in the Vines 5.5 directory service.

"We're definitely going to upgrade, but it's a major change with no road back, so we'll wait until our third-party vendors for such products as mail gateways and remote access programs release Vines 5.5 versions," he said.

Users expressed concerns over minor bugs in the Version 5.5 file system and printing routines, but Banyan fixed the bugs in a "maintenance" release that will ship shortly, said Pam Campagna, Banyan's product manager for Vines 5.5.

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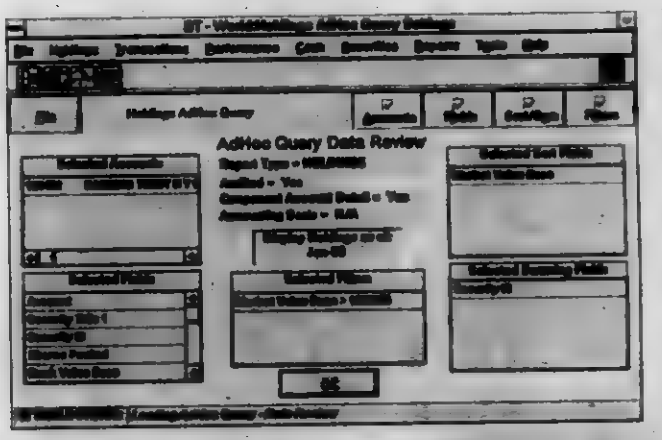

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Tech Talk

Distributed map

In advance of next month's Challenge '93 showcase in Boston, the Open Software Foundation (OSF), in collaboration with the University of Michigan's Center for Information Technology Integration, has developed a geographic information system for a world map. The system, which uses the OSF's Distributed Computing Environment (DCE) standard, allows users to zoom in and out of the map. Queries are made through the system's Motif user interface, which retrieves information from different DCE servers.

Full-motion MPEG chip

At Comdex/Spring '93 in Atlanta next month, Audio Digital Imaging, Inc. (ADI) will unveil a chip that is able to encode and decode real-time, full-motion video. The MPEG I chip, dubbed Apogee I, uses a parallel processor that encodes and decodes up to 30 frames per second. This Application Specific Integrated Chip complies with the MPEG-I standard but adds proprietary enhancements for functions such as digital special effects. ADI expects to have its product ready to ship in July. According to Will Strauss at Forward Concepts Co. in Tempe, Ariz., the market for video encode/decode chips of all types is doubling each year and is now worth about $23 million.

Like magic. . . .

"Principles, techniques and ethics of stage magic and their potential application to human interface design" is the title of one of the technical sessions at this week's Interchi '93 in Amsterdam. An international forum for discussion of human/machine interface technology and research, Interchi '93 is jointly sponsored by the Association for Computing Machinery's Special Interest Group on Computer and Human Interaction in New York and the International Federation of Information Processors in Geneva.

E-mail meets voice mail

You may soon be able to *read* your phone-mail messages

By Ellis Booker

Pervasive but far from perfect, voice-processing technology is now largely the province of multibutton office telephones.

That is about to change, however, as vendors of voice-mail and voice-response systems scramble to integrate their products with client/server computer networks.

What this evolution will mean for office workers in the near future is this: Instead of an electronic-mail system accessed via a desktop computer and a voice-mail system associated with the telephone, users will be able to look at a single screen detailing the contents of their mail, both electronic and voice, or route compressed voice messages around a local-area network using the E-mail network.

"We're approaching what I'll call the third wave," said Don Van Doren, president of Vanguard Communications Corp., an industry consulting and research firm in Morris Plains, N.J.

According to Van Doren, the first wave began in October 1980, with the deployment of the first large-scale voice-mail system. Voice-response systems date from the early 1970s.

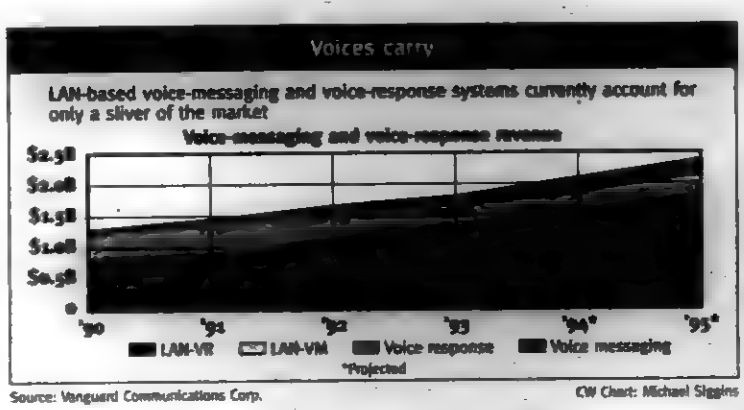
Next came integration with telephones and the private branch exchanges. "Now the move is right to the desktop . . . making these systems LAN-able," Van Doren said.

Van Doren and others pointed out that the migration of voice services to the desktop has been enabled by the added power in those desktop machines. "As we get more [Digital Signal Processor]-equipped PCs and PCs with sound capabilities, there will be an explosion in this market," Van Doren said.

The addition of voice to the LAN inevitably raises the question of network congestion.

However, this issue does not worry Henry Hyde-Thomson. Hyde-Thomson is founder of The Vmail Co., a London-based company specializing in LAN-based voice processing that was acquired earlier this month by San Jose, Calif.-based VMX, Inc., which wanted to establish a client/server software division.

"With our compression scheme, a 10-second voice message takes up about 30K; a 30-second message is around 100K," he said. For storage, Vmail recommends a 50% addition to the space currently allocated to E-mail mailboxes.



Source: Vanguard Communications Corp. CW Chart: Michael Siggins

Voice-processing vendors

Here is a short list of vendors in the voice-processing market that have already implemented client/server approaches:
- Active Voice Corp., Seattle
- Applied Voice Technology, Inc., Kirkland, Wash.
- Centigram Corp., San Jose, Calif.
- VMX, Inc., San Jose, Calif., which this month acquired The Vmail Co., a London-based vendor specializing in LAN-based software.

Systems vendors, too, are plumbing the market, generically known as Computer Telephone Integration:
- IBM offers its Call Path Services Architecture.
- Digital Equipment Corp. has its Computer Integrated Telephony product line.

Still problems

While screen-based voice-processing systems may add convenience, they will not, by themselves, eliminate all the complaints about voice-processing technology.

"The complaints about voice mail rarely come from the users; they generally come from the callers," said Paul Stockford, a principal analyst at market research firm Dataquest, Inc. in San Jose, Calif.

The trouble, Stockford said, comes either from abuse (principally users who "hide" behind voice mail and do not return calls) or because of a poor implementation of the system (too many choices in a menu, an endless loop or no convenient way to escape back to a live operator).

Nevertheless, integration at the desktop over the LAN will mean incoming voice messages that arrive from other users on the LAN can be screened according to their time of recording, length and source. Unfortunately, the source of messages coming from locations off the LAN will not be identifiable, unless the phone call provides (and the messaging application accepts) automatic number identification (ANI) signaling from the phone network.

Once the ANI is captured, a local database can be checked for an associated name, which can then be added to the header field of a message-alert screen.

The ANI solution, of course, only identifies the calling phone, not the caller. To address this issue, some people in the voice-processing industry advocate the development of a communications ID number that would be unique to each caller.

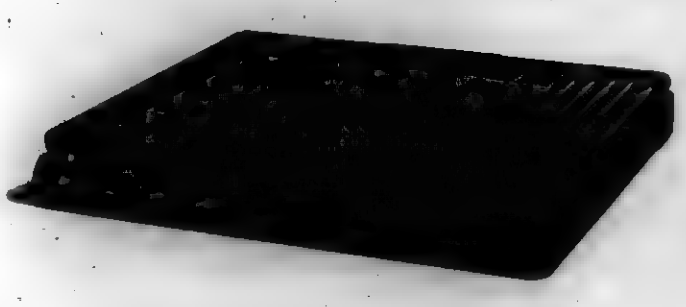
Ultimately, speech-to-text technology will connect the voice-mail and E-mail realms, but analysts said they are not hopeful that this solution will become a commercial reality for three to five years.

On the other hand, there are text-to-speech systems that can read portions of E-mail messages to users on the road who wish to check their E-mail and do not have laptop computers with them.

Calling in the standards

The Audio Messaging Interexchange Specification (AMIS), a vendor/user group formed in 1987, currently has a formalized analog specification; its digital standard is still being refined. The Voice Mail User Interface Forum, formed in 1990, is working on a standardized interface for voice-processing systems. Its work is not as far along as that of the AMIS interexchange group.

After all the thinking we put into it, we still can't say whether it's a notebook computer or a desktop computer.



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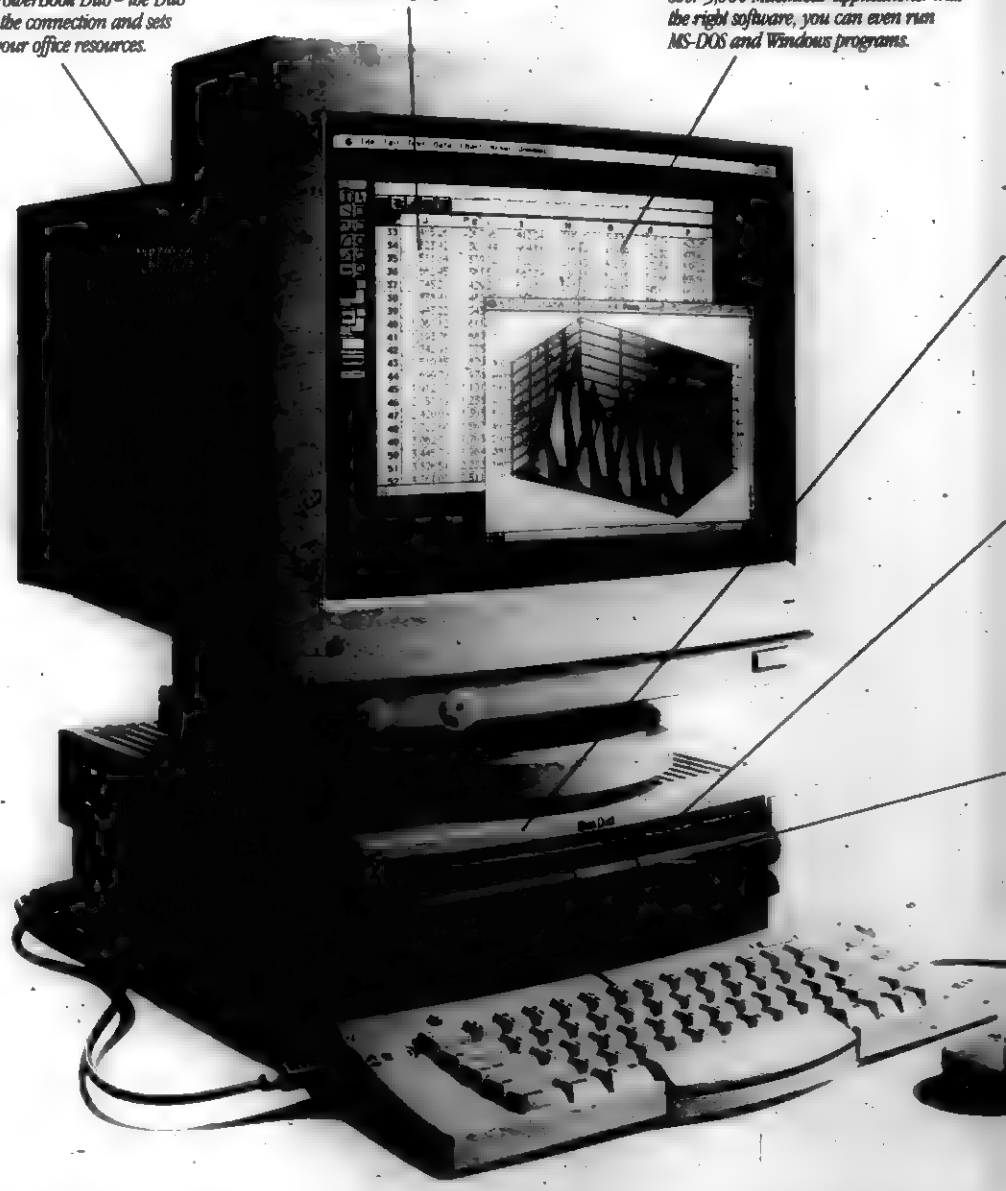

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Portable power. *The PowerBook Duo is a full-featured computer with a gray-scale supertwist display. It works up to 4.5 hours on a single battery charge.*

Expandable. *The Duo Dock has two NuBus™ expansion slots (for such additions as 24-bit graphics and Ethernet) and ports for up to six peripherals.*

Plenty of storage. *You have one set of files, wherever you go. PowerBook Duo stores up to 80MB (with the option of 120MB in the PowerBook Duo 230).*

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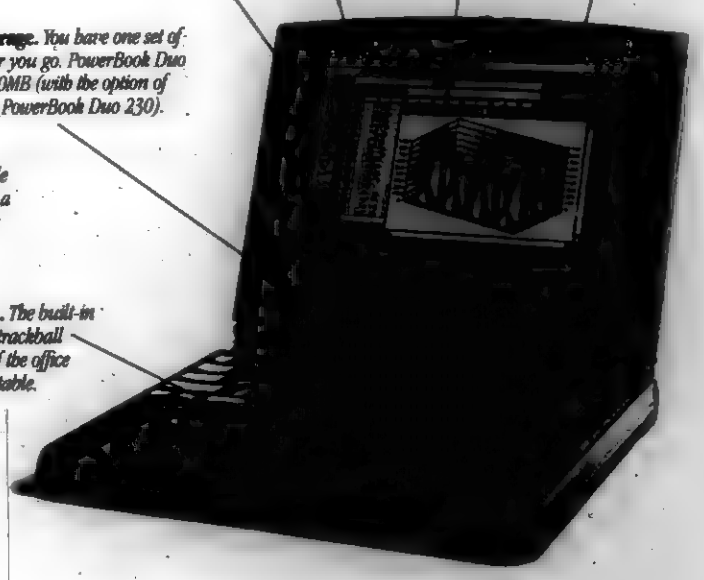

color display and any peripheral devices that may be attached.

In fact, you can use your PowerBook Duo with different Duo Docks in different offices, and no matter where you decide to work, the system will automatically set itself up for your connected resources.

When you're ready to leave, you just press the eject button, and the Duo Dock releases the notebook, much like a VCR ejects a videocassette. (Unless you have unsaved files on the screen—in which case it has the good sense to point that out before you disconnect.)

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Fighting back

True story. Every fourth grade in every blue-collar town during the late 1950s had a bully, and in my class, I was he. It was great fun for me to pick on this big, docile kid who never fought back. One day I guess he'd had enough. A bloody nose and a fat lip later, I was a born-again pacifist having exited his last fistfight ever. The big kid? I suppose he learned that flexing some muscle once in a while ain't such a bad idea.

For years, despite having the collective power of a titan, the Society for Information Management (SIM) kept an extraordinarily low profile on most issues that interested its members — 2,700 IS directors who make up the greatest information technology buying force on earth.

SIM maintained an eerie silence in recent years as some software suppliers were screwing its members with unreasonable upgrade fees, rigid licensing options and inflexible contracts. In fact, at a meeting of SIM's biggest members a year ago, SIM leaders scrambled to control damage when, in an informal discussion, some members aired their anger.

A year later, at the same annual meeting, the big kid finally struck back. As reported last week, SIM has released a software license manifesto. No, it doesn't want software for free. But it is not going to let its members be taken to the cleaners by vendors that don't deliver significant value-added to software and services but charge as though they do.

Although the language of the SIM position statement is somewhat general and therefore vague in a few places, it is a major initial step in bringing order to the chaos that has existed for far too long now.

Equally important, the statement cuts a wide swath across the practices of all kinds of software providers, not just large systems vendors. The SIM members at multinational corporations are demanding order from the fluctuating global prices of PC software. They are asking, "Why should we pay $1,000 abroad for the same package that costs $300 in the U.S. and whose marginal cost of manufacturing is about $10?"

The impact of the SIM memo is already apparent. Vendors we spoke with last week endorse the baseline principles of fairness that the society outlined. SIM is even encouraging the vendors to state publicly in their advertising materials that they support the guidelines.

It would be a positive step to hear from the two big software vendor organizations, the Software Publishers Association (SPA) and the Information Technology Association of America (ITAA) regarding the SIM memo. The SPA and ITAA have not been shy about speaking on behalf of their members on issues such as software bootlegging and contract programming legislation. Let's hear from them on this most pressing issue from the voice of the buying community.

Meanwhile, SIM must keep up the pressure in its demand for greater fairness in this time-critical issue.

Bill Laberis

Bill Laberis, *Editor in chief*

Proof of purchase

Joe King's article "Don't get swept up in 'upgrademania'" [CW, March 22] regarding the vertigo caused by the software marketing technique he terms "upgrademania," demands a postspin response. It is impossible to stay abreast of the constant updates to software. I want the additional features and functionality, but I also need more time between upgrades to implement them.

On the issue of competitive upgrade fraud supported by the retail channel, King is way out of line. I work for a major software retail chain, and we are reminded daily not to sell any upgrade (competitive or otherwise) without proof of ownership. Notification to the publisher is filled out before the customer walks out the door.

None of the software publishers that we deal with encourage us to "look the other way" when it comes to upgrade documentation reporting. We are regularly audited. King has a responsibility to work with retailers to ensure compliance with upgrade documentation reporting. Retailers are not the problem.

Keith Stillinger
Atlanta

Hold responsible

Because I am not a lawyer, I do not know the legal definitions of "libel" or "slander." However, having participated in corporate environments for almost 20 years, I have seen countless cases of so-called "harmless" talk used purposely to cast an individual in a particular light.

Irresponsible and false statements have caused people to lose promotions and their jobs. And it is also true that many responsible and true statements have helped to oust others. E-mail and public bulletin boards have the added feature of being reprintable.

It is unfortunate that ours is a world run by gossip. Because it is doubtful that that will change in our lifetimes, I strongly agree with Paul Gillin's conclusion in his editorial "Flame out" that users of electronic forums need to accept responsibility for their actions. However, there are a lot of people out there who might want to question Gillin's statement that "It's generally harmless."

Tom De Baker
Minneapolis

Booming business

I was surprised by Charles Babcock's comment that Oracle's U.S. applications business was "faltering" ["Tool time," CW, April 12]. I think "booming" is a more apt adjective. While we don't publish results for the U.S. separately from worldwide, overall applications license revenue is up nearly 55% this year to date ($42 million) and was up 130% in the last quarter.

The U.S. has been a major contributor to this remarkable growth. "Faltering" doesn't quite capture this reality.

George Koch
Senior vice president
Oracle Corp.
Redwood Shores, Calif.

Search and you shall retrieve

The article "Why business managers are empty-handed" [CW, April 5] was excellent but did not adequately examine the role that content-based retrieval systems can play in a corporate document management strategy.

Keyword searching is expensive in time and space, but a retrieval strategy that depends on keywords and character string matching is not really a content-based retrieval system.

True content-based retrieval applies techniques from fields as diverse as statistics and artificial intelligence to help managers find relevant information.

Some of these techniques are concept trees, soundex, pattern matching, word stemming and word proximity. These techniques far exceed the capabilities of simple keyword indices; they enable the user to strike a balance between recalling too much information and not recalling enough.

Content-based retrieval, which can be integrated with information foldering and linking, can help managers collect the information they need to make decisions.

Richard A. Menard
Framingham, Mass.

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If you can't be a know-it-all, be humble

Michael Cohn

People used to think we computer folks were pretty smart. We spoke in strange acronyms and sounded smart. We wore thick glasses and looked smart. We built databases, tended water-cooled mainframes and got paid as if we were smart.

But this is the '90s — practically the mid-'90s — and looking smart isn't that easy anymore. Buzzwords don't cut it. Assembler doesn't cut it. Dump-reading and flowcharts don't impress anyone anymore.

If you're in IS, it's probably time to let go of your listings, step out from behind your console and take a hard look at what you bring to the table. Hint: Some of the following had better be on the platter.

•Business skills. In the beginning, companies wanted programmers. We coded, they paid us, and everyone was happy. Then the companies wanted more. We had to understand applications. We had to talk to users. It was terrible.

Now it's even worse. Companies want industry skills. They expect us not only to know their business but the business of their customers, suppliers and competitors. They want us to walk into meetings and show how IS will provide competitive advantage.

This is a lot to ask from guys who need a week and a half just to write a page-break routine.

•Negotiation skills. You can't get by without them. And it's not just negotiating with your

boss for a raise or negotiating with your CFO for more capital. In the new multiplatform, multivendor world of IS, true negotiating skills get tested every day as you beg, pray and plead with all these vendors for support — or at least for them to pick up the phone.

•Communications skills. In the old days, no one outside IS understood IS. So the quick way to the top was to be the guys who explained to executives how your expensive technology worked.

Now, to get to the top, you may have to become the guy who explains to executives why your expensive technology hasn't worked since 6 a.m. last Tuesday. It might also help if you are pretty good at begging for mercy. See "negotiation skills."

•PR skills. IS today requires a mastery of public relations, or at least personnel relations. That's because you're going to have to defend your existence, especially to head count-happy folks in personnel.

In the downsized '90s, convincing the bean counters that they really need a fully staffed IS department can get a little tricky, especially when you are trying to explain why it still takes three shifts of 10 operators to run an AS/400 and two PCs.

•Humility. Once there was a very pleasant time when the rest of the world knew nothing about computers, and they were glad to keep it that way. Those days are gone. Now, we have to contend with power users — folks with PCs at work, PCs at home and a half-dozen disks in their coat pocket.

These guys love to back you into a corner during a meeting, wanting to talk about information systems. And all your years of DASD and MIPS and structured methodology cannot save you from all the scuzzy-mousey-hertzy stuff they spew at a mile a minute.

So learn some modesty. Learn humility. And, most importantly, learn to say, "Yes, but have you thought about INTEGRATION?" — and then bolt for the door.

Cohn practices humility in Atlanta.

Danger! There's nobody to steer client/server

LISTEN UP! *by* Elaine Bond

The herd instinct often leads us from one extreme to another, and that's what seems to be happening with mainframe vs. client/server architectures today. The glass house is definitely "out," and client/server is "in."

That's fine, but before we discard the old ways completely, we need to figure out who is going to integrate all this wonderful stuff and make sure it delivers the kind of operational characteristics we've come to expect.

In the mainframe era, it was clear who had the responsibility for "end-to-end" services such as architecture planning, ensuring performance, reliability and serviceability, guaranteeing recovery and so forth. Those responsible may not have always executed well, but at least we knew who they were — IS personnel with major support from the system vendors.

In a client/server environment, the answer to "Who's responsible?" isn't so clear.

If traditional mainframe professionals are given the task, they will most likely replicate the glass-house environment.

Here's a real-life example: A major corporation that had been highly decentralized recently recentralized its LANs under the control of its former IS manager. This was done in the context of a move to a new building, with a high-tech, industrial-strength infrastructure. Telecommunications closets were placed on each floor to bridge backbone wiring to floor wiring, and each floor was also equipped with locked "server" closets.

This is distributed?

You have to ask yourself: If that's the only way to ensure control, is there any difference, aside from the price of components, between distributed architectures and mainframes? But if mainframe-trained personnel aren't the ones to manage client/server, who is?

When client/server entered the picture, we were thrown back to something very much like the old "Heath kit" days of component buyers and builders. Alongside the tightly integrated collection of components called a "mainframe," we now have sprawling collections of systems, integrated in what would be kind to call de facto fashion. And instead of trained electrical and design engineers attempting to understand and design for the interrelationships of the computing nodes (hardware, software and data), we have the "sneaker brigade."

When the components are physically spread out and subject to local control, we may also have end users and administrators with even less knowledge, training and skills impacting the operational and performance characteristics of the network.

Building client/server networks from the workstation up has been exhilarating, challenging and fun. It has produced many quick benefits. But once you start growing into enterprise-level networks, someone or some set of highly skilled people must take on the responsibility for end-to-end performance and operational characteristics.

The answer isn't in locked closets. It isn't in trying to replicate the glass-house environment or in building "virtual mainframes." It is in learning to design and implement unique client/server architectures as elegantly and efficiently as we did with mainframes. Right now, we don't have many people equipped for that challenge. We have to create more of them quickly.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank N.A. She is a founder of the user advocacy group, Open User Recommended Solutions (OURS).

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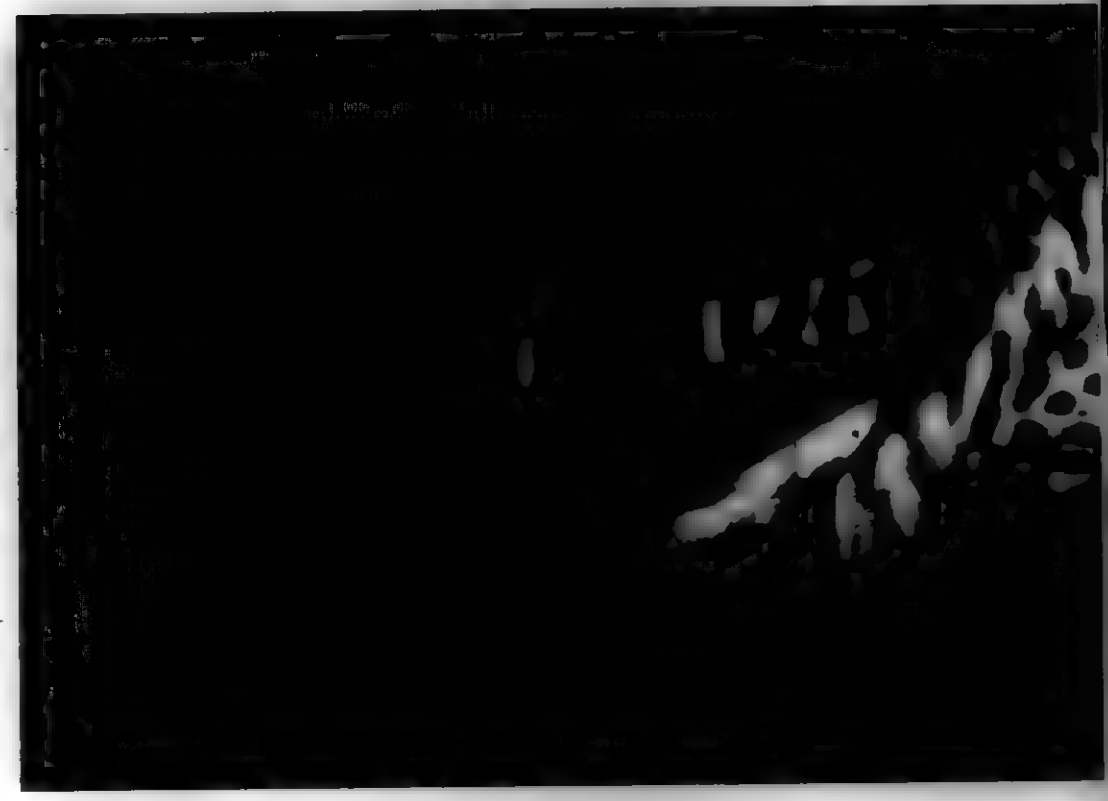

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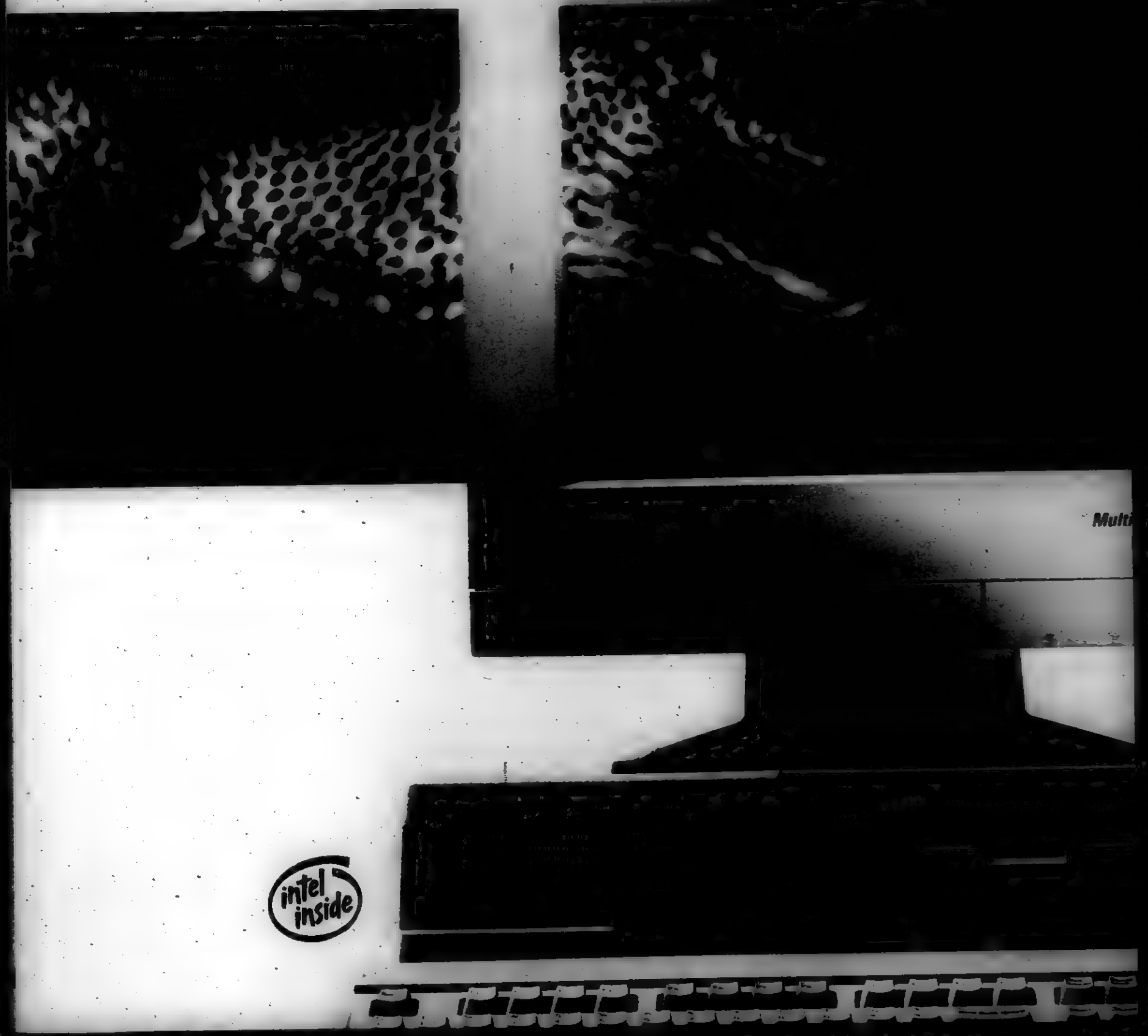

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Charles Babcock

Go with the flow

Work flow is usually thought of as one part of a desktop program. That's changing, however, and work-flow software is rapidly becoming a significant category in its own right.

Productivity experts say disorganized information is one of the greatest barriers to greater workgroup output. If work-flow software can automatically feed the right data into routine and dynamic tasks, it has the potential of becoming the next killer application on PCs.

In part, work flow represents a kind of collection of those programs that have enhanced individual productivity — word processing, database, communications and spreadsheet. A work-flow system pulls together data from diverse sources and puts it in forms or documents that push a task forward. It also defines the route along which these results should flow, monitors their progress and tracks versions of a document to see who did what to it and when.

But there's no single, clear-cut way to do all this, as was evident in recent talks with two work-flow system progenitors — XSoft and Reach Software Corp.

"The key is to enable people to collaborate," Barry Obrand, XSoft's vice president of marketing, said from his office next to Xerox PARC in Palo Alto, Calif. XSoft builds its InConcert system around a relational database system, currently either Oracle or Sybase, and runs it on a Sun or IBM RS/6000 server. Clients are SPARC or RS/6000 workstations and 386/486 PCs.

Reach Software, a 50-employee start-up in Sunnyvale, Calif., has a different approach. "The important thing is to leverage the existing local-area network," said Anand Jagannathan, Reach's president and co-founder of Banyan Systems.

Reach's Workman makes use of the Message Handling Service built into Novell's NetWare or the E-mail transport built into Banyan's Vines to move information and documents around. It doesn't sit atop the existing E-mail system. Rather, it is a co-resident application on the LAN server, with capabilities not available in E-mail. The client PCs are running Microsoft Windows 3.0 or 3.1.

Reach builds work flow on the existing Windows and LAN infrastructure. It does not rely on an RDBMS because it can use the integrating force of Windows and the underlying Dynamic Data Exchange and Dynamic Data Link Libraries of Windows applications, Jagannathan noted.

XSoft has stronger conceptual roots. It is based on a vision of how information and documents should be shared and, with its database underpinnings, offers more real-time capabilities. With the database on a server, it also offers greater security, a consideration if the data involved is crucial to the firm's operation.

Each approach has its backers. Reach has raised about $5.5 million from three San Francisco Bay area venture capital firms, with Novell as an additional backer. Kim Peyser, chief operating officer, is a former vice president at Novell.

The 380-employee XSoft was set up as an independent business by Xerox in 1991 after researching object system management and document management. Obrand was a vice president and general manager at Ashton-Tate.

Sitting literally in the shadow of the famous Xerox PARC, XSoft officials worry that a Xerox group will once again invent leading technology and have sales stolen out from under it by lower priced or better packaged implementations.

Workman, with its common denominator approach, threatens to do that. But at the same time, the PC-based approach leaves obstacles for end users to leap in order to gain access to mainframe data.

Neither approach satisfies all needs, but each brings a new level of coordination to group projects.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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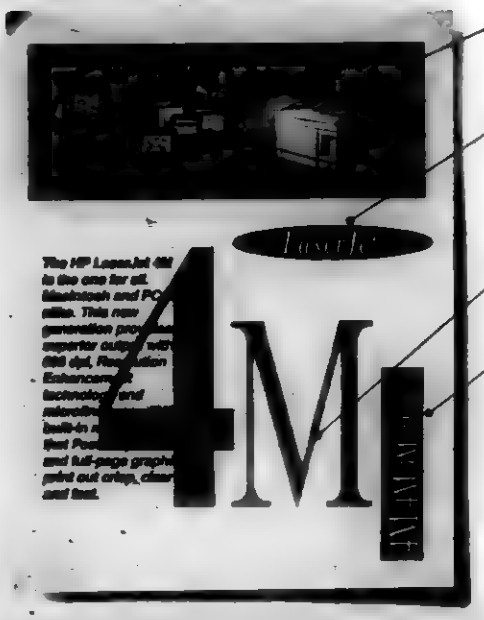

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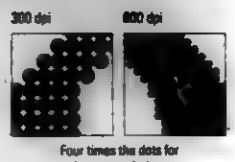

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Price cuts, PC sales to taper off in '93

By Michael Fitzgerald
SANTA CLARA, CALIF.

PC pricing will not fall in 1993 the way it did in 1992, according to a new report by Computer Intelligence/Infocorp.

The report predicts that users will react to this price moderation by buying fewer PCs in the second half of the year, forcing the PC industry to do its version of the shimmy as the market shakes out.

Part of that shakeout will be attributable to the gangbuster first half of 1992, said Kimball Brown, CI/Infocorp vice president.

"We don't see price cuts continuing at last year's pace, so 1993 will be just like 1992, but in reverse," Brown said. He said vendors that have been ramping up to handle this year's continued high demand, which is running more than 30% above demand during the first half of 1992, may catch up just in time to see year-to-year growth literally stop.

Such a scenario could deal a knockout blow to financially shaky vendors. "If you're a smaller vendor and you're not preparing for growth rates to slow way down, you're going to be in trouble," Brown said.

The PC industry will be dominated by the x86 chip from Intel Corp. and other vendors in 1993, with Intel's overall production expected to decline late in the year in the face of competition from IBM, Advanced Micro Devices, Inc. and Cyrix Corp./Texas Instruments, Inc., according to a CI/Infocorp report.

While users will buy more units in the second half of 1993 than they did in the first, CI/Infocorp said compared with 1992's huge growth spurt, U.S. PC shipments will fall slightly in the fourth quarter; worldwide market numbers will slip by 5%.

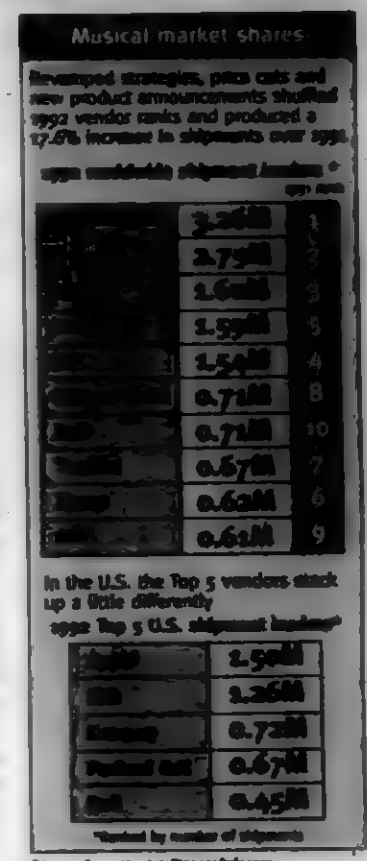
The result will be going-out-of-business sales and consolidations, as well as companies retrenching to focus on specific niches.

Some vendors, such as Northgate Computer Systems, Inc., have completed their restructuring and the trend may have recently started to accelerate. Hyundai Electronics America, after its big end-of-year effort failed in 1992, has put its PC-business through a massive restructuring and executive purge. The company said it will now focus on multimedia PCs.

Despite the growth slowdown expected in its second half, 1993 will be the second consecutive year of double-digit growth in the PC market after single-digit growth in 1991. CI/Infocorp projects 15.9% growth in the world market, following 1992's unexpectedly high 17.6% gain. Brown also said it was possible that the second half of 1993 could see higher than expected growth if component pricing declines help spark a second-half price war, driving up demand again.

Among the top U.S. vendors, CI/Infocorp projected a strong year for IBM PC Co., with a 30% growth spurt that will regain its top position in the U.S., while Apple Computer, Inc.'s growth slows down to about 15%. Compaq Computer Corp. will gain on IBM, with at least 50% growth expected, but Dell Computer Corp. and Gateway 2000 Ltd. will continue to outgrow Compaq.

CI/Infocorp predicted, in fact, that Dell will become the fifth largest PC vendor in the world in 1993, nosing out mass market champion Packard Bell and slumping Commodore Business Systems, Inc. AST Research, Inc. will also have strong growth worldwide, although CI/Infocorp predicted flat U.S. sales for the PC maker.



Norton Utilities 7.0 keeps pace

By Christopher Lindquist

In the PC utilities market these days, it pays to be light on your feet if you are going to keep ahead of Microsoft Corp. and its propensity for putting more and more utilities into operating systems.

One of the companies most adept at filling the market opportunities left in Microsoft's wake is Symantec Corp. Its Norton Utilities 7.0 continues that trend.

PRODUCT test DRIVE

The advances in this latest version of the venerable DOS utilities package are few in number, but they will be important to some users, particularly those who use data compression or who have large hard disks. Users who have lost one of the multiple manuals that came with Version 6.0 will also appreciate this lastest version.

The first group — those who use data compression — is likely to grow rapidly now that MS-DOS 6.0 is shipping with data compression built in. Norton Utilities 7.0 supports data compression in both its Disk Doctor diagnostic tools and the Speed Disk defragmentation util-

Norton Utilities, *page 41*

Center to spread data on health

By Rosemary Cafasso
ATLANTA

The national Centers for Disease Control and Prevention (CDC) plan to open up their massive database on health and disease statistics to public health professionals across the country.

Not that the data is currently off-limits. But getting to it has been a time-consuming and difficult task.

"There's about 6G bytes of data on-line and a lot more off-line," said Kenneth Long, a systems analyst and database administrator at CDC. "We have public health, scientific data, statistical data and a huge textual reference database. Currently, its primarily available to mainframe users, particularly at CDC."

But since 1990, CDC has been working to change that. The organization is designing a Microsoft Corp. DOS-based graphical data retrieval program that allows users to request data through a series of menus and prompts.

The front end interfaces with a CDC-designed communications server, dubbed the Wideranging Online Data for Epidemiological Research (Wonder) Communications Hub, that routes requests to a second server. It runs a set of IBM OS/2-based tools from Software AG of North America, Inc. that perform queries directly to the mainframe and navigate through the different communications protocols to get at the Software AG Adabas database management system on the host.

Long would not reveal the project costs, which include the front-end software. He said CDC will give it to users at no charge, providing they are public health professionals. "We are under some budget restraints, but CDC Wonder is important enough and will continue to be funded," Long said.

In February, a version of this system was released with basic functions, including electronic mail and limited database access. About 500 users inside and outside of CDC tested it, and while it was considered a production version, Long said it had "very limited functionality and only a very small amount of mainframe data was available."

Easier access

But Version 2, currently scheduled for completion in June, will deliver the full-blown PC-based front end. Currently, Long's team is fine-tuning the performance among the Wonder Communications Hub, the data access server and the mainframe. The goal is to provide easier access to a wider range of data, he added.

Long considers this front-end software to be critical to the success of the new system. It was written in the C programming language and designed for the DOS operating system because "governmental health agencies often can't afford Windows [systems], so it is character-

Center, *page 41*

ON SITE

The Centers for Disease Control
Atlanta

Goal: To make it easier for public health officials to access the CDC's huge collection of health and disease statistics.

Approach: Develop a front-end system that includes user-friendly Microsoft Corp. DOS-based PCs and a set of server-based tools to interface with the host, a Software AG database management system.

Expected results: Help health officials make better use of data by presenting it in a graphical format.

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PC security

Beware of spring

By James Daly

May's warm weather may feel good, but don't let it lull you into complacency when it comes to safeguarding your data.

It is a slow month for pernicious viruses in general, with only one really nasty creature set to strike. But there will still be plenty of nondestructive nuisance viruses around, according to the folks at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software.

The one bit of rogue code you should be especially on the alert for is the 1210 virus, which is sometimes known as the Prudents virus. It is set to activate anytime during the first four days of May.

The 1210 is a memory-resident virus that infects .EXE files when they are executed. It causes disk writes to be changed to disk verifies, so writes to the disk never occur between these dates — that is, no information can be saved to the hard disk.

It was first isolated in Barcelona, Spain, in December 1989.

As with all viruses, the activation dates are for general awareness and are not exclusive. With a little tinkering, most can hit at any time.

Lab tools becoming finance tools

By Michael Vizard
WILMINGTON, MASS.

Some of the tools commonly associated with scientific analysis are beginning to find their way into financial applications.

Labtech Corp. recently released Realtime Vision, a Microsoft Corp. Windows-based package that allows users to monitor business processes in real time using a series of graphic displays.

Based on data acquisition technology that Labtech offers for laboratory and industrial applications, Realtime Vision makes use of a Dynamic Data Exchange link to monitor data stored in spreadsheets and databases.

Realtime Vision then takes this data and displays it in trend charts, digital readouts, analog meters and dials, which were designed to fluctuate as the data changes.

Labtech President Fred Putnam said he expects securities analysts, retail sales offices and service providers to be among the users that will be interested in real-time monitoring of data.

For example, Fox River Financial Resources, Inc. in Batavia, Ill., has adopted Realtime Vision to monitor its trading activities.

Fox River has a number of custom artificial intelligence programs that execute trades based on a predetermined model.

Testing against predictions

Fox River President Keith Dickson said he uses Realtime Vision to monitor how closely his programs are executing trades compared with the actual forecasted test model.

"It doesn't lie. It tells me the story graphically, so it's quantitative," said Dickson, who noted that any slip in Fox River trading programs can cause the company significant losses.

Realtime Vision is priced at $99 until the end of this month. After that, it will be priced at $395.

A developer's edition of the product is priced at $995.

[redacted]

Software application packages

Expert Choice has released Version 8.0 of the Expert Choice decision-support program.

The DOS-based product assists users by organizing complex problem-related information into a hierarchical model comprising a goal, criteria, possible scenarios and alternatives, the firm said.

Features include graphical adjustment of criteria importance, an enhanced information screen editor and mouse support.

The product runs under DOS 3.2 or higher and requires a PC with at least 640K bytes of random-access memory.

Single-user versions cost $495. Prices for network and runtime versions depend on configuration.

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Wolfram Research, Inc. has introduced Version 2.2 of Mathematica, a software system for technical computing.

New features have been included in areas such as programming, notebook interfaces and numerical, symbolic and graphical computation. Additional linear algebra and differential equation capabilities are also provided.

Mathematica 2.2 prices start at $595.

▶ *Wolfram Research*
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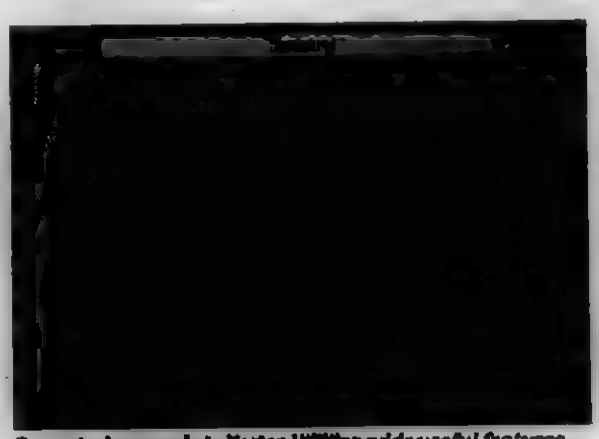
Norton Utilities

CONTINUED FROM PAGE 39

ity. But Microsoft's DoubleSpace compression is not the only data compression method out there, so Symantec has built Norton Utilities 7.0 to support Stac Electronics, Inc.'s Stacker and AddStor, Inc.'s SuperStor compression algorithms as well.

The updated Norton Utilities also supports large hard drives — up to 2G bytes. However, be aware that supporting such large drives can require 1M or 2M bytes of extended or expanded memory. While it is unlikely that many machines with 2G-byte drives have less than a couple of megabytes of memory, it must be free memory that is not being used by device drivers or resident applications.



Symantec's upgrade to Norton Utilities *adds useful features for users employing data compression.*

The enhanced Norton Utilities also includes a set of hardware diagnostic programs that run the gamut of memory, disk, video, CPU and other tests intended to help technicians pinpoint system problems. Symantec even provides loop-back connectors for testing serial and parallel ports. They are useful for technicians, but the brightly colored connectors will probably see more time stacked on user's desks than they will on the back of PCs.

Finally, my favorite new feature is the manual that now comes with Norton Utilities. It is a *single* volume that covers all the features — no more losing the slim multiple volumes that came with Version 6.0 (and they were so thin you could practically lose them on the shelf), and no more hunting for the proper volume. In addition, the manual has one of the more usable "lie-flat" bindings I have seen, although time will tell if it is sturdy enough for heavy use. No more forcing the books to stay open by balancing the stapler on them.

I have one small concern. The NDOS command processor documentation is now included in a rather large (1M byte) text file instead of in the printed manual. That is a plus if you like to search for things on-line but a minus if you prefer to have paper in your hands.

Other features of note include the following:

- DupDisk, a single-pass disk copier that makes an exact duplicate of one floppy to another (of the same size and capacity) without wasting time playing floppy swap.
- Disk Editor has been enhanced to allow you to attempt to rescue data from badly damaged disks by "virtualizing" the physical disk. It is another useful feature for brave technicians, but not something you will want the average user to mess with.
- File Fix now supports larger files by using extended and expanded memory.

So who needs the latest Norton Utilities? The new manual may be worth the upgrade price of $40 for registered users. Anyone who is using or planning to use data compression, but who wants to stick with the trustworthy Norton Utilities, will want to pick this up, as will anyone using large, network-size disk drives. But older versions should still be fine for average users with uncompressed or smaller drives.

Norton Utilities 7.0 has a list price of $179. Symantec also reports that many large software retailers are offering Norton Utilities 7.0 for $99 to purchasers of MS-DOS 6.0.

Center spreads data

CONTINUED FROM PAGE 39

based with a graphical user interface."

The front end will give users "an analysis system" that they have not had before, Long said. "It will allow them to generate tables and graphs from the data that's sent back to them," he said.

The software is menu-driven and guides users through a series of prompts and menu selections to narrow their requests for data. Then they "fill in the blanks" for their request and send it to the CDC network, Long said.

Some of the requests are quick hits on the database for statistical information and take no longer than a few minutes. But others are long searches and require downloads of text abstracts that can take 15 to 30 minutes, Long said. As a result, CDC included a feature in the Wonder Communications Hub to keep track of queries. The user can submit a request, log off the CDC system and then return later to retrieve the information.

In addition to ease of use, the new system will address another big issue: security. Long said the front end was designed to provide access to public information and restrict users from entering other areas of the CDC host system. "They will not have direct mainframe access," he said.

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IBM aims for Novell arena with servers

By Michele Dostert and Kim S. Nash

■ Taking advantage of its newfound independence, IBM PC Co. has targeted its recently announced midrange server squarely at users of Novell, Inc.'s NetWare local-area network operating system.

The uniprocessor versions of both the new Personal System/2 Server 195 and IBM's high-end PS/2 Server 295 are now Novell-certified for use with NetWare v3.11; NetWare support for the multiprocessor versions of the servers will be available in the third quarter.

The servers also support OS/2, IBM's LAN Server 2.0 Advanced and Microsoft Corp.'s LAN Manager.

"IBM running NetWare from the start is a first," said Brad Day, principal analyst at Dataquest, Inc.'s office in Framingham, Mass. Day added that the move signals the strong influence of IBM's recently formed Client/Server Computing unit. "They know that to be taken seriously in client/server, they have to run a lot more than OS/2."

The PS/2 195, with a base price starting at less than $20,000, is built to order for each customer by IBM. Based on a single Intel Corp. 1486/50 processor, the server can be upgraded to a multiprocessing system.

The 195 is especially designed to handle LAN I/O needs, with two 32-bit reduced instruction set computing microprocessor-controlled disk channels, Small Computer Systems Interface technology and support of up to 29G bytes of hard disk storage using Orthogonal redundant arrays of inexpensive disks level 5 (RAID-5) technology.

Corporate target

Hoping to lure corporate LAN buyers, IBM is touting the PS/2 Server 195's fault tolerance and configurability, as well as three-year, on-site, fast-response IBM service.

"Our first requirement was Novell certification, and the 195 has that," said Alex Hoffman, vice president of information systems at Millers Group, a Fort Worth, Texas, insurance company that is consolidating three servers onto a single 195. "Secondly, because we are running mission-critical applications, we needed RAID-5 support, which ensures that we can quickly rebuild our disks in case of failure."

Hoffman also said he expects IBM's fast-response support to be a vast improvement over the local-dealer support he gets with the three clone servers he has now.

Middleware question on NT

Work-flow software vendors wonder about Microsoft's ultimate plan

By Michael Vizard

As the official launch of Microsoft Corp.'s Windows NT draws near, independent software vendors that specialize in technologies such as work-flow and scheduling software are nervous.

Currently, these products are used to provide the infrastructure for building distributed groupware applications in PC environments, but questions concerning how much middleware technology Microsoft will bundle with NT is pushing software vendors to develop product lines that span multiple operating systems.

For example, Microsoft plans to bundle electronic-mail services with the Advanced Server version of Windows NT. Because many work-flow products are based on E-mail transports, industry analysts said Microsoft's need to differentiate its operating systems from rival offerings will push the company into bundling more middleware technologies, such as work flow and scheduling, into the operating system.

"Mail should be bundled in the operating system since it's really a basic transport, not an application. Once that happens, it's only a matter of time before they add procedures and rules-based tools for work flow and scheduling. It's self-evident," said Neil Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

"Any [independent software vendor] who is not worried about Microsoft is smoking dope," noted Conall Ryan, president of On Technology, Inc., a Cambridge, Mass., developer of electronic meeting software that recently deployed its software on both Windows and Apple Computer, Inc. Macintosh platforms.

Still a benefit

Even if Microsoft does not bundle work-flow and scheduling software within NT, software vendors can probably expect Microsoft to at least market these types of products as E-mail-enabled applications, noted Anand Jagannathan, president of Reach Software Corp., a provider of work-flow software in Sunnyvale, Calif.

To combat Microsoft's expected entry into these markets, vendors are highlighting the fact that products such as work-flow offerings and scheduling software packages must work across Windows, Macintosh, OS/2 and Unix environments to be truly effective.

"I wouldn't be surprised to see Microsoft put scheduling and routing into the operating system, but existing work-flow vendors will offer more in terms of functionality and support for other operating systems," said Karen Styres, director of marketing at Edify Corp., a provider of work-flow software in Santa Clara, Calif.

"If Microsoft puts these features in the operating system, it may actually serve to validate the market and kick it off," she added.

However, given the work on NT Microsoft still has to complete, software vendors expect it will be some time before Microsoft adds work-flow and scheduling features to NT.

Middleware, *page 48*

As the market for work-flow software evolves, four distinct disciplines appear to be emerging. One class of work-flow products relies on E-mail such as Reach Software's Workman. The other class relies on database technology such as Visualtec's namesake product.

Network operating systems

Sharing software ekes more life out of older Unix boxes

By Maryfran Johnson
TORONTO

Utopia seems like a mighty unlikely concept in places where hundreds of Unix workstations are tying the network into knots.

But in the case of Platform Computer Corp., Utopia is not a pipe dream but a product.

This small spin-off firm from the University of Toronto is now negotiating with several major workstation vendors for distribution rights to its sophisticated yet virtually unknown network operating system, called Utopia Load-Sharing Facility (LSF).

"Utopia is a network operating system that makes it easier to share compute resources across a heterogeneous Unix network," said Songnian Zhou, president of Platform Computing and an assistant professor at the university's Computer Systems Research Institute.

"Other vendors are providing bits and pieces of this capability," Zhou said. "But nobody has had a vision of unifying all the Unix boxes and handling large-scale, heterogeneous programs under a uniform network operating system."

Among Utopia's handful of early user sites are Pratt & Whitney Aircraft Co. in Hartford, Conn., Mitre Corp. in Bedford, Mass., Bell Northern Research in Ottawa and the Superconducting-Supercollider Center in Dallas.

"We're using it fairly extensively with about 230 workstations in eight clusters," said Dan Minior, an information systems manager of commercial engineering at Pratt & Whitney. "This is really breakthrough technology. It's a shift in the way you use equipment because you can use a lower cost mix of workstations but get more out of them.

"Utopia gives you total control of the resources, so you can optimize them for batch, parallel or interactive processing," Minior explained. "A lot of people don't believe this until they see it themselves."

That disbelief factor actually led Zhou to pick the name Utopia, he said.

The technology is based on a suite of algorithms and mechanisms — developed over several years by Zhou and his researchers — that tie together disparate Unix boxes to form a virtual supercomputer. The software resides between the Unix operating system kernel and the applications, and it is currently available on Unix variants from Sun Microsystems, Inc., IBM, Digital Equipment Corp., Hewlett-Packard Co. and Silicon Graphics, Inc.

Utopia's main function is to transparently manage the computing work load by redistributing it across the network — a concept known as load-sharing. Installation of Utopia can be

Sharing software, *page 48*

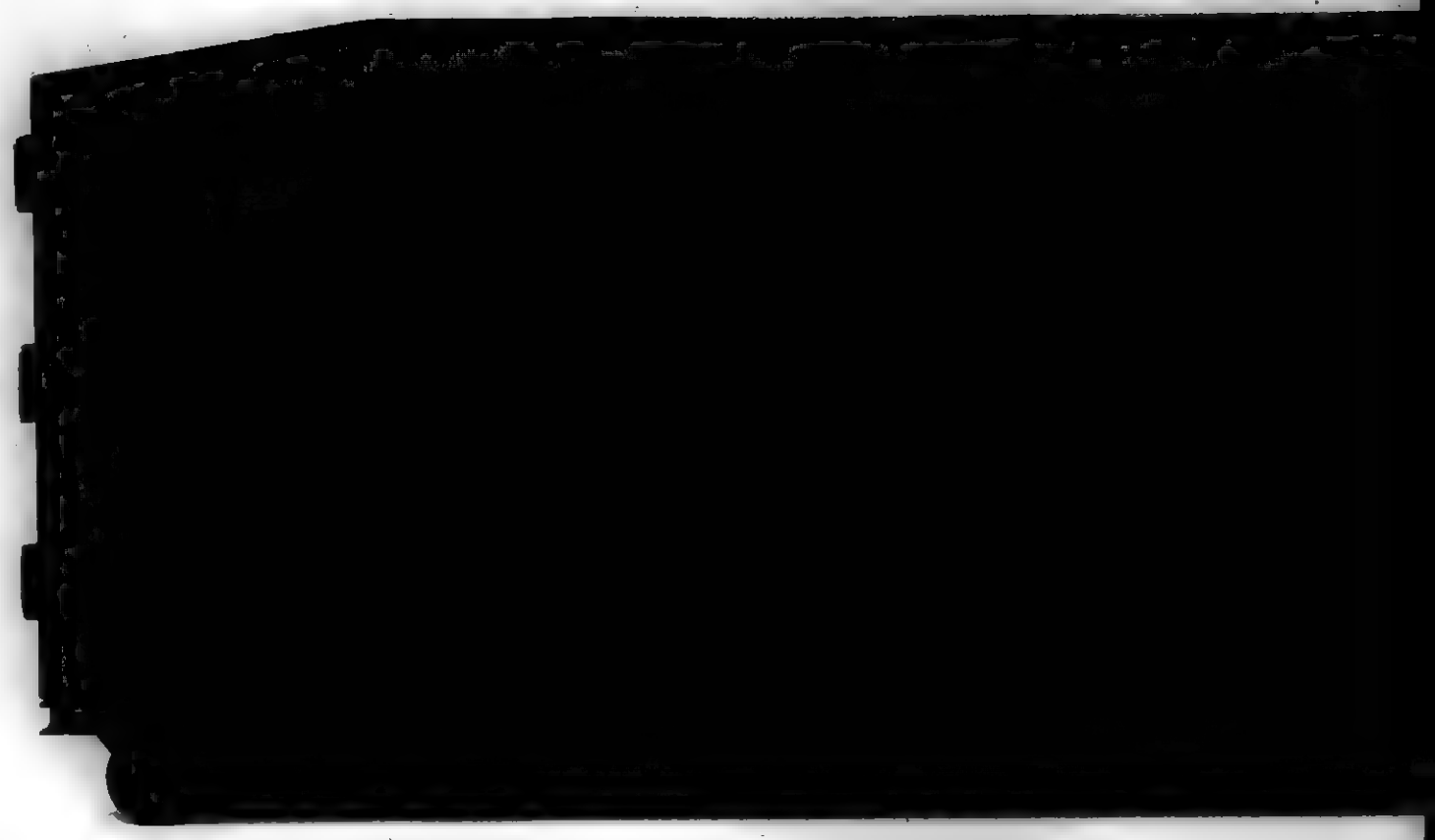
At a glance

Utopia LSF enables interactive, parallel and batch-computing jobs to be run on underused CPUs elsewhere in the network.

Available from Platform Computer on Solaris, AIX, Ultrix, SGI Irix and HP/UX.

Maintains information on host configuration and computer resources load.

Cost: $800 per workstation node, with some volume discounts available.



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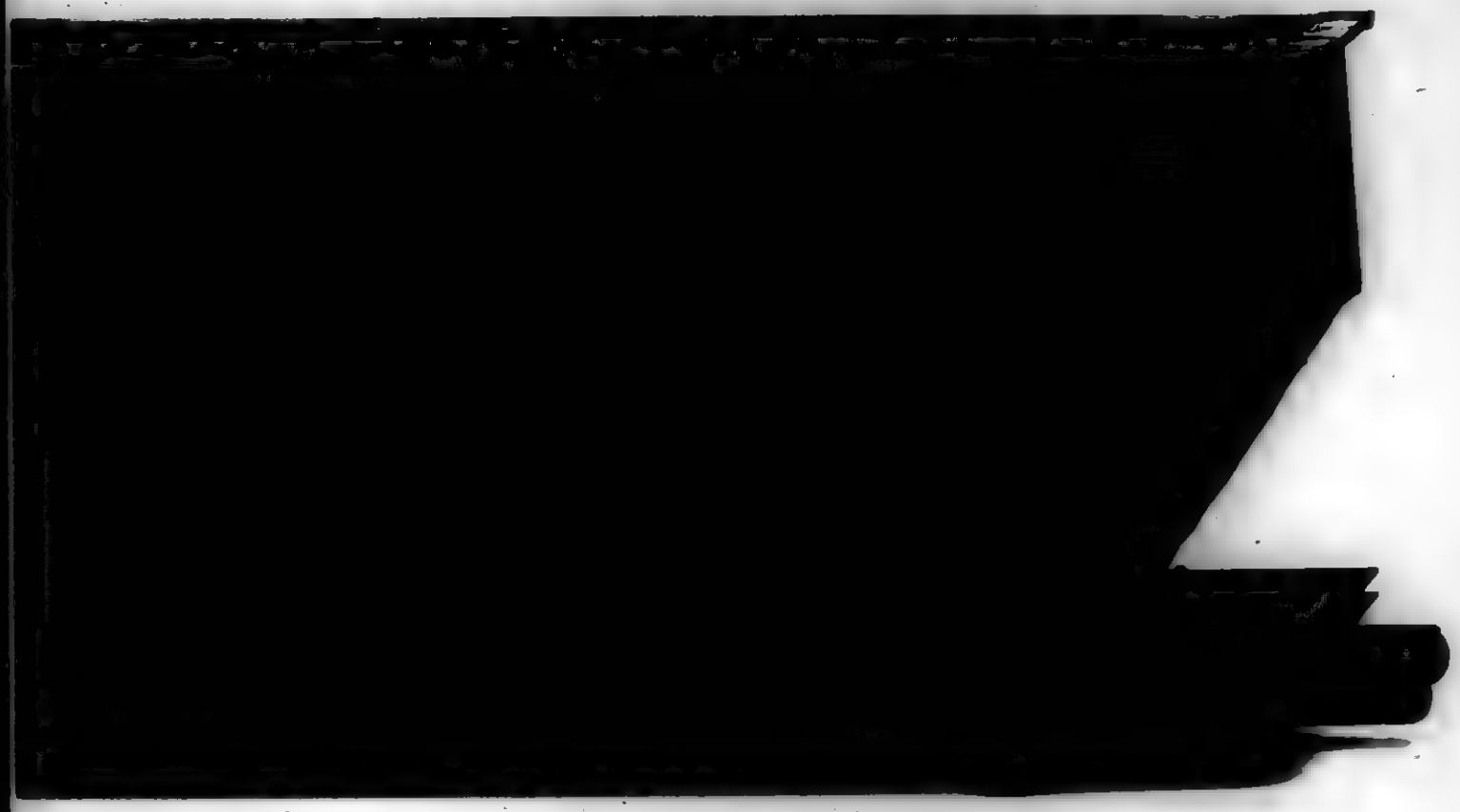

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Utility powers up text retrieval

Fulcrum engine part of Florida Power's customer service project

By Michael Vizard

As part of its plan to move to a client/server environment built on top of an IBM DB2 server and around Microsoft Corp. Windows NT clients, Florida Power Corp. has purchased a comprehensive site license for text-retrieval software from Fulcrum Technologies, Inc.

Florida Power, a subsidiary of Florida Progress Corp. in St. Petersburg, will use the Fulcrum text-retrieval engine and Search Tools as part of an effort to manage the data that the government requires nuclear energy utilities to keep on-line, said Nancy Smith, manager of system development.

According to Smith, Florida Power, which provides electricity to 1.2 million customers, evaluated Fulcrum and the Verity text-retrieval engine from Verity, Inc. Smith said the utility decided to go with Fulcrum because it was less expensive and has a more modular architecture that could be more easily linked to other applications.

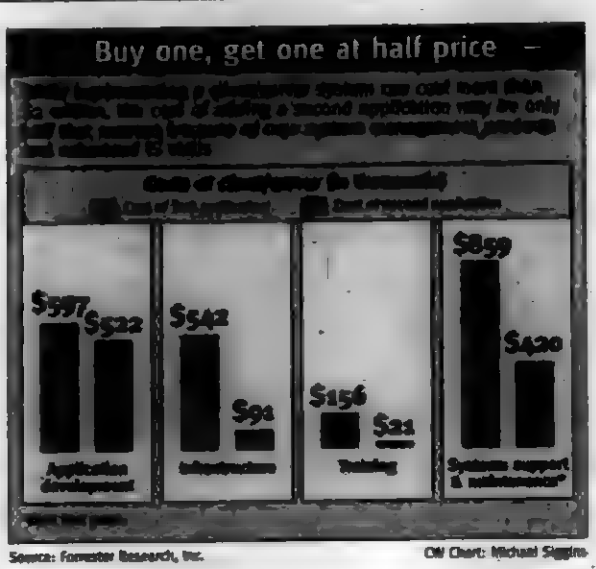
The move to Fulcrum is part of a three-year customer service project that will go on-line in the third quarter of 1994. Valued at $48 million, the project is a joint effort with Andersen Consulting, with the application being written in Andersen's Foundation suite of computer-aided software engineering tools.

After deciding to move to a client/server architecture using DB2 as a server running on an IBM mainframe, the company chose to standardize on Windows NT, which takes 100M bytes of disk space to load and as much as 32M bytes of memory to run, as its client platform for the project.

"We really need a preemptive multitasking operating system for this application," Smith said.

Currently, developers at Florida Power are using OS/2 to create the customer service application, but Smith said the application will be deployed on Windows NT desktops because the utility anticipates that Windows environments will ultimately have the most software.

The value of the Fulcrum license was undisclosed.



Source: Forrester Research, Inc. CW Chart: Michael Siggins

Middleware questions

CONTINUED FROM PAGE 45

"It will be at least two years before Microsoft gets around to bundling work flow in the operating system. They are just now getting to the mail services and have not started on the directory services for mail," Jagannathan noted.

In addition, there is a school of thought that says mail services do not make the most effective media for work-flow and scheduling software. So while Microsoft may bundle work-flow software with its operating systems or E-mail software, there will still be a market for high-end work-flow packages.

Different models

"We believe that work flow is a middleware service that will be put in the operating system, but you have to remember there are different types of work-flow models," said Dave Ruiz, director of product marketing at ViewStar Corp., a developer of work-flow software in Emeryville, Calif.

For example, ad hoc work-flow applications may require only an E-mail system, but transaction-based work-flow applications will require a database system. And Microsoft is not likely to bundle both a database and work-flow software with Windows NT.

"E-mail is a pretty miserable platform for building scheduling software. You need a database to support multiple interactions and mobile users," Ryan said.

Like most software vendors, however, the near term for work-flow and scheduling software providers will be spent closely watching Microsoft.

"It's still probably two to three years away before Microsoft bundles work-flow type capabilities in the operating system, so until then work flow and scheduling will be high-growth areas," Hill said.

"E-mail comes with Unix, but there is still quite a large E-mail and office automation market for Unix," Styres added.

Sharing software

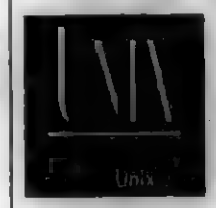
CONTINUED FROM PAGE 45

accomplished within several hours, Zhou claimed, and the manual is only "tens of pages" long instead of hundreds.

The product is also architected to play cooperatively with the Open Software Foundation's Distributed Computing Environment and Distributed Management Environment, should those "middleware" technologies become widely used.

DEC is the first vendor to offer Utopia LSF to its customers as one of the batch-queuing and load-leveling software packages on the Alpha AXP workstation "farms," or clusters. Other vendors in various stages of discussion with Zhou include HP, Convex Computer Corp., IBM, Sun and Silicon Graphics.

However, striking a deal with Platform Computer may present something of a two-edged sword to the vendors, which stand to lose some hardware sales when Utopia cranks up performance on their older boxes.



At Pratt & Whitney, for example, Utopia helped triple the performance of a Sun workstation cluster containing about 25% older, lower performance IPC workstations and 75% IPX systems, SPARCstation 2s and SPARCstation 10s.

"We're able to run these IPCs three times faster under the interactive load-sharing shell of Utopia LSF," Minior said.

In one recent example, he noted, a mathematical calculation that previously took one hour to run on a SPARCstation 2 was trimmed down to only five minutes by spreading the processing load over the cluster.

Dynamic duo

Utopia's foundation is built on two servers: the Load Information Manager and the Remote Execution Server.

The load manager collects information such as CPU memory use, I/O traffic and host status and then acts as a resource to applications by telling them where to run jobs based on their specific requirements. A sample command might read: "Find 20 non-Ultrix hosts, each with at least 32M bytes of memory and idle for 10 minutes or more."

The remote server supports transparent, low-overhead remote job execution.

Utopia is somewhat similar to Novell, Inc.'s NetWare network operating system but is aimed specifically at the technical, engineering and scientific community rather than PC users. Where NetWare provides file and data sharing for a variety of open and proprietary systems, Utopia enables sharing of compute resources under Unix only.

Utopia also cannot offer much help with commercial database processing, high-intensity interactive graphics or PC networks, Zhou said.

[redacted]

Applications

Executive Software, Inc. has introduced Version 1.0 of Diskeeper, a defragmenter designed for Digital Equipment Corp.'s AXP OpenVMS systems.

According to the company, the product is an on-line disk defragmenter that improves system speed and performance by consolidating fragmented files and free spaces on the disk.

While jobs are running, Diskeeper can be used without interfering with system activity. To prevent disks from becoming fragmented again, the optimum run frequency is automatically determined.

Diskeeper runs on both data disks and system disks, the company said.

Prices range from $2,000 to $7,105.

▶ *Executive Software*
6th Floor
701 N. Brand Blvd.
Glendale, Calif. 91203
(818) 547-2050

Xcelerated Systems, Inc. has released Liken 1.3, software that enables Unix workstation users to run off-the-shelf Apple Computer, Inc. Macintosh applications without any modification, according to the company.

Databases and files can be shared by using software residing in the Macintosh server, and Network File System-mounted storage, including tape drives, disk drives and disk arrays, can be used. Access to Meeting Maker, On Technology, Inc.'s group scheduling package for the Macintosh, is also provided.

A single-user license is priced at $695.

▶ *Xcelerated Systems*
Suite 130
9245 Sky Park Court
San Diego, Calif. 92123
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Unix

Data General Corp.'s Clarion Business Unit has announced the Series 4000 Tape Array, a high-performance, fail-safe tape array for Unix.

According to the company, up to seven 4mm digital audio tape cartridges can be supported that offer as much as 30G bytes of compressed storage. Data is backed up at a sustained rate of 3.5G bytes per hour.

To enhance performance the product has a 20M byte/sec. Small Computer Systems Interface-2 interface between the array and the host system.

Prices start at $19,500 for a five-drive system.

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Bank rich in APPN experience

Uses protocol to link AS/400, PS/2s, mainframes

By Elisabeth Horwitt
OTTAWA

An eye-opening presentation at IBM's recent Advanced Peer-to-Peer Networking (APPN) Implementors Workshop was given by Ken Smith, systems software manager at Canada Mortgage and Housing Corp., who related his three years of experiences with IBM's strategic internetworking protocol.

Canada Mortgage began using APPN to interconnect its IBM Application System/400s when they were first installed three years ago, Smith said. More recently, it implemented IBM's OS/2 Extended Edition Communications Manager to bring IBM Personal System/2s into the network.

PS/2s and AS/400s can act as APPN network nodes, which coordinate addressing and routing across the network, and as APPN end nodes, which can automatically register their own resources on a network node.

More recently, the Ottawa mortgage company became a beta-test site for the yet-to-be-shipped IBM VTAM Version 4.1, which enables an IBM mainframe to act as an APPN network node.

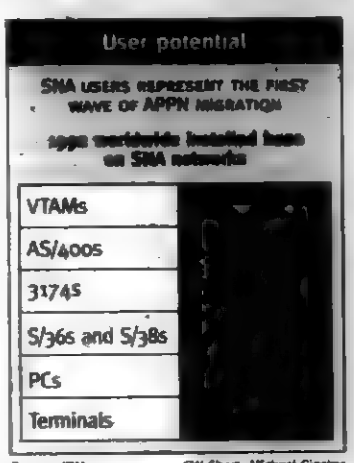
Canada Mortgage used the product to configure its IBM mainframe as a central APPN router that interconnects any two AS/400s in the company, Smith said.

The firm continues to connect its AS/400s through a mesh APPN network; however, a transmission might have to take two or three hops across intervening AS/400 nodes before it finally reaches its destination, Smith said. The new host-based connections are speedier because they make use of existing high-speed lines between each AS/400 and the host and because transmissions never have to go more than two hops, he added.

Compared with traditional IBM Systems Network Architecture (SNA), APPN is far more flexible and easy to define, Smith said. For example, "If I visit Vancouver, I can log onto a terminal there and ask [the local APPN network node] 'pass me through to my office AS/400,' and it finds the best route."

Smith reported one minor drawback in the earlier APPN installation. When the network reroutes transmissions around a network failure, it does not know that it should restore the original route when the failure is over.

When this happens, network administrators may not know that a particular AS/400 is now actively routing APPN traffic. They might take it down for maintenance, cutting the connection. The new VTAM 4.1 APPN software fixes this problem, but it still afflicts the AS/400 version, according to Smith.



Help on the way

IBM is working on several APPN enhancements and features that would be of use to the Canadian company [CW, April 19].

One is the dependent LU requestor feature that enables traditional 3270 terminals and printers to communicate over a multihop APPN network. Canada Mortgage's AS/400s currently access the IBM host as 3270 terminals over direct connections. However, without dependent LU requestor support, they cannot take an APPN path through another AS/400 as an alternate route when the direct connection breaks down.

Smith said he would also like to see IBM improve APPN network management functionality in areas such as problem identification and correction, performance monitoring, network cost allocation and design.

"APPN has less network management than traditional SNA right now," Smith said.

Use outpacing addresses on the Internet

By Gary H. Anthes

■ At the present rate of growth, the number of computers attached to the Internet will exceed the world's human population in 10 years.

"That is a worst-case scenario used for Internet planning," said Tony Rutkowski, director of technology assessment at Sprint Corp. and a vice president of the Internet Society. "But in fact it could be worse, with more addressable objects with [Internet Protocol] addresses than people."

Commercial use of the Internet — the loosely connected and informally managed agglomeration of networks running mostly Transmission Control Protocol/Internet Protocol (TCP/IP) — is growing especially rapidly.

"It's become mainstream," said Lawrence Landweber, professor at the University of Wisconsin at Madison and an Internet Society vice president. "Just a few years ago, it was this plaything of the academics. Most [users] were in the U.S., most were at universities, and you couldn't tap into all the databases that are available now. We've now reached a critical mass of services and people."

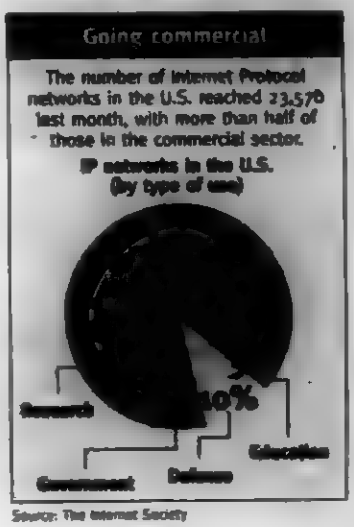
Growing at 20% per month

There are now more than 10,000 IP networks connected to the Internet. In February alone, 1,000 networks hooked up, more than the total population just three years ago. Some 5 million people are believed to use the Internet, and total use is growing at a phenomenal 20% per month. "There is nothing like this in human or telecommunications or electronics history," Rutkowski said.

But, he said, the growth curve may just get steeper. Rutkowski pointed out that the new Microsoft Corp. Windows NT was written with TCP/IP networking in mind; it will even prompt users for an IP address when it boots up. "What Windows NT is doing is using TCP/IP to enable all kinds of seamless networking applications, just as Unix did for workstations," he said.

The number of hosts is a crucial issue because IP is now limited to the number of Internet addresses enabled by a 32-bit addressing scheme, a limit likely to be hit within two years or so. Several ideas have been proposed — and are in trial use today — to head off the exhaustion of network addresses.

For example, the Simple Internet Protocol scheme on the table could simply extend the IP address to 64 bits by deleting nonessential fields from the IP header. Another idea is to move part way to Open Systems Interconnect (OSI) by replacing IP with OSI's Connectionless Network Protocol, which is similar to IP. A third option uses a smart new IP header format and routing scheme.



Some of the alternatives being tested exact a stiff penalty. As they increase the number of addresses, the number of possible routes that must be maintained in routing tables quickly fills the available memory of today's Internet routers.

The options are being field-tested by the Internet Engineering Task Force. "The winner will be the proposal that proves out in practice, gathering support by an increasingly convincing demonstration that it can solve the problems," said Lyman Chapin, chief network architect at BBN Communications and chairman of the In-

Internet, *page 52*

Fiber bandwidth

Cable TV operator to extend fiber miles

By Joanie M. Wexler

America's fledgling information "superhighway" sprouted significant bandwidth-widening potential recently when cable television operator Tele-Communications, Inc. said it is accelerating its fiber backbone deployment to accommodate emerging interactive, large-bandwidth applications.

Tele-Communications in Englewood, Colo., said it plans to invest nearly $2 billion on the project during the next four years, which will include a total of 168,000 fiber miles to be installed this year alone. The fiber backbone will work in tandem with digital compression techniques applied to the "last mile" of coaxial cable running to most homes, in order to pave the way for applications such as telecommuting and educational, information and entertainment services.

The firm's fiber installation will affect 100 cities this year.

It is unclear yet whether the effort will spur fiercer competition or added cooperation from local telephone companies, which currently run lower capacity twisted-pair wiring to homes and are prohibited by antitrust legislation from offering phone and cable TV services

Cable TV, *page 52*

E-mail standards

Shell goes own way with directory database

By Elizabeth Heichler
LONDON

The Shell Group of companies has built its own electronic-mail directory database as a stopgap measure until international standards and products mature.

Electronic messaging is a critical application for the Dutch energy company, which is looking toward the international X.400 and X.500 standards to untangle the complexity of interconnecting its myriad electronic mail, fax and telex messaging systems. Shell manages some 30,000 E-mail addresses worldwide.

Built on top of its X.400-based Shell International Message Interchange Service (SIMIS) backbone, the company's homegrown directory database is only an interim solution because of the stress that increased local-area network-based E-mail traffic will put on the centralized system, explained Henk Reimers, consultant in message handling at Shell Internationale Petroleum Maatschappij B.V. in The Hague, Netherlands.

"Maintaining a central directory with the hundreds of LAN servers in a LAN-based E-mail system would be impossible," Reimers said. "We want directory management to be distributed rather than centralized."

Shell's commitment to international standards — it began work on its X.400 backbone in 1987 — combined with the demands on its worldwide messaging systems clearly dictate its planned migration to X.500 directory services, Reimers said.

Yet many products based on the 1992 X.500 specification are not available or are unproven, and time-tested products based on earlier versions of the X.500 standard lack key capabilities, such as access-management functions, he noted.

"Why are we not already doing X.500?" Reimers asked a recent gathering of the European Electronic Messaging Association in London. "When X.400 came along, Shell was among the first to jump in." With X.500, Shell does not want to repeat the experience of being on the "bleeding edge," working with products based on an immature standard.

Until Shell is ready to take the plunge, it will rely on its newly deployed central directory, called SIMIS Directory Information System (SIDIS), built on top of a relational database. SIDIS collects, distributes and processes E-mail addresses, acting as a central repository of directory information. It does not function as an active gateway, however, and thus cannot be directly interrogated by Shell's SIMIS software.

Local maintenance

The information contained in SIDIS is maintained by local supervisors, who on a daily basis update their E-mail gateways (for local systems such as IBM's Profs, Digital Equipment Corp.'s All-In-1, HP Desk and others) with changes to local user information. Once a week, the local E-mail gateways are updated with directory information from the SIDIS database. Built-in filtering mechanisms help ensure that each site gets only the addresses it needs.

While SIDIS does a good job of managing directory information from host-based messaging systems, it will not suffice as Shell's E-mail traffic becomes increasingly distributed across LANs, Reimers said. "Our biggest growth is LAN-based E-mail, such as Microsoft Mail and CC:Mail."

At Shell's Netherlands site, for example, there are 6,000 to 7,000 E-mail users on a host-based system, with addresses maintained in a single directory. Once the company moves to LAN-based E-mail, the system will be broken up into a collection of 20 or so "post offices," each maintaining approximately 250 to 300 users, Reimers explained.

The Shell Group's operating companies extend around the world, and the standard messaging system remains Shell Telex because telex remains the only reliable messaging system in some developing countries. Shell has implemented public telex gateways on SIMIS to transfer telex messages to X.400.

Heichler is an IDG News Europe correspondent.

Cable TV

CONTINUED FROM PAGE 51

over the same system. Similarly, cable TV companies are prohibited from offering telephony services via their networks.

"There are currently competing public policy issues," explained John Mansell, senior analyst at Paul Kagan Associates, Inc., a media analysis firm in Fairfax, Va. For example, legislators have not yet arrived at policies that can both dispel the threat of monopolies and reap the cost-saving benefits of consolidating cable TV and regional Bell operating companies' (RBOC) network infrastructures, he said.

The situation is analogous to the efforts of alternative local access carriers such as Metropolitan Fiber Systems and Teleport Communications Group, which have gradually won interconnection rights with the regional telephone companies — their competitors.

"Arguably, it is more efficient to have just one wire to everyone's door," Mansell said.

However, Bruce Ravenel, Tele-Communications' vice president of technology, noted, "There is no clarity today in this political debate. And there are huge regulatory problems for cooperation to actually work, such as how to administer cross-ownership rules with the RBOCs operating under rate-of-return regulation and the [cable TV] companies not being regulated at all."

Tele-Communications has several joint trials with carriers in progress in the hopes that federal regulations will soon change. These include a $1 million joint trial with wireless giant McCaw Cellular Communications, Inc. for delivering cable TV and cellular telephony through a single box at a customer's site. In the Denver area, US West, a regulated RBOC, and Tele-Communications are immersed in a two-way pilot allowing users control with their TVs.

However, "these trials will require changes in FCC law" to be offered commercially, a company spokesman said.

Meanwhile, "gray telephony-based service areas," such as home shopping, banking and videophone service, exist where cable TV and phone companies might team up in the future, Mansell said. However, "it will be two to three years" before the phone companies will be providing cable TV and vice versa because of the regulatory brouhaha, he predicted.

HP, Microsoft announce E-mail link

By Lynda Radosevich

In the first of what are expected to be several such partnerships, Hewlett-Packard Co. last week announced that client software from Microsoft Corp. will run on HP's X.400-based electronic messaging server software.

HP said it will ship drivers that let Microsoft Mail Version 3.2 users retain that product's graphical interface and features while using HP's OpenMail, an X.400 standard messaging backbone. An HP official also said a similar agreement with Lotus Development Corp. should be completed soon.

"HP is not known as excellent for promoting its products, but the company is committed to openness and connectibility," said Walter Ulrich, Pacific Southwest director at Arthur D. Little, Inc. in Los Angeles. "This is a pretty prominent example of HP selling infrastructure products that allow companies to support the products of their choice."

Now, Microsoft Mail users can connect to an X.400 backbone using translation software or "gateways." However, that method traditionally has troublesome directory access and lacks features such as return receipts. Running mail as a native X.400 client on OpenMail will alleviate these problems, HP said.

"It sounds as if it would be easier to use an X.400 backbone without having to teach users a new interface," said James Song, a computer scientist at Computer Sciences Corp., a Microsoft Mail shop in El Segundo, Calif.

OpenMail runs on the HP 9000 series of Unix workstation and has recently been ported to IBM's RISC System/6000, Digital Equipment Corp. Ultrix and several other Unix platforms.

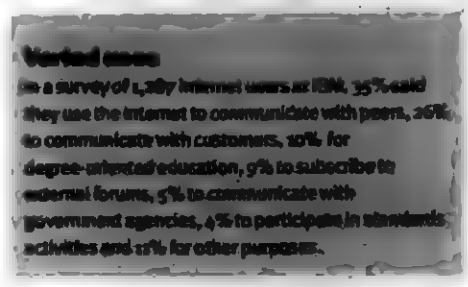
Internet

CONTINUED FROM PAGE 51

ternet Architecture Board.

Whatever the solution that is decided on, Chapin said, it must be backward-compatible to protect the investments of millions of users.

As the field tests unfold and as router vendors continue to increase the capacity of their machines to handle ever-larger routing tables, network administrators are being urged to employ CIDR, or Classless Inter-Domain Routing. CIDR proposes the use of new interdomain routing protocols that support the use of variable-length masks to identify the network number part of an Internet address.



"The best expert opinion tells us that with cooperation from network administrators, CIDR can hold off network-number exhaustion for at least two years [and possibly] until the end of the decade, assuming that the capacity of Internet routers ... continues to grow as it has in the recent past," Chapin said.

LOTUS cc:MAIL

Awards (1992-1993)

ComputerWorld I/S Brand Preference
Winner, February 1992

•

Windows Magazine WinAward, February 1992

•

LAN Times Reader's Choice, March 1992,
January 1993

•

InfoWorld Product of the Year, March 1992

•

BYTE Magazine Reader's Choice, June 1992

•

BYTE Magazine Award for
Cross-platform E-Mail, March 1993

•

Network Computing's Certified Interoperable
Application Award, December 1992

•

Network World's Enterprise
Technology Award, December 1992

•

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

•

MacUser Editors' Choice Award, 1992

•

MacWEEK 1992 Editors' Choice
Diamond Award, December 1992

•

UNIX World's Best Product of the Year for
1992, January 1993

MICROSOFT MAIL

Awards (1992-1993)

PC Magazine Editor's Choice Award
October 27, 1992

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Lotus cc:Mail

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IBM Business Partner

Tales from the warehouse

Data warehouse is a central storehouse of data that is easily accessed and manipulated by end users from their PCs. It can take many forms, from enterprisewide data on a host computer to a departmental database on a small server that is used by a few people. In almost all cases, however, the data in the warehouse is separate from the production applications used to run the business.

By Johanna Ambrosio
WASHINGTON, D.C.

THERE IS NO ONE RIGHT WAY to implement a data warehouse, but there are plenty of mistakes that can be made along the way. Users recently gathered here to swap war stories and learn from one another about the myriad things that can and do go wrong.

The issues surrounding warehouses range from the technical to the managerial to the political. These challenges span all aspects of warehouse-building, from the design to the implementation and administration phase.

Among the challenges raised at the meeting were the following:

▶ How much, if at all, should the production applications that feed the warehouse be re-engineered?

This is a widespread debate, and, in many shops, it touches on political, cultural and technical issues all at once. The issue rears its head when it becomes obvious — usually fairly early in the design stage — that the data formats and names in the production applications generally do not match those required for the warehouse. Often this means the data in the warehouse environment is different from that in the production environment, which results in end users having to face two different sets of numbers for monthly sales, for example.

Users have adopted various solutions to this dilemma, ranging from not doing anything to change the production systems to re-engineering them completely.

US West Communications, Inc. in Boulder, Colo., was "not successful in re-engineering the operating environment," said Mark Johnson, a data warehouse planner. "We've gotten blown off the hillside a few times when we tried."

> "Clean at the source" is the motto at the Salt River Project in Phoenix. "You have to identify and fix 'existing problems' and create programs to stop the introduction of new problems," said John Chatfield, information warehouse architect.

In time, Johnson said, the success of the warehouse should cause end users to insist the production, or feeder, systems be re-engineered so the information matches on both sides.

A middle ground was taken at The Pillsbury Co. in Minneapolis. Ron Eldred, systems planning manager, said his firm was successfully able to re-engineer the consumer relations production application for the warehouse project servicing that group, but the other feeder production systems were basically off-limits.

"We took the position that the operational consumer relations system could and should be modified to capture cleaner data," he said. "But other systems were not in our control, and we had to accept any limitations as a practical matter."

Yet another tack is being taken at the Salt River Project in Phoenix, which essentially modifies all operational systems that require it. "Clean at the source" is the motto there, according to John Chatfield, information warehouse architect. "You have to identify and fix existing problems and create programs to stop the introduction of new problems."

> "There is a learning curve for everyone, and . . . all that time, end users are breathing down your neck and wanting to see all this wonderful information you've promised them," said a warehouse planner at an insurance company.

▶ How do you avoid political imbroglios with the end-user community and the information systems staff?

In many user organizations, the people closest to the warehouse project are data analysts who design the warehouse and database administrators who help implement it.

Traditionally, these groups have been an offshoot of the IS staff. But warehouses require all factions to work together to interface the new applications to the production systems, and this does not always go easily.

"Real men do transaction processing, not decision support," is how Denver-based consultant Bill Inmon describes the tension. Warehouse is more a decision-support kind of environment and is not a transaction processing system to which IS can easily relate, he said.

But even more problematic than turf battles with the IS staff — and far more damaging — are political problems with the end-user community. Like most other technology projects, the ticket to warehouses is to get buy-in from the key executive in the area that will pilot the first warehouse application. But be careful of promising too much too soon, which is what happened at a Midwest insurance company whose warehouse planner requested anonymity.

"Data warehouses can yield real benefits in bringing information to end users in a way that they can use," the planner said. "But there is a learning curve for everyone, and it takes time to build the warehouse using structured techniques and to populate it with data from production systems. All that time, end users are breathing down your neck and wanting to see all this wonderful information you've promised them."

In his case, the political problems were even more severe than in other shops. "To get buy-in, our IS vice president ran through all the benefits and got commitments from all the line executives. Now they all want to be first. We have a new IS vice president, and everything is up in the air."

The message, the planner said, is this: "Be realistic in what you can do when and narrow the first application's focus down to something that will succeed. Then market the hell out of that success."

Many users agreed that the first warehouse application can take 12 to 18 months to build, with the pilot stage lasting three to six months after that.

▶ Management challenges: Once there are a couple of warehouse projects under way, how do you manage them and successfully seed them throughout the organization?

Whirlpool Corp. in Benton Harbor, Mich., started implementing a data warehouse in the third quarter of 1991. Two "major projects" later, it introduced a formal support organization to help manage what has now grown to some half-dozen initiatives. Laura Sager, data warehouse project leader, said the organization was announced last month.

At the top of the warehouse support structure is Whirlpool's corporate information technology group, for which Sager works. This central oversight group takes care of implementing new information types, looks into warehouse tools and platforms and rolls out warehouse initiatives globally.

At the second tier is the regional development centers — approximately five of them — which actually implement the projects and to which the individual project teams report.

Stumbling blocks

Issues commonly faced by users building data warehouses include the following:

- **Balancing the business need for timely, complete information with the cost of providing that information. It is very expensive to build warehouses that are complete and totally accurate. For this reason, most users start small, typically with a marketing application that is well-defined.**
- **Dealing with political issues, such as trying to provide end-user access quickly even as the warehouse is being built.**
- **Deciding who owns the data — who defines it; who updates it.**
- **Figuring out what kind of data is needed and which operational systems it should come from, and then reconciling data names and other elements that are different from one production application to the next.**
- **Once the source of the warehouse data has been figured out, how do you get the data from production systems to the warehouse? Some automated tools are coming out to help populate the warehouse, but many users have had to write code themselves for this task.**
- **Security: Is the data provided to virtually any legitimate user who asks for it, or are there roadblocks built in?**
- **Who pays for the warehouse, and how (chargeback vs. up-front fee)?**
- **What kinds of end-user access tools should there be?**
- **What should you do about a catalog that shows end users the kind of information that is in the warehouse? Choices include building one in-house, buying one or adapting an existing data dictionary to the task.**
- **Separating the various elements of the warehouse architecturally, so one component — an end-user tool, for example — can be changed without having to rewrite everything.**
- **How much or how little should you rewrite the operation systems that are feeding the data warehouse?**

— Johanna Ambrosio

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James M. Connolly

Impressive imaging

Sometimes technology's progress has to hit you in the face before you realize, "Hey, this thing is going places." That seems to be what's happened with imaging.

Imaging is the nephew who lives out of state, the one you haven't seen in five years. He was a scrawny, bratty 12-year-old when he moved away. Sure, you've talked to him on the phone, acknowledged his birthdays, followed his progress through high school and even seen pictures of him.

But suddenly one day, he parks his car in your driveway and walks into your house, and with the boom of his baritone "Hello, Uncle," you discover that you stand only chest-high to this onetime runt.

I hadn't been to the AIIM show in about five years. The major showcase for imaging is sponsored by the Association for Information and Imaging Management.

During those years, I'd seen plenty of imaging systems in product demos, on other show floors and at user sites, and I'd edited a million imaging-related product stories and user case studies. I knew the benefits users were getting from the technology, and I knew some of the neat new things that were coming down the road.

But none of that prepared me for a walk around the show floor in Chicago. Indeed, imaging is that 17-year-old nephew who may still be rough around the edges and not totally sure of his place in life but who is definitely growing up.

Imaging as strategy

Imaging is no longer a pilot project built around a proprietary software package that transfers images of contracts and checks from clunky optical jukeboxes to dedicated monochrome screens attended by people who could do little more than just look at them.

I remember talking with a guy from a federal agency a few years back. As he shook his head, he observed that those machines looked neat — but he couldn't justify spending that much money on something that really only allowed him to look at paper in a new way.

Imaging is more than that today. First, rather than being a technology or an industry, imaging is an element of the IS manager's strategy. It is the process of managing and presenting paper or film-based images as part of a broader application. Even if you don't accept the view of some vendors that an image is really just another data type, you do have to recognize that very few people are now building imaging systems the way insurance companies, banks and other paper handlers had to.

What is more likely to be built today is a system that allows a user to click on icons to read or send mail, to append notes to a document or to suggest changes in a design. Hidden under those icons may be "images" of documents that were scanned into the system.

The end users don't care that they are looking at an image. They care only that they can call up, read, deal with and forward a piece of their work. That means IS and the vendors have to provide systems that have images in them rather than imaging systems.

New standards

What was most amazing about the products at the AIIM show was that user-mandated technologies such as Microsoft's Windows, LANs, object-oriented development and links to existing applications were not features; they were givens. Even the makers of the most expensive enterprise-oriented products seemed to acknowledge that the products will go nowhere without these technologies.

I saw proof of how far imaging has come: Almost no IS folks were looking at optical drives. Instead, they were crowding in for a closer look at the software demos.

Where does imaging go from here? Watch for stratification in the next year or so. The folks with the high-end products, such as IBM and FileNet, should still do fine with their half-million-dollar systems. But some start-ups — including PaperClip Imaging Software, Watermark Software and Westbrook Technologies — are pushing products that allow workers with infrequent imaging needs to scan and handle documents such as contracts, memos and invoices for as little as $150 per user.

It remains to be seen whether the low-end products pack the horsepower that departmentwide work-flow demands. But one thing they should accomplish is to give more people a taste of what can be done with images, and that may bring yet another wave of users who want to make imaging a key part of their day-to-day job.

Connolly is *Computerworld*'s technical sections editor. His MCI Mail address is 507-1804.

Armco outsources to Genix

Flexibility, proximity cited as reasons for partnership

By Mark Halper
BUTLER, PA

What is good for your affiliate is not always good for you.

That was the decision Armco Advanced Materials Co. reached earlier this year when it decided to outsource a portion of its processing to The Genix Group, even though affiliate Armco Steel Co. was tapping IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary [CW, March 1].

Although ISSC offered a price competitive with the Genix offering, other factors weighed predominantly in Genix's favor, according to Ted Benham, general manager of information and automation at Armco Materials in Butler, Pa.

Armco's Ted Benham: *IBM would not deviate from its standard contract*

"With ISSC, we would be a very small customer, and our chance of getting special dispensation would be small," Benham said.

What sold Armco Materials on Genix was a greater sense of business partnership that the Dearborn, Mich., outsourcer provided. Genix's local presence (it anchors a strong regional operation with a data center down the road from Butler in Pittsburgh) helped boost the good partner vibrations, Benham said.

Furthermore, Genix was more flexible in contract terms and conditions, Benham said. He declined to reveal the value of the accord.

"We asked for several things, and IBM was reluctant to deviate from their standard contract," Benham noted.

For instance, Armco wanted a five-year deal, a duration to which Genix was amenable. IBM, on the other hand, offered a 10-year contract with a fifth-year withdrawal option, he said.

If that were not enough, Benham said ISSC seemed unwilling to run Armco's Digital Equipment Corp. systems.

"They indicated they would probably farm that part out to another company," he said.

So Armco Materials handed the job to Genix, which now processes the company's DEC VAX-based financial, payroll and trend analysis operations.

Armco Materials made its decision for good around the beginning of the year — after putting a scare in Genix last October by reconsidering a decision it had made earlier to go with Genix. That near change in course came when Armco Steel asked Materials if it would be interested in joining an outsourcing evaluation.

Armco Steel had declined to go outsourcer shopping with Armco Materials earlier in 1992 when Materials was beginning its considerations because back then Steel was not interested in outsourcing. But in October, Steel changed its mind.

Even though Benham's crew at Armco Materials already had begun to lay groundwork with Genix, it could not dismiss the new option presented by Armco Steel. "It possibly meant better pricing," Benham recalled, noting that by going in together, the two Armco operations might be able to leverage a contract with a more attractive price tag than the one Genix provided.

But it did not work out that way.

For one thing, Armco Steel wanted to negotiate an all-inclusive outsourcing deal covering multiple information systems facets including processing as well as application development. Armco Materials, on the other hand, was interested in selective outsourcing. Furthermore, the price break with ISSC did not materialize, Benham said.

So for the same reasons Armco Materials had earlier selected Genix, it decided to stick with it.

The new outsourcing deal is not Armco Materials' first with Genix. Armco tapped Genix in early 1992 to handle DEC VAX-based financial processing that Armco Materials was providing for its parent company.

The parent had asked the subsidiary to take over financial processing operations after a consolidation eliminated those operations in Middletown, Ohio.

In Brief

Data center consolidation

The U.S. Air Force Materiel Command awarded a five-year, $362-million contract to **BDM International, Inc.** to help consolidate 26 data centers into six centers in Dayton, Ohio; Sacramento, Calif.; San Antonio; Oklahoma City; Ogden, Utah; and Warner Robins, Ga. IBM mainframes will be replaced by Amdahl Corp. computers running Unix.

Unisys lands tax services contract

The Swedish National Tax Board has granted **Unisys Corp.** a $5 million contract to extend its tax collection and management services with a Unisys 2200/900 mainframe and an electronic-mail network based on Unisys' Mapper fourth-generation application development system.

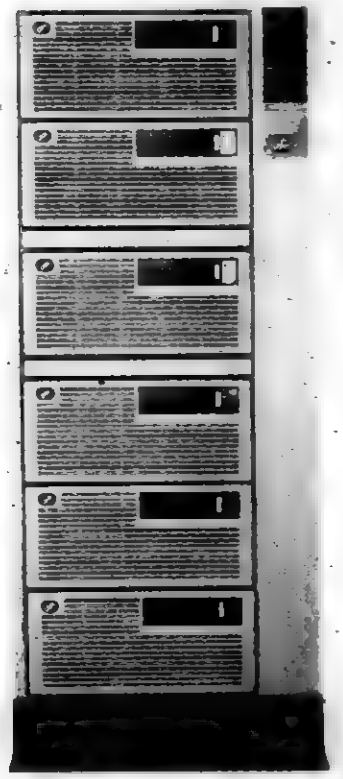
Firms unite on weather product

Concurrent Computer Corp. and **Lockheed Missiles and Space Co.** announced an international agreement to jointly market and sell Lockheed meteorological products to weather system users. The turnkey meteorological software, called Lockheed MeteoStar, will run on real-time computer systems from Concurrent.

Sterling, Zebra make moves

In other product news, **Sterling Software, Inc.** in Dublin, Ohio, said it has ported its Gentran Unix EDI management and translation software to Hewlett-Packard Co.'s HP 9000. **Zebra Software** in Austin, Texas, released a development tool for connecting front-end Microsoft Corp. Windows 2.1 programs to HP and Digital Equipment Corp. multiuser systems.

Look out!



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IBM

Pyramid, Oracle work together on cluster

By Mark Halper
SAN JOSE, CALIF.

Pyramid Technology Corp. said last week that it has teamed with Oracle Corp. to develop a port of the Oracle 7 Parallel Server database that supports clusters of Pyramid boxes sharing the same database.

The multiuser Unix computer vendor also said it has created a support alliance program with database vendors and introduced a new "early warning" system management tool.

Through a combination of Oracle software and Pyramid software and hardware, Pyramid users can continuously access data in the event of a single processor crash within a cluster of Pyramid machines, said Alan Shoap, Pyramid's manager of distributed computing platform marketing.

Pyramid is now shipping the cluster, called Valence, and has been beta-testing it since last fall [CW, Sept. 28, 1992].

Pyramid's earlier cluster scheme, called Reliant, requires downtime when a processor fails. But unlike the Valence cluster, Reliant works with other databases, such as earlier Oracle versions, and programs from other database vendors.

Features added

Pyramid said the technology it added to enhance Oracle 7 Parallel Server's clustering capability included fault-tolerant distributed lock management, node interconnection, a high-availability array system and distributed disk mirroring.

It also developed what it called virtual Ethernet, which Shoap said is a layer of software that manages multiple Ethernet connections as a single logical connection. The Valence cluster runs on DC/OSX, a Pyramid version of Unix System Laboratories, Inc.'s System V.Release 4 that is more standard than earlier Pyramid Unix flavors.

Pyramid set pricing at $200 per named user and $300 per concurrent user, following the same pricing model as Oracle's to avoid pricing confusion, Shoap said.

Meanwhile, the "affiliate support" program that Pyramid announced last week is intended to prevent users from getting batted back and forth as hardware and software vendors argue over responsibility for problems, said Lauren Ventura, Pyramid customer services marketing director.

Worth considering

Paul Ricker, vice president of IS at Pyramid shop G. Heileman Brewing Co., said Valence "is something we'll be looking at. [The enhanced clustering] would be a big advantage because today, if we have a problem with just one processor on a multiprocessor machine in a cluster, that machine is down."

The program is intended to better coordinate service to end users from Pyramid and its partners — Oracle, Ingres Corp., Informix Corp. and Sybase, Inc.

Paul Ricker, vice president of information systems at Pyramid shop G. Heileman Brewing Co., was receptive to the program. Support can involve "a lot of finger pointing" among vendors, he said.

"In the past, when there's been a problem, you could get Oracle saying it's Pyramid's problem and Pyramid saying it's Oracle's, and you end up in that eternal loop," Ricker said.

Separately, the new system management software, called ServiceExpert, was designed to provide early warnings of hardware and software errors. Pricing starts at $750 per month, depending on system configuration.

Bosch ships tape library

By Jean S. Bozman
BRIDGMAN, MICH.

Two German manufacturers are collaborating on a late entry into the American automated tape library market. Robert Bosch GmbH and Grau Automation GmbH are contributing the hardware and software to make a compact, high-capacity tape library that is being manufactured by Bosch Storage Systems, a Bosch division that makes robotics equipment.

The Bosch 8900 Automated Tape Library, announced last month, carries list prices from $250,000 to $1.5 million. The base unit holds 5,780 cartridges, slightly fewer than Storage Technology Corp.'s 4400 Automated Cartridge System (ACS), which established the market for IBM-compatible automated tape libraries in the late 1980s.

The Bosch unit is based on Bosch robotics and software from Grau, said Robert Farkaly, marketing director of Bosch Storage Systems, which has about 30 employees. Farkaly said the Bosch 8900 unit is two-thirds the size of a comparable Storage Tek tape-library silo.

The Bosch system can use tape drives from several vendors, Farkaly said. It is based on the stacking of ½-in. tape cartridges in several tiers; up to four robots can "pick" the tapes, he noted.

Investment protection

Bosch's main selling point is that it protects user investments in two generations of tape-drive technology, said Paul Wolfstaetter, a storage analyst at Gartner Group, Inc. in Stamford, Conn. He said Bosch's library accepts IBM's 3480 and 3490 drives, as well as those made by Storage Tek, Memorex Telex Corp. and Hitachi Data Systems Corp. Storage Tek and IBM libraries accept only one kind of tape drive, he said.

Bosch's late start means it will fight an uphill marketing battle against hardware giants IBM, Storage Tek and Memorex Telex. However, Wolfstaetter noted that Grau has installed 125 libraries in Europe and the Mideast. "Bosch will probably not become one of the predominant players," he said, "but they are answering a niche requirement."

Medical reform could spur IS spending

By Ellis Booker

How will the Clinton administration's proposed reforms to the health care industry affect hospital information systems departments? According to a recent survey, hospital IS executives suspect the changes will accelerate the advancement of information technology in health care.

This was one of the key findings of the fourth annual survey sponsored by Hewlett-Packard Co. and the Healthcare Information and Management Systems Society (HIMSS) of the American Hospital Association.

Eight in 10 of those surveyed said the proposed managed competition formula would have this affect; but six in 10 said it was unclear whether the administration's fiscal policies would allow hospitals to afford IS advances.

Reflecting the sentiment from earlier surveys, more than half of those polled said government and payee pressure to control costs is exerting the strongest pressure for computerization.

The impact on health care IS stemming from the Clinton administration's health care reform proposals come broadly from two areas, according to Andrew Pasternack, assistant director for publications at HIMSS.

First is the massive systems integration effort.

"The key to some kind of universal insurance plan in the U.S. is knitting together an incredible patchwork of public and private plans," he said, adding that this sort of integration has never been accomplished before.

A second impact will come from efforts to "drastically reduce" the administrative costs associated with delivering health care. In particular, tracking the clinical transactions will fuel development in such things as patient identification cards featuring microchips and bedside or portable computers for hospital staff.

Survey says:

Other results from the survey include the following:

- Seven in 10 providers of medical care said they expect a modest or substantial increase in IS expenditures in the next two years.
- A migration toward open systems architectures is evident. Nearly six in 10 said this is their fundamental strategy.
- Downsizing is not yet a watchword for the health care industry. Only four in 10 said they are downsizing their systems.
- As a group, the respondents expressed more optimism than they did just a year ago about the future of a standardized computer-based patient records system.
- The technology believed to have the greatest potential for improving patient care was, by far, clinical decision support systems for guiding diagnosis and therapy.
- A quarter of this year's survey respondents said they intend to invest in bedside computer systems.

The fourth annual HIMSS/HP Leadership Survey, conducted by J.C. Pollock Associates in Trenton, N.J., polled 571 health care professionals at the HIMSS conference last month in San Diego.

[redacted]

Utilities

Generic Software, Inc. has introduced the Change Management Facility, a full-function change management system for IBM's Application System/400.

The product offers a variety of features such as the ability to archive all source code as it is moved from the test environment into production and the ability to lock a production source to prevent multiple users from "checking out" the same program, according to the company.

A security module and a complete audit trail for all functions are also provided.

The product has a price tag of $995.

▶ *Generic Software*
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Banner Software, Inc. has announced five new enhancements to its VM-based product, LIBR/VM.

According to the company, the enhancements consist of support of native VSE Cobol in CMS, linkage editing in CMS, compilation of VSE Cobol programs in CMS, execution of VSE Cobol programs in CMS and read/write security control.

All versions of VM and VSE are supported.

LIBR/VM costs $9,000.

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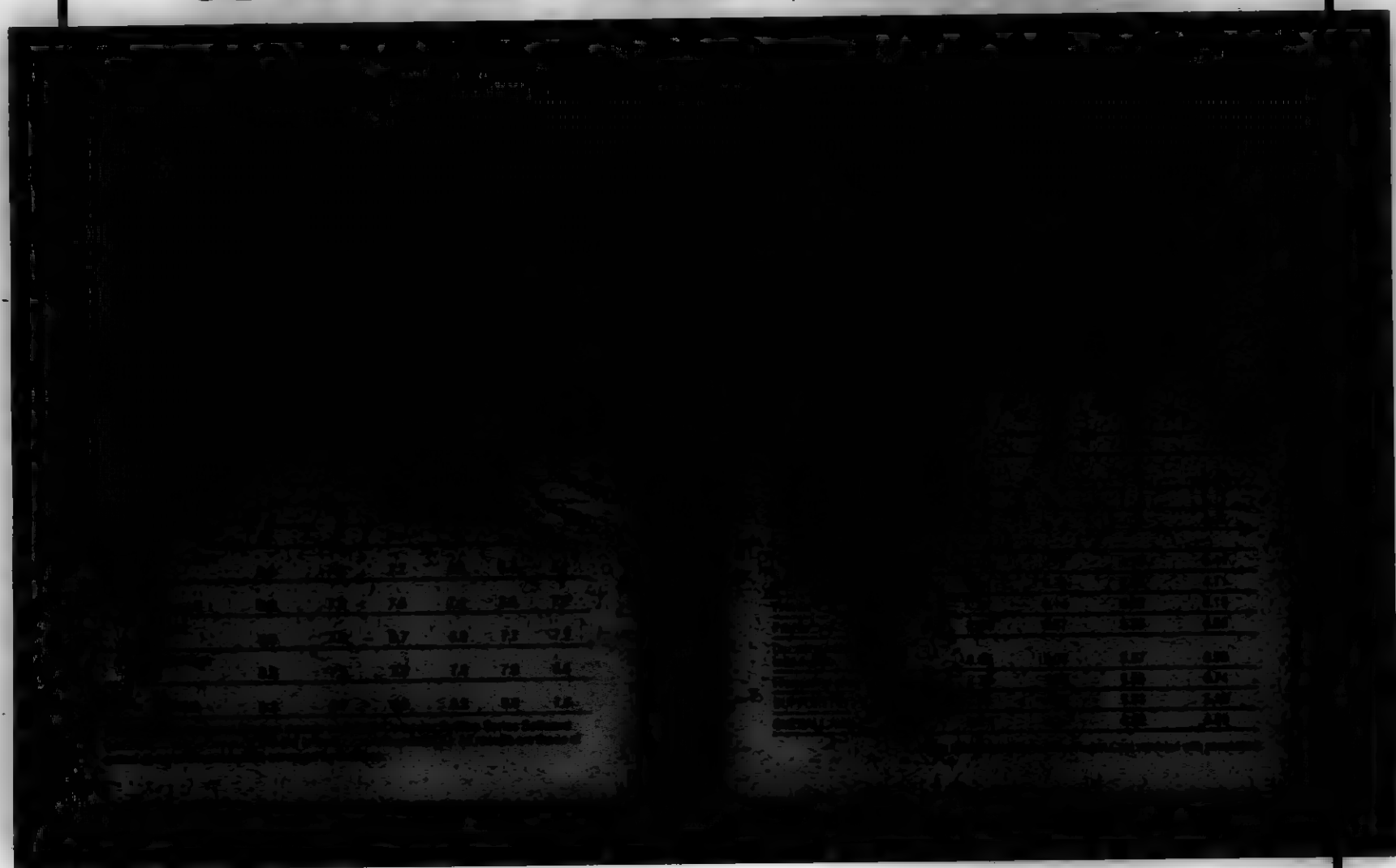

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Bumpy road to client/server

Lack of integration between CASE and client development tools a problem

By Garry Ray

With all the hoopla surrounding client/server application development, you might think that integrating client programming tools into enterprisewide development is as easy as crossing the street. Not so.

While interest in client/server tools has heated up in the past six months — witness the initial public offering of Powersoft Corp. last month and the acquisition of tools vendor Mateys Corp. by Atlanta's KnowledgeWare, Inc. in February — developers might be well-served to look both ways before hitting the asphalt.

At the top of the problem list, according to a number of consultants, vendors and users of the technology, is the difficulty of using client programming tools in a structured, enterprisewide development effort.

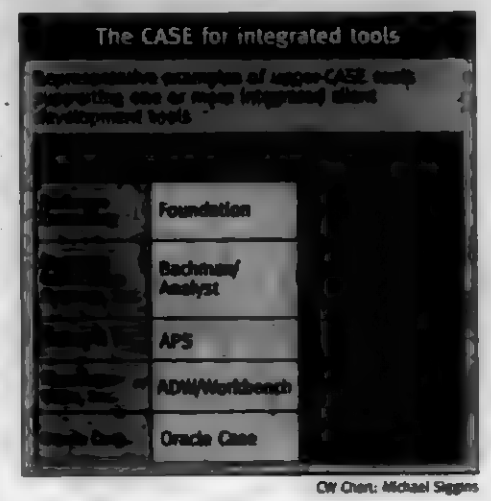
That may not be much of a problem today because "people are buying low-cost, portable client/server tools to experiment," not to develop enterprisewide production systems, said Anthony Picardi, vice president of software research at International Data Corp. (IDC) in Framingham, Mass. However, "a year from now, users will find that they'll have to bring in full life cycle tools because client/server development is very complicated," he added.

In a recent study, Picardi found that only 10% of all the companies he surveyed worldwide are actually experimenting with the technology. Quixotically, "the percentage of companies committed to client/server increased from 22% to 25% during 1992," Picardi said.

Other companies may be in for a client/server shock, according to Ed Acly, director of software research at Technology Investment Strategies Corp., an IDC-affiliated consultancy in Framingham. Because client/server tools lack the capabilities of enterprisewide computer-aided software engineering (CASE) tools, "rude discoveries are going to be made by developers" about client/server limitations, Acly said.

Users ahead of the technology curve may find themselves at the end of a very long road but with no room to maneuver.

According to Acly, "We don't have any proof that the midrange client/server tools will scale up easily to more robust, enterprisewide applications" — the very applications they are said to address.



CW Chart: Michael Siggins

Happily ever after

The ideal marriage between upper-CASE design tools and client programming tools would allow developers to "move the CASE work down to the client, without a lot of re-engineering to be done in the client tools," said Paul Siegerist, president of Tulsa, Okla., systems integrator The dTech Group.

Siegerist, whose firm uses a wide variety of CASE, client programming and database development tools for projects in the natural gas industry, said the perfect scenario would allow entity relationship modeling using CASE, generation of SQL statements for a client tool and automatic insertion of the SQL into a client application. However, Siegerist said such a tool does not now exist.

"If someone says they have it, then I have a bridge in Brooklyn to sell you. Nothing out there does it," he said.

Still, Siegerist said a recent contract led to the use of KnowledgeWare's ObjectView client development tool. The application, which Siegerist said is "3M bytes of compiled ObjectView code," was created for an energy company that buys and sells natural gas contracts.

Patiently waiting

Although he was not using KnowledgeWare's CASE offerings in the project, Siegerist said he is familiar with the company's CASE tools and looks forward to their integration with ObjectView. "The way enterprise development is moving, most CASE vendors are moving to create an integrated symbiosis between CASE and client/server tools," he said.

KnowledgeWare President Donald P. Addington said last week, "The integration of ADW and ObjectView is one of our highest priorities." Integration with the Application Development Workbench Design and Analysis Workstations will be unveiled later this year, he said (see story page 82).

The lack of integration between CASE tools and client development tools may seem an intractable problem today but can at least be understood.

According to Farzad Dibachi, senior director of product marketing for Oracle Corp.'s Cooperative Development Environment initiative, "CASE companies don't know much about client/server, and client/server companies don't know much about CASE." The Redwood

Client/server, *page 66*

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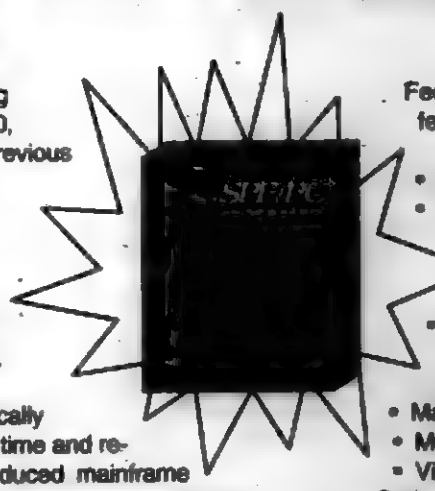

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Firm to ship 'Easy' CASE with rules, Windows

By Melinda-Carol Ballou
REDMOND, WASH.

Evergreen CASE Tools, Inc. will ship in June new versions of its low-cost EasyCASE Professional and EasyCASE System Designer with support for Microsoft Corp.'s Windows and rules-based design.

EasyCASE Professional is the company's core product. It offers a full chart editor, a data dictionary, reporting features and methodology rules.

EasyCASE Designer takes those capabilities and adds automatic schema generation for more than 16 dialects of SQL, as well as forward- and reverse-engineering for Xbase databases.

The products have now been "completely re-engineered from scratch" for Windows, and the DOS and Windows versions are compatible "down to the chart and data dictionary levels," said Sue Hutchinson, product marketing manager at Evergreen. "In this way, holdouts on DOS can work together with Windows users with our multiuser support."

Also new is support for rules-based design via a methodologies manager that sets methodologies used for a project and then enforces them.

"If someone tried to do something silly [or inconsistent], the product will catch the error on the fly and give them a message saying they can't do it and why," Hutchinson said. "It enforces rules as you build diagrams, hierarchies and as you define records and elements and entity relationships on the data side. This allows a team to use consistent design practices automatically."

EasyCASE Professional 4.0 and EasyCASE Designer 4.0 are priced at $795 and $1,195, respectively.

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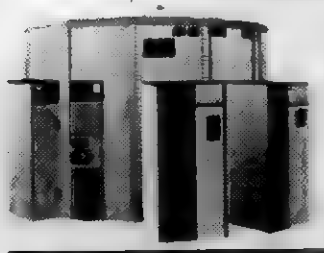

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In Brief

Cross-platform deal

Neuron Data, Inc. said IBM has signed an agreement to use the company's Open Interface cross-platform development tools to create and deploy commercial applications.

AS/400 CASE tool

System Software Associates, Inc. will be working with Bachman Information Systems, Inc. to develop an IBM Application System/400 version of the Bachman/Analyst computer-aided software engineering (CASE) modeling tool. The new tool, to be called AS/SET Bachman/Analyst-400, will work with System Software's current line of CASE tools for the AS/400.

Converting to tools

Following the trend of converting application development methodologies into software tools, Coopers & Lybrand in New York is now shipping Summit Process, which implements its Summit-D systems delivery methodology.

Cognos honored

Cognos, Inc. was named an IBM Business Partner/Cooperative Software Supplier, offering its PowerHouse fourth-generation language to users of IBM AS/400s.

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Bumpy road to client/server

CONTINUED FROM PAGE 63

Shores, Calif., database vendor is probably an exception among tools vendors because its CASE offerings and client tools all share the same repository — an Oracle database.

Such an integration gives Oracle the potential to weld CASE and client offerings together.

No surprise

That companies are making a commitment to client/server technology without benefit of a trial run is not necessarily surprising to Don Dall, managing director of the Foundation group at Andersen Consulting in Chicago.

Dall, who said client/server technology "runs best on an overhead projector," also noted that client development tools can provide an impressive turnaround in requested applications. But the domain of client/server tools and applications is very limited, he said.

"The client side is all focused on building a window tied to a specific database," he said, not on larger projects crossing multiple distributed databases with hundreds or thousands of users.

Approaches to integration

Client/server tools vendors have just begun to recognize the need to provide links to a variety of upper-CASE products. While the list of offerings is growing as users request more robust client/server programming environments, two of the more prominent examples are being set by Powersoft and Oracle.

Although they have conflicting definitions for "open development environments," both companies hope to enlist third-party CASE vendors to supplement their own client development tools.

The foremost example in the client development tool area is Powersoft, which has announced alliances with Bachman Information Systems, Inc., LBMS, Inc., Intersolv, Inc., Popkin Software and Systems Corp. and other prominent CASE vendors.

Behind Powersoft's business partnerships are two initiatives that add technical substance to the marketing arrangements.

First is Powersoft's Client/Server Open Development Environment (CODE). Largely a statement of intent, CODE promises open application programming interfaces (API) to PowerBuilder functions, libraries and the PowerBuilder repository.

The Open Repository CASE API subset of the CODE initiative has already been embraced by at least one CASE tool vendor. Last September, Bachman said its Bachman/Analyst database development tool would be enhanced to develop database specifications to populate the PowerBuilder repository. Although business logic must still be written in the PowerBuilder editor, Bachman officials said the technology reduces overall development time.

Portable programming

Oracle has taken an approach that, while it remains proprietary, may be made available on a selected basis in the future, according to Oracle officials.

Called Cooperative Development Environment (CDE), the technology places a portable programming layer and API on top of a number of platform interfaces, including Apple Computer, Inc.'s Macintosh, Microsoft Corp.'s Windows, the Open Software Foundation's Motif and OpenLook.

Client tools written to use the CDE can access the Oracle repository and, therefore, models created by upper-CASE tools such as Oracle's Entity Relationship Diagrammer.

Information in the Oracle repository can also be shared by Texas Instruments, Inc.'s Information Engineering Facility and KnowledgeWare's Information Engineering Workbench.

Although the CDE interface is currently used only by Oracle tools, Farzad Dibachi, Oracle senior director of product marketing, said the company has "disclosed [the CDE programming interface] on a case-by-case basis" to some Oracle customers.

—Garry Ray

Making a CASE for client/server

At Florida Power Corp. in St. Petersburg, Fla., manager of technical services Don Higgins said the utility's mainframe customer service application could eventually be brought to the client/server environment with PowerBuilder tools. When all is delivered next year to supply 1,600 customer service representatives, the application will have about 600 windows. Currently, the project has populated Foundation's repository with approximately 30,000 objects, according to Higgins.

While Higgins said client tools are useful in small-scale development efforts, he complained that they would just have worked with file structures. Long-term migration to client/server now being planned by Florida Power "Upper-CASE tools are fundamentally required in the long haul to make client/server work," he said.

With more than 30 years' experience in mainframe systems, Higgins was not prepared to select tools that would limit the project over the long term. "We were looking for a vendor which could tie the pieces together with a single repository," he said.

But those with reasons other than integration that some development shops hope CASE vendors will supply workable client development tools show familiarity.

Peter Van Hoof, a systems specialist at Great Western Bank in Northridge, Calif., said his shop's experience with a mainframe version of Interactive, Inc.'s APS application generator was reason enough to consider it for client/server development. "I like the philosophy of Interactive. It's not sophisticated, but it's functional," he said.

Under Van Hoof's direction, Great Western's team of application designers will upload applications for testing. Van Hoof said the greatest appeal of the APS tool is that "there will be only one program entity to maintain" for both terminal-based and client/server implementations. The bank has about 2,000 terminals for network users.

Approaches to integration

In addition, Great Western's experience with CASE tools and application generators has created a steep curve in bringing applications, Van Hoof said, "We don't go down to the code. I'd rather bring Higgins off that curve once." But he also sees the curve as operational issues. "If I have to touch the code, it totally defeats the purpose of having a CASE tool," he said.

Such concerns showing CASE vendors what is really demanded in client/server application development. Like Don Dall, managing director of the Foundation group at Andersen Consulting in Chicago, some CASE vendors have begun to realize that "it is our obligation to provide client/server tools with the same flexibility" as popular client tools, such as Powersoft Corp.'s PowerBuilder. Otherwise, Dall said, "some companies will be going down an alley with no way out." *—Garry Ray*

Digitalk ships Smalltalk extension

By Kim S. Nash
LOS ANGELES

Digitalk, Inc. last week shipped an extension to its Smalltalk object-oriented development language designed to address some of the pitfalls of group-based software-building projects.

Team/V lets several programmers define, store, browse and share Smalltalk "packages," which are modules of source code that define a program's functions or elements. The $1,495 product also helps manage those packages as developers work on different parts of the same application.

Southern California Gas Co. has built several small accounting and contracts-tracking applications with Smalltalk during the past year, but a lack of workgroup-based organizational tools had locked Smalltalk out of bigger initiatives, such as customer service projects, according to Arun Kiri, senior analyst at Southern California Gas.

"Smalltalk has been a single-workstation tool, which has kept developers of large applications from embracing it. We see promise in Team/V," Kiri said. Kiri, who is part of a group that evaluates tools for the Los Angeles-based utility, explained that Southern California Gas plans to stop all DOS development, instead of targeting IBM's OS/2, using Smalltalk.

Pros and cons

Fifty to 70 developers work in groups to build client/server software for the utility. Having tested Team/V on a small chunk of a planned customer service application, Kiri has seen the good and the bad of the tool.

Key pieces

- **Package Browser** for creating and organizing data and process definitions; browsing function classes by category and identification information associated with definitions.
- **Definition Organizer** for viewing, moving and swapping definitions.
- **Version Management and Access Control** for managing packages stored on multiple repositories.

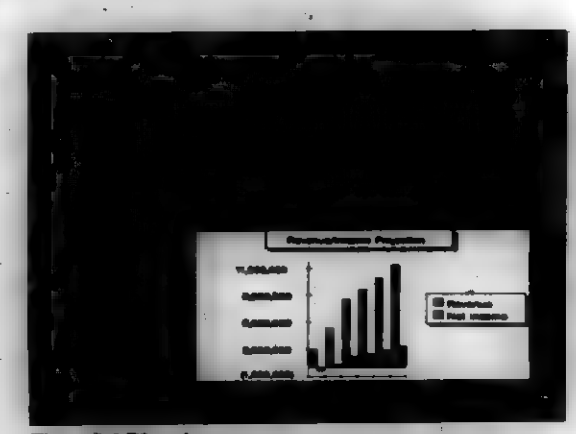
For example, Kiri said he likes Team/V's ability to let different developers work on various parts of a program in progress simultaneously.

Plus, he said that Team/V is a "fine" way to add a control layer between application analysis and code generation. "It helps us track who's doing what and when," he said.

However, Kiri noted that there appear to be some small compatibility problems with Team/V and Parts, another Digitalk Smalltalk utility for creating reusable objects.

Specifically, transferring objects between the two tools has sometimes been bumpy.

"We're not sure whether it was us or them, but we're working with the vendor on it," Kiri said.



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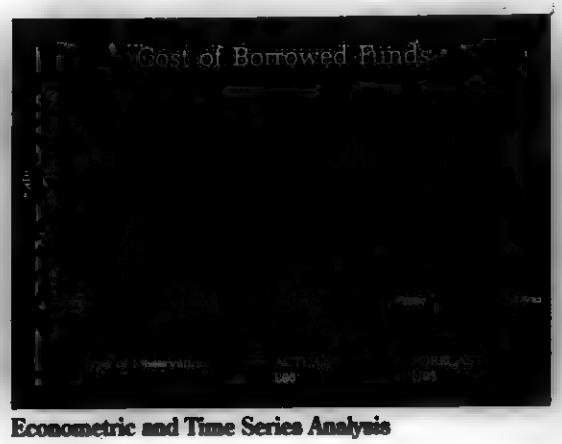

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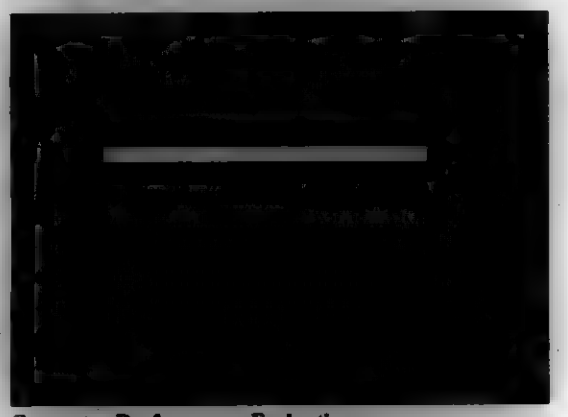

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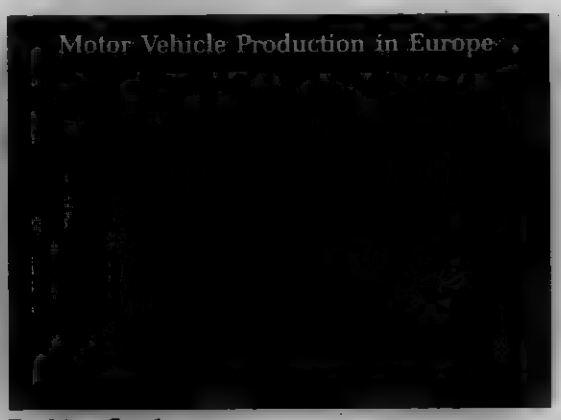

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Visualization

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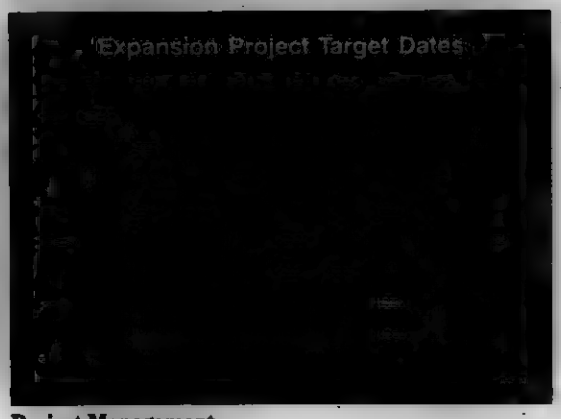

Project Management

After a decade of business focus, the pendulum is swinging back to technology. IS execs, get ready for the

TECHNO Renaissance

Alan Levenson

▶ **Mitsubishi's Esther Delurgio:** *Informal get-togethers with peers help her keep up with new products, issues*

By Alan Radding and Joseph Maglitta

Bears that get lost in the woods. Preachers who misquote the Bible. Chief information officers who don't understand technology. What's wrong with this picture?

Since the late 1980s, technology bosses have been encouraged to "learn the business" in order to be more effective. Ironically, many have let their technical skills slip, sometimes so badly they end up losing their jobs or steering their firms down blind, often expensive, alleys.

"Many CIOs have lost their grasp of technology," Patricia M. Wallington, Xerox Corp. vice president and CIO, told attendees at a Society for Information Management (SIM) conference in Rancho Mirage, Calif., earlier this month. CIOs, she says, "have focused on administrative tasks and paper shuffling. Many have not kept abreast enough to be the technology expert in the company, or at least at the awareness level."

However, a growing number of consultants, corporate executives and information systems professionals say a solid understanding of technology is once again becoming crucial for CIOs and other top IS managers.

Strong technical expertise is crucial, they say, for helping companies absorb new technologies and approaches such as mobile, distributed and object-oriented computing into a new data infrastructure for the 21st century.

Few suggest CIOs trade their suits and power briefcases for programmers' jeans and moccasins. In fact, many say it's more crucial than ever that IS align itself with corporate goals.

But increasingly, that means acting as a technology adviser on a cross-functional corporate team tackling re-engineering or other key projects. So more experts say they believe it's time for technology chiefs to get back to their roots while keeping an eye on organizational goals.

"The CEO wants to know how certain technologies will impact the business," says Bruce Rogow, a Gartner Group, Inc. fellow and independent consultant in Marblehead, Mass. Unfortunately, says Rogow, who has been

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calling for a new focus on technology for several years, that is a question "a lot of CIOs can't answer."

If anything, demand for IS leaders to act as corporate technology experts only seems likely to increase. A recent *Computerworld*/Andersen Consulting survey of 203 top corporate officers ranked technical expertise as *the* most desired skill for CIOs [CW, April 19].

"Technology is changing dramatically," notes Bruce Marlow, chief operating officer at Progressive Corp., a Columbus, Ohio, insurer. "To find people who are very proficient with central IS systems technology *and* client/server technology *and* emerging Windows applications *and* operating systems in a client/server world — that's a hard thing to find," he says. "You have to be able to make those choices across all the different options that are available today."

Barry Clemson, director of the Change Management Network and associate professor at Old Dominion University in Norfolk, Va., adds: "There is a realization that we need to make better, more effective use of PCs, LANs, databases — that we need a framework to tie all this technology together."

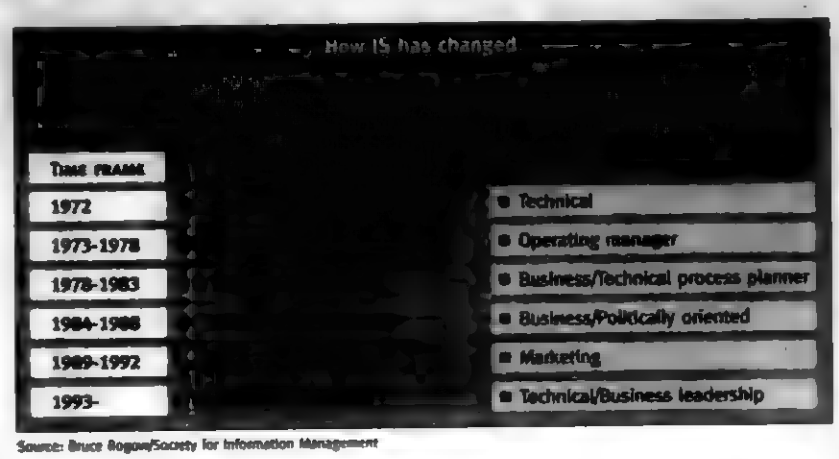
Rogow says the renewed emphasis makes perfect historical sense: It's the latest pendulum swing between technology and business that has marked IS for the past two decades (see chart).

Rogow wrote in a recent paper called "Putting The T Back Into IT" that in the early 1970s, computer professionals needed a technical management style to cope with emerging new technology and expanding business architecture. After the great upheavals in the 1970s and '80s, Rogow says, the situation reversed, making way for new business and technology platforms that have recently emerged.

"Technology isn't changing any faster than before," he says, "but the underlying platform is changing, and that makes all the difference." The new approach hinges on "middleware" — technologies, strategies and standards that enable interoperability among a variety of new and existing systems.

"The CIO has become the organization's chief information *infrastructure* officer," says Bud Mathaisel, director at Ernst & Young's Center for Information Technology and Strategy in Boston.

Rogow concludes: "The 1990s are starting with the almost total collapse of the IT platform. IS leaders will spend the next decade responding to business needs and 'rearchitecting' lagging technical resources."



Source: Bruce Rogow/Society for Information Management

How to keep up

The renewed focus on technology and architecture begs the question: How are busy IS executives supposed to keep up with the hugely complex new world of technology *and* their own company *and* their industry *and* organizational politics? IS heads concur: It's a Herculean job.

Craig Goldman, CIO at The Chase Manhattan Bank NA in New York, agrees that one of his main tasks is relating technology to business needs and potential opportunities. But, he says, "It is impossible to keep pace with everything."

Yet faced with a turnover rate pegged by a recent Deloitte & Touche survey at 25%, CIOs will need to keep their hands on to avoid losing their heads.

Experts say technology chiefs don't need to know, for example, every router on the market. But they must have at least a broad overview of the technology landscape to lead effectively.

So what does this new species of CIO look like? Probably similar to William Murray, director of IS at Tribune Broadcasting Co., an entertainment conglomerate based in Chicago. Murray has two jobs: Besides his CIO duties, he is the director of strategic technology.

The dual titles, he says, force him to spend his day differently than do peers with more traditional roles. "Fully 50% of my time is supposed to be spent as a hands-on participant in advanced technology projects," he says.

That participation often takes the form of the lead researcher in technology evaluation. Murray spends the other half of his time managing the company's existing information systems.

Or consider Ron Brzezinski, a Coopers & Lybrand partner in Chicago and former CIO at Quaker Oats Co. He says the importance of technology in a CIO's job depends on the firm, its needs and how it views the position.

If the CIO is perceived as a change agent, Brzezinski says, most likely the emphasis will be on knowing the company business. But if the CIO is seen as creator and custodian of the information infrastructure, the balance shifts toward a greater emphasis on technology.

Tips for techno-literacy

So how does an IS honcho become a Renaissance man or woman? Obviously, different strategies work for different individuals. But the following tactics have proved successful for some IS managers.

• **Networking:** Esther Delurgio, vice president of IS at Mitsubishi Motor Sales, Inc. in Cypress, Calif., depends on a group of local colleagues to keep her current. "We get together every few months at one or the other's companies to exchange information," she explains. Recent talks have focused on rightsizing and client/server technologies.

• **Inside job:** Some CIOs get experts inside the company to help them keep their technology skills sharp. "My biggest source of information is people in the company who have expertise in a particular subject," says John Alexander, CIO at Unum Life Insurance Company of America, Inc. in Portland, Maine. Many CIOs also report that they depend on subordinates to keep them informed about new technology.

• **Read, read, read:** Literature — magazines, journals, periodicals, books — is the best source for keeping abreast of changing events, Brzezinski says. But he adds that "a lot of IS executives don't know how to study the literature" and get buried in details. Instead, he encourages them to skim, browse and scan material, looking only for relevant and interesting information.

• **A little night programming:** Some IS managers swear there's nothing like actual programming to keep skills sharp. For hands-on experience, Alexander has been experimenting with Smalltalk, an object-oriented language that presents a vastly different programming experience than what he's used to. "It's like falling down the rabbit hole," he says, but acknowledges that it keeps him up to date.

Warren Harkness, director of information services at Bose Corp. in Framingham, Mass., also pounds the keyboard to keep sharp. A heavy Apple Computer, Inc. Macintosh user, Harkness likes to try new technology. "I will always offer myself as an alpha- or beta- [test user] for certain applications," he says. Those include teleconferencing, electronic mail and data access software.

• **Trade associations:** Reviews are mixed on using formal groups to keep up with technology.

"Associations are bad news for keeping current," Brzezinski says. While associations may be great for networking, the technology insight they offer typically has the depth, for example, of a faxed survey to members on PC use, he says.

Harkness, president-elect of SIM, disagrees. "Formal affinity groups are one of the best ways to keep up," he says.

Delurgio agrees. She is active in local SIM activities and attends Guide and Share (IBM user group) events in her area.

• **Be wary of vendors:** For years, IS executives got much of their technical information directly from computer hardware and software companies. Buyers today are much more skeptical. "Don't go to your favorite vendor," Brzezinski warns, saying vendors are often just as much in the dark as you are. A possible exception: specialized firms that represent very specific areas of expertise, he adds.

Still, Goldman says he tries to familiarize himself with the technologies he believes are key to the bank by attending vendor briefings. His hands-on experience is limited to evaluating end-user products.

• **Consultants:** Consultants pose another problem because, according to some, they discourage CIOs from thinking for themselves.

"The CIO wants the consultant to neatly package a report giving him the real message, but there is no single real message," Brzezinski explains. Instead, he recommends that the CIO play what-if with the material. "He needs to let his mind run," he says.

Mathaisel adds: "There is no substitute for intelligent, alert people staying in touch with the patterns of things going on around them."

• **Training:** Top IS execs are also budgeting for-

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ROGOW'S RULES

&

Effective time management requires some ground rules, says independent consultant Bruce Rogow. CIOs today spend the bulk of their time talking to business managers and working on budgets, he says, so although technology is important, keep it in balance.

5%

of the CIO's time should be spent actually using new technology. "They need to struggle a bit with Windows or Unix to find out what it is like," Rogow says.

20%

should be spent on decision-making and setting direction.

25%

should be spent reconceiving the IS role and management process to reflect the latest technological changes.

25%

should be spent learning the end-user businesses.

25%

should be spent educating the company on the new technology possibilities.

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mal education time to catch up on technology.

Dave Barrett, vice president of information technology at Investco Funds Group in Denver, says a major downsizing project has demanded his attention for the past two years, causing him to neglect his education.

He intends to get caught up on the latest developments by attending seminars and sitting in on training sessions about products from Oracle Corp., among others.

For example, he has budgeted education funds for himself and his entire IS staff; he spends some of that money to bring in experts for detailed, one-day briefing sessions.

What next?

Some consultants say the renewed emphasis on technology will serve CIOs well as they assume a new role in their organizations.

Michael Ashmore, vice president at CSC Index, Inc. in Cambridge, Mass., says the CIO's new role will increasingly be to teach business units how to use technology to realize the company's potential.

One challenge ahead will be to see if organizations can set up a stable role for CIOs. "Many companies are caught in the pendulum swing, from the techie who can't run a business to the general businessperson who doesn't know spaghetti code from pasta," says Dean Meyer, president of NDMA, Inc. in Ridgefield, Conn., an IS management consultancy.

Some note that CIOs are faced with seemingly insurmountable pressures to master business and technology. "Nobody can be all these things," says Bob Wilson, a principal at Praendix, Inc., a consulting firm that specializes in matching skills with jobs. His solution? Hire someone to supplement areas you're weak in.

Of course, many also caution that it's unwise to go overboard on technology and discard the valuable focus on business that has taken root during the past few years. Balance is key, they say.

Wallington compares the CIO's role to a rope with three strands: business, technical and organizational acumen. "The rope is as strong as those three strands," she says. "If you do an effective job as a CIO, that rope can be used for a lot of things."

She counsels IS people to create a technology vision that can be turned into action through careful interplay of the three key elements.

How long the technical focus will continue is anyone's guess. But Richard Swanborg, a consultant at Ernst & Young, offers an anecdote that hints at future directions.

Recently, Swanborg says, he received a call from a New York financial services firm that was looking to hire a chief technical officer who would not only oversee IS but also set vision and direction for corporate technology growth. Salary: $300,000.

Two weeks later, Swanborg says, he received an almost identical call. A Boston-based financial services firm was hiring for a position with an almost identical job description. Salary for this job: $800,000. "I started updating my resume," Swanborg jokes.

Even during the heyday of lofty CIO talk about business aspirations, the best CIOs always kept a close eye on the technology. The smart ones are now opening the other eye, too.•

Study: Users key to system development

By Michael L. Sullivan-Trainor

PALM SPRINGS, CALIF.

Forget relying solely on technology to speed systems development. A new study reveals that good organization structure and user involvement are the most powerful development tools.

That conclusion is among many contained in a study of 25 information systems organizations conducted by consultancy Ernst & Young and the Society for Information Management (SIM). Released earlier this month, the report focuses on isolating "best practices" that could give benchmarks for top IS performance.

There are no silver bullet practices.

"We want real-life examples of what's working," explained Warren Harkness, SIM president-elect and IS chief at Bose Corp. "We want to know the best practices and then have the analytical horsepower to document them."

Best of the best

Some 50 "best practices" were identified by the survey respondents. But Richard Swanborg, director of Ernst & Young's Center for Information Technology and Strategy IS leadership program, warned that a practice that works for one company may harm another. "There are no silver bullet practices. The best thing to do may be to use a composite of practices that together provide a better process for your organization," he said.

In application development, the study found that tools such as computer-aided software engineering products, relational databases and workstations often help deliver systems more quickly and cheaply than traditional techniques.

The right touch

But the study found that "high touch" approaches such as cross-functional teams and prototyping lead to fewer application defects and higher user satisfaction.

The 100 or so SIM members who attended Swanborg's presentation responded favorably to the report and offered their own experiences with best practices.

Ray Hoving, director of MIS, process systems group at Air Products & Chemicals, Inc., vouched for the success of Rapid Application Development (RAD), which Swanborg ranked 18th on the list of best practices.

Hoving said his firm's use of RAD will reduce application delivery from nine months to only four, then to nine weeks. He cited a recent example of a four-week application that helped his group qualify for ISO 9000 certification.

The joint study, Harkness said, was the first phase of a three-part effort to establish best practices benchmarks. The next survey is being distributed to all SIM institutional members. Data from 50 to 60 respondents will be included in the final report. All SIM members will be included in the third phase, which will cover IS infrastructure.

Calendar

MAY 9-MAY 15

Advanced Topics in DB2. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Eastern Communications Forum (ECF). Washington, D.C., May 10-12 — Contact: ECF, Chicago, Ill. (312) 938-3500.

Micro Focus Users Conference. Orlando, Fla., May 10-12 — Contact: A&R Partners, Redwood City, Calif. (415) 363-0982.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

SunWorld '93. San Francisco, May 11-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles, Los Angeles, Calif. (310) 825-1879.

1993 Boole & Babbage User Group Conference. Las Vegas, May 13-14 — Contact: Boole & Babbage, Inc., Sunnyvale, Calif. (408) 720-0231.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

MAY 16-MAY 22

ICA Comdex Dallas '93. Dallas, May 16-20 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Wireless DataComm '93 Exposition and Conference. San Jose, Calif., May 18-20 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Annual 1993 Midwest Computer Show. Rosemont, Ill., May 19-21 — Contact: Illinois CPA Society Foundation, Chicago, Ill. (312) 993-0393.

Virtual Reality Conference and Exhibition. San Jose, Calif., May 19-21 — Contact: Meckler Managing Information Technology, Westport, Conn. (203) 226-6967.

National Operations and Automation Conference. New Orleans, May 23-26 — Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

MAY 23-MAY 29

Fuse '93 Educational Conference and International User Meeting. Atlanta, May 24-25 — Contact: Fuse, Inc., Manalapan, N.J. (908) 308-9277.

American Production Inventory Control Society 1993 Remanufacturing Seminar. Oklahoma City, May 24-26 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Midwest Electronics Expo. Minneapolis, May 24-27 — Contact: Midwest Electronics Expo, Dallas, Texas (214) 239-3060.

UniWorld Expo '93. San Francisco, May 25-27 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3870.

MAY 30-JUNE 5

Unatech '93. Caracas, Venezuela, June 1-5 — Contact: International Exhibitions, Inc., Houston, Texas (713) 529-1480.

Joint Application Design User Conference. Hershey, Pa. June 2-4 — Contact: Anthony Crawford and Associates, Oakville, Ontario (416) 845-3844.

Transforming the Organization: Integrating Business, People and Information Technology. Wellesley, Mass., June 2-4 — Contact: Babson College, Wellesley, Mass. (617) 239-4354.

JUNE 6-JUNE 12

Equipment Resources Planning Institute. Albuquerque, N.M., June 7-8 — Contact: Equipment Resource Planning Institute, Santa Monica, Calif. (310) 394-2997.

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Client/server development tools for WINDOWS

By David Baum

Client/server tools have exploded as quickly as Microsoft Corp. Windows itself, with a plethora of new products and diversification of existing products. On the surface, all vendors sound the same as they court customers with all the right buzzwords. But tools differ widely in their ability to develop complex applications.

"Tools tend to serve a particular constituency and a particular type of application," says John Rymer, an analyst at the Patricia Seybold Group in Boston. "Once you get beyond the bounds of that positioning, you have to use a different product, often with very little resemblance to the product you started out with."

Most organizations end up selecting two or more tool sets: one for smaller, Windows-only applications and others for large, multideveloper projects that span Windows and other operating environments.

The lowest level

The lowest level client/server tools, known as graphical user interface (GUI) builders, are really just interface builders. These "frontware" products enable developers to create GUI front ends, complete with dialog boxes, buttons, scrolling bars and pull-down menus for existing mainframe programs.

Mainframe code doesn't have to be changed, so it's a good solution for firms that simply want a friendlier front end. The downside is that most of the instructions for sending, receiving and editing data must be coded by hand using an embedded third-generation language (3GL).

They've proved themselves in pilots and simple applications, but many question how well these tools will perform in more complex environments

Many of the 3GLs themselves have taken on extensions to make them client/server-ready. But these languages — at least as they pertain to Windows — are still fairly new and, to some degree, unproven.

"We are still probably six months to a year from seeing the robust 3GL tools and class libraries that will form the foundation for industrial-strength applications for the desktop," says Dan Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc., a consulting firm in Redwood City, Calif.

The Visual Basics

A step up in complexity leads to Windows development environments, such as Microsoft's Visual Basic and Borland International, Inc.'s ObjectVision. Like the GUI builders, these tools automate the interface creation, but they also add libraries of functions that programmers can easily embed in their applications.

These products are hard to beat for building tactical applications quickly. You simply draw the user interface and attach code that responds to events in the GUI. But a development team will be frustrated if it tries too much with one of these simpler Windows products, particularly when it comes to relational database

Client/server tools, *page 74*

INSIDE:

Firing Line: Users find ObjectView production-ready. **Page 82**

Buyers' Scorecard: Uniface rates highest satisfaction. **Page 80**

Voice of experience: What it's really like to use these tools. **Page 77**

Client/server tools

CONTINUED FROM PAGE 73

management system processing.

For example, Visual Basic queries are coded in Basic; to connect with a SQL database, a translator turns the query into SQL. This isn't a problem for a simple application that accesses a few database tables, as is typical with most tactical departmental systems. But it can get extremely time-consuming for more complex corporate applications, where 50 or 100 tables might be involved, with numerous joins among them.

"Tools such as Visual Basic are really only a pixel deep," Shafer cautions. "They require developers to program the underlying logic of an application, as well as all the database transactions."

More sophisticated Windows development tools, such as Powersoft's PowerBuilder, KnowledgeWare, Inc.'s ObjectView and Gupta Corp.'s SQLWindows, include a 4GL to simplify the coding process in each of these areas.

The focus of tools such as Visual Basic and ObjectVision is on building decision-support systems within the PC client framework. Some are more Windows-specific than others. For example, PowerBuilder features dynamic Object Linking and Embedding, making it possible for users to invoke one Windows application within another and create hot links among the data.

Windows specificity also tends to go hand in hand with a client orientation. "PowerBuilder concentrates the processing on the client side and reserves the server for database management," says Peter Duggan, vice president of corporate information systems at The New England Mutual Life, a Boston-based insurance and information provider. New England Mutual built a system for its staff to enter insurance data into Windows PCs, which would then update the mainframe server database at headquarters. "We wanted to keep the architecture of the new application as simple as possible," he says.

On the downside, PowerBuilder applications are currently restricted to the PC. Other tools, such as Uniface Corp.'s Uniface, are cross-platform development environments that operate on non-Windows platforms as well. "Even though you may be designing an application for Windows, you spend more time with the logical layout of the data" with Uniface, says Kent Failing, president of Computer Design Professionals, a consulting firm in Atlanta.

With Uniface, applications are divided into three parts: the presentation interfaces, data definitions and the logistical handling of data once stored. The architecture lets users mix and match platforms, DBMSs, GUIs and networks, largely eliminating the need for redeveloping applications.

Of course, there's a downside to Uniface running in all environments: It really doesn't take full advantage of any one environment. "If you wish to exploit the full potential of a particular environment — in this case, Windows — you may be better off with a Windows-only tool," Failing says.

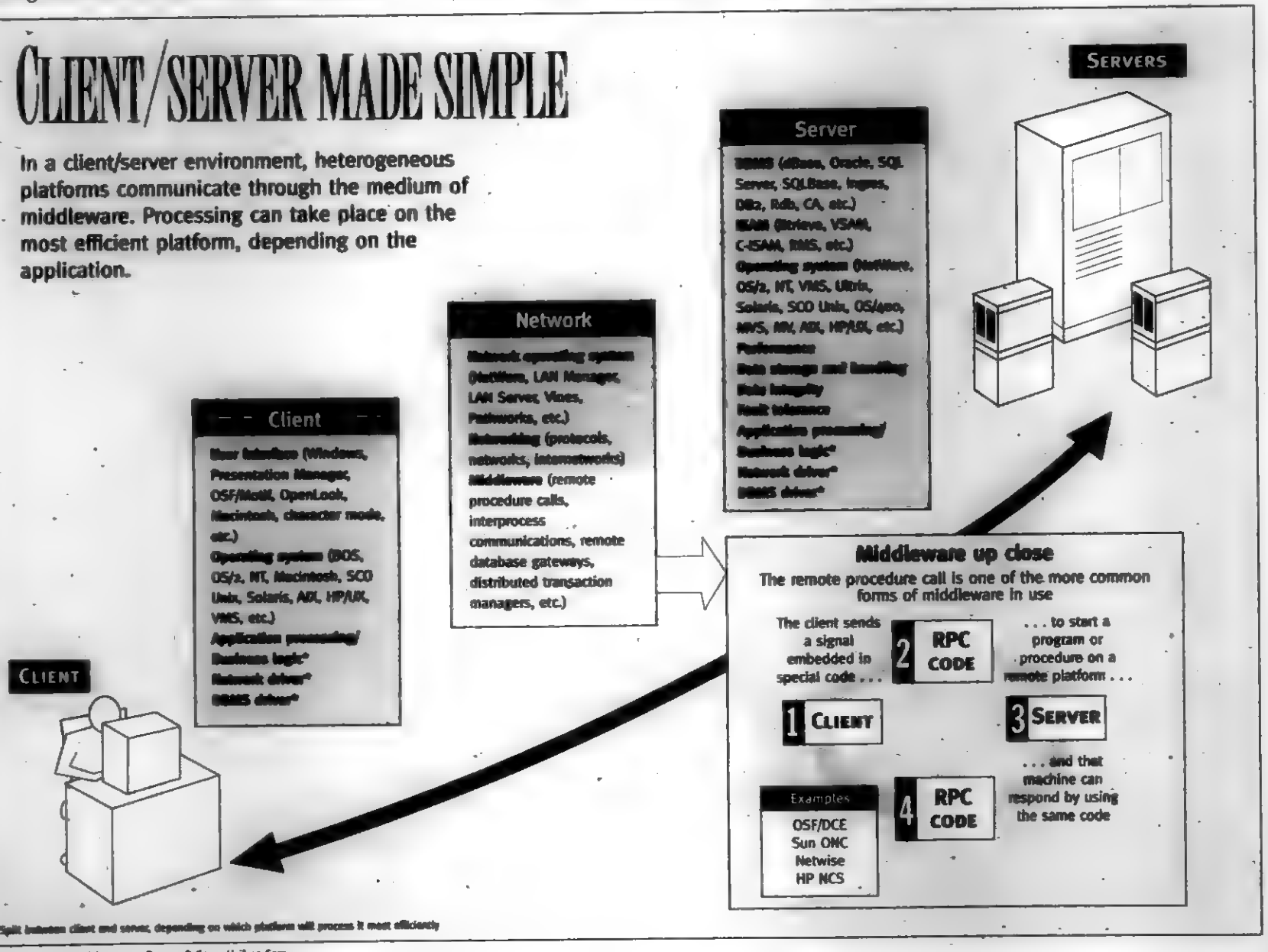
Importance of the server

Another critical difference among the various types of client/server tools is the extent to which they support SQL database processing and whether they can divide application logic among client and server machines.

Five places to code

The following are five areas in which the developer has to either write code or find a tool that generates code automatically:

1. **The GUI,** including the menus, dialogues and other interface objects.
2. **SQL statements** that are executed to insert, retrieve, delete or update information.
3. **Business rules,** which determine what the application actually does.
4. **The connections between the business rules and the GUI,** which determine the action the interface takes when an event such as a mouse click occurs.
5. **Rules for SQL** determining what is done with data once it has been retrieved, such as where and how to display it.



Source: Database Decisions, Inc., Powersoft Corp., Uniface Corp.

What about CASE?

In their favor, CASE workbenches have more extensive analysis and design modules than do most of the newer tools. Furthermore, CASE methodologies include mature project management and version control features important for creating enterprisewide applications, says Peggy Ledvina, an analyst at Meta Group, Inc. in Westport, Conn.

On the other hand, most of the Windows tools are better than CASE as smaller scale, departmental solutions.

To bridge the gap, some of the point-solution tool makers have started to partner with CASE vendors. For example, Powersoft Corp. has signed joint development deals with Popkin Software Systems, Inc. and Bachman Information Systems, Inc. to add their analysis and design modules.

Meanwhile, CASE workbench makers are peddling furiously to keep up with smaller, more easily manipulated Windows tools, says Ed Yourdon, author of several application development books.

For example, Andersen Consulting's Foundation for Cooperative Processing is frequently cited for adeptly taking up the client/server cause with its ability to generate applications for Windows, IBM's OS/2 and Unix.

For now, Ledvina advises users to "keep your CASE tools, and see what you can do to extend them down to the departmental level."

—*Elen E. Nash*

"Enterprise-level applications require code that is oriented to both the client and server, with more emphasis on the server," explains Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "Such development systems can be used to create applications that previously could only be developed on a mainframe, providing server-based security, data management and integrity services that cannot be handled with client-only software."

For example, with Intellicorp, Inc.'s ProKappa development environment, the server maintains primary logic operations, access to enterprise data and data modeling information. The server architecture is composed of a number of server engines that communicate, via a protocol mediated by a network manager, with client applications.

Compare that tight server link with that of PowerBuilder, which uses intelligent database objects known as DataWindows to manipulate data from an RDBMS without any need to code SQL commands in scripts.

Strong in back, weak in front

The strongest products for SQL processing are the 4GLs from database vendors such as Oracle Corp., the Ingres Products Division of The ASK Group, Inc., Information Builders, Inc. and Software AG of North America, Inc.

But these 4GLs are only now arriving at solid PC implementations. Most of them are still weak on the Windows front, even though their back-end processing is much more sophisticated than the client-only 4GLs, such as Visual Basic and PowerBuilder.

"The major database vendors are belatedly getting their acts together when it comes to Windows," Patricia Seybold Group's Rymer says. "The same is true with the 4GL vendors. They are struggling to move out of character-mode, forms-based approaches into an object orientation."

Some 4GL products that fit this description include Uniface, Ingres/Windows 4GL and SmartStar Vision from SmartStar Corp., which can dynamically query multiple, heterogeneous database tables in a single transaction. No coding is required on the part of the developer to enable these capabilities because these products include a transaction model as part of each application. They can also support referential integrity among multiple, dissimilar databases.

Achieving reusability

Taking another step forward in the ability to work in complex environments, object-oriented products provide developers with a GUI-building component, a 4GL for coding business rules and a library of commonly used application objects whose attributes can be set without programming.

"The trend in Windows tools is to encapsulate more and more of the common behavior exhibited by large numbers of applications," Shafer notes. "Programmers shouldn't have to reinvent wheels or even understand much about how they work."

Shafer sums up this philosophy with a simple guideline. "The key question when evaluating any development tool should be this: 'How little work can I get away with?' You should try to find a tool that has done as much of the hard work for you as possible." •

Baum is a free-lance technology writer in Santa Barbara, Calif., who specializes in application development issues.

DEFINITIONS

Client: A single-user workstation that provides presentation services and the appropriate computing, connectivity and database services and interfaces relevant to the business need.

Server: One or more multiuser processors with shared memory that provide computing, connectivity and database services and interfaces relevant to the business need.

Client/server computing: An environment that appropriately allocates application processing between the client and the server. The environment typically is heterogeneous, with the client and server communicating through a well-defined set of standard APIs and remote procedure calls.

*From the book *Client/server Computing* by Patrick Smith and Business Systems Group. Published by Howard Sams, a division of Prentice Hall Computer Publishing. Used by permission of the publisher.

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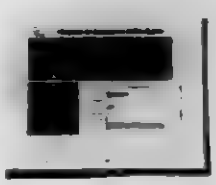

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Voice of experience

Tools have ups and downs

By Lee Ann Hantula

Like most veterans of client/server installations, I have both praise and criticism for the tools. What's kept me on track is the right attitude: Don't be seduced by sexy technology, and keep your software engineer's hat on firmly.

After several years of systems integration work on mainframes, IBM System/36s, System/38s and PCs, I began work on a custom order processing and accounts receivable system. Cost and development speed were the motivations for choosing a client/server approach, using Gupta Corp.'s SQLWindows and Oracle Corp.'s Database Manager. Here are some pointers from my experience:

It's imperative that you set up-front coding standards. SQLWindows is written in C and retains C's top-down structured flavor. But remember: Power and flexibility can be abused in any language.

For example, in SQLWindows you can broadcast a message to all objects on a window. It's like coding a "GOTO" — but to where? Without discipline and coding standards, you will end up with wildly different code among programmers.

Developers need to be intimate with back-end databases. One of the hallmarks of client/server architecture is the relative independence of front-end tools from back-end databases. But in reality, client/server developers still need to be aware of features in the back end.

For instance, your database's SQL statement optimizer may dictate that your SQL be worded in a certain way to perform well. That wording might differ for another database, so programmers need to know not only basic SQL but also specifics about your database brand.

Code debugging is much more difficult. Separating the user interface process from the database is fundamentally a good idea. But the downside becomes apparent when debugging code. To the front-end tool, your SQL code is just a string. The compiler cannot help you debug SQL or find spelling errors in the bind variables. You must use a tool along the lines of Gupta's SQLTalk and then cut and paste your SQL into your code. Then you must map the returned data into your programs' variables. It's easy to make mistakes in this process.

But the tools can be flexible and rich in features. We produced a user interface prototype within a few days that helped with user design.

And the design capabilities exceed many mainframe-based tools. The on-line code animator is much better than that of any large-system testing tool I've used. The source code editor is in outline form, and the outline can be expanded or collapsed. This makes writing structured code natural.

Scrolling becomes a snap. Our former mainframe users were amazed that they could scroll backward as well as forward.

Where design issues really increase is on the user interface. When do you use a push-button vs. a menu pick? Will the new bit-map icon you just designed mean something to the user or just look like a strange picture? The old issues — such as naming conventions and flexible navigation — don't go away.

And some of the tools from the mainframe arena just don't exist yet. Most large-system development platforms have well-established tool sets that help standardize and maintain code, but these aids are just emerging in the client/server arena.

Client/server technology is not for the faint of heart or those fearful of rapid change. As we look forward to future developments, we're also holding onto our software engineer hats for a wild ride. •

Hantula is a senior analyst at consulting firm Palladian Consulting Co. in Atlanta.

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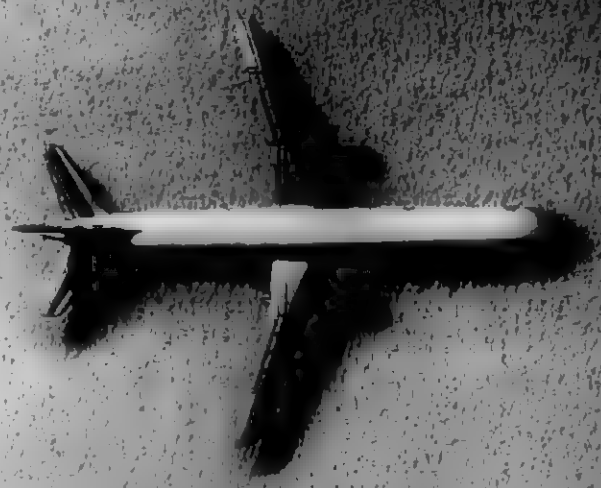

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Buyers' Scorecard: Uniface receives highest user satisfaction ratings

By Derek Slater

Although the hype is high, buyers are still cautious about jumping into client/server application development. As a result, the market for development tools is wide open.

"If you have 100 licenses out there, that makes you a major player in the client/server market," said Richard Finkelstein, president of Performance Computing, Inc.

Uniface Corp.'s tools clambered to the top in a user satisfaction poll of early market share leaders, earning a score of 76, just ahead of Easel Corp.'s Enfin/2 at 75. Powersoft Corp.'s PowerBuilder achieved a score of 72, and Gupta Corp.'s SQLWindows scored 65. JYACC, Inc.'s JAM/PI tool was not included in the final score because of a low number of respondents.

Users' comments indicated that Uniface does not handle the Windows interface as cleanly as the dedicated Windows development tools. But Uniface supports other client platforms, including character mode, the Open Software Foundation's Motif, OpenLook and Workplace Shell. Support for Apple Computer, Inc. Macintoshes has been promised.

Uniface received the highest satisfaction ratings in quality of service and support and in speed.

Easel acquired Enfin Software Corp. in 1992. Users gave Enfin/2 high marks for the strength of its object-oriented programming language, based on Smalltalk. It also received the highest rating in value for the dollar.

Lower scores for Enfin/2 included service and support and speed of applications produced.

Powersoft's development tool appears to be rapidly gaining momentum in the marketplace. PowerBuilder achieved the highest ratings in ease of use and training time required but finished in the middle of the pack in most areas. PowerBuilder is a native Windows application that handles Windows interface functions well but does not facilitate porting to other client platforms.

PowerBuilder finished first in last year's client/server survey. The company just announced Version 3.0, including a version control interface and other significant enhancements.

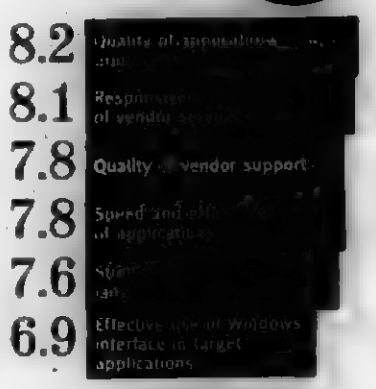
Users said SQLWindows is relatively easy to learn and use and lets them develop applications quickly. However, it trailed the competition in quality of applications produced.

A major upgrade of SQLWindows started shipping earlier this month. It addresses some user concerns expressed in the survey, such as strength of programming language. The new version adds object-oriented features and support for collaborative programming.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their tools in 17 categories. All categories were factored into the final score. The scores for each product in the six most important categories are listed in the charts. •

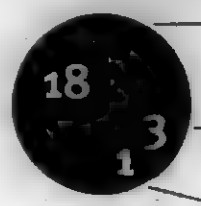
Uniface Corp.'s Uniface

OVERALL SCORE: 76



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?



LIKELY
REASON: Good environment

UNLIKELY
REASON: Tough to learn

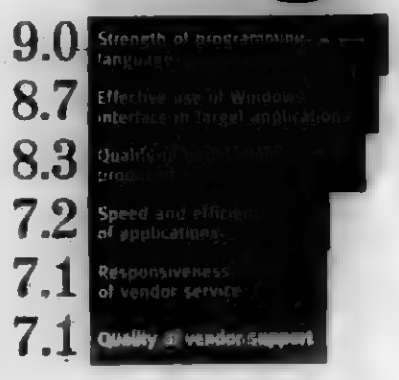
DON'T KNOW

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 22 USERS

Easel Corp.'s Enfin/2

OVERALL SCORE: 75



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?

LIKELY
REASON: Great object-oriented functionality

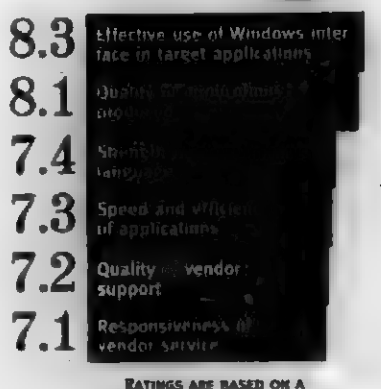
UNLIKELY
REASON: Poor vendor support

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 20 USERS

Powersoft Corp.'s PowerBuilder

OVERALL SCORE: 72



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?

LIKELY
REASON: Easy to use

UNLIKELY
REASON: Lack of network support

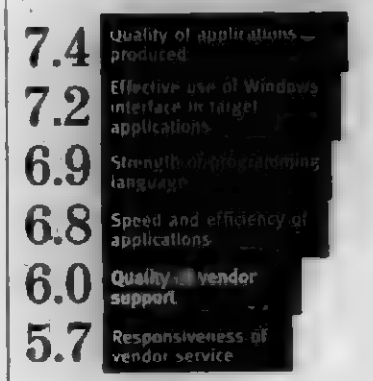
DON'T KNOW

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 50 USERS

Gupta Corp.'s SQLWindows

OVERALL SCORE: 65



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?

LIKELY
REASON: Very fast development

UNLIKELY
REASON: Difficult learning curve

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 35 USERS

METHODOLOGY

User names were obtained from a combination of vendor and non-vendor sources. First Market Research Corp. in Austin, Texas, conducted the survey and tabulated the results. The response base was 20 users for Enfin/2, 22 for Uniface, 50 for PowerBuilder and 35 for SQLWindows.

Users rated their satisfaction with their installed products and were not asked to rate one product directly against another.

The overall scores were calculated by combining each product's ratings with the importance rating given each criterion.

JYACC's JAM/PI Windows development tool was included in the survey but received an insufficient response base. Based on 11 respondents, JAM/PI scored 9.0 in quality of applications, 8.9 in strength of programming language, 8.8 in quality of support and 8.6 in speed of applications.

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WHAT THE MARKET LOOKS LIKE

Windows client/server development tools are infiltrating from a number of directions. The market can be roughly divided as follows:

▶Front-end tools

Build GUIs that can be snapped onto many types of host-based systems. Examples: Easel Corp.'s Easel, Gupta's SQLNetwork, Attachmate Corp.'s Extra.

▶PC database access tools

Combine visual GUI-building capabilities with an underlying 3GL or 4GL for programming application logic and database transactions. These products typically rely on gateways to access server databases. Some can work with more than one database. Examples: Microsoft's Visual Basic, Borland's ObjectVision, KnowledgeWare's ObjectView, Gupta's SQLWindows, Powersoft's PowerBuilder, Easel's Easel Workbench, Computer Associates International, Inc.'s CA-dBFast, Open Environment Corp.'s ODE Toolkit, Uniface's Uniface.

▶Object-oriented libraries

Class libraries to aid programmers with the object-oriented construction of Windows applications. Examples: Visix Software, Inc.'s Visix Galaxy, Neuron Data, Inc.'s Open Interface, XVT Software, Inc.'s Design C++, Liant Software Corp.'s C++/Views, Software Transformations, Inc.'s Universal Component System.

▶3GLs for client/server

3GLs, from Basic to C++, that have acquired Windows extensions. They interface with the Windows application programming interface (API) and exhibit strong hooks to the Microsoft or Borland framework. Most are acquiring ODBC drivers, based on Microsoft's Open Database Connectivity standard. Typically weak on SQL access. Examples: Borland's C++ and Pascal for Windows, Microsoft's C 7.0 and Visual C++, CA's Realia Cobol.

▶4GLs for client/server

4GLs, primarily for building relational front ends that interface with the Windows API and one or more database servers. Examples: Unisys Corp.'s Mapper, Information Builders, Inc.'s Focus, Software AG's Natural, Cognos Corp.'s Powerhouse, JYACC's JAM/PI.

▶CASE tools

Information engineering tools rearchitected to deploy applications under a Windows client/server framework. Examples: Synon, Inc.'s Synon CSG, KnowledgeWare's Application Development Workbench, SEER Technologies, Inc.'s High Productivity System, Manager Software Products, Inc.'s Method-Manager, Popkin Software Systems, Inc.'s System Architect, Andersen Consulting's Foundation for Cooperative Processing. Others vendors have client/server CASE products on the horizon: Texas Instruments, Inc, Intersolv, Inc., CGI Systems, Inc., Netron, Inc.

▶Knowledge-based tools

Some artificial intelligence vendors have recently released or are about to release general-purpose, object-oriented tools for client/server. These products excel at building applications that involve complex rules and logic, integrated within the Windows environment. Examples: Intellicorp, Inc.'s ProKappa PC, Inference's Enterprise Object, Trinzic's KBMS for Windows.

▶Graphical query and reporting tools

Executive information system builders that use a simple spreadsheet metaphor to build reports and queries. Examples: Trinzic's Forest and Trees, DataEase International, Inc.'s DataEase Express for Windows, Pioneer Software, Inc.'s Q+E Database Editor.

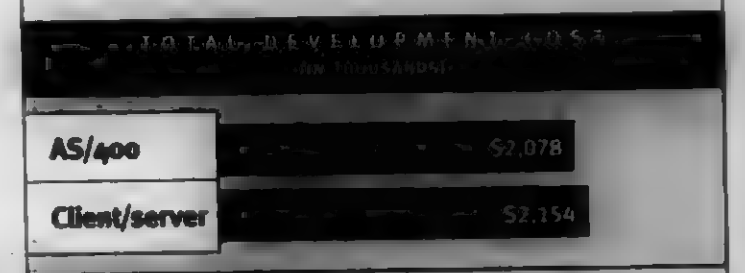
▶Object-oriented visual development environments

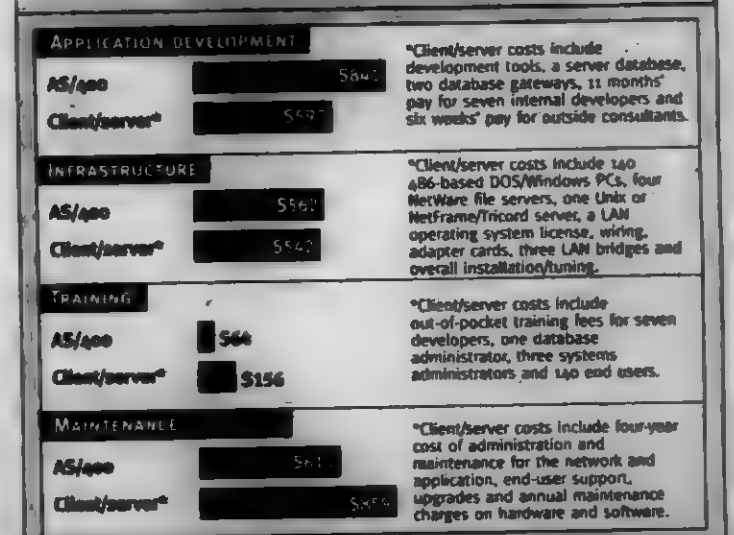
Object-oriented toolsets that offer class libraries of prefabricated objects. These vendors see the market segmenting into object builders and object assemblers. Examples: Digitalk, Inc.'s Parts Workbench, ParcPlace Systems, Inc.'s Visual Works, Serius Corp.'s Serius, Easel's Enfin Open Interface, TGS Systems' Prograph, Cooper & Peters, Inc.'s Window Builder.

—David Baum

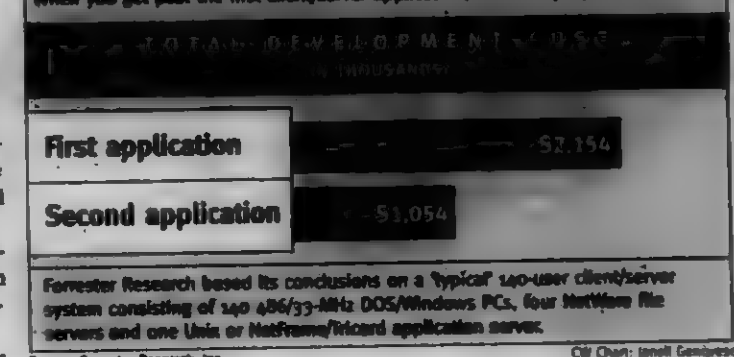
WHAT USERS ARE PAYING

Two years ago, it cost 15% to 20% more to build a client/server system than a minicomputer-based system, according to Forrester Research. Today, there's a much smaller price gap.





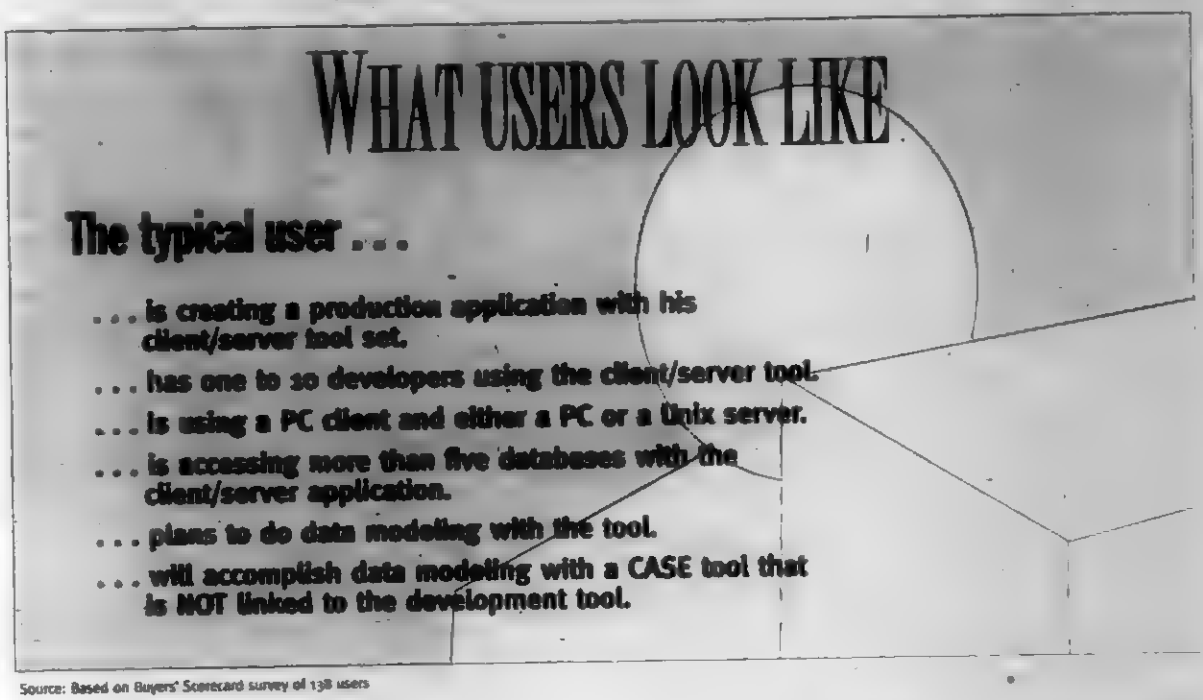
When you get past the first client/server application, costs drop by more than half



Forrester Research based its conclusions on a 'typical' 140-user client/server system consisting of 140 486/33-MHz DOS/Windows PCs, four NetWare file servers and one Unix or NetFrame/Tricord application server.

Source: Forrester Research, Inc. CW Chart: Ismail Gambrese

WHAT USERS LOOK LIKE



Source: Based on Buyers' Scorecard survey of 138 users

ObjectView 2.0: Users find it competitive but say it lacks some Windows support features

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

KnowledgeWare's ObjectView 2.0

■ Once a little-known client/server development tool, ObjectView has vaulted into the spotlight after being acquired by CASE vendor KnowledgeWare, Inc. Evaluators said they were pleased by the acquisition because it strengthens the long-range outlook for the product.

■ Evaluators were generally satisfied with the performance of ObjectView and gave it high ratings for database support, ease of use and technical support. But they were not enamored with the report writer and the package's lack of compatibility with Windows' OLE.

As of late last year, ObjectView was hidden in the shadow of such erstwhile competitors as Powersoft Corp.'s PowerBuilder, Gupta Corp.'s SQLWindows and a host of other Microsoft Corp. Windows-based client development products that had no trouble grabbing the limelight.

That changed last month, when longtime computer-aided software engineering (CASE) tools vendor KnowledgeWare, based in Atlanta, purchased Matesys Corp. and ObjectView in a stock swap valued at more than $20 million.

While that may seem an outlandish sum for a development tool booking less than $3 million per year in sales, it does speak loudly of the growing interest in client development tools.

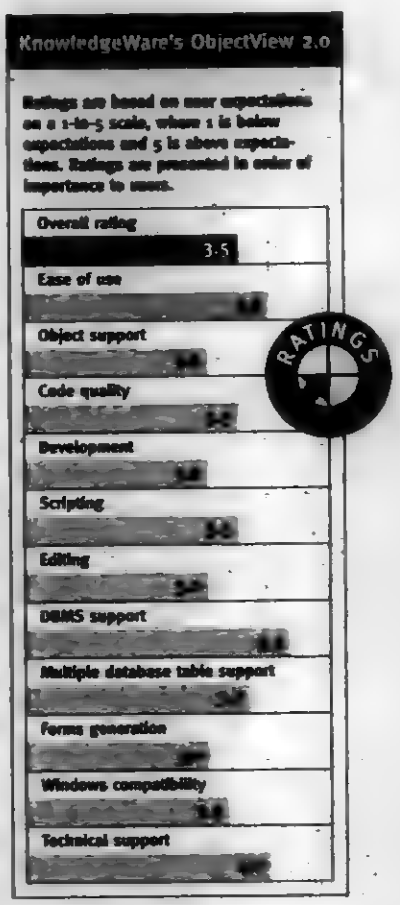
In addition, KnowledgeWare officials have stated that they intend to integrate ObjectView with the company's Application Development Workbench (ADW) CASE tools during the coming year. By the end of this year, ObjectView will have bidirectional links to the company's Analysis and Design Workstations (see story page 84).

For this evaluation, *Computerworld* interviewed four users of ObjectView who had been working with the tool prior to the KnowledgeWare acquisition. All had developed and deployed applications built with previous versions of ObjectView, and all had used beta-test copies of Version 2.0 to varying degrees. At the time of this evaluation — late March — ObjectView 2.0 had been in general release for little more than one week.

ObjectView is the fruit of a little-known Basic language tool originally released by Matesys in May 1990. The tool, ObjectScript, was the first Basic programming tool specifically made available for Windows 3.0. Much of that language remains today in ObjectScript, the ObjectView scripting language.

ObjectView 2.0 adds a number of new features and support options to the conventional client development tool feature list. Along with the usual array of buttons, windows and dialog boxes, the new version of ObjectView offers a spreadsheet object, business graphics, a "panel object" that can read database dictionaries and a debugger with stepping, watchpoints and trace functions.

The survey used for this evaluation was created with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.



Installation descriptions for users who evaluated KnowledgeWare's ObjectView 2.0

SITE PROFILES

	Systems integrator	Health care provider	Utility	Bank
Applications	Accounting, commodities trading	Decision support	Natural gas tracking, customer information	Financial, equipment tracking, call tracking
Database(s)	SQL Server	Sybase, SQL Server	Sybase, SQL Server, Oracle	SQL Server, Oracle
Network operating system	NetWare	LAN Manager, Windows for Workgroups	Unix, NetWare, LAN Manager	LAN Manager
Number of ObjectView programmers	5	3	20	70
Number of ObjectView users	50	120	200	300

Ease of use

ObjectView was being used by the evaluators to create applications supporting up to 300 users. With applications ranging from simple executive information systems with limited database queries and presentation screens to sophisticated transaction applications with up to 200 database tables, the evaluators were able to put ObjectView through its paces.

In all cases, ObjectView was being used by professional programming staffs. Evaluators did not recommend ObjectView as an end-user programming, querying or reporting tool.

Object support

To the standard array of buttons, dialog boxes and menus, ObjectView 2.0 adds a new set of built-in objects to ease development. These include a panel object that converts a database into manipulatable ObjectView objects, a spreadsheet object with the features one might expect in any spreadsheet and a graphics object with support for bar, line, scatter and other common charts. The lat-

ObjectView, *page 84*

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Users are pleased with KnowledgeWare's support of ObjectView after acquiring it from Matesys

CONTINUED FROM PAGE 82

ter two objects can be used with database queries.

Evaluators were mixed in their responses to other object enhancements in Version 2.0.

Utility: "The table object makes up for some of the functions lacking in the report area."

Code quality

ObjectView includes a runtime module to execute applications on each client system. Evaluators said the execution speed of compiled ObjectView applications was on par with other tools.

Systems integrator: ObjectView applications "run faster than some applications we've seen running under PowerBuilder."

Development tools

ObjectView's new debugger with stepping and tracing was applauded by the evaluators. They had not used the new object manager in Version 2.0, but they said they thought it would be useful for multiprogrammer projects.

Health care provider: "The debugger makes it easier to see intermediate values without creating additional [testing] objects."

Editing

The ObjectView editor allows searching for parameters and functions in an application, but it lacks support for multiple source-code files. Functions can be cut and pasted into an application from the on-line Help system.

Bank: "The ability to pull in outside SQL files makes it very strong."

DBMS support

Evaluators were generally using ObjectView with SQL databases such as those from Oracle Corp. and Sybase, Inc., although Version 2.0 supports six databases, three database application programming interfaces and five database gateways.

Health care provider: "I give high marks to any product I can take out of the box and have working with Sybase."

Multitable support

Even though the largest reported application used 200 database tables and 120 screens, none of the evaluators were accessing more than a single vendor's database from a single application, although heterogeneous database access is supported within ObjectView applications.

ObjectView 2.0 features

- New object-level panel provides high-level representation of database tables.
- Interactive application debugger with code tracing, stepping and breakpoints.
- Embedded spreadsheet objects.
- Direct support for six databases, three database APIs and five database gateways.

Forms generation

Evaluators said they were generally satisfied with the forms generation capabilities of ObjectView. They said they did not anticipate developing the complex forms made possible with Version 2.0's spreadsheet or graphing objects.

Windows compatibility

Evaluators reported no significant difficulties with Windows compatibility. One evaluator did experience problems using ObjectView with a specialized, high-performance video adapter. All said they would make use of the Multiple Document Interface capabilities in Version 2.0 but were bothered that ObjectView does not support Object Linking and Embedding.

Technical support

Evaluators had built strong relationships with the support staff at Matesys prior to its acquisition by KnowledgeWare and were concerned that the acquisition would affect the quality of technical support. However, their limited experience with KnowledgeWare's technical support has been positive so far.

Systems integrator: "Whenever we called, we got more than we expected. Since the KnowledgeWare acquisition, it's better."

Written and compiled by senior editor Garry Ray.

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KnowledgeWare responds

Donald Addington, KnowledgeWare's president and chief operating officer, answered questions about some of the issues raised in this evaluation:

Q: What are KnowledgeWare's plans, if any, to integrate ObjectView with the KnowledgeWare Encyclopedia?

A: Integration of ADW and ObjectView is one of our highest development priorities. Integration will be delivered in two phases — Phase I (available in June) allows developers to import objects and functions from the ADW/Design Workstation. Phase II (available later in 1993) links ObjectView to both the Analysis and the Design Workstations and allows bidirectional access to design objects.

Q: How does KnowledgeWare intend to support version control and configuration management in multiple programmer shops using ObjectView?

A: Version 3.0 (available in mid-1993) features an object repository allowing developers to share and reuse common objects, with underlying code, throughout their applications. Multiple forms of inheritance are supported at the object level. Version 3.0 will also provide check in, check out and version control.

Q: How will the acquisition of ObjectView alter the technical support policies instituted by Matesys?

A: They are significantly enhanced. ObjectView users now have access to KnowledgeWare's customer support organization, which is orders of magnitude more robust than Matesys was able to provide as a small start-up. We have preserved the variety of service plans customary for tools such as ObjectView. Customers can choose among maintenance service (fixes, minor enhancements), upgrade services (maintenance plus major enhancements), hot-line telephone support and TopView service (a combination of all services targeted at the ObjectView developer).

Q: What is KnowledgeWare's thinking on the general utility of point-solution client/server tools? How does this fit with the company's efforts in the upper-CASE area?

A: KnowledgeWare still believes in the fundamental importance of building systems and applications based on solid requirements. The current generation of point tools identifies requirements through iterative prototyping, CASE tools through a rigorous analysis and design process. We see a convergence of these approaches to yield powerful, easy-to-use tools for development of increasingly complex client/server applications and systems. Fundamental to this convergence is the expanded use of object-oriented techniques as a cornerstone of the development process. The next wave of development technology will have object orientation as its basis.

Q: Why did KnowledgeWare buy Matesys and ObjectView?

A: Our customers want visual development tools for rapid development of client/server applications, and they want the benefits of object-oriented development. ObjectView was architected to take advantage of object-oriented development techniques. We want to continue to be the No. 1 provider of application development tools and services, so we have to offer the kinds of products that have value to our customers today. We expect to continue to expand our product and service portfolio as the infrastructure for client/server applications matures over the next few years.

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NETWORK JAM

Client/server activities such as database updates can overburden your network — but not if you make sure it can expand by at least 30%

By James A. Hepler

Nothing can drain the lifeblood out of a client/server system faster than an inadequate network.

For one furniture manufacturer, whose client/server architecture supports its high-volume, rapid response shipping operation, slow data traffic nearly choked its operation to death. The numbers were startling: In six months of poor network performance, the company lost nearly $2 million in business and goodwill and at least $700,000 in employee productivity.

"Network problems were ruining our reputation and our business," a senior business manager explains. The company's was not the only reputation in peril: The information systems manager has since taken an "early retirement."

What happened to this firm isn't unusual in client/server setups. IS staffs generally spend more time and money worrying about raw connectivity and how to migrate than about whether the network will be robust enough and fast enough to handle what client/server throws at it. The result: The network can be the Achilles' heel of a client/server effort.

But it doesn't have to be if you put enough bandwidth behind your efforts. Client/server architectures strain networks for several reasons: Their distributed nature increases the network load, security and backup demands can be hefty and physical layout can slow things down as data meanders through bridges, routers and gateways.

Network killers

SOME CLIENT/SERVER ACTIVITIES PUT A HEAVY STRAIN ON YOUR NETWORK

CLIENT SERVER ACTIVITY	NET EFFECT
Two-phase commit and distributed network functions	Up network traffic 5% to 40%
Security checking	Hikes transaction volume 2% to 5%
[illegible]	[illegible]

Because client/server is a distributed technology, much more dialogue occurs between clients and servers than among machines in "traditional" terminal data access.

For instance, in an order processing and fulfillment operation, there is information flow between client and servers, as the client queries every server-resident database for information to fill an order. Important to this exchange is the two-phase commit, which synchronizes and updates databases on both ends of a transaction. A shipping order, for example, is guaranteed on both the sending and the receiving ends.

While two-phase commit is critical to database accuracy, it adds significant traffic to the system. With each update, numerous messages cross the network among nodes. Network traffic can rise from 5% to as much as 40% for systems with a complex distributed database.

For example, after the furniture manufacturer put its client/server system in place, it saw network response time for order processing climb from subseconds to 15 seconds and longer. Creating a pick list went from two to 30 minutes. This sluggishness was in part because of two-phase commit activity, which upped data volume on the network.

As business grew, so did overtime to complete a day's orders. Some employees, tired of waiting for the pick list to navigate the network, began shipping partial and incorrect orders. Same-day shipping with 99% accurate delivery in one or two days became delivery in a week, with questionable accuracy.

Network jam, *page 90*

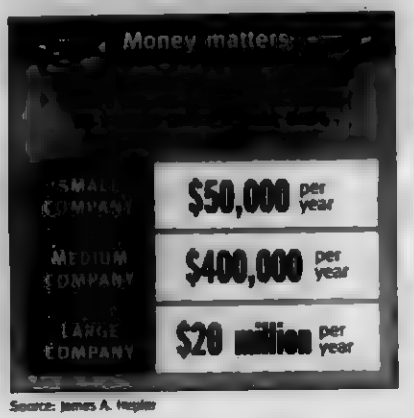
Network jam

CONTINUED FROM PAGE 89

The result was a dramatic increase in customer complaints and returned or canceled orders. Expenses related to incorrect shipments increased more than 600% in a six-month period.

The firm had two choices: add a second shift of eight workers — at $400,000 a year — or pump up the network bandwidth. Boosting bandwidth by 40% was the economical choice. Immediate network improvements cost $180,000, with another $100,000 budgeted for the future. The company upgraded the server, at a price of $75,000, to bring it up to speed with the more robust network.

Sufficient bandwidth is also important for handling peak loads that two-phase commit activities can create. For example, if the network goes down, clients can continue to work on a distributed database, but the system might not be able to post information to the server database. When the network comes back up, it's like a dam breaking: Updates flow all at once to all databases, temporarily worsening network performance.



Source: James A. Hepler

Source: James A. Hepler

Security checking between client and server can also slow transaction time and increase network traffic. Clients and servers must talk to each other not only to ensure authorized users are on the network but also to find out whether the physical client machine is legitimate and not a hacker attached to the network. Such security checking can add 2% to 5% to the volume of network transactions.

Even activities such as backup and recovery can be a burden on a client/server network. Depending on the frequency and times a company backs up a client to a server, large bursts of data hit the network. That's not a problem until production work passes through the network at the same time backup and recovery are happening. The result is a reduction in network bandwidth and a delay in getting production data to its destination.

After it moved from a mainframe-based to a client/server architecture, one cement manufacturer found that the only sensible way it could back up critical data was to reduce network operating time.

While bridges and other connectivity tools helped ease network operation for this cement manufacturer, they can cause problems when part of a legacy system. Data center-based networks have grown and evolved during the last 20 years into a hodgepodge of hardware and software, including a variety of bridges, routers and protocol converters. It is likely that a major company may have 50,000 users tied together through every type of network imaginable, from asynchronous dial-up to IBM Systems Network Architecture to Token Ring to local-area network connections.

When you pit client/server's increased data traffic against the challenging physical layout of these "evolved networks," the result is not pretty.

Passing through protocol converters or system software, such as VTAM, to make physical connection to a database server can cause network delays. These delays not only affect the client/server application but can also affect other networks through which data passes. Certain physical configurations can increase network overhead by 10%, creating delays of five to 10 seconds.

The more clients and the more disparate their locations, the more complex this process becomes.

Plan with purpose

Underestimating the amount of traffic in a client/server network isn't unusual in these early days of the technology. Traditional network planners aren't familiar with this environment and overlook the toll extra transactions such as security and two-phase commit can take on the network. These network planners are used to asking, "How many orders do you transmit per hour?" or "How much data is in an order?" What they are not used to asking is, "How many servers need updating?"

Companies need to build a network that can grow with their client/server aspirations, one that is adequate and expandable enough so they only have to do minor alterations over two or three years. One rule of thumb is to implement a network that can grow at least 30% before it gets saturated.

A major manufacturing company found out the hard way that it didn't have enough network to handle client/server. While the company could add departments to the $1.2 million backbone as they came on-line, the increased traffic pushed the backbone to its limits. Fourteen months after it bought the network, the company had to rip it out and replace it at a cost of $1.6 million. Savvy planning could have saved the company some money; it had the option initially to purchase an expandable backbone at an incremental cost of $300,000.

If your network can handle a peak amount of data with minimal delay at times of heaviest production use, it is at least in the bandwidth ballpark for client/server. •

Mind meld

TO DETERMINE IF YOUR NETWORK IS ADEQUATE FOR CLIENT/SERVER, ASK YOURSELF THE FOLLOWING QUESTIONS:

1

2

3

Breaking point

The point at which an IS manager will say with conviction, "The response time on my network is unacceptable" is difficult to predict. He may be willing to endure slower response time to save some money.

One IS manager at a market research firm was willing to go from a two-second response time with his traditional system to a five-second average response with client/server because of the savings. The client/server system's network and systems were 10 times cheaper than what he was using previously, saving the firm $3 million a year.

For mission-critical transactions, however, IS may put a priority on fast response times.

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Hepler is a Detroit-based senior technical consultant at Hewlett-Packard Co.'s mainframe alternative practice, which is part of the company's Professional Services Organization.

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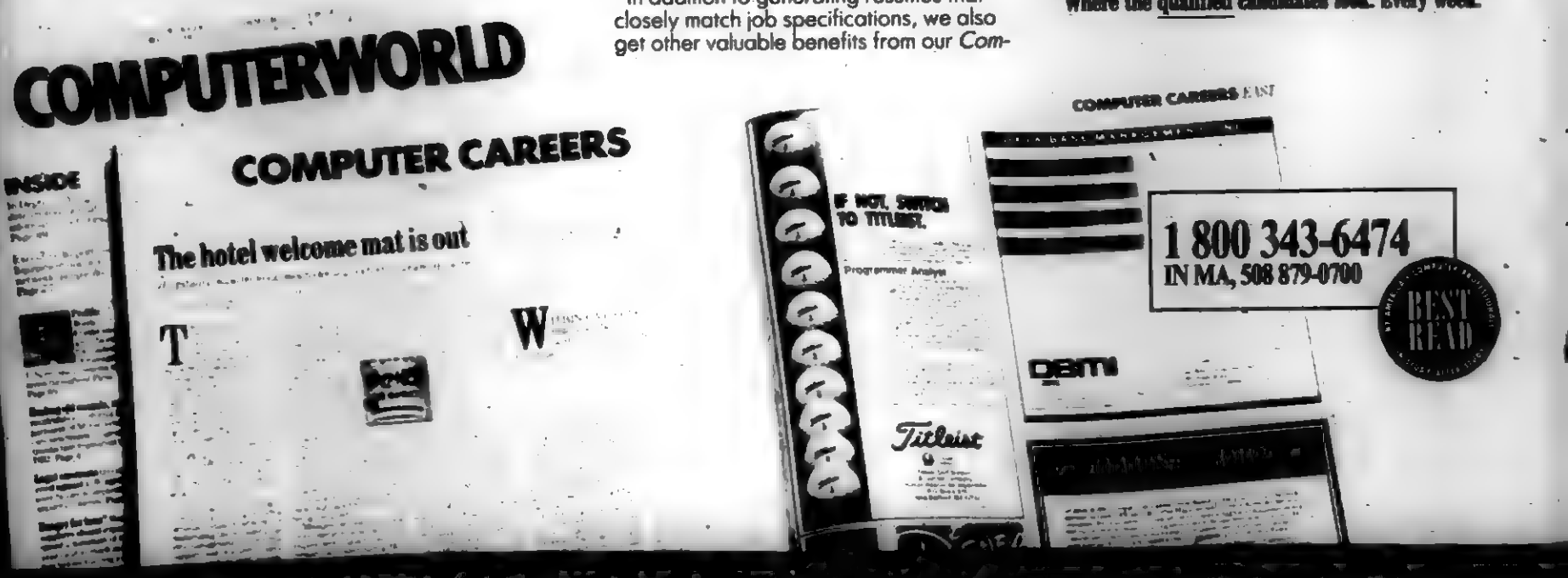

Self-assessment strategy

Look at the present to plan for the future

By Naomi Karten

COMBINE THE QUICKENING pace of business and technological change with increasing pressure to cut information systems costs, and wise IS personnel will realize that it's up to them to plan for their career futures.

Developing an action plan for your career requires a willingness to do a little analysis and self-assessment. Once you've done that, it's time to put your career plan in writing and establish a time frame for a periodic reassessment of your progress.

Take a minute to jot down your professional goals, both immediate and over a five-year period. Take a look at how your goals may have changed in the past several years or even since you took your current job. Sometimes, careers take an unplanned twist — an outsourced IS department, for example.

Once you've established a career time line, check your progress against it periodically. If, for example, you want to move from a technical position to a more management-oriented job, your goals should reflect incremental steps to achieve that end.

Your company

With the big picture in focus, it's time to start by answering some commonsense questions; putting them on paper can add perspective.

■First, are you familiar with the education and job options your company offers for professional development? Many companies offer numerous options for career advancement, both in technical and management positions. For example, a stint in a user department could broaden your perspective on the problems IS is called on to solve.

■What two key areas do you want to improve? These could range from a broadened understanding of your business to developing expertise in client/server architecture.

■Do you keep current with changes in the IS world? Do you routinely question the implications of these changes relative to your own advancement?

■What other skills must you work on to advance in your IS career? Many IS positions require competence in listening, negotiating, managing conflicts, influencing and gaining concensus.

■In your current post, what options are available to you to gain skills needed to move ahead?

■What specific steps will you take in the next 12 months to acquire these skills and experiences? How will you measure your success?

■Pinpoint the people who can help you gain a perspective on your current status and your options for the future.

Where are you now?

So now you know where you want to be in five years and whether your current company can get you there. What about your current job?

Here are some issues you should consider.

■How would you describe your current position? This should be done strictly in terms of the work you actually do. Why? Many people have a title such as programmer/analyst, not because it describes their work but because their company has not yet come up with a title that better suits their responsibilities.

■What aspects of your job do you particularly like or dislike? Consider specific tasks, such as database design or performance reviews, as well as general responsibilities, such as managing a development team or providing PC support.

■What technical, analytical, interpersonal and management skills does your position require? Which of these skills is most valuable for the next position you'd like to have? What skills would you like to develop or use that are outside your current position? Why are they outside your current scope?

■Lastly, think about your office environment. For example, do priorities change constantly? Is management receptive to risk-taking?

Technology track

If you want to stay technologically current, you have to do the homework. First, assess how up-to-date your company is technologically. How much interest does IS have in leading-edge technologies such as client/server, object-oriented design, network management, workgroup computing and desktop operating systems (e.g., IBM's OS/2 and Microsoft Corp.'s Windows NT)?

■What new technologies does your organization view as integral to its ability to successfully respond to corporate goals and responsibilities?

■What has been the impact of these technological changes on your IS organization and your current position? What about the future? For example, if you're a Cobol programmer in a company moving to client/server, it's time to learn new skills.

■What is your level of expertise in using, supporting or managing emerging technologies? What steps have you taken to become conversant with technological changes?

■What has been the impact of the growth in end-user computing in your company on the division of computing responsibilities between users and IS?

■What is your reaction to the technological changes now taking place?

Once you've determined your goals, it's up to you to take action to make them happen. This could mean talking to your manager about taking on more responsibility. Or it may be time to look outside your company.

You might also use this checklist as a way to identify new technologies you'd like to learn more about, as well as a way to measure where you are against where you want to be.

Karten is president of Karten Associates in Randolph, Mass., and author of *Managing expectation: Dealing with people who want more, better, sooner, faster, now!* Her MCI Mail address is NKARTEN.

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Career advice for the '90s

International jobs worth a look

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest is Steven B. Fogle, a managing director at the Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q. I have a computer science degree with eight years' experience. Because of a recent financial hardship, I need to increase my income substantially.

I've been thinking of looking in Saudi Arabia. What opportunities are available there? What other options might I consider?

A. An international position can be financially lucrative if you are willing to make that type of personal sacrifice. Depending on how much you need to increase your income, you may also want to consider a sales position using your technical background or become a consultant, which requires significant travel. Both positions can pay much more than most information systems jobs.

You can also work as a contract IS employee on long-term projects that pay much more than full-time, in-house positions.

Q. I received my associate's degree in computer science and plan to obtain a bachelor's degree this summer. I've been looking for a job, but everyone wants at least two years' experience and/or a bachelor's degree. How can I find an entry-level programming position?

A. Try to find a job using your administrative skills in an IS department. While in this type of position, you can learn about programming positions and how you can direct your skills after finishing school.

Large companies might support your movement into a programming position while you continue your education. Smaller firms may let you wear several hats and assume some programming responsibilities.

Q. I have been the IS manager at a medium-size company for four years. I have 18 years of IS experience. Economic conditions prompt me to explore the market.

Unfortunately, when I speak to IS recruiters, they tend to look only for similar positions and not for the "move up" that I am looking for. Is there a different type of recruiter that specializes in high-level posts?

A. The best way to find these jobs is to create opportunities yourself. Identify companies where you would like to work and make contacts with senior IS management at each one.

Contact the major retained general management search firms. These can be found in the Directory of Executive Recruiters, and such firms specialize in recruiting professionals for senior IS management positions.

Q. I have 12+ years' experience in data processing. For the past two years, I've worked at a software vendor. I spend most of my time at client sites coding Natural and Construct and teaching my company's software products. But by not being in the office, it's hard to keep up with technologies. How can I keep up to date?

A. It appears that your interest lies in software development. You might pursue this in a company where you can use your computer-aided software engineering experience.

You may also have to make a career change into a systems shop where you can learn design processes and work with a development team.

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If you have a career question you've always wanted to ask your boss but haven't had the courage, Raymond Perry has your answer. The chief information officer at Avon Products, Inc. will be our Fast Track guest adviser in the May 24 issue. If you'd like him to answer your career question, fax it to Kelly Sewell by May 5 at (508) 875-8931 or call our Fast Track line at (800) 343-6474, ext. 522.

How to prepare an IS-related development project

■ Regardless of who you present it to, you really need to find a champion for the idea — someone in the user community or the IS department who will go to bat for you. That's key to getting any of these applications projects acknowledged.

Greg Klein, MIS manager
Sara Lee Personal Products Training Division, Winston-Salem, N.C.

■ I would approach my boss directly after I had evaluated what the project would require. We're understaffed, so we would have to determine how to spread our resources. Then, my boss and I would take a fairly well-developed proposal to the user department head.

Jerry Weinberger, senior systems analyst
New York City Department of Transportation, New York

■ In my company we have a program specifically for that process called "Kaizen," a Japanese word that means continuous improvement. We have a facility for initiating ideas so that we get credit for them and so they are evaluated by management. I've had several ideas accepted for new, small applications.

Andrew Blakeslee, programmer/analyst
Darnell-Jeakens, Jacksonville, Fla.

■ Approach the user first and propose the application from his perspective. Design it the way you think he would think it should operate, even though he didn't come up with the idea originally.

Joe Banks, programmer
The Bowlin Co., Shreveport, La.

Compiled by Leslie Goff, a free-lance writer in New York.

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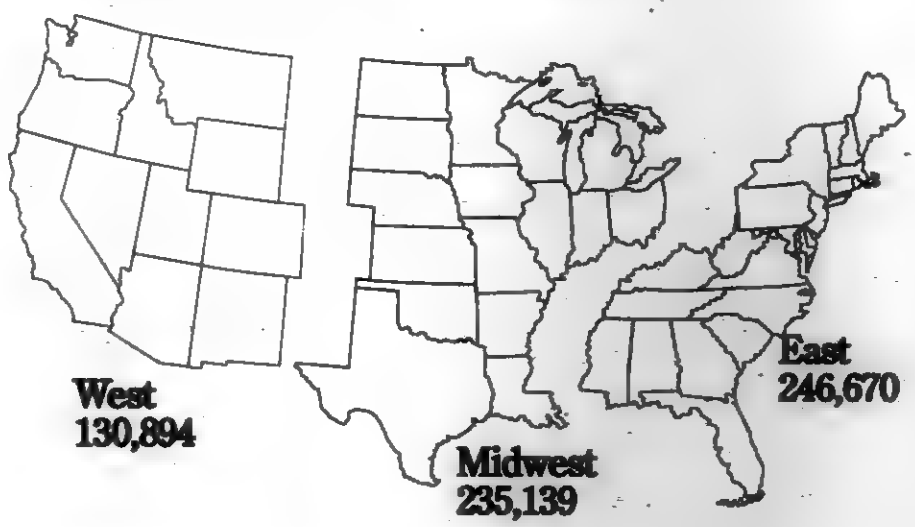

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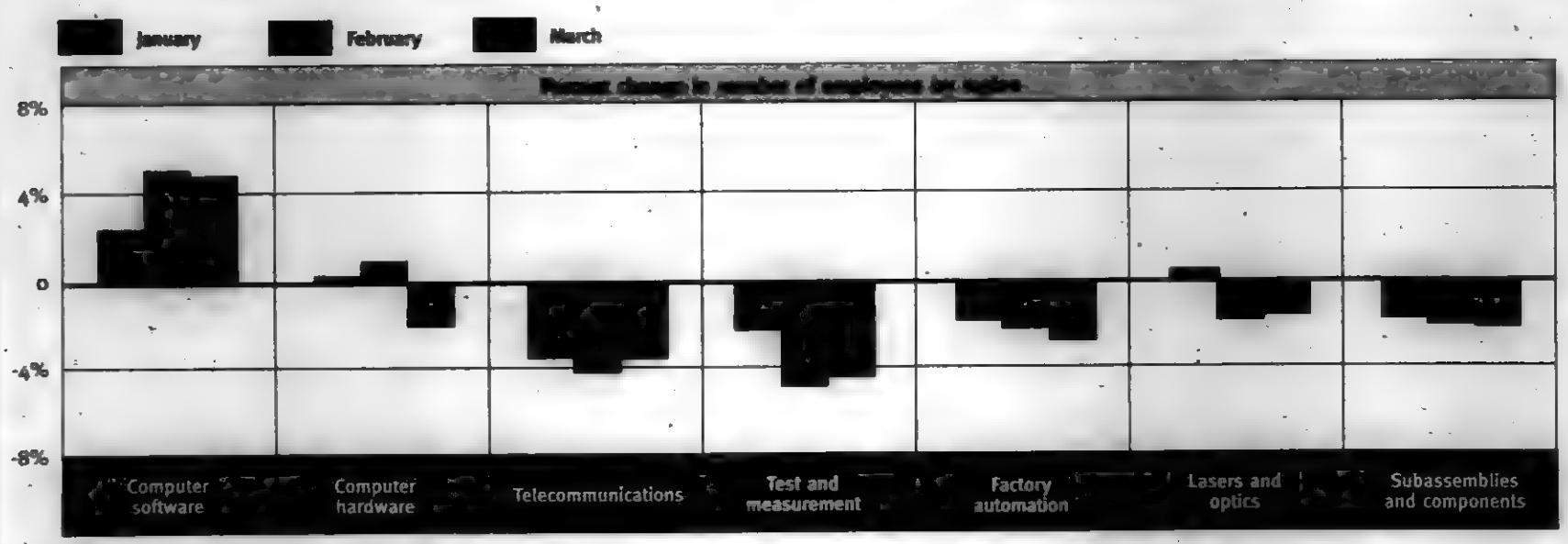
Computerworld/CompTech Career Index

The computer software industry steadily hires while other industries continue to cut back



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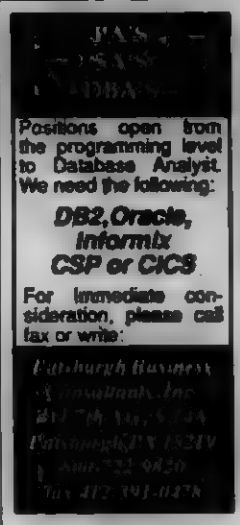

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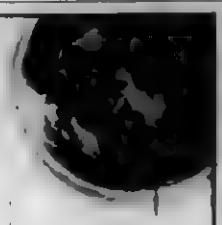

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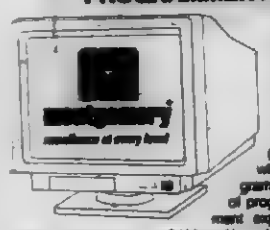

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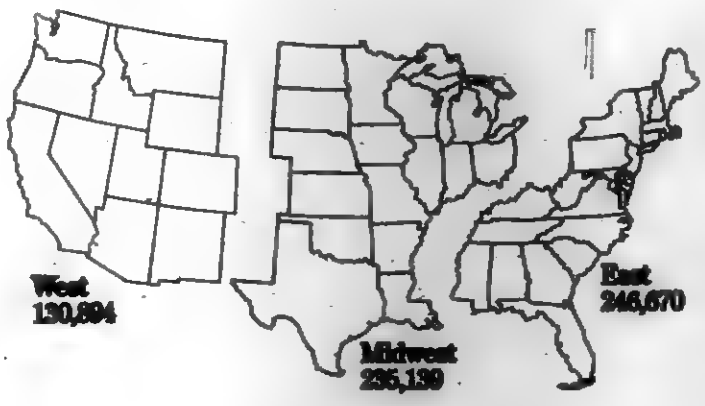

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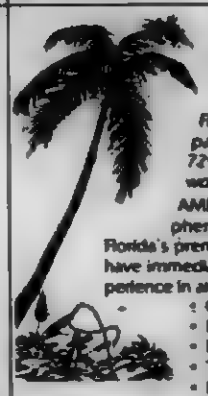

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When your PC vendor goes belly-up

shopper alert!

By Alice Bredin

Should you worry when your PC vendor disappears? Only a little, say information systems veterans. Companies contacted for this article fared well when faced with this dilemma by planning ahead and not panicking. Here's how they did it:

A few months ago Harvard University lost its key PC provider. Tandon Corp. filed for Chapter 11 bankruptcy protection, leaving the university with approximately $80,000 worth of Tandon computers and PCs. For Harvard, this meant no more warranties, no more technical assistance and no more spare parts.

However, the lost warranties and technical support did not worry Harvard's IS staff — they could handle most PC repairs. The real problem was getting parts for the machines. "Essentially, we are facing using generic parts to the extent that they are available," says Dick Sullivan, manager of technical services.

Harvard also plans to contact the company that bought out Tandon's stock, as well as other sources, to continue the flow of spare parts. "We are cannibalizing the machines we have in stock to keep machines in use going," Sullivan says.

Under the circumstances, Harvard's IS staff, like the staffs at many firms, is coping well with a PC vendor that's gone belly-up.

One reason for this success is that more firms are maintaining their own PCs to begin with. According to a Dataquest, Inc. survey, 50% of all Fortune 1,000 firms handle traditional PC service and support in-house, and another 27% use both in-house and outside services.

Companies that receive service from third parties can usually expect their agreements to be honored even if the vendor shuts itself down.

Even if you don't have in-house support now, it can be brought in easily by purchasing service manuals and tools from the defunct vendor, says Stephen Clancy, associate director of desktop support services at Dataquest.

No one home

One company forced to bring service in-house was Roland R & D Chicago, Inc., a research and development subsidiary of a musical instrument manufacturer. When staff technicians called QIC, they discovered that their PC vendor's phone had been disconnected. At first, Everex Systems, Inc. supported the PCs because it had manufactured QIC's systems, but it stopped service less than a year later. "We've fixed things ourselves because a lot of us have had similar problems," says Loch Milaw, project engineer at Roland R & D.

The real hassle for most companies is obtaining parts and upgrades. "I don't know of any parts you can't get some way, but it may cause you a lot of headaches," says Dennis Smeltzer, editor of *Service and Support Management*, a magazine devoted to service and support professionals in Overland Park, Kan.

HOW THE PROS COPE

Why do companies succeed?

- They service their own PCs: 50% of Fortune 1,000 companies handle traditional service in-house.
- They bring service in-house by purchasing service manuals and tools from the defunct company.
- They regularly stock parts based on the life of the product.
- They move critical applications off equipment from defunct vendors when parts become too expensive or difficult to find.

The biggest hassles?

- Finding parts and upgrades.
- Third- and fourth-party vendors' markups on defunct equipment.

For starters:

- Call the vendor's strategic service partners (generally third-party service providers) to see if the company is still providing service.
- Call the vendor's trustee to locate laid-off service technicians who may continue to service your machines.

In addition, third- and fourth-party vendor markups on defunct equipment may be prohibitive.

For some companies, scavenging parts is a way of life. Brad Elliott at Amoco Production Co., for instance, has seen his PC vendors disappear so many times, he knows what to do before it happens.

As the supervisor of field computing technology support at the Houston-based oil and natural gas exploration and production division of Amoco Corp., Elliott regularly stockpiles parts based on the life of a product, such as clone motherboards that will fit in all his PCs. He also purchases PCs and scrape them for parts even when a vendor looks financially healthy. If certain parts are too difficult or expensive to find, Elliott moves the work load to another system.

Other IS veterans move PCs from defunct vendors out of mission-critical areas even before they look for suppliers. "We don't want machines with a questionable parts supply to be used as servers," Sullivan says.

Action plan

If your PC vendor goes under, the first step is to follow up with the vendor's strategic service partner, generally a third-party service provider, to see if maintenance is still being provided. If it's not, firms should call the vendor's trustee to locate the laid-off service technicians, who may be working on their own or at a new firm.

Overall, IS staffs who have faced this experience say there isn't necessarily that much difference between when a PC manufacturer is in business and when it's not. "Just because a company went out of business doesn't mean it has an inferior product," says Charles Thompson, general manager of the Boston Computer Exchange Corp., which buys and sells brand-name used computers. "A lot of companies still in business wouldn't be able to get you parts for a four- or five-year-old machine anyway."

Bredin is a free-lance writer based in New York.

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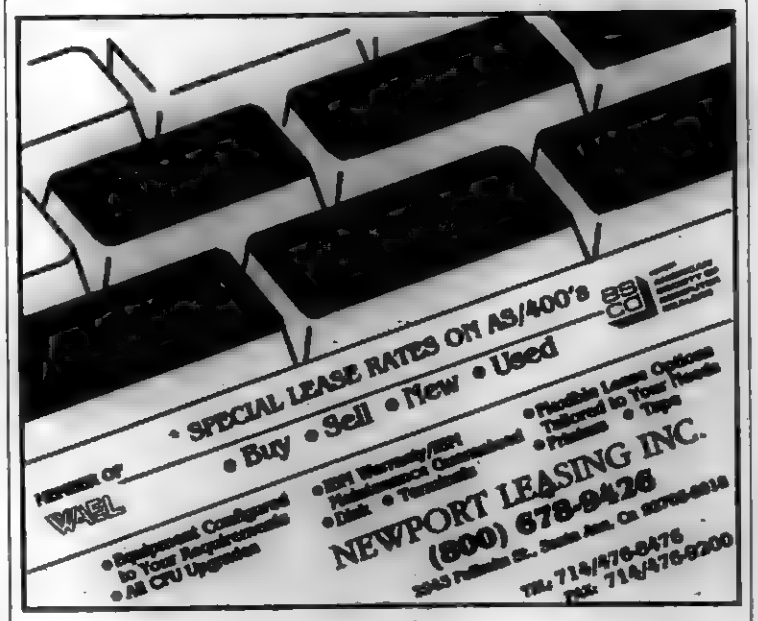

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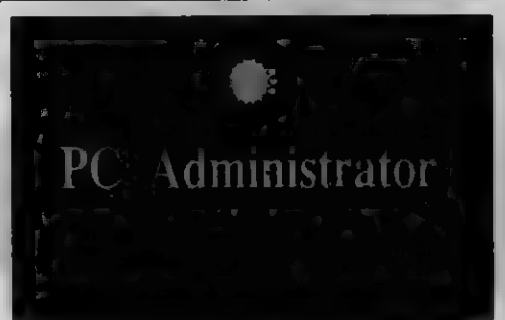

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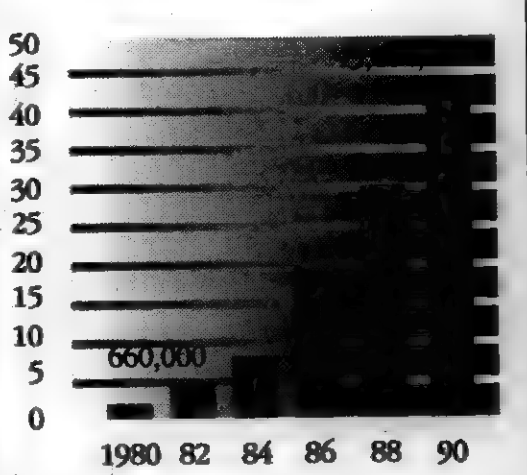

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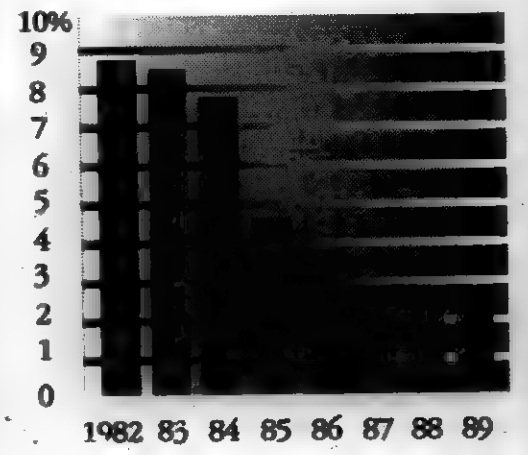

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Armco Advanced Materials Co. 58
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Bachman Information Systems, Inc. 64,75
Banner Software, Inc. 60
Banyan Systems, Inc. 25,37
Baxter Healthcare Corp. 1
BBN Communications 51
BDM International, Inc. 58
Becton Dickinson & Co. 109
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Borland International, Inc. 1,73,81
Bosch Storage Systems 60
Bose Corp. 67,72
Boston Computer Exchange Corp. 100
Breakaway Software 6
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Cabletron Systems, Inc. 20
California Dept. of Motor Vehicles 16
Canada Mortgage and Housing Corp. 51
Cascade Communications Corp. 16
Centers for Disease Control and Prevention 39
Central Point Software 14
CGI Systems, Inc. 81
Citgo Petroleum Corp. 14
Cognos, Inc. 64
Commodore Business Systems, Inc. 39
Compaq Computer Corp. 14,39
Computer Associates International, Inc. 8,81
Computer Design Professionals 73
Computer Information Enterprises, Inc. 2
Computer Intelligence/Infocorp 25,39
Concurrent Computer Corp. 58
Conner Peripherals, Inc. 108
Conservatree Paper Co. 14
Continental Grain Corp. 25
Control Data Systems Corp. 6
Convex Computer Corp. 45
Cooperative American Physicians 25
Coopers & Lybrand 64,67
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Data General Corp. 48
Dataquest, Inc. 1,25,28,45,100
Dell Computer Corp. 39
Delmarva Power & Light Co. 20
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Digital Equipment Corp. 8,14,20,45,48,58,109,110
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E

Easel Corp. 6,80,81
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Environmental Protection Agency 14
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Fifth Generation Systems, Inc. 39
First Market Research Corp. 80
Florida Power Corp. 65
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Forrester Research, Inc. 45
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Fox River Financial Resources, Inc. 41
Frame Technology Corp. 1
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G

Gartner Group, Inc. 12,16,60,67
Gateway 2000 Ltd. 39
Generic Software, Inc. 60
Graphic User Interfaces, Inc. 73
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Great Western Bank 65
GreenDisk Co. 14
Gupta Corp. 73,80,81

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Hewlett-Packard Co. 8,14,25,45,52,60,80,110
Hitachi Data Systems Corp. 6,80
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Hudson Foods, Inc. 1
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I

IBM 1,6,8,10,14,20,25,37,39,45,51,58,60,89,109
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J

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KnowledgeWare, Inc. 6,63,73,81,82
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L

Labtech Corp. 41
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M

Manager Software Products, Inc. 81
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Maxtor Corp. 108
McCaw Cellular Communications, Inc. 1,51
McData Corp. 20
MCN Corp. 8
Memorex Telex Corp. 60
Merrill Lynch Global Securities 8
Meta Group, Inc. 8,75
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Microsoft Corp. 1,4,6,8,14,25,37,39,41,45,51,52,73,81,82,110
Midwest Stock Exchange 1
Millers Group 45
Missouri Highway and Transportation Department 12
Mitre Corp. 45
Mitsubishi Motor Sales, Inc. 67
Monsanto Co. 1
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National Car Rental System, Inc. 8
National Medical Enterprises 25
National TechTeam, Inc. 16
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NCR Corp. 14
NDMA, Inc. 67
NetLabs, Inc. 6
Netron, Inc. 81
NetTech, Inc. 20
Network Software Associates, Inc. 6
Neuron Data, Inc. 54
New York Life Insurance Co. 10
Northgate Computer Systems, Inc. 39
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O

Object Design, Inc. 6
Old Dominion University 67
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Open Environment Corp. 81
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Oracle Corp. 16,60,63,67,73,110

P

Pacific Bell 16
Pacific Gas & Electric Co. 14
Pacific Studies Center 14
Packard Bell 39
Patricia Seybold Group 73
Patrol Software, Inc. 110
Paul Kagan Associates, Inc. 51
PeerLogic, Inc. 109
Performance Computing, Inc. 80
Perkins Coie 4
Perot Systems Corp. 8
Petrotechnical Open Software Corp. 110
Platform Computer Corp. 45
Platinum Software Corp. 109
Popkin Software Systems, Inc. 75,81
Powersoft Corp. 63,65,75,80,81
Praendix, Inc. 67
Pratt & Whitney 16,45
Progressive Corp. 67
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Q

Quaker Oats Co. 67

R

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Robert Bosch GmbH 60
Roland R & D Chicago, Inc. 100

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Salomon Brothers, Inc. 108
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Shell Group 52
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SmartStar Corp. 73
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Software 2000, Inc. 8,109
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Software Transformation, Inc. 109
Southern California Gas Co. 65
Spring Industries 2
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Sprint Corp. 51
Stac Electronics, Inc. 39
Sterling Software, Inc. 58
Storage Technology Corp. 60
Summit Strategies 16
Sun Microsystems, Inc. 16,20,25,37,41,45
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Symantec Corp. 16,39
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System Software Associates, Inc. 64

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Tele-Communications, Inc. 51
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Texas Instruments, Inc. 14,81,109
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The Genix Group 58
The New England Mutual Life 73
The Pillsbury Co. 65
The Santa Cruz Operation 25
The Vmail Co. 28
The Yankee Group 1
Thompson-CSF, Inc. 109
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Ungermann-Bass, Inc. 16
Uniface Corp. 73,80,81
Unisys Corp. 14,58
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University of Wisconsin 51
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Unocal Corp. 4
Unum Life Insurance Co. 4,67
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V

Vanguard Communications Corp. 28
Verity, Inc. 48
Versant Object Technology 6
ViewStar Corp. 45
VMX, Inc. 28
Volkswagen of America, Inc. 5

W

Walker Interactive's Financial Application Software 2
Weizer Associates, Inc. 2
Whirlpool Corp. 55
Wolfram Research, Inc. 41
WordPerfect Corp. 1,2,4,16
WorkGroup Technologies, Inc. 1,10

X

Xccelerated Systems, Inc. 48
Xerox Corp. 37,67,72
XSoft 37

Z

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Zenith Data Systems 10

Gainers / Losers

Percent

McAfee Associates	42.9	Sierra Semiconductor	-36.3
Advanced Micro Devices (H)	38.5	Brooktree Info. Systems (L)	-25.0
Group I Software	25.0	Cambrex Corp.	-18.4
ISMS	23.2	Exabyte Corp.	-18.8
Intelligent Info. Systems	22.1	American Mgmt. Systems	-17.3
MathSoft	21.9	Ask Computer Systems	-17.0
Picturetel Corp.	20.3	Intel Corp.	-16.0
Raytheon	18.9	Xircom Inc.	-16.0

Dollar

Advanced Micro Devices (H)	7.25	Intel Corp.	-17.75
Silicon Graphics	4.38	Cabletron Systems (H)	-5.25
Intelligent Info. Systems	4.25	Microsoft Corp.	-5.25
Informix Corp.	3.88	Powersoft	-4.50
EMC Corp.	3.75	Sierra Semiconductor	-4.13
Picturetel Corp.	3.25	American Mgmt. Systems	-4.00
Autodesk Inc.	3.00	AT&T (H)	-3.38
IMRS	2.88	Dell Computer Corp.	-3.38

Cold storage

The PC disk drive industry suffered through a "self-destructive" first quarter this year, according to Salomon Brothers, Inc. analysts John Dean and Kristienne Perry.

A surprising price war kicked in to put pressure on drive manufacturers' revenue and gross margins, Dean and Perry said in an April 15 report.

Technology difficulties in moving to new drives' forced Conner Peripherals, Inc. (CNR) and Maxtor Corp. (MXTR) to derive more revenue from sales of older models with lower capacity and lower profit margins. An oversupply of high-capacity models ultimately resulted in putting heavy price pressure on models of all sizes. Manufacturers were forced to drop high-end model pricing to compete on a cost-per-megabyte basis with the older drives.

For example, Salomon Brothers estimated that prices of 340M-byte disk drives dropped nearly 21% in the first quarter. Overall, it estimated that prices declined 15% in the first quarter for disk drives with capacities of 340M bytes or less, coming on top of a 9% drop in the fourth quarter of 1992.

Drive suppliers' stocks tend to rise or fall as a group, Dean and Perry noted. The shares typically rise only when investors are confident that the companies will be able to sustain gross margins of 20% or higher. Salomon Brothers said it expects the composite margin for the group to stay below that level until the fourth quarter of this year, although investor anticipation could push the stocks up somewhat earlier.

For now, Salomon Brothers is advising investors to stand pat on most of the drive companies' stocks.

—Derek Slater

Salomon on disk drives

RATINGS FROM SALOMON BROTHERS FOR DISK DRIVE MANUFACTURERS

Conner Peripherals, Inc.	13 1/8	Buy
Maxtor Corp.	7 7/8	Hold
Micropolis Corp.	6 1/2	Hold
Quantum Corp.	13 1/8	Hold
Seagate Technology, Inc.	15 5/8	Buy
Western Digital Corp.	5	Hold

Source: Salomon Brothers, Inc.

Exch	52-Week High	52-Week Low		Apr 23 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	36.75	9.63	3 COM Corp.	30.88	0.00	0.0
NYS	80.25	61.38	American Info Techs Corp. (H)	77.13	-2.13	-2.7
NYS	60.38	40.63	AT&T (H)	56.50	-3.38	-5.6
OTC	3.56	0.75	Aztel Communication Corp.	2.19	-0.13	-5.4
OTC	24.50	10.25	Banyan Systems Inc.	17.00	0.25	1.5
NYS	56.75	42.38	Bell Atlantic Corp.	52.88	-1.75	-3.2
NYS	57.50	46.75	Bellsouth Corp	53.88	-2.88	-5.1
NYS	6.25	3.63	Bolt, Beranek & Newman	6.63	-0.50	-9.8
OTC	18.50	9.75	Brooktrout Technology	10.75	-0.75	-6.5
NYS	93.00	62.13	Cabletron Systems (H)	83.88	-5.25	-5.9
OTC	34.75	17.75	Compuserve Corp. (H)	29.75	-2.75	-8.5
OTC	48.25	16.50	Cisco Systems Inc.	42.50	-2.00	-4.5
OTC	20.50	5.50	Compression Labs Inc.	10.00	0.88	9.6
OTC	4.63	0.88	Data Switch Corp.	3.44	-0.50	-12.7
NYS	22.13	13.00	Digital Comm. Assoc. (L)	13.38	-0.38	-2.7
OTC	12.75	6.00	Digital Systems Int'l Inc.	6.25	0.25	4.2
OTC	31.63	4.00	DSC Communications (H)	31.63	1.75	5.9
OTC	9.50	4.75	Fibronics Int'l Inc.	6.75	0.00	0.0
OTC	28.50	8.75	Fiserv Corp.	11.00	0.75	7.3
OTC	4.38	1.50	Gandalf Technologies Inc.	2.94	-0.06	-2.1
OTC	2.06	0.69	Gateway Communications	1.06	-0.06	-5.5
NYS	11.50	2.88	General Datacomm Inds.	9.50	0.38	4.1
ASE	4.13	2.00	Go Video	2.31	0.00	0.0
NYS	37.75	30.63	GTE Corp.	34.88	-1.13	-3.1
NYS	84.25	62.50	ITT Corp. (H)	80.50	-2.75	-3.3
OTC	69.25	29.88	MCI Communications Corp.	48.00	1.00	2.1
OTC	12.00	2.25	Microcom Inc.	3.50	-0.25	-6.7
OTC	24.25	4.75	Netrix Corp.	5.50	-0.50	-8.3
OTC	19.00	8.75	Network Computing Devices (L)	10.50	1.50	16.7
NYS	15.38	5.38	Network Equipment Tech. (L)	6.50	0.75	13.0
OTC	23.25	8.00	Network General	10.25	-0.50	-4.7
OTC	15.75	8.50	Network Systems Corp.	9.75	0.63	6.8
OTC	64.00	13.63	Newbridge Networks Corp.	60.00	0.75	1.3
NYS	46.00	30.50	Northern Telecom Ltd.	34.50	-0.25	-0.7
OTC	35.25	22.50	Novell Inc.	31.25	-0.63	-2.0
NYS	92.50	74.63	Nynex Corp.	86.50	-3.38	-3.8
OTC	30.00	14.50	Octel Communications Corp.	21.25	0.63	3.0
OTC	6.75	3.38	Penril Data Comm Networks	4.25	0.00	0.0
OTC	40.50	10.25	Picturetel Corp.	19.25	3.25	20.3
OTC	15.25	5.25	Proteon Inc. (L)	5.88	0.13	2.2
NYS	30.38	10.16	Scientific Atlanta Inc.	24.75	0.00	0.0
NYS	81.50	59.38	Southwestern Bell Corp. (H)	77.50	-3.25	-4.0
NYS	33.25	21.00	Sprint Corp. (H)	33.13	0.38	1.1
OTC	27.00	8.75	Standard Microsystems Corp	13.38	-1.38	-9.3
OTC	18.50	6.88	Stratacom Inc.	12.25	0.75	6.5
OTC	107.50	19.75	Synoptics Communications	106.25	-0.50	-0.5
OTC	7.13	4.25	Telebit Corp.	4.38	-0.25	-5.4
OTC	9.38	2.13	Telematics Int'l Inc.	6.63	-0.50	-7.0
OTC	25.50	13.38	US Robotics	19.25	-1.75	-8.3
NYS	44.38	34.38	U S West Inc. (H)	42.88	-0.63	-1.4
OTC	46.50	12.00	Wellfleet Communications (H)	40.50	-1.75	-4.1
OTC	18.50	7.00	Xircom	9.25	0.13	1.4
COMPUTER SYSTEMS						
OTC	7.75	2.50	Advanced Logic Research (L)	2.88	0.00	0.0
OTC	65.25	61.50	Apple Computer Inc.	49.75	1.25	2.6
OTC	24.25	11.25	AST Research Inc.	13.75	0.38	2.8
NYS	13.38	4.38	Commodore Int'l.	4.50	0.00	0.0
NYS	58.50	22.25	Compaq Computer Corp.	49.38	-1.75	-3.4
OTC	49.88	15.00	Dell Computer Corp.	28.38	-3.38	-10.6
NYS	82.88	50.25	Hewlett Packard Co.	73.38	-0.38	-0.5
NYS	33.00	14.88	Silicon Graphics	31.88	4.38	15.9
OTC	41.00	22.50	Sun Microsystems Inc.	26.00	-1.00	-3.7
NYS	32.13	22.25	Tandy Corp.	28.75	-0.63	-2.1
OTC	11.00	2.75	Zeos International Ltd.	4.38	-0.13	-2.8
ARRAY SYSTEMS						
ASE	18.38	5.75	Amdahl Corp.	5.75	-0.13	-2.1
NYS	10.25	4.25	Convex Computer	4.75	0.13	2.7
OTC	6.13	1.88	Cray Computer	2.75	-0.38	-12.0
NYS	39.75	19.00	Cray Research Inc.	28.75	1.00	3.6
NYS	13.88	7.13	Data General Corp.	9.38	-1.25	-11.8
NYS	49.25	30.38	Digital Equipment Corp.	41.38	2.25	5.5
NYS	38.63	26.63	Harris Corp.	36.88	-0.75	-2.0
NYS	100.38	45.88	IBM	48.00	-0.88	-1.8
OTC	22.00	5.50	Kendall Square Research	14.50	-1.63	-10.1
NYS	122.00	83.00	Matsushita Electronics	119.25	-1.75	-1.4
OTC	17.00	6.00	Pyramid Technology	13.63	0.63	4.8
OTC	24.00	11.13	Sequent Computer Sys.	18.75	1.63	9.5
OTC	16.38	1.38	Sequoia Systems Inc.	2.25	-0.25	-10.0
NYS	48.50	29.50	Stratus Computer Inc.	33.63	0.88	2.7
NYS	16.88	9.88	Tandem Computers Inc.	10.75	-1.63	-13.1
NYS	13.88	7.75	Unisys Corp.	11.50	-1.75	-13.2
ASE	5.13	0.06	Wang Labs Inc. (H)	0.50	0.00	0.0
SOFTWARE						
OTC	49.25	25.25	Adobe Systems Inc.	47.25	3.00	6.8
OTC	22.25	10.25	Aldus Corp.	15.88	-1.13	-6.6
OTC	16.63	5.63	American Software Inc.	6.38	-0.63	-8.9
OTC	28.13	9.75	Ask Computer Systems	11.00	-2.25	-17.0
OTC	56.50	27.75	Autodesk Inc.	42.13	0.88	2.1
OTC	15.00	2.63	Bachman Info. Systems (L)	2.63	-0.88	-25.0
OTC	43.00	34.75	BGS Systems Inc.	37.00	-1.75	-4.5
OTC	84.13	37.25	BMC Software Inc.	45.25	1.00	2.3
OTC	28.25	17.00	Boole & Babbage	24.25	0.25	1.0
OTC	54.50	17.50	Borland Int'l Inc.	22.50	2.75	13.9
OTC	6.50	3.00	CE Software	3.38	-0.13	-3.6
ASE	23.38	6.25	Cheyenne Software Inc.	23.00	1.13	5.1
OTC	19.50	8.25	ChipSoft	10.00	0.00	0.0
OTC	9.75	5.63	Cognos Inc.	6.63	0.13	1.9
NYS	27.38	10.88	Computer Associates	23.00	-0.13	-0.5
NYS	12.38	3.25	Computervision Corp. (L)	3.38	-0.38	-10.0
OTC	34.25	19.25	Computware Corp.	23.25	-0.75	-3.1
OTC	15.75	6.50	Conshare Inc.	6.75	-0.88	-11.5
OTC	17.25	10.75	Corel Corp.	13.63	-1.13	-7.6
OTC	29.25	6.00	Easel Corp.	6.50	-1.50	-18.8
OTC	25.25	12.00	4th Dimension	19.00	-1.25	-6.2
OTC	22.75	6.50	Frame Technology (L)	6.50	-0.13	-1.9
OTC	20.75	10.50	Group I Software	13.00	2.50	23.8
OTC	35.25	19.50	Gupta (L)	21.00	-1.63	-7.2
OTC	8.75	3.50	Hogan Systems Inc.	7.00	-0.13	-1.8
OTC	25.75	11.25	IMRS	15.25	2.88	23.2
OTC	34.75	18.50	Information Resources	28.75	-0.38	-1.3
OTC	42.00	12.13	Informix Corp.	33.63	3.88	13.0
OTC	18.50	10.25	Intergraph Corp.	10.25	-0.38	-3.5
OTC	13.63	7.75	Interleaf Inc.	9.25	0.38	4.2
OTC	18.00	6.75	Intersolv Inc.	7.50	0.50	7.1
OTC	16.00	8.25	Knowledgeware Inc. (L)	8.25	-1.00	-10.8
OTC	34.75	27.75	Legent Corp.	27.75	-2.75	-9.0
OTC	33.75	14.75	Lotus Development	24.75	-0.75	-2.9
OTC	23.00	7.75	MathSoft	9.75	1.75	21.9
OTC	23.25	5.25	McAfee Associates	7.50	2.25	42.9
OTC	11.63	1.88	Meca Software (H)	11.38	-0.13	-1.1
OTC	15.00	5.25	Mentor Graphics	8.75	0.50	6.1
OTC	46.00	27.25	Micro Focus	32.00	-2.00	-5.9
OTC	19.00	4.38	Microgra ph Inc.	4.88	-0.25	-4.9
OTC	99.00	65.50	Microsoft Corp.	82.00	-5.25	-6.0
OTC	37.50	12.00	Oracle Corp.	33.75	0.38	1.1
OTC	31.88	15.38	Parametric Technology	25.75	-0.25	-1.0
OTC	40.50	22.50	Peoplesoft	29.25	0.25	0.9
OTC	9.50	3.50	Phoenix Technologies	4.88	-0.75	-13.3
OTC	40.00	28.50	Powersoft	29.25	-4.50	-13.3
OTC	25.00	11.25	Platinum Technology	13.00	-0.25	-1.9
OTC	61.50	29.00	Progress Software Corp.	35.25	0.50	1.4
OTC	18.00	2.94	Quarterdeck Office Sys.	3.72	0.09	2.6
OTC	24.50	11.75	Rainbow Technologies Inc.	20.75	2.50	13.7
OTC	16.00	4.00	Rasterops	5.50	0.88	18.9
OTC	15.25	3.63	Ross Systems	11.50	-0.13	-1.1
OTC	27.25	8.50	Sapiens USA Inc.	25.75	0.00	0.0
OTC	19.50	6.75	Software Publishing Corp.	8.00	-0.13	-1.5
OTC	9.13	2.00	Software Toolworks Inc.	7.75	-0.13	-1.6
OTC	4.88	0.75	Spinnaker Software	3.50	-0.13	-7.7
OTC	12.75	3.25	State of the Art	9.75	-0.25	-2.5
NYS	24.63	13.75	Sterling Software Inc.	20.13	-0.75	-3.6
OTC	18.75	8.00	Struct. Dynamics Research	16.50	0.50	3.1
OTC	62.25	21.00	Sybase Inc.	56.00	0.50	0.9
OTC	44.25	5.88	Symantec Corp.	13.13	-0.13	-0.9
NYS	12.50	5.25	Systems Center Inc.	10.50	-0.50	-4.5
OTC	35.50	10.00	System Software Assoc.	12.75	0.50	4.1
OTC	7.75	2.50	Tomric Corp.	3.88	-0.06	-1.6
OTC	22.75	9.13	ViewLogic Systems	15.25	0.50	3.4
OTC	23.50	6.75	Walker Interactive Systems	6.75	-0.75	-10.0
OTC	3.19	1.38	Wordstar	2.13	0.13	6.3
SEMICONDUCTORS						
NYS	31.50	7.38	Advanced Micro Devices (H)	31.00	7.25	30.5
NYS	21.38	9.00	Analog Devices Inc.	18.00	-2.00	-10.0
OTC	20.75	7.63	Atmel Corp. (H)	20.13	-0.25	-1.2
OTC	9.38	2.75	Chips and Technologies (L)	3.25	0.13	4.0
OTC	39.75	16.25	Cirrus Logic	21.13	0.63	3.0
NYS	12.38	7.38	Cypress Semiconductor Corp	10.25	0.25	2.5
NYS	16.13	7.00	Dallas Semiconductor	12.63	-1.00	-7.3
OTC	121.25	46.50	Intel Corp	93.00	-17.75	-16.0
NYS	14.13	4.88	LSI Logic Corp.	11.75	-0.13	-1.1
NYS	28.50	12.88	Micron Technology	22.38	1.75	8.5
NYS	74.88	37.13	Motorola Inc.	71.38	-0.13	-0.2
NYS	14.13	8.50	National Semiconductor	12.38	-0.50	-3.9
OTC	18.50	7.25	Sierra Semiconductor	7.25	-4.13	-36.3
OTC	38.50	22.25	SynOptics	35.25	2.75	8.5
NYS	63.38	32.25	Texas Instruments	55.63	1.13	2.1
OTC	8.88	6.00	VLSI Technology	7.13	0.50	7.5
OTC	7.63	2.13	Weitek	6.25	0.63	11.1
ASE	9.63	3.75	Western Digital Corp.	4.88	-0.25	-4.9
OTC	37.50	14.50	Xilinx	33.13	1.25	3.9
OTC	27.84	12.50	Zilog Inc.	25.25	2.25	9.8
PERIPHERALS AND SYSTEMS						
OTC	33.75	10.38	American Power Conversion	27.63	2.38	7.9
OTC	20.16	13.66	Arctic Inc.	18.25	1.50	9.0
OTC	18.00	6.25	Cambex Corp.	7.25	-1.75	-19.4
ASE	18.38	6.50	Cognitronics Corp.	7.50	0.38	5.3
NYS	25.50	12.50	Conner Peripherals (L)	13.13	0.63	5.0
OTC	38.50	10.75	Creative Technologies Inc.	28.25	-0.75	-2.6
OTC	30.75	14.25	Data Race Inc.	19.50	-0.50	-2.5
ASE	17.00	4.75	Dataram Corp.	9.00	0.13	1.4
NYS	28.75	8.16	EMC Corp.	28.75	3.75	15.0
OTC	10.50	5.38	Emulex Corp.	7.38	1.13	18.0
OTC	19.00	13.25	Evans & Sutherland	15.88	-0.13	-0.8
OTC	38.25	12.00	Exabyte	13.63	0.50	3.8
OTC	26.00	7.09	Intelligent Info. Systems	23.50	4.25	22.1
OTC	8.88	3.88	Iomega Corp.	4.25	0.13	3.0
OTC	23.00	5.75	IPL Systems Inc.	7.00	0.75	12.0
OTC	24.00	10.75	Komag Inc.	16.25	-1.00	-5.8
OTC	19.63	6.75	Maxtor Corp. (L)	6.75	-0.13	-1.8
OTC	11.75	5.75	Micropolis Corp. (L)	6.38	0.13	2.0
NYS	116.00	92.25	3M Corp (H)	113.13	-1.88	-1.6
OTC	7.75	4.00	Printronix Inc.	7.00	0.00	0.0
NYS	17.13	6.88	QMS Inc.	16.50	0.25	1.5
OTC	17.88	11.63	Quantum Corp. (L)	13.00	0.88	7.2
OTC	12.75	3.50	Radius Inc.	3.81	-0.06	-1.6
NYS	16.25	7.50	Recognition Equipment	13.13	-0.75	-5.4
OTC	13.88	5.25	Rexon Inc.	5.25	-1.00	-16.0
OTC	22.38	12.00	Seagate Technology	15.38	1.88	13.9
NYS	49.50	18.00	Storage Technology	27.13	1.50	5.9
NYS	27.88	16.88	Tektronix Inc.	26.50	-0.88	-3.2
NYS	88.88	66.75	Xerox Corp.	78.88	-1.50	-1.9
SERVICES						
OTC	23.50	12.66	American Mgmt. Systems	19.13	-4.00	-17.3
NYS	4.75	3.00	Aracoma Inc.	3.50	-0.38	-9.7
OTC	35.75	16.25	Analysts Int'l	25.75	0.00	0.0
NYS	56.13	38.75	Auto Data Processing	47.88	-0.50	-1.0
NYS	17.25	9.41	Ceridian Corp.	15.13	0.00	0.0
NYS	17.38	12.50	Comdisco Inc.	15.38	0.00	0.0
OTC	8.66	6.50	Computer Horizons	7.75	-0.25	-3.1
NYS	80.50	57.00	Computer Sciences	70.63	-2.50	-3.4
NYS	9.63	6.88	Computer Task Group	6.88	-0.63	-8.3
NYS	40.50	22.00	CompUSA Inc.	29.00	-1.50	-4.9
OTC	17.50	6.00	Corporate Software	12.00	-2.00	-14.3
OTC	26.00	7.38	Egghead Discount Software (L)	8.63	1.00	13.1
NYS	35.88	25.25	General Motors E (EDS)	33.13	1.13	3.5
OTC	25.50	9.25	Imacon Corp.	17.13	-0.38	-2.1
OTC	15.38	6.25	Intelligent Electronics	13.25	0.50	3.9
OTC	14.38	6.63	Mercsel	9.88	-1.25	-11.2
OTC	14.75	5.75	Microdage Inc. (H)	13.00	-1.25	-8.8
OTC	43.00	21.75	Paychex	40.75	-2.00	-4.7
NYS	87.25	37.00	Policy Management Sys.	42.38	-3.25	-7.1
NYS	35.38	16.81	Reynolds and Reynolds	32.88	-2.13	-6.1
NYS	31.75	22.00	SEI Corp.	28.25	-0.25	-0.9
OTC	24.38	16.88	Shared Medical Systems	20.00	-0.50	-2.4
OTC	13.88	5.75	SHL Systemhouse	11.00	0.13	1.1
OTC	29.25	18.25	Software Spectrum Inc.	23.50	0.13	0.5
OTC	33.75	21.75	Sungard Data Systems	30.75	-0.25	-0.8
NYS	4.00	1.13	Ultimate Corp.	3.25	-0.25	-7.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Novell ready to buy

Novell, Inc. last week said it plans to acquire Software Transformations, Inc., an application development tools maker in Cupertino, Calif. [CW, April 19]. The deal calls for Novell to give Software Transformations' owners 800,000 shares of Novell stock, worth about $26.8 million. Software Transformations' object-oriented tools for building Unix, Windows and Macintosh systems give NetWare users a framework for creating client/server applications that run over PC networks, a Novell spokesman said.

DEC spin-off

Digital Equipment Corp. is spinning off a company that specializes in refurbishing and manufacturing disk and tape drives, as well as modules. Called SpringBoard Technology Corp., the company will work out of DEC's Springfield, Mass., manufacturing plant and is expected to eventually employ approximately 100 people. SpringBoard will handle 5¼-in. hard drives, 8mm and 4mm digital audio tape drives and DEC's proprietary cartridge tape drives.

TI buys stake

Texas Instruments, Inc. has agreed to buy a minority stake in PeerLogic, Inc., a San Francisco developer of middleware. TI will also remarket PeerLogic's Pipes software both as a standalone product and with the Information Engineering facility, its computer-aided software engineering tool.

SHORT TAKES Amapex Systems, Inc. in Santa Clara, Calif., has filed an initial public offering, proposing to sell 5 million shares at $10 to $12 a share. . . . Platinum Software Corp. in Irvine, Calif., has acquired Automation One, an Australian developer of accounting software.

ISO standard attracts U.S. interest

Users demand adherence to quality specs for building software

By Gary H. Anthes

A series of quality standards developed by the International Standards Organization (ISO) in Geneva is catching on in Europe and is beginning to attract serious attention in the U.S. from sellers and buyers of information technology.

Measuring up to the ISO 9000 quality standard is a lot less difficult than winning a Malcolm Baldrige National Quality Award, but hardware and software vendors said it can make a valuable contribution to product and customer service quality. And, they said, an ISO 9000 stamp of approval offers an increasingly important competitive advantage.

"Within two to three years, the American software company that is not ISO 9000-registered will not be competitive, period," said R. Douglas MacIntyre, president of Software 2000, Inc., a Hyannis, Mass.-based developer of business applications for IBM's Application System/400s.

ISO 9000 certification, or "registration," is granted after a company has passed an audit by an accredited third party. The registration attests that a particular site has complete documentation and rigorous procedures to ensure quality in contracting, manufacturing, customer service, software development and other functions (see story at right).

"It's no longer a European issue; the genie is out of the bottle in the U.S.," said Robert Kennedy, ISO 9000 program director at Digital Equipment Corp., which has received ISO 9000 registration for 19 plants in the U.S. "Customers are asking their suppliers about ISO 9000 registration," he said.

Ed Kane, vice president for quality at Dun & Bradstreet Software, said the company has postponed until 1994 a major push to get U.S. sites registered under ISO 9000 but has completed the process for its facility in the UK.

Jean-Louis Olie, chief executive officer at Aleya, Inc. in Reston, Va., said the computer-aided software engineering developer had already embarked on its own program to get ISO 9000 registration when its parent company, Thompson-CSF, Inc. in Arlington, Va., mandated that all Thompson units that develop software obtain such certification.

Olie said European and U.S. customers are beginning to ask in requests for proposals whether bidders are ISO 9000-compliant. "It's a plus if you can say, 'Yes,'" he said.

Not all companies seeking ISO 9000 registration for their software development work are software vendors. Becton Dickinson & Co. has no ISO 9000-registered facilities yet but is gearing up for registration in a number of areas, including two of its 18 divisions where software is developed for medical diagnostic instruments.

Woody Green, Becton Dickinson's director of quality assurance and regulatory affairs, said ISO 9000 registration pays dividends in terms of quality improvement and public relations. However, he said a rush to jump on the ISO 9000 bandwagon has led to some abuses by vendors. "Sometimes advertisements imply that ISO has blessed what a firm does," he said. "That is not the case."

And MacIntyre warned against seeing the quality standard as a guarantee for business success. "There is the same criticism of ISO 9000 as there is of the Baldrige award," he said. "It is quite possible to win the Baldrige and then go into Chapter 11 [bankruptcy]."

Who is certified

A survey of 2,317 ISO 9000-registered companies by Price Waterhouse and Salford University Business Services Ltd. for the British government revealed that 67% reported greater operational efficiency as a result of ISO 9000 conformance; 49% reported increased profitability; 78% reported improvements in marketing; and 38% reported increased export sales.

Stamp of approval

ISO 9000 refers to a series of five related quality management standards. The most comprehensive of the standards encompasses 20 business functions, such as contract review, design control, document control, purchasing, inspection and testing, training and maintenance.

The standards are geared to two-party transactions, and they assess a supplier's ability to fulfill the customer's contractually specified requirements.

ISO 9000-registered sites are audited every three years and receive less comprehensive "surveillance visits" every six months.

A substandard developed specifically for software development deals with issues such as protection of proprietary information, change management, project planning, configuration management, acceptance testing and maintenance. —*Gary H. Anthes*

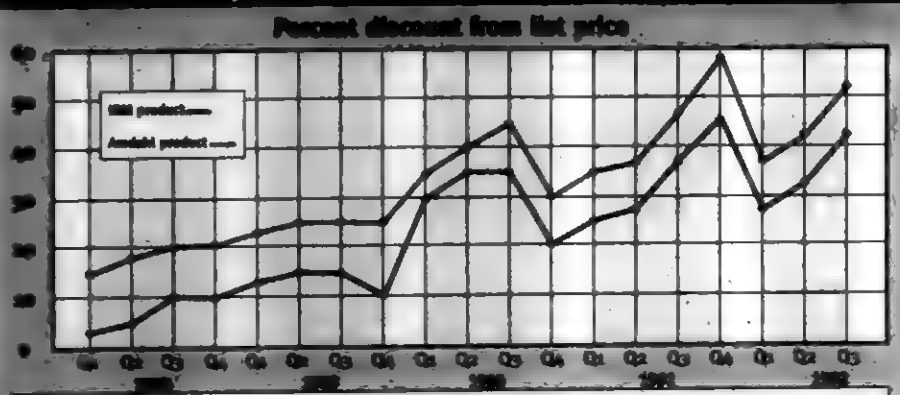
First-quarter earnings, calendar 1993

Company	Revenue	Revenue change	Net income	Net income change
AST Research	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Compaq Computer	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Data General Corp.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Gupta Corp.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
IBM	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Peoplesoft Inc.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Sun Microsystems Inc.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Sybase Inc.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Tandem Computers Inc.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Unisys Corp.	$[illegible]	[illegible]%	$[illegible]	[illegible]%
Wellfleet Communications, Inc.	$[illegible]	[illegible]%	$[illegible]	[illegible]%

* Not meaningful

IBM continues to struggle with weak demand for its mainframe and large disk drive products, which has caused another quarterly loss despite increases in service revenue and decreases in operating expenses.
Compaq reported robust results, posting $1.6B in sales while driving operating expenses down to 13.4% of revenue.
Gupta Corp. pulled off a strong quarter, increasing both product and service revenue by 78% and 107%, respectively, over the corresponding quarter of 1992.
In its first full quarter as a public company, **Peoplesoft** nearly doubled its earnings, crediting a number of relatively large contracts with an average value in excess of $400,000.
Sun reported record revenue of $1.14B, but due to gross margin declines, profits were less than their level a year ago.

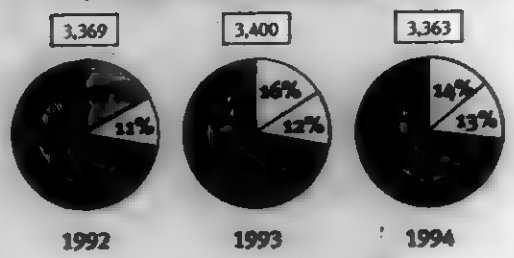
Industry Pulse: Large-scale systems*



IBM	3090-600E	3090-600S	3090-600S	9021-720	9021-900
Amdahl	5090-600E	5990-1400	5990-1400	5995-1400A	5995-4550M

Constricting market

TOTAL WORLDWIDE SHIPMENTS



TOTAL WORLDWIDE INSTALLATIONS

*IDC defines large-scale systems as systems with an average value exceeding $1 million.

Industry distribution

PERCENT OF SITES WITH ONLY MAINFRAMES INSTALLED. DOES NOT INCLUDE PCs.

1% Agriculture/Mining/Construction
10% Process manufacturing
11% Discrete manufacturing
6% Transportation/Utilities
13% Wholesale/Retail
9% Bank/Savings & loan
10% Finance/Insurance
4% Business services
11% EDP services
11% Medical/Education
14% Government

Source: International Data Corp./ Computer Intelligence

CW Chart: Nancy Kowal

The Fifth Wave *by* Rich Tennant

"TECHNICALLY HE'S A WIZARD, BUT AS A MANAGER HE LACKS PEOPLE SKILLS."

Inside Lines

Cozying up

DEC is warming to the Unix Common Open Systems Environment (COSE) initiative. The company has held a series of discussions with the group aimed at discovering which technologies the Maynard, Mass., manufacturer can offer and what role the company can play, according to Vicki Farrell, director of Unix marketing at DEC. The primary negotiator representing COSE is former DECie and current Hewlett-Packard executive Gary Kinhorn.

DME delayed

The Open Software Foundation will ship its Distributed Management Environment (DME) services later this year but will push back the release of the DME framework until the first half of 1994, according to internal sources. One reason for the delay is DME's use of the CORBA standard from the Object Management Group. Implementations of CORBA can comply with the standard, but they aren't interoperable, which is an "intolerable" situation, the source said. Seeking extra cash and support, the OSF is also negotiating with Petrotechnical Open Software Corp. to jointly sponsor certain OSF initiatives, though no deals have yet been finalized.

Feline callings

June will see the fruits of an HP and Microsoft joint venture, according to sources. The two intend to ship a 2.9-pound "superportable," code-named Lion, early in June. The Lion features DOS, Windows, Word and Excel in read-only memory; HP's 1.3-in. Kittyhawk hard drive and two PCMCIA bays. The product will run on AMD's AM386SXLV chip and is expected to achieve five to 10 hours of battery life. The Lion can also run on AA batteries if need be, sources said. Pricing is expected to be near $2,000, several sources said, or $2,500 with flash cards. Cats are in at HP, which has code-named its 95LX follow-on Cougar. Look for the 95LX on May 4.

One-stop shopping

A swarm of start-ups is converging where no database administrator has gone before: at the boundary of Unix operating systems and Unix relational databases. They are attempting to recreate the glass house's automated mainframe consoles for open systems. Some will show their wares at this week's Oracle developers' conference near San Francisco, including year-old EcoSystems Software, Inc. in Cupertino, Calif. Among the new kids on the block are Patrol Software, Inc., a Redwood City, Calif., firm started by Oracle alumni from Australia, and Open Vision Technologies, Inc. in Pleasanton, Calif., started by Michael Fields, a former Oracle sales executive who reportedly has $25 million in funding to acquire monitoring technology.

That's a terminator, all right

West Virginia University data communications manager Jeff Fritz was unpleasantly surprised last week when he was informed by his local telephone company that AT&T had slapped a 200% price increase on ISDN terminators, the little boxes that provide customer lines with access to ISDN services. The extra $200 per ISDN Basic Rate Interface will put a real damper on ISDN deployment, particularly for data users who require a whole ISDN link, Fritz said. AT&T says it didn't change the price; although a two-year promotional price program to local telcos recently ended.

A high school hacker managed to change the electronic sign boards along Interstate 95 in Connecticut to say, "You all suck." The boards are used to announce construction, fog, weather conditions and so forth. It took the state police and highway department several hours to clear the message. Then it happened again with a different message attacking the governor. After they caught the kid, he told police that changing the message was easy once he got into the highway department's computer because no password was required. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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JANUARY 29, 1990

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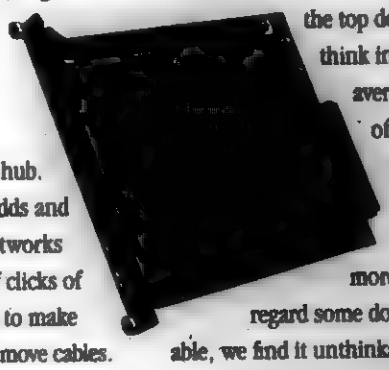

APRIL 29, 1991

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MAY 13, 1991

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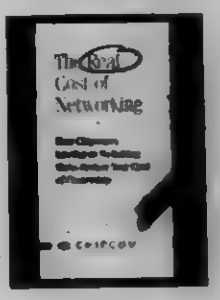
Or what the heck, ask for all three.



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COMPUTERWORLD

Inside

DATA CENTER UPDATE
As the pace of data center automation picks up, operations staff members struggle to adapt and carve out a solid career path. *Page 6*

PARALLEL PROCESSING
Unisys chose last week's Cube and Use user group conference to unveil the Extended Processing Complex, which was designed to guide systems through bottlenecks while providing high-performance parallel processing among 2200 systems. At the same time, Convex fleshed out its massively parallel processing strategy while strengthening its technical alliance with Hewlett-Packard. *Page 16*

OUTSOURCING
The promise of skilled help and savings motivates some users to outsource PC software support. *Page 63.* ISSC and its Advantis partner ink a $650 million pact with credit kingpin Equifax. ISSC will co-market Equifax services as part of the deal. *Page 12*

Rollouts could fire up net management plans

By Elisabeth Horwitt

■ Several major integrated network management rollouts planned for the next few months could prove to be the starting gun that triggers serious corporate implementations of enterprise network management systems.

Leading vendors are racing to respond to users who have demanded distributed, yet integrated, network management systems capable of managing the full gamut of network applications, devices and installation sizes.

Companies set to roll out products include the following:

•IBM is grooming NetView/6000 as a distributed enterprise manager able to manage Systems Network Architecture as well as internetworking installations. It will also be able to handle enterprise networks of a much higher order of magnitude than can the average Simple Network Management Protocol system, IBM spokesmen said (see story page 14). Availability is expected by year-end.

•Hewlett-Packard Co. is expected next week to announce OperationsCenter, which will extend its OpenView network management system beyond internetworking to encompass management of HP, IBM and Sun Microsystems, Inc. Unix systems. Also planned are remote procedure calls to support more dynamic communications between OpenView and managed systems, an HP spokesman said.

•HP and Ungermann-Bass, Inc. will announce a Unix-based version of NetDirector, UB's OS/2-based hub management system, that will be based on OpenView.

•NetLabs, Inc. is expected this

Net management, *page 14*

Wireless 'glue' stirs fury

By Joanie M. Wexler
NEW YORK

■ In a noble yet nebulous stab at fixing today's interoperability glitches among disparate wireless and wired networks, Motorola, Inc. last week officially unveiled its wireless "glue" technology, once code-named Mollet.

Meanwhile, a vehement dismissal of the interface by McCaw Cellular Communications, Inc., coupled with an industry divided as to how companies will actually use wireless communications during the coming decade, further thickened the wireless plot. It is one already muddled by incongruous protocols, a deficit of radio frequency-enabled applications, service coverage gaps and bandwidth and security limitations [CW, March 22].

"The wireless world is neither seamless nor transparent today," acknowledged Les Shroyer, corporate

Wireless, *page 16*

Drumroll, please

MOTOROLA'S 1993 DEPLOYMENT SCHEDULE FOR ITS MNI INTERNETWORK "GLUE" TECHNOLOGY:

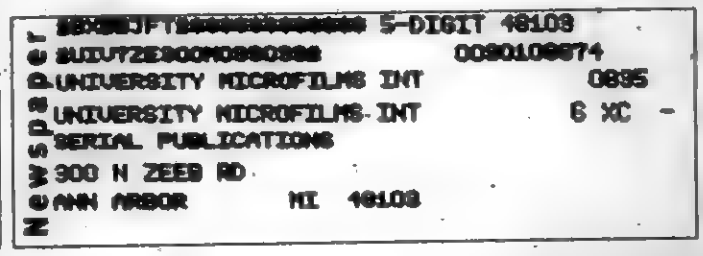
IN PROGRESS
Beta test

JUNE
Public demonstration

JULY
Field test with selected end users

THIRD QUARTER
Product announcement

FOURTH QUARTER
Service for beta-test users



Sun opens Unix to Windows apps

WABI removes need for dual systems

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Taking aim at the heart of Microsoft Corp.'s enterprise strategy for Windows NT, Sun Microsystems, Inc. is expected Wednesday to announce a software interface said to enable Windows applications to run up to 70% faster on Sun and other Unix workstations under the X Window System X11 standard.

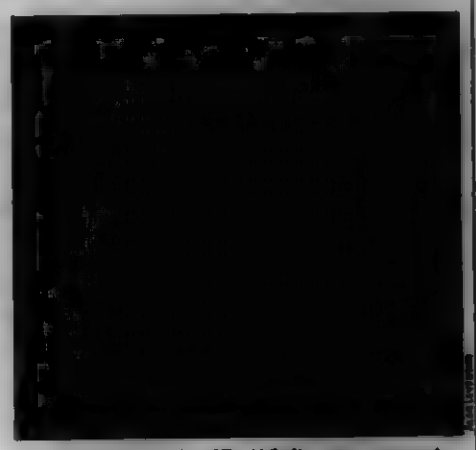
Sun hopes that a successful interface will allow it to make inroads into Windows' installed base even as Microsoft launches Windows NT this spring. Windows NT will eventually allow users to run Unix applications from a variety of hardware platforms.

Sun plans to provide the interface free to users who buy Solaris before Jan. 1, 1994. However, Sun has not yet provided prices for the standalone software.

But there may be a wait for the Windows Application Binary Interface because "WABI," as it is called, could take a detour through the courts before users and developers get to see it in action.

In speeches to two user groups last week, Sun Chief Executive Officer Scott McNealy crowed about not having to pay royalties to Microsoft.

But a Microsoft spokesman said the company plans to respond to the concept of Windows on Unix next week.



Sun's Scott McNealy: *'We didn't pay a penny to the Evil Empire,' referring to rival Microsoft*

WABI is a software interface that sits on top of Unix on workstations running the X Consortium's X11 interface. These include Sun workstations running the Solaris operating system, IBM's RISC System/6000s running AIX and Hew-

Sun, *page 10*

PC makers embrace Green Revolution

By James Daly

The brutally short product life cycles of many of the latest and greatest PCs and workstations have created one whopper of a high-tech headache: what to do with an estimated 10 million old computers that end up in the scrap heap each year.

A recent Carnegie Mellon University study estimated that as many as 150 million used computers will be piled in the nation's landfills by the year 2005. Disposal costs could reach $1 billion.

In an attempt to stem the tide

■ Plastic used in PCs can be recycled and reused. Four of the firms below the threat to the material begin to lose their flexibility. Once separated, they can be used as plastic fillers for other purposes.

of trash, hardware manufacturers IBM, Digital Equipment Corp., Hewlett-Packard Co., Apple Computer, Inc., NEC and Xerox Corp. teamed up with the American Plastics Council [illegible] work to encourage a major effort to recycle plastics from computing equipment [from last page 1].

"PCs should be viewed [illegible] as a disposable item, for [illegible] sale," said [illegible] director of the technology at the APC in Washington, D.C.

The problem of [illegible] is [illegible] [illegible]

CLIENT/SERVER

Moving from legacy systems to client/server poses enough of a problem that you can count the number of users integrating production environments "on your hands and feet," according to one analyst. *Page 112*

Experts describe the steps IS professionals can take to prepare for a career in a client/server world. *Page 129*

DATABASES

Attendees at last week's Sybase user conference learned that virtually all of Sybase's System 10 components have moved into beta testing and will ship by year's end. At an **Oracle** user meeting, CEO Lawrence J. Ellison leaked details about Oracle 8 and a forthcoming Oracle 7.1. *Page 8*. Separately, DEC talked up some new database releases of its own. *Page 2*

OPEN SYSTEMS

Open Vision Technologies, a new venture, is promising to bring mainframe-like command-and-control consoles to the world of open systems by year's end. *Page 8*

ENTERPRISE NETWORKING

IBM is repositioning NetView/6000 as an enterprise and SNA management system and plans also to provide SNA network reconfiguration without downtime. *Page 14*. **Motorola**, meanwhile, unveiled its own interface for developing distributed applications across disparate wireless and wired WANs but offered few tangible details. *Pages 1 and 15*

WINDOWS NT

Sun Microsystems this week will unveil an interface that runs Windows applications on X Window X11-compliant systems. *Pages 1 and 10*. **Microsoft**, meanwhile, begins to move to object-oriented environments for Windows with the delivery of **OLE 2.0**. *Page 4*

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Rdb update, gateway on tap

By Melinda-Carol Ballou
SAN FRANCISCO

■ Digital Equipment Corp. is expected this week to announce new versions of its Rdb database and will demonstrate a database gateway that will ship later this year.

While the new versions strengthen DEC's database and connections to other environments, some analysts questioned the company's corporate commitment to its own software.

Code-named DB Integrator, the gateway will allow users to transparently perform database joins across multiple platforms and databases, according to DEC sources.

Based on remnants of the company's defunct RdbStar technology [CW, July 17], DB Integrator will be able to use Rdb or other third-party databases (such as those from Oracle Corp., The ASK Group, Inc. or Sybase, Inc.) to store catalogs for determining where data resides and then to perform the joins, according to the sources.

Rdb 5.1, which is expected to ship next week, will provide multimedia enhancements, support for full-motion video and a driver for Microsoft Corp.'s open database connectivity, or ODBC. DEC's Accessworks will support Information Builders, Inc.'s EDA/SQL. DEC's Rdb Access services will offer read/write access to DB2 and Oracle, sources added.

DEC will also provide details of Rdb 6.0, which reportedly will support a quick-sort algorithm similar to one previously available only on IBM mainframe systems. Rdb 6.0 will also support stored SQL procedures and multithreaded restores. The product will not ship until the end of this year, however.

Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago, said the main advantage of a database like Rdb is how well-optimized it is for its environment and its administrative and development tools.

Finkelstein questioned DEC's commitment, however, to its own database. "I think this announcement is an attempt to resurrect Rdb, but unless DEC really wants to fight it out against the third parties like Oracle and Sybase — unless it wants to sell Rdb and not just hardware — it will always be behind," he said.

A DEC spokeswoman countered, "We're putting significant resources into Rdb and will be marketing it very aggressively. At the same time, we want to give customers [a choice] of databases."

DEC eyes simplicity with revamped service plans

By Melinda-Carol Ballou
MAYNARD, MASS

Responding to competition and user pleas, Digital Equipment Corp. is revamping its service offerings and streamlining business practices to simplify customer access to services.

This process is expected to be finalized and announced by the fall and will result in new pricing and a leaner portfolio of service offerings, according to DEC sources.

"Before, for instance, we would offer different versions of the same service contract for DEC and non-DEC platforms," a DEC source said. "One goal of this reorganization is to offer one flavor [of service contract] for multivendor platforms."

DEC now bases prices on the particular products that are serviced. Under the new structure, pricing would be based on the actual services required by users, the DEC source added.

DEC officials refused to elaborate.

Customer gripes

Some DEC users have been disgruntled by a range of service issues — everything from poor management of maintenance contracts to the blaming of local service representatives for problems occuring at higher levels, according to discussions on DECUServe's user network. The revamping of the service organization is welcomed by many — assuming that user input is effectively solicited, according to members of the Digital Equipment Computer Users Society (DECUS).

"They need to streamline because the service offerings and business practices they use now are just too complicated and confusing," said Ta Fuh Chiam, services issue manager for DECUS' Business Practices Special Interest Group. "To get DEC to do anything, you have to go through a lot of bureaucracy. They seem more interested in internal control with multiple layers of administration than in responding to customers."

Analysts said that upcoming price wars in the service industry require simpler methods of doing business. They also noted that DEC has a major job to complete as it forges ahead. Sun Microsystems, Inc., IBM and Hewlett-Packard Co. recently revamped their service offerings, for instance [CW, April 12].

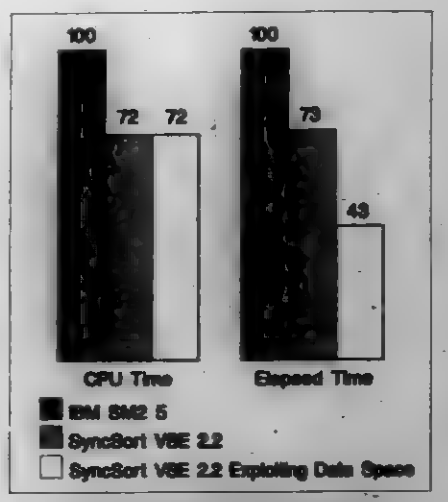
From roughly 200 different service offerings, DEC is reportedly trying to reduce the number of offerings to 10 (the number is currently at about 25).

"We have heard some people say that [DEC's] prices are high, but it's good for what you get, and other vendors are doing a worse [service] job than DEC," Chiam said. "But what does charging people based on what they use actually mean? It's hard to form an opinion right now."

Corrections

- A story on Series/1 migration in the April 19 issue incorrectly cited the name of Computer Information Enterprises, Inc. in Tustin, Calif.
- A news brief in the April 19 issue may have left the impression that Version 2.0 of Walker Interactive's financial application software, which will support Windows and Presentation Manager, is already available. The product is not expected to ship until the fourth quarter.

HERE'S WHERE WE LEAVE THE COMPETITION.



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Conferencing app aids interactive links

Groupware package lets up to eight users view screen simultaneously

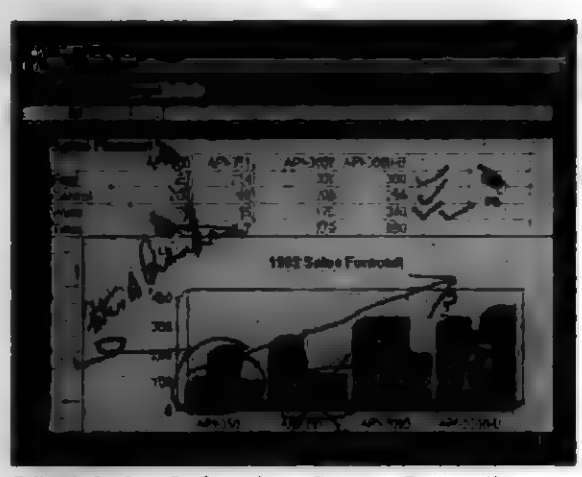
By Michael Vizard
STAMFORD, CONN.

Looking to take the concept of groupware to its next logical level, Fujitsu Networks Industry, Inc. this week will unveil a peer-to-peer conferencing application that allows users to simultaneously view and share the same Windows application across a Novell, Inc. NetWare network.

Unlike existing groupware applications that do not support live interactive links, Fujitsu's Desktop Conferencing software lets up to eight users view the same application while talking on the phone.

"Anything you can do in Windows we can support. We can turn any software into groupware," said Jim Zimmerman, director of marketing for Fujitsu's communications systems.

"This is live. That's its big differential as a groupware product," added Michael Heylin, a senior associate at Creative Strategies Research International, Inc. in Santa Clara, Calif. "What this adds is a real-time capability that isn't in something like Lotus Notes," he said.



Fujitsu's Desktop Conferencing *software reflects on the participants' screens updates made by the group chairman*

For example, Global Marine, Inc., an offshore drilling company in Houston, has adopted the Fujitsu software as part of an effort to cut down on trips to Aberdeen, Scotland, said Rob White, director of MIS technical support.

Global Marine is moving from a mainframe to a client/server environment based on a Novell wide-area network. The Fujitsu software trains users in Aberdeen how the new client/server applications work, White said. "We have about 32K bit/sec. available for data on our network, and it takes about 10 seconds to repaint an entire screen."

He said Global Marine expects to use the Fujitsu software to let managers review spreadsheets, contracts and proposals without traveling to Aberdeen. "In a spreadsheet application, the Fujitsu software allows you to change a cell value without having to repaint the entire screen," White said.

As a software-only solution, the Fujitsu offering essentially extends the NetWare architecture by adding real-time capabilities on top of Novell's IPX protocol. After setting up the initial conference, the designated chairman controls the application, while other members of the conference are designated participants. The chairmanship can be switched at any time.

Because each user is viewing the same screen, the chairman's updates are reflected automatically on the participants' screen.

The software includes support for a light pen interface to make handwritten notes on screens, a flip chart function for presentations, a text-messaging feature for sending notes to a specific member of the conference and a file-transfer utility.

"Right now, there is a lot of interest in desktop videoconferencing, but I think this may be more useful in the short term because it's application conferencing. It doesn't have the same political issues that are associated with telecommunications systems," Heylin said.

Pricing for the Fujitsu groupware product starts at $2,475 for a five-user pack. A light pen pack costs $395.

Microsoft gets object-oriented with OLE 2.0

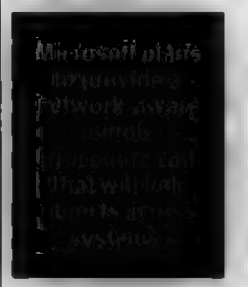
By Michael Vizard
TYNGSBORO, MASS.

■ Microsoft Corp. last week began shipping Version 2.0 of its Object Linking and Embedding (OLE) protocol for Windows, heralding a new storage format that will consolidate a large number of the application programming interfaces (API) that Windows developers are currently required to master.

OLE 2.0 is Microsoft's initial effort to create an object-oriented environment for Windows that will simplify application development by consolidating APIs into a collection of objects.

"The APIs in Windows today tend to be ambiguous and badly named functions," said Kraig Brockschmidt, a software design engineer at Microsoft.

The arrival of OLE 2.0 coincides with Lotus Development Corp.'s delivery of its API for Notes. Lotus has delivered its Notes API to both Microsoft and WordPerfect Corp. as part of an effort to better integrate non-Lotus applications with the Notes database.



Also, Microsoft and Lotus are working together to create compatibility between OLE 2.0 and the object-oriented storage format specified in Notes. "We're working closely with Microsoft to make sure we can access the storage formats in OLE 2.0 so that applications can launch each other. This will not be a VIM vs. MAPI type of issue," said Alex Morrow, general manager for cross-platform architecture development at Lotus.

From Microsoft's point of view, cooperating with Lotus will help ensure that sites adopting Notes will not automatically adopt Lotus applications that are better integrated with Notes.

In general, OLE 2.0 provides a more robust set of objects for Windows that Microsoft expects will become the preferred method for linking applications because it provides a superset of the functions found in Dynamic Data Exchange, File Manager drag-and-drop protocols, OLE 1.0 and the Windows Clipboard.

"OLE 2.0 is a direction that all developers will have to follow. Users usually have one primary application they work from, and then they launch other applications as they need them," noted Said Mohammadioun, vice president of Lotus' Word Processing and Advanced Spreadsheet Division.

Speaking at the International Windows Developer's Conference sponsored by Boston University here, Brockschmidt said OLE 2.0 consists of three primary objects: Allocator Objects, Storage and Stream Objects and Data Objects. Instead of using 11 APIs to access local memory or 21 APIs to access global memory, programmers will be able to address objects to handle memory management, he said.

OLE 2.0 for Windows NT and Apple Computer, Inc.'s Macintosh is due later this year.

Major distribution channel

Choices, lower cost foster CD-ROM use

By Michael Fitzgerald

Software on CD-ROM looks poised to become a major distribution channel, bringing with it lower prices and more application choices.

Last week, Ingram Micro, Inc. said it would follow Boulder, Colo., distributor InfoNow Corp. into the market for CD-ROM software distribution. Analysts said Merisel, Inc. and Tech Data Corp. are likely to follow suit.

And Apple Computer, Inc. is expected to begin aggressive CD-ROM distribution, accompanied by sharp price-discounting for applications, sources said. Apple declined comment.

"The cost of doing a CD at this point is certainly less than putting 10 diskettes in a box," said Will Fastie, an independent industry consultant in Baltimore.

Chevron Corp. expects to save millions by getting software from InfoNow [CW, Feb. 22].

Other factors contributing to the CD-ROM software distribution movement include the following:

- Novell, Inc.'s NetWare 4.0 comes on CD-ROM, and Microsoft Corp.'s Windows NT will require CD-ROM to run.
- Software packages are growing in size, and CD-ROM drives are declining in price.
- Software vendors can gain copy protection.

Users also like the idea.

"We're incredibly interested in [distributing applications via CD-ROM]," said Irene Kirk, global office technology integrator at Pepsico, Inc.'s Pepsi-Cola International division.

Officials at Santa Ana, Calif.-based Ingram Micro said they do not expect CD-ROM to garner more than 15% of volume.

Fastie said, "You'll know CD-ROM has arrived when a hardware manufacturer puts drives into their product line."

That time is approaching as vendors push multimedia PCs. IBM PC Co. intends to ship all of its PCs with CD-ROMs by late 1994.

Gateway 2000, Inc. already builds CD-ROM drives into local bus versions of its 33/66-MHz DX2-based systems and may put the drives into other local bus models, according to Mike Schmith, Gateway's marketing manager.

"By 1996, no PC will be considered a complete system without CD-ROM," said Patty Chang, senior analyst at Dataquest, Inc., a San Jose, Calif., market research firm.

Still, bugs need to be worked out. Sheldon Laube, national director of information technology at Price Waterhouse and an early adopter, said software vendors are working on problems such as a limit on the types of characters a disk will recognize.

Easy Access

Under Ingram Micro's CD Access project, up to 200 encrypted applications will go on a single CD-ROM disk. Ingram Micro will encourage its resellers to hand out the disks to PC buyers. Dave Ellasberg, CD Access project manager, said Ingram Micro expects its product to give users access to software from both big and small vendors. Users can call an 800 number to exchange their credit card numbers for an application's encryption code.

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News Shorts

Costs cause Wang $87.2 million loss

Restructuring charges, tight margins and lower sales figures combined to hand **Wang Laboratories, Inc.** an $87.2 million net loss for its third quarter, ended March 31. Third-quarter revenue fell from $460.8 million in 1992 to $294.8 million this year, leading to an operating loss of $17.5 million for Wang. That loss was compounded by restructuring charges linked to Wang's bid to escape Chapter 11 bankruptcy court status.

Message tool added to SoftBench

Hewlett-Packard Co. upgraded its SoftBench Unix application development framework, adding a previously announced SoftBench Message Connector. The connector was designed to let users adapt development tools from different vendors to exchange software-building information without fiddling with underlying source code. SoftBench 3.2 is priced at $2,300 for a C language version and $4,500 for C++. Current users can get the upgrades for free.

Stac, IIT resolve suit

Stac Electronics, Inc., has settled a software patent infringement suit filed against **Integrated Information Technology, Inc.** (IIT). IIT has admitted that its XtraDrive software, XtraDrive Plus Hardware and DCP compression processor chip infringe on Stac's patents, and it will purchase a royalty-bearing license. The patents in question are still the subject of a suit between Stac and **Microsoft Corp.** concerning Microsoft's DoubleSpace data compression utility in MS-DOS 6.0.

Certification for resellers

PC resellers, whose ability to provide service is questioned in proportion to the complexity of PC technology, were offered a new certification program designed to allay such inquiries. **ABCD: The Micro Computer Industry Association** announced its A+ certification program, which is supported by **IBM PC Co., Apple Computer, Inc., Compaq Computer Corp., HP** and others.

Intel goes after AMD

Intel Corp. has sued **Advanced Micro Devices, Inc.** for copyright infringements relating to newly issued AMD486 clones. The suit also covers AMD's unannounced clean-room-developed 486 clones. AMD said the suit was "not unexpected" and that it expected to win in court.

SHORT TAKES **IBM** Vice Chairman Jack D. Kuehler announced his retirement after 35 years with the company.... **The Santa Cruz Operation** said it plans an initial public offering of 6 million shares of common stock in mid-May, expecting to bring a price of $14 to $16 per share.... With its hardware business winding down, **Next, Inc.** last week announced that as of May 15 Bell Atlantic Business Systems Services will assume responsibility for servicing all Next workstations and printers under warranty in the U.S.... The **IBM Personal Software Products Division** is moving its headquarters from Somers, N.Y., to Austin, Texas.... Manufacturing and financial software maker **Platinum Software Corp.** in Irvine, Calif., signed an agreement to buy **Cypher Business Systems Ltd.** in Cheshire, England, which provides Ergo distribution industry software.... Despite an operating profit of $336,000, **Sequoia Systems, Inc.** reported a net loss of $3 million after taking a charge for settling a class action suit.

News shorts, *page 16*

Automation picks up pace

Faced with job loss, data center managers reevaluate careers

By Johanna Ambrosio
DALLAS

■ The speed of data center automation is picking up, analysts said, primarily because of continuing mergers and the quest for distributed computing. Meanwhile, people who work in these data centers are struggling to cope as best they can.

These and other related issues were at the forefront of discussions among the more than 2,000 users and vendor representatives who gathered at the Association for Computer Operations Management (AFCOM) annual conference last week.

On the whole, there was a lot less "techie talk." Operations staff members instead swapped information about how to adapt to an industry in which their mainframe-oriented skills are less in demand.

Making matters more frightening for them is the quickening pace of automation. "The companies [that] sat back and waited are now jumping in," said Arnold Farber, a principal at consulting firm Farber/La Chance, Inc. in Richmond, Va. "The second wave has started."

Industry trends of corporate downsizing, consolidation and distributed computing are very much fueling the speed of data center automation, said Igor Stenmark, an analyst at Gartner Group, Inc. in Stamford, Conn.

At the Daughters of Charity, a not-for-profit health care provider, the automation rollout started in March 1992. "I'd like to say we're done, but we're not," said T. Scott Culiver, operations manager at one of the organization's major data centers in Evansville, Ill.

The biggest problem Culiver's staff ran into was a lack of PC expertise. As they brought in PCs to help manage multiple platforms from a central location, "we did not have a PC guru to assist us," Culiver said. That has now been addressed.

But the most pernicious issues surrounding automation are human ones, most observers said.

"I'm really afraid that a lot of our members are not prepared for these changes," said Len Eckhaus, AFCOM president. "Traditionally within the data center, people perceive themselves in terms of how big the equipment is and how much of it there is. That is no longer the case."

If you can't beat 'em...

Most practitioners agreed that the more successful data center people — those who keep their jobs and continue to advance in the company — are those who accept downsizing, consolidation and distributed computing as unstoppable industry forces. And instead of trying to fight the inevitable, practitioners suggested approaching change as a chance to learn new things and help companies by providing better service.

As more client/server applications are implemented throughout corporate America, one primary data center task will be to look after the quality of response time throughout the far-flung network.

"I know a lot of my people worry," said Kenneth Stedtfeld Jr., data center manager at Hexcel Corp., a manufacturing firm in Pleasanton, Calif. "I try to encourage a new way of thinking, and I try to assure them that they will be part of the new environment."

Hexcel adopts a lights-out environment during the weekend, where the system remains accessible to end users, and operators are paged if anything goes wrong.

In addition, Stedtfeld's staff has reduced floor space requirements for disk storage gear by more than 20%, while increasing the total amount of storage capacity by swapping older technology for a smaller, more current model. The staff has also improved response time, from an average of 4.5 seconds to an average of 2 seconds, by adding more memory.

All the while, Hexcel's information systems department has gone from a high of 40 people to its current level of 27.

Morris Polston, manager of computer operations at Miles, Inc. in Elkhart, Ind., said his philosophy is: "For every threat, there is an opportunity for mainframe and glass-house people to leverage their training." He and his staff will test that motto when the Elkhart data center merges with one in Pittsburgh later this year.

IBM seeks to solve SNA downtime

By Elisabeth Horwitt
ARMONK, N.Y.

IBM last week began shipping a product said to eliminate the need to take SNA networks down every time the Network Control Program tables on the front end need to be reconfigured.

With Fast Network Reconfiguration RPQ, users can keep their Systems Network Architecture (SNA) networks running 24 hours a day, 7 days a week, IBM said. And they do not need to migrate to IBM's Advanced Peer-to-Peer Networking (APPN) protocol to achieve this dynamic configuration.

However, there is one caveat: The product works only on a high-end 3745 front-end processor with dual channel control units (CCUs).

"This seems like a brute force hardware solution to a software problem; IBM is requiring people to spend more money on their aging 3745s," said David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn.

The price — it costs about $70,000 to upgrade a 3745 with a second CCU — could make the product a less attractive stopgap solution for pre-APPN customers.

According to IBM, however, 55% to 60% of its customers with high-end 3745 models have dual CCUs. And users require only one such model per SNA network in order to use the feature, an IBM spokesman said.

Covia Partnership originally suggested the idea of Fast Network Reconfiguration to IBM and became the first user of the product.

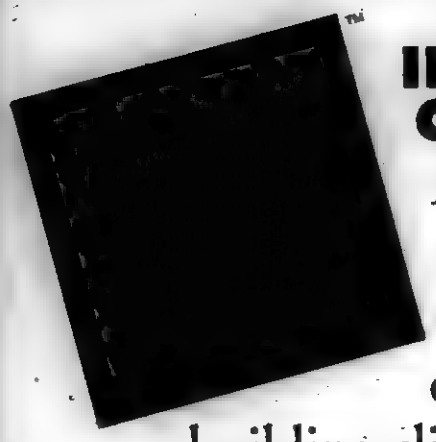
"In mid-1992 through first-quarter 1993, Covia has been working on a project called continuous operations," said Anthony J. Giardullo, manager of network systems development at the Apollo computer reservation system.

"We are raising the bar to close to 100% uptime" in order to provide continuous service to some 50,000 Covia users, including travel agents, he added.

Covia used to take its network down for a network generation every six weeks for five to 15 minutes, Giardullo said. With IBM's product, the company can make network generations with little or no user impact.

The product allows users to implement Network Control Program table changes on one CPU, while the other handles all SNA traffic. Once the changes are finalized, they can be implemented in less than a minute — fast enough not to terminate SNA sessions, IBM said.

Pricing for Fast Network Reconfiguration RPQ is $9,000.



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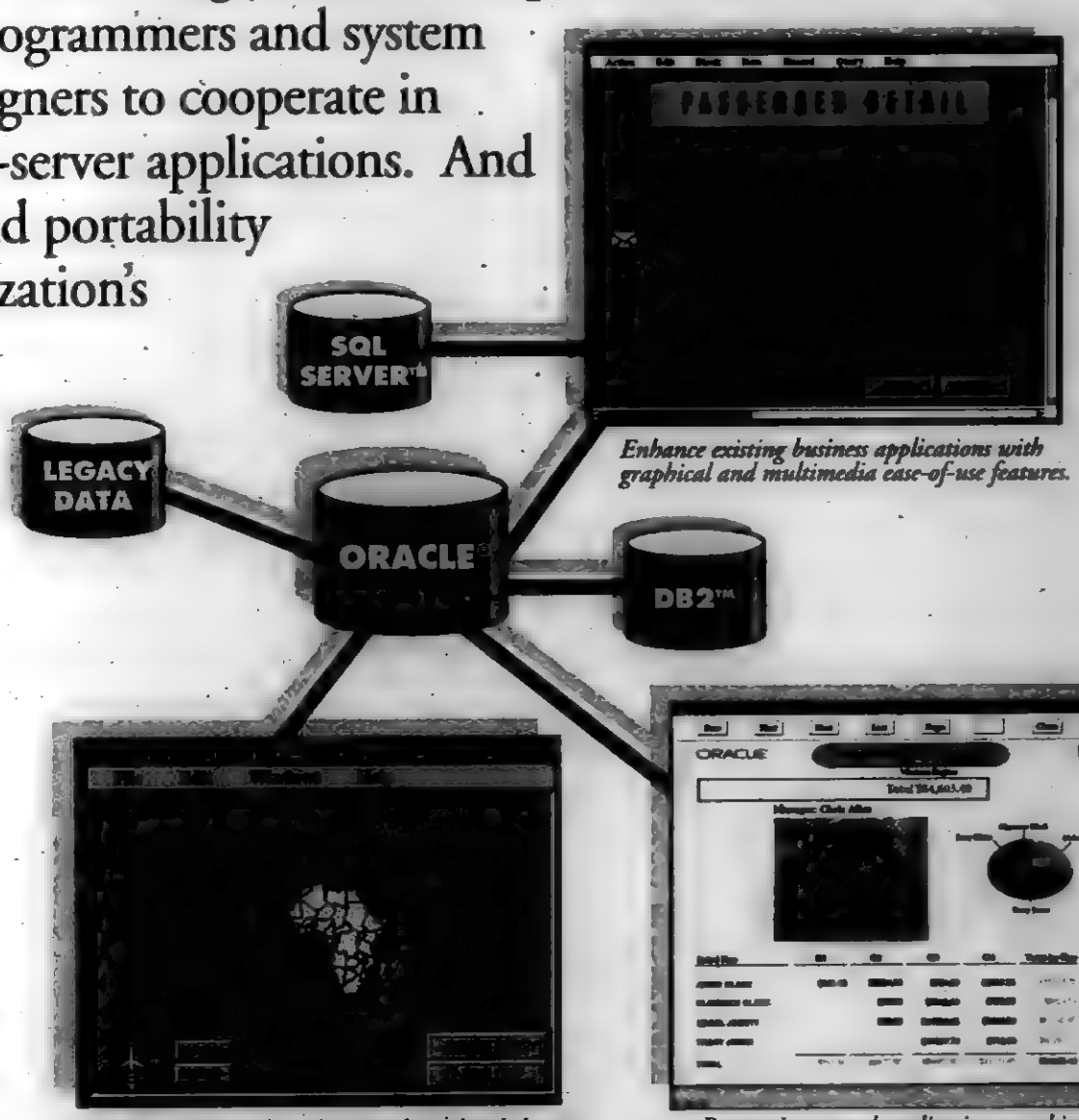

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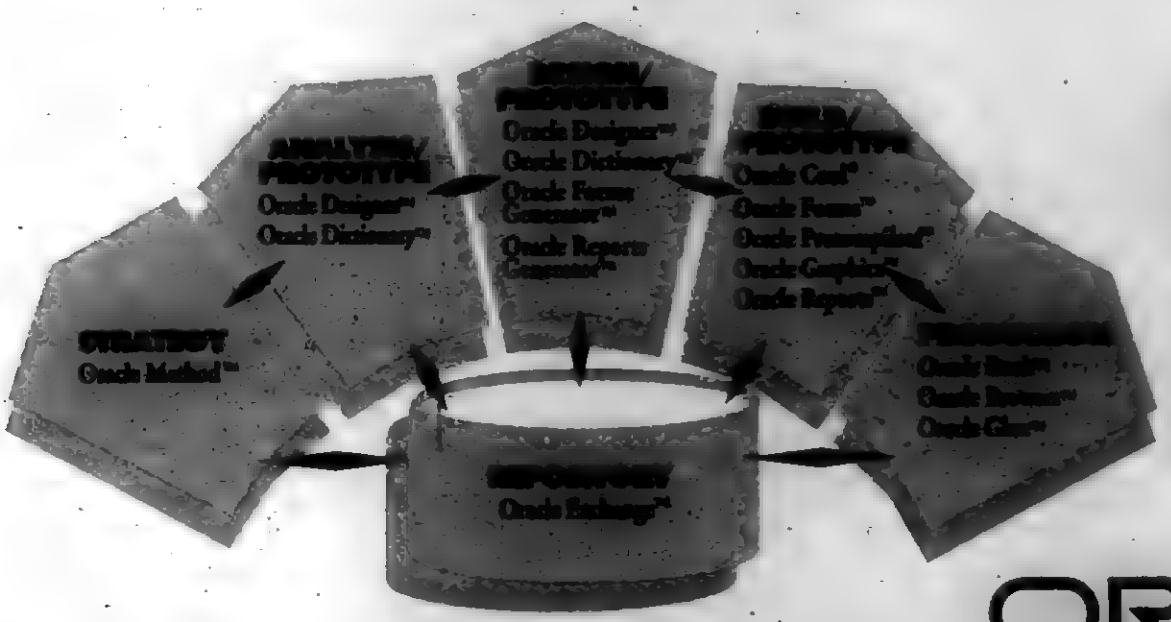

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Next Sybase migration outlined

Completed System 10 line to ship by year's end

By Jean S. Bozman
SAN JOSE, CALIF.

Users said they anticipate a smooth transition later this year from Sybase, Inc.'s current database to System 10, now that eight of the 11 components in System 10's distributed database server line have reached the beta-test stage.

Further fueling those expectations was a report from Stewart Schuster, Sybase marketing vice president, who told a Sybase user conference last week that all System 10 modules will be shipped by year's end. A related tools announcement is slated for June, he added.

In addition, one System 10 module, OmniSQL Gateway, a tool that allows accessing many brands of databases, has already shipped [CW, April 12].

Among the modules undergoing tests at user sites are the Backup Server, the enhanced SA (System Administration) Companion system monitors and the enhanced versions of the firm's Open Server and Open Client application programing interfaces (API).

Still, the year-end shipment schedule could be tight. That is because Sybase said the Replication Server 10 for distributing database updates and the Navigation Server 10 for parallel processing SQL queries — both key elements of System 10 — will not enter beta-test sites until later this year.

The chief attractions of System 10 are its administrative utilities, which address backup, system administration and data distribution across an enterprise network [CW, Nov. 9]. It will compete with Oracle Corp.'s Oracle 7 (see story page 145).

"The product set fills in the gaps in the client/server infrastructure," said Myke Miller, a consultant at Andersen Consulting's Minneapolis office who designed Sybase applications for Northwest Airlines. "You sort of had to get by without this stuff before."

Some users said they expect a fivefold speedup in backup and recovery procedures using the Backup Server, a component that will be bundled with System 10. Backing up a multigigabyte database can take hours with existing Sybase systems, and recovery can take just as long, users said.

Moving ahead without it

Some of the users attending the fifth annual Sybase conference said they could not wait for System 10's arrival and are building new client/server applications with Sybase SQL Server 4.9.1, Sybase's current release.

"We can't afford to put System 10 as a milestone on our schedule because our client has a hard deadline," said Richard Esposito, a senior systems architect at Zyga Corp., a federal contractor in Columbia, Md.

"We could migrate to System 10 capabilities after we put in the Sybase [SQL Server 4.9] database," Esposito said. He said he does not expect any conversion problems and anticipates that he could add System 10 features to the application.

Pricing for the Sybase SQL Server 10 ranges from $2,000 to $256,000, depending on computer platform and number of users; many System 10 components, including the database server, are available as maintenance upgrades.

Ellison talks up Oracle Version 8.0

By Jean S. Bozman
BURLINGAME, CALIF.

Oracle Corp. developers who expected nonstop talk about migrating to the just-released Oracle 7 and related development tools at their annual conference here were surprised to find Oracle Chief Executive Officer Lawrence J. Ellison once again chatting about the firm's unfinished Version 8.0 database.

Ellison is already focused on Oracle 8

Speaking off-the-cuff to Oracle developers, Ellison said Version 8.0, a relational database with object-oriented features, would be announced by December 1994, two years after shipment of Oracle 7.

He said Version 8.0 will feature object-oriented extensions to SQL, a new object schema layered over the Oracle 7 database and server support for multimedia.

Ellison promised an interim release, Oracle 7.1 with parallel-query support, to be announced in October, and he reviewed Oracle 7 tools shipment slated for June.

Also on the agenda was migration to object tools. Oracle, which just upgraded its character-based development tools to graphical user interface tools, will have to change them yet again into object tools, analysts noted. Ellison said that even the company's computer-aided software engineering tools will have to become object-oriented.

"We want something that can take you from the relational world to the object world gracefully and with 100% upward-compatibility," he said. "We'd like to make Oracle 8 as easy to administer as the [Apple Computer, Inc.] Macintosh file system."

Some users questioned Ellison's emphasis on Oracle 8 just as Oracle 7 is becoming a reality. "I appreciate him sharing his vision of Oracle 8, but what's significant is that some of the Oracle 7 stored procedures and packages can be used to prototype the object-oriented interfaces of the future," said Mark Whitney, president of SoftNet Corp., a consultancy in Armonk, N.Y.

Microsoft, D&B align on NT applications

By Melinda-Carol Ballou
FRAMINGHAM, MASS.

Microsoft Corp. last week added to its recent spate of technical alliances by announcing an agreement with Dun & Bradstreet Software that will produce jointly developed D&B Software products for Microsoft's Windows NT operating system.

Eager to bolster its client/server efforts, D&B Software will resell Microsoft's Access database as an embedded tool for its SmartStream decision support products. Microsoft will beta-test D&B Software's SmartStream for internal use. Microsoft recently announced alliances with Computer Associates International, Inc. and Compaq Computer Corp.

Users were enthusiastic about the D&B Software relationship.

"This is important to us for a couple of reasons. We are closely tied to D&B, and we have also set Microsoft products as a strategic direction," said Karen McKemie, director of financial information systems at Enron Corp.

Enron is in the process of setting up SmartStream client/server products for a site with 1,200 financial system users.

"We're using Access to do all our ad hoc reporting, and it's critical to us," McKemie said. "We previously used a mainframe-based tool supplied by D&B called Info-Expert, but it wasn't meeting our needs. You had to be an analyst/programmer to be proficient."

Some analysts questioned the Access database's adequacy as a client/server front-end tool.

"It's a good desktop platform, but it wasn't designed for client/server and doesn't support the back-end servers. It has poor performance and questionable multiuser support," said Rich Finkelstein, president of Performance Computing, a market research firm in Chicago.

D&B Software's SmartStream product manager Gail Goodman answered: "We've had very acceptable performance with reasonably large data sets."

Other analysts said the announcement was a strong one for both companies.

"It's very good news for D&B, bringing the kind of backing they needed for SmartStream and work-flow products, and it's good for Microsoft to gain access to D&B's installed base," said Jennifer Schols, an analyst at International Data Corp., a market research firm in Framingham, Mass.

D&B Software's revenue in the first financial quarter grew roughly 2.5% for its marketing information services but decreased 5.6% for software services due partly to divestiture of its Information Associates division.

"Microsoft gains an insight into a leading-edge client/server product development effort and into what is required for operating systems and tools functionality," added Peter Kastner, a vice president at Aberdeen Group, a market research firm in Boston. "Working with Microsoft will yield a superior product for D&B, who is behind some of their competitors but ahead of their customers in that they are just now grasping the opportunities for enterprise downsized [decision support systems]."

D&B Software, he continued, is "marching to its own drummer." The company is rolling out its decision support system component infrastructure first, to be followed later by transaction processing applications. PeopleSoft Corp. has released some client/server applications already, and SAP AG and The Dodge Group will roll out their applications later this year.

Systems management

Start-up offers tonic for open systems control

By Jean S. Bozman

A start-up founded by a former Oracle Corp. executive promised last week to bring mainframe-like command-and-control consoles to the open systems world by year's end.

Michael S. Fields, who exited Oracle last year after heading up its U.S. sales division, started Open Vision Technologies, Inc. with $25 million in funding from Warburg, Pincus Ventures, Inc. His strategy is to build an integrated systems administration tool to control operating systems, networking and multiple databases.

The New York company will be based on technology acquired from a constellation of smaller firms. The final product, called OpenVOPSS, is slated to ship by year's end, Fields said.

To date, the Pleasanton, Calif., firm has acquired several companies and their software products in areas such as archiving, security, job scheduling and backup. An engineering team headed by former Amdahl Corp. and Ingres Corp. software designer Asa Lanum is writing custom code to bind the separate Open Vision utilities into a single console system.

Industry analysts said the task of providing a seamless environment could prove daunting, as could competing directly with Computer Associates International, Inc.'s CA-UniCenter product [CW, April 26].

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Sun opens Unix to Windows applications

CONTINUED FROM PAGE 1

lett-Packard Co.'s Precision Architecture-RISC machines running HP/UX.

WABI will let users "run your [PC] legacy applications on Windows and run your business on Solaris," McNealy said in an address at an Oracle Corp. developers conference held in Burlingame, Calif., last week.

WABI is targeted mostly at information systems managers who want to distribute application software evenly to both Unix and PC client machines.

Sun users attending Oracle and Sybase, Inc. user conferences said WABI could reduce their cost of computing by allowing them to have just one computer instead of a workstation and an Intel Corp.-based PC on their desktops. Some said they have been running Windows applications in an emulation mode on Sun workstations — a costly option.

Moreover, the emulation approach adds to system overhead by forcing users to run their Windows applications on top of Unix and DOS, a Sun spokesman acknowledged.

McNealy has "been telling us about putting these great Unix boxes on our desks, but we've had to pay megabucks for a word processor," said Teri Iaconis, manager of database consulting services at Computer Task Group, Inc.'s San Francisco office.

McNealy said he clearly expects that WABI, based on technology gained from the 1992 acquisition of Praxsys Technologies, Inc. in Norwood, Mass., will provoke the legal attention of his desktop rival, Microsoft.

"We didn't pay a penny to the Evil Empire," he quipped, referring to Microsoft royalties for Windows products. "We probably spent more on lawyers on this product than we have on engineering." But Sun engineers will still have to test individual Windows applications to certify them for WABI support, McNealy said.

Watchful eye

Microsoft, meanwhile, is "not looking to start something, but once we see what they have and whether or not it works, we [may] have to protect our intellectual property rights," said Microsoft spokesman Collins Hemingway.

Hemingway also noted that Windows will change with the introduction of Windows NT next month — and Version 2 of Windows' Object Linking and Embedding technology (see story page 4). "It's a moving target, and it's going to be extremely difficult for them [at Sun] to promise that they'll be able to keep up with us over the next six, nine, 12 or 24 months," he cautioned.

Tim McCollum, senior vice president of research at Dean Witter Reynolds, Inc., said Sun is pushing WABI as a better mousetrap than the standard combination of Windows and PCs.

"It's the speed because you're running Windows on a faster processor," McCollum said.

API loyalties

The arrival of Sun's WABI specification is the latest maneuver in what is expected to become a high-stakes game for the loyalties of application developers.

Software providers report that Apple Computer, Inc. has lined up Novell, Inc. for its Examplar object linking technology, which will ultimately lead to a common API for writing and translating applications between Macintosh and Novell platforms.

Developers are also waiting to see if Microsoft will counter Examplar by endorsing WABI or by extending Object Linking and Embedding (OLE) and its Windows API to Unix. Microsoft has previously said it will deploy OLE on top of Windows APIs for Windows, Windows NT, Macintosh and Unix systems. —*Michael Vizard*

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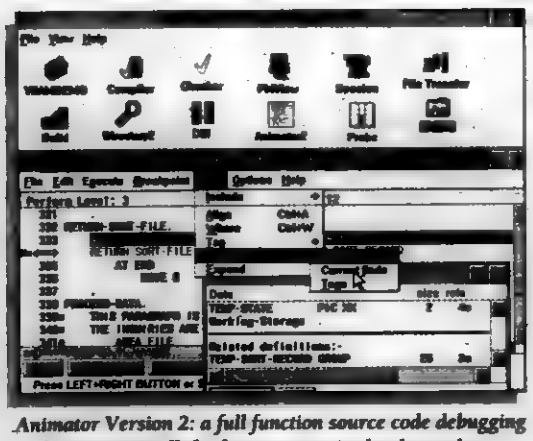

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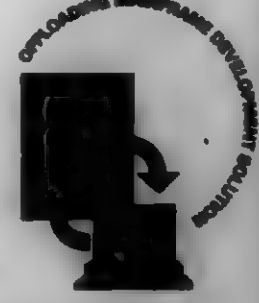

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Rightsize, prioritize, organize, customer-ize

A scant four weeks into the job, IBM Chairman Louis V. Gerstner Jr. last week attempted to placate a roomful of brain-stockholders with limited details on where he plans to take the company.

In the absence of "a plan," Gerstner cited "the four objectives we must and will focus on for the rest of 1993," including rightsizing the firm, sharply defining its strategic priorities, organizing IBM around that strategy and redoubling commitment to customers.

Louis Gerstner has four objectives for IBM's future

Gerstner alluded to a long, hard season of layoffs and the dicey prospect of pinning down which businesses to pursue and which to de-emphasize or cut loose.

"I don't have answers for you yet. And we can't expect quick fixes," Gerstner said, asking stockholders to stay patient.

IBM analyst Rick Martin at The Chicago Corp. noted that Gerstner's very presence at the podium sent a much more succinct message than the new chairman's words could reasonably have been expected to.

"Everybody already knows what's wrong with IBM, and most have a good idea of the kinds of actions that are needed to turn that around," Martin said. "What the company needs most isn't a strategy — it's a catalyst, an outsider who can break down the old corporate culture and implement the strategy [former Chairman John] Akers already worked out."

"One thing I didn't hear [Gerstner] say, and wish I had, is that he's going to split up the IBM sales force. That's critical," added Input analyst J. P. Richard.

Strong business units such as outsourcing subsidiary ISSC, he said, "could be so much more powerful with their own sales forces. The one-company, one-sales force model is a sacred cow that Gerstner ought to slaughter." — *Neil Margolis*

Outsourcing

ISSC, Equifax sign $650M deal

By Neil Margolis
ATLANTA

■ IBM's Integrated Systems Solutions Corp. (ISSC) last week reeled in its first "megadeal," hooked with the advantages of its Advantis networking unit.

ISSC landed a 10-year, $650 million contract to provide a potpourri of data center, network management and disaster recovery services (see story at right) to consumer financial information services giant Equifax, Inc.

"Strategically, this is an important initiative for Equifax," said company Chairman and Chief Executive Officer C. B. Rogers. The deal, he noted, promises Equifax customers enhanced computer and network management and support, while freeing the $1 billion-plus firm's internal information systems crew to focus on application development.

Along with its IBM 3090-300, Equifax has three Amdahl Corp. mainframes and two Digital Equipment Corp VAX 6500s.

Reliability push

In addition, the agreement aims at boosting Equifax's already substantial network reliability. "Equifax has network availability in the high 90% range," said Advantis Chairman and CEO Syd N. Heaton. "We'll meet it and better it."

J. P. Richard, an analyst at the Vienna, Va., offices of market research firm Input, said he viewed the deal as a coup for all parties "and a particularly strong strategic thrust on ISSC's part." The reason, he said, "is that they bid the Advantis card. This is going to be the proving ground where ISSC shows what Advantis can do and how smart they were to do the deal with Sears last summer."

Advantis is a networking management outsourcing joint venture between ISSC and Sears, Roebuck and Co., born last August when the two companies joined and honed their respective networking operations. On its first day, noted International Data Corp. analyst Caroline Michel, the IBM/Sears combo had some 9,000 internal customers, representing approximately 1.6 million end users.

Advantis currently has a Systems Network Architecure high-speed network and a multiprotocol network providing leased-line access at speeds up to 1.544M bit/sec. and dial access at line speeds of 300K to 19.2K bit/sec. The system boasts 4,500 attached networks, 2,500 T1 circuits, 1,100 videoconference centers and voice capacity of 1.8 billion annual call minutes.

The current contract leaves all application development in Equifax's hands.

"The ISSC people will simply be handling the systems that handle the data," an Equifax spokesman said.

Equifax may be skittish about its reputation for keeping client confidences in the wake of last year's widely reported infiltration of computers at its credit reporting subsidiary, Equifax Credit Information Services, Inc., by suspected thieves. The culprits used illicitly obtained access codes [CW, March 30, 1992; April 27, 1992].

An Equifax spokesman last week denied any connection between the incidents and any aspect of the ISSC/Advantis deal.

It's a deal

Highlights of the ISSC/Equifax contract include the following:

- ISSC will run Equifax's data center and network operations; Equifax will migrate to the Advantis network during the next 18 to 24 months.
- ISSC will handle some operating system software development; however, all application development will remain with Equifax.
- All Equifax data center staff will be employed by ISSC. ISSC project executive Nick Fici will take over as data center head.

Green revolution

CONTINUED FROM PAGE 1

housings into leading-edge machines could be further streamlined by anointing a single plastic composition as the standard to be used by all manufacturers. But Fisher said those unification efforts — because of vendor politics — are a long way off.

The immediate goal is to change computer design practices and create a "green PC," one that is more cost-effective to pull apart and reuse than toss in the dumpster.

IBM is expected to make an early move toward that goal this summer when it announces an energy-efficient PC whose housing and parts are made from a blend of recycled plastic and virgin resin.

Just like new

Key to the success of green PCs is that they be made just like machines made from virgin resins, so their maintenance and disposal costs will be identical.

Inder Wadehra, a senior engineer at IBM's Center for Environmentally Conscious Products in Research Triangle Park, N.C., said he does not expect the new PCs to cost customers a premium.

Users said that no matter how concerned they are about the environment, keeping the price of the new green machines down is key. "It's really great to see these companies act responsibly, but we've all got to keep our eye on our budget," said Trey Thompson, a systems analyst at Citgo Petroleum Corp. in Tulsa, Okla.

"Make no mistake — the only way this is going to work is if it's effective at the bottom line," added Terry Moburuk, manager of vinyl recycling at the Geon Vinyl Division of BF Goodrich Co. in Cleveland.

The move toward ecologically responsible PCs is being hastened by the largest buyer of computers in the world — the federal government.

Last month, President Bill Clinton said the government is committed to purchasing only those computers and printers that meet the Environmental Protection Agency's Energy Star guidelines for energy efficiency. The action is expected to save the federal government $40 million a year on electricity.

Financial sense

The monetary draw of such a move is strong. Starting this summer, an estimated 70 hardware manufacturers will introduce energy-efficient computers that use up to 75% less energy than current models.

APC members said they hope the federal government might make a similar commitment to PCs that integrate reused plastics, which would encourage more manufacturers to join their recycling effort.

Analysts said the teamwork between the manufacturers and the APC is clearly a step toward keeping the cost of recycling and disposal down.

"The more we think about things like [recycling and reuse] now, the less we're going to have to worry about where we're going to build the next landfill tomorrow," said John Young, a senior researcher at Worldwatch Institute, an advocacy group in Washington, D.C.

Remade in the U.S.

IBM
- Will make housing and parts from a blend of recycled plastic and virgin resin, beginning this summer.

Xerox
- Established an internal plastics recycling team whose goal is to incorporate 25% recycled content by weight into its products by 1995 and 50% by 2000.

DEC
- Reclaims plastic computer housing, which is returned to General Electric and recycled as roof panels for McDonald's restaurants.

Canon
- Donates $1 to environmental preservation groups for each returned printer cartridge.

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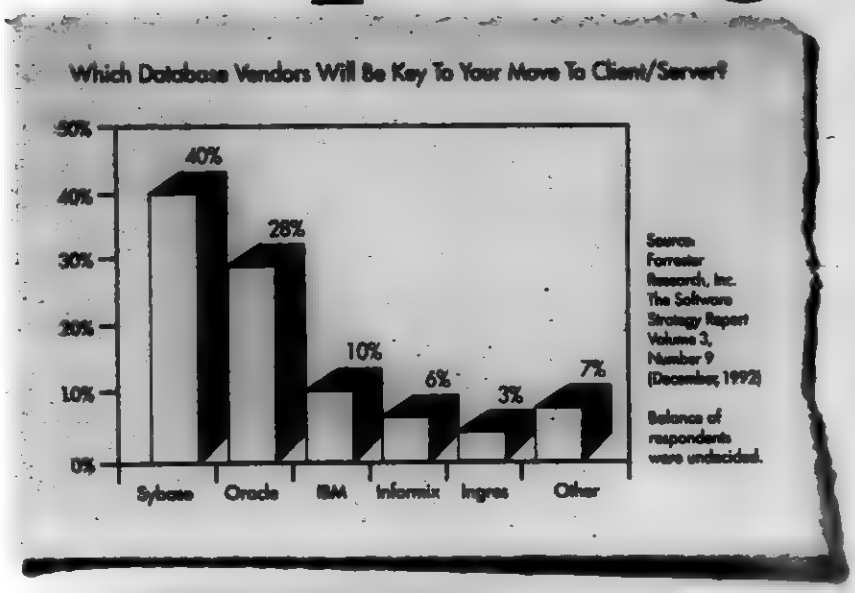

And they have also spoken.

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CMIP may not be dead after all

By Elisabeth Horwitt

Simple Network Management Protocol (SNMP) supporters may be premature in their claims of total victory over rival Common Management Information Protocol (CMIP). Indeed, some powerful users and vendors claim that even when SNMP Version 2 arrives, CMIP will still be the only viable vehicle for managing complex, enterprisewide network installations.

SNMP now dominates internetworking and local-area network management niches. However, companies such as Motorola, Inc. have tried in vain to find a viable SNMP-based enterprise management system and are still waiting for CMIP products.

With the recent finalization of the Network Management Forum's Omnipoint, CMIP specifications have gained stability and support from key vendors such as BT, Hewlett-Packard Co., NetLabs, Inc. and IBM. And users are beginning to evaluate the resulting products.

CMIP is more suitable than SNMP for enterprise management for the following reasons, users and analysts said:

•It supports peer-to-peer interaction across different management domains, while SNMP centrally polls remote devices. This makes CMIP far more suitable for a distributed system in which multiple network management domains exchange data for collaborative, troubleshooting and administrative purposes.

•CMIP is also more suitable for "umbrella management" systems that provide a centralized view of enterprise networks, according to Jim Moorhouse, Motorola's manager of network management strategies.

One reason is CMIP's ability to distribute management intelligence out to multiple nodes, enabling it to handle more extensive, complex networks. This is why IBM picked CMIP for LAN NetView, its product for managing "hundreds of thousands of workstations," said IBM product manager Rich Lechner.

•CMIP also allows domain management systems to initiate notifications to the central management system, such as "gee, my DASD is 90% full," Lechner said. SNMP systems' polling setup can delay the delivery of crucial alerts.

•CMIP, and its underlying Open Systems Interconnect transport protocols, are said to provide guaranteed delivery of data; SNMP and Transmission Control Protocol/Internet Protocol do not (see story at right). SNMP Version 2 is said to help the problem, but not totally solve it.

•CMIP's greater reliability makes it a strong candidate for organizations such as the Federal Aviation Administration, "whose network and systems reliability and availability numbers" are around 99.99999%, said Paul Brusil, who chairs a network management standards group within the National Institute of Standards and Technology.

•CMIP is the basis for most network management systems abroad and is virtually mandated by many European governments, Brusil said.

•CMIP and Omnipoint, unlike SNMP, use common object definitions. Many analysts and vendors view object-based systems as the next wave of integrated network management.

Michael Disabato, network manager at McDonald's Corp., spoke for many when he complained of the lack of real applications running on top of CMIP systems. The exception is telecom carriers, particularly overseas, and telecom equipment vendors — many of whom also support SNMP.

However, companies such as McDonald's may well end up implementing systems that use CMIP and Omnipoint as their foundation. Right now, McDonald's is evaluating one such product: NetLabs' Overlord.

[redacted]

[redacted]

Net management

CONTINUED FROM PAGE 1

month to ship Overlord, an enterprise management system for which several major corporations have been eagerly waiting.

Companies such as McDonald's Corp. and Motorola, Inc. tried and failed 18 months ago to find the right enterprise management system. This year's spate of activity is causing their network managers to look again.

What makes these companies a tough sell is their need for a system that can not only manage thousands, or even hundreds of thousands, of network systems and devices but also interact with "domain managers" that specialize in a particular management function or device. These devices are often products from other vendors, running on different platforms.

This is the wave of the future for enterprise network management — but it has not quite arrived, users and analysts said.

Jim Moorhouse, manager of network management strategies at Motorola, outlined a common corporate ideal for enterprise network management: a centralized "umbrella" management system that can overview important activities happening across the enterprise and element managers that monitor and troubleshoot individual network domains.

For example, Motorola wants to be able to maintain network control centers in different parts of the world that can take over for one another as one sector goes to bed, Moorhouse said. The company also wants to set up management domains along functional lines: one for voice systems, another for wide-area transport links and a third for local-area networks, bridges, routers and front ends.

Vendors have so far failed to provide truly distributed systems where domain management systems can do local management and exchange data with one another and the umbrella manager, users said.

Several users cited Overlord from NetLabs as the most hopeful of the bunch. IBM's NetView and HP's OpenView still have the functionality of "element managers": SNMP-based systems that can manage limited installations of LANs, routers and hubs, Moorhouse said.

A major motivation for distributing network management functions out to local nodes is cost. "Once the network gets to a certain size, you need a Cray just to run SNMP," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. "And we don't want to go to anything bigger than a SPARCstation 10. Offloading [network management tasks] means you can buy capacity in small chunks as you need it."

An ideal scenario for many companies is to implement their managers on Unix and the less demanding domain managers on less pricey platforms, such as Microsoft Corp.'s Windows and IBM's OS/2. HP said it is working to address this need by providing first common user interfaces, then communications, across the Windows and Unix versions of OpenView.

IBM NetView/6000 to wear enterprise hat

By Elisabeth Horwitt

ARMONK, N.Y.

IBM is positioning and enhancing NetView/6000 to become its leading enterprise management system, leaving NetView primarily for managing IBM hosts and SNA-only installations, according to David Passmore, vice president at Gartner Group, Inc. in Stamford, Conn.

A series of new products and enhancements will metamorphose its NetView/6000 from just another Simple Network Management Protocol (SNMP) system into a powerful manager of enterprisewide networks, including IBM Systems Network Architecture (SNA) installations, IBM spokesmen said last week.

IBM's SNA/6000 software, due out by year's end, turns an IBM NetView host into an element manager that monitors VTAM SNA networks and passes alerts, configuration and traffic data to a NetView/6000 over an IBM LU6.2 link, said Sanjiv Ahuja, manager of AIX network management services. Eventually, NetView/6000 will manage SNA on its own, he added.

The ability to manage SNA installations will make NetView/6000 far more appealing to IBM users who are currently weighing it against Hewlett-Packard Co.'s OpenView, Passmore said. "NetView/6000 is a much better platform [than a NetView host] for an integrated view of everything," he added.

IBM is also preparing the following NetView/6000 enhancements:

•The ability to manage enterprise networks with hundreds of thousands of nodes. The boost is likely to come from upgrading reduced instruction set computing hardware and distributing management intelligence to distributed NetView/6000 agents.

•More sophisticated rules-based tools for correlating alerts across the enterprise and automatically responding to trouble situations.

•Incorporation of Resource Object Data Manager, IBM's SystemView-compliant, object-oriented database structure, as the basis

U·M·I

THE "IBM NETVIEW/6000" ARTICLE ON PAGE 14, WILL BE CONTINUED WITH THE MAY 10TH ISSUE.

Wireless 'glue' stirs fury

CONTINUED FROM PAGE 1

vice president and director of Motorola's Paging and Wireless Data Group.

However, aside from a 1993 schedule (see chart page 1), a list of a dozen "endorsers" that includes RAM Mobile Data and General Magic, Inc. and a roster of as-yet-intangible characteristics, Motorola is offering few details about its technology, now renamed Mobile Networks Integration (MNI).

MNI is slated to take the form of a data gateway, an application programming interface and a developer's tool kit. It aims to allow application developers and computer/communications equipment manufacturers to design products that will operate over many service providers' wired and wireless networks. That number totals 38 today, analysts said.

Promises, promises

The to-be-licensed MNI is slated to route and deliver messages, directory services, unified billing and user profile information. Other objectives include the following:

- Lower costs to end users. The plan is for users to pay for one network connection rather than multiple network links.
- A single identification number per user for "anywhere" accessibility.
- Cohesive billing for linked services, as provided by telephone service suppliers today.
- Public key encryption for data security.

Notably absent as MNI endorsers, however, were AT&T, McCaw and any third-party developers. McCaw's current strategy is to stay focused on vertical wireless markets where users run closed pockets of wireless applications, such as field maintenance automation or courier vehicle dispatch.

Rob Mechaley, senior vice president and general manager of McCaw's Wireless Data Division, formed last week, said he does not see "any reason why a user of the RAM Mobile Data network [for example] would want to interoperate with the McCaw wireless network."

Split decision

The industry is divided on this issue. "We can hardly wait for wireless E-mail and fax, and we want it to be just like the telephone system is today," said Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc., a worldwide advertising agency based here.

"Rob Mechaley hasn't paid very much attention to how people are going to use electronic mail," said analyst David Coursey, editor of the "P.C. Letter" newsletter in San Mateo, Calif.

"He thinks CDPD" — an emerging standard for running data over cellular networks — "is all anyone is ever going to need," added Andrew M. Seybold, publisher of "The Outlook" newsletter on professional and mobile computing.

"That's fine for vertical markets, but John Q. Businessman is going to choose other networks because CDPD has no service set up for messaging and other broad, horizontal applications," he said.

On the other hand, United Parcel Service, Inc., which runs a package-tracking application over McCaw's cellular network and an on-call air application over the Ardis packet data network, "has set up separate networks for separate applications. We don't foresee the need for interconnecting them," said Daneen Cooper, systems manager.

And while Ardis customer Avis Rent A Car System, Inc. in Garden City, N.Y., anticipates "several different wireless applications" in its future, "they will be very specific, and I don't see them talking to each other," said Peter R. Tittler, vice president of networks and technology.

"My initial reaction, though, is if I did want to connect them, I would link our users back to our wired data network" then to the different network, he said.

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Bill Inmon, creator of the data warehouse.

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News Shorts

Borland shows new Quattro Pro

Borland International, Inc. last week previewed Version 2.0 of its Quattro Pro spreadsheet for Windows before a group of securities analysts. Due this fall, the new release will include prepackaged macros, called Experts, that will initiate specific functions. It will also include a data modeling utility, interactive tutor and expanded Help facilities. Meanwhile, Borland created a Client/Server Division to coordinate the product development and marketing of client/server databases, software tools and middleware.

Proteon restructures, cuts staff

Networking company **Proteon, Inc.** in Westboro, Mass., last week said a corporate restructuring following a quarterly net loss of $2.67 million will result in a 15% staff reduction. The firm said it will create two independent business units: an adapter card and "dumb" wiring hub group and an internetworking and intelligent hub group.

CA told to pay saleswoman

A San Mateo, Calif., Superior Court jury awarded nearly $900,000 to a former **Computer Associates International, Inc.** saleswoman, who charged that CA had wrongfully withheld a sales commission owed her. In April 1989, Linda Sample, 44, sold a CA-Datacom DB for IBM's MVS environment software package to **CTB-McGraw Hill** in Monterey, Calif., for $450,000. Shortly after the sale, Sample was demoted to an entry-level sales position after a new regional CA sales manager was brought in, according to her attorney, Daniel Bartley. After several failed attempts to obtain her commission, Sample left CA in September 1989 and filed suit against CA. CA's attorney declined to comment on whether CA will appeal.

AXPs tied to Internet

Digital Equipment Corp. has made two DEC 4000 Alpha AXP systems available to Internet users, said company officials last week. Developers can use these systems to test, qualify or port their software, and other Internet users can log on to evaluate the systems. One DEC 4000 AXP system is running DEC's OSF/1 with an address of axposf.pa.dec.com, and the other, running VMS, has an address of axpvms.pa.dec.com.

Townsend honored

William R. Townsend was named data center manager of the year by the **Association For Computer Operations Management**. Townsend, manager of the Computing Services Division at **Air Products & Chemicals** in Allentown, Pa., was nominated for his role as "a proactive agent of change and champion for the career growth and development of his staff."

SHORT TAKES **Delrina Technology, Inc.** will unveil this week a Windows version of its electronic forms software. . . . **Microsoft Corp.** has reached a settlement with Z-Nix Co., a Microsoft OEM that the Redmond, Wash., firm had accused of pirating its software. . . . **Zeos International, Inc.** announced its Contenda 486, a 3.9-pound notebook based on Intel Corp.'s 25-MHz 486SL processor. . . . **United Technologies Automotive** — a $2.4 billion United Technologies Corp. subsidiary — inked a $14 million, five-year outsourcing pact with **The Genix Group**. . . . **The American National Standards Institute** is offering a registration service to provide organizations with unique electronic-mail names. . . . **The Peripheral Component Interconnect (PCI) Special Interest Group** announced Version 2.0 of the PCI bus, which includes a 3.3V definition and a finalized connector definition.

Convex, HP expand systems ties

Cross-licensing may help firm build massively parallel computer

By Ellis Booker
RICHARDSON, TEXAS

Forthcoming massively parallel processing (MPP) systems from Convex Computer Corp. last week led the supercomputer maker and Hewlett-Packard Co. to extend a 14-month-old strategic alliance by announcing additional cross-licensing of each other's software systems.

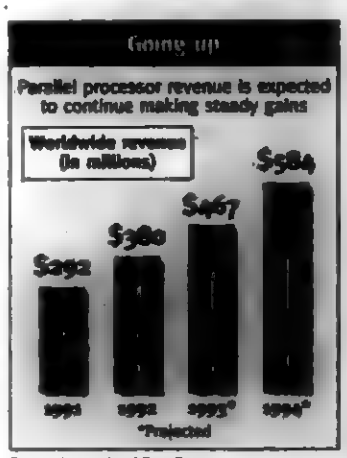
Still under development and aimed at the commercial marketplace, future MPP systems from Convex will run HP's Unix-based HP/UX operating system and use HP's Precision Architecture-RISC hardware.

"Right now, 'general purpose' and 'MPP' is an oxymoron," said Steven Wallach, Convex's senior vice president of technology. He argued that current MPP systems have largely failed to break through to commercial sites because they do not run a broad range of third-party software.

Gary Smaby, president of the Smaby Group, Inc. in Minneapolis, agreed that the commercial application of MPP technology has been hampered for this reason.

"The company that develops the silver bullet and can tap into hundreds or thousands of application codes could have an advantage," Smaby said. On the other hand, he said it was unclear how many of those thousands of commercial codes were suitable for MPP.

To differentiate between current MPP technologies and its own strategy, Convex refers to its future products as scalable parallel processing (SPP) systems. Wallach claimed an SPP system will be able to run more than 4,000 applications.



Source: International Data Corp.

The first phase of Convex's SPP strategy was launched last year in the form of the Meta Series, which links Convex supercomputers to clusters of PA-RISC processors running cluster-specific parallel software.

Convex has installed about 12 Meta Series systems, 10 of which were put in during the first quarter of this year, Smaby said.

The problem for traditional supercomputer vendors, he said, has not been meeting raw performance levels but satisfying expectations about service and support.

To address this, Convex, besides licensing HP/UX, will get a suite of "middleware" products from HP, including libraries, commands, user interface modules and utilities for software distribution and system administration.

By using HP's PA-RISC hardware platform and adapting the Mach 3.0 microkernel to include faster I/O, Convex hopes to be able to run thousands of existing HP/UX applications on its SPP systems. Concurrently, the company is continuing work on its C4, an MPP supercomputer, using proprietary chip technology.

HP invested $18 million in Convex last March. No additional investment was announced by the firms last week.

Parallel processing

Unisys unveils fast processor to connect 2200 series

By Thomas Hoffman
PHOENIX

Stepping gingerly into parallel processing, Unisys Corp. last week unveiled a technology designed to speed systems throughput for its 2200-class enterprise hosts and servers.

The Extended Processing Complex (XPC) ushered in here at the joint Cube and Use, Inc. user conference, was warmly received by 2200 mainframe customers and analysts at an already-sizzling conference.

XPC, a 6-ft-high, refrigerator-size cabinet containing a complex of microprocessors, can be linked with a single 2200 host or with any combination of four 2200/400, 600ES or Model 900 systems, totaling up to 32 processors.

Processors are linked in parallel using fiber-optic connections so that different 2200 systems can share databases and maximize system memory and disk and tape subsystems without forcing users to modify their software applications in any way.

Those features drew high praise from James L. Caswell, vice president and service director of large computer systems strategies at Gartner Group, Inc., a Stamford, Conn., research firm. "The Unisys XPC for the 2200 is one of the best solutions for high-volume transaction users requiring performance, high availability, scalability and recoverability," noted Caswell, a conference attendee.

Caswell said XPC is "at least two years ahead of the industry" in providing these capabilities using shared stand-alone storage.

In the right direction

XPC's parallel processing capabilities follow Unisys' introduction last month [CW, April 12] of entry-level parallel processing between the Single Chip A series Mainframe Processor, which powers the vendor's A series product line, and an Intel Corp. 1486 chip running on a Unisys U6000/65 server.

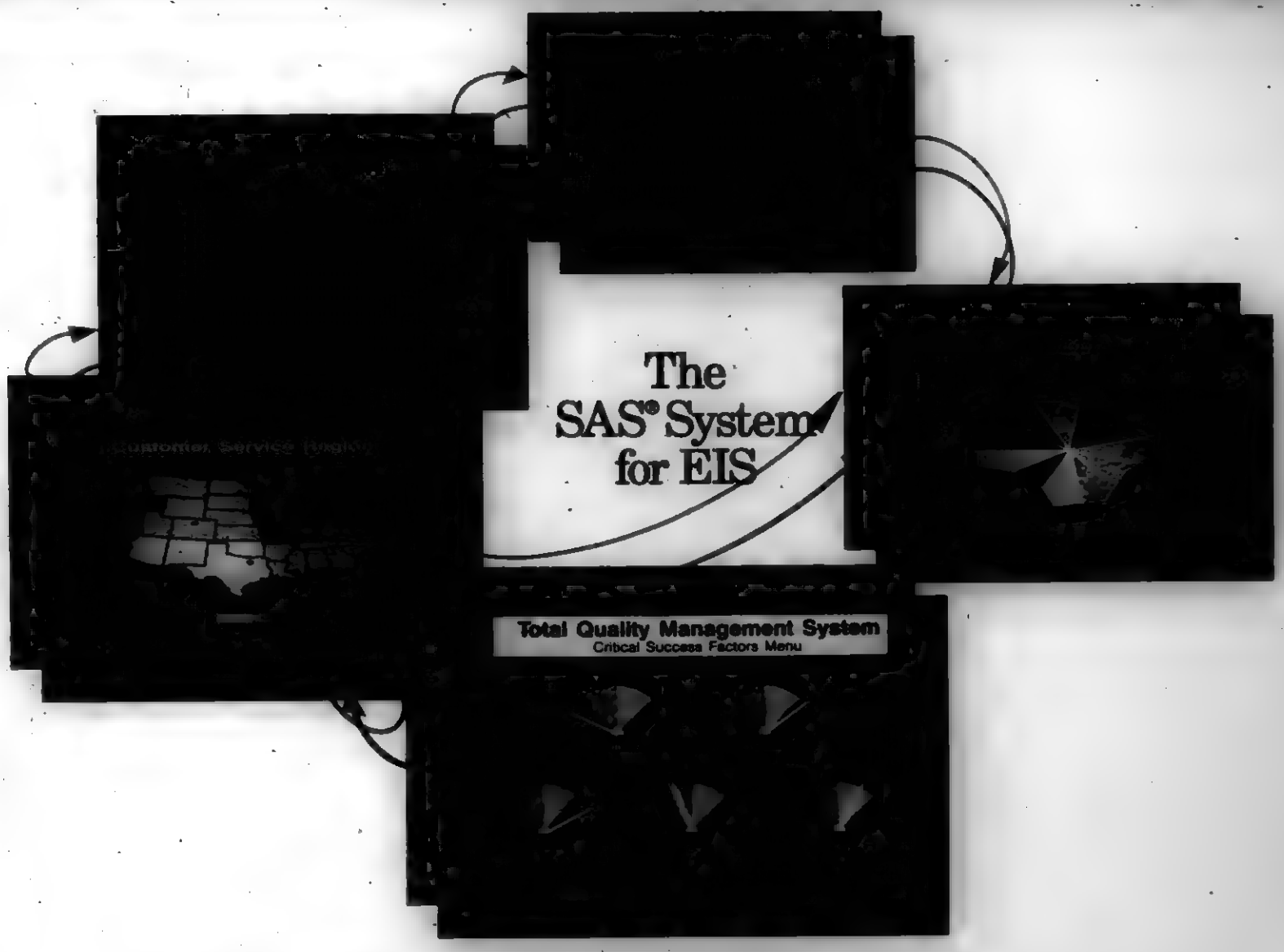
Though the announcements are unrelated, both embellish Unisys' first steps in a planned strategy to evolve its current-generation mainframes into massively parallel processing machines.

Unisys executives said early testing results of XPC have shown the system can boost mainframe throughput by up to 30% compared with existing technical capabilities of stand-alone 2200s.

Those improvements were well-received by Michael J. Minnis, senior systems analyst at Pacific Bell in Hayward, Calif. Pac Bell, which runs one dozen 2200 machines, is facing I/O constraints with its systems, particularly with its high-end 2200/900 models. Minnis said XPC may be a solution to those problems. "We're very interested in XPC since we think it could certainly help us out with some I/O issues," Minnis said.

Jim Lee, manager of technical support at Nynex Corp. in Pearl River, N.Y., said he is interested in how XPC could potentially ease resource management constraints for Nynex's three 2200 hubs. However, Lee added that any acquisition would have to be cost-justified from a performance standpoint.

Pricing for XPC is dependent on configurations with attached 2200 systems and ranges from $230,000 to $3 million. Shipment is slated for the fourth quarter of this year following the completion of beta testing this summer.



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HEWLETT PACKARD

Development tools

KnowledgeWare outlines object CASE enhancements

By Kim S. Nash
ATLANTA

KnowledgeWare, Inc. last week detailed enhancements to a recently acquired PC-based, object-oriented tool that targets the same users that Powersoft Corp. and Gupta Corp. want to capture.

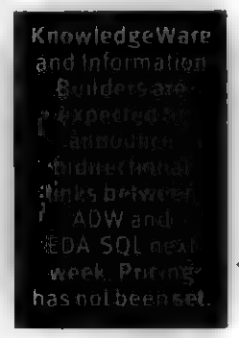
However, several attendees of the KnowledgeWare user group meeting here said that while they want to see what ObjectView is all about, they are too swamped with mainframe computer-aided software engineering (CASE) to change tracks in the near term. KnowledgeWare inherited the product during its February buyout of Matesys Corp.

Neil Morgan, vice president of the Bank of New York, offered a typical response: "Sure, I'll go see [ObjectView]. But we've got enough to do with keeping our mainframe projects going. There's just no time to sit down with something new right now."

Nevertheless, KnowledgeWare is doing what is necessary to keep up with the Joneses, according to Charles Troutman, manager of business systems development at Cessna Aircraft Co. in Wichita, Kan.

Improvements to ObjectView will be rolled out in stages this year. Phase one will include the ability to import Data Definition Language information from KnowledgeWare's Application Development Workbench (ADW)/Design Workstation to ObjectView, said Paul Hessinger, KnowledgeWare's senior vice president. That way, developers will be able to model and change SQL databases supported by ObjectView, such as Oracle Corp.'s Oracle and Sybase, Inc.'s Sybase, via ADW tools, he said.

Phase two calls for making that link bidirectional with both ADW/Design and ADW/Analysis workstations.



Troutman said he has seen other CASE makers, such as Intersolv, Inc., scamper to add PC modules and support for Unix-based relational databases to what historically have been IBM mainframe-centric workbenches. That, combined with newer offerings such as Powersoft's PowerBuilder, means vendors are now zinging a lot of products into the client/server market.

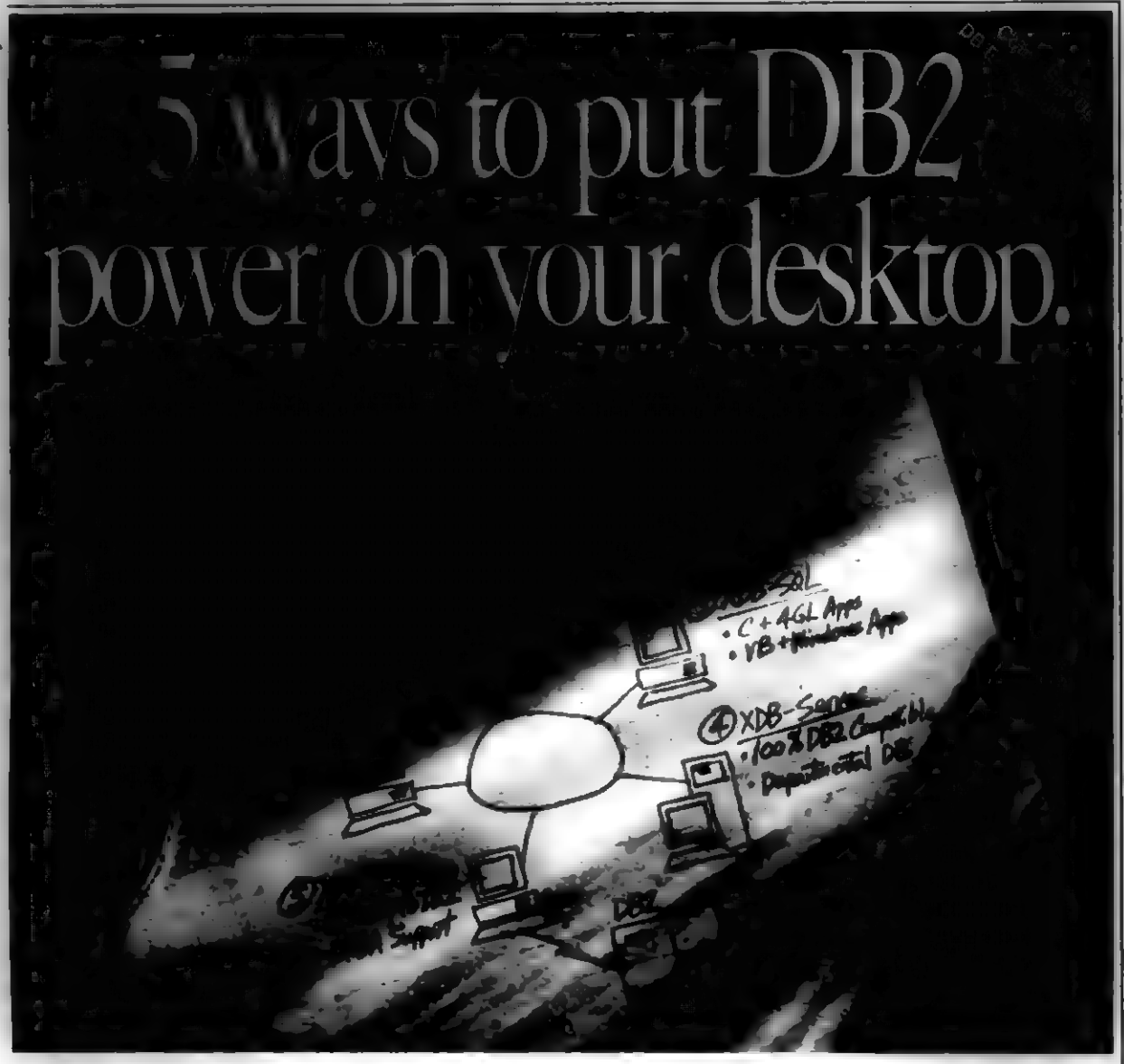
"We have a lot to choose from," Troutman said. "But we still have to wait and see how it all comes out."

Meanwhile, ADW "is very much alive and well," Hessinger said, seeking to assuage fears that KnowledgeWare's bread-and-butter mainframe customers were forgotten amid ObjectView hype.

Users can look for the following enhancements in the third-quarter release of ADW 2.7.02:

- ADW/Encyclopedia Expert, a $3,500 utility KnowledgeWare bought from third-party developer Model Software, that manages ADW's repository via PCs.
- A workgroup tool to let up to 10 developers work on a project simultaneously.
- Easier exchange of information among modules that cater to different parts of the development life cycle and an update of ADW/MVS generator.

Such promises have made Marvin Taylor happy. Taylor, supervisor of systems and programming at Farm Bureau Insurance in Indianapolis, said a dearth of PCs at the company will keep him doing mainframe development for the foreseeable future. "A lot of companies are like us, where you just need mainframes for big, big applications," he said.



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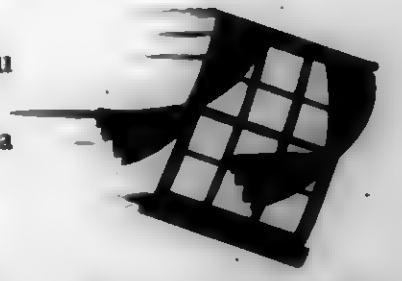

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Vendors back next-generation FDDI

Unshielded twisted-pair products for high-speed nets leapfrog draft standard

By Lynda Radosevich

Products based on the Fiber Distributed Data Interface (FDDI) over unshielded twisted-pair networking standard, which reached draft form in February, will roll out this week.

Network Peripherals, Inc. will announce FDDI over unshielded twisted-pair adapter cards, and SynOptics Communications, Inc. will announce FDDI hubs. The companies said they worked together to ensure interoperability between their products.

Aimed at use in network servers and high-performance workstations, the products will allow users to run FDDI's 100M bit/sec. maximum networking speeds over Category 5 (data grade) copper cabling. This is a typically lower cost cabling scheme than the fiber requirements of the current FDDI standard.

Pricing for FDDI over unshielded twisted pair is meant to rival anticipated pricing for products based on 100M bit/sec. Ethernet standards, said Gordon Stitt, vice president of marketing at Network Peripherals.

The adapter cards, available now, cost $995 for SBus and AT bus computers and $1,495 for Micro Channel Architecture and Extended Industry Standard Architecture bus computers. Fast Ethernet adapters are not available yet, but pricing is expected to be between $800 and $1,000. The SynOptics hubs will cost $714 per port and will be available in the third quarter, SynOptics said. Modules compatible with existing SynOptics System 3000 modules will cost $3,750.

Unmatched

However closely vendors' products adhere to the draft standards, there is a possibility that the products will not exactly match the finished standard.

"The standard is quite far along, but there are still outstanding technical issues," said William Cronin, chairman of the ad hoc committee working on FDDI over unshielded twisted-pair standards.

Remaining issues include particulars about transmitter and receiver behavior. "Officially, it isn't a standard until it is blessed by the board of standards review," he said — an event that may happen by the end of the year. Whether this would impact the compatibility of draft-standard products and standards-based products is unclear, Cronin said.

Used in network servers and high-end workstations, FDDI over unshielded twisted-pair wiring results in a lower cost cabling scheme than traditional FDDI.

For organizations with users running data-intensive applications, such as NASA's Jet Propulsion Laboratories (JPL) in Pasadena, Calif., FDDI over unshielded twisted pair presents an available high-bandwidth desktop solution. Other high-bandwidth options including 100M bit/sec. Ethernet and Asynchronous Transfer Mode (ATM) high-speed networks are in earlier stages of development.

The 5,000-employee JPL, which uses an FDDI network backbone, will begin testing the Network Peripherals and SynOptics copper-based products this month, possibly for use by workstation users doing scientific imaging processes and other applications, said Ted Su, network engineer.

The lab will also consider ATM networks but cannot implement ATM until congestion- and flow-control issues are addressed, Su said.

Prestandard hubs and adapters for FDDI over unshielded twisted pair already exist. For example, Crescendo Communications, Inc. in Sunnyvale, Calif., has been shipping such products since January 1992. Crescendo technology comprises the basis of the developing standard.

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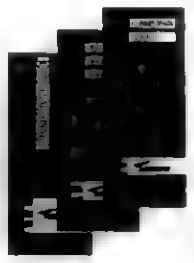

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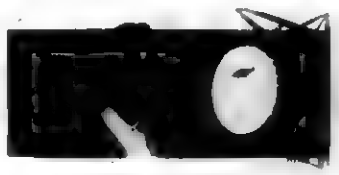

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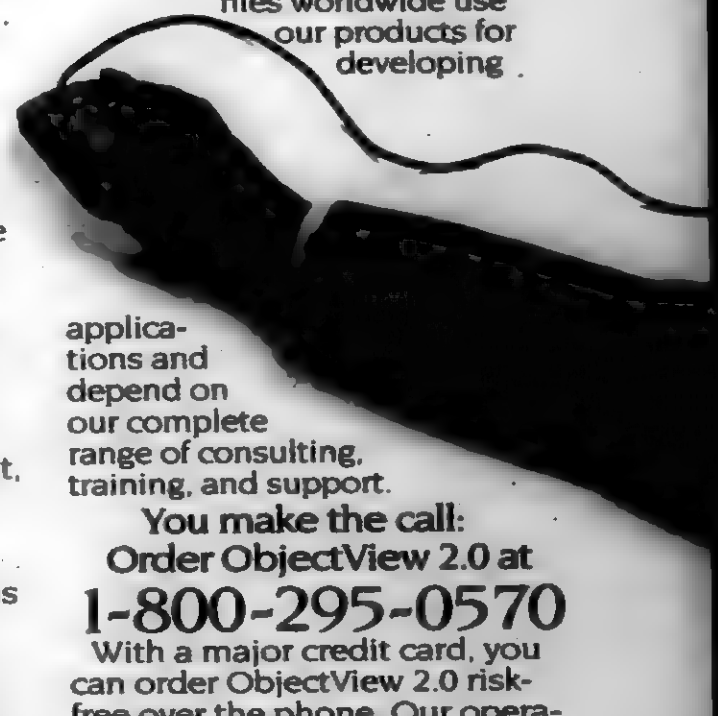

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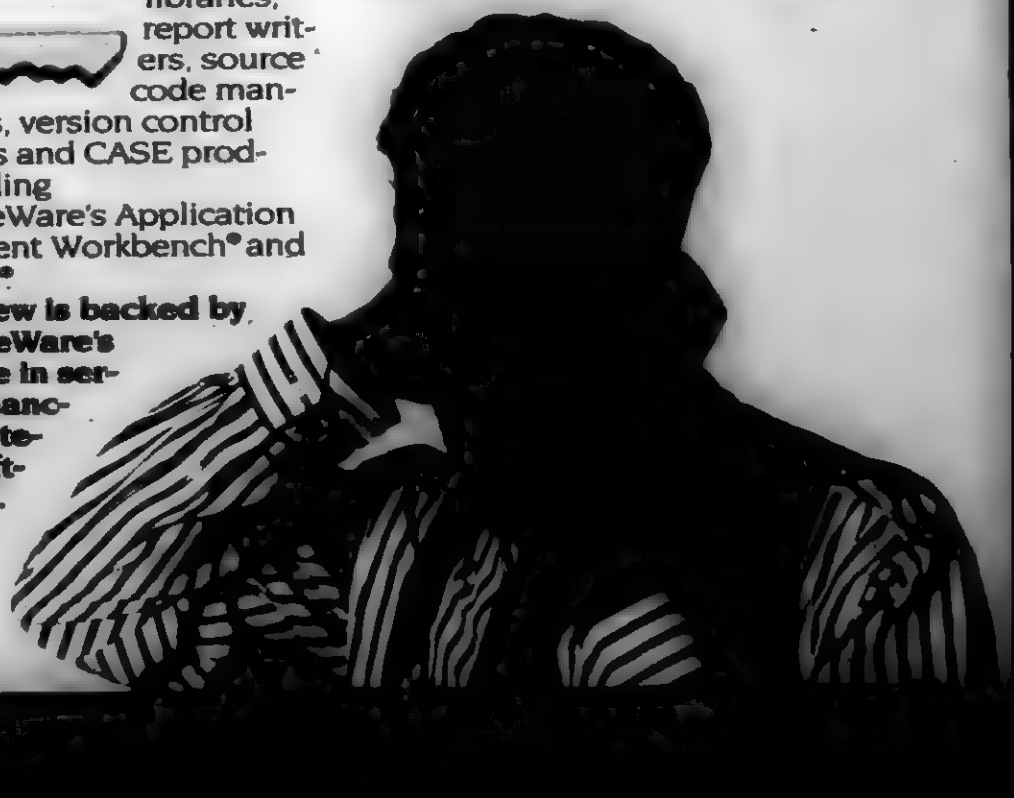

A disk problem causes you incredible discomfort. A lapse in memory takes its toll on your entire system. It wasn't anyone's fault. But now it's yours. Because if it affects the LAN, you're the one who has to deal with it.

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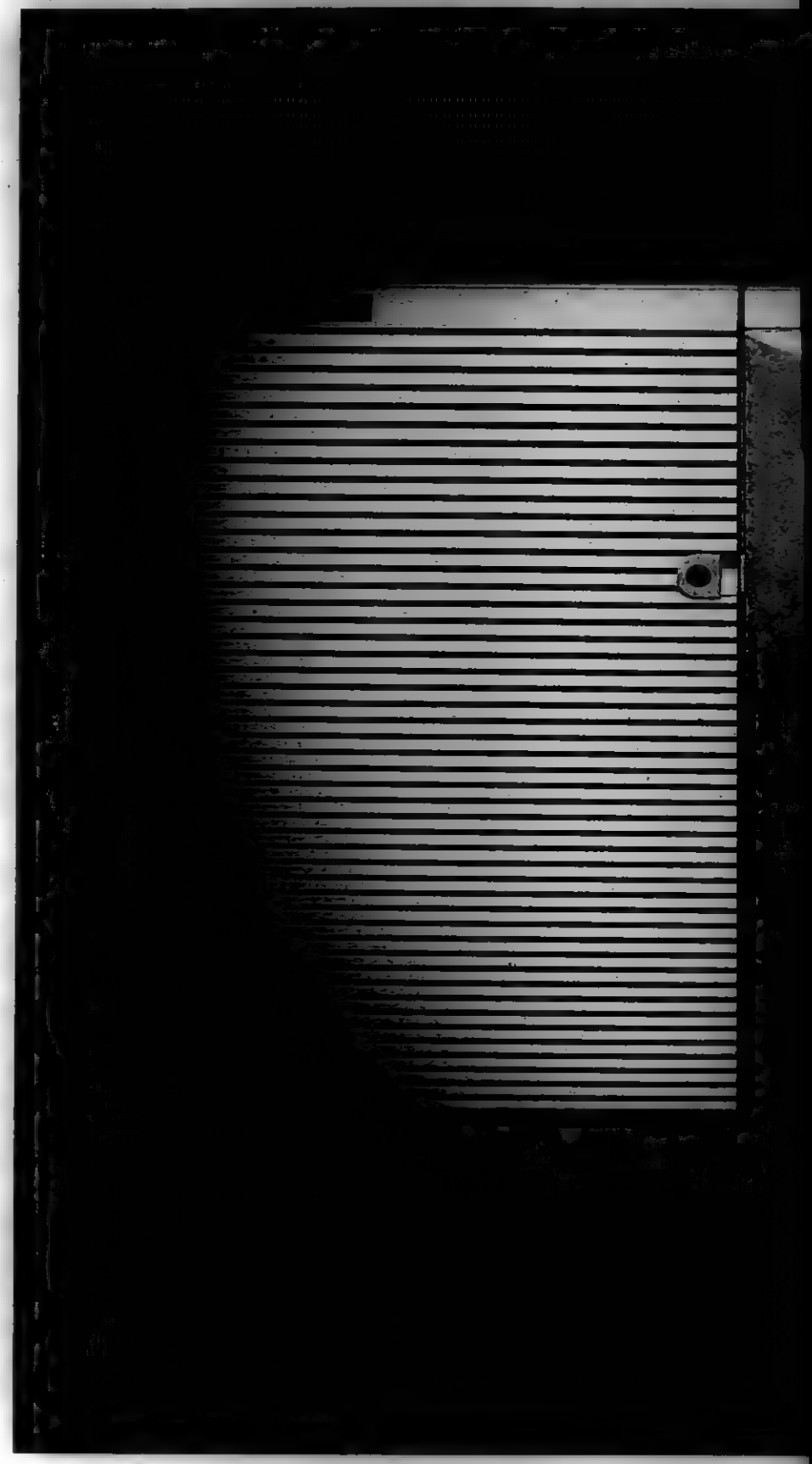
With the Maximum Availability and Support System/2 (MASS/2) option, the Server 195 provides comprehensive local and remote server monitoring, control, tuning



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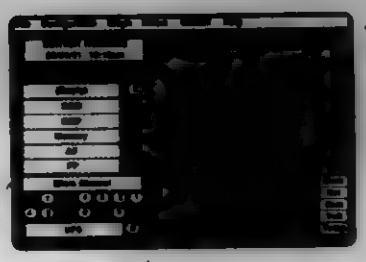
It even tolerates

and recovery capabilities. MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



The MASS/2 option has a user-friendly GUI that lets you distribute computing power across your organization from a central location.

Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
Available Slots	8 Micro Channel®	12 Micro Channel	12 Micro Channel
MASS/2	optional	standard	standard

Like all PS/2s, the Server 195 is backed by IBM HelpWare™—a range of service and support so complete, it's hard to find fault with. You get a three-year on-site warranty with four-hour average response time*, around-the-clock set-up, usage and service assistance on IBM hardware and software during warranty,** a 30-day money-back guarantee** and more. For more information or an IBM certified dealer near you, call our Personal Systems HelpCenter™ at 1 800 772-2227 or TDD ASCII 1 800 426-4238. In Canada, call 1 800 465-7999.

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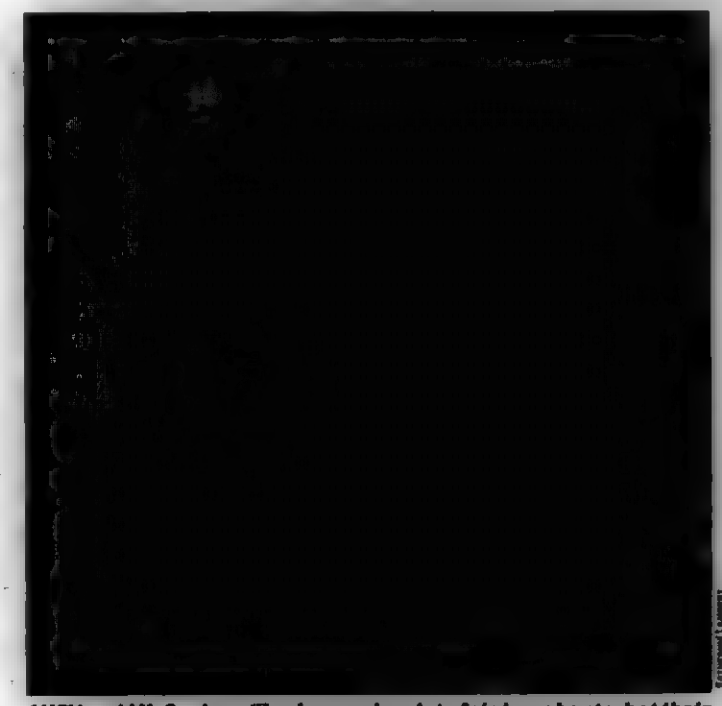
Tire-kicking technology

AMS' chief technology officer describes his firm's new lab

Even though American Management Systems, Inc. (AMS) had its best year ever in 1992, the systems integrator and software house undertook a major strategic review of its business and decided to rededicate itself to being a technology leader.

To that end, AMS recently tapped software expert Jerrold M. Grochow as chief technology officer and established the AMS Center for Advanced Technologies as an applied research laboratory.

Grochow has had a 20-year career at AMS and formerly worked at MIT, where he earned a doctorate degree. Grochow recently talked with Computerworld *national correspondent Mitch Betts about the center, which opens this month in Fairfax, Va.*



KATHERINE LAMBERT

AMS' Jerrold M. Grochow: 'Vendors make a lot of claims about what their software can do, but until you get the hardware and software plugged together, you can't verify whether it will perform well'

Q. Why start an advanced technology laboratory now?

A. The technology for developing large-scale business systems is changing so dramatically that AMS is making a major push to get out in front, lead where it's going and make sure our clients are making effective use of these new technologies.

Q. How did you choose topics to study?

A. We already had some active research programs, so we picked the ones we think will have the most impact across the organization. For example, object technology is a very obvious one. In multimedia, one of our business units had a fledgling research activity, but now we see that becoming much more pervasive in all of the work we're doing.

Research on mobile computing began in one of our federal defense units, but now we see applications in a range of industries including insurance, utilities, banks and telecommunications.

Q. What will the client/server lab do?

A. We're bringing in equipment from a variety of manufacturers and tying it into our existing and experimental networks. We'll be able to advise our clients about which technologies actually work and which are hype.

We'll also have what I call the "workstation of the future," where people can see what they might have sitting on their desktop in three or four years. It's a combination of technologies . . . that exist today but are too expensive.

Q. Can you test whether Product X works with Product Y?

A. That is certainly one of the activities we're engaging in — a systems integration activity. Vendors make a lot of claims about what their software can do, but until you get the hardware and software plugged together, you can't verify whether it will perform reasonably well in a high-volume business environment.

We're also starting a new performance measurement lab. We see a real need to be able to predict the performance of some very complex client/server application systems — systems that involve multiple servers [and multiple networks].

There is some literature about the performance of very simple server networks, but if the database is spread over three different server machines and there are transaction servers and imaging servers and so on, no one does that kind of analysis.

So, we're starting to do simulation and modeling to predict performance. Performance is a key issue when information systems departments move from mainframes, where they understand the performance characteristics, to these complex networks.

Q. How do you make sure the research is relevant to business needs?

A. We'll get guidance from both an internal board and an external board of advisers, which will include academics and chief information officers from around the world.

Of course, we'll be hedging our bets. We'll spend a small amount of money to find out what impact virtual reality will have on business in the future. But we'll spend a lot more figuring out how to bring object technology into the business mainstream and how to get the promised benefits.

Q. Would you kill research on a technology that either fizzles or matures?

A. Absolutely. I expect that over time, some of our labs will come and go and some will change their focus.

Two years ago, we might have created a lab for document imaging, but that technology is now in the mainstream, so it doesn't need an advanced technology lab.

Two or three years from now, maybe object technology will be mainstream, although I suspect it may take a little longer than that.

What the center will do

▶ Besides consolidating various AMS research projects, the Center for Advanced Technologies will analyze the practical issues involved in implementing new-wave technologies such as client/server computing, object-oriented programming, pen computing and multimedia workstations.

AMS' total budget for research and development was $15 million in 1992, or 4.5% of total revenue ($333 million).

The center has a handful of full-time employees and more than 150 part-time associates. AMS consulting clients will have access to the laboratory at no additional charge, and the laboratory's results will also be disseminated through seminars and technical papers.

The center will have research units focusing on the following areas:

- **Applications architectures:** Promoting reusable software.
- **Client/server technology:** Distributed computing environments, workstation operating systems, database servers and interoperability testing.
- **Collaborative work environments:** Lotus Development Corp.'s Notes software and electronic meetings.
- **Computer/human interaction:** Graphical user interfaces and usability testing.
- **Mobile computing:** Examining pen-based interfaces, wireless data communications and the integration of mobile technologies with client/server systems.
- **Multimedia:** Enriching applications with interactive video and audio.
- **Object technology:** Development languages, tools and database management systems.
- **Performance and measurement:** Modeling complex client/server systems to assess their performance and capacity constraints.

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Open and shut

One trillion dollars — 10^{12}. One big chunk of moola (unless, of course, you're the federal government, which spends that much every few months).

This staggering amount also represents the approximate value of the installed base of so-called legacy or proprietary systems worldwide — most of it here in the U.S. Not included in this total are the tens of billions of dollars that went into training people to install, program and manage these systems.

This installed base of users and machines also represents the main reason why the gulf between the promise of open systems and its reality will remain wide well into the rest of this decade. As the international user group X/Open Co. noted, "The unstoppable force, open systems, seems to have met the immovable object of installed systems. The energy given off by the collision is frustration, primarily with the vendor community."

Many of X/Open's members said they also believe vendors are resisting the shift to openness. Instead, vendors are attempting to lock open systems-seeking users in with proprietary functions and are "creating confusion via subsidy of competing standards, consortia and technology frameworks."

Vendors seeking to partner with corporate users should first seriously consider what users want. Very often they do not. Instead of getting the much-needed bridges between the proprietary and open worlds, users get pieces of each and are left to cobble them together, either by themselves or with their consultants.

Vendors should also be aware that perceptions of openness, or lack thereof, will weigh heavily in purchasing decisions. These perceptions will be shaped by the degree to which vendors tailor their products to user demands.

For example, the keynote speaker at the recent Society for Information Management's conference chided those who "buy into the lie that Microsoft's Windows NT" is an open product. In fact, a theme that consistently arises when I speak to senior IS managers is the fear that Microsoft is growing into the company that IBM was in the '70s and '80s — a company seeking to set standards itself rather than customize its offerings to corporate requirements.

Whether this is perception or reality, the buying public absolutely will sort out those vendors that serve it from those that seek to control it. After all, the vendor landscape today is littered with the wrecks of companies that heard, then ignored, the open computing call.

Bill Laberis

Bill Laberis, *Editor in chief*

Love at first Step

"PC vendors step up to NextStep 486" [CW, April 19] confirms the widely held impression that NextStep is by far the most advanced object-oriented programming environment available today.

What is less well-known is that NextStep is also an elegant, intuitive, easy-to-learn user interface that sits on top of the robust, standard, multitasking operating system Unix. NextStep is not just a development environment. I have seen many users, ranging from complete neophyte to expert, learn to use NextStep in a much shorter time than is typical for other GUI systems.

One reason is that NextStep applications tend to have very consistent user interfaces. The application kit contains most of the tools that are needed for common user operations such as selecting files, choosing fonts, printing, displaying menus, etc. These tools are easy to program with and versatile enough to handle pratically all special needs, so developers nearly always use them.

By describing NextStep as only a development environment, you do Next, Inc. and your readers a disservice. Most users fall in love with NextStep very quickly.

Nigel G. S. Taylor
Parkside Station, N.Y.

Wireless a winner

"Wireless computer card ships" [CW, March 29] underscores the importance of PCMCIA-based wireless networking for the burgeoning mobile computer marketplace. However, the article's comparison of wireless' data transfer rates to that of wired Ethernet networks misses the mark. Properly conceived, wireless networking should be viewed as an extension or enhancement to existing wired networks rather than a replacement technology.

Today's wireless networking products provide an effective solution for mobile professionals who need a network connection for many of the most popular networking applications, including E-mail, printer sharing, file transfer and terminal emulation.

In addition, PCMCIA-based wireless LANs offer a major improvement in network performance for mobile workers using wireless, handheld data communications devices in application environments such as health care, manufacturing and retailing.

Without a doubt, the wireless revolution has just begun.

David King
Mountain View, Calif.

Odd couple

Regarding the articles about the alliance between Microsoft and Compaq ["Compaq, Microsoft to extend partnership, CW, April 12 and "PC factions rearming," April 19]: Why did Microsoft choose Compaq? A majority of Compaq's latest models have serious design flaws and enough trouble functioning in their own right.

Microsoft could surely have chosen to publicize its existing relationship with Dell or Gateway — whose products are more like Microsoft's in stability and reliability.

While it is clear that Microsoft is merely creating the appearance of a threat to the Apple/IBM alliance, it should have waited until Compaq "cleaned house."

The only benefit from a Compaq alliance is name recognition, and to this reader that recognition is not positive.

David B. Ciolkowski
New York

Terrible two

I have noted with interest your recent layout changes. In the past few months, you have changed Page 2 a number of times.

The original format was in the form of an index that contained a short summary of each article. The present format only lists a few items.

In the past, I used Page 2 to determine how to find articles of interest to me as well as to keep up on current events. Each of the changes has been progressively less useful to me.

I have enjoyed the newspaper and have found it of value to my computer knowledge base. Unfortunately, that is no longer the case.

I encourage you to return to your previous Page 2 format.

Michael Somand
Pleasant Ridge, Mich.

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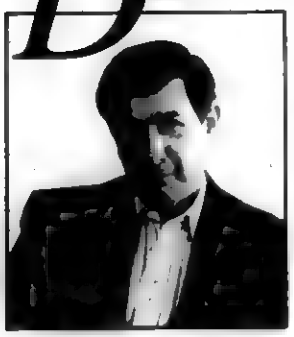


As readers of this insert, you are obviously looking for new technology to help your organizations adapt quickly to change and provide the competitive advantage needed to prosper in today's dynamic business environment. In founding Taligent as an independent software company in March 1992, Apple and IBM jointly affirmed what both companies had already decided separately: that object-oriented programming was just such a technology base. Taligent believes that the full exploitation of object technology has the potential—like other breakthrough technologies such as the transistor, magnetic media and the microprocessor—to drive major paradigm shifts and fuel new periods of expansive growth and innovation.

At Taligent, we are designing and building a new system software environment that leverages the use of object technology at every level of its architecture. Our goal is to provide a multiplatform environment that will bring about dramatic improvements in application development productivity while enabling new classes of innovative applications that address real world business problems.

We recognize that the success of our strategy depends on participation from every segment of the computer industry. That's why the new environment will be open and extensible. We are working with some of the world's most advanced corporate users of object technology and developers of application software packages to help us shape our product designs and business strategies. These early adopters have shared their experiences* with us and have identified key goals for the next generation of information systems. Taligent is developing a set of products to be responsive to their needs in the mid 90s and beyond.

While our approach is new and unique, we recognize that change must come in orderly increments and at a pace that will enable customers to move to the next generation of system software. That's why we're working with our investors, Apple Computer and the IBM Corporation, as well as others in the industry, to provide smooth transition strategies to work with what came before us.

Taligent.

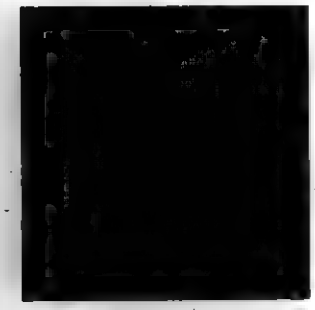
While change is always unsettling, in change comes the real opportunity to reach new levels of competitiveness and innovation.

Sincerely,

Joe Guglielmi

Joseph M. Guglielmi
Chairman and Chief Executive Officer

*** For your copy of Taligent's "Lessons Learned from Early Adopters of Object Technology" white paper, please contact 1-800-288-5545, ask for Department TL1.**



INTRODUCTION

Software development is like an old, but well-kept house. It is built on a solid foundation, gets a new coat of paint every few years and, generally speaking, provides a comfortable abode. It may not be the Taj Mahal, but it is livable.

Even the most meticulously maintained old house, however, is subject to the inevitable ravages of time. So it is with software development. Built on a foundation of procedural programming, it has periodically enjoyed the new paint of enhanced programming techniques, but has grown uncomfortable as these cosmetic updates failed to produce significant increases in programmer productivity. This old house needs rebuilding.

Object technology can provide the new approach necessary to bring software development into the '90s and beyond. With its ability to treat abstract entities like real-world objects, it provides reusable programming while eliminating the costly and complex "spaghetti code" that keeps valuable programming expertise focused on maintenance while new applications wither on the vine.

Words like "messages" and "classes" take on new meanings in the lexicon of object technology. Used as a means of communication between objects, messages enhance software development by streamlining the process. By creating classes, object technology provides a richness of information and establishes a hierarchy that clarifies objects and their attributes.

Although nascent, the object technology market is growing vigorously. The four major segments — languages and programming tools, developers' toolkits, object-oriented databases and object-oriented CASE tools — are attracting a steady stream of new vendors and users alike. Annual growth rates of over 100% are expected over the next five years.

Despite its glowing possibilities however, object technology is still largely unproven in the eyes of users, who have grown to disdain the hyperbole that typically attends new technology. The expanding product base and efforts aimed at establishing object-oriented standards will help break down the barriers between these users and what may become the Taj Mahal of technologies.

This White Paper was written independently of the Computerworld editorial department by John Silva, Vice President of Marketing, the Object Management Group.

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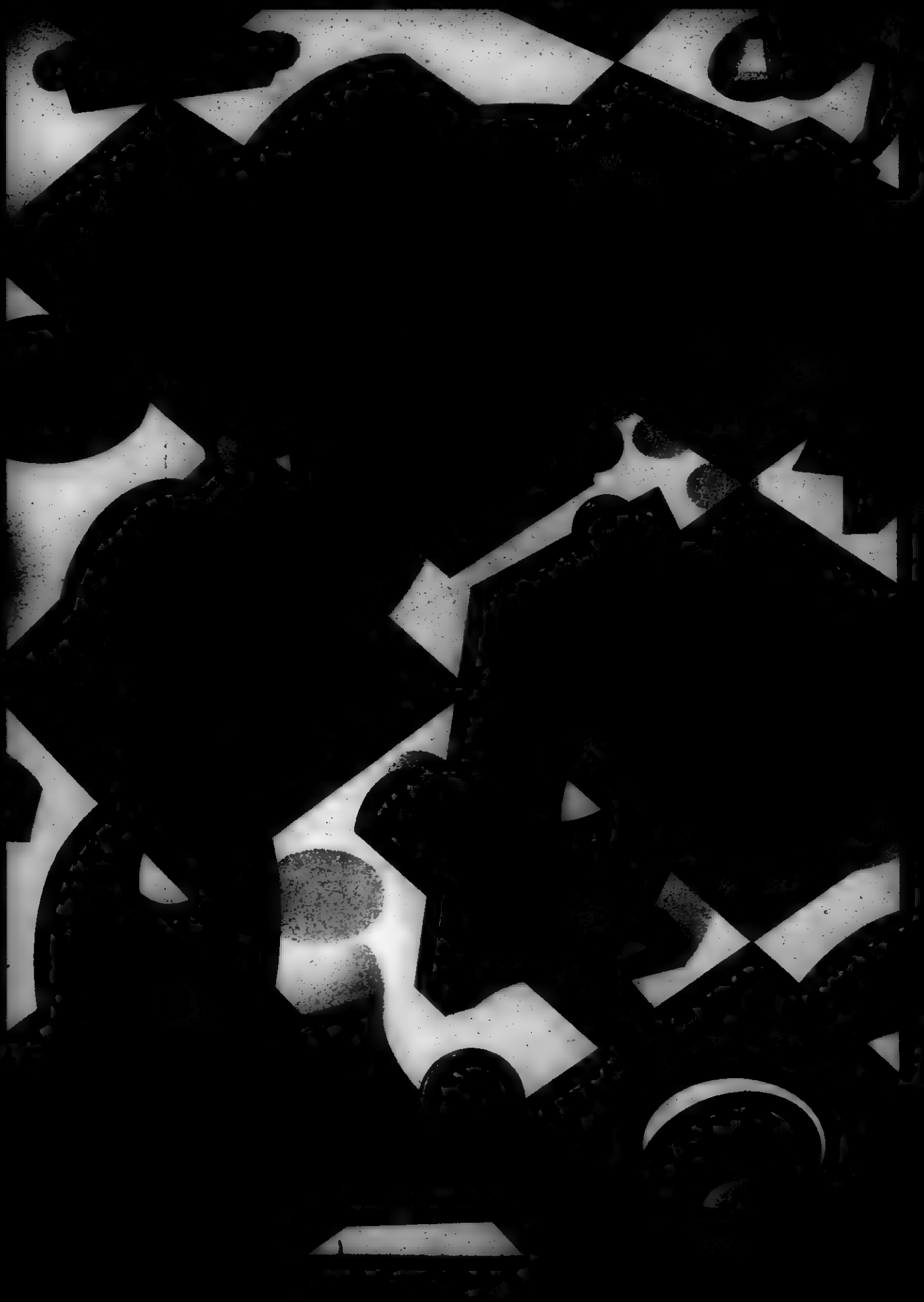


A Component Technology for the Future

The modern business enterprise is under assault. Rapidly changing technology and worldwide markets, coupled with the globalization of businesses linked by new communications technology, have precipitated a crisis. Organizations are challenged to modify their internal structure, and most importantly their information systems, to address rapidly changing market conditions.

The result is a worldwide business climate where opportunities appear and disappear, like Flying Dutchmen on foggy nights. Those businesses that fail to respond fast enough, or do not heed the early warning signs, flounder on the reefs of lost market opportunity.

Object Technology: The Optimal Defense

There exists a critical technology that is changing the way we conceive, build, use and evolve our computer systems. It is a technology that many companies are adopting to increase their efficiency, reduce costs and adapt to a dynamic marketplace. It is called object technology (OT).

By allowing the integration of disparate and non-compatible information sources, OT has the potential to precipitate a revolution in information systems design on a par with that caused in computer hardware by the introduction of the computer chip. Yet OT is not a new phenomenon. Development and product releases have been ongoing since its origin almost 25 years ago. However, the recent emphasis on the complex task of enterprise information technology integration has brought OT into the spotlight.

OT promises to provide component-level software objects that can be quickly combined to build new applications that respond to changing business conditions. Once used, objects may be reused in other applications, lowering development costs and speeding up the development process. Because objects communicate by sending messages that can be understood by other objects, large integrated systems are easier to assemble.

Each object is responsible for a specific function within either an application or a distributed system. That means that as the business changes, individual objects may be easily upgraded, augmented or replaced, leaving the rest of the system untouched. This directly reduces the cost of maintenance and the timing and extendibility of new systems.

The Software Revolution

The past 30-year period has been a time of incredible growth and change for the computer business. Once populated only by expensive and scarce

mainframes, the computing landscape has been overrun with smaller, faster, less expensive computers. This revolution has corresponded with the rise of an independent software business growing to supply ever-smaller computers with a wide array of software products.

While the means and underlying philosophy for producing computers has radically changed over this time period, the philosophy used for producing software has not. The development of microprocessor technology, "computers on a chip," gave hardware vendors a flexible building block from which to rapidly improve and assemble ever-faster and less expensive computers.

On the software side, no such rapid developments were forthcoming. That meant that each new product required software designers and programmers to start from scratch and produce more and more code until the program was finished.

The Problem: Incompatibility

The conditions that stimulated the growth of the software industry gradually changed as businesses recognized the value of integrated information and the increasing costs of maintaining their legacy systems. (Many believe the cost of that maintenance consumes 60% to 80% of the total money a company spends on software.)

Moreover, local area networks began linking the rapidly growing number of PCs, printers and servers, and enabling the easy movement of files at the workgroup level.

It became easy to see that the larger sharing of information across an enterprise could result in faster and better decisions when addressing rapidly changing market conditions. This realization led to a monumental problem.

The problem was that until the late '80s, little or no thought was given to making the result of one application transparently available to another application, much less having one vendor's system easily communicate with another's. The folly of such a myopic approach became obvious when someone finally realized that, worldwide, there was easily over a trillion dollars of installed and useful software and hardware and that almost all of it was developed to either ignore or inhibit the flow of information to other systems.

Vendors wanted to preclude the easy movement of information in the belief that it would keep them from losing customers. They only thought of how to lock customers into a particular application or hardware line. But greed was not the only culprit. What also led to this proprietary environment was the sheer technical difficulty of designing and building open systems without conventions, standards or user demand.

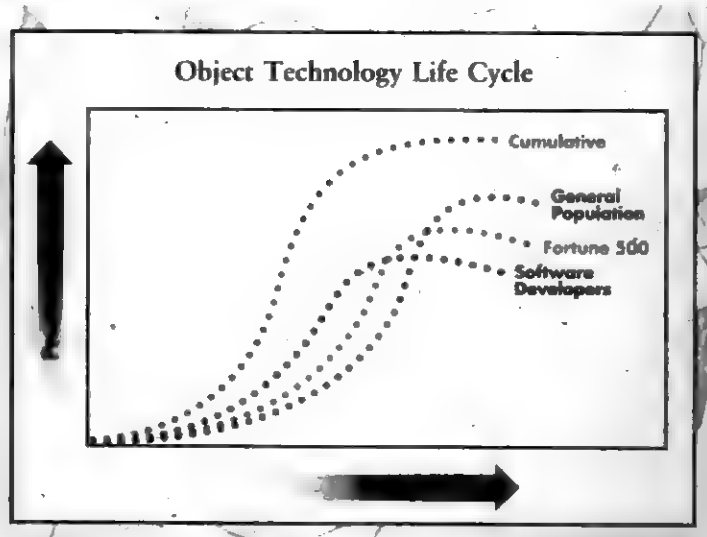
Dealing With The Dilemma

Now that these realities have been faced, users have a dilemma: how can they produce the vast amounts of software needed to build integrated enterprise computing systems while continuing to maintain the incompatible legacy systems? If not addressed, this problem will devour even the most lavish IS budget while expanding the trillion dollars worth of legacy systems.

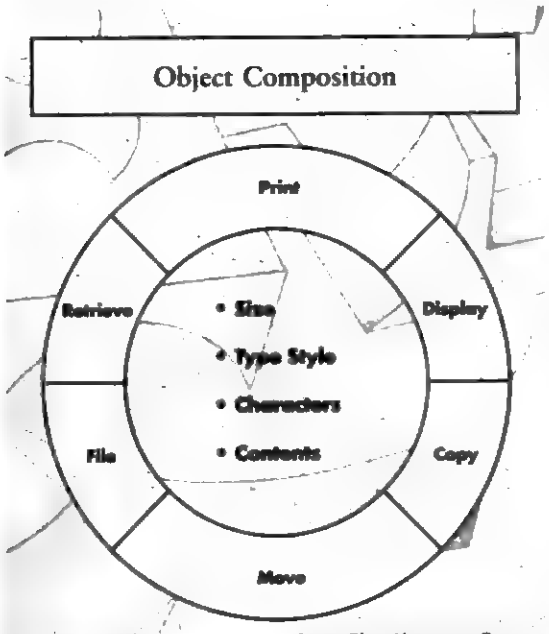
Unabated, the current situation must either lead to a substantial increase in funding for IS or a basic change in the way software is produced and maintained. In the scramble to integrate independently constructed software and hardware into enterprise computing systems, the level of interdependence and complexity will go up exponentially.

It is important to examine what benefits can accrue through a shift to OT. Studies of software development processes in general have shown that the key areas of concern are:

- flexibility
- timeliness
- development and implementation costs
- maintenance time and costs
- portability and compatibility in heterogeneous systems
- the ability for non-IS personnel to access information and customize information systems.



In order of entry, software developers, Fortune 500 companies and finally the general population will drive the object technology market.



Source: Object Management Group

An object is composed of behaviors ("Display," "Copy," etc.) and data ("Size," "Capacity," etc.)

pensive computing resource was controlled by one procedure at a time. It also required that each change be accompanied by the creation of a new program or a modification in the existing program. The result was maximization of the scarce, expensive resource, computing power, and the use of cheaper programmer power dedicated to modifying the software for each new request.

Combined with the ever-growing numbers of programmers, this constant tweaking of programs led to the belief that software was short-lived and transitory.

As programs became more complex, the size and interrelationship of procedures within them also increased. The result was the creation of what programmers called "spaghetti code." This moniker was affixed to large-computer programs where the dependency and interrelationship among procedures created a maze-like complexity that made maintenance and enhancement very difficult and expensive.

The simple change of a few lines of code in such a million-line program might well have led to critical failures in seemingly unrelated parts of the program. A change that takes only a few hours to code may have taken months to debug. That is one of the principle reasons for the escalating cost of maintenance.

Procedural Programming

To readily exchange information, two applications must have a common interface. Unfortunately, the building of interfaces between existing systems is an expensive and difficult undertaking. The traditional method of software development, used for legacy systems, was based upon the line-by-line construction of software, which isolated data from procedures.

This method, popularized in the '60s, is called procedural programming. Procedural programming is based on the efficiency derived by separating the operations or procedures from the data on which those operations are performed. This segregation allows the same data to be operated upon by different procedures in order to achieve varying results required in several applications. It also eliminates the duplication of data to each program that may need it.

For example, the data might consist of a file containing a list of names. A set of procedures may be constructed that would arrange the list alphabetically. The same data could then be used by another program, or set of procedures, that would select from the list only those names that begin with the letter "D." The result would be a subset of the original list containing only those names that began with the letter "D." This approach reduced the need for each program to contain its own copy of the data and, therefore, eliminated a serious problem.

Along with allowing multiple uses for data, the procedural-based approach made certain that the ex-

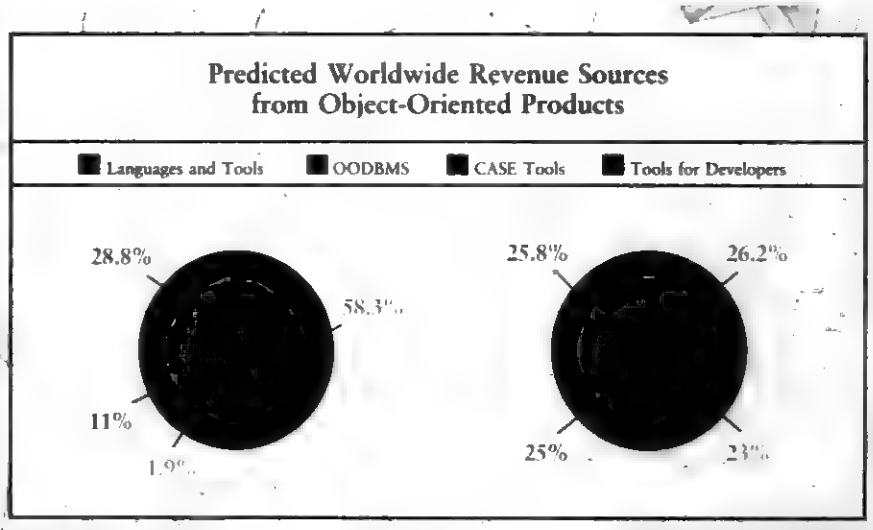
OT: The Next Step

OT encompasses many disciplines currently used in software development. As stated, it is not new, but rather the next logical step in the evolution of software design and engineering. OT development and product releases have been ongoing for almost 25 years internationally. In fact, the origin of OT dates back to work done in Norway in 1969. The majority of OT development has been conducted in research environments as computer scientists sought ways to model complex operations.

Object technology promises to provide component-level software objects that can be quickly combined to build new applications that respond to changing business conditions.

The guiding premise of OT is the belief that computer systems should function in a way that more closely models the common experience of objects in the everyday world.

In traditional software development, designers decide on functions to be carried out. For example, in a traditional word processing application, a *print* pro-



Source: Ovum, Ltd.

Object-oriented database management systems are slated for explosive growth over the next four years.

cedure would take the file specified and print the document. The *print* command is specific to that word processing program and must function with the printer, operating system, hardware, and under the other parameters anticipated by the programmer when the program was written. This leads to problems when that environment changes and the program does not work as anticipated. There is a constant battle in traditional systems environments to ensure that all versions of hardware and software are current — or at least equally out of date — so that changes to the applications can be minimized.

In an object system, the software designer is not concerned with functions and procedures. Instead he or she decides which real-world objects the system should model. For example, in a word processing application objects called DOCUMENT or PAGE might be constructed. These software objects, sometimes called modules or components, contain both the procedures and data necessary to replicate their real-world counterparts.

The problem is that, until the late '80s, little or no thought was given to making the results of one application transparently available to another application.

Software ICs and Messages

The notion of an object as the basic building block of an OT system is similar to the idea of a computer chip in the hardware business. In fact, Brad Cox, an early OT pioneer, coined the term "software ICs" to draw exactly that analogy.

Objects can either be very small or extremely large depending upon the real-world object they are trying to model. And as in the real world, software objects are identified by a name. Objects can then be described by their properties and attributes. For example, a document object may have the name CWARTICLE. Its properties would be the ability to print or display itself on a variety of devices, and its attributes would be the date of its creation and the number of words it contains.

In addition, a software object has the concept of behavior similar to its real-world object. Thus, the object CWARTICLE responds to messages that ask it to print, display, file, copy or send itself to another location in the same CPU or across a communications network to another CPU.

This is the normal behavior we expect of the real-world article that we shuffle on our desks. The only way one object may communicate with another object is through the sending and receiving of messages. Messages between objects cause the receiving object to carry out a specific function. In an object application the message *print* would be sent to a document object, which would have its own procedures to print itself.

Adele Goldberg, founder of Parc Place and an early researcher of object-oriented languages, calls OT "the polite computer science" because of this use of messages. In order for an object to perform a function, a message is sent requesting that the object perform that function. In a traditional procedural system, the procedure takes control to ensure the function is complete. That is not, by comparison, very "polite."

To carry the example back to the real world, it is apparent that real-world objects can and do perform a variety of actions: moving, replicating, lifting, jumping, etc. In our example, CWARTICLE, someone

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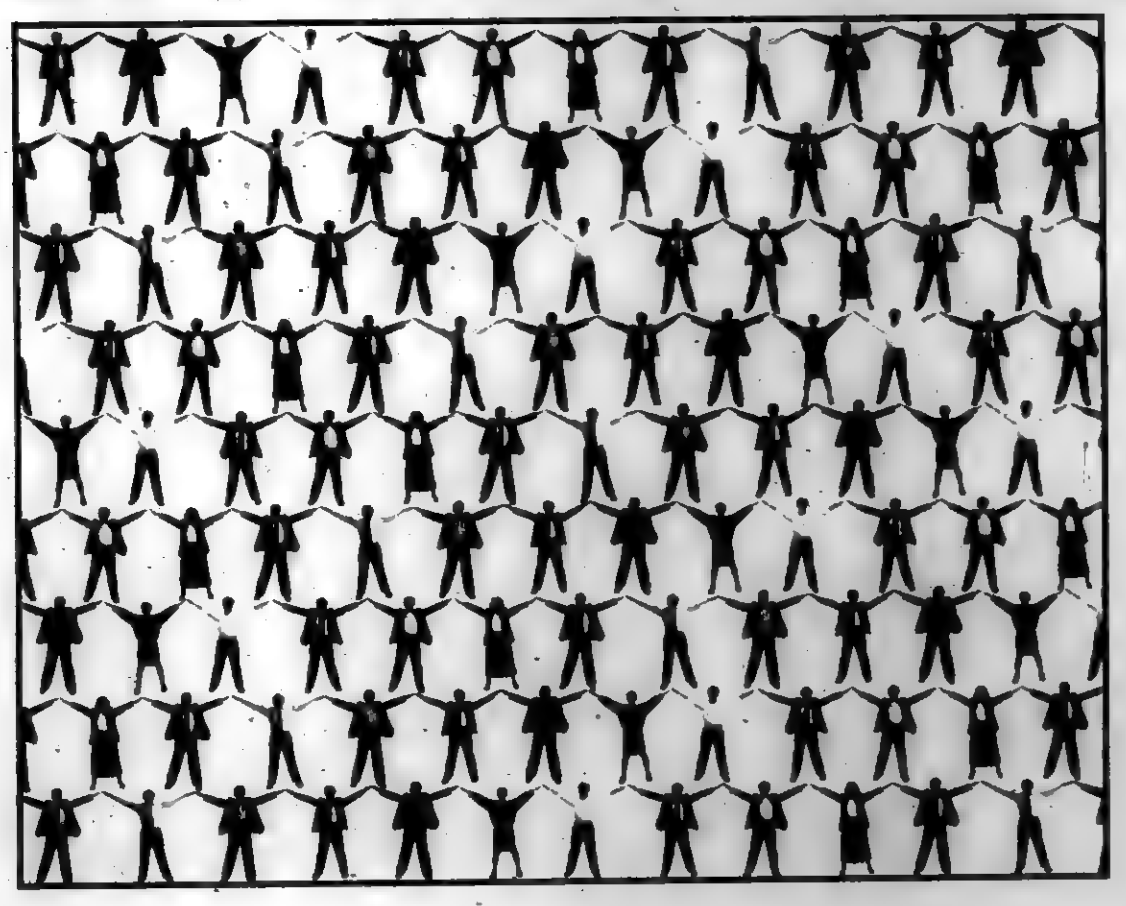

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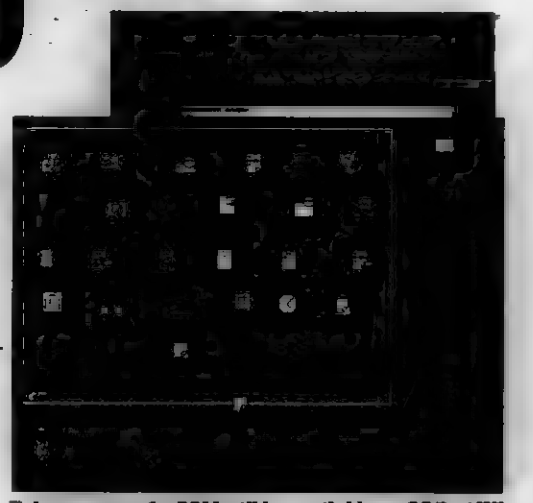

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could pick up the paper article, move it from one place to another, give it to a colleague or copy it on a copier.

To model these actions of the real world in a computer, the designers of Simula, the first object-oriented language, introduced the concept of a message. A message is composed of the name of an object and the behavior that the object is capable of performing. The object that initiates the message is called the sender — or sometimes the client — and the object that receives the message is called the receiver or server.

If additional information is required, it is contained within the message as a parameter. Parameters are the detailed instructions or data that are necessary for the receiver object to carry out the request.

In the real world, a person could pick up the telephone and dial the name of a receiver, for example, "0" for the operator. The message is, "Will you look up a number for me?" The response is "No." Local operators do not look up telephone numbers; the information operator does. In the OT system the same sequence may occur if an object requests a behavior from another object that it is not able to perform.

The use of messages is a key concept in an OT system because all actions are initiated at the request of messages, and all responses are conveyed in the form of messages. Messages allow objects to be combined on the basis of their declared behavior and to have that behavior invoked by any object capable of sending a message and receiving the reply or return values. Because of the central role messages play, a great deal of attention is placed on providing easily accessible, open interfaces as part of any object.

A real-world example of this system can be portrayed by viewing the process of calculating and paying taxes. A typical citizen, as a tax paying object, needs to have taxes calculated. That person sends a message to a tax preparer or accountant object asking for a behavior or service.

The message includes the information pertinent to the preparation of taxes: W-2, family status, deductions, etc. The return value or response, from the tax preparer object, is a completed tax return. Now the tax preparer, formerly the receiver object, becomes a sender object. In this exchange the tax preparer addresses (name), an envelope (message), which contains a bill for services rendered (parameters). The citizen, as the receiver object, responds with a check.

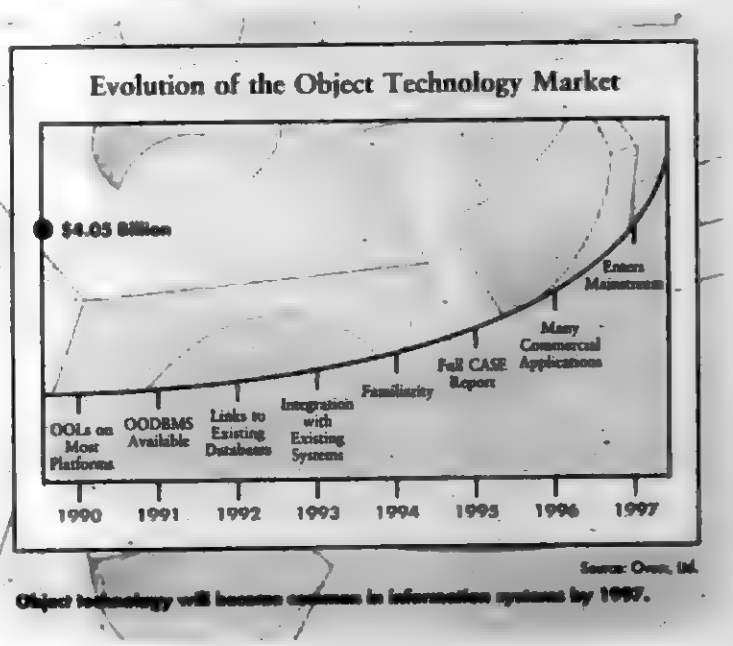
The important point in this example is how, in the real world, the roles of sender and receiver are constantly changing. The same is true in an object-oriented system. After an initial message that a tax preparer is unavailable, the citizen could send the same message to another, and so on, until a positive response is received. It is this ability to model the complexity and variety of the real world that makes OT a better technical solution for developing integrated enterprise information systems.

Classes

Also, as in the real world, software objects can be grouped into classes. The American Heritage Dictionary defines class as "a group whose members have at least one attribute in common." In the real world, sports teams, corporations and supermarkets are examples of classes that fit into a hierarchical structure. For example, supermarkets fit in a class structure that might be called retail stores. This class might also include department stores as subclasses.

If someone attempts to enter "whale" into this class, it could be seen intuitively that a large seagoing mammal does not have any shared attributes with retail stores. The advantage of grouping objects into classes is the richness of information that is available for any object by its inclusion in, and relationship to, the hierarchy of a class structure.

Software objects similarly can be grouped into classes based on the shared properties of the individual objects. A class contains all the methods and attributes that are common to all members of the class. Software objects could, for example, be grouped into a hierarchy consisting of the primary class DOCUMENTS, and subclasses, LETTERS and ARTICLES.



Object technology will become common in information systems by 1997.

Therefore, the object CWARTICLE is an instance of the class ARTICLES and it shares all of the properties of the superclass DOCUMENTS.

Finally, just as in the real world, classes can be organized into a hierarchy. Once objects are grouped into classes it is possible to see that attributes are inherited by subclasses from higher classes. Subclasses may inherit attributes (data and procedures) from higher classes in the hierarchy, known as superclasses.

In an object system, software designers are not concerned with functions and procedures. Instead, they decide which real-world objects the system should model.

DOCUMENTS is a superclass that includes the subclasses LETTERS and ARTICLES. These subclasses inherit attributes of the documents class but add special features of their own (e.g., address, special format). For example, a letter to Fred inherits all the attributes of the superclasses DOCUMENTS and LETTERS, then adds the unique attribute of being addressed to Fred.

Each instance of a class will have its own unique name and location within the system. Inheritance allows objects to efficiently represent the large amounts of redundant information that is common to all the objects in a class. It does this simply by listing an object's relationship to a class.

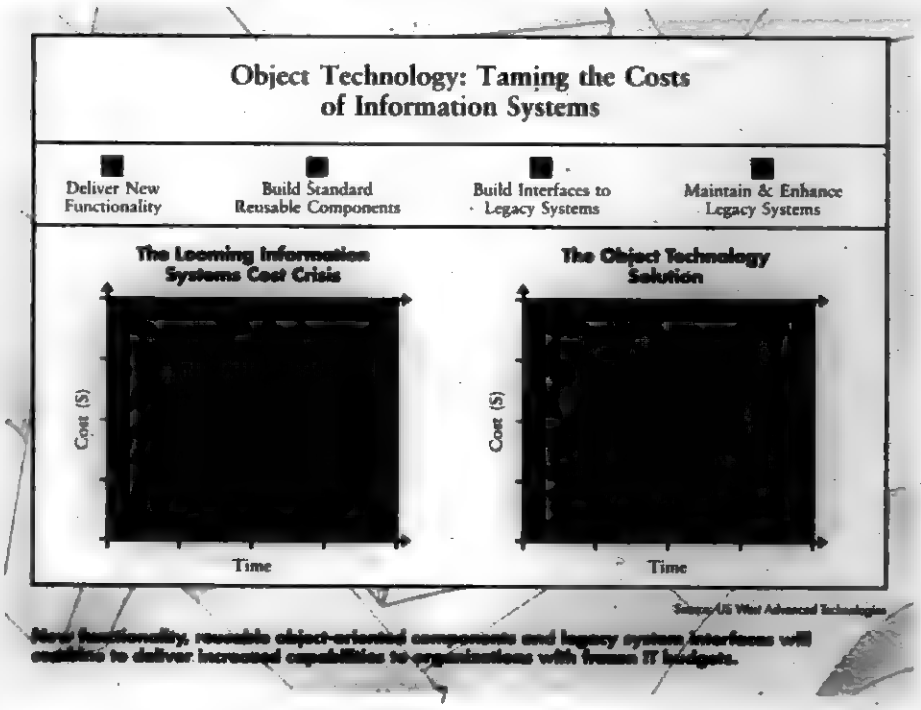
While inheritance can be a powerful feature of an object-based system, it can also introduce implementation issues if that system is distributed over a wide network of computers. For example, a very large class structure with many subclasses can be difficult to manage over a large network.

In simple terms, it may be simpler and safer to replicate classes in local nodes on a network even if that means duplicating the same information in many places. Then if a change is made in a superclass, all effected subclasses can more easily be found and updated.

In the report "Objects in Use: Meeting Business Needs," produced by Ovum, Ltd., the following explanation is given for the internal workings of an object:

"The mechanism for packaging data and procedures is known as encapsulation. Think of an object as a capsule, in which data is stored at the center. Access to the data is via the methods, which in turn are accessed by messages from the consumer (other objects or a user). The surface of the capsule is the interface with the consumer. It consists of public information containing the names (or selectors) and the definitions of the methods.

"To initiate a method, a message is sent to the object, which compares it with its list of selectors. If it finds a match, the corresponding method is activated and the appropriate response is sent to the consumer. Otherwise an error message is sent."



New functionality, reusable object-oriented components and legacy system interfaces will combine to deliver increased capabilities to organizations with frozen IT budgets.

The flexibility of an object-based system comes from the capacity of objects to make available a public interface, while hiding the internal data and procedures that make up the core of the object. In a system constructed from products produced by many vendors, it then becomes possible to have these diverse products work together through interaction at the object interface level without knowing any of the inner workings of any other object on the system.

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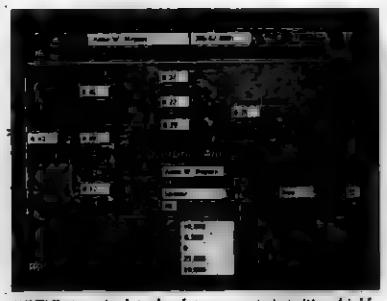

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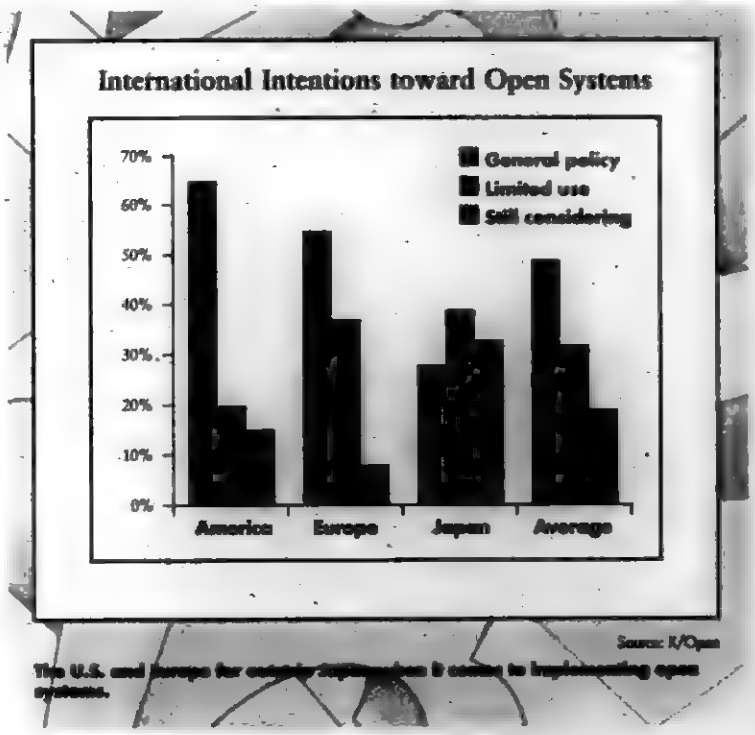
notions of encapsulation, attributes, methods, messages, inheritance and interfaces describe how objects are constructed and how they function. The last major term to understand is polymorphism.

Again, this OT concept is modeled on the real-world way in which the behavior of objects is described or initiated. In the example of the class, DOCUMENTS, the *print* command is a polymorphic command: a single command that may be performed in a different manner by each object, yet with the same end result.

Each object that receives the *print* command will, if its behavior allows, print itself. Some objects will require a common character printer. Other objects, such as pictures, might require a special output device, perhaps a laser printer or plotter.

After receiving the polymorphic print message, it is up to the object to determine if it can comply. In a traditional system, the programmer would have to take into consideration all the necessary parameters that would be required for each object to be printed, and write separate programs for each type of document.



The U.S. and Europe far outpace Japan when it comes to implementing open systems.

OT Covers All Disciplines

It is important to remember that OT covers all the disciplines that contribute to the conception, production and use of software. A confusing point for many people when they are first introduced to OT is their need to equate it to an existing specific software technology, e.g., database, operating systems, language, etc.

Because a computer language is an identifiable and important contributor to creating computer software, much discussion is focused on OT-based languages. Two of the more popular languages are SmallTalk and C++. There are also a number of other languages that adhere to the OT paradigm.

Languages, operating systems, object bases, user interfaces and network interfaces are all part of the object paradigm. In meeting the need for wide-scale integration, OT provides a uniquely versatile and useful perspective for systems designers. A central premise of OT is the notion that all objects, whether local or remote, should communicate through the sending of messages. This puts tremendous emphasis on objects to conform to a standard interface structure for formatting, sending, receiving and responding to these messages.

> In attacking the need for wide-scale integration, object technology provides a uniquely versatile and useful perspective for systems designers.

Any object that can properly format and respond to messages can participate in an OT system without exposing the inner workings of the object. As a result, widely distributed objects may be assembled from proprietary, custom and/or standard objects without the need to be involved in the details of each object's construction and operation. This is sometimes referred to as information hiding.

In his book, "Object-Oriented Technology: A Manager's Guide," David Taylor discusses encapsulation and information as two of the key features of OT:

"The encapsulation mechanism of object technology is a natural extension of the information-hiding strategy developed in structured programming. Object-oriented technology improves on this strategy with better mechanisms to pull the right kinds of information together and hide their details more effectively."

By expanding the idea of information hiding with OT, it becomes possible to build more complex systems as each object retains its own data and methods, uncorrupted and incorruptible by the other objects in the system.

Emerging OT Products

The movement to adopt OT principles into the development of many different types of products is escalating. In 1991, Ovum Ltd., published "The Object Technology Sourcebook." That report identifies 157 products and 106 suppliers. A year later, an update of that report shows an increase in products to 302, and suppliers to 191.

The current market for OT-based products can be divided into four major segments:

- languages and programming tools
- developers' toolkits
- object-oriented databases
- object-oriented CASE tools.

Languages and Programming Tools

The largest segment of the current market for OT-based products is languages and programming tools, which according to Ovum, represents 42% of the market. Products in this area include language compilers for C++, SmallTalk, Common Lisp Object System (CLOS), Eiffel, Ada and Objective-C, as well as extensions to Pascal and Modula-2.

Products in this category are available from a variety of vendors. Increasingly, the trend in this group is to offer the language compilers with associated de-

Glossary of Terms

Abstract class: A class that can be used only as a base class of some other class; no objects of an abstract class may be created except as instances of a subclass. An abstract class is typically used to define a common interface for a number of subclasses.

Abstraction: The logical form that analogous things have in common. Also, the process of identifying the characteristics that distinguish a collection of similar objects; the result of the process of abstraction is a type. (synonym: concept, type)

Architecture: The structure or ordering of components in a computational or other system. The architecture of a particular application is defined by the classes and the interrelation of the classes. At another level, the architecture of a system is determined by the arrangement of the hardware and software components. The terms "logical architecture" and "physical architecture" are often used to emphasize the distinction.

Class Hierarchy: A characterization of the inheritance relations between classes. A class hierarchy is typically shown as a directed acyclic graph or tree. The nodes represent classes and are connected by arcs to indicate inheritance relations. In the case of multiple inheritance, the structure is actually a lattice.

Class-Based: Any method, language, or system that supports abstract data types and requires that every object is an instance of an abstract data type or class. C++ is an example of a class-based implementation language.

Coupling: A description of the interdependence of classes. Two classes are tightly coupled when there are inverse or client-server relations between them. Decoupling occurs when neither class depends on the other for a requested service.

Embedding: Definition of an object that contains a non-object value. The purpose of embedding is to enable software entities (i.e. applications) to operate in an object-oriented environment.

Encapsulation: The characteristic that an object is a discrete unit of data with a set of permissible operations that controls access or modification of the values. Encapsulation is the language mechanism by which external aspects are separated from the implementation of an object. (synonym: information hiding, data hiding)

Inheritance: The language mechanism that allows the definition of a class to include the attributes and methods defined for another more general class. Inheritance is an implementation construct for specialization relations. The general class is the superclass and the specific class is the subclass in the inheritance relationship. Inheritance is a relation between classes that enables the reuse of code and the definition of a generalized interface to one or more subclasses. (synonym: class inheritance, derivation)

Interface: The set of requests that applies to a class. (synonym: public interface, protocol)

velopment tools as part of a complete development environment.

Developers' Toolkits

Developers' toolkits account for the next largest part of the OT market at 38%. Ovum projects this segment to continue its recent rapid growth by increasing at a 28% rate between 1992 and 1997. Developers' toolkits cover a variety of products from communication-level interfaces to graphical user interfaces (GUIs).

These products are designed to develop a program that enables a developer to easily do one of two things. The first is interfacing an application to a distributed environment, such as the HyperDesk Distributed Object Management System. The second is developing a graphical screen through a product, for example, Open Interface from Neuron Data.

By providing developers with higher level description languages and reusable components, products in this category give developers an easy and cost effective way to begin producing object-oriented systems.

An important component in this category is the relatively new area of end-user tools. This element is important because organizing and analyzing the increasingly large amounts of data that computer systems are capable of collecting is a key problem.

An early product by Hewlett-Packard called "New Wave" produces a visual environment where information contained in one program can more easily be moved to another application. New Wave offers knowledge workers the ability to encapsulate

Method: The specific implementation of an operation for a class; code that can be executed in response to a request. A method can extend or override the behavior defined in the operation. In many systems, the selection of a specific method to respond to a request can be done at compilation or execution. A method is an implementation of behavior of a type.

Model: A representation of a problem or subject area that uses abstraction to express concepts. A model is often a collection of schemata and other documentation.

Module: A collection of objects, methods, and classes that collaborates to provide a subset of the functionality of an application. Modules can retain their own state and share information with the rest of the application.

Object: Anything to which a type applies; an instance of a type or class. An instance of a class is comprised of the values linked to the object (object state) and can respond to the requests specified for the class.

Object-based: Any method, language or system that supports object identity, classification and encapsulation. An object-based system does not support specialization. Ada is an example of an object-based implementation language.

Object-oriented: Any method, language or system that supports object identity, classification, encapsulation and specialization. C++, Smalltalk, Objective-C and Eiffel are examples of object-oriented implementation languages.

Object type: An abstraction (predicate) that can apply to a collection of objects; the logical form of a collection of analogous objects. An object type is an idea or notion that can be determined to apply, or not to apply, to an object; it classifies objects according to meaningful properties and behavior. (synonym: type, concept)

Object request broker (ORB): A software mechanism by which objects make and receive requests and responses.

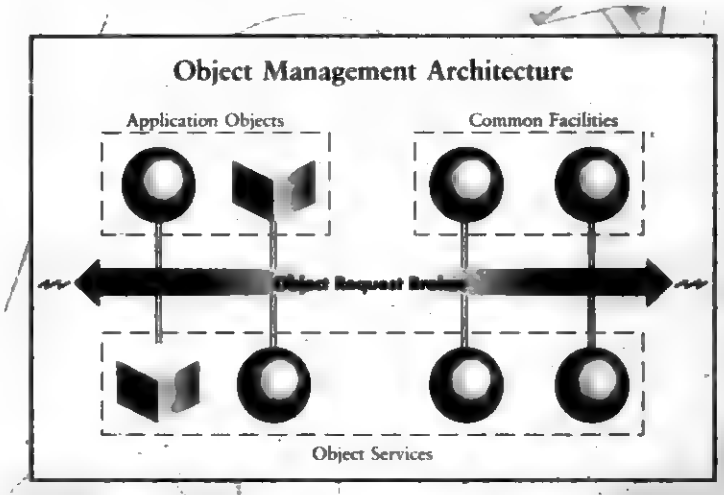
Polymorphism: A request-handling mechanism that selects a method based on the type of the target object. This allows the specification of one request that can result in the invocation of different methods depending on the type of the target object. Most object-oriented languages support the selection of the appropriate method based on the class of the object (classical polymorphism). A few languages or systems support method selection based on other characteristics of the object, including values and user-defined defaults (generalized polymorphism).

Request: An event that is the invocation of an operation. The request includes the operation name and zero or more actual parameters. A client issues a request to cause a service to be performed. Also associated with a request are the results that can be returned to the client. A message can be used to implement (carry) the request and any results.

(From "Glossary of Object Oriented Software," SEMAPHORE, MASS., 1993)

DOS applications in a manner that has them appear on a screen as New Wave objects.

Information in one application may also be linked to another. For example, it is possible to have a spreadsheet appear in a document produced by a word processing program. The value of this linking process is found in the fact that the document and spreadsheet may each be developed and updated within their respective programs, and combined only for display or printing.



Source: OMG

The Object Management Architecture shows all the aspects of an object-oriented environment connected via the Object Request Broker, which passes messages throughout the system.

Hypertext is an older system that approaches the same issue another way. Within Apple's HyperCard program links can be created to key words that explain terms, display pictures and produce effective interactive navigation through complex information. Each card in a hypercard stack has many, although not all, of the characteristics of an object.

Object-oriented Databases

Object-oriented database management systems are one of the most interesting and rapidly growing segments of the OT market. A number of companies, including systems vendors like Digital and HP, and start-ups such as Object Design, Servio, and Objectivity, have all produced products.

These products, dubbed "Objectbases" by John Rymer of the Seybold Consulting Group, fill an important need by storing complex objects as a single entity. The objectbase products allow objects to be stored, retrieved and shared in much the same way as data is stored in a relational database management system. This product category, while only comprising 8% of the market in 1991, is projected by Ovum to grow to 24% by 1997. This 114% annual growth rate will produce a market value of over $1 billion.

The value of an objectbase, as opposed to a database, for storing objects, is best described by David Taylor:

"Object databases offer a better way to store objects because they provide all of the traditional database services without the overhead of disassembling and reassembling objects every time they are stored and retrieved. Compared with an object database, storing complex objects in a relational database is tedious at best. It's like having to disassemble your car each night rather than just putting it into the garage!"

Object-oriented CASE Tools

Over the next few years, Ovum expects to see a shift from proprietary CASE implementations to those based on the object paradigm. This area has lagged in growth from earlier projections. OT-based CASE tools will have to emerge as a viable product category to address the wide-scale development of large systems. This category also includes those tools that are methodological in nature.

Commenting on this phenomenon in the September 1990 issue of *BYTE* magazine, Ed Yourdon states, "Considering the transition into object-oriented methodologies, I would say that this is going to be a big one in the nineties, as a replacement of the pure process-oriented methodologies, like structured analysis and structured design."

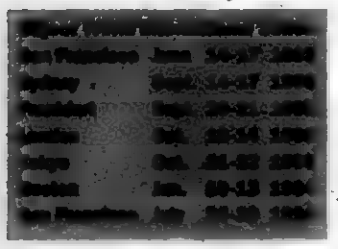
Over the next few years more system- and user-oriented products will begin to emerge as significant contributors to the object revolution. In the summer of 1992, IBM and Apple surprised the industry with the formation of Taligent. The mission of this new company is to provide a new object-oriented operating system with software adapters to help link existing applications to the new environment.

Microsoft has also come out strongly in favor of object technology with indications that their new Windows NT operating system will support objects.

Exploring the OT Requirements

In January, 1992, X/Open, an international open systems consortium, undertook a research study called the "Xtra World Survey on Open Systems." The goal of this survey was to focus on worldwide open systems opinion leaders. The survey was mailed to over 1,000 screened open systems influences and

Object World is the practical, no-nonsense event for people and companies either exploring the potential of object technology or putting it to work right now. And it's the only all OT series to focus on both the technical and business aspects of OT, providing practical knowledge for all ranges of experience.



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decision makers.

The survey drew 381 responses from Europe, the United States and Japan. The results indicated the top five strategic priorities for the implementation of open systems:

- interoperability across heterogeneous systems and networks
- an overall architecture for enterprise open systems computing
- heterogeneous, networked database access and management
- integrated open and proprietary network management
- open systems access to proprietary mainframe applications.

The survey results echo many OT objectives, including the need to integrate existing systems into open heterogeneous enterprise systems. Any enterprise system must have highly functional autonomous parts, as well as an open architecture that encourages the easy movement of information. The architecture, to be open, should be vendor-independent and capable of connecting to the existing installed base of proprietary systems.

OT Experts on the Future of OT

In January and February 1993, the Object Management Group and TechVantage, a New York-based market research firm, conducted another survey. The purpose of the study was to interview a number of leading system designers, systems architects and OT leaders on their views of OT's emergence as a major force over the remainder of the decade. This survey was the first part of a two-stage survey.

The first stage consisted of 28 detailed interviews of screened and selected technologists. Those surveyed included senior technical people from major U.S. and European corporations. Academicians and industry analysts were also interviewed. In the second phase, 200 prospective end-users are to be surveyed. The purpose of this research is to explore the similarities and differences of expectation for OT between the two groups.

Based on results from the first-stage interviews with the technologists, OT will:

- experience increasing acceptance over 10 to 20 years as systems become fully integrated
- have a profound impact on application development
- move from applications that require complex data/object manipulation such as CAD and the integration of applications, into enterprise computing systems.

The experts are divided in their opinions of the three currently most visible manifestations of OT: objectbases, languages and CASE tools. The discussions on objectbases unveils three key points:

- objectbases will coexist with DBMSs because they functionally address different problems
- initial acceptance of objectbases is currently for highly complex structures like CAD drawings
- the possibility that object-oriented operating systems and extension to RDBMSs may encroach on objectbase use through extending object-oriented file systems.

Because of the emerging nature of object technology, many survey respondents see the potential for "hype" that, unsupported by products, could cause a backlash from potential buyers.

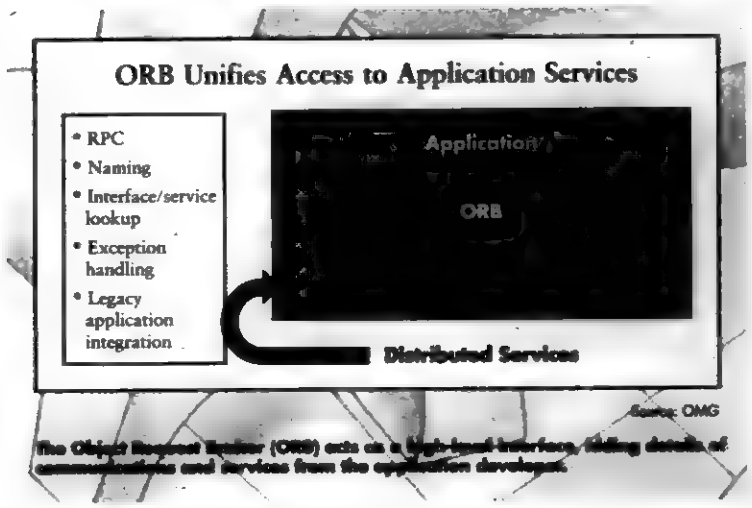
The respondents see current languages having limitations that would be alleviated over time as future releases become more robust. Asked about OT CASE tools, the experts predict adoption and integration of the OT paradigm into CASE products within five years.

A common theme in the responses is the belief that the next five years will bring significant changes to the production of applications as object-oriented components become increasingly available. Many see a likely change in software distribution methods to support the demand for objects of varying granularity. Such a new distribution channel would supply commercial and in-house developers with objects capable of being assembled into applications.

The next five years will bring significant changes to the production of applications as object-oriented components become increasingly available.

While none of those surveyed feels that OT will fizzle, they think there are potential problems. Because of the emerging nature of OT many see a potential for "hype" that, unsupported by products, could cause a backlash from potential buyers. If this happens they think the use of OT would "go underground," meaning that it would still be used by developers but that users would be largely ignorant of OT architectures and components.

When asked about the timing of OT adoption, the majority of respondents say that significant product introductions are still several years away. However, they predict a vigorous market in OT components, CASE tools, operating systems and applications within the next five years.



The Object Request Broker (ORB) acts as a high-level interface, hiding details of communications and services from the application developer.

OT Standards

While OT provides many benefits for vendors and users of software technology, it does require a level of coordination, particularly at the architectural and interface levels. The software industry has attempted to address the issues of incompatibility between vendor products by establishing standards. The Object Management Group, founded in April 1989, is a non profit, member-sponsored organization dedicated to establishing open standards in the area of OT.

Over the last four years, OMG has grown to represent over 300 member companies. Central to its mission is the belief that for OT to be successful, an open architecture supported by open interfaces must be widely available.

OMG provides a reference architecture with terms and definitions upon which all specifications are available under fair and equitable terms. OMG's Object Model defines a partial model for computation that embodies the key characteristics of objects as realized by the submitted technologies. Within the Object Model, it is at the interface level where de facto standards are described.

The Object Management Group provides a reference architecture with terms and definitions upon which all specifications are available under fair and equitable terms.

OMG also publishes industry guidelines in its "The Common Object Request Broker: Architecture and Specification (CORBA)." This publication is offered for users of commercially available object-oriented systems. It focuses on the areas of remote object network access, encapsulation of existing applications, and object database interfaces.

W. Roelandts, Manager, general computer systems organization with Hewlett-Packard states, "I believe OMG's Common Object Request Broker Architecture specification will be one of the main standards in distributed object technology for two reasons. First, there are over several hundred companies that support CORBA. Second, CORBA is there; the fact that it is a standard that people are using today dwarfs any potential shortcomings it may possess."

Conclusion

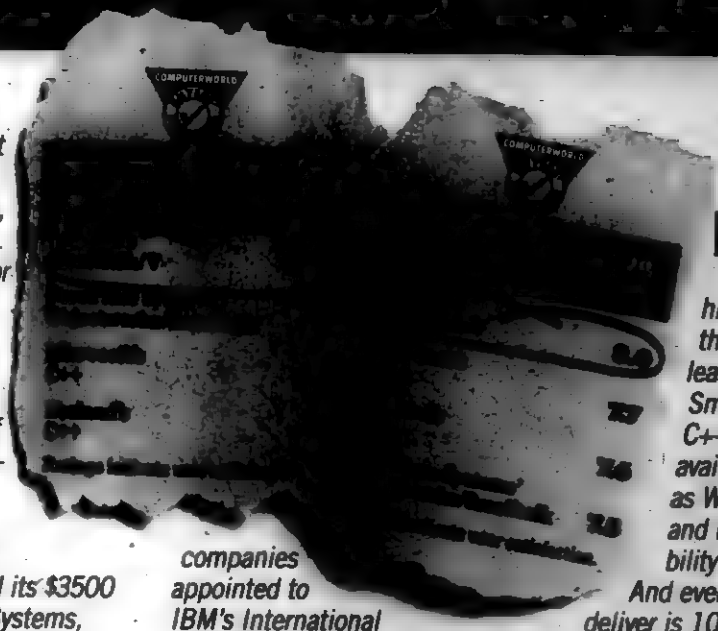
A key point in understanding the change to OT is made by Chris Stone, president of the Object Management Group, when he says, "The change to object technology is 80% psychological and 20% technological." This need to rethink software systems from the standpoint of assembling pretested, reusable components, rather then producing thousands of lines of new code is the significant change IT staffs must face.

OT requires a different view of analyzing problems and provides a powerful and efficient means of enabling solutions. It offers new tools and flexibility, but also has a requisite learning curve and migration time. OT can be a valuable tool in providing easy information access to all levels of people. This is demonstrated by the fact that it is currently reducing IS development time and maintenance at many user sights.

The transition to OT is like learning to swim. You either jump right in with both feet or test the waters at a gradual pace. Either method may be appropriate, depending on the resources, organizational structure and embedded software needs of the company.

The benefits of OT are irrefutable. The road that must be traveled is clear. Now is the time to lead, follow or get out of the way. ▶

MICROSOFT AND BORLAND STAND BEHIND SMALLTALK/V.



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Modems, bulletin boards and other tools of Satan

Rob Rosenberger

The mass media will soon kill bulletin board services (BBS) as we know them, yet it will never stand trial for the murder. Society continues to applaud it for slaying the evil beast of BBSs.

Reporters have already destroyed the spirit of the word "hacker." A monicker the computing community once wore with pride now brands you as a teenage geek who writes viruses and breaks into defense computers.

Go ahead, Mr. 40-year-old, walk up to someone and describe yourself as a computer hacker. That person will treat you like a repugnant teenage video game addict — or call you a fool for thinking you know as much as some dangerous, pimple-faced hacker.

What happened to hackers will soon happen to BBS users, thanks to the mass media. Society will cast you out for "hanging around on bulletin boards." BBS use may even corner you into a murder rap.

Seriously. Rumors abound right now about a cult murder in Phoenix supposedly linked to a BBS. A satanic cult, of course. Nebraska police arrested two BBS users not long ago for the kidnap, rape and murder of a university student.

The killers probably hung out at bars, too, but does that make news? No. Toss in the fact the guys logged onto BBSs — whoa, you've got one hell of a murder story.

A recent episode of *Law and Order* tantalized TV viewers with the fictional story of a teenage hacker bent on revenge. His computer virus creation killed two patients who relied on the medical analysis of an infected program. Naturally, BBS users helped the hacker write his virus, and he infected the medical computer via modem.

What do parents usually hear about BBSs? They listen as some TV reporter describes how he "pierced the underground" to find all sorts of stuff their son taps into on a daily basis — pornography, snuff software, details on how to read President Clinton's E-mail and phone numbers for (God forbid!) the National Rifle Association's BBS.

Unfortunately, the mass media doesn't care about many important contributions made by BBS users. Numerous companies, for example, run BBSs so their employees can telecommute. Defense Department BBSs transmit reports, make software available to field units and provide access to personnel records.

Do you consider disk compression a "new" technology in DOS 6.0? You can thank BBS users for it — they've used compression programs for more than a decade. BBSs, more than anything else, advanced the state of the art in compression software and modem throughput speeds during the 1980s.

BBSs have also advanced the state of the art in antivirus software; indeed, every major antivirus company runs a BBS for its users.

I could go on about the other important benefits of BBSs, but none of them matter. Reporters have branded BBSs as a conduit for satanic cults, organized crime, corporate espionage, treason, viruses — you name it. The moral of each story: Never trust anyone who owns a modem.

Rosenberger is a 30-year-old computer hacker who owns four modems. He regularly logs onto the NRA's bulletin board.

Spooky days for IBM, DEC – and their users

FIRE WATCH *by* John Gantz

Welcome to the witching hour. In Wall Street terms, that's the last hour of trading on those rare days when stock options, index options and index futures all come due at the same time, wreaking havoc with programmed trading. In that last hour, the market can go through wild, unpredictable swings.

On our street, it means a time like now — when so many contradictory trends are at work that the immediate future is unknowable. Small events, such as a judicial decree on who can make 486 chips, can have a major impact on the future of the industry. The witching hour ushers in what the experts call "positive feedback economics" — also known as uncertainty.

One of the more nerve-racking worries for users is the viability of key vendors. If IBM's stock can drop below $50, anything can happen. The industry has no firmament. Or what it had is crashing down.

So, how can you pick vendors in this unsettled time? What distinguishes the likely survivors? Market share helps, particularly the near-monopoly kind Microsoft and Novell have in software and Hewlett-Packard has in laser printers. Cash is also useful, as are lightning-fast decision-making and luck.

Most of all, though, vendors need real-time monitoring of customer needs — a direct pipe to customers — to follow the twists and turns of market demands. This requires not just research, but a total outward focus — each employee thinking from the customer's point of view every minute of the day.

And that is why the witching hour is so dangerous to our two biggest computer companies: They are so focused on their own internal organizations, cultures and infrastructures that the market is passing them by.

Customers? What customers?

At a meeting with an IBM exec last week, for instance, I asked how many meetings a year he thought the average IBM employee had with customers, analysts or reporters, hoping to compare IBM to an outwardly focused company such as Apple. He admitted that there was no comparison. Plenty of IBM employees have never even met a customer.

A new CEO may help change the culture, but that change will proceed with all the speed of a blood transfusion through a cocktail straw. An IBM that once officially aspired to be a $100 billion business by 1990 will now be lucky (very lucky) to hit it by 2000.

And look at DEC, which may be even more inwardly focused right now. Yes, Mr. Palmer is making strides to rationalize the company, but to do so he has to change job functions, organizational charts and personnel deployment. Employees in the midst of that kind of upheaval often have other things on their minds besides customer welfare. Of the last dozen industry-related conversations I've had with DEC employees, six have ended up on the topic of job prospects. Resumes are shipping faster than Alpha chips.

When favored suppliers focus inward, users have to worry about not only long-term security but also immediate fallout. New sales representatives appear who don't know the account. Product design quality can become variable, and there is always the nagging question of whether the tailspin will continue. Technology choices have to be defended more rigorously.

I'm not saying these companies are goners; they still have plenty of positive attributes. But the next several months are not going to be an easy ride for anyone, including customers.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Charles Babcock

Object lessons

Developing business systems using an object-oriented approach realizes many of the benefits and savings that other software development methods have only promised.

Object-oriented designs map more closely to the realities of the business world. Products, customers and processes can all be objects, and the business rules that govern them can be encapsulated in the object's code.

Object-oriented systems require fewer

lines of code. They are more modular, so fewer things need to be changed when business conditions change. And they are composed of chunks of reusable code, although this latter gain is more difficult to achieve than object-oriented proponents allow.

These claims aren't based on texts or academic theories but on field reports from early implementors. Many of these pioneers adopted an object-oriented approach after concluding they could not do what they wanted to do with a procedural system, even though the whole development staff was schooled in Cobol, C and Fortran. For many it was difficult mastering C++ or Smalltalk and the new way of thinking that object-oriented requires, but the consensus was that the adjustment was worthwhile.

Working examples

At the recent Seybold conference in Boston, one IS director after another explained how he or she had produced a system on deadline and under budget while climbing a steep learning curve. Proponents included representatives of Citibank, Federal Express, Deere, CSX Transportation, Electronic Data Systems, Eastman Kodak and Southern California Gas.

All in all, it was powerful testimony.

Southern California Gas built a gas purchasing system in 5,125 days of programmer time compared with 8,130 days for a Cobol CICS system. The system runs under OS/2 on a PC LAN instead of an IBM mainframe. The labor cost came to $1.1 million compared with an estimated $1.76 million for a CICS Cobol system, a 37% savings, said Anne Estrada, senior computer analyst on the project.

CSX Transportation, the railroad conglomerate, built a locomotive management system that tracks the movements of train engines on a map of the Southeast. Dispatchers can use the drag-and-drop convention to move engines around. CSX estimates it has saved $24 million a year through a 3% gain in locomotive productivity realized by the system. Art Masson, director of transportation systems development, said it would not have been possible to develop such a system on a mainframe.

Although Masson was concerned about getting projects done on time, in one instance he found that programmers caught up to where they would have been with a procedural language in three to seven months. After that, the work moved more quickly because "you don't have to develop as much code."

For most parties, learning the ropes frequently requires calling in outside consultants, particularly in the design phase. Object-oriented methodologies are still loosely defined, so success in using them depends in part on the skill and discipline of the user.

Once learned, however, a system design stemming from object-oriented analysis "does mirror the business," said Rick Wohleber, IS managing director at Federal Express, where package tracking and other functions are moving into object-oriented systems.

As more commercial users plunge into the field, object-oriented development is likely to adopt more standard methods and procedures. With the right amount of discipline, the promise of object-oriented can be made real.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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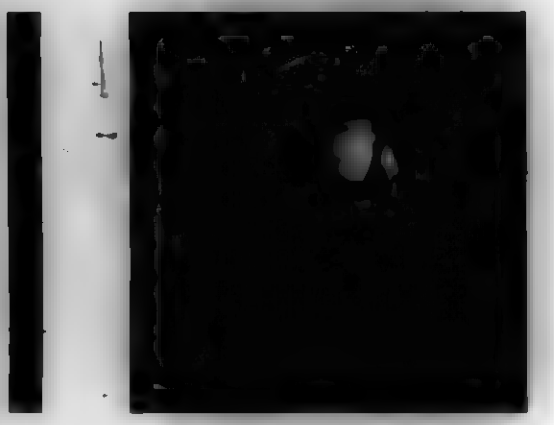

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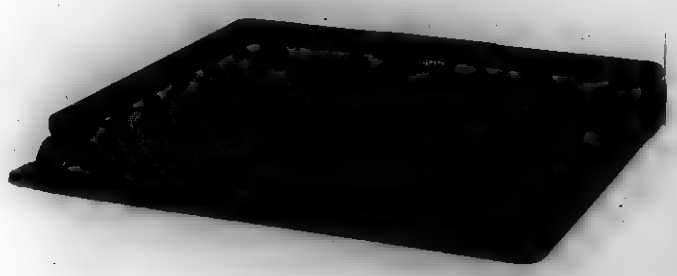

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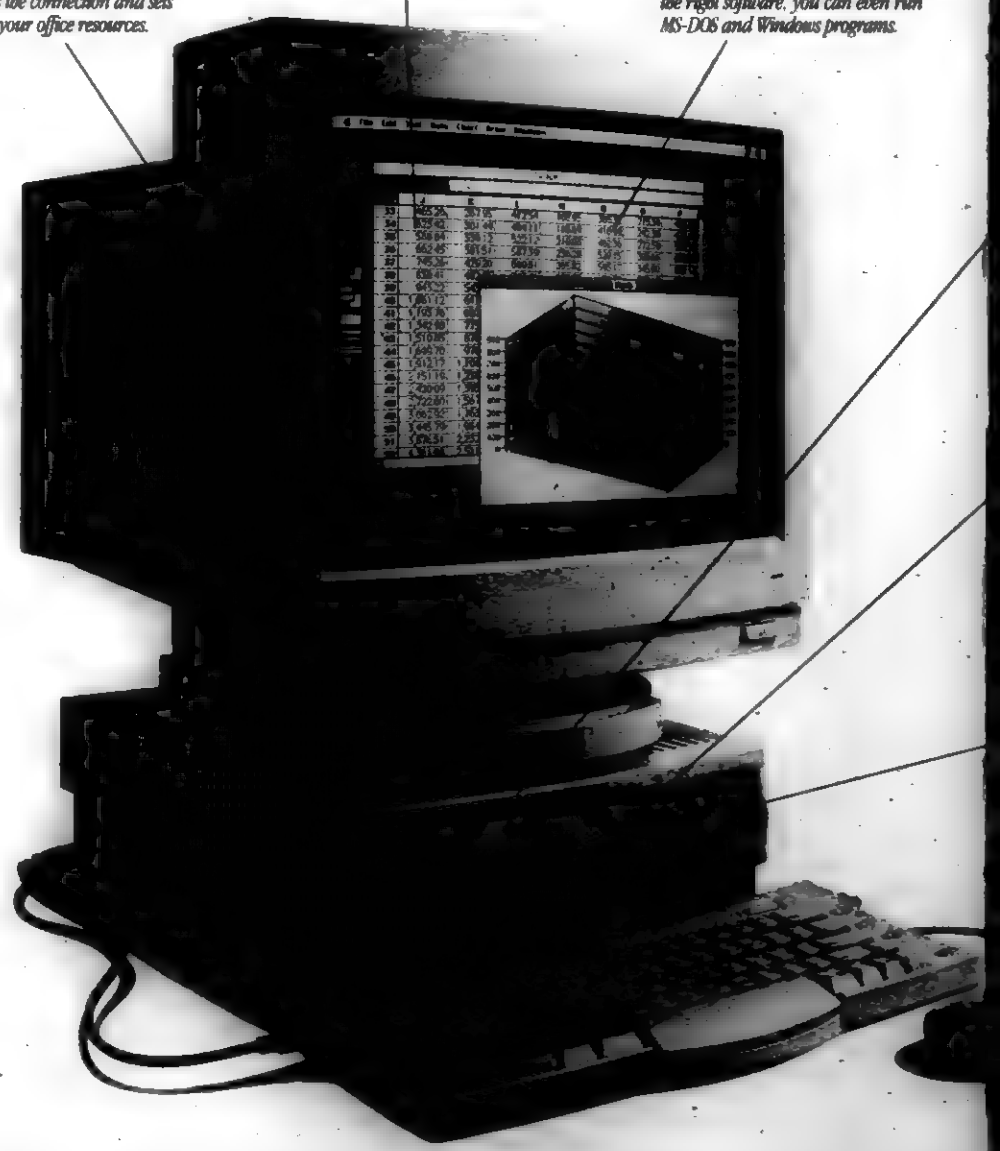

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[redacted]
Christopher Lindquist

Bugs: A fact of life

If you've followed this column through its short history, you've found more than a few references to bug reports from the various electronic services out there. Bug reports are a mainstay of computer journalism. It's an instant story: "User data damaged by bugs," or "Security flaw used by hacker to steal millions."

But let's get something clear: Bugs are not news in this industry. We've all seen them, and we know we'll see more. Software vendors today are trying to solve 100 equations in 100 variables to keep their products running on the myriad pieces of hardware we all have bought in order to save some money. Now we're paying the price for it.

These vendors don't like using their resources to fix bugs. They'd much rather spend the money and time on research and development, sales expansion and "RTFM" T-shirts.

So why don't we all cut them some slack and be a little more forgiving, OK?

What? Microsoft cleared *how much* this quarter? Ahem. Forget what I said about slack. If these companies are making that kind of money, their software should run on my toaster oven.

On to the bugs.

•MS-DOS, Windows 3.1 and NT, OS/2 2.0 and the 2.1 beta-test version, Unix (all flavors), Cairo, Pink, Taligent, Pick and good ole CP/M are buggy, slow, too big, unnecessarily proprietary, outdated, misguided, impossible to use and conducive to brain tumors, according to some bulletin board users.

That point having been made, beta-test users of both OS/2 2.1 and Windows NT 3.1 (What's in a name? A Version 1.0 by any other name is still a first release) are still reporting problems with installation and driver support, though things apparently are improving as the latest updates work their way out to the masses.

•Windows NT's MS-DOS and Windows' emulation quality are also on the upswing, users report, no doubt boosted by the efforts of Insignia (makers of emulation software for dozens of hardware and operating system platforms) on Microsoft's behalf. Even with Insignia's help, don't expect applications that directly manipulate hardware to work under Windows NT: The unreleased operating system's C2 security won't allow such hanky-panky.

•MS-DOS 6.0 is taking some lumps these days,

Lindquist, *page 65*

Turning to one-stop support

Benefits include better service, lower price tag

By Kim S. Nash

PC software companies such as Borland International, Inc. and WordPerfect Corp. have recently rid themselves of at least some end-user support costs by outsourcing the task to third-party support firms. But end users are also working deals with support providers such as Software Support, Inc. in Lake Mary, Fla., and Corporate Software, Inc. in Canton, Mass.

Among the benefits users reported were a streamlined payment process from buying all support from a single vendor and faster, more adept service than they would otherwise receive free from software vendors.

For example, Chemical Banking Corp. in New York escapes the accounting red tape of paying several software makers for support. The bank's Geoserv unit farmed out support for 1,300 PC users to Corporate Software in January 1992. Geoserv also buys applications from Corporate Software.

Geoserv now receives top-notch service that it could not always get internally, according to Anni Levy, manager of vendor relations and contract negotiations.

"Those technicians know what they're doing. There's no panic when someone calls with a technical networking question," she said.

The deal has gone so well, Levy explained, that she is considering buying support for other Chemical divisions, which would double the number of users calling outside the bank for PC help.

Software Support gives support to 125 PC applications and 50,000 to 60,000 end users through deals with at least seven vendors, including Borland, Deltrus Technology, Inc., Corel Corp., Dell Computer Corp. and end users such as General Electric Co., MCI International, Inc., Coca-Cola Co. and Rockwell International Corp.

Corporate Software, meanwhile, offers multiple support options directly to end users and through software makers and retailers such as Computerland Corp. and Egghead Discount Software. The company also sells many of the packages it supports.

Outsourcing support can save end users money on internal help desks on a per-call basis and also on training help desk workers in new technologies, according to Steve Murtagh, director of consulting services at the Help Desk Institute in Colorado Springs.

Pfizer, Inc., a $7 billion pharmaceuticals firm, bought Corporate Software's HelpLine Custom program for its U.S. Pharmaceuticals Division more than a year ago in part to speed up the time end users spent getting questions answered. The program is aimed at custom-

Support, *page 68*

Microsoft may have card to play in PDA market

By Michael Fitzgerald

■ Microsoft Corp. has so far ignored the nascent personal digital assistants (PDA) market, but numerous industry sources said the firm is gearing up to go after what could be the hottest growth market of the late 1990s.

Microsoft, together with Intel Corp., is rumored to be nearing an announcement for a software/hardware reference kit for the PDA market, which some think could see millions of units sold.

Microsoft's portion of the effort, a non-DOS operating system called WinPad, "could be very important to Microsoft and the entire PDA market," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

Bajarin said Microsoft's presence could draw developers of software that currently runs on Intel chips away from developing for Apple Computer, Inc.'s Newton operating system. Other contenders in the PDA operating system market include Go Corp.'s PenPoint and GeoWorks, Inc.'s GEOS. General Magic, Inc.'s Magic Cap may also become a factor in the market down the road.

WinPad is expected to be used with a 3.3V 1486 chip set being jointly developed by Intel and VLSI Technology, Inc., according to sources. Intel needs to parry bids by AT&T and others to grab the processor market for PDAs, analysts said. Sources said WinPad will be based on a non-DOS core with a Windows application programming interface (API) so that developers can write software for it more easily.

WinPad will accept pen input and address some of the technical problems with Windows for Pen Computing, such as its tendency to stop accepting pen input when a task is operating in the background. At the same time, it gives Microsoft an entree into a market that could become important.

Key market

"PDAs are not important now, but toward the end of the decade they'll be as common as calculators, and if Microsoft loses control of that market, their business strategy begins to falter," said Jesse Berst, editor of the "Windows Watcher" newsletter in Redmond, Wash.

At the same time, analysts agreed that while Microsoft has little visibility in the PDA market, no one else, including Apple, has had anything to show but hype.

Given that the market for PDAs may not develop until the end of the decade, "does the fact that [other companies] have a head start make Microsoft late? The jury's still out on that," said Mark Cummings, pocket intelligence program manager at SRI International, Inc. in Menlo Park, Calif.

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Desktop printers

Color ink jets aim for top spot

By Stephen P. Klett Jr.

Advances in the quality of color ink-jet output tied with rapidly falling prices may signal a premature end to the heyday of serial dot-matrix printers.

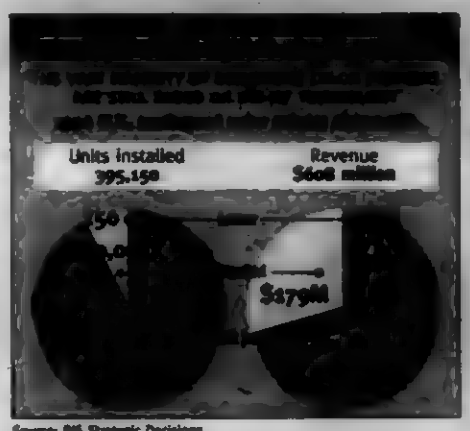
According to a five-year forecast by market research firm BIS Strategic Decisions in Norwell, Mass., U.S. sales of dot-matrix printers reached their peak at just under 5.5 million units last year, compared with 5.1 million in 1991. Sales are expected to drop to fewer than 5.2 million units this year and decline by nearly 80% by 1997.

Meanwhile, color ink-jet printer sales quadrupled in 1992, from 90,000 units shipped to 360,000, and are expected to continue this explosive growth trend.

Monochrome ink-jet sales will overtake dot-matrix printer sales by 1995, with color and color-capable ink-jet sales bringing up the rear but overtaking monochrome ink-jet sales by 1997, according to Bill Flynn, senior market analyst for BIS' color hard copy service.

"Everyone knew there would be a change in the market someday [from dot-matrix to ink-jet technology], but a lot of people didn't think it would happen so soon," he said.

In 1997, 3.75 million color/color-capable ink-jet units are projected to ship at a list value of $1.04 billion, for an average price of just under $300 each, Flynn said. He added that low-end dot-matrix printers currently sell for an average list price of $250.



Source: BIS Strategic Decisions

The big switch

Users are already beginning to take advantage of the new prices and quality improvements.

Randy Shaw, senior end-user services analyst at the Federal Reserve Bank of Baltimore, said his department has two Hewlett-Packard Co. DeskJet 550Cs and recently purchased an XL300 color laser printer. Shaw has seen an increase in the number of staff members using the color printers. "They are really going to be popular," he said. "Users want to print the colors they see on their screens ... and [color printers] are starting to come down in price enough and their quality is good enough to do what you want them to."

Shaw said that initially some users expressed reservations about using color ink jets. "They were worried about problems with smearing, but once you've seen the output you see it's not a problem," he said.

Ben Berry, manager of computer services at Hughes Aircraft Co. in Long Beach, Calif., said he has noticed an increase in the company's use of color printers, which are used mainly for outputting high-quality presentation graphics.

"We're not buying dot-matrix printers anymore; the output is not professional enough," Berry said. He added that Hughes primarily uses color laser printers and is not buying ink-jet technology right now. However, Berry said that when an ink jet comes out with a full range of color capabilities at a good price, "that's something we would jump on."

According to Flynn, HP is enjoying considerable success with its single-cartridge DeskJet 500C and appears to be one step ahead of the rest of the market. HP cut the price of the 500C from $779 to $619 in March, and Flynn said he has seen them sell for as low as $500. HP also cut the price of its new dual-cartridge DeskJet 550C, which debuted in October, from $1,099 to $879. He said more cuts are in the offing.

Lightning can strike twice

By James Daly

Pernicious hackers and destructive viruses are not the only threats to the safety of your computer system. Information systems security managers need to worry about the electricity demon as well.

In a recent ranking of the sources of loss on PC systems, electrical power surges ranked second only to theft, the perennial front-runner, and accounted for a whopping $174.2 million in damages last year. Power surges represented 12% of all losses, while havoc specifically due to lightning accounted for 3%, or $47 million, in damage.

Altogether, PC losses exceeded $1.5 billion during 1992, according to Safeware, The Insurance Agency, Inc., a Columbus, Ohio-based insurer that conducted the study. The damage figures represent hardware lost and not the cost of repairing or replacing lost data.

Safeware Chief Executive Officer David Johnston said computer electrical problems have gotten worse because users leave their machines running constantly, a habit that Johnston thinks people should avoid. "I just don't think people realize how fast lightning can fry your data," he said. Johnston added that the increased use of modems has provided another path for surges.

A surge is a short-term overvoltage lasting several milliseconds and usually local in origin, especially when heavy current-draining electrical motors are turned on and off repeatedly. They can also occur regionally when a utility company is making adjustments through an area power grid.

Overvoltage makes equipment run hot and, if not corrected, can cause equipment failure and totally disrupt a data center. Problems can range from data loss to permanent hardware damage.

Johnston said a good preventive measure is the installation of a surge suppressor, an electrical device placed between your PC equipment and the main electrical supply. It contains special circuitry that clamps down voltage when it starts to rise beyond an acceptable level, preventing dangerously high voltage from reaching sensitive PC equipment.

All surge suppressors should have a circuit breaker, a resettable switch that turns the supply off if the circuits become overloaded. Many surge suppressors also provide multiple sockets, wherein each socket is protected separately. Experts said the better protectors have a UL 1449 rating of 330V.

Try to get a protector with fusing for fire protection and a load capacity of 15 amps; less than 15 amps can be inadequate for a computer system.

Johnston noted that even if electrical bursts do not knock out your equipment right away, they can still cause damage.

Lindquist

CONTINUED FROM PAGE 63

too. Seems some users are not exactly pleased at the fact that once you compress a disk with DoubleSpace, the only way to get rid of it is to reformat. Third-party products, such as Stac Electronics, Inc.'s Stacker, allow you to deinstall should you run into problems.

MemMaker, the automatic memory optimization utility in MS-DOS 6.0, is also catching some flack. Seems some users are not getting anywhere near the free memory they used to get with products such as Quarterdeck's QEMM under MS-DOS 5.0. The response from some happy MS-DOS 6.0 customers is, "You should feel lucky you get it at all for less than $50."

•For you X Window System users, there's a rather nasty security leak that allows unauthorized users to manipulate resources they shouldn't be able to touch. An Internet user posted a C program to alt.hackers that allows users to close windows, kill processes and so on, without proper authorization. If you want details, send an E-mail and I'll gladly pass along the information about the posting, just so you can see what you're missing.

•Do you have PC Tools for Windows? Do you like it? Do you want to add a couple more buttons that aren't listed in the documentation? A user posted a patch to a PC Tools .INI file that puts an "indicate expandable branch" and "toggle file viewer window on and off" button on the PC Tools for Windows file manager. If you like hex searches, send me a message. No warranty is either expressed or implied.

•Finally, if you're a fan of British Parliamentary debate, rugby or other contact sports, check out alt.fan.bill-gates on Usenet. There's enough vitriol being spilled there to make a libel lawyer salivate. No word from Bill himself, but a couple forged messages have caused some fuss.

One false "billg" even said that Nostradamus had predicted that Unix System IV Release V would be the last version ever to see the light of day, but that's not really true. He said Next would become a software company.

Lindquist is a *Computerworld* West Coast correspondent.

Turning to one-stop support

CONTINUED FROM PAGE 68

ers who generate more than 100 calls per month and require on-site personnel assistance.

Three Corporate Software technicians work on-site at Pfizer, freeing up 35 to 40 information systems staff members who previously supported end users and largely replacing vendor-supplied hot line support, according to John Morgan, manager of pharmaceutical systems at the company.

"Waiting on technical support lines was not the most productive use of our time," Morgan explained, adding that Pfizer was not able to build the same expertise that Corporate Software offers. "Buying support is not the cheapest [option], but the benefits we've been able to draw are worth it," he said.

Not for everyone

However, because Software Support and Corporate Software offer only limited, if any, mainframe software support, some users have decided against third-party options.

Southern California Gas Co., for example, has no plans to buy outside support for its 5,000 PC users, according to Bob Holmes, computer technology research analyst.

An in-house, seven-member help desk supports the Los Angeles-based utility well because it can trouble-shoot and fix more than just PC software, according to Holmes.

"We need that kind of wide-ranging service," Holmes said.

Support switch

Borland recently handed over support duties for 12 applications to Software Support, including support for several former Ashton-Tate Corp. packages.

Users received free support until May 1 and then had to cut deals with Software Support, according to a Borland spokesman. Customers were notified of the change by a message posted on CompuServe and a recording on the current support hot line. Also, MultiMate users received a letter explaining the new support options, the spokesman said.

Borland said it was forced to outsource end-user support for these applications because the high cost of maintaining a support staff trained in obsolete applications now outweighs sales of those old packages.

Other factors motivating some PC makers' moves to paid support include the following:

- High research and development outlays by software makers to build today's increasingly complex PC applications.
- Squeezed profit margins on current packages swept up in a software price war.
- Users downsizing to PC networks are seeking help with quite complex issues that vendor-provided support technicians cannot always address.
- Hot line overload during busy periods such as upgrade times.

— *Kim S. Nash*

[illegible] Software now supported by Software Support

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Systems

ZyLab, a division of Information Dimensions, Inc., has introduced ZyIndex 4.0 for DOS, a document retrieval system.

The product allows users to extract precise information from word processing, database or spreadsheet files on a hard disk and network system, the company reported. All files are kept in their native file format. Version 4.0 provides new search capabilities, unlimited index and file sizes and greater ease of use.

Other features include pull-down menus, new printing options, streamlined index building and maintenance procedures, auto sense word processing file formats, search requests of up to 800 characters and mouse support.

The product costs $395 for single users and $995 per network pack with three concurrent user licenses.

▶ *ZyLab*
100 Lexington Drive
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SMJ Electronics has introduced the Cache Port, an expansion card.

The product was designed to replace the standard PC parallel port, streamlining high-volume printing operations. It has the ability to minimize the CPU time needed for printing tasks and does not require additional configuration or software to operate in industry-standard PCs, the company reported.

The card fits into an 8- or 16-bit slot of any XT/AT-compatible computer and comes standard with 1M byte of random-access memory. A standard single in-line memory module with room for a single 1M-, 4M- or 16M-byte module is also included.

The Cache Port costs $449.

▶ *SMJ Electronics*
B-200, 3500 Clayton Road
Concord, Calif. 94519
(510) 672-3885

VIS Development Corp. has released Avenue, a system that enables corporations to convert videotapes into personal computer-based interactive multimedia applications, according to the company. A user database is built with collected information.

The product uses Intel Corp.'s DVI compression standard and ActionMedia II board. The firm said Avenue delivers playback in full- or quarter-screen windows at a speed of 30 frames per second.

Avenue runs under Microsoft Corp.'s Windows 3.1 on an 80386 or 1486 processor with 8M bytes of random-access memory. It requires a 256-color, 640 by 480 Video Graphics Array display.

Complete Avenue applications start at $10,000.

▶ *VIS Development*
100 Fifth Ave.
Waltham, Mass. 02154
(617) 466-6678

Macintosh products

Epson America, Inc. has introduced Epson Talk, a connectivity kit for Epson LQ dot-matrix printers.

Epson Talk allows Apple Computer, Inc. Macintosh users to access printers in the Epson LQ 70 series and certain ActionPrinter products.

According to the company, Epson Talk was designed for users who require specialized forms-printing solutions that are not fulfilled by other printers or printing technologies. A LocalTalk interface and chooser level driver are included. Epson Talk works with every Macintosh software package.

The product costs $229.

▶ *Epson America*
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Windows NT platform choices plentiful

By Michael Vizard and Michael Fitzgerald

With the delivery date for Microsoft Corp.'s Windows NT operating system looming, information systems directors are pondering their options for systems to run NT on.

Unlike previous Microsoft operating systems, Windows NT, due to appear late this month at Windows World in Atlanta, was designed to run on several hardware platforms. Windows NT supports Intel Corp.'s Pentium, Digital Equipment Corp.'s Alpha AXP, the R4400 from Mips Technologies, Inc. and the Clipper system from Intergraph Corp. As a result, providers of reduced instruction set computing (RISC) systems have come to view NT as an entree into the mainstream world of commercial Windows applications.

But whether these vendors will be able to leverage the performance of their RISC systems against formidable Intel is very much in doubt, according to analysts such as Andrew Allison, an independent consultant in Carmel, Calif.

"NT is the RISC guys' big opportunity and their last hope," said G. Glenn Henry, senior vice president at Dell Computer Corp. in Austin, Texas. Henry said Dell is paying close attention to the RISC market because "for customers, NT [will] really enable them to think about moving things off one platform to another."

But that benefit will not come without some cost. Henry said no application is portable without some hand-coding, so testing and bug-fixing become the major costs of application ports.

"Realistically, a 20% to 30% performance difference [between RISC and Pentium], which is what you're seeing out there, won't be enough to drive software people and customers to do a lot of new work," Henry said.

According to Allison, the performance and volume pricing of Pentium processors, which will not be widely available in systems until early 1994, will put pressure on both DEC and Mips to deliver higher performance processors for NT in the near future. For example, DEC currently touts a 150-MHz system for Windows NT developers but is capable of delivering a 200-MHz system. Pentium's highest planned speed is 100 MHz.

The speed differences have offered software vendors a plethora of options regarding NT. Dave Morehead, director of research at IMRS, Inc. in Stamford, Conn., reported that 10M to 12M bytes of floating-point data runs about twice as fast on an R4000 or Alpha platform as it does on a 50-MHz I486, though Intel countered that Pentium's performance is substantially faster than that of an I486.

Making the grade

Pentium's initial 66-MHz speed makes it a close rival of a 150-MHz Alpha AXP system in terms of SPEC integer performance, which reflects office automation applications.

The Pentium processor also fares well in industry-standard benchmarking tests such as SPEC floating-point performance, which reflects graphics and other numeric-intensive applications, compared with a 50-MHz R4000 Mips processor. However, a 150-MHz Alpha AXP system is almost twice as fast in terms of floating-point performance.

"We haven't optimized our NT code for Alpha, but it's our sense that NT runs a lot faster on Alpha," added Tom Daly, manager of trading systems at the Midwest Stock Exchange in Chicago.

Still, analysts said Intel's early focus on working with compiler vendors has given it a significant advantage with software vendors.

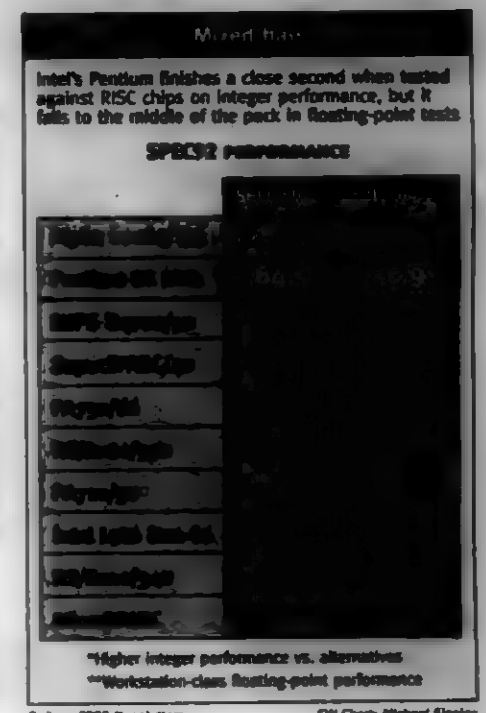
"Intel set out a road map that included hiring experienced compiler developers to work directly with software vendors, while DEC, for instance, depends largely on Microsoft to handle that," said Janet Ramkissoon, an analyst at Quadra Capital, Inc., a research and money management firm in New York.

"And there are some disadvantages, in theory, to jumping to a different processor — for example, the lack of native executable code compatibility," said James Hansel, vice president of investment systems at UBS Asset Management, Inc.

"I understand they have emulators [for my existing DOS and Windows applications], but I have always been extremely skeptical of emulator claims."

Performance enhancer

While Windows NT provides a standard front-end compiler for applications, called the *C7* compiler, each hardware vendor provides its own back-end compiler. The sophistication of these compilers, which handle memory management and I/O subsystem calls, can dramatically affect performance.



Pending Pentium chip debut spurs plans for system buys

By Kim S. Nash

The chip is not even out yet, but early signs indicate that Intel Corp.'s Pentium processor may bring a few large sales and a lot of small deals when it ships in volume midmonth, according to a recent survey by the *Computerworld* Database Division.

More than 500 information systems executives polled during February and March said they plan to spend more than $31 million, collectively, on Pentium-based workstations and servers this year. In addition, 39 of the 506 companies surveyed plan single buys of more than $100,000 each.

One estimate pegged Pentium shipments at 10,000 chips in the second calendar quarter, ramping up to 450,000 processors by year's end, according to Brad Day, analyst at Dataquest, Inc. in Framingham, Mass. "And nearly every one of those will be sold," Day predicted.

Dell Computer Corp. and Gateway 2000 Ltd. are in line to catch a fair share of that business, according to respondents who have chosen a vendor. However, 242 people said they were undecided on a source for their new boxes.

Systems are expected to start at $5,000 to $7,000 each for low-end server and desktop machines, according to several firms that have laid out plans to ship Pentium-based systems in parallel with Intel's formal unveiling of the chip May 17. Product plans include the following:

- **Compaq Computer Corp.** will put Pentium on three lines of boxes: SystemPro/XL multiprocessor servers, ProSignia single-processor PC servers and DeskPro/M single-user PCs. All will use Compaq's TriFlex server technology, which was designed to exploit Pentium's promised processing power [CW, March 22].
- **NCR Corp.** plans to announce a series of underdesk PCs, upgrade boards and scalable superservers running Pentium, a spokeswoman said.
- Superserver makers **Tricord Systems, Inc.** and **NetFrame Systems, Inc.** have promised systems. For example, NetFrame's models in its CS line of servers, which are targeted at minicomputer users downsizing to client/server architectures, can run Intel's latest and greatest, the company said.
- **IBM** demonstrated a Personal System/2 Server 295 running Pentium recently at CeBit in Hannover, Germany.
- On the OEM side, **Corollary, Inc.** plans to ship C-bus II Pentium boards and basic systems to Siemens/Nixdorf Information Systems, Inc. and is looking to sign similar deals with other hardware makers, said George White, Corollary president.

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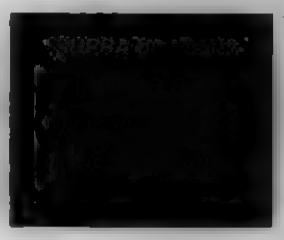

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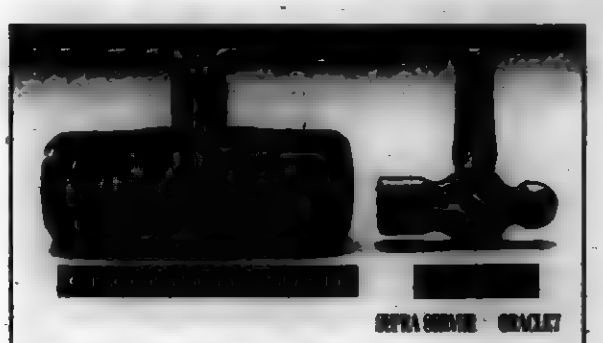

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Vendors try to bridge backup tape gap

By Michael Fitzgerald

Spring seems to have inspired tape backup makers to flood the market with new products, many of which are aimed at closing the gap between mainframe backup and current client/server-oriented products.

Several of those announcements were made recently, and Michael Peterson, president of Peripheral Strategies, Inc. in Santa Barbara, Calif., predicted that "all the players will release new products in the next 90 days."

Still, users said these products would fall short of the features they will need to begin to match the performance they get from their mainframe systems.

"Everybody's come up with sophisticated schedules to do things overnight, but it takes a lot of time to retrieve information when you need it, and we need to be able to do that faster," said Allen L. Cournyer, senior vice president and manager of the data center division at Texas Commerce Bank NA in Houston. Cournyer said the bank was looking at hooking up its IBM 3480 and 3490 host-style tape devices to its local-area networks to address this need.

What's new

Announcements included the following:

•**Conner Peripherals, Inc.**'s new storage division, Conner Storage Systems Group (formerly Maynard Electronics) in Lake Mary, Fla., announced a partnership with **Legato Systems, Inc.** to produce a high-capacity network data backup and management tool aimed at the client/server market. The Conner Networker is already shipping, and prices range from $750 to $7,500. Conner also released three autoloaders for the digital linear tape, digital audio tape and 8mm markets capable of 48G- to 50G-byte capacity. In a separate announcement, Palo Alto, Calif.-based Legato said it will support Sun Microsystems, Inc.'s Solaris 2.1.

•**Palindrome Corp.** in Naperville, Ill., will move toward the low end of the market by offering Backup Director 2.1, essentially its high-end Network Archivist software without the archiving and migration feature. The product, now shipping, has an introductory price of $795.

•**Cheyenne Software, Inc.** announced ARCserve 5.0 for Novell, Inc. NetWare, which features a Microsoft Corp. Windows interface and allows for simultaneous processing for up to seven tape drives. The Roslyn Heights, N.Y., company will ship its product on June 30.

Briefs

Object and Cadence agree

Object Design, Inc. and **Cadence Design Systems, Inc.** have agreed that Cadence will use Object Design's ObjectStore database in its next-generation electronic design automation (EDA) software tool suites, due out next year.

ObjectStore will also be incorporated as the storage manager for Cadence's Design Framework II, a move company officials said signals the EDA industry's shift away from proprietary databases to standard commercial databases.

Tool kit provided

SunSoft, Inc., the software subsidiary of **Sun Microsystems, Inc.**, recently announced that it will provide **IXI Corp.**'s OSF/Motif tool kit to SunSoft's third-party software developers. Under the terms of the agreement, SunSoft will make IXI's Motif developer's kit immediately available on Sun's Scalable Processor Architecture (SPARC) platform and will provide the kit on Intel Corp. platforms later this year.

SunSoft also said it will incorporate IXI's OSF/Motif technology as part of the graphical user interface in the next release of Solaris for SPARC and Intel platforms.

ProWorks for Solaris

SunPro, the software development business of Sun Microsystems, Inc., is planning shipments this month of its ProWorks tools for the Solaris Unix operating system on Intel Corp. X86 platforms. The tools will be identical and fully source-code-compatible with SunPro tools on the SPARC platform, company officials said.

ProWorks includes development tools, code management tools and language systems for C, AT&T's C++ and Fortran. SunPro also slashed the price of its C development environment by nearly 40% to $995 for SPARCworks Professional C and ProWorks C.

Spreading FDDI

As part of a move to expand Fiber Distributed Data Interface (FDDI) networks to desktop PCs, **Network Peripherals, Inc.** said that **Anixter Bros., Inc.**, a Skokie, Ill., distributor, will resell its line of FDDI network cards and concentrators.

Token Ring prices lowered

For the second time this year, **Thomas-Conrad Corp.** in Austin, Texas, dropped prices on its Token Ring adapter cards. For example, a 16M/4M bit/sec. XT/AT bus Token Ring adapter, formerly listed at $599, now costs $495.

Separately, Thomas-Conrad said it signed a multimillion-dollar contract with systems integrator **Electronic Data Systems Corp.** EDS will resell Thomas-Conrad's Token Ring, Ethernet and Arcnet adapter cards.

Da Vinci for CompuServe

Local-area network electronic-mail company **Da Vinci Systems Corp.** in Raleigh, N.C., is providing technical support through the **CompuServe Information Service.**

Users of DaVinci Email can access the DaVinci Forum by typing "GO DAVINCI" from CompuServe. The company's support people will answer users' questions on-line for no charge above the typical CompuServe fees.

DaVinci is the third most popular LAN E-mail package — after Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail — with an estimated 1.2 million user installed base.

NASA contract

Network Computing Devices, Inc. (NCD) has been selected as the sole vendor to supply thousands of X Window System terminals to NASA under the Scientific and Engineering Workstation Procurement program. The contract, awarded by NASA's Goddard Space Flight Center in Greenbelt, Md., through contractor **Government Technology Services, Inc.**, could be worth as much as $4 million to NCD during the next five years.

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SAMPLE Cw

Notework E-mail system enhanced

By Lynda Radosevich

BROOKLINE, MASS.

Notework Corp. announced an updated version of its Novell, Inc. NetWare-based electronic-mail software, which has been shipping since March.

Reportedly lauded by technophobes for its simplicity, Notework Version 2.0 fills in a few feature holes and increases the capabilities of some administrative functions.

"The biggest difference for us is seeing the full name in the address list," said Mike Nippo, information center supervisor at the Physicians Insurance Co. of Ohio in Pickerington. Before, addresses included first initial and last name. Now, users can search for cohorts by first name as well, he said.

Unlike most large E-mail installations, Notework does not require a dedicated server to check messages for forwarding.

On the server side, Notework distinguishes itself from the biggest local-area network E-mail packages, including Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail, because it does not require a dedicated router or message transfer agent — an "extra level of complexity that you don't need," said David Ferris, editor of the "Ferris E-Mail Analyzer."

Usually, large E-mail installations require a dedicated server to check message storage to see if messages need to be forwarded. That intelligence, Ferris said, is in Notework's client software. According to Notework, the package can use NetWare's Message Handling Service to support up to 100 file servers without requiring a dedicated mail server.

Notework, which costs $30 to $45 per user, is a 5K-byte program that stays in a computer's upper memory. It can be accessed in DOS applications using a keystroke combination or in Windows applications by clicking on an icon.

Physicians Insurance first chose Notework in 1991 after a committee comprising "80% computer-illiterate users and 20% expert users" overwhelmingly picked Notework over Lotus' Notes and CC:Mail, WordPerfect Corp.'s Office and Da Vinci Systems Corp.'s Email.

"It does not have the more advanced capabilities [such as spell-checking], but our objective was to find something that was easy to use and that users liked," Nippo said.

Other new features include a 50,000-name address book that automatically logs senders' addresses. When searching for a name such as Michael, a user can type an "M" and all the names beginning with "M" pop up. As more letters are typed, the address book pinpoints the correct address. Addressees across file servers all appear on the same address list.

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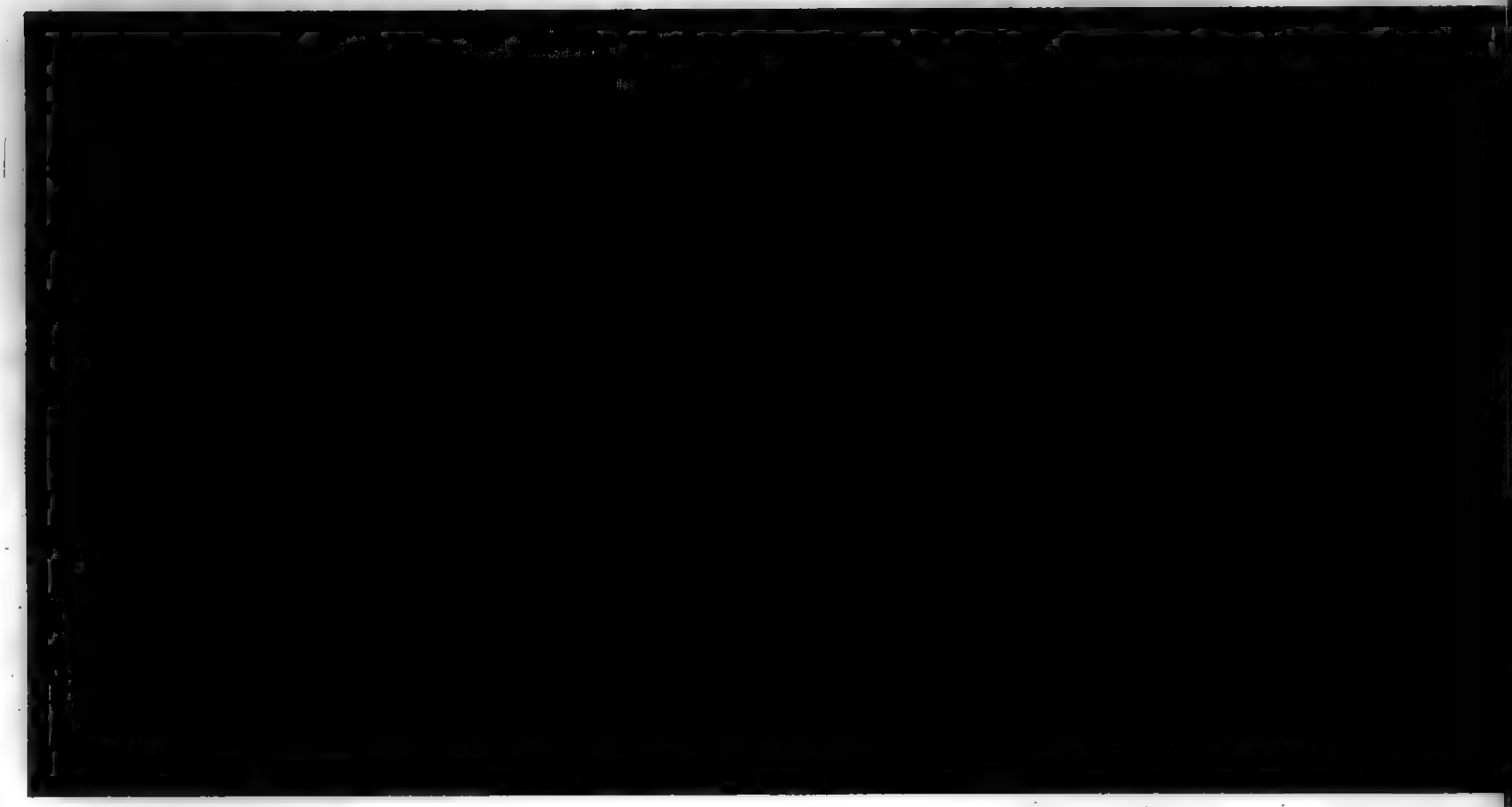

Once upon a time, mainframes and networks didn't get along. They were so different, they feared each other. But now, with the upswing in downsizing, client/server and PC networks, mutual cooperation is in order. So you're probably asking: *"How can I leverage my investment in mainframe applications and data to benefit my network clients?"* Which is tough enough to say, let alone do.

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Workgroup software applications

Hiarc, Inc. has introduced Sparcus, a software product that enables Unix workstation users to transparently manage files based on their on-line, near-line and off-line data access requirements. File servers can be created with practically unlimited storage capacity by using a Sun Microsystems, Inc. SPARCstation and an optical jukebox as overflow storage for workstation-based magnetic disk drives, the company reported.

All files, including those that are stored near-line on optical cartridges, appear to be on-line.

Sparcus costs from $16,500 to $95,000.

▶ *Hiarc*
Suite 250
3 Corporate Park
Irvine, Calif. 92714
(714) 253-6990

Unix

Software AG of North America, Inc. has announced Natural Construct and Predict for Unix.

The production-scale application engineering tools for Unix platforms enable users to maintain central or departmental control while distributing application development anywhere from the desktop to the mainframe.

Natural Construct is a model-based application generator that offers ease in prototyping applications and rapid application development. The technical design, implementation and maintenance of applications and databases are supported and documented by Predict, an integrated, active data dictionary.

Prices for each product range from $600 to $34,900.

▶ *Software AG of North America*
11190 Sunrise Valley Drive
Reston, Va. 22091
(703) 860-5050

4th Dimension Software, Inc. has announced the release of the Enterprise ControlStation. According to the company, the product runs as a Unix application on Sun Microsystems, Inc.'s SPARCstations and IBM's RISC System/6000s.

The Enterprise ControlStation also communicates with the company's Control-M Automated Job Scheduling and Production Control system when it is on the mainframe by using Transmission Control Protocol/Internet Protocol or IBM LU6.2 protocols.

Prices range from $35,000 to $90,000.

▶ *4th Dimension Software*
1 Park Plaza, 11th Floor
Irvine, Calif. 92714
(714) 757-4300

Saratoga Systems, Inc. has introduced SPS, an account management and sales information software package for The Santa Cruz Operation's SCO Unix.

According to the company, the product offers an integrated, companywide solution to sales automation. Users receive access to sales-related information and multilevel customer profiles and can perform updates. PC or laptop computer users have the ability to upload or download information from their company's central SPS database because the product typically functions as a distributed database, the company said.

SPS costs $1,250 per PC copy.

▶ *Saratoga Systems*
Suite 230
1650 S. Bascom Ave.
Campbell, Calif. 95008
(408) 371-9330

SPSS, Inc. has introduced SPSS 5.0 for Unix, a statistical software package.

The Open Software Foundation's Motif user interface has been provided for greater ease of use and learning. Integrated capabilities have been added for analysis, data access, graphics and reporting. Many features are included, such as hypertext Help and a glossary of statistical terms, clipboard support for moving text and data to other applications and object-oriented chart editing.

Prices start at $1,000.

▶ *SPSS*
444 N. Michigan Ave.
Chicago, Ill. 60611
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Workstations

CompuAdd Computer Corp. has announced the CompuAdd SS 10, a fourth-generation Scalable Processor Architecture (SPARC) workstation.

The product is 100% binary-compatible with Sun Microsystems, Inc.'s SPARCstation 10 and incorporates two M-bus and four S-bus slots. Sun-specific single in-line memory modules are supported, providing 512M bytes of memory.

The SS 10 replicates the Sun machine in all I/O capabilities.

A typical configuration consists of 32M bytes of random-access memory, a 525M-byte Small Computer Systems Interface hard drive, a 19-in. monochrome monitor and a 3½-in. floppy drive. It costs $15,495.

▶ *CompuAdd*
12303 Technology Blvd.
Austin, Texas 78727
(512) 250-1489

Storage

MountainGate Data Systems, Inc. has announced the IncreMeg 6000, a hard disk storage subsystem that consists of up to six 3½-in. IncreMeg removable drives.

Up to 7.2G bytes of formatted on-line capacity is provided for either a desktop or rack-mount configuration, and removable drive cartridges are offered for secure storage, exchange and transport of data, the company reported.

IncreMeg 6000 can be used for mission planning, video/audio editing and file servers. It supports most major platforms.

A fully-configured 7.2G-byte subsystem costs $19,500.

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1110 W. Taft Ave.
Orange, Calif. 92619
(714) 998-6900

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Naturally, there's a cost. Eventually.

Interestingly enough, a recent independent study[1] concluded that less than 10% of the cost of e-mail is the initial software investment. So before Microsoft convinces you that you're smart to make a strategic enterprise-wide decision based on 10% of the real stakes, consider what it will cost you once you've signed up.

Consider your "free" e-mail's back end. Then consider yours.

To accurately assess the other 90% of your e-mail investment, there are four key areas to consider.

First there are the back-end service costs: the design and administration tools required to run the system. The quality of these tools will impact hidden costs associated with disk storage and network bandwidth.

There are the infrastructure costs including minimum hardware configuration and platform changes.

There are connectivity costs associated with bridges and gateways to other systems.

And, of course, the people-related costs. Installation. Administration. And training.

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The basic idea of the mail is that it gets delivered. But Microsoft Mail is not designed to deliver efficiently across competitive operating systems. To the contrary, if anyone in your organization works, or wants to work, on anything but a Microsoft operating system, there's a potential problem.

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Microsoft doesn't have a UNIX® client. Its commitment to the OS/2® platform is historically questionable. And its connections to Mac® are inconsistent.

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All of which explains why small companies and large corporations, including more of the Fortune 1000, have reached the same conclusion. When it comes to e-mail, the message is obvious:

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Analysis

At a distance

Tools for off-site network access are coming of age

By Joanie M. Wexler

Trends toward mobile computing and local-area networking are causing multiflavored remote networking offerings to catch users' attention.

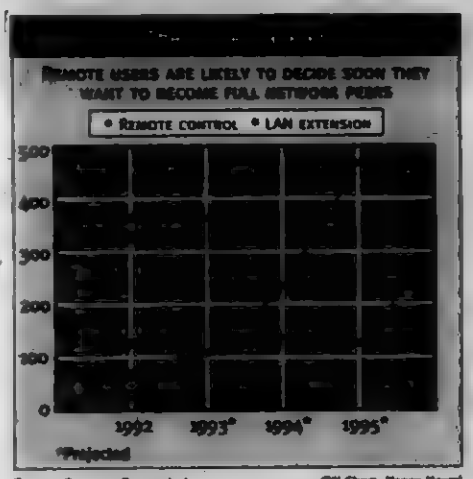
Today's products fall into two main categories. "Remote control" software allows users to operate their office PCs from another location and see the activity, such as electronic-mail messages, on their remote screens. "LAN extension" products render a remote computer an actual node on the corporate LAN internetwork.

Each mode of remote access fits different application types. For example, "remote control is good for file-based applications, such as [Borland International, Inc.'s] Paradox database," said Janet L. Hyland, director of communications strategy research at Forrester Research, Inc. in Cambridge, Mass.

She said this is because Paradox "finds a user-requested entry and then sends the file to the local PC being controlled remotely for the crunching." This sidesteps the limitations of today's wide-area network bandwidth and the processing limitations of laptops.

Most copies of remote control software, which currently outsells LAN extension products but will likely fall behind next year (see chart), have been sold to allow support staff to "get into some user's PC and troubleshoot remotely," Hyland said.

Products vary not only in type of access but also in the variety of client platforms and LAN protocols they support and whether one server at the central site can support multiple users.



Source: Forrester Research, Inc. CW Chart: Nancy Hamel

A good fit

In addition, products differ in licensing structures and how many protocols a user can juggle simultaneously, said Mike Neuburger, a network engineer at the University of Oregon in Eugene, a Centrum Communications, Inc. Centrum-Remote shop. He said the network extension-oriented CentrumRemote fit his environment — a large population of telecommuters — for three main reasons:

- Users run very high performance applications, "and there is no way with our limited budget we could give them a duplicate PC to control" at the office.
- The product can handle multiple protocols simultaneously, which was critical for users transferring files off Unix hosts to a Novell, Inc. file server over a serial line.

This means "you have to be talking both protocols. Centrum and Digital Communications Associates, Inc. allowed you to do that, but [competitors] Shiva and Microtest didn't," Neuburger said.

- Centrum's licensing scheme required him to pay a flat $2,000 price for the server, whereas some vendors also ask for a per-user license fee. "We have a potential user base here of 19,000 people, so that could get into some money," Neuburger said.

The network extension form of remote access software, which shifts processing off the network onto the remote client, is becoming important with the emergence of client/server applications.

"We're doing a lot of client/server development, and we want to provide these applications to all users, local and remote," said Thea Hansen, technical consultant at MCA/Universal Studios in Universal City, Calif.

MCA/Universal uses Shiva Corp.'s LAN Rover/L modem-based product for linking Apple Computer, Inc. Macintosh computers over dial-up lines to a LocalTalk LAN. From there, users can tap into the rest of the corporate internetwork through bridges and routers on-site.

The LAN extension products are necessary because "client/server applications are written to specific networking protocols. With 'dumb' modems, you write that way and you're [in trouble]," said John Paig, senior research analyst at Meta Group, Inc., a research firm in Westport, Conn.

Bandwidth restrictions

The downside to LAN extension is limited wide-area bandwidth. However, products such as Telebit Corp.'s NetBlazer include compression techniques to alleviate the problem.

Security is another issue. Mastercard International, Inc. is using the LAN Rover/L for a temporary project that has technical staff exchanging design documents between Orlando, Fla., and St. Louis. It has kept the installation isolated "because we're concerned with LAN security in general," said Tom DeWald, manager of technical development.

However, DeWald said that once his mainframe security vendor, Computer Associates International, Inc., moves its ACF2 security system to LANs, LAN extension is likely to pick up at Mastercard.

Two in one

Some recently announced products blend the remote control and network extension forms of remote networking, allowing users to switch modes to fit the application they are running.

For example, for simply checking E-mail, users can operate in remote control mode; when they want to tap into distributed corporate resources, they can shift to LAN extension.

Citrix Systems, Inc. announced last week that it is shipping WinView for Networks — Novell NetWare- and Microsoft Corp. LAN Manager-compatible software that supports 10 concurrent remote users per application server at the host site.

WinView requires a 486 or Pentium-based PC as a host. Users pay $1,995 for server software supporting five users and $2,645 for 10 users. Five-user add-on packs cost $995.

Meanwhile, in early March, U.S. Robotics, Inc. in Skokie, Ill., bundled a function it calls Dynamic Access Switching into its Shared Access LAN modem for the switchable capability. Unlike Citrix, U.S. Robotics gives users a one-to-one relationship with host PCs.

"It would be appealing to have a switchable product," said Thea Hansen, technical consultant at MCA/Universal Studios. "Our systems analysts are responsible for maintaining our equipment, and remote control would be great for them. Executives are more likely to need LAN extension."

The two-in-one offering is a trend analysts said they expect to see spiral during the next few years.

—*Joanie M. Wexler*

Users to climb, not jump on SNMP-2 bandwagon

Despite benefits, migration questions remain

By Elisabeth Horwitt
SAN FRANCISCO

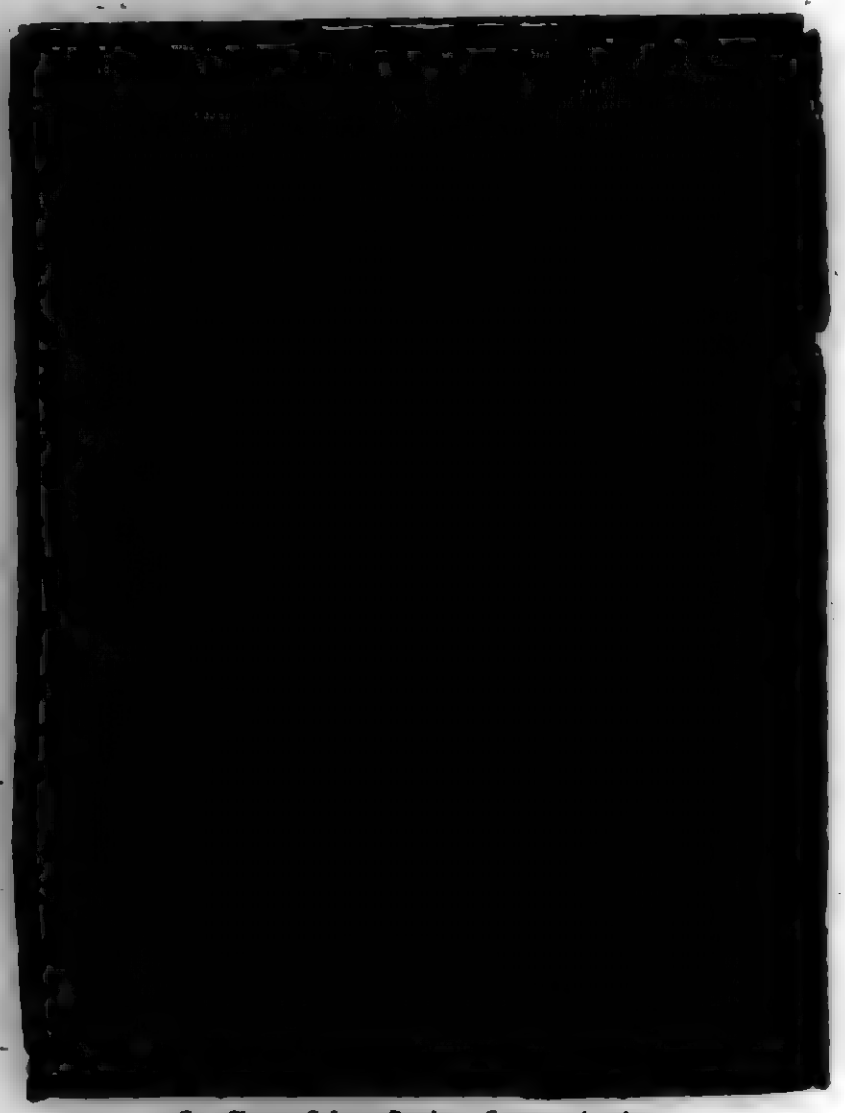
Simple Network Management Protocol (SNMP) Version 2.0 recently became "finalized enough to start a horse race" of vendors implementing the improved network management protocol, according to Steve Simon, senior telecommunications engineer at The Travelers Corp. The new version of the network management standard offers users a variety of benefits over the old, including secure communications, faster collection of management data and manager-to-manager communications.

However, users may face a tough migration path to reach these benefits.

The new version of SNMP recently won official status

SNMP-2, *page 84*

"No more de



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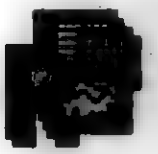

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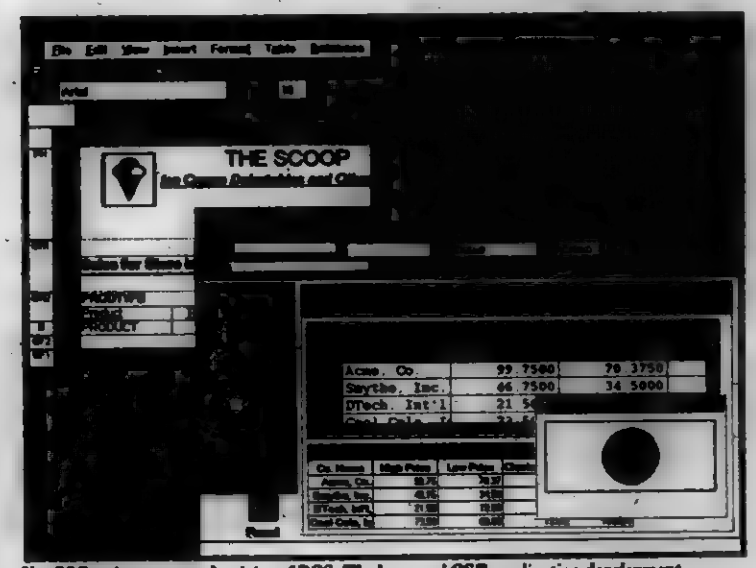

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Mark Eppley

Wires vs. waves

As an avid reader of 50 pounds of computer industry trade publications each week, I can't help but notice the media's cyclical pattern of devoting reams of column inches to the latest megatrend, such as the "year of the LAN" or the "year of the laptop."

Now it seems they have discovered radio-based data communications.

The "year" is now one of wireless communications — a technology sometimes billed as a connectivity panacea. Indeed, wireless certainly has its place; it is unlikely that any of us involved in computing will escape its effect during the next decade.

But users intrigued by the freedom wireless promises might want to examine closely the response time trade-off of today's products. Wireless technologies in their current form pose limitations for certain applications. If you support users who are doing any remote computing, you probably know these people have little tolerance for inferior functionality or performance compared with what they get when wired to the corporate internetwork.

The reality is that users with a direct 3270 connection to a host or running a 16M bit/sec. Ethernet network link achieve much greater performance than remote users connected over a radio-based packet network. The first reason is simply raw throughput disparities between today's wired and unwired worlds.

For example, the 1.2M bit/sec. throughput of a wired IBM 3270 terminal-to-host connection roughly compares with the 2.4K and 4K bit/sec. speeds of the Ardis and RAM Mobile Data packet data networks, respectively.

In addition, the architecture of the application will often determine if it is a viable candidate for living a wireless life. For instance, most terminal or client/server applications require a circuit-switched, real-time connection that a terrestrial network or modem transport provides. Unless an acceptable emulation scheme is provided, a wireless packet-based data transport would not be suitable because of bandwidth limitations.

In the data-over-cellular world (for which standards are still gelling), data traffic will take a back seat to voice by running in the "free space" when no voice is being sent. This, again, compounds bandwidth issues.

Radio network communications for these real-time applications could be compared with someone trying to have an urgent phone conversation with a person who doesn't own a phone and relies on his phone-equipped neighbor to shout his messages over the backyard fence. Not particularly efficient.

Wireless delays

Basic multiplication tables show us that a client/server application having a one-second response time for updating display information on a wired NetWare/Ethernet node would experience a 40 to 90 times greater delay over some vendors' wireless LAN connection.

It is doubtful, then, that a user accustomed to one-second response times would use the same application over a wireless node, if given a choice.

On the other hand, a short "bursty" application such as E-mail is very suitable to radio packet technology because it requires little bandwidth and works well in batch mode.

All of us will be doing some sort of "surfing" on the airwaves of the future. So it's not too early to start thinking about which application surfboards we need to build or modify to be able to ride the waves.

Eppley is the founder and CEO of Bothell, Wash.-based Traveling Software, maker of the LapLink portable communications product family.

Wireless benefits seen in cellular/digital link

By Ellis Booker

The first customer trial of a Cellular Digital Packet Data (CDPD) network will swing into operation later this year in Chicago.

The test is being conducted by Ameritech Corp. with an eye toward commercial service in Ameritech's multistate cellular region by the first half of 1994.

There are now more than 10,000 cellular radio "cell sites" in the U.S., and cellular carriers are keenly interested in leveraging this infrastructure for wireless data services. According to market research firm Booz Allen & Hamilton, Inc., there will be more than 13 million users of wireless data services by the year 2000.

The test will use IBM's CellularPlan II "overlay" technology for sending packetized data across idle voice channels on a cellular radio network.

Ameritech last week said it planned to examine a number of applications, including one- and two-way messaging, broadcast messaging to all receivers in a particular region or cell and multiple broadcast to receivers in numerous locations.

Derek Podobas, assistant director of mobile data at Ameritech's cellular division in Hoffman Estates, Ill., said the trial will likely involve four or five companies and 2,000 users.

While Ameritech's plans are emerging first, sources said other carriers in the cellular consortium will announce CDPD services shortly. Just last week, in fact, the leader of the cellular consortium, McCaw Cellular Communications, Inc., announced the formation of a wireless data division to support and promote CDPD networks.

Still, some analysts doubt whether the CDPD scheme will satisfy user requirements for wireless, on-the-go computing. Specifically, they question whether CDPD will be able to provide its promised 19.2K bit/sec. speeds.

"The effective speed you get on a wireless packet data network is not the same as you get on a circuit-switched, land-line network," said Ira Brodsky, president of Datacomm Research Co. in Wilmette, Ill. Brodsky estimated the actual throughput of CDPD networks will be more in the 3K to 4K bit/sec. range.

But Podobas noted that even in this case, CDPD networks will offer a data transmission capability two to four times greater than is possible today over typical cellular networks.

In addition, he said, a packet network offers other advantages, such as per-packet instead of per-minute pricing. Also, users would log onto the network once, instead of repeatedly dialing in, as with a circuit-switched network.

Electronic data interchange

EDI maturing as standards take hold

By Lynda Radosevich

Communication and software standards are helping reshape the once exclusively proprietary world of electronic data interchange (EDI). Several new standards-based products were announced at the EDI Conference in San Antonio, including the following.

▶ BT North America, Inc. in San Jose, Calif., unveiled X.400, fax, Systems Network Architecture (SNA) and Odette File Transfer Protocol (OFPT) options for its EDI Net value-added network.

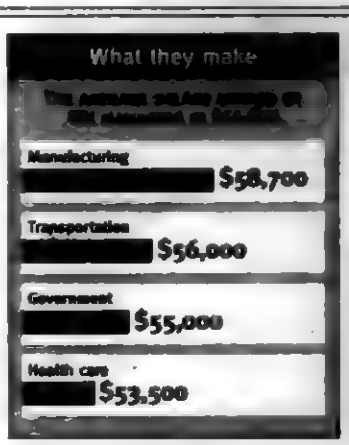
BT's EDI services, based on the 1984 X.400 international standard for messaging, will be available in June 1993, and the company said it would support the X.435 EDI "envelope" part of the X.400 standard by 1994.

Support for OFPT, which picks up dropped sessions in the middle of transmission, is available now. The EDI Net-to-fax feature, due in June, will let users send EDI forms to trading partners' faxes. The SNA support will allow IBM users to exchange messages with non-SNA users.

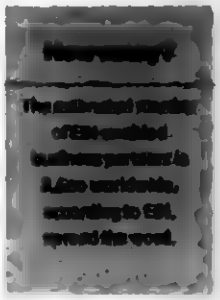
▶ To help users migrate EDI off the mainframe, Texas Instruments, Inc. in Dallas added desktop and Unix packages to its mainframe line of EDI software. The TI software is based on the ANSI X12 and the United Nations' Edifact standards for EDI transactions. The Microsoft Corp. Windows-based desktop software can work with MCI Communications Corp. messaging and enables both EDI and messaging. Both desktop and Unix versions are due in mid-1993.

▶ General Electric Information Services in Rockville, Md., rolled out a Unix-based EDI server that combines translation software and communications interfaces on Hewlett-Packard Co. HP 9000, IBM RISC System/6000, NCR Corp. 3000 series and Sun Microsystems, Inc. SPARCserver workstations. Also, new $495 PC software lets smaller trading partners receive and print EDI documents.

▶ Digital Equipment Corp. announced that its EDI products will support the X.435 standard later this year. DEC also announced five ready-to-go EDI applications for manufacturing, accounting and logistics and direct communication connections for its customers to connect with Ford Motor Co., Chrysler Corp., General Motors Co. and Kmart Corp.



Source: EDI News salary survey



▶ AT&T EasyLink Services and Isocor said customers will be able to send EDI documents using the X.435 communications protocol via Isocor's Isotrade 400 software and AT&T's EasyLink network by midyear.

Other announcements included:

▶ The membership of the Accredited Standards Committee voted to align the U.S. X12 EDI standard with the international Edifact EDI by 1997. The move will allow U.S. businesses to trade and compete domestically and internationally with EDI-enabled businesses, said Jeff Sturrock, chair of the XIZ committee.

▶ The Data Interchange Standards Association, Inc. (DISA) awarded Burton F. Millard, Procter & Gamble Co.'s manager of EDI applications, its EDI Professional Award for his work in establishing EDI standards.

▶ A special DISA award went posthumously to Michael W. Gerus for his crusading EDI work in the automobile manufacturing industry. Gerus died last year.

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Climbing on SNMP-2 bandwagon

CONTINUED FROM PAGE 79

as a proposed draft standard, approximately a year after it was first proposed to the Internet Engineering Task Force.

More recently, seven vendors demonstrated prototype SNMP Version 2 products at the International Symposium on Integrated Network Management last month.

Unfortunately, widespread commercial availability seems to be at least a year away.

At the demonstration, for example, only Sumitomo Electronics, a Fiber Distributed Data Interface vendor, had committed to providing SNMP Version 2-based end-user products within a specific time frame.

Migration questions

Even when products start appearing, migration questions may hold some users back from immediate implementation.

"It would be nice to start with SNMP-2" rather than implement the original SNMP and then have to migrate, Simon said. Travelers plans to begin implementing the network management standard in conjunction with the rollout of its corporatewide router backbone, which is still in the product selection stage, he added. "It would be nice to start with SNMP-2," Simon said.

The new version provides several features that Travelers wants in its internetwork management system. One is secured communications between management systems and managed network devices; another is the ability of the central system to collect multiple pieces of information from managed devices in one gulp.

"If you are managing a lot of resources" using the older SNMP, collecting the necessary information "would take a lot of frames and a lot of network overhead," Simon said.

For companies that already have extensive SNMP installations, however, migrating to the new version may not be worth the bother. At Salomon Brothers, Inc., for example, "We already have our value-added products that are based on SNMP; moving to SNMP-2 means undoing some of the stuff we did," said Sam Malek, manager of technology support.

"Still, it would be nice to have a good crystal ball to see what things will be like in a couple of years," he added.

Vendors cited several potential strategies for easing users' migration woes. A likely tack will be for network management platforms such as HP's OpenView to support both SNMP and SNMP Version 2. This will enable users to take their time with the migration of SNMP agents that sit on network devices and systems and report key information to the management system. However, a mixed SNMP and SNMP Version 2 management system may not be so easy to administer, Simon said. "The trick for the network manager is keeping track of which device uses which protocol."

Most SNMP systems have discovery programs that automatically figure out what devices are on the network and what their configurations are. It would be useful if updated discovery systems could automatically figure out whether a device supports SNMP or SNMP-2, Simon said; otherwise, performing a common network management function such as collecting traffic data from a router would involve "negotiating" to find out whether the device supports the more sophisticated SNMP-2 features such as bulk data collection.

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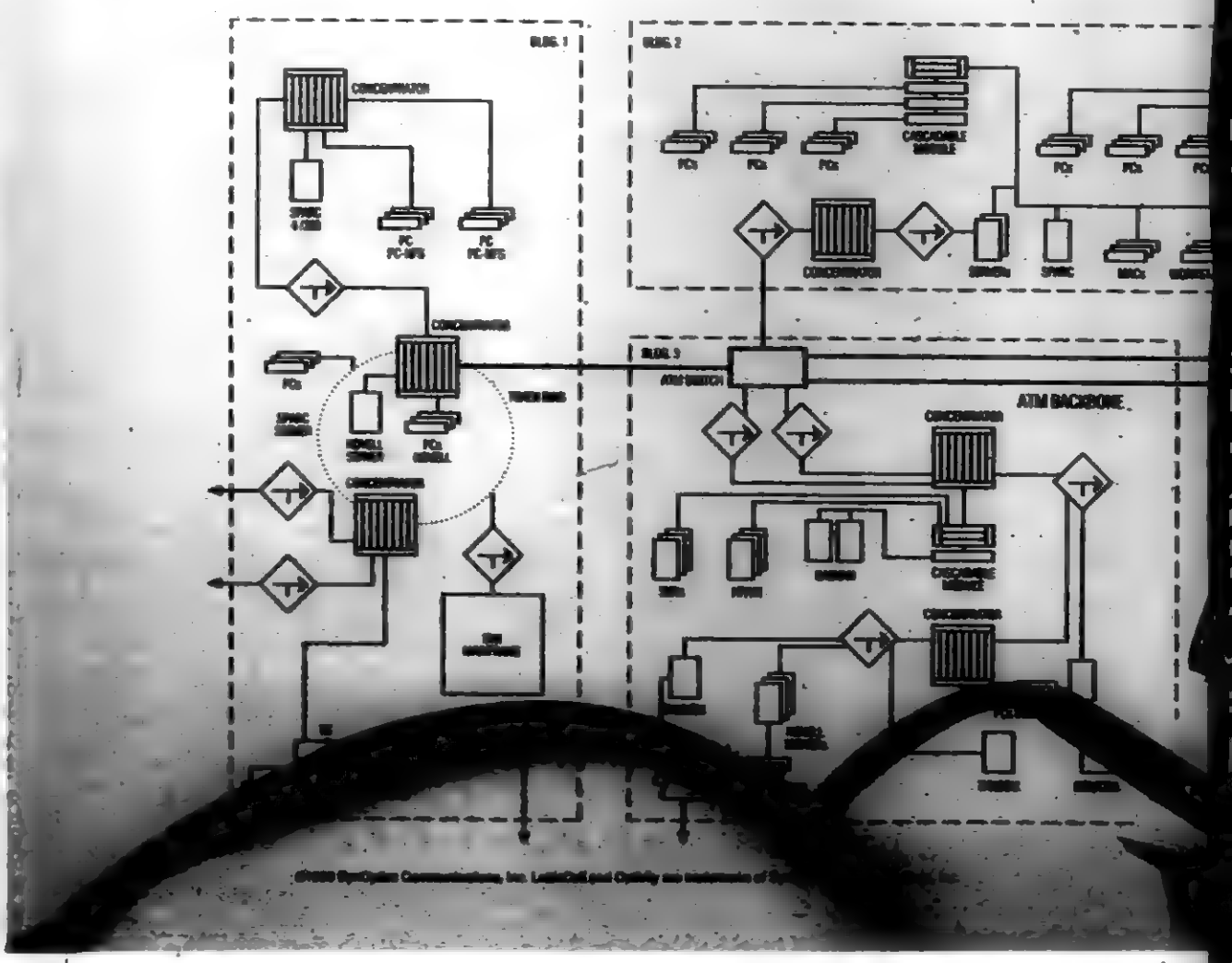

SNMP management of SNA in the offing

By Elisabeth Horwitt

It is likely to be about a year before vendor working groups come up with the official standard for managing IBM Systems Network Architecture (SNA) devices via Simple Network Management Protocol (SNMP). Meanwhile, however, vendors are beginning to come up with their own prestandard products, targeting users who want to view their SNA and Transmission Control Protocol/Internet Protocol internetworking installations from the same management console.

A major move in that direction is Cabletron Systems, Inc.'s Spectrum/BlueVision.

The product is said to allow Cabletron's SNMP-based system, Spectrum, to exchange key management data with an IBM NetView host [CW, April 26]. It is due out this summer.

Cabletron has already provided some integration of internetworking and SNA through a joint development agreement with Irvine, Calif.-based Sync Research, Inc. The two companies have developed an intelligent card version of SNAC, which converts IBM Synchronous Data Link Control (SDLC) transmissions so that they can run on a local-area network or a LAN-to-LAN connection.

The card sits on Cabletron hubs, doing away with the need to have a separate box to perform the conversion, the vendors said. Announced last fall, the card began shipping earlier this year. In addition, Spectrum can manage the card as part of the hub, Cabletron said.

In sync with SNAC

Meanwhile, Sync Research plans next fall to deliver software that will enable any SNMP-compatible system to manage its SNAC line of SDLC-to-Logical Link Control converters. The software will include a management information base that sits on an SNMP system and allows it to check the status of devices that a SNAC is connecting to a LAN.

The SNMP system will also be able to check the status of the lines between a SNAC-equipped LAN and an IBM host, a Sync Research spokesman said. The software will be tailored to the type of connection — X.25, SDLC/leased line or frame relay, he added.

Sync's chief rival, Raleigh, N.C.-based Netlink, Inc., hopes to deliver by June a similar capability for its own SDLC-Link Server family of products, a company spokesman said.

The product will satisfy the needs of users who want to extend SNMP management of interconnected LANs all the way to Netlink devices as well as to the IBM terminals and controllers they link to the LAN, according to the Netlink spokesman.

Both Sync Research and Netlink currently provide similar capabilities for managing their devices via IBM's NetView. Both companies are participating in the Internet Engineering Task Force working group to define a standardized way of managing such devices from SNMP.

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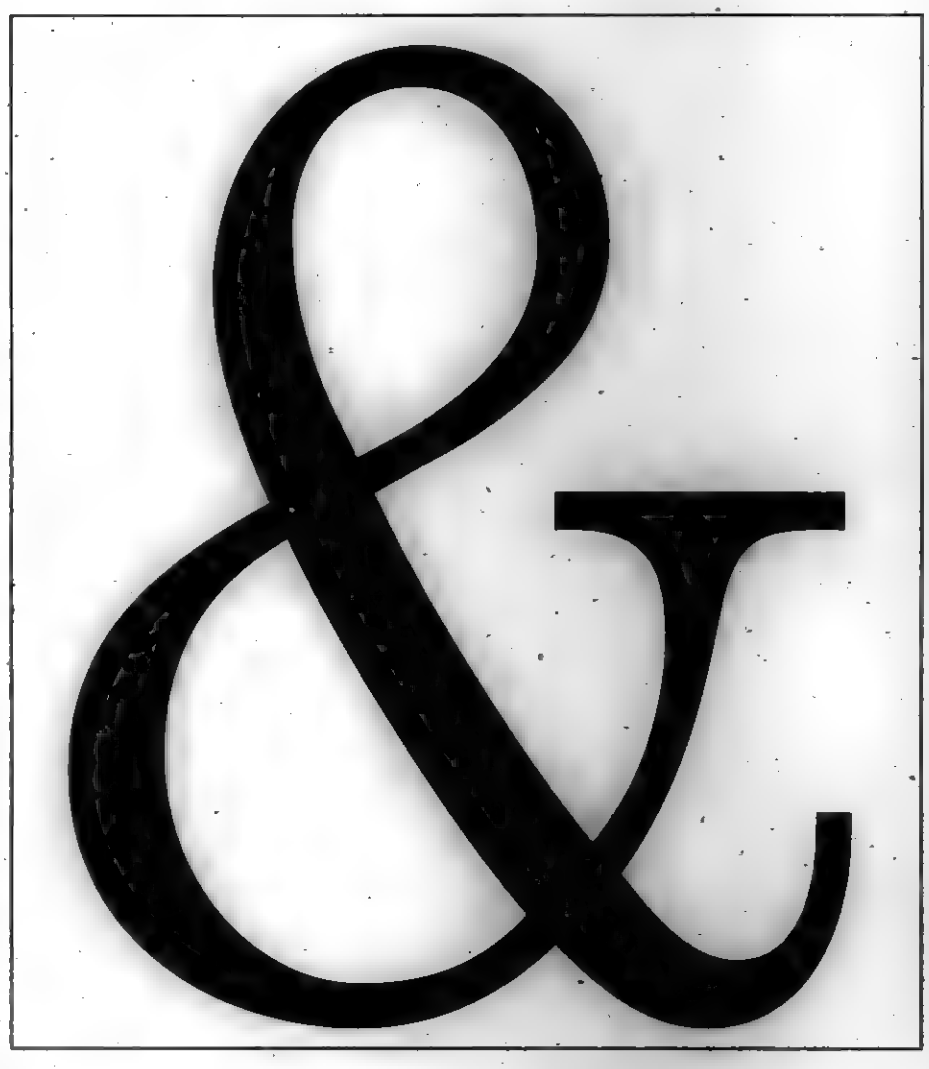

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HDS users ponder plans for Unix server, host links

By Jean S. Bozman
SANTA CLARA, CALIF.

Hitachi Data Systems Corp. (HDS) users are solidly in the IBM-compatible mainframe camp, but the mainframe maker's recent announcement that it would support OSF/1 Unix got users' attention.

The Osiris Super Server, which includes Hitachi America Ltd.'s OSF/1 software and a network coprocessor to link mainframes with remote Unix local-area networks, was announced April 6 [CW, April 12].

MIGRATION TO OPEN SYSTEMS

Users said they have no immediate plans to use Osiris, but many are already considering ways to connect mainframes and Unix LANs.

Under consideration

The state of Wisconsin's Info-Tech data center in Madison has two big mainframes, an Amdahl Corp. 5995M-4550 and an HDS GX 8320 three-processor machine. Planners there have decided to install broad-based Transmission Control Protocol/Internet Protocol and Ethernet networks to support statewide client/server applications.

The new HDS Osiris software would fit into Info-Tech's blended mainframe/Unix network, but no decision to adopt Osiris has been made. "It certainly is being considered," said Neal Steinhoff, administrator of information technology services at Info-Tech. "However, we're still trying to figure out what our enterprise direction on open systems should be."

Clemson University in Clemson, S.C., has tried Osiris under a beta-test program. HDS' HI-OSF/1-M software was installed first, followed by Sun Microsystems, Inc.'s Scalable Processor Architecture-based network coprocessor in late 1992. Osiris was tried as a way to bridge the connectivity gap between Clemson's 2-year-old HDS EX 80 and a number of Sun and other Unix machines on campus.

The shakedown run for Osiris was done off-line, but the promise of on-line interaction between mainframes and Unix networks is still there. "We're moving more and more to open systems, but we have a huge suite of programs that run on the mainframe," explained Chris Duckenfield, vice provost for computing. "We don't see any chance of offloading all that work off the mainframe for the next five to 10 years."

But Duckenfield said the pricing of HDS' Unix solution is still a concern. "The economics of it are still unclear."

Another HDS user said the Unix software is appealing, but it does not answer one motive for moving to Unix: saving money through downsizing. "We're already seeing the economic benefits of shutting one of our mainframes down," said David Okimura, project manager at Associated Grocers, Inc. in Seattle. The $1.2 billion cooperative is leasing two aging HDS mainframes but turned one off in June when application development moved to PCs.

Pricing options

Osiris carries two price tags: The OSF/1 software ranges from approximately $2,500 to $25,000, depending on mainframe size, while the network coprocessor costs $150,000. Both products are available immediately. A hierarchical storage manager is set to ship in the fourth quarter, and support for an Oracle Corp. Oracle 7 database is expected in early 1994.

The impact of pricing is relative, some analysts noted. "It's an expensive solution to a non-HDS customer, but it's not a bad incremental cost if you already have Hitachi systems," said Jim Cassel, vice president and director of Gartner Group, Inc.'s Large Computer Strategies service. Cassel said the OSF/1 software supports symmetrical multiprocessing, making it a good Unix solution for mainframes.

Another analyst said HDS is moving too slowly into the Unix market, where sales growth is explosive. "They are moving so cautiously that, by the time they get this whole project out, they may have missed the ferry," said Marc Butlein, chairman of Meta Group, Inc. in Westport, Conn. HDS' Unix solution should have been more comprehensive from the start, including several Unix software tools, Butlein said.

Unix

Stratus prepares next step into open systems

By Melinda-Carol Ballou

For Stratus Computer, Inc., 1993 is the time to focus on and ship fault-tolerant software and middleware.

Last year, Stratus released its high-end Unix systems, and next year the company is slated to ship its line of platforms based on Hewlett-Packard Co.'s Precision Architecture-RISC chip.

While the overwhelming majority of Stratus' commercial customers still run on Stratus' proprietary VOS-based systems, many are now considering the move to Unix, according to John Jones, analyst at the San Francisco office of Salomon Brothers, Inc. Users interviewed recently said they were satisfied with the support and transition path provided by the company and look forward to the release of middleware for fault-tolerant Unix.

"Everything's running VOS right now, but somewhere down the line we will probably have some activities with Unix and connections with Novell for file-server activity over Ethernet," said Jim Fraser, manager of the MIS division of telecommunications and data processing at the Houston Department of Aviation.

Focus on Unix

A new version of Stratus' FTX Unix operating system, previously delayed but now expected to ship within the next two months, will enable the company to better target the high-availability Unix market, company officials said. Also slated for release later this year is middleware support for Transarc Corp.'s Encina transaction processing monitor, Novell, Inc.'s NetWare and the Open Software Foundation's Distributed Computing Environment.

Changes in FTX Release 2.2, which officials said will make it "equivalent in functionality to VOS," include symmetric multiprocessing and a rewrite of the virtual memory manager to eliminate Unix "panics"; full support of remote service network; a "powerfail" ride-through capability so that systems will stay operational after a power failure to enable an orderly shutdown; and the ability to reconfigure the system on-line for planned downtime, according to Jim Holley, director of product marketing at Stratus.

"We also increased the granularity of our locking mechanisms to address the issue of multiple processors accessing

Stratus, page 99

Holiday Inn won't let go of its big iron – yet

By Rosemary Cafasso
ATLANTA

Holiday Inn Worldwide's Americas Division is taking the first steps into client/server computing and is finding that it will be later rather than sooner before it reaps any big benefits.

The company, which manages 100 hotels in North America (the other 1,500 Holiday Inn facilities are franchise operations), is a long-time Dun & Bradstreet Software shop, running several financial applications on an IBM mainframe. In 1992, it licensed D&B Software's SmartStream client/server software and launched a pilot project in October.

Holiday Inn

The pilot, a profit-and-loss analysis application, was rolled out to one 22-hotel Holiday Inn region. The graphical front end was a big improvement from the host-based applications, and SmartStream took care of the networking and data access hassles of downloading host data to the new application.

But today "we are basically on hold," said David Peach, vice president of finance.

Not that the pilot did not go well or that Holiday Inn has received anything but "exceptional" support from D&B Software, according to Peach. The problem lies with a feature not yet developed by D&B Software to synchronize account codes in the SmartStream profit-and-loss application with account codes on the host.

Peach said this missing piece would have been a nonissue if the application were static. But, as work increased on the pilot, Peach's team realized that account codes were frequently being added to the mainframe database, and these changes were not being reflected in the downloads to the SmartStream platform.

To accommodate the changes, the group set up a process to manually track account code changes and load them into SmartStream. But Peach said the team soon realized this time-consuming task was starting to offset the bene-

Holiday Inn, page 96

MTI improves access to high-performance SCSI

By Melinda-Carol Ballou

Micro Technology, Inc. (MTI) is shipping a new series of Stingray storage servers targeting I/O-intensive, mission-critical applications in Digital Equipment Corp. environments. Dubbed Stingray Gemini, the product offers the hot-swapping, dual porting and auto failover capabilities previously available with Stingray.

It also provides double the performance, twice the number of ports and twice the number of DEC's Computer Interconnect attachments and devices supported by Stingray.

Gemini delivers up to 1,500 I/Os per second balanced across two Computer Interconnect-based servers and six high-speed Small Computer Systems Interface (SCSI) array controllers. It optimizes disk I/O via overlapped seeks and seek reordering, features that are not available with other disk subsystems. MTI's disk caching software is also included with Gemini.

Each processor contained in Stingray Gemini is an independent storage server that allows I/O to be segmented for I/O-intensive applications where the heavy read/write load is spread among two Stingray Gemini server engines and six SCSI interfaces, company officials said.

"SCSI is a single-bus device with one common bus structure. With Stingray Gemini, we created a dual-channel interface to bring two independent SCSI I/O channels to each drive," said Tom Raimondi, vice president of marketing at MTI. He added that DEC, in comparison, offers two servers accessing one SCSI device.

Gemini Stingray is shipping and is priced starting at $50,000 with 14 ports.

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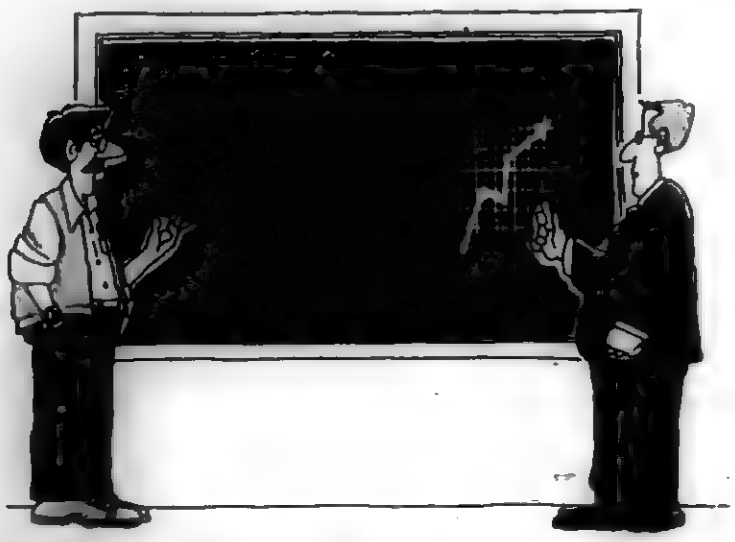

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Stratus prepares for open systems

CONTINUED FROM PAGE 89

a similar piece of the operating system," Holley said. "We're excited about Release 2.2 because the demand for fault-tolerant Unix is great not just from telecom and typical markets, but we're seeing growing interest in the commercial sector as well."

Some users said they have received good support from Stratus on the proprietary side and are considering making the transition to Unix.

"I've been very satisfied with their support," said John Lane, chief information officer at the Securities Exchange Commission (SEC) in Washington, D.C.

Although much of the SEC's contact with Stratus support is through a systems integrator, Stratus officials became directly involved last year when a power spike brought down the SEC's system.

"They did a terrific job working in their labs and actually identified the problem—which had nothing to do with their system—and rectified it," Lane said.

He added that the SEC is examining the possibility of moving from VOS-based Stratus systems to Unix for its Electronic Data Gathering and Retrieval filing system.

"The advantage of staying with VOS means we can [upgrade] at lesser cost. The trade-off on the Unix side is higher up-front costs initially but the ability to modularize better and then change pieces of the system [as we need to]," Lane said.

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Multimedia to save hotel time, money

By Michael Fitzgerald
ATLANTA

Holiday Inn Worldwide, which laid claim to developing the first automated hotel reservation system, said it believes it has broken new ground for its industry by using multimedia technology for staff training.

The 1,700-hotel chain said its efforts probably make it the largest single corporate user of multimedia technology and could save it millions of dollars.

"We have already seen our [system] implementation team cut its time from 11 days to six days," said Jewell DeWeese, vice president of franchise system education and training at Holiday Inn Worldwide, which is a Bass PLC subsidiary.

Holiday Inn is using its new multimedia capabilities in select hotels to help install a new property management system designed in conjunction with Encore Systems, Inc.

Typically, front-desk employees use a mouse to click on various features on a screen, such as a computer or customer, and the selected item "talks" to the user. Or, a manager might have a screen where employees, for instance, present various concerns that must be addressed.

The multimedia portions of Holiday Inn's new systems were developed by Atlanta-based FloydDesign, and the first CD-ROM training module, devoted to rate and inventory management, was built by MicroMentor, Inc. in Cambridge, Mass.

John Lipscomb, manager of research and development for multimedia at Holiday Inn, said each hotel receives one IBM Personal System/2 Model 57SLC Ultimedia box with IBM's OS/2 with Multimedia Extensions installed.

Holiday Inn said it intends to have 500 hotels using multimedia by Oct. 1 this year and will complete the rollout by October 1994.

The Encore system, which will be installed in all Holiday Inn locations by July, requires 12 hours of training, and a new Holiday Inn Reservation Optimization system requires three hours.

The impetus for the training effort came from turnover rates, according to the company.

"Within six months [of opening a new franchise], you have substantial staff turnover," DeWeese said. "We thought multimedia gave us a way to sustain the skill levels of the hotel staff."

Holiday Inn

CONTINUED FROM PAGE 89

fits the company would gain from the client/server application.

Currently, Peach's team is working with D&B Software to come up with a fix to "bolt on" the SmartStream application so code changes from the host will be automatically reflected in the server environment.

Problem solving

Bobby Cameron, D&B Software's director of product management for decision-support applications, said Holiday Inn has run into "a classic distributed data problem. We are definitely working on that problem."

Cameron said SmartStream Release 1.0, which Holiday Inn licensed, was intended to deliver data to the client/server world. D&B Software is aiming to provide a synchronization function in Release 2, expected this summer.

Until Holiday Inn gets its fix, it will not roll out the software to its other regions, Peach said.

So far, Holiday Inn has invested approximately $200,000 in new hardware and software for the project. Peach said the company is still committed to the promises of client/server but is less starry-eyed than before.

Peach said he believes one source of difficulty comes from expectations. People expect client/server applications to be as stable as mainframe programs and as user-friendly as desktop packages, he said.

They may forget that client/server is still very new technology, he added.

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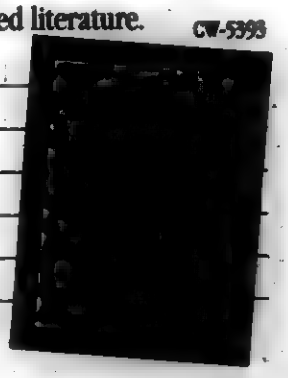

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Eatery swaps dollar-hungry mainframe for lean HP mini

By Mark Halper
SAN DIEGO

Ask steakhouse chain operator The Paragon Restaurant Group, Inc. where the beef is, and the answer could be "anywhere but in the computer room."

After spending years on a meaty IBM 3090 run by outsourcer Litton Computer Services, the operator of 76 Hungry Hunter and Mountain Jack's steak restaurants now conducts daily computing business on a Hewlett-Packard Co. Unix minicomputer, the HP 9000 Model 845.

And after a grisly cutover, the company is now seeing dividends. Paragon is saving about $700,000 a year on processing fees, information systems director Kevin Mead said.

Paragon's decision stemmed from a change in business operations some 2½ years ago, when the company established three subsidiaries that corresponded to what were then its three restaurant themes: steakhouses, seafood and Mexican.

With each of the three operating independently, the need for big iron processing disappeared. "No one of the three was large enough to support a mainframe," said Mead, noting that Paragon has since sold its seafood and Mexican restaurants and has itself been purchased by Japan's Kyotaru International.

In making the computing switch, Paragon reviewed three suppliers: IBM for its RISC System/6000, Digital Equipment Corp. for its VAX line and HP.

Mead said the company eliminated DEC "because we really didn't know them that well," and while the RS/6000 could have met the firm's needs, "We would have been at the top of [IBM's] line with no growth path."

Paragon's Kevin Mead: *Downsizing led to beefy savings*

While the HP system works well today, the switch from the mainframe was not exactly as easy as slicing filet mignon.

Converting a critical mainframe-based cash and sales program that tracks coupons and gift certificates was going to be a monstrous project because the program was based on CICS Cobol, "an environment that does not exist in Unix," Mead said. Rewriting the code would have cost $300,000 to $400,000.

So the company used a CICS Cobol emulator supplied by VI Systems, Inc. in Dallas, at about one-tenth the cost of a conversion, Mead said.

"The project basically failed at first," Mead said. After five months of difficulties, "we were back to square one looking at a conversion," Mead said. VI Systems eventually addressed the problems.

Conversion of a Management Science America, Inc. accounting package to a Stevenson Financial Service, Inc. program was less problematic. The biggest issue surrounding it, he said, was training end users in the new program.

Another conversion — of a point-of-sale system supported by outsourcer Martin Marietta Corp. — entailed recompiling Cobol code. It proceeded relatively error-free, Mead said.

Paragon has upgraded the HP 9000 once, from a Model 835 to a Model 845, as it expanded from 53 steakhouses to its present 76. Mead said Unix has not been as difficult to learn as some people think it is, but he conceded that while it did not take long to master the fundamentals, "we are still learning today."

Mead's recollection of long nights during the cutover process prompted the question of whether he would do anything differently a second time around. His answer: He would convert each package individually, not all at once.

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Utilities

BMC Software, Inc. has announced Version 3.4 of Copy Plus, a copy utility designed for IBM's DB2 database management system.

Version 3.4 now copies the DB2 Catalog and Directory table spaces and includes a free space-consolidation option that enhances data compression.

CPU-level prices start at $12,000 for a perpetual license.

▶ *BMC Software*
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Kisco Information Systems has introduced the Object Compression Manager.

The product is a utility designed to activate and maintain object compression on IBM's Application System/400. According to the company, object compression can significantly reduce the amount of disk space needed to help text panels, menus, display files, printer files and store programs. A schedule is created for regular recompression of decompressed objects, keeping disk savings from compression.

A onetime per-machine license fee costs $300.

▶ *Kisco Information Systems*
Suite 122
120 Beverly St.
Mt. Kisco, N.Y. 10549
(914) 241-7232

SofTouch Systems, Inc. has announced Version 3 of CICS Windows, a CICS Multi-Sessions Manager.

Features include on-line customization, concurrent window sessions, CICS release support and dynamic hot keys, among others. A message broadcasting feature enables users to send messages to any other user or group.

Without reprogramming, the Help-windows feature allows users to add Common User Access-compliant on-line Help to any CICS application. The menu generation feature permits users to create menus that automatically pop up when specific transactions end or the screen is cleared, the company reported.

Prices start at $6,300 for a permanent license on a single CPU running DOS/VSE and $10,500 on an MVS machine.

▶ *SofTouch Systems*
Suite 600
1300 S. Meridian
Oklahoma City, Okla. 73108
(405) 947-8080

Advanced Software Products Group, Inc. has introduced Version 5.0 of Spacecalc.

The product is an interactive direct-access storage device and VSAM Modelling Utility. According to the company, Spacecalc Version 5.0 was created to eliminate the guesswork in calculating allocation requirements by hand.

Prices range from $8,900 to $11,900.

▶ *Advanced Software Products Group*
595 6th Ave. South
Naples, Fla. 33940
(813) 649-1542

Data storage

IPL Systems, Inc. has introduced the 7737 Disk Array, an IBM 9337-compatible subsystem for IBM Application System/400 users.

The product is said to be the first AS/400 subsystem to offer users a choice of redundant arrays of inexpensive disks implementation in one unit.

By pushing a button on the front display panel, users can pick which IBM 9337 mode they want to emulate, along with the protection level. The product can be configured for full compatibility with IBM Models 010, 020, 110 and 120, the company said.

A fully configured subsystem costs $42,000.

▶ *IPL Systems*
60 Hickory Drive
Waltham, Mass. 02154
(617) 890-6630

Baber Information Services, Inc. has announced a modular package that consists of four utilities for IBM's Application System/400 Disk Management.

The company said the Disk Saver helps maintain storage requirements at a minimum by finding and managing unnecessary space allocated by the user application or the operating system.

The Disk Analyzer enables users to optionally archive objects to tape by analyzing objects that are on the system and determining which ones are obsolete. The source file is compressed by up to 80% with the Source Manager.

The Backup Manager automates backup procedures and records where each object or library is stored.

Prices range from $1,500 to $4,800.

▶ *Baber Information Services*
4417 N. O'Connor Road
Irving, Texas 75062
(214) 650-0606

Application packages

QCC, Inc. has announced the Credit Receivables and Deduction (Credit) Management System.

The product is used as a front-end application solution that operates on all IBM Application System/400 models. Earned and unearned deductions can be tracked, controlled and monitored. Credit assists in resolving customer claims, enhances control of claimed deductions and improves the collection process, the company said.

Prices range from $7,500 to $35,000 per client license.

▶ *QCC*
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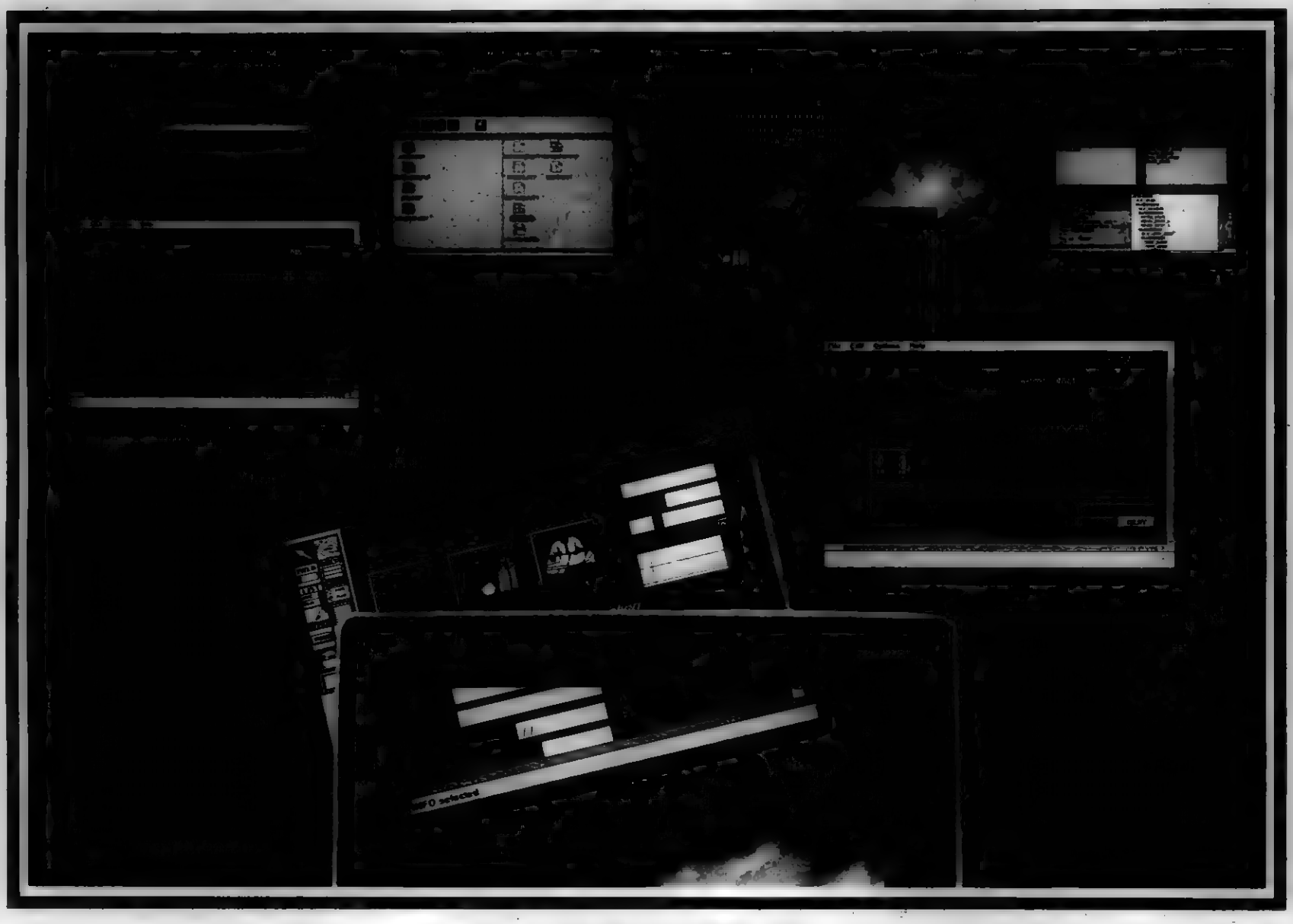

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Measurement programs need vision

By Garry Ray

Growing interest in software measurement did little to buffer underlying skepticism at the semiannual meeting of the International Function Point Users' Group earlier this month in New Orleans.

"Half of these people won't be here in two years" because their measurement programs will fizzle, Howard Rubin, a conference speaker, said of the event's 260 attendees. Rubin, a professor of computer science at Hunter College, explained that measurement programs must be "congruent with the goals of the organization" to be successful.

Because "most information technology groups can't even describe what value they add to the company," it is not surprising that they often cannot describe the benefits of a software measurement program, Rubin said.

Despite evidence that function point and other software measurement programs are gaining broad interest in development shops — International Function Point Users' Group rolls have grown by more than 100% per year since 1989 — common lore indicates that only one out of six measurement programs reaches the second-year mark.

Function point analysis provides techniques to count the number of software functions delivered to users of an application. The resulting tally of "function points" can then be used by development shops to track productivity, costs and efficiency. Function point programs are typically used with other "quality management" initiatives within a company. But the techniques can be useless if improperly implemented.

Software measurement experts said the high failure rate of metrics programs has a number of causes that can easily be avoided.

Heading the list of problems, they said, is that measurement enthusiasts rarely bother to sell the benefits of their programs to senior information systems or business management. "Measurement programs in shops without the support of the rest of the organization have failed," said Charles Douglis, president of Software Productivity Research, Inc., a measurement consultancy in Burlington, Mass.

Also doomed are programs that have no larger business goal, said Andy Belden, president of the Cincinnati-based International Function Point Users' Group. "People who say, 'We want to do function points' without a plan eventually crash," he said. "Then they ask, 'Why did we do it?' "

All the right stuff

But the high failure rate is balanced by programs that have been properly launched.

Mead Data Central, an information technology company in Dayton, Ohio, created a department specifically responsible for software measurement and metrics. Alec Johnson, manager of processes and metrics at the company, said his seven staff members have become part of the overall development process for Mead's 1,000 programmers. "You can't leave certain key phases of [Mead's] development methodology unless you have cooperated with my department," he said. The department participated in more than 200 software development projects during the last year, he said.

Such a mandate is unusual in development shops. But Johnson said proactive "marketing" of his department is another key success factor. "We have 'bicycle tours' where we go to other departments and explain what we do."

The department also publicizes its successes through monthly presentations to development managers (Johnson calls them "productivity flashes") and "a lot of work with individuals" in other departments, he said. As the department refined its approach to analysis, marketing and presentation, Johnson found that "senior and executive management's appetite for this material is voracious."

In the end, that meets Rubin's key determinant of the success or failure of a measurement program: "The first criterion is that metrics are used by management to make decisions," Rubin said.

Hurricane Andrew's aftermath

Miami paper gets Pulitzer thanks to stats analyses

By Gary H. Anthes
MIAMI

To the age-old criteria of tenacious reporting and agile writing, add information technology smarts to the list of skills helpful in landing a top prize in journalism.

According to Stephen K. Doig, research editor at the *Miami Herald*, computer-assisted statistical analyses were essential to the preparation of a package of stories on Hurricane Andrew that recently helped the newspaper win the Pulitzer Prize for public service.

Doig, a former reporter who traded his notebook for a computer terminal, used an IBM mainframe running software from SAS Institute, Inc. to sort through millions of records on property damage, property-tax assessments, building inspections and political contributions in South Florida.

The analyses turned up several "smoking guns," Doig said, and supplanted anecdotal evidence to reveal the devastating contribution to human misery made by a relaxation of building codes, shoddy construction and fraudulent inspections during the building boom of the 1980s.

Piece of the prize

When *Miami Herald* research editor Steve Doig has a question about SAS software, he often sends it to SAS-L, an Internet electronic-mail list of SAS users. Two weeks ago, he broadcasted a message to SAS-L about the newspaper's recent Pulitzer Prize: "I know I couldn't have pulled it off without all I have learned from the SAS-L folks in the past year or so. So, thanks for that help — you all can honestly say you earned a piece of a Pulitzer this year."

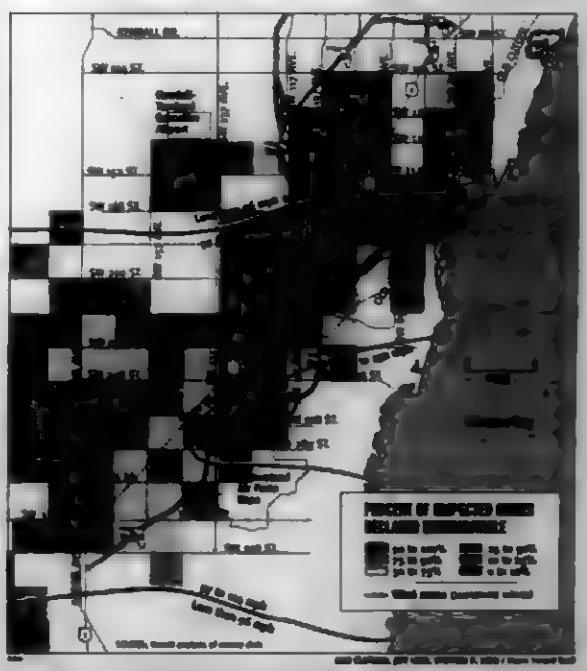
Doig combined a file of 60,000 post-hurricane damage reports with 100,000 property-tax records to discover whether the amount of damage a house sustained was linked to its value, size, construction materials, age and other variables.

"The only strong correlation was with the year built," Doig said. "The newer the house, the worse it tended to do."

Mapping it out

To help visualize the patterns, Doig produced maps from geographically coded SAS output using a PC running AtlasGIS, a geographical information system mapping package from Strategic Mapping, Inc. in San Jose, Calif.

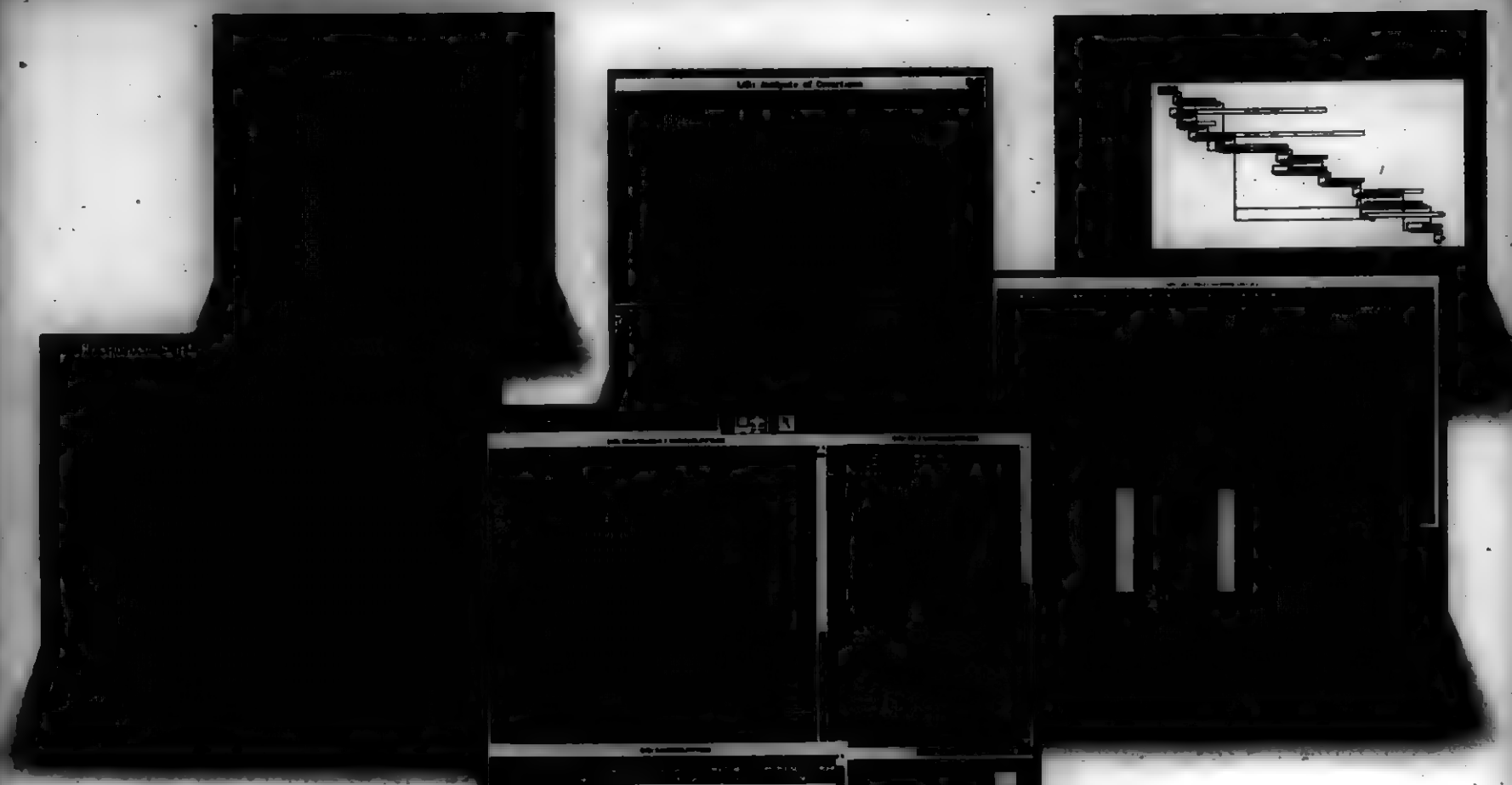
Armed with the computer output, reporters were able to show that a successive builder-urged relaxation in building codes — for example, allowing the use of roofing staples instead of nails — led to a 68% greater likelihood that houses built after 1980 would sustain more serious damage than those built earlier.



This computer-generated map, *which helped* The Miami Herald *win its Pulitzer Prize, shows the percentage of homes in South Dade declared uninhabitable after the hurricane*

The *Miami Herald* unearthed another contributor to the devastation caused by the hurricane. After loading 7 million home-construction inspection records from 35 magnetic tapes

Pulitzer, *page 101*



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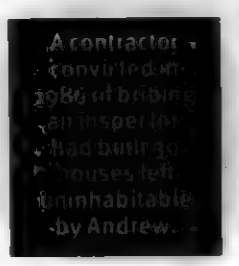
Pulitzer Prize

CONTINUED FROM PAGE 99

obtained from Dade County, statistical analyses turned up anomalies such as inspectors who reported having made as many as 80 inspections in a single day — about four times the maximum number thought feasible.



"There had been grand jury investigations done sort of anecdotally," Doig said. "An undercover agent would follow an inspector and find, for example, that while he was supposed to be inspecting, he was off bowling."

Computer analysis pinpointed other "anecdotes" used in the newspaper's coverage — for example, that a contractor convicted in 1986 of bribing an inspector to approve roofing jobs had built 30 houses left uninhabitable by Andrew.

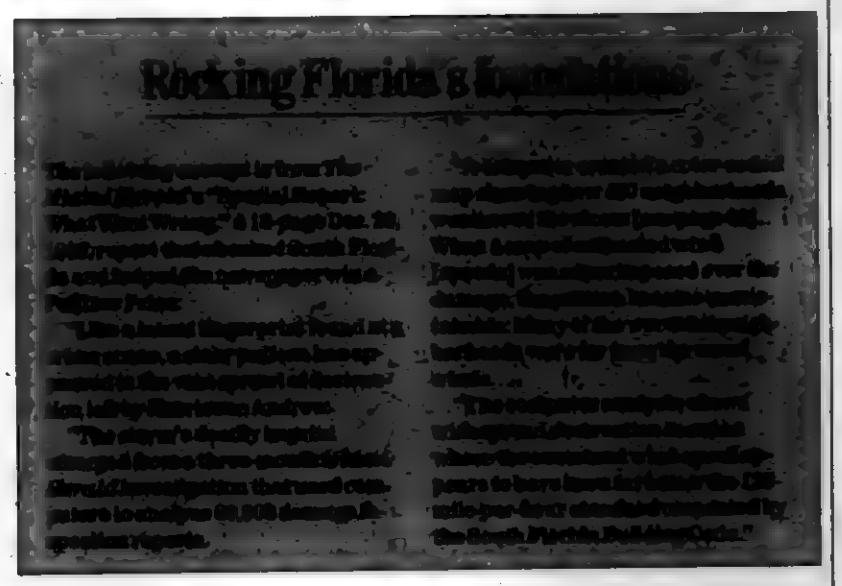
To support another computer-assisted analysis, the newspaper created a database by keying information about 17,200 local political contributions since 1980. That revealed a cozy relationship between building interests in Dade County and elected members of the county Metro Commission, which has final say on building code revisions.

"In 1986, when construction was booming, the building industry gave [Metro] at least one of every three campaign dollars," the paper reported in the story "Do builders' bucks buy political power?"

Doig said the newspaper's report is now paying dividends. "The construction code has been stiffened," he said. "A new code about to go into effect will address a number of the problems that led to the patterns we found."

Doig said there are about 30 newspapers in the U.S. able to do "database reporting" — inferring trends, patterns or other useful information from raw databases. But he cautioned against confusing high-technology tricks with old-fashioned journalism skills.

"When you use a computer like this, it doesn't tell you why," he said. "It just tells you what happened, and you still have to do traditional reporting to find out why that pattern was there."


Rocking Florida's foundations?

In Brief

TI to play Pipes

Texas Instruments, Inc.'s Information Technology Group and PeerLogic, Inc. have announced an agreement under which TI is purchasing a minority equity position in PeerLogic and will become a worldwide distributor of PeerLogic's Pipes. Pipes, a middleware product suite, is said to facilitate building multivendor distributed computing systems. TI will also incorporate Pipes in its computer-aided software engineering tool, Information Engineering Facility.

Powersoft building interface

Powersoft Corp., whose stock has soared up the charts since going public in early February, recently signed a joint marketing and development deal with Popkin Software Systems, Inc. in New York. The firms plan to build a Microsoft Corp. Windows interface between Popkin's System Architect front-end development tool and Powersoft's PowerBuilder generation product. The interface, SA/PowerBuilder Link, is due in the second quarter of this year; it will cost $1,995.

Tool for SPARCstations

Fremont, Calif.-based International Software Automation, Inc. recently introduced Panorama C++, a development tool for designing, generating, debugging and testing Unix applications. The $8,000 product, which is discounted to $2,800 through May 15, runs on Sun Microsystems, Inc.'s SPARCstations.

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- BIMECHO - CICS Screen Duplication and Demonstration Facility
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EcoTools expanded

Sybase, Informix RDBMS capabilities added

By Jean S. Bozman
CUPERTINO, CALIF.

EcoSystems Software, Inc. is set to announce this week that it will broaden the reach of its six-month-old EcoTools systems administration tools to Sybase, Inc. and Informix Software, Inc. relational databases. Previously, the EcoTools package, which began shipping last fall, only worked with Oracle Corp. relational databases.

EcoTools Version 2.0 is due to ship by year's end, the 2-year-old firm said. The firm's EcoSphere systems management software deploys software "agents" to check Unix operating system parameters and database performance [CW, Oct. 19, 1992]. The resulting status reports about I/O, memory use and response time are displayed to database administrators on a central console. The EcoTools package allows users to tune database performance based on a snapshot of their computer system's efficiency.

The new EcoTools package now supports the Open Software Foundation's Motif graphical user interface (GUI), and the management console can be hosted by Sun Microsystems, Inc. workstations, IBM RISC System/6000s or Hewlett-Packard Co. HP/UX workstations. Previously, the same tool set ran only on Sun workstations under Sun's OpenLook GUI.

Version 2.0 will also have a job-scheduling module, said EcoSystems Marketing Vice President John Howorth. Pricing for EcoTools begins at $6,000 for an eight-user system; additional modules are priced at $2,000 each.

Rare birds

EcoSystems is one of a handful of vendors that combine systems administration with database administration. Computer Associates International, Inc. sells the UniCenter open systems management product, and two small newcomers include Patrol Software, Inc. in Redwood City, Calif., and Open Vision Technologies, Inc. in Pleasanton, Calif.

"Open systems are getting so complex that users don't have a choice," said Rikki Kirzner, principal analyst at Dataquest, Inc. in San Jose, Calif. "They've got to manage this stuff."

[redacted]

Application development tools

Cascade Technologies, Inc. has enhanced Cascade Voice Tools, its OS/2-based application generator for interactive voice-response systems to support the Btrieve file format.

Off-the-shelf access support is provided to dBase, Fox, Btrieve, Clipper, ASCII and Oracle Corp.'s SQL files. According to the company, the Btrieve support enables users to work with familiar Btrieve syntax. Btrieve query results are either directly spoken to the caller, utilized within conditionals and calculations or kept in variables.

Prices for Cascade Voice Tools range from $2,000 to $10,000.

▶ *Cascade Technologies*
1430 Broadway
New York, N.Y. 10018
(212) 768-7380

Set Laboratories, Inc. has introduced Version 4.0 of UX-Metric for C, a measurement and analysis package.

New metrics, reports and a variable cross-reference feature have been added to this version. UX-Metric was designed to assist users in allocating software review, testing resources and examining trends in the code as it evolves, the company said.

A single-user license costs $525.

▶ *Set Laboratories*
26976 S. Highway 213
Molino, Ore. 97042
(503) 829-7123

National Information Systems, Inc. has announced Accent Sun Transition Pack (STP), an Xview and OpenLook Intrinsics Toolkit (OLIT)-to-Motif source code translator.

Accent STP was designed for users of Sun Microsystems, Inc. workstations who will need to support the Common Open Software Environment by converting their applications to the Open Software Foundation's Motif.

The product is said to translate 85% to 100% of the C application source code generated by Sun's DevGuide, OLIT and SunSoft's Xview where there are equivalent paradigms provided in Motif. Depending on the features used by the application, 100% of the source code can be converted, the company reported.

Accent STP costs $4,995 for the first node-locked user license on the network and $2,495 for each additional node-locked user license.

▶ *National Information Systems*
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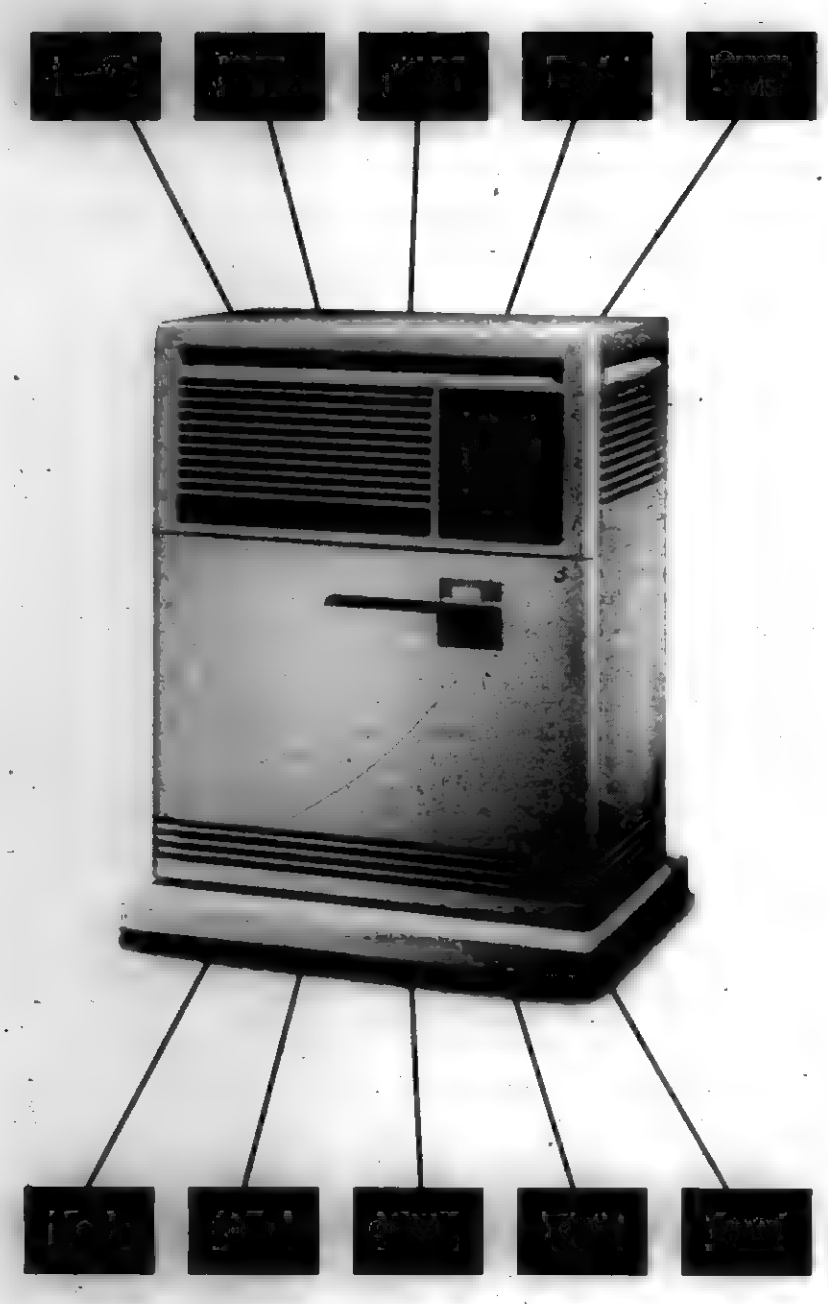

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Grow with the [information] flow

A crush of E-mail, on-line information services and mobile computers is forcing IS to find new ways to make data usable

▶ California State Department of Insurance's Ron Kuhnel: *'My office looks like a control center for NASA'*

By Jean S. Bozman

Information once flowed through fairly predictable channels: databases, departmental reports and accountants' spreadsheets. Such structured data could be easily indexed, retrieved or queried.

Now, a variety of alternate data pipelines — including electronic mail, mobile computers, groupware, voice mail and on-line information services — are making information systems managers' jobs more difficult by delivering new torrents of *unstructured* data to companies.

And some observers predict the surging data stream will only widen: Heavier traffic from portable office devices and high-bandwidth channels such as the Internet, Integrated Services Digital Network and multimedia are transmitting more real-time communications and video.

"We really are on the edge of tremendous change," says Arno Penzias, vice president of research at AT&T Bell Laboratories in Murray Hill, N.J., and a Nobel Prize laureate. According to Penzias, IS has a key but still unfulfilled role in the new information world.

"If everybody does their own thing, you lose all hope of corporate coherence," Penzias warns. While individuals need some amount of freedom, he says, "IS needs to add some value" in the form of uniform information exchange.

Too much information

Unfortunately, in many companies the ability to create unstructured data is far outstripping the ability to digest it. The result: IS groups increasingly find themselves in an awkward transitional phase in their role as corporate information custodians — and as professionals.

"I have information overload," says Ron Kuhnel, chief technologist at the California State Department of Insurance. "I have three phones on my desk, two computers and a pager. People joke that my office looks like a control center for NASA." Kuhnel carries a cellular telephone so he can receive calls outside the voice-mail system.

The basic technical problem is both simple and deceptively complex: It's almost impossible to prejudge the format of the data that comes from outside sources and arrives on the local-area network via modem. An outside source might be offered in ASCII characters, for example, which in-house systems might not support.

What's worse, there are few IS-managed communications pipelines that can easily link established systems with unstructured data obtained via PC from such emerging sources as commercial news services and stock-trading databases.

Plus, few software interfaces exist that can bridge the gap between in-house data formats and those used by outside data providers. And connecting voice mail and computer systems remains only a fond hope for at least the next three years.

It all adds up to one big, information-stuffed headache for end users and IS. Although many say they feel awash in undifferentiated data, IS managers are often unsure how — or even whether — to cope with the problem.

That's understandable: Most IS departments have their hands full maintaining existing systems while simultaneously tackling tough client/server and re-engineering projects. Often there's little time, money, energy or interest left for unstructured data.

As a result, attention to information overload issues in many companies is being deferred to

Information, *page 109*

Life is full of tough choices: A performance car vs. a practical car. A job that satisfies your pocketbook vs. one that satisfies your mind. A disk storage solution that offers speed vs. one that offers complete data availability. Well, the last choice just got easier to make. Because now there's the Symmetrix 5500 ICDA,™ from EMC.

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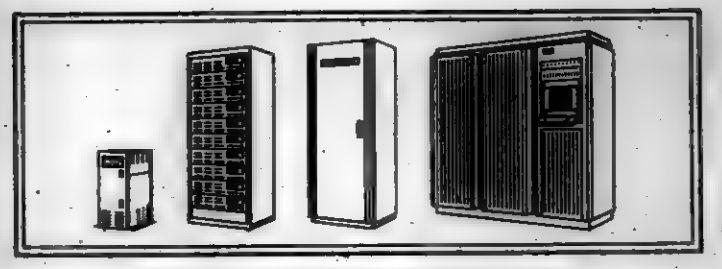

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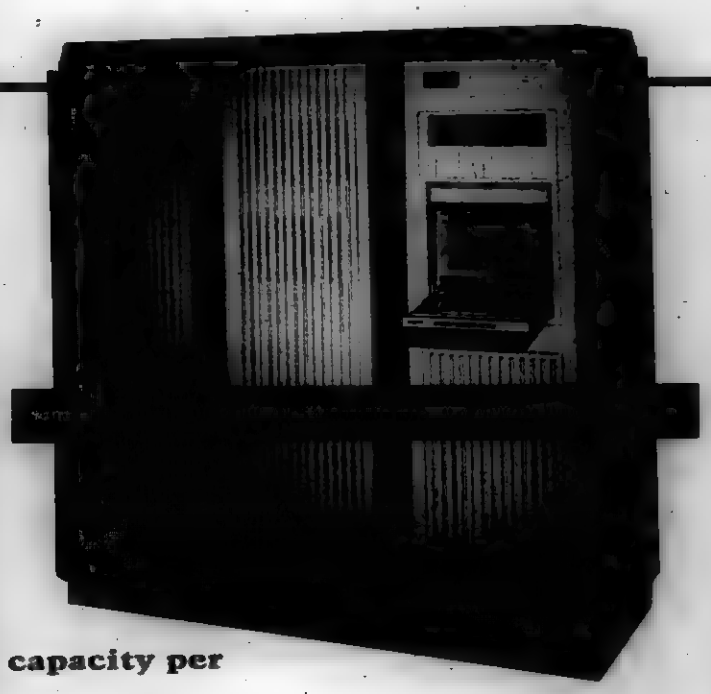

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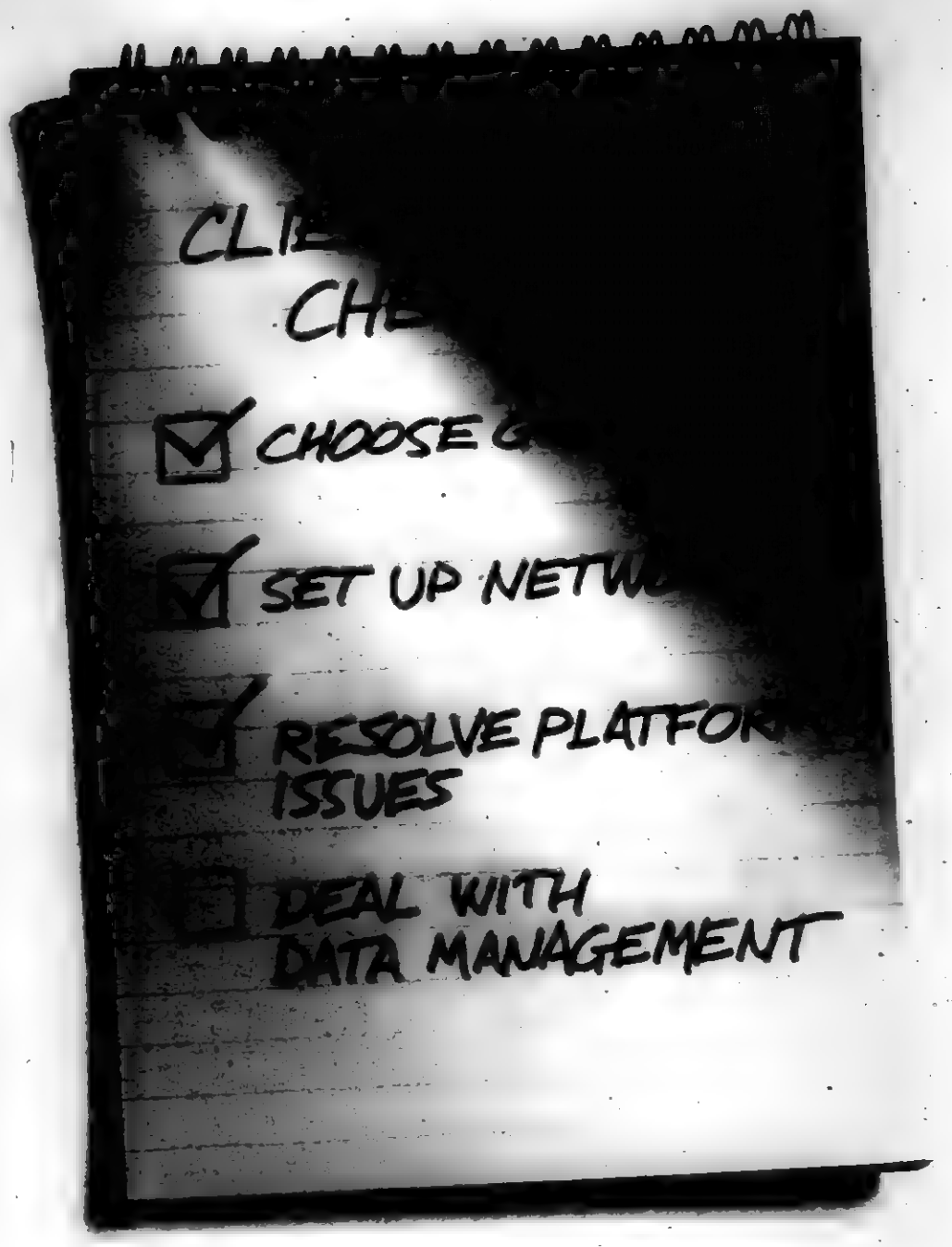

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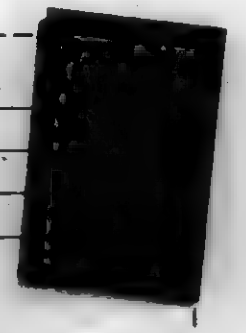

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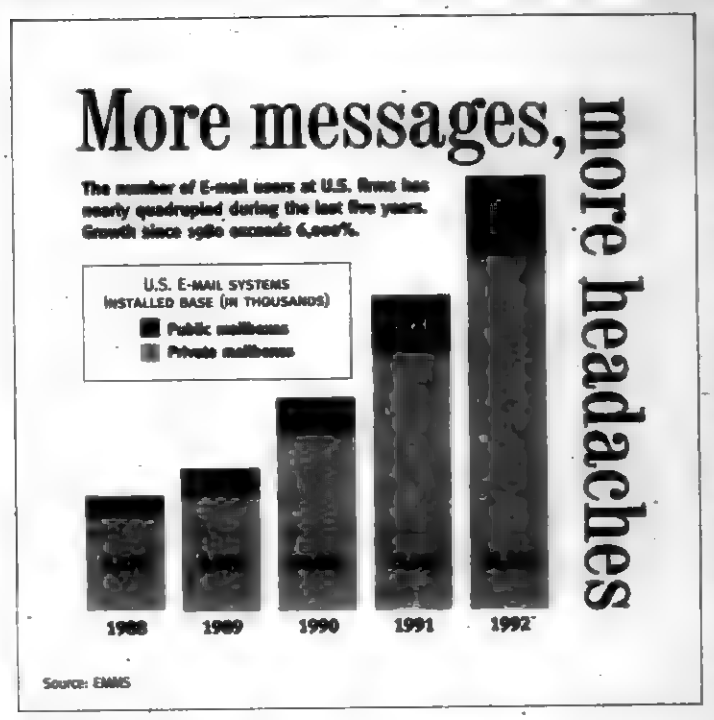

Information

CONTINUED FROM PAGE 105

user departments or put on hold until better technology comes along.

But some IS chiefs are already concluding that when it comes to information, less is better.

"Some people like to say that [IS] should provide users with as much information as possible," says Eric Firdman, executive director of strategic IS at Pacific Bell in San Ramon, Calif. "This is absolutely wrong. We should provide people with as little information as is necessary for them to get their jobs done."

That's a far cry from just a couple of years ago, when users scrambled to pipe as much data as possible into the organization.

Architecture called key

As IS managers begin the painful changeover to a world of open systems and unstructured data, most say the biggest task is learning ways to channel incoming data into predefined pipelines.

"Architecture is the single most important contribution of IS in an era of open systems," Penzias declares. "If the IS organization doesn't step up to its role of providing a corporate information architecture, what are they good for?" He and others note that if IS fails to handle the task, each division or department will do so, eventually leading to informational chaos.

IS managers and experts say a proven, universal method for handling information overload is still a long way off.

Until then, forward-looking organizations are exploring new ways to blend the old world of structured data with the new world of CD-ROM, multimedia and near-universal E-mail.

Among popular techniques: using electronic "filters" to identify selected topics and store related data files for future retrieval by end users. Such filters are already being used to trap incoming messages of interest from outside data services. Other IS managers are installing CD-ROM databases as network resources and systems.

Texaco Corp.'s Exploration Producing Technology department in Houston hires outside data vendors to sift through raw petroleum industry data before the data is uploaded to company computer systems.

Even though the process takes about a week, it's still a great time saver and productivity booster, according to Tom Peters, manager of data management.

Outside vendors "will sift it, massage it and get it into a common format." Large data tapes are then downloaded to several company facilities. But drawbacks remain, Peters says.

Texaco uses many types of computers, so data tapes must be adapted for on-line use with several systems. And, Peters adds, "somebody [here] has to look after it on a monthly basis."

Fortunately, internal data flows more freely at Texaco — thanks to the fact that 18 months ago the company's IS department linked nine separate E-mail systems.

"Before that, you had to log on to the individual systems," Peters recalls. Now, users can log on to their own computer system and automatically have access to E-mail in all Texaco systems, he says.

Texaco also designed a "virtual data server" based on Sybase, Inc.'s SQL Server to navigate through data stored in several databases, including IBM's DB2 and AT&T/NCR Corp.'s Teradata/Sharebase.

A Texaco IS team built a "seamless" access method that helps users find data dispersed over many computer systems — and to retrieve it for their own PC-based applications. The virtual data server in Houston has provided such a valuable window on diverse databases that Peters plans to place similar servers in other cities.

Hope in relational

Relational databases are emerging as an important stop-gap tool in the struggle to tame unstructured data, largely because these products can be queried through the use of industry-standard SQL commands.

The following are some related articles on effective information management:

- "Hot picks for understanding: Designing software to help users gain new understanding about information," *Communications of the ACM*, October 1992.
- "Soften up: Usage of soft information in executive information systems," Hugh Watson, *Computerworld*, Oct. 19, 1992.
- "Query tools: Get information now!" *Open Systems Today*, September 1992.
- "Personal data information forms U.S. businesses [illegible] four categories of information," William Hutchings, *Computerworld*, Oct. 5, 1992.
- "Index everything, [illegible] publicly developed wide-area information servers are [illegible] applications," *Mainframe Computing*, [illegible] 1992.
- "Third Annual Information [illegible] Problems [illegible] Information," [illegible] Oct. 22, 1992.

IS managers say storing unstructured data in relational databases makes information easier to find and easier to capture for analysis.

That's the approach used to organize consumer protection information at the California Department of Insurance.

"An early-warning [insurance fraud] system allows every employee in the department to input free-form comment in the Oracle database," Kuhnel explains. "It's like a bulletin board."

In all, 1,000 users can log on to the insurance agency's system. The only downside, he says, is that the free-form comments are posted to the central database immediately and cannot be called back for revision later on.

Other IS managers prefer to keep their unstructured data separate from traditional systems.

Pacificorp, a Portland, Ore., power utility, has decided to make CD-ROM use a matter of personal choice that involves little support from the corporate IS staff. Users employ CD-ROMs hooked into the corporate network as sources of external data, such as newspaper articles.

Wayne Horecroft, manager of data management, says the arrangement frees IS from having to create or administer databases provided by outside vendors.

Pacificorp has also experimented with executive information systems (EIS) to capture key information for top executives. But Horecroft says the system required continuous changes and updates by the IS staff, and its use was often spotty.

The experience legitimizes a common fear that IS could get swamped if it tries to tame too much unstructured data. Some fear that users would be subjected to an "information backlog" as severe and frustrating as today's application development backlog.

While Horecroft says he's pleased with the advances so far, he says he sees room for more improvement, especially through

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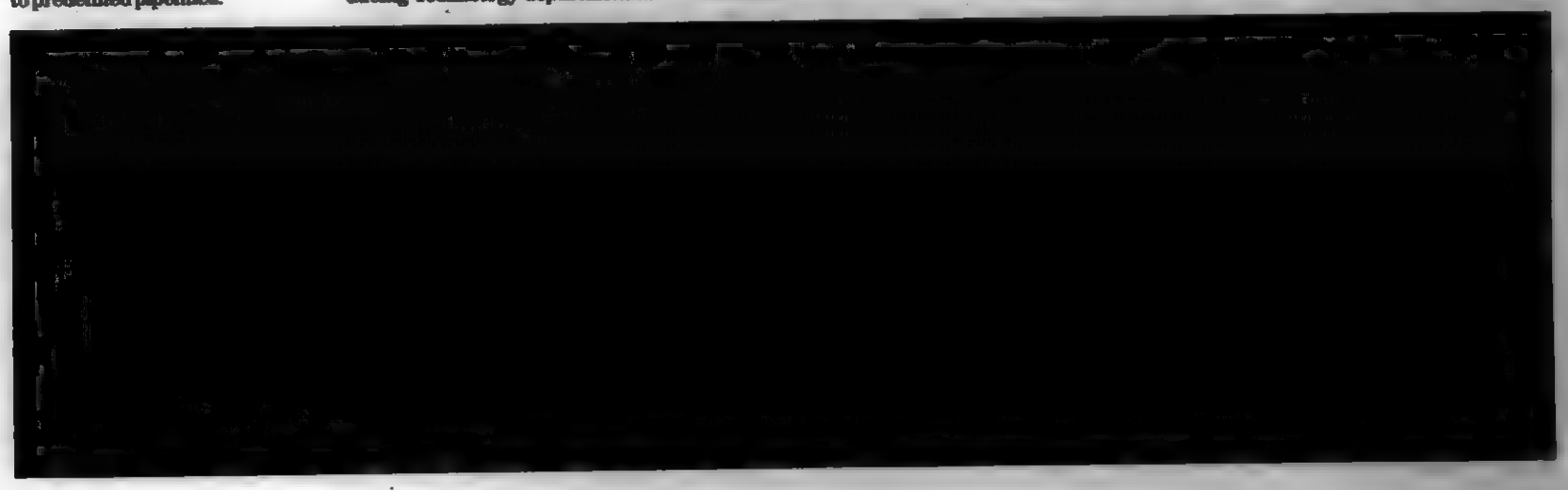
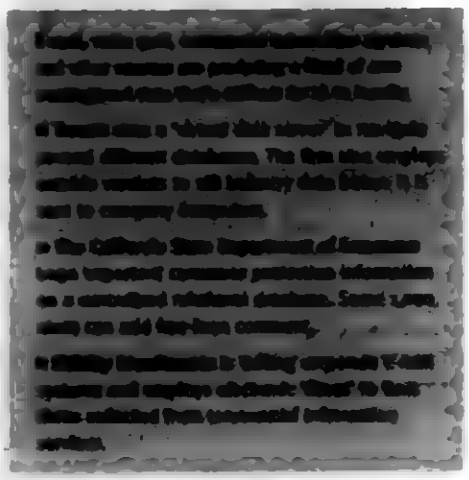


Info overloads, smart solutions



Information

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better data filtering.

"We've got a lot of data flowing through our organization, but no filtering is taking place," Horscroft says. "I'm beginning to wonder if the old idea of the information resource center should be changed into a group of expert information listeners."

In such a scenario, specialists would be appointed to look for outside data sources to support the work of each business unit.

Any hope?

By the late 1990s, visual material from CD-ROMs, videos — and even the nightly news — will be viewed from PCs and combined with text, voice and data.

Does IS have any prayer of lessening the mismatch between current communications technology and the growing size of the electronic "in" basket?

Hopes seem brightest for taming E-mail, primarily because it can be scanned and edited.

To this end, leading-edge companies, including Fidelity Investments in Boston, are working to link all their E-mail systems.

Bill Niemi, director of distributed systems at Fidelity, says the financial services firm is trying to train users to be part of the solution.

Fidelity has numerous Sybase SQL Server relational databases that IS monitors to ensure peak performance and reliability. The goal, explains Niemi, is to let users access these databases with PCs without slowing them down.

"The big thing you've got to be careful about is the runaway query," Niemi says. "You have to make the users aware they could impact response time for all users."

Apple Computer, Inc. and Microsoft Corp. are both working on devising industry standards, but results are still years away. Combined E-mail servers that support many kinds of client PCs may provide one answer.

Better interfaces between voice-mail services and PCs will help users quickly edit, annotate and share data.

Bell Laboratories now has 60 speech researchers working to translate voice mail into a readable and scannable E-mail interface. But Penzias says a speech-to-text interface won't be available until 1996.

Object-oriented technology may also offer a way to handle the mix of text, data, images and voice. But much object-oriented code must be written first so that data can have a safe haven.

Database makers Oracle Corp., The ASK Group, Inc.'s Ingres Products Division and others are devising ways to incorporate multimedia data into standard relational databases. But products are still a ways off.

Some say it's crucial that IS continue to develop front-end systems that help end users manage the information flood by providing menus or "windows" to different data sources or by creating new forms of EIS.

More optimistic IS managers are bracing for a challenging and potentially rewarding task.

"You gain productivity by buckling together all these separate systems," Kuhnel says. "That's where the power is. There's a synergy involved in which the whole is greater than the sum of the parts." •

Executive Track

New York-based executive recruiting firm **Russell Reynolds Associates** has brought former **Price Waterhouse** consultant **Donald K. Jones** on board to help expand its technology practice. Jones, whose title at Russell Reynolds is executive director, will work out of the firm's Washington, D.C., office.

Former management consultant **Don Harder** has been appointed to the position of senior vice president of information technology at **EMI Records Group North America** in New York City.

During his 18 years with **Ernst & Young**'s Management Consulting Division, Harder — who had been a partner at the firm since 1982 — served as a consultant to Ernst & Young client EMI Records.

In his new capacity as EMI Records' top information systems executive, he will oversee development and implementation of technology and business systems for the company's North American operations.

Robert Woods, deputy assistant secretary for information resources management at the **Department of Veterans Affairs**, walked away with FOSE's annual government award for outstanding demonstration of ability to manage, influence or shape the U.S. government systems arena. FOSE is among the nation's largest computer shows; candidates for its annual awards — one given to a person in government and one to an individual from private industry — are nominated by their peers.

Robert W. Rapp is the new vice president of IS at Dallas-based **Southwest Airlines**. Rapp, a 20-year IS industry veteran, formerly served as IS director at **Pacific Enterprises Oil Co. (USA)**, which is also based in Dallas. He will be responsible for all of Southwest's computer and communications services.

Calendar

MAY 16-MAY 22

ICA CamNet Dallas '93. Dallas, May 16-20 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Wireless DataComm '93 Exposition and Conference. San Jose, Calif., May 18-20 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Annual 1993 Midwest Computer Show. Rosemont, Ill., May 19-21 — Contact: Illinois CPA Society Foundation, Chicago, Ill. (312) 993-0393.

Virtual Reality Conference and Exhibition. San Jose, Calif., May 19-21 — Contact: Meckler Managing Information Technology, Westport, Conn. (203) 226-6967.

MAY 23-MAY 29

National Operations and Automation Conference. New Orleans, May 23-26 — Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

International DB2 Users Group Conference. Dallas, May 23-27 — Contact: International DB2 Users Group, Chicago, Ill. (312) 527-8777.

Fuse '93 Educational Conference and International User Meeting. Atlanta, May 24-25 — Contact: Fuse, Inc., Manalapan, N.J. (908) 308-9277.

American Production Inventory Control Society 1993 Remanufacturing Seminar. Oklahoma City, May 24-26 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Midwest Electronics Expo. Minneapolis, May 24-27 — Contact: Midwest Electronics Expo, Dallas, Texas (214) 239-3060.

Trade Show and Symposium on Client/Server Technology. Regina, Saskatchewan, Canada, May 25-26 — Contact: Dawn Redmond & Associates Ltd., Regina, Saskatchewan, Canada (306) 781-7200.

MacWorld Expo '93. San Francisco, May 25-27 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3870.

MAY 30-JUNE 5

Unotech '93. Caracas, Venezuela, June 1-5 — Contact: International Exhibitions, Inc., Houston, Texas (713) 529-1490.

Joint Application Design User Conference. Hershey, Pa. June 2-4 — Contact: Anthony Crawford and Associates, Oakville, Ontario (416) 845-3844.

Transforming the Organization: Integrating Business, People and Information Technology. Wellesley, Mass., June 2-4 — Contact: Babson College, Wellesley, Mass. (617) 239-4354.

JUNE 6-JUNE 12

Equipment Resources Planning Institute. Albuquerque, N.M., June 7-8 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2987.

Xhibition '93. San Jose, Calif., June 7-11 — Contact: Ed Chuang, Integrated Computer Solutions, Inc., Cambridge, Mass. (617) 621-0060, Ext. 111.

Annual Personal Communications and Computing Show. Chicago, June 3-6 — Contact: Electronic Industries Association, Washington, D.C. (202) 457-8762.

Autodesk Expo '93. Anaheim, Calif., June 8-10 — Contact: AEC Systems, Inc., Newington, Conn. (203) 666-6097.

A/E/C/ Systems '93. Anaheim, Calif., June 8-10 — Contact: A/E/C/ Systems, Inc., Newington, Conn. (203) 666-1326.

First Government Help Desk and Computer Training Conference. Washington, D.C., June 8-11 — Contact: Ruder Finn, Inc., Cambridge, Mass. (617) 577-0007.

Retail Systems '93. Boston, June 9-11 — Contact: Candace Cutler, Retail Systems '93, Newton Highlands, Mass. (617) 527-4629.

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APPLES AND ORANGUTANS

You can't just drop those legacy systems when client/server arrives. However, juggling the two presents new challenges and difficulties.

BY ROSEMARY CAFASSO

Companies that are embracing client/server technology as they build for the future are finding they need to think plenty about the past. In almost all cases, these companies are running host systems that represent several millions of dollars and a few decades of investment. Scrapping these "legacy" systems doesn't make sense because most of them still perform well and, more importantly, hold a lot of important corporate data.

The goal, then, is to figure out how to integrate client/server with existing systems. In some cases, companies are simultaneously plotting long-term migration strategies, but in others, companies such as Holiday Inn Worldwide Americas have already determined that client/server technology will supplement — but not supplant — the mainframe.

"We can see the possibilities of more extensive use of client/server," says David Peach, vice president of finance at Holiday Inn in Atlanta. "However, our vision is we also really need the power and size of our mainframe."

Whether a company envisions an eventual transition to total client/server or indefinite coexistence, integration strategy is critical because decisions made today are likely to live on for a very long time.

Those who have been there describe the process of integrating new client/server systems with legacy systems as slow and complex.

Users and industry analysts say even relatively straightforward integration projects, such as a simple client/server query application, can easily take more than a year. As the complexity increases, project length stretches. Consolidated Edison of New York and Pacific Bell, for example, are both working on projects that are expected to take upward of five years (see stories pages 115 and 117).

The integration challenge can be overwhelming because it demands that information systems juggle so many different tasks that are typical of any integration project, including selecting different technologies, managing software and networking issues, pooling staff expertise from different disciplines and training users on the new environment. What makes these efforts unique is the newness of the client/server world. Many of the products and techniques required to integrate client/server software with legacy systems do not have much of a track record yet.

Some brave souls are in the early stages of integrating production client/server applications with a host environment. This creates a real technological challenge — specifically, ensuring that corporate data shared among platforms stays in sync. Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., says you could count the number of users integrating production environments "on your hands and feet."

LEGACY SYSTEMS AND CLIENT SERVER

But because of the tremendous challenges involved, most

WHAT'S A LEGACY SYSTEM?

A legacy system is an application that was developed on older technology and is past its prime but is too critical to disrupt. What we now call legacy systems usually run on mainframes and minicomputers. Eventually, PC- and workstation-based systems will be 'handed down' to the legacy category as well.

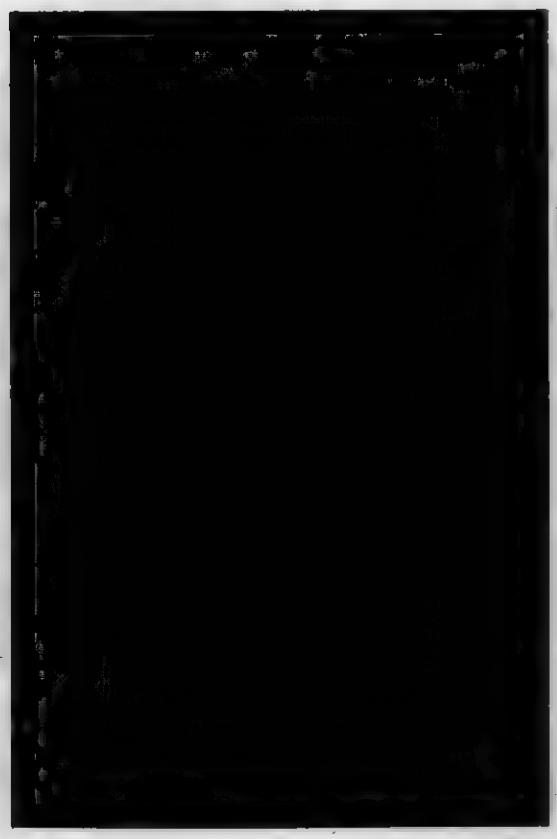
companies are taking small steps and first working with decision-support client/server applications. In this case, users typically need access to mainframe data but do not require it in real time. As a result, IS can set up a system to download mainframe data to a server at set intervals, such as once a day. This is referred to as "staging" data.

For those who are integrating decision-support applications, techniques may vary. These typically include middleware, software vendor solutions, "homegrown" methods or a mix of these approaches (see story below).

Whatever the option, there are bound to be complications. The Centers for Disease Control and Prevention in Atlanta had some networking problems when doing a relatively straightforward client/server integration project. Kenneth Long, a systems analyst, says that by linking Software AG of North America, Inc.'s Adabas host database with a new set of server and PC products, users would have easier access to the data.

But "we were doing things a little differently [than a standard Software AG configuration], and we've had quite a bit of trouble," Long says.

IS departments often work with recently released or newly designed software that may not work just right. Or the integration may be set up perfectly but then you discover, as Trane Co. did, that the data transfer rate to move data between the old and the new system is horribly slow (see story at right). ■



Trane's Chip Lombardo *on just-in-time manufacturing: 'The dilemma is you need to plan more frequently'* ▶

Ken Hicks

Communication the heart of just-in-time manufacturing

BY ROSEMARY CAFASSO

At Trane Co., a maker of residential and light commercial air-conditioning units in Tyler, Texas, marrying a client/server Unix-based application with a host-based manufacturing system has produced a quantum improvement in customer responsiveness and planning efficiency.

For example, when Hurricane Andrew hit the Miami area last year, causing many businesses to scramble for fast delivery of new air-conditioning units, the company was able to confirm deliveries within hours instead of the usual day or more.

Fresh manufacturing data from Andersen Consulting's host-based MAC-PAC application is also now available continuously, rather than once a week, after a weekend batch run. Workers can run analyses on mainframe data by downloading it to a new client/server system the company dubbed Lightspeed, based on Carp Systems International's Advanced Planning System.

CASE STUDY

These performance gains were hard won. Getting the pieces to work together required painstaking effort.

Trane had been running MAC-PAC, which handles inventory and customer information. While the company wanted the mainframe-class performance, security and reliability, it also wanted a system that was more on-line and flexible.

"We were moving to just-in-time manufacturing," says Chip Lombardo, manager of information systems at Trane's Unitary Products Division. "The dilemma is you need to plan more frequently. You are looking at smaller production runs but doing them more frequently. That taxes a traditional MRP system."

Last year, Trane contracted with Carp for an IBM RISC System/6000-based client/server planning package that the vendor tailored to mimic the mainframe MAC-PAC system. As a result, the impact on users was minimal.

But Lightspeed was missing one key piece: the MAC-PAC data. The mainframe's role in managing data was considered too crucial to change.

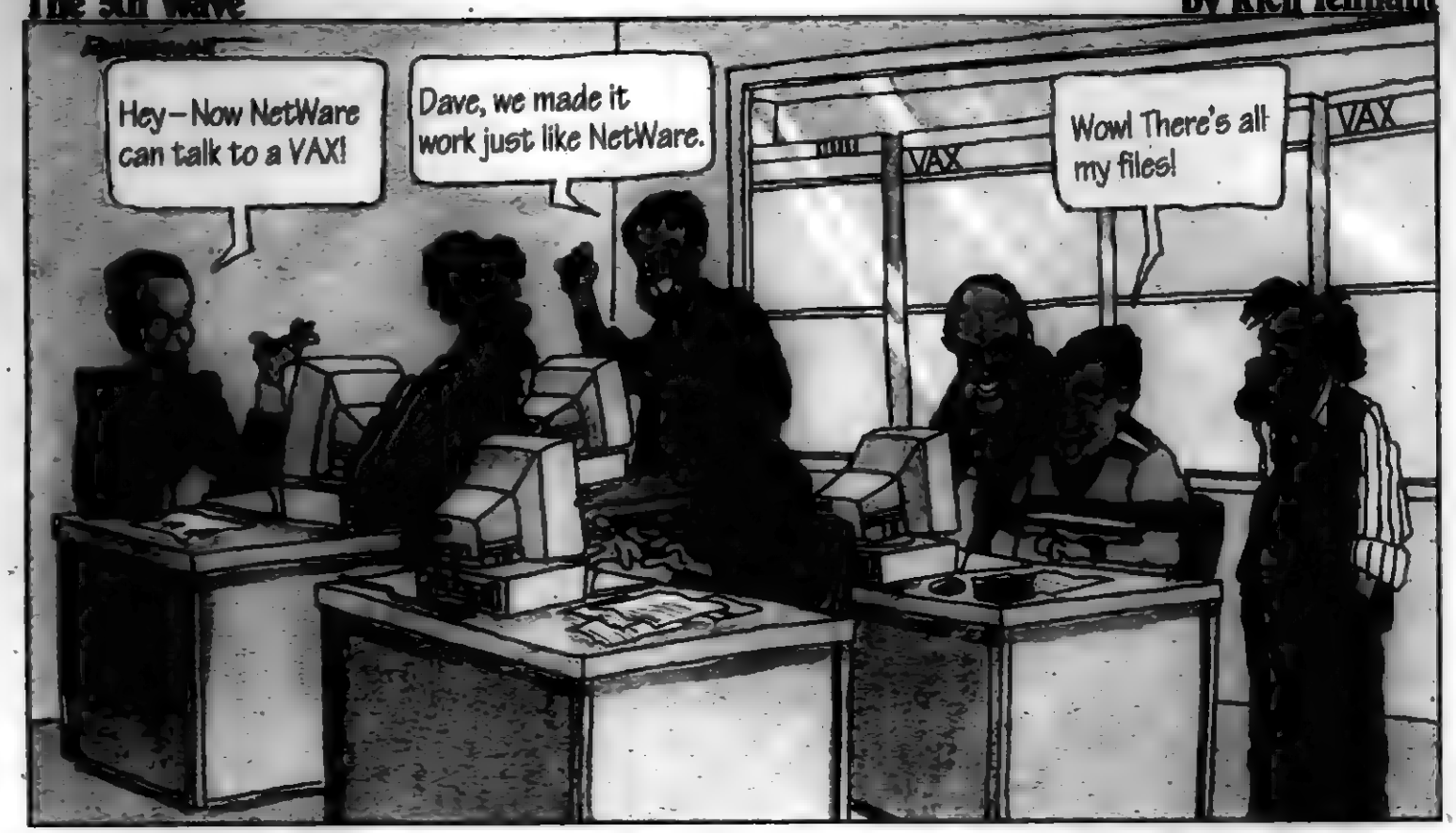
When Lightspeed was first installed last year, it was unusable because the communications link between the new software and the host system was too slow.

Initially, the team downloaded data from the host via a T1 line to the Tyler facility. It went to a PC-based communications server and was then routed to the RS/6000. With this configuration, Trane received about 30M bytes of data on an hourly basis, Lombardo says.

Not satisfied with this performance, the team installed IBM's Host Connection Program on the RS/6000 and then routed data directly to the server.

Results were better after that but still not all the company wanted, so the team began to tackle every possible element. Data packet sizes and buffers were adjusted.

Today, after what Lombardo calls "a very arduous process," Trane is now moving an average of 60M bytes of mainframe data to the server per hour. Later this year, Trane will tackle another big communications issue: getting data back up to the host easily. Currently, users are working with extracts of production data. ■



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From old to new with just a 'click'

BY ROSEMARY CAFASSO

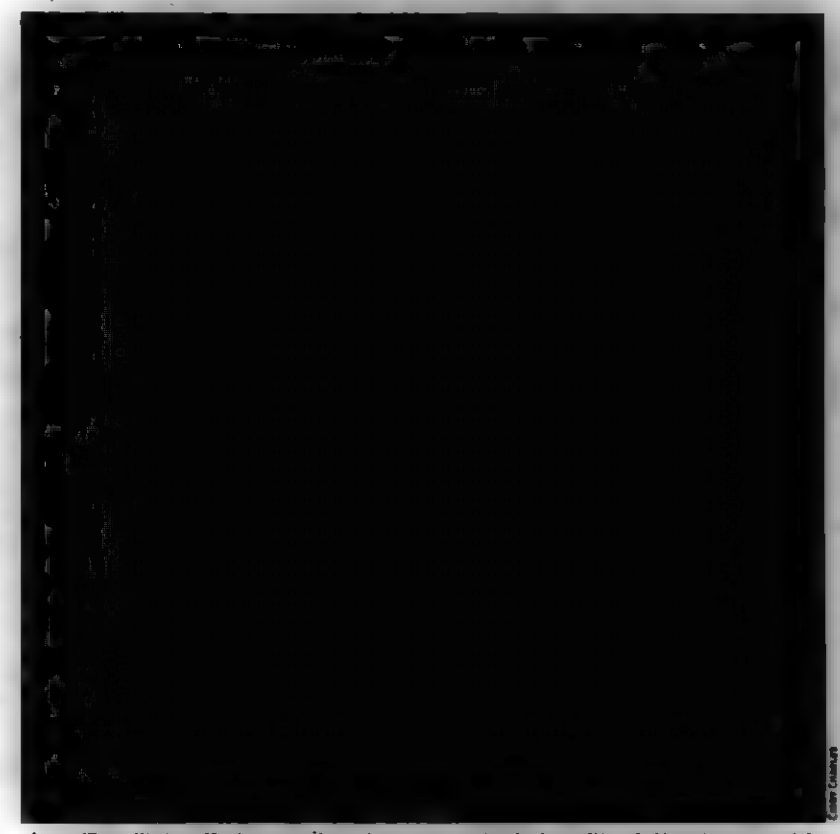
Lee Bitterman, a maintenance administrator at Pacific Bell in San Ramon, Calif., remembers well what it was like troubleshooting a customer account just a few months ago. It wasn't unusual for her to access several different host-based systems; with each one, she was required to provide a separate log-on and password.

"You had to remember all of them, and that can be impossible," she says.

Recently, Bitterman worked with a prototype client/server data retrieval system designed as a front end to several of the company's older applications, including IBM host-based and Digital Equipment Corp. Unix-based programs.

Two Sun Microsystems, Inc. SPARCserver 670s run in-house-designed and licensed software that handles the navigation through the legacy systems, as well as the networking mechanics of transmitting messages through the systems. At the front end, users work with Microsoft Corp. Windows-based PCs, which provide a user-friendly view of the data.

Now, Bitterman clicks on menu selections and options lists to move through the legacy environment and is able to devote more time to "what I want to do."

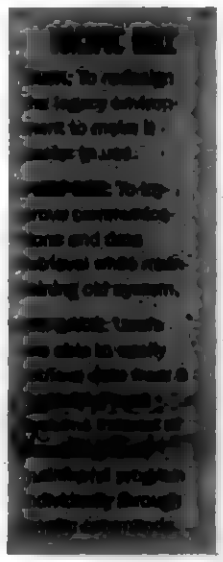


▲ **Pacific Bell's Jennifer Lamarre** *found ways to gain the benefits of client/server without sacrificing the conveniences of legacy systems*

Old dog, new tricks

This new system is part of a several-year project under way at Pac Bell to make its old systems more usable.

Along with a planning committee, Jennifer Lamarre, director of the strategic systems interconnection district, devoted nearly two years on the front end of the process to determine how to gain the benefits of client/server without sacrificing the legacy systems.



From the field, the project team learned that users liked the performance of the older systems. The problem, however, was that they were rigid and difficult to use.

"They had started to organize around the systems instead of around supporting customer needs," Lamarre says.

The team's decision: Create a layer of software based on a client/server model that would "surround" the older systems. The client/server front end handles communications and data retrieval processing as well as providing the graphical front end.

To achieve this, Pac Bell acquired some software tools and kept the design of the front-end system in-house. The company is using Template Software, Inc.'s Snap, a fourth-generation language expert system shell, as well as Borland International, Inc.'s C++. A key piece comes from Apertus Technologies' Enterprise/Access, a middleware product that handles the programming interfaces to link the front layer to the legacy systems more easily.

On the user end, a maintenance administrator such as Bitterman no longer works with the legacy application. Instead, she works with a graphical front end and selects options. Behind the scenes, her requests are moved to the first Sun server, a navigation plan is established and the second server performs the actual retrieval. The data is then downloaded and presented on the PC.

But because the Pac Bell system is working with many legacy systems — it could eventually be 19 — this ease of use is coming at a price, Lamarre says. The big challenge with this system is configuration management. If a change such as a maintenance update is made in a legacy application, it could affect the new client/server front end.

"We have to deal with multiple systems and potentially multiple versions," Lamarre says. "We are now spending a lot of time developing a change management database. "If the legacy tells us about changes, then we can schedule things in advance."

Lamarre says the project has put the development team on the "forefront of technology" because much of this software was so recently put together.

"There are a lot of things that aren't definite," such as the type of graphical user interface and middleware, she says. "We are making decisions that we feel are good ones, but it can feel like a risk."

CASE STUDY

At Pac Bell, as at other companies, networking decisions are core to making a project like this successful, Lamarre says. The team is implementing a Transmission Control Protocol/Internet Protocol network to gain better performance and get more flexibility because it is based on industry standards. "That required a whole migration," Lamarre says. The legacy environment had been using an older network based on Xerox Network Systems' protocol, originally made by Ungermann-Bass, Inc.

A production version of the system was recently rolled out to 100 users in the company's Sacramento, Calif., office. It will potentially be available for 5,000 users.

Lamarre says she expects the new software to be part of Pac Bell for a long time. "It will change a lot, though, because the way we built it is very modular. Theoretically, the user layer could stay there forever. The core architecture doesn't have to change." ■

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Consolidated: Miles to go before it rests

BY ROSEMARY CAFASSO

In 1993, Consolidated Edison of New York expects to be running a client/server-based customer information system that handles account management, inquiries and conflict resolution. But the company has a lot of miles to travel before it reaches that goal.

The utility decided in 1991 that it was time to replace its 21-year-old IBM host-based customer information system. The decision coincided with a corporate directive to move to a client/server model where appropriate, and the customer information system was a prime candidate. While the back-end data engine was still performing well, the front end was so unfriendly that it was impeding user efficiency.

Switching to a new application would have been too expensive to design in-house, and there was nothing on the market geared toward a utility operation, says Ed Glister, senior project manager.

So the design team came up with a two-phase plan that was officially put into place in December 1991. The first phase, currently under way, combines PC initiation with a gradual shift to client/server. While users are taking delivery of PCs and adjusting to off-the-shelf desktop applications, development efforts are concentrating on client/server enhancements to key host applications and creation of client/server applications. Also, graphical user interfaces are being built for host applications with Easel Corp.'s front-end design tools. Ground-up application development is concentrating on new client/server applications such as an automated work-flow program, a cash processing program and an ad-hoc query and analysis program.

Glister estimates Phase 1 will cost $25 million when the new hardware, software, development and training is rolled in. Phase 2, scheduled for completion in five years, will create a new back-end client/server-based database system.

While this two-phase plan is more practical and less traumatic than immediate wholesale replacement, it also presents some unique challenges. For example, Glister says taking this phased approach means devising methods to bridge new and old systems for the next several years — a potential integration nightmare.

"There's integrating technologies, then there's integrating technology with people and then there's integrating technologies with processes," Glister says. "These issues are constantly confronting us."

No easy task

Phase 1 is a whopper to manage because it has so many components. The company designed a client/server architecture for each of its 20 sites and includes PC workstations and three Compaq Computer Corp. 486-based servers. The servers handle communications between the user workstation and the host, new client/server applications and management of data files that are either established locally or downloaded from the mainframe.

Some programs did not require immediate replacement but did need fine-tuning to fit better with the client/server environment. In the case of a customer letter program, the company used Easel to design graphical front ends and more efficient data-retrieval mechanisms. These programs function like terminal-based applications but boost user productivity, Glister says. The query can now pool data from several mainframe files and present it in a single package to the user.

From the workstations, data requests are dispatched to the server and sent to the mainframe via a Digital Communications Associates, Inc. Select gateway.

Cash processing was one application in need of replacement with client/server. Previously, clerks at local offices could not access account histories stored on the mainframe. Consolidated Edison licensed an automated cash processing system from Systems Innovations, Inc. (recently acquired by Uniquest in Jacksonville, Fla.) and enhanced it. The software is now accessed via PCs and gives clerks immediate access to account histories.

The firm also identified important functions for which applications did not exist. Local ad-hoc query was one of the functions given high priority, so the project team built a program based on Gupta Corp. software. It includes a gateway that pulls data from IBM's DB2 on the host, stages it on the server and then lets users access it from PCs.

Not all the new applications have been developed in-house. For automated work flow, the utility licensed a program from Sigma Imaging Systems, Inc. that resides on the server and uses PCs as its front end. It accesses local data as well as data staged on a server that has been downloaded from the mainframe via the gateway.

▲ Consolidated Edison's Ed Glister *claims people and coordination issues can be more challenging than technical areas*

CASE STUDY

Though some of the technical work has been difficult, Glister says, coordination chores and dealing with people issues are probably the biggest challenges.

Yet he considers himself lucky: Executive commitment remains strong, the effort is well financed and users have played an active role from the start.

"In a lot of ways, we've reduced the frustration levels," Glister adds. "Obviously, there's a frustration if you make a mistake. But most of the time, if we take two steps forward, we only take a small step backward." ■

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Benefits outweigh the costs

The move to client/server raises many questions for information systems managers. Consultant Herb Edelstein answers some questions frequently asked by clients interested in integrating legacy systems and client/server.

Q. How much money will I save by converting to client/server?

A. You will save little, if anything, from the move to client/server itself. Real savings are available from using modern hardware that reflects today's cost structures, but those savings can be achieved by low-cost centralized multiuser systems. Most of the stories about cost savings compare an old, high-cost application with a modern implementation and count as savings, costs that have been shifted.

For example, the savings on cutting central IS personnel are counted, but the costs of adding departmental technical people are ignored. The costs of administering multiple, interconnected local-area networks, the integration problems of bringing together heterogeneous hardware and software and the difficulty of debugging and maintaining the mix may make client/server computing more expensive than some alternatives.

Q. If I'm not going to save money and I'm going to have all this grief in addition, why go to all the bother?

A. Remember, many companies are successfully migrating to client/server computing and reaping the benefits. Most applications do benefit from a client/server architecture.

There are two main reasons for moving to client/server. The first reason is that the benefits ultimately outweigh the costs. These benefits include a better user orientation with graphical user interfaces; scalability of applications with the addition of clients, servers and new LANs; and flexibility to meet a distributed, dynamic business environment.

Q&A

The second reason is that computer vendors — both hardware and software — aren't going to give you much choice. They are putting the bulk of their research and development efforts into enterprise computing solutions based on networks, cooperative processing and client/server architectures. The older technologies are just going to fall further behind for lack of vendor attention and user demand.

Q. What tools should I use to query my legacy database?

A. You probably shouldn't run queries against it at all. Most likely, neither the database management system nor the database schema was designed to efficiently support ad-hoc queries. Even a moderate query load will probably bring performance to its knees and hurt operational applications. Rather, you should create query subsets that are downloaded to local servers and used with appropriate front-end tools.

While a large number of tools for connecting to legacy systems have been released, such as Information Builders, Inc.'s EDA/SQL and Sybase, Inc.'s Open Server, users are increasingly moving to replicated data strategies.

This year a wave of tools and announcements from companies such as Sybase (Replication Server) and Oracle Corp. (Snapshots and replication functions) have joined up with products such as Micro Decisionware Database Gateway's Transfer function, Digital Equipment Corp.'s Data Distributor and Channel Computing, Inc.'s InfoPump.

Q. What do I do with legacy data when I'm converting to client/server?

A. Unfortunately, it is virtually impossible to get rid of legacy data because it usually is filling the needs of certain users who will not allow it to go away.

You can't simply convert it to a new client/server system. Legacy systems typically have grown well beyond their original design goals as succeeding generations of users have added new requirements.

Furthermore, data is commonly extracted from legacy systems and stored redundantly for use by other legacy systems, so that eliminating one can have a serious ripple effect and expand the size of the conversion significantly.

You should migrate portions of your legacy systems to new architectures in a way that will help you meet your current business requirements. This means developing new systems for which the existing systems are a major input. It may also be best to re-engineer business processes as part of the effort.

While this migration is going on, the legacy system is maintained but not enhanced. You will have to decide which system is the source of updates. Depending on the application, transaction updates may continue to be done on the legacy system for some time, with extracts of data to client/server systems. Over time, the client/server system will become the live transaction system, and the legacy system will become an appendage updated through extracts.

However, keep in mind that as more users are off-loaded from the legacy system, the charges per user to do this will increase. ■

Edelstein is a principal at Euclid Associates, a Potomac, Md.-based consulting firm specializing in database management, client/server and document image management.

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Richard Finkelstein

Don't forget support

In the rush to replace mainframes with client/server systems, application support issues are being overlooked or ignored. For example, take the time-honored method for debugging problems: controlled replication of problems and gradual isolation. When the offending program code is located, it is then fixed.

Client/server environments are so complex, it is almost impossible to replicate and isolate problems in a controlled sequence. Errors caused by any combination of hardware and software components can occur on any of the client PCs, on the network and on the server. Tracking down the offending program code is tricky. It requires perseverance and often a good amount of luck. Problem resolution time is unpredictable, which means organizations are exposed to repeated downtime without any recourse.

LEGACY SYSTEMS AND CLIENT SERVER

Even if the offending program(s) is ferreted out, there is still the problem of getting the code fixed. A typical client/server environment comprises a myriad of components, all of which come from different vendors. Memory chips, BIOSs, control cards, network cards, disk drives, operating systems, network operating systems, etc., are only loosely integrated. If two or more vendors are involved, finger-pointing begins. It is almost impossible to pinpoint responsibility for the program. Meanwhile, the application languishes.

Watch your steps

If any of these situations sound familiar or possible in your company, the risks can be minimized. Here are some tips:

- **Carefully choose applications.** Applications that are read-only, such as decision support and executive information systems, are less prone to severe problems and less affected by unpredictable problem-resolution time frames.
- **Limit the number of vendors that participate in a client/server environment.** Mainframe and minicomputer hardware and operating systems are highly homogeneous, making these platforms and their associated legacy systems supportable. By mimicking this proven tactic, users can make client/server environments more supportable. Products that are highly integrated by relatively few vendors (or just one) are easier to test, deploy and maintain. When problems do occur, it is easier to assign responsibility for fixes.
- **Choose products with solid references and a proven track record.** This rule of thumb is especially important when you're linking legacy and client/server systems. Most client/server products have a short history and limited production use. By selecting more mature products (which is almost an oxymoron when it comes to the client/server industry), users can expect that at least some of the more common problems have already been discovered and fixed and that other users can assist when unexpected problems arise.
- **Attend local user groups or check bulletin board services.** This is where you can check with other users to find out which products have proven track records and to find out about hidden problems.

The move toward client/server processing is inevitable because there are numerous benefits. However, the road is laden with bombshells, and organizations should do what they can do avoid them. Not only is problem resolution in heterogeneous environments expensive and resource-consuming, but it also has the potential to delay or abort major client/server efforts. Plan for the unexpected, and be prepared for the problems that will inevitably occur. ■

Finkelstein is president of Performance Computing, Inc. in Chicago.

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Front-end tools

A new face for tired apps

By David Baum

Companies with substantial investments in mainframes and host-based systems are having the most difficulty making the jump to client/server computing, but a number of vendors of front-end development tools are reaching out to lend a hand.

These vendors are offering re-engineering, but re-engineering on a realistic scale: a way to update just the interface of aging legacy applications without tampering with the underlying code. Such tools allow developers to create sexy graphical user interface (GUI) front ends to run on PCs, complete with dialog boxes, pull-down and pop-up menus, scrolling bars and other graphic devices. The PCs replace dumb terminals as the user link to the mainframe.

Purists of client/server point out that such development doesn't really lead to client/server at all but simply provides a face-lift for a sagging system. But for some, the improvement is worth the effort and is a step in the right direction.

However, despite the user appeal of front-end integration, it is more a migration plan than a long-term solution.

"It's not a permanent solution but the initial stage in a migration to client/server. It's not necessarily rational, but it's defensive," says John Rymer, an analyst at the Patricia Seybold Group in Boston.

Defense is, in fact, one of the best arguments for starting client/server at the front end. Ease of use and flexibility are important, but many companies are very concerned about security in client/server environments. Because all data and processing remain on the host with this approach, there is less chance of data loss than with true client/server architectures.

Not a wasted effort

Another advantage is that an investment in this type of development is not necessarily wasted if and when a company decides it wants full-fledged client/server. Some frontware vendors, such as Easel Corp. and Gupta Corp., have added the capability to access SQL servers, enabling an eventual migration to PC-based applications using the same development tools.

But not every host-based system can benefit from the addition of a GUI. "For intensive, heads-down data entry, a GUI wouldn't really make sense," notes Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "It would probably slow the operators down. But if data entry clerks are moving between five or six different screens, then a well-designed GUI makes good sense."

For example, at Napa County's Department of Health and Human Services in Napa, Calif., a Unisys Corp. 2200 mainframe was implemented to run a cumbersome welfare application. It monitors a host of continually changing regulations while determining welfare eligibility, computing welfare benefits and handling reporting and a number of related administrative functions.

But the system was very difficult to learn and use, prompting Terry Longoria, deputy director at the site, to investigate the Designer Workbench, a Unisys product that can be used to build graphical front ends for Unisys mainframe applications. With the help of Deloitte & Touche, a consulting firm with an office in Napa, she created an interface that automatically navigates users from screen to screen, reduces keystrokes and handles some data validation.

Longoria says she isn't convinced that the GUI running will simplify the application or that the cost of the PCs will be repaid in productivity, but she still thinks the change was worth the effort.

The reason? "A lot of it has to do with staying current with modern technology," she says. "People in the outside world have become accustomed to GUIs. Adding a similar interface puts us in line with the strategic direction of the industry." ■

Baum is a free-lance writer based in Santa Barbara, Calif.

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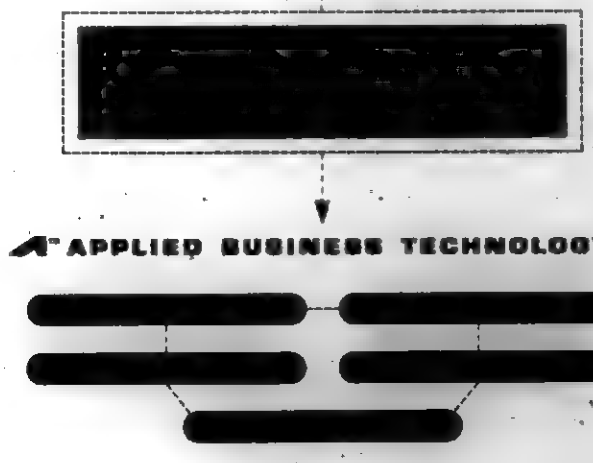

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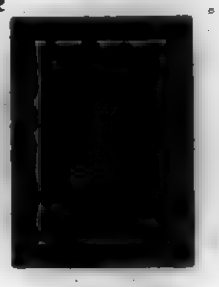

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The real power of technology is not that it can make old processes work better but that it lets you destroy outdated assumptions and create new ways of working — that is,

RE-ENGINEER

EXPLOSIVE THINKING

By Michael Hammer and James Champy

A company that cannot change the way it thinks about information technology cannot re-engineer. A company that equates technology with automation cannot re-engineer. A company that looks for problems first and then seeks technology solutions cannot re-engineer.

Information technology plays a crucial role in business re-engineering but one that is easily miscast. Modern, state-of-the-art information technology is part of any re-engineering effort as an *essential enabler* because it *permits* companies to re-engineer business processes.

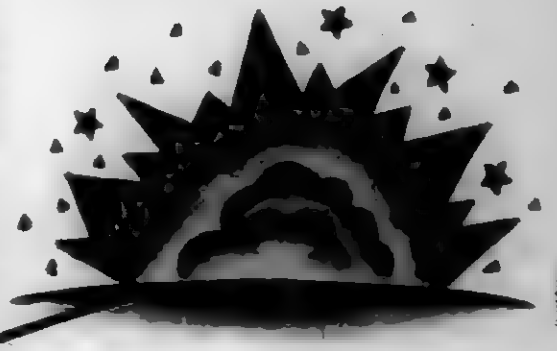
But, to paraphrase what is often said about money and government, merely throwing computers at an existing business problem does not cause it to be re-engineered. In fact, the *misuse* of technology can block re-engineering altogether by reinforcing old ways of thinking and old behavior patterns.

Learning to think inductively

To recognize the power inherent in modern information technology and to visualize its application requires that companies use a form of thinking that businesspeople usually don't learn and with which they may feel uncomfortable. Most executives and managers know how to think *deductively*. That is, they are good at defining a problem or problems, then seeking and evaluating different solutions to it. But applying information technology to business re-engineering demands *inductive* thinking — the ability to first recognize a powerful solution and then seek the problems it might solve, problems the company probably doesn't even know it has.

From the book *Re-engineering the Corporation: A Manifesto for Business Revolution*, published this month by HarperBusiness. Copyright 1993 by Michael Hammer and James Champy. By arrangement with HarperCollins Publishers.

The fundamental error most companies commit when they look at technology is to view it through the lens of their existing processes. Instead, they should ask, "How can we use technology to allow us to do things we are not already doing?"



Needs, as well as aspirations, are shaped by people's understanding of what is possible. Breakthrough technology makes feasible activities and actions of which people have not yet dreamed. The challenge that most corporations fail to meet is recognizing the business possibilities that lie latent in technology. This shortcoming is understandable if not excusable.

Take, for instance, teleconferencing. Initially, most organizations saw its value as a means of reducing travel costs: People would be able to meet without having to fly.

In this respect, teleconferencing has, by and large, proved a monumental failure. People travel to be with other people for many reasons. A trip, by its very undertaking, says something about the importance attached to the message ultimately delivered, of the subject eventually discussed. The nonverbal communication that takes place in a face-to-face meeting is probably more important than most of the words actually spoken. No surprise, then, that teleconferencing has had little effect on corporate travel costs.

That doesn't mean, however, that teleconferencing is without value. It means that its worth lies in transforming how work is done, not in lowering its costs.

For instance, one company we know has used teleconferencing to cut its product development cycle by six months. How?

This company's engineering and marketing staffs are based in two different states, so once a month one group would fly to the other's location and, face to face, they would iron out their problems. Now the company has installed teleconferencing facilities, but the engineers and marketers still fly to see one another once a month because they have found it difficult to resolve all their differences over television.

However, the engineers and marketers do use teleconferencing for weekly discussion sessions, which they previously could not hold because of the inconvenience, lost time and costs associated with travel.

With teleconferencing, everyone can "meet" once a week, stay informed and have their routine questions answered. As a result, product developers and marketers keep in better touch, problems get resolved earlier and faster, fewer trips get taken down blind alleys, projects are completed faster, and the products they produce are better suited to their markets.

In short, the value of teleconferencing to this

Explosive thinking, *page 126*

TARGET PRACTICE

For technology to be meaningful to a re-engineering effort, you have to ask the right question:

NOT How can we use these new technological capabilities to enhance, streamline or improve what we are already doing?

BUT How can we use technology to allow us to do things we are not already doing?

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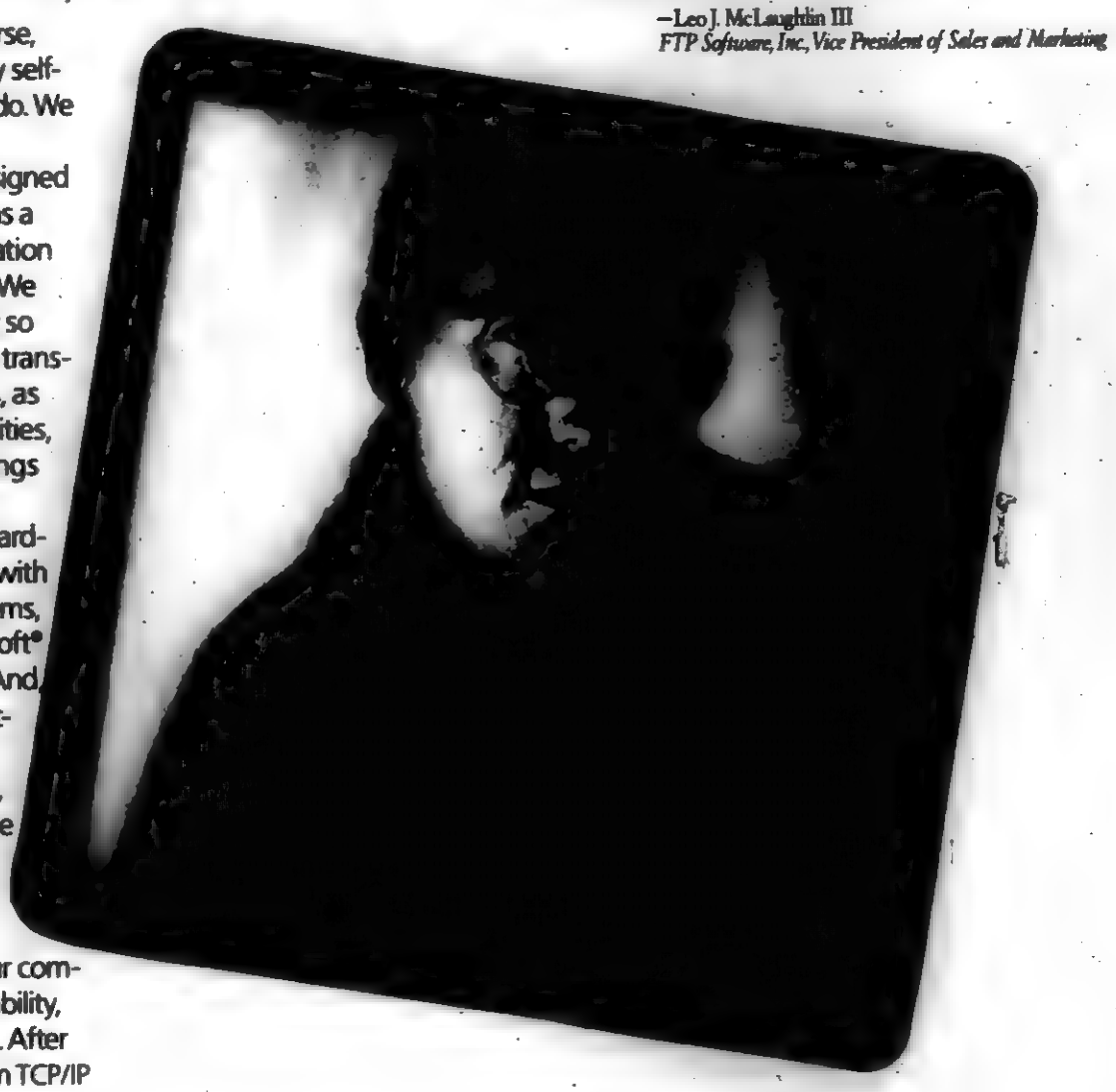

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Re-engineering

CONTINUED FROM PAGE 123

company is in allowing it to do something it had not done before: Keep marketers and designers in weekly contact. This use had not occurred to the people promoting teleconferencing because they had not broken out of their old, deductive thinking mode.

To reiterate, the real power of technology is not that it can make the old processes work better but that it enables organizations to break old rules and create new ways of working — that is, to re-engineer.

In building a brand new facility in which to manufacture its Saturn cars, General Motors Corp. enjoyed the opportunity to re-engineer old work processes without the constraints imposed on it by existing plants.

GM designed the Saturn plant, located in Spring Hill, Tenn., to include an on-line manufacturing database that is accessible by the company's component suppliers. The suppliers do not wait for GM to send them a purchase order; they simply consult the carmaker's production schedule, which is included in the database. Then they take it upon themselves to deliver the appropriate parts to the assembly plant as needed.

In this process, there is no paper — no purchase order and no invoice. After shipping the parts, the vendor sends an electronic message to Saturn saying, in effect, "These are the parts we sent you." When the box of goods arrives, the receiving clerk scans the bar code printed on it with an electronic wand. The computer can then tell the receiving clerk to what part of the plant the goods should go. The scanning also initiates payment to the vendor.

In essence, information technology has enabled Saturn and its supplier to operate as one company, to eliminate overhead in both organizations and to break one of the oldest rules in any corporation's unwritten rule book: Treat vendors as adversaries.

Grab the opportunity

In fact, breaking rules is how we recommend that people learn to think inductively about technology during the re-engineering process: Find the long-standing rule or rules that technology allows the company to break, then see what business opportunities are created by breaking those rules. (See below for some rules technology helps break.)

It is this disruptive power of technology, its ability to break the rules that limit how we conduct our work, that makes technology critical to companies looking for competitive advantage.

Staying on top of new technology and learning how to recognize and incorporate it into an organization must be an ongoing effort — no different from research and development or marketing.

Our view is that if you can buy a technology, it is not new. We subscribe to what might be called the Wayne Gretzky School of Technology. Gretzky, who became the National Hockey League's all-time leading scorer at age 28, was once asked what made him a great hockey player. He was exceptional, he answered, "because I go where the puck is going to be, not where it is."

The same rule applies to technology. Building a strategy around what one can buy in the market today means that a company will always be playing catch-up with competitors that have already anticipated it. Companies that have had great success with applying technology — for instance, Chrysler Corp. with its satellite communications system for helping dealers manage their parts inventories — were asking for the technology they needed well before it appeared on the market. Year after year, Chrysler sent out requests for proposals that outlined what it wanted. When a vendor eventually responded with the needed capabilities, Chrysler was ready to implement. Management knew what rules it wanted to break with the technology before the technology was even at hand.

Companies cannot see or read about a new technology today and deploy it tomorrow. It takes time to study it, to understand its significance, to conceptualize its potential uses, to sell those uses inside the company and to plan the deployment. An organization that can execute these preliminaries before the technology actually becomes available will inevitably gain a significant lead on its competition — in many cases, three years or more.

It is entirely possible to stay three years ahead of the market on technology. There does not exist a technology that will become important in 1996 that is not yet demonstrable today. Smart companies can start figuring out how they will use a technology even while its developers are still polishing their prototypes.

As an essential enabler in re-engineering, modern information technology has an importance to the re-engineering process that is difficult to overstate.•

Hammer pioneered the re-engineering concept and is president of Hammer and Co., a management education and consulting firm in Cambridge, Mass. Champy is chairman and chief executive officer at CSC Index, Inc., an international management consulting firm in Cambridge.

RULES are made to be broken. Technology can be the means by which companies smash their old, constraining business processes and transform their operations.

OLD RULE: Information can appear in only one location at one time.
DISRUPTIVE TECHNOLOGY: Shared databases.
NEW RULE: Information can appear simultaneously in as many places as it is needed.

OLD RULE: Only experts can perform complex work.
DISRUPTIVE TECHNOLOGY: Expert systems.
NEW RULE: A generalist can do the work of an expert.

OLD RULE: Businesses must choose between centralization and decentralization.
DISRUPTIVE TECHNOLOGY: Telecommunications networks.
NEW RULE: Businesses can simultaneously reap the benefits of centralization and decentralization.

OLD RULE: Managers make all decisions.
DISRUPTIVE TECHNOLOGY: Decision-support tools (database access, modeling software).
NEW RULE: Decision-making is part of everyone's job.

OLD RULE: Field personnel need offices where they can receive, store, retrieve and transmit information.
DISRUPTIVE TECHNOLOGY: Wireless data communications and portable computers.
NEW RULE: Field personnel can send and receive information wherever they are.

OLD RULE: The best contact with a potential buyer is personal contact.
DISRUPTIVE TECHNOLOGY: Interactive videodisc.
NEW RULE: The best contact with a potential buyer is effective contact.

OLD RULE: You have to find out where things are.
DISRUPTIVE TECHNOLOGY: Automatic identification and tracking technology.
NEW RULE: Things tell you where they are.

OLD RULE: Plans get revised periodically.
DISRUPTIVE TECHNOLOGY: High-performance computing.
NEW RULE: Plans get revised instantaneously.

Source: Michael Hammer and James Champy

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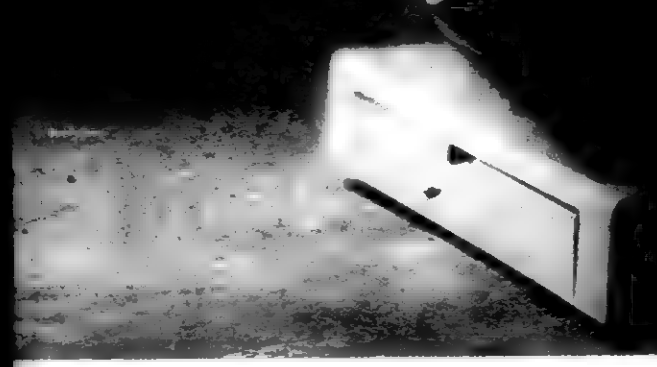

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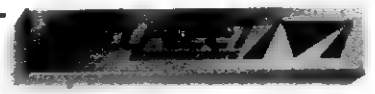

When Your Networks Are Complex, Your Choice Is Simple.℠

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Training for the client/server leap

By David A. Kelly

IF YOU'RE AN INFORMATION systems professional specializing in mainframes, now is the time to retrain yourself so you won't be left behind when the big machines are unplugged at your company.

The good news is that you can teach yourself many of the skills necessary for a client/server job. Client/server re-engineering experts agree that it's an excellent idea to buy a PC with DOS, Microsoft Corp.'s Windows 3.1 and Windows-based applications.

Experts also say IS professionals interested in making the shift should focus on the following areas:

•**The PC/workstation environment.** "You are dealing with a very complex set of systems, networking and applications software. The managers have to get used to dealing with a wide range of software and hardware," says Majid Naderkhani, assistant vice president of business systems development at Sprint Corp.

•**Servers.** A typical Unix-based server has a host of areas that need professional control: relational database management systems, stored procedures and triggers, network and server operating systems, network gateways, version control and interface maintenance.

•**Open system standards.** Client/server systems require a knowledge of standards — for example: Posix, Government Open Systems Interconnect Profile, SQL and Windows — that are the basis for building portable and interoperable applications. Windows is the entry-level technology to the client/server world, says Peter Minnal, president of Technology Insight Corp., a Marblehead, Mass., consultancy specializing in software re-engineering and client/server tools.

•**RDBMS.** "One of the easiest ways to migrate from mainframes is if you have relational database skills," says George Schussel, chairman of Digital Consulting, Inc., an IS consultancy in Andover, Mass. Schussel's advice is to move away from old-style databases such as VSAM and IMS and to learn SQL-based RDBMSs such as Oracle Corp.'s Oracle 7 and IBM's DB2.

•**Object-oriented techniques.** IS professionals will have to make the change from procedural code to object-oriented code and treat business processes as objects. To do this, Minnal suggests getting involved in Windows and linking Windows applications to become familiar with the techniques.

•**Graphical user interfaces (GUI) and fourth-generation languages (4GL).** Most applications are now being written using a GUI and 4GLs. Schussel suggests learning a GUI such as Windows or IBM's OS/2 2.0 and a 4GL such as Uniface Corp.'s Powerbuilder or Microsoft's Visual Basic.

Kelly is a free-lance writer in West Newton, Mass.

Discard assumptions

Some companies will teach their mainframers the skills they need to take on client/server jobs. Sprint is one such company, according to Majid Naderkhani, assistant vice president of business systems development.

"We found that we really needed the large-system expertise that our mainframers had because the people we hired from the outside didn't understand how all of our systems fit together and the ramifications of the systems they were designing," Naderkhani says.

"But we also found that the experienced mainframe managers did not look at how to implement software in a distributed environment. Instead, they just used assumptions that were valid in the mainframe world. They had to relearn how to make the software operational." —*David A. Kelly*

It can be done

When Standard Commercial Tobacco Corp. in Wilson, N.C., decided to switch three years ago from an IBM 4341 to a client/server environment consisting of Windows 3.1, Powerbuilder 2.0, a NetFrame Systems, Inc. file server, LAN Manager 2.1 and a Sybase, Inc. 4.9 SQL Unix server platform, Frances Williams, software development manager, had to convert her 18 years of mainframe experience into client/server skills.

The move was difficult, but it had its rewards. "Coming from a mainframe background, it was hard to work in the PC environment, with cable problems and network problems and software problems," Williams says. "But once we got oriented, we made a lot of progress."

Williams made the transition

Standard Commercial used a team approach to develop its first client/server application. The composition of the transition team — four mainframers and four PC experts — enabled the mainframe professionals to learn client/server fast. "Any time we had problems, we were able to rely on team members with a PC background to help us," Williams says.

Williams adds that the SQL database approach was one of the hardest things for her to learn. Instead of the record-oriented databases she was familiar with, she had to learn new programming techniques to efficiently use the power of the SQL database. But Williams says she finds SQL databases much more powerful than mainframe databases.

The rollout of the first completed application, which took 10 months, was a success. "The users were ecstatic with the graphical approach and the way it looked and worked," she says.

"The big success on the first phase just really convinced everyone that they had made the right decision and encouraged us to continue with the project."

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Computerworld/CorpTech Career Index

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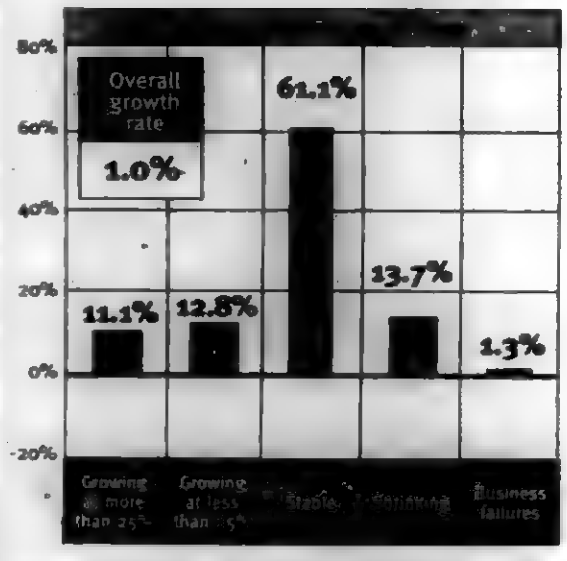

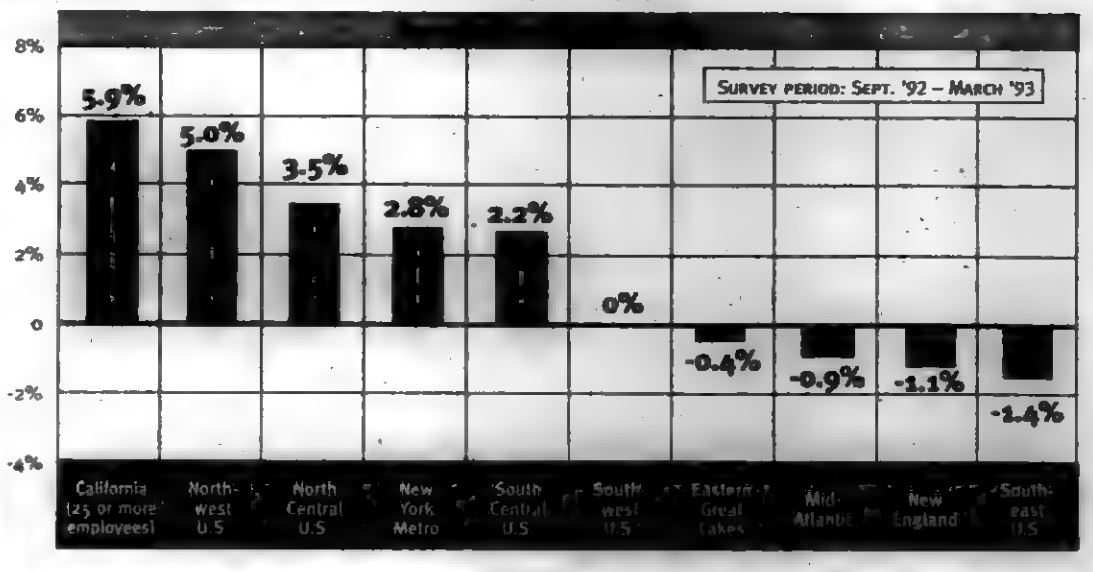

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Household goods and freight carrier business

Movers not exactly shakers

By Joe Panepinto

NEARLY 50 YEARS after Ernest S. Wheaton founded Wheaton Worldwide Van Lines, a $60 million-per-year household goods and freight carrier based in Indianapolis, the company's 300 agents around the country can still ask Ernie what's going on.

Today, however, Ernie is really ERNIE (Electronic Rating Network and Information Exchange), a PC package written in Fox Software, Inc.'s FoxPro by Wheaton's information systems department.

"We built ERNIE to be a little humorous and fun," says Gene Snipes, director of IS at Wheaton. "It has a completely mouse-driven interface that has caricatures of a guy we call Ernie on the screen."

Actually, there may be more than a little method to Wheaton's madness. In the household goods and freight carrier business, IS professionals can expect to run into a healthy dose of computer naivete, if not downright computer phobia. "Lots of people in the moving industry have been in it a long time and have been slow to adapt to computers — lots still have the old adding machines where you punch in numbers and pull the handle down," Snipes jokes.

As a result, IS professionals entering the industry can expect to write applications for a fairly unsophisticated, but increasingly demanding, audience. The primary goal of any development is ease of use.

> "Our industry is not so much interested in being state-of-the art technologically as it is interested in being cost-effective."
>
> *— Chuck Berning,*
> *Director of technology and*
> *production services*
> *Mayflower Transit*

All of the applications at Wheaton, including ERNIE, the PC-to-Application System/400 interfaces, the electronic-mail system and all AS/400 applications, were written in-house or by contract programmers.

"We try to run pretty lean," Snipes says. "In this era of deregulation, discounts are steep and margins are thin."

Running lean is a reality across the industry. National Van Lines in Broadview, Ill., a $40 million-per-year operation, runs its AS/400-based IS operation with fewer than 20 employees. Mayflower Transit, Inc., the $500 million goods carrier in Indianapolis, has held steady for several years with an IS staff of abut 80.

And at Bekins, the Glendale, Calif.-based carrier, deregulation, the recession and the soft real estate market have forced a 25% reduction in the IS work force during the past five years, from 100 staff members to 75.

This is an industry where support and maintenance are in much greater supply than technological innovation.

"Our industry is not so much interested in being state-of-the-art technologically as it is interested in being cost-effective," says Chuck Berning, director of technology and production services at Mayflower.

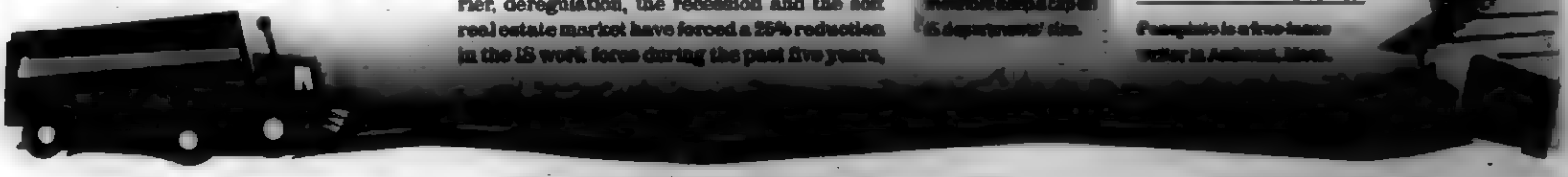
Still, some companies are pushing the envelope. At Bekins, IS staff members developed a PC-based system that agents can use as a front end to the company's IBM 3090 series mainframe. Becom (Bekins Communication Package) sends data from the PCs through Tymenet in Teletype transactions to a DB2 database running on the mainframe.

IS personnel at Bekins are involved in several functions: Some work in Pascal on the yearly update release of Becom; some work on mainframe application maintenance and support of Cobol; others work on the help desk.

By offering fairly comprehensive help desk services, Bekins is taking a different approach to supporting a user community that "is not the most computer-literate," says Bill Bullington, manager of customer services.

Because moving companies have fairly unsophisticated users, they haven't had the demand for state-of-the-art systems. Most have mainframes with PC applications that they've written themselves, and when they need more specific skills, they call on contractors.

It will be some time before this industry pulls ahead technologywise. IS managers say that in their industry, systems may save money, but they don't move the freight faster.



Panepinto is a free-lance writer in Amherst, Mass.

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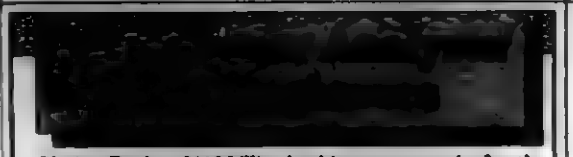

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Marketplace

Don't forsake power in negotiations

This is the first in a series of articles that presents negotiating questions asked by information systems purchasers. Joe Auer, president of International Computer Negotiations, Inc., a negotiations, consulting and training firm in Winter Park, Fla., provides the answers.

I evaluated several comparable software products from different vendors and selected one that I thought offered the best solution. The costs looked pretty good because I gave the vendor my budget. I've also informed both management and the end users that I've selected a vendor and have begun the necessary steps to acquire the products.

What's left is to negotiate for favorable contract terms, but the vendor is unwilling to negotiate. The worst part is that almost all of our deals seem to come down to this type of scenario, although it's not necessarily company policy on acquiring new products.

—Director of purchasing at a major corporation

Unfortunately, you've lost your power in these negotiations. By telling the vendor you have chosen its product over all the rest and by providing your budget numbers, you have painted yourself into a corner. Now, your only option is to beg for everything.

A tactic you could have considered using is what we call the "zone of consideration" (see story below). To maintain your negotiating position, make vendor selection your last step. The evaluation process is your time to negotiate, and your choice of vendor should be a result of those negotiations.

You need to remember that every move, statement or activity by anyone in your company who interacts with vendors — beginning when the salesperson first appears — will have some impact on the success of your negotiations.

A customer's power is very high during the evaluation stage. When you tell a number of suppliers that you're considering a product, most will do whatever it takes to get your business.

Once a customer selects a vendor, the power is turned over to the vendor and often increases as the customer's commitment grows. If you start negotiating at the last minute, you have no power at all.

NEGOTIATING DILEMMAS

In the middle of negotiating for a computer system and don't know the next move? Have questions about past deals? If yes, we want to help. Phone or fax your questions to Jodie Naze at Computerworld, and a negotiating pro will advise you. Call (800) 343-6474, ext. 727, or send a fax to (508) 875-8931.

To use the "zone of consideration," you should have an interdisciplinary negotiating team. Although the players change for each deal, the team should typically include a technical person, a contracts person such as a lawyer, individuals from finance and purchasing, a manager of end users and, ideally, someone from management.

When you've narrowed down your vendors, contact two or more of them and say the following:

- You are in the zone of consideration, along with at least one other supplier.
- We will approach each vendor separately; the one with the best deal is probably going to win our business.
- We recommend that someone with sufficient authority from your company always be available.
- Keep in mind that you are still being evaluated. You will be getting plus and minus points for your performance — especially your responsiveness to our financial and contractual concerns.
- When we are ready to negotiate, your score will be lowered if you're unreachable or if we can't find the person responsible for the contracts or someone with the right authority level.
- We believe that your responsiveness is going to be at its highest during the presale period. If you are not responsive now, your responsiveness will only decrease after you get our money.
- Furthermore, we reserve the right to negotiate and complete the deal with anyone in the zone of consideration — at any time. We will do this without "last chances" or notice to anyone. If you don't have your best deal on the table at all times, we might do business with someone else.

Under competitive negotiation like this, prices, contractual warranties and remedies usually improve; however, we don't suggest holding an auction or disclosing one vendor's proposal to another vendor. It's unethical and serves no purpose that can't be accomplished some other way. Vendors may even give a much better price if their competition's offer is unknown.

At some point in this process, one vendor will offer a better deal. Only then do you select your vendor.

What does this approach do for your negotiating position? It gives you a lot of power, and that's the name of the game. *— Joe Auer*

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Profinas 4/33	$1,050	$1,550
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LTE-286	$650	$700
DeskPro 486/33i	$1,850	$1,725
Apple Macintosh SE	$625	$650
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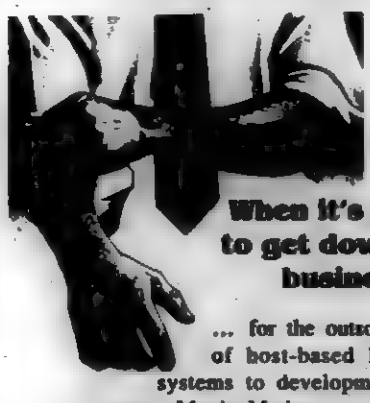

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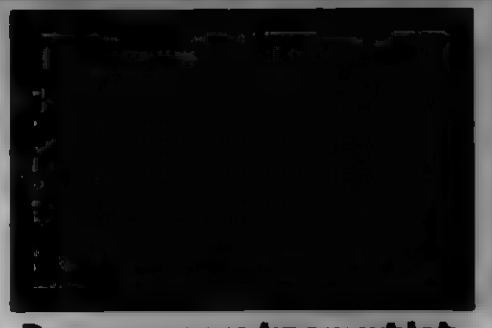

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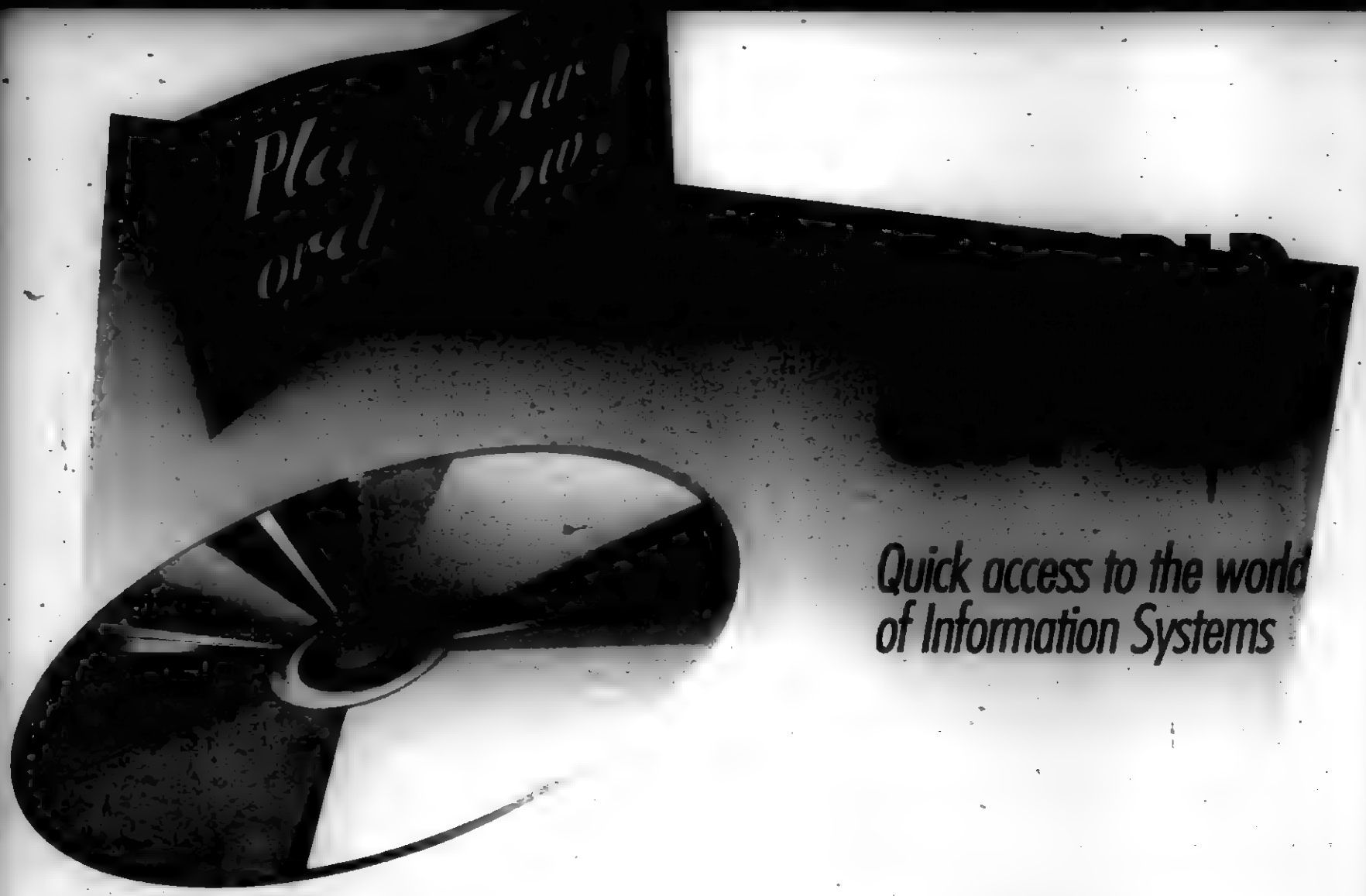

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Percent

Applied Systems Inc.	28.6	Applied Communication Corp.	-17.1
Globally Technologies Inc.	19.1	Pinetree Inc. (L)	-17.0
CadSoft	18.9	Digital Systems Int'l Inc. (L)	-16.0
Electrosys	18.2	Communication Labs Inc.	-15.0
Intrada Corp.	17.6	Cosmos Logic (L)	-14.8
Ridan Inc. (L)	16.7	Networks Kingdom	-13.6
Knowledgeware Inc. (L)	16.7	Arrogant Corp.	-13.0
Cadence Software Inc. (H)	15.7	Quantitative Office Sys.	-11.8

Dollar

Apple Systems Inc.	9.75	Cosmos Logic (L)	-1.13
Matsushita Electronics (H)	6.25	Advanced Micro Devices (H)	-2.75
Synoptics Communications (H)	5.25	Zebra Corp.	-2.25
Intl Software Inc.	4.88	Creative Technologies Inc.	-2.25
Microsoft Corp.	4.25	Policy Management Sys.	-2.25
Intel Corp.	3.75	Paychex	-2.00
Cadence Software Inc. (H)	3.50	Electron Systems Inc.	-2.00
Compuvision Systems	3.50	Autodesk Inc.	-1.88

A decent proposal

Leading technology stock analysts answer the question: If you had $1 million to invest in only one stock, which would you pick?

William Milton Jr.
Analyst
Brown Brothers Harriman & Co.

"Stratus. The valuation is very low, the earnings comparisons are going to get much better as we move through the year, and street earnings estimates are conservative. I think collapsed sales to IBM and Olivetti have masked some real strengths — there's some momentum there outside of those two.

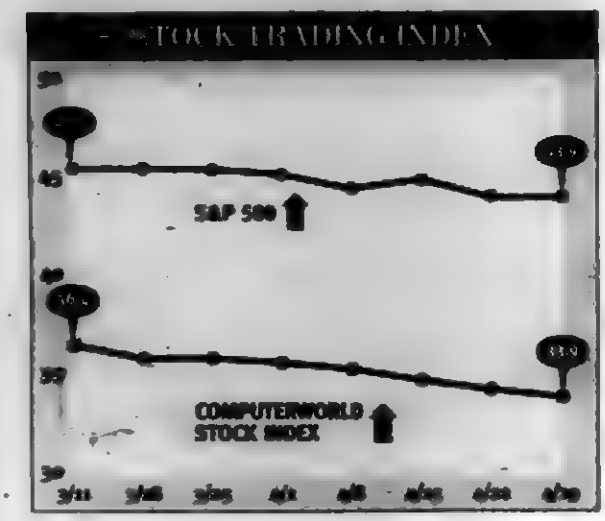
"I'm not looking for a home run, but I think I'd get a single out of it."

Neeraj Vohra
Analyst
Standard & Poor's Corp.

"Long term, there's no way I would put a million dollars in one technology stock. I've seen even large cap stocks move 30% in one day. You get ulcers that way.

"Short term is more interesting. With about a year's turnaround, the top of the list would be Digital, Cray Research or possibly Commodore. Commodore would be a huge long shot, but by December that could be a hot stock."

— Compiled by Derek Slater



Exch	52-Week High	52-Week Low		April 30 Stock Price	Wk Net Change	Wk Pct Change
MAINFRAMES, INTEGRATED SYSTEMS						
OTC	36.75	9.63	3 COM Corp.	32.75	1.88	6.1
NYS	80.25	61.38	American Info Techs Corp.	76.00	-1.13	-1.5
NYS	60.38	40.63	AT&T	56.38	-0.13	-0.2
OTC	3.56	0.75	Aztec Communication Corp.	1.81	-0.38	-17.1
OTC	24.50	10.25	Banyan Systems Inc.	15.00	-2.00	-11.8
NYS	56.75	42.38	Bell Atlantic Corp.	51.75	-1.13	-2.1
NYS	57.50	46.75	BellSouth Corp.	53.75	-0.13	-0.2
NYS	6.25	3.63	Bolt, Beranek & Newman	4.50	-0.13	-2.7
OTC	18.50	9.50	Broadband Technology (L)	11.75	1.00	9.3
NYS	93.00	42.13	Cabletron Systems	87.38	3.50	4.2
OTC	34.75	17.75	Chipcom Corp.	32.25	2.50	8.4
OTC	48.25	18.50	Cisco Systems Inc.	43.25	0.75	1.8
OTC	20.50	5.50	Compression Labs Inc.	8.50	-1.50	-15.0
OTC	4.63	0.88	Data Switch Corp.	3.44	0.00	0.0
NYS	22.13	12.75	Digital Comm. Assoc. (L)	12.75	-0.63	-4.7
OTC	12.75	5.25	Digital Systems Int'l Inc. (L)	5.25	-1.00	-16.0
OTC	34.13	4.00	DSC Communications (H)	34.13	2.50	7.9
OTC	9.50	4.75	Fibronic Int'l Inc.	6.50	-0.25	-3.7
OTC	28.50	8.75	Fiserv Corp.	10.50	-0.50	-4.5
OTC	4.38	1.50	Gandalf Technologies Inc.	3.50	0.56	19.1
OTC	2.06	0.69	Gateway Communications	1.06	0.00	0.0
NYS	11.50	2.88	General Datacomm Inds.	10.50	1.00	10.5
ASE	4.13	2.00	Go Video	2.19	-0.13	-5.4
NYS	37.75	30.63	GTE Corp.	35.88	1.00	2.9
NYS	84.25	62.50	ITT Corp.	82.13	1.63	2.0
OTC	49.25	29.88	MCI Communications Corp.	47.00	-1.00	-2.1
OTC	12.00	2.25	Microcom Inc.	3.50	0.00	0.0
OTC	24.25	4.75	Metrix Corp.	6.00	0.50	9.1
OTC	19.00	8.75	Network Computing Devices	10.50	0.00	0.0
NYS	15.38	5.38	Network Equipment Tech.	6.38	-0.13	-1.9
OTC	23.25	8.00	Network General	8.88	-1.38	-13.4
OTC	15.75	8.63	Network Systems Corp.	9.00	-0.75	-7.7
OTC	64.00	13.63	Newbridge Networks Corp.	61.25	3.25	2.1
NYS	46.00	30.50	Northern Telecom Ltd.	36.75	2.25	6.5
OTC	35.25	22.50	Novell Inc.	30.50	-0.75	-2.4
NYS	92.50	75.00	Nynex Corp.	84.63	-1.88	-2.2
OTC	30.00	14.50	Octel Communications Corp.	20.50	-0.75	-3.5
OTC	6.50	3.38	Perrin Data Comm Networks	4.50	0.25	5.9
OTC	40.50	10.25	Picturetel Corp.	21.00	1.75	9.1
OTC	15.25	4.88	Proteon Inc. (L)	4.88	-1.00	-17.0
NYS	30.38	19.36	Scientific Atlanta Inc.	25.88	1.13	4.5
NYS	81.50	59.38	Southwestern Bell Corp.	77.38	-0.13	-0.2
NYS	33.25	21.00	Sprint Corp.	31.25	-1.88	-5.7
OTC	27.00	8.75	Standard Microsystems Corp	15.00	1.63	12.1
OTC	18.50	6.88	Stratacom Inc.	12.50	0.25	2.0
OTC	111.50	22.75	Synoptics Communications (H)	111.50	5.25	4.9
OTC	7.13	4.25	Telebit Corp.	4.63	0.25	5.7
OTC	9.38	2.13	Telematics Int'l Inc.	6.00	-0.63	-9.4
OTC	25.50	13.38	US Robotics	20.75	1.50	7.8
NYS	45.00	34.38	U S West Inc. (H)	42.63	-0.25	-0.6
OTC	46.50	12.00	Wellfleet Communications	43.25	2.75	6.8
OTC	18.50	7.00	Xircom	9.25	0.00	0.0
PERSONAL COMPUTER SYSTEMS						
OTC	7.25	2.50	Advanced Logic Research	2.88	0.00	0.0
OTC	65.25	41.50	Apple Computer Inc.	51.75	2.00	4.0
OTC	24.25	11.25	AST Research Inc.	14.00	0.25	1.8
NYS	12.88	4.25	Commodore Int'l (L)	6.38	-0.13	-2.0
NYS	58.50	23.13	Compaq Computer Corp.	48.38	-1.00	-2.0
OTC	49.88	15.00	Dell Computer Corp.	29.25	0.88	3.1
NYS	82.88	50.25	Hewlett Packard Co.	74.25	0.88	1.2
NYS	33.50	16.13	Silicon Graphics	33.50	1.63	5.1
OTC	41.00	22.50	Sun Microsystems Inc.	27.25	1.25	4.8
NYS	32.13	22.25	Tandy Corp.	29.63	0.88	3.0
OTC	11.00	2.75	Zeos International Ltd.	4.38	0.00	0.0
LARGE SYSTEMS						
ASE	18.38	5.00	Amdahl Corp.	5.00	-0.75	-13.0
NYS	9.75	4.25	Convex Computer	5.13	0.38	7.9
OTC	6.13	1.88	Cray Computer	2.50	-0.25	-9.1
NYS	39.75	19.00	Cray Research Inc.	28.63	-0.13	-0.4
NYS	13.88	7.13	Data General Corp.	9.50	0.13	1.3
NYS	49.25	30.38	Digital Equipment Corp.	44.00	0.63	1.4
NYS	38.63	26.63	Harris Corp.	36.63	-0.25	-0.7
NYS	100.38	65.88	IBM	49.00	1.00	2.1
OTC	22.00	5.50	Kendall Square Research	15.50	1.00	6.9
NYS	125.50	83.00	Matsushita Electronics (H)	125.50	6.25	5.2
OTC	17.00	6.00	Pyramid Technology	14.63	1.00	7.3
OTC	24.00	11.13	Sequent Computer Sys.	19.25	0.50	2.7
OTC	16.38	1.38	Sequoia Systems Inc.	2.00	-0.25	-11.1
NYS	48.38	29.50	Stratus Computer Inc.	33.50	-0.13	-0.4
NYS	16.88	9.88	Tandem Computers Inc.	10.88	0.13	1.2
NYS	13.88	7.75	Unisys Corp.	11.75	0.25	2.2
ASE	4.13	0.06	Wang Labs Inc. (H)	0.50	0.00	0.0
SOFTWARE						
OTC	57.00	25.25	Adobe Systems Inc.	57.00	9.75	20.6
OTC	22.25	10.25	Aldus Corp.	14.50	-1.38	-8.7
OTC	16.63	5.63	American Software Inc.	6.00	-0.38	-5.9
OTC	28.13	9.75	Ask Computer Systems	11.00	0.00	0.0
OTC	56.50	29.75	Autodesk Inc.	40.25	-1.88	-4.5
OTC	15.00	2.50	Bachman Info. Systems (L)	2.88	0.25	9.5
OTC	43.00	34.75	BGS Systems Inc.	36.50	-0.50	-1.4
OTC	84.13	37.25	Bmc Software Inc.	50.13	4.88	10.8
OTC	28.25	17.00	Boole & Babbage	22.75	-1.50	-6.2
OTC	54.50	17.50	Borland Int'l Inc.	22.75	0.25	1.1
OTC	6.50	3.00	CE Software	3.13	-0.25	-7.4
ASE	26.50	6.25	Cheyenne Software Inc. (H)	26.50	3.50	15.2
OTC	19.50	8.25	ChipSoft	11.88	1.88	18.8
OTC	9.75	5.63	Cognos Inc.	6.50	-0.13	-1.9
NYS	27.38	10.88	Computer Associates	23.13	0.13	0.5
NYS	12.38	2.75	Computervision Corp. (L)	3.13	-0.25	-7.4
OTC	34.25	19.25	Compuware Corp.	24.75	1.50	6.5
OTC	14.75	5.75	Consware Inc. (L)	6.50	-0.25	-3.7
OTC	17.25	10.75	Corel Corp.	14.25	0.63	4.6
OTC	29.25	6.00	Easel Corp.	7.00	0.50	7.7
OTC	25.25	12.00	4th Dimension	17.75	-1.25	-6.6
OTC	20.25	6.00	Frame Technology (L)	6.75	0.25	3.8
OTC	20.75	10.50	Group I Software	12.00	-1.00	-7.7
OTC	35.25	19.50	Gupta	20.50	-0.50	-2.4
OTC	8.75	3.50	Hogan Systems Inc.	7.38	0.38	5.4
OTC	25.75	11.25	Hars	14.50	-0.75	-4.9
OTC	34.75	18.50	Information Resources	31.25	2.50	8.7
OTC	42.00	12.13	Informix Corp.	36.50	2.88	8.6
OTC	17.75	9.50	Intergraph Corp. (L)	10.25	0.00	0.0
OTC	13.63	7.75	Interleaf Inc.	8.25	-1.00	-10.8
OTC	18.00	6.75	Intersolv Inc.	7.50	0.00	0.0
OTC	16.00	8.25	Knowledgeware Inc. (L)	9.63	1.38	16.7
OTC	54.75	26.25	Legent Corp. (L)	29.50	1.75	6.3
OTC	33.25	14.75	Lotus Development	25.75	1.00	4.0
OTC	23.00	7.75	MathSoft	10.25	0.50	5.1
OTC	23.25	5.25	McAfee Associates	7.75	0.25	3.3
OTC	11.63	1.88	Meca Software	11.13	-0.25	-2.2
OTC	15.00	5.25	Mentor Graphics	9.13	0.38	4.3
OTC	44.00	27.25	Micro Focus	32.00	0.00	0.0
OTC	19.00	4.38	Micrograf Inc.	4.63	-0.25	-5.1
OTC	95.00	65.50	Microsoft Corp.	86.25	4.25	5.2
OTC	37.50	14.00	Oracle Corp.	35.63	1.88	5.6
OTC	31.88	15.38	Parametric Technology	27.50	1.75	6.8
OTC	40.50	22.50	Peoplesoft	30.75	1.50	5.1
OTC	9.50	3.50	Progress Technologies	5.25	0.38	7.7
OTC	40.00	28.25	Powersoft (L)	28.25	-1.00	-3.4
OTC	25.00	11.25	Platinum Technology	13.75	0.75	5.8
OTC	61.50	29.00	Progress Software Corp.	37.50	2.25	6.4
OTC	17.50	2.94	Quarterdeck Office Sys.	3.28	-0.44	-11.8
OTC	24.50	11.75	Rainbow Technologies Inc.	20.00	-0.75	-3.6
OTC	16.00	4.00	Rasterops	6.50	1.00	18.2
OTC	15.25	3.63	Ross Systems	10.75	-0.75	-6.5
OTC	27.25	8.50	Sapiens USA Inc.	24.50	-1.25	-4.9
OTC	19.50	6.75	Software Publishing Corp.	7.50	-0.50	-6.3
OTC	9.13	2.00	Software Toolworks Inc.	7.50	-0.25	-3.2
OTC	4.88	0.75	Spinnaker Software	1.63	0.13	8.3
OTC	12.75	3.25	State of the Art	9.13	-0.63	-6.4
NYS	24.63	13.75	Sterling Software Inc.	19.75	-0.38	-1.9
OTC	18.75	8.00	Struct. Dynamics Research	15.25	-1.25	-7.6
OTC	68.25	21.00	Sybase Inc.	57.88	1.88	3.3
OTC	44.25	5.88	Symantec Corp.	12.88	-0.25	-1.9
NYS	12.50	5.25	Systems Center Inc.	10.25	-0.25	-2.4
OTC	25.50	10.00	System Software Assoc.	12.50	-0.25	-2.0
OTC	7.75	2.50	Trimix Corp.	3.88	0.00	0.0
OTC	23.75	9.13	ViewLogic Systems	14.88	-0.38	-2.5
OTC	23.50	6.75	Walker Interactive Systems	7.25	0.50	7.4
OTC	3.19	1.38	Wordstar	2.38	0.25	11.8
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices (H)	28.25	-2.75	-8.9
NYS	21.38	9.00	Analog Devices Inc.	19.13	1.13	6.3
OTC	20.75	7.63	Atmel Corp.	19.25	-0.88	-4.3
OTC	9.38	2.75	Chips and Technologies	3.06	-0.19	-5.8
OTC	39.75	13.00	Cirrus Logic (L)	18.00	-3.13	-14.8
NYS	12.38	7.38	Cypress Semiconductor Corp	10.38	0.13	1.2
NYS	16.13	7.50	Dallas Semiconductor	13.13	0.50	4.0
OTC	121.25	46.50	Intel Corp.	96.75	3.75	4.0
NYS	14.13	6.88	LSI Logic Corp.	11.00	-0.75	-6.4
NYS	28.50	13.13	Micron Technology	23.13	0.75	3.4
NYS	74.88	37.13	Motorola Inc.	73.38	2.00	2.8
NYS	14.13	8.50	National Semiconductor	13.00	-0.63	-5.1
OTC	18.50	6.75	Sierra Semiconductor (L)	7.50	0.25	3.4
OTC	38.50	22.25	SynOpsys	34.75	-0.50	-1.4
NYS	63.38	32.25	Texas Instruments	57.25	1.63	2.9
OTC	8.88	6.00	VLSI Technology	6.75	-0.38	-5.3
OTC	7.63	2.13	Weitek	6.25	0.00	0.0
ASE	9.63	4.13	Western Digital Corp.	4.75	-0.13	-2.6
OTC	37.50	14.50	Xilinx	32.00	-1.13	-3.4
OTC	27.84	12.50	Zilog Inc.	25.25	0.00	0.0
PERIPHERALS AND SUBSYSTEMS						
OTC	33.75	11.75	American Power Conversion	26.75	-0.88	-3.2
OTC	20.38	13.66	Banctec Inc.	19.25	1.00	5.5
OTC	18.00	6.25	Cambex Corp.	7.50	0.25	3.4
ASE	18.38	6.50	Cognitronics Corp.	7.50	0.00	0.0
NYS	25.50	12.38	Conner Peripherals	12.38	-0.75	-5.7
OTC	38.50	10.75	Creative Technologies Inc.	26.00	-2.25	-8.0
OTC	30.75	14.25	Data Race Inc.	20.00	0.50	2.6
ASE	17.00	4.75	Dataram Corp.	9.75	0.25	2.8
NYS	31.50	8.66	EMC Corp. (H)	31.50	2.75	9.6
OTC	10.50	5.38	Emulex Corp.	6.63	-0.75	-10.2
OTC	19.00	13.25	Evans & Sutherland	16.63	0.75	4.7
OTC	38.25	12.00	Exabyte	13.00	-0.63	-4.6
OTC	26.00	7.09	Intelligent Info. Systems	22.25	-1.25	-5.3
OTC	8.88	3.88	Iomega Corp.	5.00	0.75	17.6
OTC	23.00	5.75	IPI Systems Inc.	7.25	0.25	3.6
OTC	24.00	10.75	Kimag Inc.	17.25	1.00	6.2
OTC	19.63	5.88	Maxtor Corp. (L)	6.25	-0.50	-7.4
OTC	11.75	5.75	Micropolis Corp.	6.50	0.13	2.0
NYS	136.00	92.75	3M Corp	112.25	-0.88	-0.8
OTC	7.75	4.00	Printronix Inc.	7.38	0.38	5.4
NYS	17.25	6.88	QMS Inc. (H)	14.75	-1.75	-10.6
OTC	17.88	13.63	Quantum Corp.	13.75	0.75	5.8
OTC	12.75	3.38	Radius Inc. (L)	4.13	0.31	8.2
NYS	16.25	7.50	Recognition Equipment	13.50	0.38	2.9
OTC	13.88	5.00	Relcom Inc. (L)	6.13	0.88	16.7
OTC	22.38	12.00	Seagate Technology	15.00	-0.38	-2.4
NYS	49.50	18.00	Storage Technology	27.75	0.63	2.3
NYS	27.88	16.88	Tektronix Inc.	25.38	-1.13	-4.2
NYS	88.88	66.75	Xerox Corp.	76.63	-2.25	-2.9
SERVICES						
OTC	23.50	12.66	American Mgmt. Systems	18.50	-0.63	-3.3
NYS	4.75	3.00	Amacomp Inc.	3.50	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	26.50	0.75	2.9
NYS	56.13	38.75	Auto Data Processing	49.50	1.63	3.4
NYS	17.25	9.41	Ceridian Corp.	14.75	-0.38	-2.5
NYS	17.38	13.13	Comdisco Inc.	15.50	0.13	0.8
OTC	8.00	4.50	Computer Horizons	7.50	-0.25	-3.2
NYS	80.50	57.00	Computer Sciences	79.13	2.50	3.3
NYS	9.63	6.88	Computer Task Group	7.25	0.38	5.5
NYS	40.50	22.00	CompUSA Inc.	29.88	0.88	3.0
OTC	17.50	6.00	Corporate Software	11.00	-1.00	-8.3
OTC	25.50	7.38	Egghead Discount Software	8.38	-0.25	-2.9
NYS	35.88	25.25	General Motors E (EDS)	31.38	-1.75	-5.3
OTC	25.50	9.25	Imacon Corp.	16.13	-1.00	-5.8
OTC	15.38	6.25	Intelligent Electronics	13.63	0.38	2.8
OTC	14.38	6.63	Medisel *	10.50	0.63	6.3
OTC	14.75	5.75	Microage Inc.	13.25	0.25	1.9
OTC	43.00	21.75	Paychex	38.75	-2.00	-4.9
NYS	87.25	37.00	Policy Management Sys.	80.13	-2.25	-2.7
NYS	35.38	16.81	Reynolds and Reynolds	34.50	1.63	4.9
OTC	31.75	22.00	SEI Corp.	28.50	0.25	0.9
OTC	24.38	16.88	Shared Medical Systems	20.38	0.38	1.9
OTC	13.88	5.75	SHL Systemhouse	11.00	0.00	0.0
OTC	29.25	18.25	Software Spectrum Inc.	23.38	-0.13	-0.5
OTC	33.75	22.25	Sungard Data Systems	28.88	-1.88	-6.1
NYS	6.00	1.13	Ultimate Corp.	3.25	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Sybase sets its own direction

Early adopter of client/server sets sights on enterprise computing

By Jean S. Bozman
EMERYVILLE, CALIF.

Until recently, Sybase, Inc. was the small database firm preaching the virtues of client/server computing. Few understood its message, and most of the market was flocking to rival Oracle Corp., which was doubling in size every year. But the 6-year-old company has recently undergone a rapid growth spurt fueled in turn by growing interest in the notion of client/server computing.

These days, Sybase is trying to boost its growth further by attempting to gain a technology edge with System 10, its upcoming SQL Server database for enterprise computing (see story page 8).

As it tries to break out of the pack led by Oracle, $265 million Sybase is following its own agenda, much as it did in 1987 when it shipped its first "client/server" database.

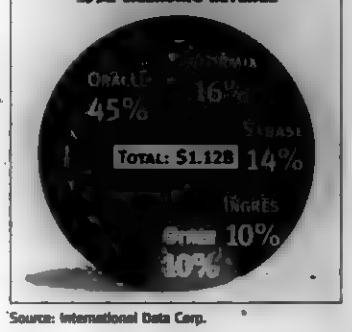
"Sybase has always been known for blazing their own technology path and not necessarily following the rest of the industry," said Peter Kastner, a vice president at Aberdeen Group in Boston. "Clearly, they can differentiate themselves by finding a better model for distributed enterprise computing, and that's what they believe they've got with System 10."

Announced in November, System 10 will compete directly with the Oracle 7 distributed database, analysts said. Its enhanced Sybase SQL Server 4.9 database engine will be strengthened by software utilities that handle backup and recovery, distributed updates and console management. System 10's first module, the OmniSQL Gateway, shipped in April. Most System 10 modules are in beta-test sites and will ship sometime later in the year, said Marketing Vice President Stewart Schuster.

Playing catch-up

Sybase hopes its next-generation database will help it close the gap with Oracle

PERCENT OF WORLDWIDE 1992 LICENSING REVENUE



Source: International Data Corp.

Impressive features

Longtime Sybase users cited greater reliability, performance and backup as System 10's top attractions.

"The Replication Server would be high on our list because our bank distributes data globally," said Robert Kunimura, executive director of information technology at Swiss Bank Corp. in Chicago.

But Sybase could stumble yet. Users attending the fifth annual Sybase user conference in San Jose, Calif., last week said advanced server technology is incomplete without advanced development tools. Industry analysts said Sybase's Achilles' heel is its lack of a cohesive tool set: Some users have likened the current array of Sybase tools to a smorgasbord of unrelated products.

Users had criticized the firm's homegrown APT Workbench tools in recent years, prompting Sybase to enhance APT. In search of better tools, Sybase bought SQL Solutions, Inc. in Burlington, Mass., in January 1990; Deft, Inc. in Toronto in 1991; and Gain Technology, Inc. in Palo Alto, Calif., in 1992.

Tom Arnold, manager of information architecture at Silicon Graphics, Inc. in Mountain View, Calif., said he wants to see an integrated Sybase tool set — and soon. "It would be great if all my core applications were constructed with the same tool kit," Arnold said. Silicon Graphics uses a mix of Sybase tools and independent tools to support 200 SQL Server databases on its corporate network, he said.

Analysts said Sybase must regain strength in tools if it is to stay successful. Otherwise, users will continue to choose tools from other vendors, including those made by database rivals. A comprehensive tools announcement is planned for June, Schuster said.

Sybase recorded 65% growth in 1992, ending the year with $265 million in revenue. In contrast, giant Oracle's sales were relatively flat at about $4.6 billion. Sybase's user base doubled to 7,000-plus sites last year, including many that are rewriting mainframe applications to run on Unix, OS/2 or Novell, Inc. NetWare servers.

Divvying up the database pie

Even if Sybase is successful with System 10, it probably will not take significant market share from Oracle. That is because Oracle is much larger and has just fielded its Oracle 7 distributed database, analysts said.

Instead, Sybase — which analysts said they expect to reach the $400 million in sales mark by 1994 — is growing alongside the expanding client/server market and the trend toward downsizing.

The database maker is aided by two big business partners — Microsoft Corp. and IBM — in its efforts to gain marketing clout and find new accounts.

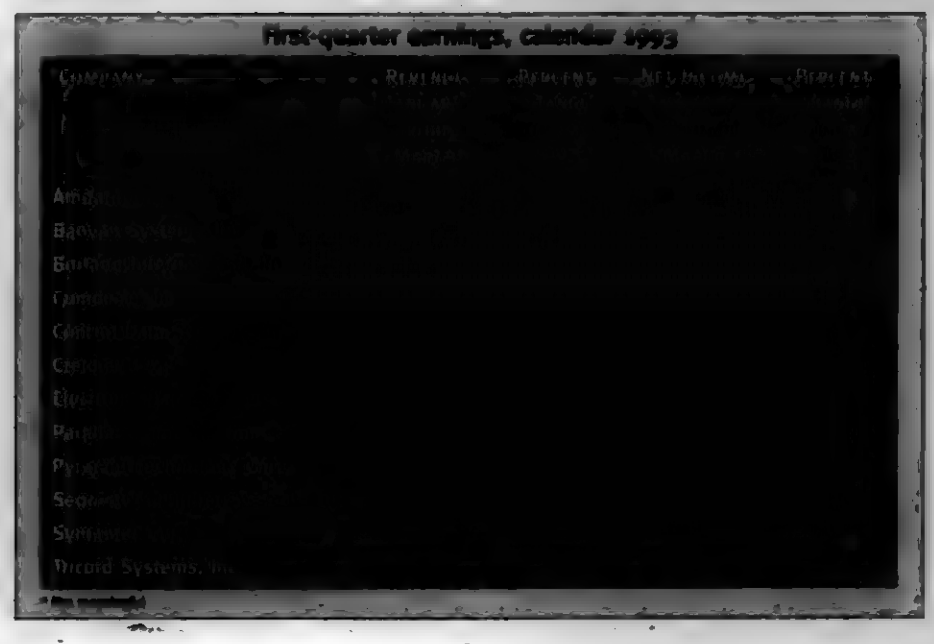
Sybase is vying for market share with two like-size rivals, The ASK Group, Inc.'s $283 million Ingres Products Division and $254 million Informix Software, Inc.

"To continue growing, Sybase not only needs to strengthen its tool strategy (see story at left), but it must work to improve customer support and absorb hundreds of new employees, some of whom have joined the company as a result of several acquisitions.

"It's fair to say that 100 people a month are joining Sybase," said [illegible] Schmidt, vice president of [illegible] support, tripling the number of [illegible] support personnel.

—Jean S. Bozman

First-quarter earnings, calendar 1993



Earnings all over the map

Mainframe vendors continued to wonder whether their ever-shrinking market would improve, while open client/server systems vendors enjoyed success and growth during the first quarter of calendar 1993. PC software vendors offered mixed results.

Amdahl Corp.'s first-quarter loss was dramatically larger than anticipated, as Amdahl's new line, introduced in February, caused users to push back purchase decisions pending product evaluations. Amdahl's first-quarter loss also included charges associated with reductions in its work force and manufacturing capacity.

Sequent Computer Systems, Inc. more than tripled its net income from the corresponding quarter in 1992. This reflects the company's direct end-user business strength, which grew 45%, from $49.1 million to $71.4 million, and accounted for 32% of the quarter's total revenue.

Borland International, Inc. ended 1993 with a net loss of $49.2 million compared with a net loss of $110.4 million in fiscal 1992. Fiscal fourth-quarter sales increased only 0.2%, although profits rose 119%. The quarter's success was chiefly fueled by the release of Paradox for Windows and sales of Quattro Pro for Windows, but the fiscal-year loss could not be offset by the Windows packages' low retail prices. —*Kevin Burden*

Wysiwyg

Computer Love Song

By Christian Tabak

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Unauthorized access
Is prohibited today.
Last interactive log in
Resulted in required
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Invariably too long,
Receiving file
In progress.
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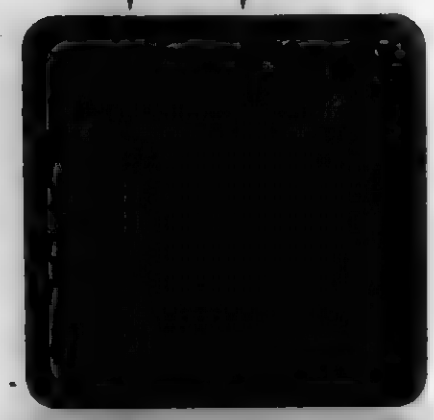

GREAT NAMES

Frosti Bergsson
General Manager
High Performance Systems Ltd.,
Reykjavik, Iceland

When this rep comes calling — RUN

In the action thriller *Point of No Return* (Warner Brothers), Bridget Fonda's character is a trained assassin whose cover is that of a sales rep for an actual hardware company in Sunnyvale, Calif. — SuperMac Technology.

Source: ID Systems magazine, February 1993

The Fifth Wave *by* Rich Tennant

Inside Lines

Another swing of the Pentium

Intel's much-awaited [illegible] Pentium microprocessor has been tested internally to run upwards of 110 MIPS — or more than twice the processing power of the [illegible] class chips, according to Daniel Hoskins, an Intel [illegible] manager. Hoskins, who spoke at Unisys' Cube and Use user group conference last week, said the next-generation Pentium 6 chip, which will incorporate 8 million to 10 million transistors, is less than 18 months from delivery. The Pentium 7, which boasts 16 million to 20 million transistors, is already under development. Intel's goal, Hoskins said, is to deliver a 2 billion instructions per second chip to market by the year 2000.

Gang way

IBM PC Co. is gearing up for announcements of PS/2 upgrades and new PS/1s in the middle of this month. PS/1s will now come with a local bus, while the PS/2s will get Pentium processor upgrade cards for the Models 55, 65, 150 and 335. Compaq, Dell, NCR, NEC and Advanced Logic Research, among others, will have fully Pentium-ready boxes on the 17th of the month. IBM-bashers may have to bite their tongues this time, though, as mid-June will bring completely [illegible], with local-bus graphics, on-board network adapters and application-specific digital signal processors, according to [illegible]. June will also bring IBM's Green PC.

How you see it, [illegible]

Almost lost in the [illegible] gave AMD a reprieve in its court fight with [illegible] new DX2 part. "AMD has a DX2 part now, and they didn't have an Intel Comdex," said Dean McCarron, analyst at [illegible] in Scottsdale, Ariz. "The DX2 was part of Intel's strategy to get away from the cloners. So what this means is that AMD now has Intel's neck now in its product line." Of course, it won't matter until sometime in 1994, when AMD begins shipping it in volume.

A UNITE-ed User Group?

Unisys customers who are members of the Use (former Sperry users) and Cube (Burroughs shops) user groups may finally be nearing a vote on combining the organizations. Panel members representing both Use and Cube have drawn up bylaws and a proposed structure for the new group, which would aptly be named Unite, or Unisys Information and Technology Exchange. Panel members said the ballots will be sent to Use and Cube members this summer, tallied by an independent auditor and decided on by the fall conference.

Fear and loathing

DEC is raising the bar for its commission-based sales force, which is expected to go into action this summer. The company will weed out those sales reps making less than $75,000 to $100,000. Meanwhile, DEC is designing a special June incentive plan to help reps earn extra revenue: a commission of 1% will be given to those closing deals of $1 million or more, the sources said.

Party crasher

KnowledgeWare will continue a push into the swamped client/server arena with GUI-builders for Unix and Windows, confirmed Mike Ryan, chief technology officer. Beta-test versions of CWS-GUI for Windows are going out this quarter; the third quarter is the target for the Unix tool, Ryan said.

While authorities in the U.S. continue to define the penalties for computer-related crimes, it appears China has settled on its punishment: execution. According to a Reuter news report, Shi Biao, who worked at the state-run Agricultural Bank of China, was executed by gunshot late last month after being found guilty of embezzling $175,000 via computer. It is the country's first publicized case of computer fraud. Phone, fax or CompuServe News Editor Alan Alper with news tips at (508) 343-6474, (508) 875-5931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 880-8555.

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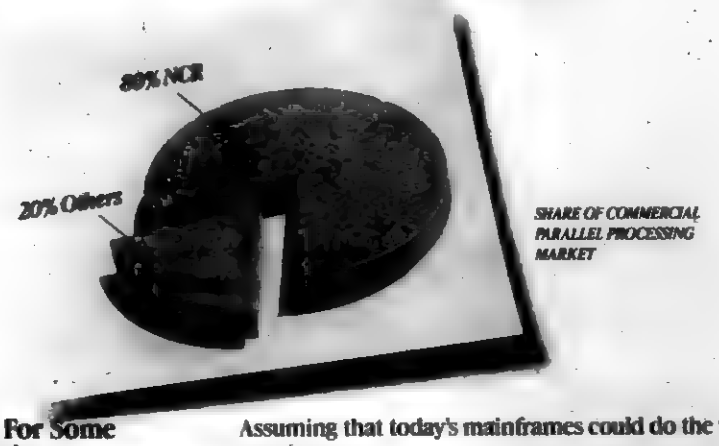

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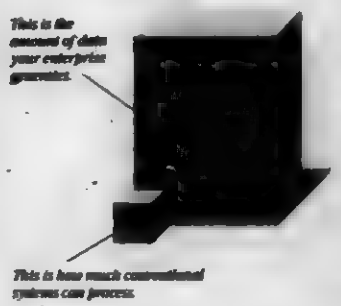

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COMPUTERWORLD

Inside

NETWORK OUTSOURCING
J. P. Morgan completes its global network outsourcing plan with an MCI pact. *Page 2*

TELEPHONY
Industry heavyweights Intel and Microsoft push ahead to blend telephones and PCs and hit a vein of pent-up user frustration. *Page 6*

API WARS
While Microsoft tells developers that OLE 2.0 is the road to Cairo (*see story at right*), Apple and Lotus counter with their own set of OLE-like protocols. *Page 14.* Sun announces a software interface said to enable users to run Windows applications on Unix workstations running X Windows. *Page 14*

SECURITY
Controversy and uncertainty surround the government's new encryption approach. *Page 57*

PENTIUM ARRIVALS
Intel Pentium-based PCs, which took two years to design, will start hitting the market next week. *Page 16*

Windows NT futures

OLE 2.0 will pave the road to 'Cairo'

By Christopher Lindquist
SEATTLE

Object Linking and Embedding Version 2.0, as described by Microsoft Corp. at the OLE 2.0 Developers Conference here last week, may put developers "on the road to Cairo," but that road will be neither short nor easy.

Despite the cautionary note sounded by Microsoft and developers alike, it is clear that OLE 2.0 is critical to the future direction of Windows and, more specifically, Cairo.

Major vendors, including Borland International, Inc. and WordPerfect Corp., have said they will support OLE 2.0, although neither Borland nor WordPerfect would comment on how or when.

OLE 2.0 is an object-oriented interface that provides for such services as application automation via a common macro language and "in-place" visual editing and embedding of data objects in documents.

Microsoft officials describe Cairo as the next version of Windows NT, though it is actually an object layer that sits on

OLE 2.0, *page 14*

Oracle, Compaq team

Duo seeks to downsize database clusters to PC servers

By Michael Fitzgerald
HOUSTON

■ Compaq Computer Corp. and Oracle Corp. are finalizing plans to develop clustered PC servers running Oracle 7's Parallel Server Option, according to sources close to Compaq.

The agreement, which the sources said could result in product delivery this fall, would focus initially on building high-powered local-area network databases. The plan is expected to be announced next month.

Clustered PC servers would face serious competition out of the chute. Rapidly falling reduced instruction set computing server prices could make those boxes an even more attractive option for downsizing databases. Moreover, building database clusters has proved to be tricky; it took Digital Equipment Corp. and Oracle several tries in the late 1980s to get it right.

> Users will gain the ability to scale up their systems by either adding processors to a high-level SystemPro XL or adding more SystemPros to the cluster.

Nevertheless, the Compaq/Oracle alliance could have huge implications for users investigating client/server networks. Together the companies hope to place PC servers based on Intel Corp. 1486 or Pentium processors on a more even footing with minicomputers.

"Right now, you don't want to handle a 50G-byte database with a Compaq server, but if I can cluster multiple Compaqs together with Oracle Parallel Server, there is nothing stopping me from putting together a poor man's mainframe," said Peter Kastner, an analyst at Aberdeen Group in Boston.

Ironically, clustering, which DEC used to create systems that rivaled IBM mainframes, should in turn give Compaq the ability to match minicomputers in throughput. Clustering multiple servers would give a PC server more channels through which to send data.

Clustered servers could have major potential for companies that wish to downsize or consolidate mushrooming LAN servers. They could spare users from having to build separate database servers.

"If PC servers are capable of clustering, you're calling into question your investment in a DEC cluster," said Paul Nelis, network specialist at Caisse Nationale de Credit Agricole's U.S. headquarters in Chicago. Credit Agricole now uses multiple VAXclusters.

Other users contacted said they would be interested in looking at clustered PC LAN server technology, but several cautioned that they would want to look carefully to see how the two

Oracle, *page 16*

Intel dominance could derail NT on Alpha train

By Melinda-Carol Ballou
NEW YORK

> "If we had to decide today, we'd opt for Pentium."
> *—Rich Lansing, vice president, Chemical Bank*

Digital Equipment Corp.'s effort to regain market share by combining its high-end Alpha chip with the Windows NT operating system is approaching a wall: Intel Corp.'s dominance of the corporate desktop.

If information systems departments at several blue chip DEC shops are any indication, DEC must deliver on numerous Alpha promises. For example, while IS managers at several leading banks here are currently evaluating the merits of Microsoft Corp.'s Windows NT on Alpha, and in most cases are enthusiastic about Alpha's performance, some said they are not sure it is a viable option for several reasons.

First, those users said they may not have room for yet another hardware platform because many now use a mix of Intel

Intel, *page 15*

Newspaper
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HP builds in infrared

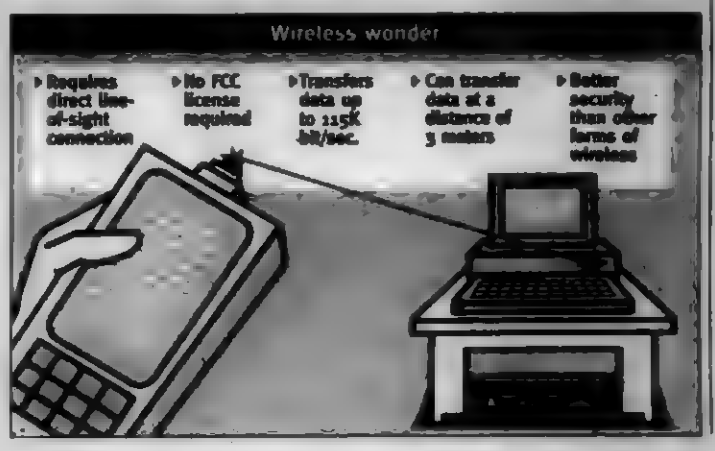
By Michael Fitzgerald
SANTA CLARA, CALIF.

On June 1, Hewlett-Packard Co. will become the first company to build infrared technology into its PCs. Some see this move as the first step toward widespread use of infrared as a means of connecting desktop and portable PCs, personal digital assistants, printers and even telephones and automated teller machines. But HP will not be alone for long.

Sources said that near the end of the year Microsoft Corp. will release Mobile Windows, a version of Windows optimized for portable users and featuring built-in data synchronization support via infrared.

Microsoft did not return calls, but HP and Microsoft are already

HP, *page 10*



ALAN LEVENSON

CLIENT/SERVER STRATEGIES

DEC's client/server standing took hits last week as **Compaq** and **Oracle** said they will challenge DEC by jointly developing cluster technology for PC servers. Meanwhile, honchos at several New York banks who are evaluating **Windows NT**-based Alpha systems indicated that DEC will have to work hard to displace **Intel**, especially with its **Pentium**-based systems. *Page 1.* On the tools front, **Bachman Information Systems** tries to shore up its fortunes with a new client/server bent *(page 121)*, while **Texas Instruments** ships **BDF**, a workstation-based business process modeling tool. *Page 24*

DATABASES

A wave of vendor support for Microsoft's **ODBC** and its rival **IDAPI** middleware standard at **DB Expo '93** last week moves user sites one step closer to having any client access any database server, users and analysts said. **IBM**, meanwhile, ships DB2's younger sibling, **DB2/2**, officially entering the desktop database fray. *Page 12.* IBM also said it is on schedule to deliver its parallel processing database management engine and its Posix-compliant version of MVS. *Page 67*

DESKTOP SOFTWARE

Last week was busy for Lotus, as it made a play for higher ground in the **Windows** spreadsheet war *(page 4)* and delivered a **Notes API** to **Microsoft** and **WordPerfect**. *Page 47.* And Microsoft integrated the **Access** database into its Office suite. *Page 4.* Meanwhile, IBM's **OS/2** Version 2.1 is taking shape. *Page 37*

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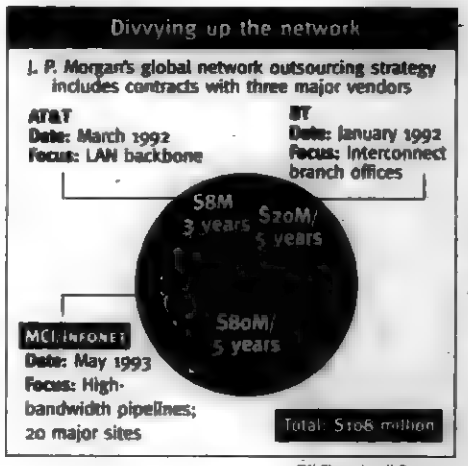
Outsourcing

Banker signs $80M contract with MCI

By Elisabeth Horwitt
NEW YORK

■ J. P. Morgan closed the loop on its overseas network outsourcing strategy last week by signing an $80 million, five-year contract with MCI Communications Corp.

The contract may be the largest of its kind to date, the vendor said. It calls for MCI, partnered with Infonet Services Corp., to implement, manage and maintain the high-speed pipelines that support voice, data and video communications among more than 20 major J. P. Morgan sites around the world.



CW Chart: Janell Genovese

The contract is the third global outsourcing deal the New York financial services firm has signed in the past year and a half (see chart above). Last year, J. P. Morgan chose BT as the provider of an X.25 packet-switched network to support branch office applications and IBM Systems Network Architecture traffic, and AT&T as the provider of its overseas local-area network backbone.

The networks are separate and managed by their respective providers, although J. P. Morgan's networking people get an overview of activity across all three from the network control center in Newark, Del., said Tom Hynd, vice president and head of network services.

The idea behind all three contracts was for J. P. Morgan to be able to provide network services for rapidly expanding overseas businesses and sites without having to significantly upgrade its networking staff, Hynd said.

The company said it expects to realize a savings of 5% to 10% from the MCI contract, primarily by reducing its staff through attrition and reassignment.

Bonus baby

The MCI/Infonet contract is by far the biggest of the three, with the network supporting virtually all of J. P. Morgan's 14,000-plus employees who make international calls, Hynd said.

MCI will supply its leased-line global communications services and deploy Network Equipment Technologies, Inc. switches to link J. P. Morgan sites in North America, Europe, Latin America and Asia.

Infonet will deploy a virtual private network over those links, enabling corporate users to allocate chunks of bandwidth for compressed voice, video and data on an as-needed basis, an Infonet spokesman said. Right now, the sites are connected via a hodgepodge of links provided by various overseas carriers.

The outsourcing contract also provides for rapid provisioning, with a guarantee that the customer can order up to 128K bit/sec. between any two of the 20-odd sites and have it in place within five working days.

Overseas high-speed links typically take up to six months to provision, the Infonet spokesman said.

MCI will provide customer support for overseas users, while Infonet, with its strong presence in various overseas countries, will coordinate problem management and dispatching overseas, Infonet said.

"Where before we were managing 25 [overseas] vendors, now we have one vendor managing 25 vendors for us," Hynd said.

Distributed work loads

Outsourcing to multiple vendors was a definite preference, if not a selection criterion, for J. P. Morgan, Hynd said.

"It communicates clearly to vendors that this is an open, competitive shop and that we award to vendors that provide the best service and best price" on an ongoing basis, he said. Based on experiences with the first two outsourcing contracts, "We see no issue [or problems] with having multiple vendors providing service," Hynd said.

MCI and Infonet won the contract from BT and AT&T on the basis of small differences in short- and long-term cost and the partnership's ability to deploy the right connections in the right places, Hynd said. As with the other two global outsourcing contracts, service-level guarantees with financial penalties apply.

Corrections

- A story in the April 19 issue incorrectly said Tampa Electric Co. would soon start a 1,200-user beta test of Motorola, Inc.'s Site Connect paging system. The utility has not yet approved the test. The $500 per-user cost for a 500-user Site Call module of the system includes a dedicated PC with Unix and application software, a $20,000 paging system with a 2,500-user capacity and a $125 to $300 alphanumeric pager for each user.
- Because of a production error, the last phrase in a story on page 14 of the May 3 issue was cut off. It should have read, "Incorporation of Resource Object Data Manager, IBM's SystemView-compliant, object-oriented database structure, as the basis for enabling applications to share data."

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Software suites

Microsoft Office gets Access

By Michael Vizard
BELLEVUE, WASH.

Bowing to large customer and competitive pressures, Microsoft Corp. last week announced plans to expand its Office application suite by adding its Access relational database.

Scheduled for release early next month, the edition of Microsoft Office with Microsoft Access will be priced at $949, which is $199 more than the standard Office package that includes the Word word processor, Excel spreadsheet, PowerPoint presentation graphics software and Mail.

The need to bolster the Office suite with Access is driven by customers who are deploying that database as a query tool for larger databases. For instance, King County Medical Blue Shield in Seattle currently deploys Access on each of its users' desktops because it provides a good query tool for users accessing Microsoft's distributed SQL Server database across the network.

"We've been pressuring Microsoft to do this for three or four months now. It's not a surprise because the only thing really missing from the application suite has been a database," said Richard Boone, manager of technical services.

"Corporate accounts have been telling us that Office is incomplete without a database," confirmed Kathleen Schoenfelder, a product manager for Office.

The Microsoft move follows the signing of a recent suite alliance between Borland International, Inc. in Scotts Valley, Calif., and WordPerfect Corp. in Orem, Utah. Under terms of the alliance, Borland will offer a suite that includes its Paradox for Windows database along with its Quattro Pro for Windows spreadsheet and WordPerfect word processing software [CW, April 26].

All Microsoft applications will be upgraded to support OLE 2.0 during the next 24 months.

In addition to Access, Boone said he expects Microsoft to include its scheduling software in Access because it is also a personal productivity tool. This is a move that Schoenfelder said Microsoft is considering.

The step to include databases in application suites is part of a long-term trend in which vendors will use the technology in a relational database, combined with support for Object Linking and Embedding (OLE), to make suites of applications behave as a single, seamless application.

"I really hope there is a blending of applications. We're anticipating being able to use the Access query functions directly from within an Excel spreadsheet," Boone said.

"Including database technology is really the only way these companies can provide more sophisticated integration features in their suites," noted Krystyna Filistowicz, an analyst at Dataquest, Inc. in San Jose, Calif.

For example, Lotus Development Corp. executives last week disclosed that they will add technology from their Notes offering to SmartSuite to provide better applications integration. SmartSuite consists of the Ami Pro word processor, Lotus' 1-2-3 spreadsheet, Freelance Graphics presentation graphics and CC:Mail.

This will allow users to merge text and spreadsheets across Ami Pro and Lotus' 1-2-3 without having to exit the application, said Lotus chief technology officer John Landry.

That technology will be incorporated into SmartSuite right after Lotus delivers Release 4 of 1-2-3 for Windows next month, according to Jeffrey Beir, Lotus vice president of spreadsheet development.

Microsoft and Borland will counter by relying on OLE 2.0 and their own database technology. Filistowicz said Lotus is likely to enjoy a short-term advantage because OLE 2.0 is still in its infancy [CW, May 3].

Lotus fires back in Windows spreadsheet war

By Michael Vizard
SAN FRANCISCO

Lotus Development Corp. will take significant strides toward restoring its tarnished reputation in the Microsoft Corp. Windows spreadsheet market when it officially launches Release 4 of 1-2-3 for Windows this week.

Scheduled to ship next month, the new version will give Lotus a spreadsheet offering that for the first time takes full advantage of Windows' graphical environment while providing users with a Version Manager feature that simplifies working with multiple copies of spreadsheet data and files.

"This release makes Lotus competitive. It brings them back into the battle," said Daniel Gasteiger, editor of "Spreadsheet Consultant," a newsletter published in Cambridge, Mass.

4 better, 4 worse

Lotus' 1-2-3 Release 4 for Windows: Competitive comparison

In-cell editing	Yes	No
Live status bar for instant access to formats and more	Yes	No
One-step charting	Yes	Yes
Drag-and-drop visual cues	Hand	Arrow
Version tracking	Yes	No
Many users can contribute data without overwriting work	Yes	Yes
Track work by user name and date	Yes	Yes
DDE/OLE client and server support	Yes	Yes

Source: Lotus Development Corp., Microsoft Corp.

The new release is widely expected to give 1-2-3 users an incentive to adopt Windows. Until now, 1-2-3 for Windows has been a disappointment to most users because it failed to take full advantage of the graphical features in Windows.

As a result, Lotus currently has only a 30% share of the Windows spreadsheet market, compared with 61% for Microsoft, according to BIS Strategic Decisions in Norwell, Mass. This shortcoming contributed heavily to a 41% drop in Lotus' net income for the last quarter as sales of DOS spreadsheet applications, which Lotus dominates, dropped sharply in favor of Windows applications [CW, April 26].

Beta-test users are giving Lotus high marks for the features included in 1-2-3 Release 4 for Windows (see chart).

"The new release is fantastic. There's really nice integration using the [Object Linking and Embedding] functions with other applications. And since all Lotus applications have the same SmartIcons, you can actually forget which application you are in," said Stacy Myers, a senior program analyst at South Florida Water Management in West Palm Beach, Fla.

According to Myers, the major new features in 1-2-3 are improved integration with other Lotus applications, a better interface with Windows, the Version Manager functions and overall better performance.

Lotus will have little time to rest on its laurels because Microsoft is closing in on delivering Version 5.0 of Excel. Also on the horizon is Version 2.0 of Quattro Pro for Windows, which Borland International, Inc. plans to deliver this fall [CW, May 3].

As for those users who have already made the switch to Excel or Quattro Pro, the arrival of Release 4 of 1-2-3 for Windows appears to have come too late.

"I moved to Quattro Pro because it has better macro facilities, and the objects make it easier to program," said the department computer consultant at Sikorsky Aircraft Co. in Stratford, Conn.

Reporter's Notebook

After almost two years of discussion, Lotus Development Corp. last week told attendees at LotusWorld that it has delivered Version 3.0 of its Notes groupware offering. More than 300,000 disks have been pressed.

Developers at Iris Associates, a Westford, Mass.-based Lotus associate responsible for developing Notes, reported that running Notes as a Novell, Inc. NetWare Loadable Module will provide a faster server environment than either IBM's OS/2 or Microsoft Corp.'s Windows NT. In fact, Windows NT is currently only about as fast as OS/2, said Steve Beckhardt, an Iris developer.

Walnut, the Worldwide Association of Lotus Notes Users and Technologists, held its first meeting last week. The association plans to establish a Notes database on CompuServe to link members. This database will replace the Notes database created by the New York Notes User Group.

One of the more daring demonstrations last week was the preview of PictureTel Corp.'s plans to integrate its videoconferencing system within Notes. PictureTel Chairman Norman Gaut established a live link to an IBM office in Paris. While the quality of the transmission left a lot to be desired, Gaut said he was pleased he could even establish the link using beta-test software. "Demonstrating beta software is kind of like bungee jumping naked with grease on your ankles," Gaut said.

Lotus has established Notes alliance partnerships with a large number of work-flow software providers. These companies, which have agreed to layer their software on top of Notes, include Viewstar Corp., Reach Software Corp., Action Technologies, Inc., Recognition, Inc., Deirian Technology, Inc., Portfolio Technologies, Inc., ELF Technologies, Inc., IET Intelligent Electronics Ltd., Quality Decision Management, Inc. and FileNet Corp.

Skytel Corp. in Washington, D.C., said it has integrated its paging system with Notes, and Simpact Associates, Inc. in San Diego said it has integrated its Remark voice recognition system with Notes, to allow users to access a database over a Touch-Tone phone.

Compiled by senior editor Michael Vizard.

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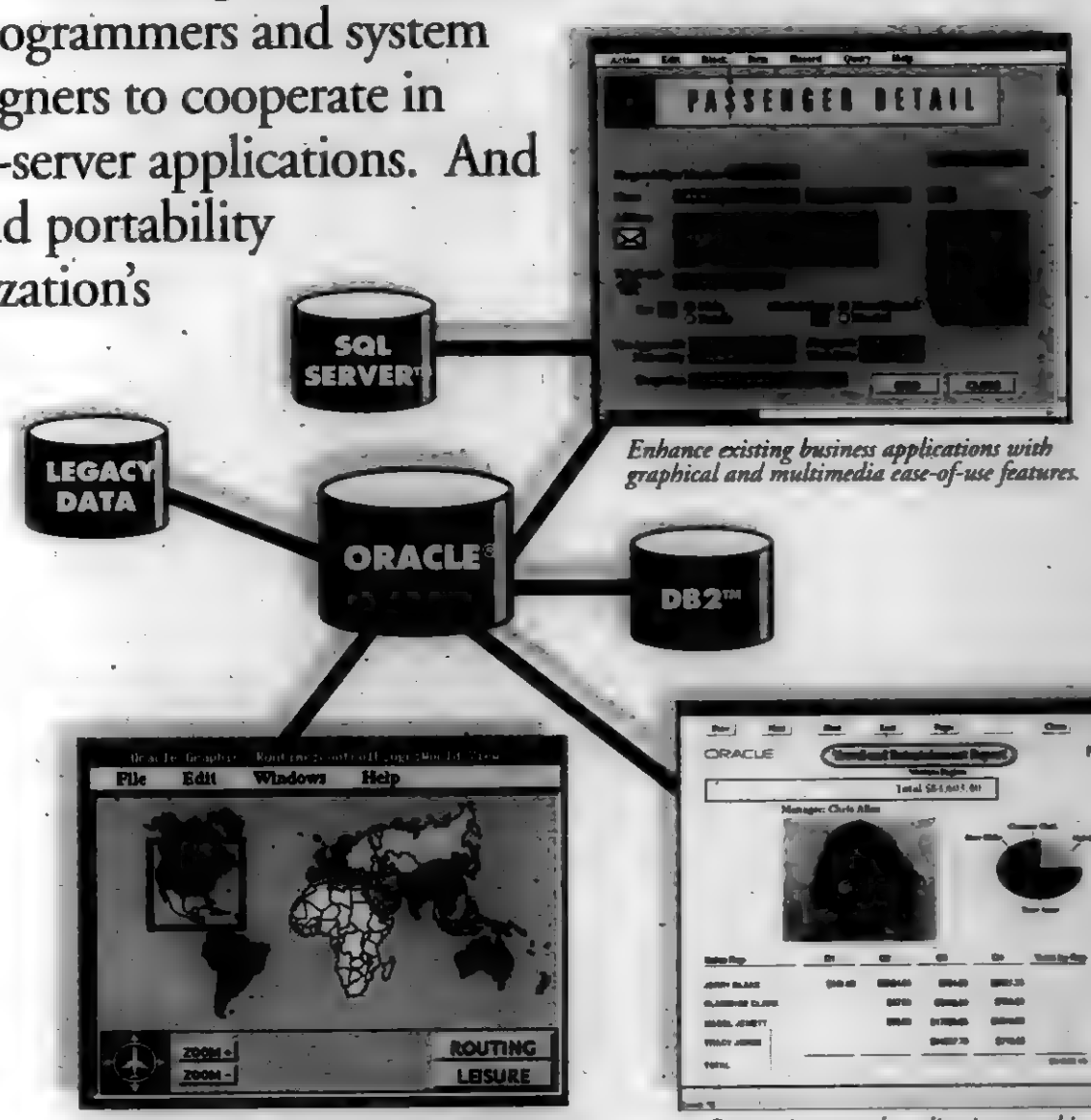

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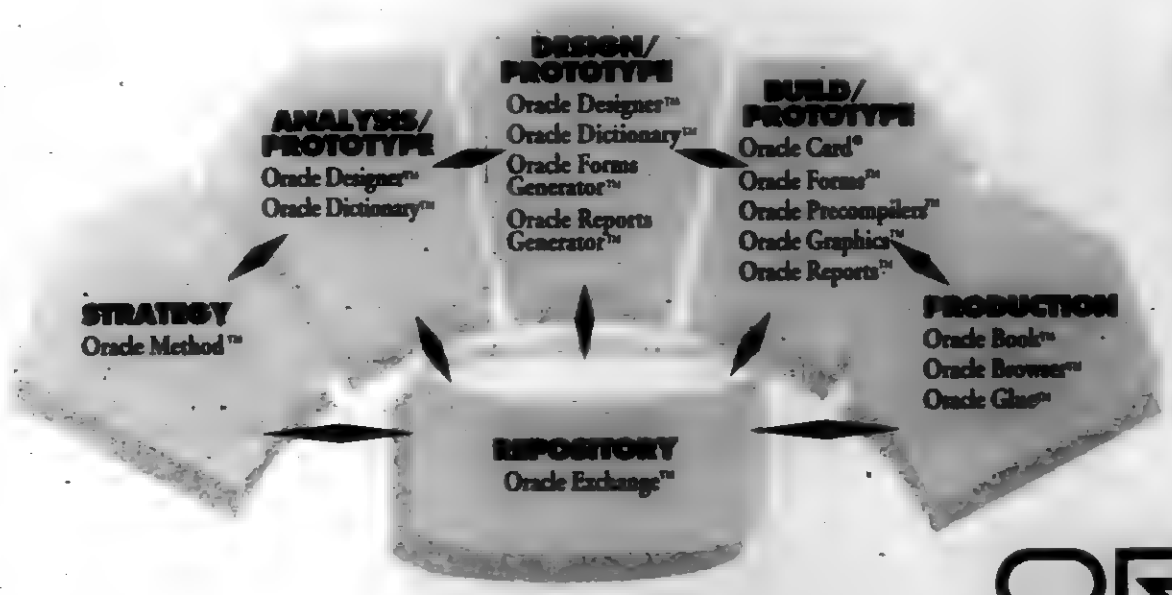

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News Shorts

DOS 6.0 bugs reported

Published reviews and bulletin boards are reporting serious bugs in DOS 6.0. These include problems with MemMaker, the Microsoft Corp. memory optimizer, and DoubleSpace, the data compression utility. The most noticeable complaint is of cross-linked files, which can result in data loss. While some users said the cross-linked files were the result of using DoubleSpace, others indicated they had noticed the problem without the data compression utility installed. Microsoft technical representatives advised customers to check for incompatibility between certain BIOS versions and memory managers. Several users on CompuServe reported that turning off write caching seemed to solve the problems.

HP and Lotus team on portable

Hewlett-Packard Co. and Lotus Development Corp. introduced an updated model of HP's 95LX palmtop computer with a built-in version of Lotus' CC:Mail. Aimed at mobile professionals, the device includes a serial port for printers and modems and an infrared link to HP desktop computers. The $749 HP 100LX features an 80- by 25-character IBM Color Graphics Array display, a 50% faster processor, Lotus' 1-2-3 Version 2.4 and personal information software.

ThinkPad line grows

IBM PC Co. expanded its ThinkPad notebook line, adding models known as the 720 and the 720C. These products feature IBM's 25-MHz/50-MHz 486SLC2, up to a 160M-byte hard drive and support for the new Personal Computer Memory Card International Association 2.01 standard. IBM has also lengthened the battery life by as much as 20%—to 7.8 hours on the monochrome version and 4.8 hours on the color version. Pricing starts at $3,195 for the monochrome 720 with a 120M-byte hard drive. IBM said dealer ThinkPad orders topped 100,000 units the first day.

ComputerLand cuts back

William Tauscher, chairman of ComputerLand Corp., confirmed that the company recently laid off 220 workers in its corporate division and received a $17 million cash infusion from its three major shareholders, including Tauscher. Tauscher also said the corporate division has begun accepting orders over the telephone at two locations, one in Livermore, Calif., and the other in Indianapolis.

New beta NT client ships

Novell, Inc. has begun shipping the second beta release of its NetWare Client for Microsoft Corp.'s Windows NT. Novell hopes that by shipping the NetWare client software to NT beta-test sites, it will get plenty of early feedback on NT/NetWare interoperability. The new release includes Novell's NetWare transport stacks, IPX and SPX II, and a new release of the SPX stack that Novell claims improves network performance and simplifies applications development.

SHORT TAKES Networking vendor Cisco Systems, Inc. reported third-quarter net sales and net income increases of 89% and 99%, respectively, compared with the third quarter of last year.... Computer Associates International, Inc. has begun shipping CA-dBFast 2.0, a dBase-compatible system for migrating Xbase applications to Microsoft's Windows environment.... Joel J. Kocher, president of domestic operations at Dell Computer Corp., won a power struggle with Andrew R. Harris, president of Dell's international operations, and was named president.

News shorts, *page 16*

PC/phone marriage likely

Intel, Microsoft technology will address telephony frustration

By Joanie M. Wexler
DALLAS

User emancipation from telephone handset tyranny drew nearer last week when a team of vendor heavyweights played matchmaker between the PC and corporate phone switch.

In interviews last week, users revealed a surprising pent-up demand for the combination PC/telephony applications that could emerge from the joint application programming interface (API) that Intel Corp. and Microsoft Corp. said they have begun shipping [CW, March 1].

Such applications could ultimately render the telephone handset an endangered species, one user said. Others said that merging phone and PC user interfaces would spur broader use of their companies' sophisticated telephone system features.

The users anticipated that having fewer telephone codes to memorize or look up would translate into time savings — benefits that are "more than just toys," one PC specialist said.

"Heck, I'm chief technologist, and I have my secretary come in and set up my conference calls!" admitted Bill Conley, manager of corporate information systems at Loral Aerospace Corp. in Newport Beach, Calif.

Point-and-click telephone

PBX maker Siemens Private Communications Systems Group/Rolm has already announced an application that supports Windows Telephony. CallBridge for Desktops allows Windows users to tap caller identification, conference calling and call time-tracking features. Among the 40 other vendors planning to develop products to the interface are Alcatel Business Systems Group, Compaq Computer Corp., Digital Equipment Corp., Ericsson Corp. Lotus Development Corp. and Northern Telecom, Inc.

Complicated calling

"We have a variety of PBXs, which all have about the same 120 functions. But most of us use only the same 12 of them", because it is too complicated to figure out how to use the others, Conley said. "Marrying [PC and phone] interfaces so you'd click on icons to place calls and consolidate electronic and voice mail definitely has potential."

A similar API slated to ship in the second half of this year is in the works by networking bigwigs AT&T and Novell, Inc. Unlike last week's announcement, though, the AT&T/Novell API announcement received a lukewarm response [CW, Jan. 11], indicating that users can envision better benefits to linking individual PCs and phones than server-to-PBX connections.

"In our company, individuals simply have trouble getting phones to do what they want," noted Mike Field, microcomputer coordinator at James River Dixie Corp. in Fort Smith, Ark. "If users could select from a menu to forward their calls when they go on vacation — instead of looking up a numeric sequence in a book — that would be a big time-saver."

"My phone has 19 buttons on it besides the keypad, and I haven't a clue what to do with them," added Joe Giljohann, senior microcomputer specialist for the city of Milwaukee. "We need one manageable PC/telephony package."

Stash Jarocki, vice president and audit director in the technology support and research group at Citibank NA in New York, said he sees potential for integrated PCs and telephones, though he has reservations about conflicting APIs.

"A common suite of APIs is nice, but now we have competing APIs" from the Microsoft/Intel and Novell/AT&T camps.

"Any time you have Microsoft on one side and anyone else on the other, you automatically have technology wars," which could stall progress, Jarocki said.

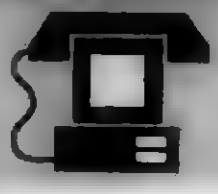
However, both sets of vendors claim their efforts to be "complementary." AT&T and Novell participated in the design review for Intel/Microsoft's Windows Telephony, and Sanford Brown, an AT&T marketing manager, said, "Our vision is some level of API commonality so we can eventually achieve application portability."

Interface wars aside, Conley said he would be willing to pay "under $100" for a telephony-enabled PC application. Field said he would pay $80 to $150 for a software-only solution but would go to $250 per user if add-ons were required for the PBX.

"What really might make this fly is if you got a site license when you got a new PBX — like the way PC makers throw in DOS and Windows," Conley suggested.

PC talk

A standard API for merging desktop and telephone applications could enable users to do the following:



- Navigate through the mire of complicated telephone features, such as call forwarding, conferencing and transfer, using PC point-and-click commands.
- Check just one mailbox for all E-mail, voice mail and fax; manipulate voice mail at leisure, in nonsequential manner as with E-mail.
- Link directly to a WAN for transmitting voice and data.

Now hear this

Linking computers and telephone switches — technology called "computer-integrated telephony" (CIT) — has been provided for years in corporate call centers by vendors such as IBM and Digital Equipment Corp.

Traditionally, CIT vendors have created proprietary links between a specific PBX and a mainframe or mid-range host.

While the applications have been critical in the niches used, the big-system technologies have not enjoyed the growth boom predicted for CIT on the desktop, observers noted.

This is because they have been reserved for "those who can pay big bucks and have the traffic to justify it," said Ameet Patel, emerging technologies analyst at BASF Corp. in Parsippany, N.J.

BASF plans to test CIT for its local-area network servers from Novell and AT&T as well as other similar technologies.

"Most application development now is on the desktop, so from the user perspective, that is where [CIT] would be most beneficial," Patel said.

—Joanie M. Wexler

Novell sells 3270 line, addresses NetWare messaging

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. said last week that it will partner with Attachmate Corp. in an effort to fill some gaps in Novell's enterprise messaging and NetWare-to-host product line, which includes NetWare for Systems Application Architecture (SAA).

In addition, Novell said it has sold its low-end IBM 3270 client software business to Attachmate. This move will enable Novell to free more resources for development of its far more strategic (and profitable) NetWare for SAA product, a company spokesman said.

Novell and Attachmate will work jointly on NetWare Loadable Modules (NLM) that incorporate pieces of Attachmate's ZipOffice electronic mail, calendaring and scheduling systems. Out of that development will come the first scheduling and calendaring capabilities for Novell's Global Message Handling System (MHS), Novell said.

This "makes great sense because one of the things people have most trouble surrendering when they move off the host E-mail system to the LAN is calendaring and scheduling," said Walter Ulrich, a director at consulting firm Arthur D. Little, Inc. in Los Angeles.

Access to functions

The partnership plans to extend existing MHS application programming interfaces (API) so that any third-party application written to those APIs can automatically gain access to calendaring and scheduling functions, Novell said.

Attachmate will develop NLMs that will enhance Novell's NetWare for SAA, MHS and NetWare 4.0 products in areas such as network management and transparent access to IBM host E-mail systems. Zip:Office provides links between local-area network E-mail and IBM's Professional Office System.

Florida State University, a current NetWare and Zip:Office user, is planning to implement NetWare for SAA shortly. It would be a "big cost benefit" to be able to implement both packages as NLMs on the same NetWare server instead of on separate servers, said Bob Graves, assistant director of office computing at the Tallahassee, Fla., university.

NetWare for SAA is an NLM that links LAN clients to a variety of IBM host environments, including IBM 3270 and 5250 terminal connections and IBM LU6.2 program-to-program to communications.

Growth expected

Novell is now shipping approximately 2,000 NetWare for SAA servers per month and expects business to grow 25% to 30% per quarter, a company spokesman said.

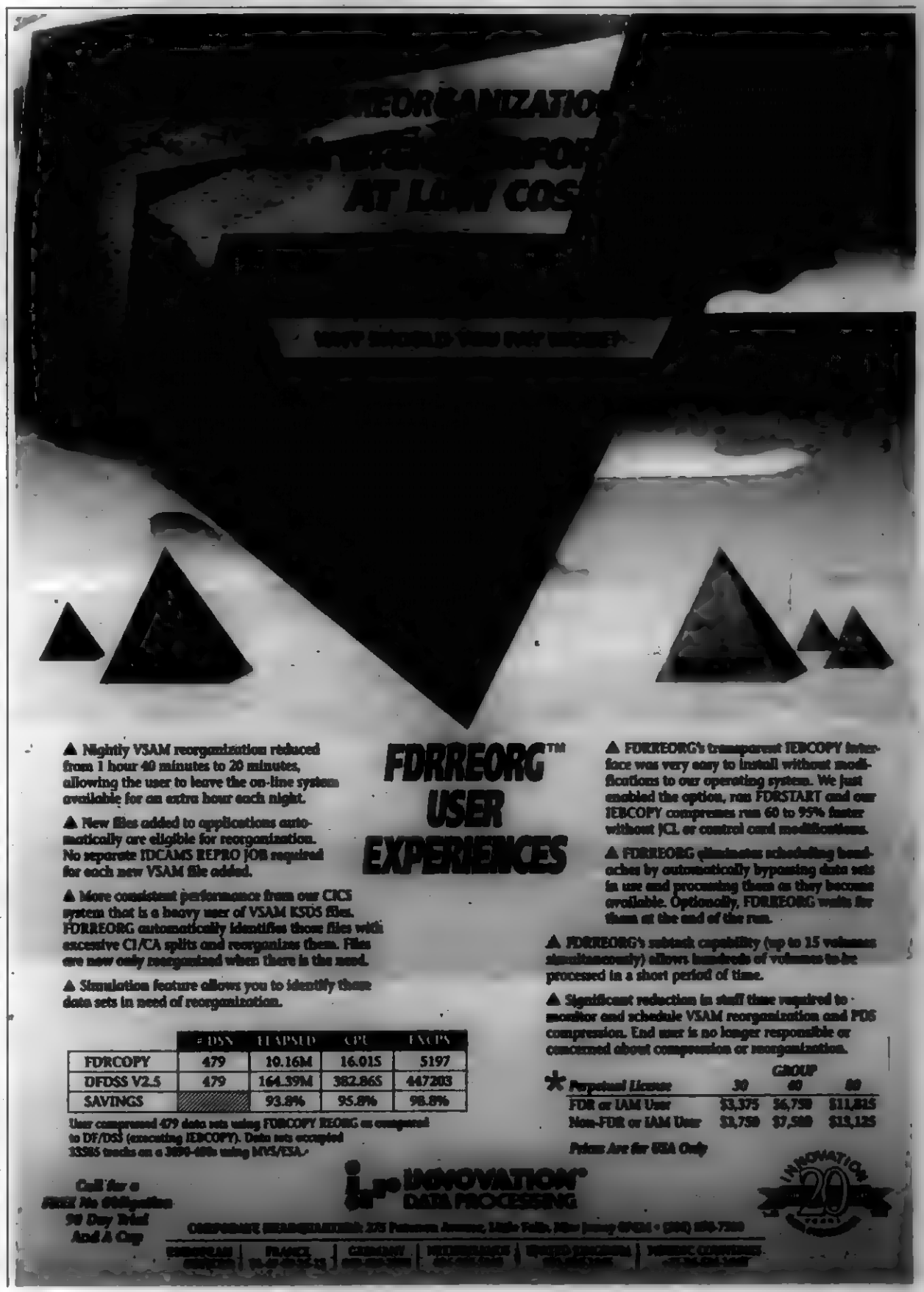
Novell is working on enhancing NetWare for SAA to support, among other features, load-balancing across multiple NetWare for SAA servers and host connections, a spokesman said. Also in the works is a hot standby feature that will switch user traffic from a downed link to a backup line, gateway server or host before the session is lost.

Novell is also in the process of integrating NetWare for SAA with NetWare 4.0 naming services so that NetWare servers can transparently connect users to the right host across the enterprise, the spokesman said.

Novell said it plans to make the client portions of this software available to third-party 3270 client vendors whose products work with NetWare for SAA.

Novell's exit from the 3270 client market will encourage third-party vendors to develop more client products for Novell's LAN-to-host gateway, a Digital Communications Associates, Inc. spokesman said. Last week, the Norcross, Ga., vendor announced Irma NetWare WorkStation for Windows, a Microsoft Corp. Windows-based 3270 emulation software package designed specifically to work with NetWare for SAA.

Digital Communications Associates, a NetWare for SAA reseller, will offer five copies of the new Irma product free with each purchase of NetWare for SAA through year's end.



486 subnotebooks loom on the horizon

Manufacturers ready their shipments as the need arises for powerful but compact portable systems

By Michael Fitzgerald

Compudyne, CompUSA, Inc.'s manufacturing arm, will ship a 486SL-based subnotebook and a high-end notebook on May 20, confirmed Kevin O'Brien, a Compudyne product manager.

Later this month, Northgate Computer Corp. will introduce a 3.3-pound subnotebook and the ZXPortable Dual-Scan, a 6.3-pound, passive-matrix color notebook. Dual-scan screen technology means the video display refreshes at roughly twice the speed of conventional passive-matrix screens, eliminating some of the problems found in passive-matrix notebooks, such as cursors that seem to disappear.

The moves indicate that vendors, trying to fill every user niche, are bifurcating and expanding their product lines.

This push seems to be responding to user needs. "We've seen a couple of different classes of users [develop]," said Carrie T. Ulvestad, national manager of dealer communications at Hyundai Motor America headquarters in Fountain Valley, Calif.

Equipment in the field

Ulvestad said she expects to give her traditional notebook users — field sales representatives — high-powered Intel Corp. I486-based notebooks next year and may give less powerful, lighter systems to executive users.

The $1,999 Compudyne 486SL/25 Subnote measures 7.1 by 10 by 1.6 in. and weighs 3.6 pounds. It joins the new Contenda 486 from Zeos International Ltd. as the first I486-based subnotebook. The product includes a Personal Computer Memory Card International Association Type II slot, a removable 80M-byte hard drive and a trackball.

Compudyne's other entry, the 5.8-pound 486DX2/66 Color Slimnote, is aimed at portable computing's version of the highly profitable Holy Grail: the desktop replacement market.

Based on Intel's most powerful I486 chip and costing $4,999, the Slimnote has a 210M-byte hard drive and an expansion station but only an 8½-in. active-matrix color screen. O'Brien said Compudyne will ship a version of this with a 330M-byte hard drive next month. A monochrome version costs $2,999. Both boxes are made for Compudyne by Twinhead Corp. in Taiwan.

"You have vendors taking different tacks and trying to differentiate themselves. As portable componentry becomes less expensive, it gets cheaper to diversify, and the Taiwanese can start to get into the market," said Janet Cole, analyst at Dataquest, Inc. in San Jose, Calif. This should lead to lower prices and the broader distribution of certain products, Cole added.

Northgate's Dual-Scan is based on Intel's 25-MHz 486SX and offers a 120M-byte hard drive and 4M bytes of random-access memory. The product will cost $2,500.

Shrinking notebooks

Of the major notebook vendors, only Zenith Data Systems has broadened its product line to include subnotebooks. Smaller players, such as Dell Computer Corp. and Gateway 2000 Ltd., have been the most aggressive in moving into this realm. Gateway last week cut prices by $300 on its 2.9-pound Handbook PC, which now costs $995.

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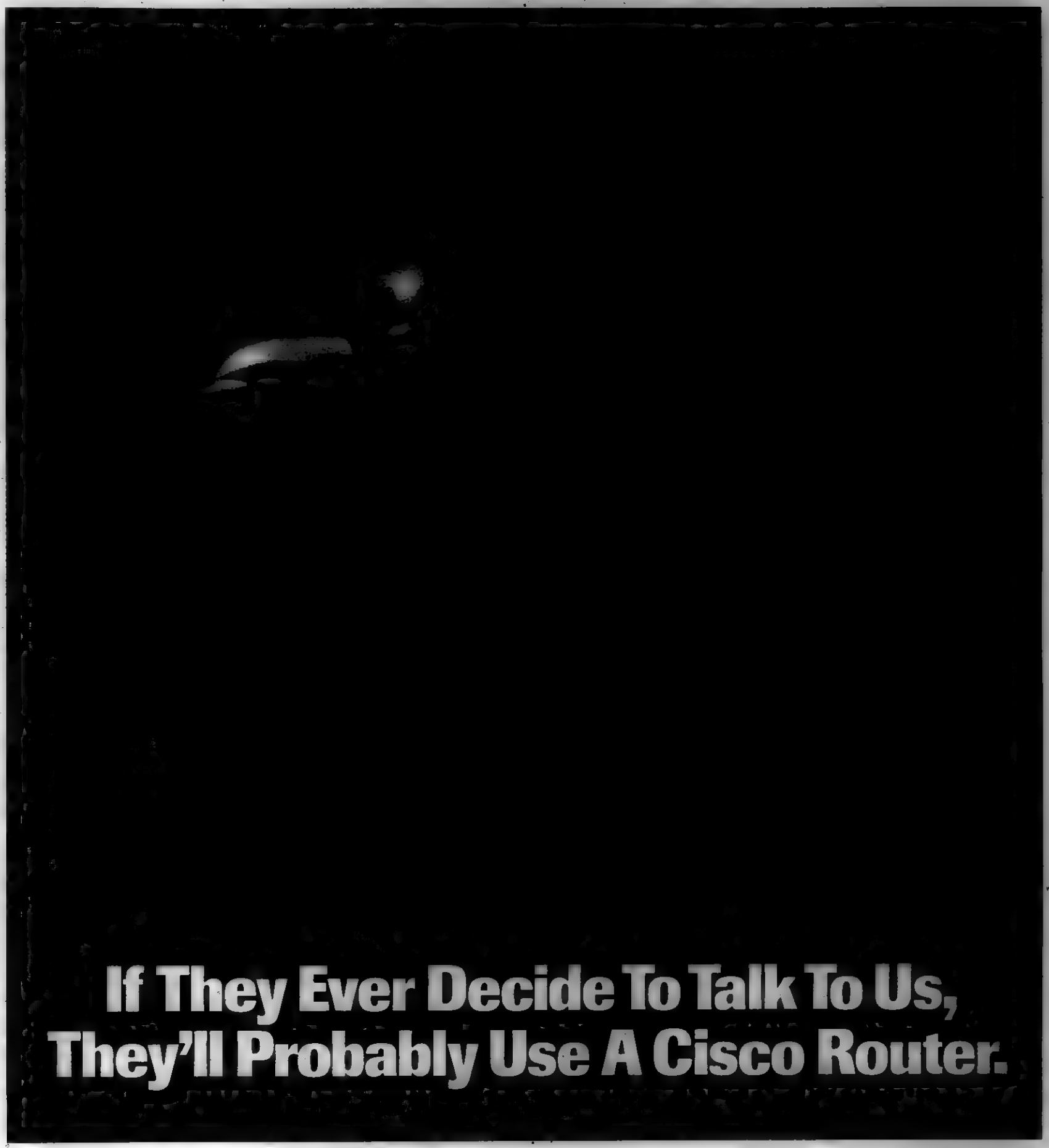

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OpenView goes beyond SNMP

HP's OperationsCenter offers multivendor systems management

By Elisabeth Horwitt
PALO ALTO, CALIF.

Hewlett-Packard Co. threw its OpenView hat into the systems management ring last week with the announcement of OperationsCenter. The product is said to extend HP's platform beyond Simple Network Management Protocol-based network management to the management of HP, IBM and Sun Microsystems, Inc. Unix workstations.

OperationsCenter is based on a client/server architecture that equips managed systems with intelligent agents that can respond to network alerts locally or send them elsewhere. This distributed form of management, which is used by competing products such as IBM's NetView/6000 Systems Monitor, is said to be far more scalable than traditional centralized systems.

HP's PerfRX, *a new OpenView application, analyzes system performance trends over the long term*

OperationsCenter may represent a breakthrough, however, in the way it uses distributed intelligence to give the system administrator "more flexibility in how we control the flow of information about performance and overall operation," said Marguerite O'Brien, manager of systems management development at Mead Data Central, Inc. "We thought we'd have to wait until 1994 [for such capabilities] or develop it ourselves."

O'Brien also praised the product's tools for proactive event management, including "filtering and taking automatic action in response to network events."

Automatic response

HP incorporated into OperationsCenter a "process-oriented view" that enables users to define procedures for responding to typical network situations, said Jeff Thieman, HP's OpenView program manager. For example, a local node can automatically respond to a system failure, check with a network administrator before taking action, call up HP Network Node Manager to find out whether the failure is network-related or send the alert to a human operator.

Mead Data will seriously consider OperationsCenter as the management system for a mixed bag of Unix systems inside the data center and eventually across the enterprise, according to Bill Fuson, director of delivery services at the Dayton, Ohio-based information service provider.

Users were less clear about HP's offer to integrate their systems and network management under one OpenView umbrella.

Mead Data would like to integrate its system and network management on one platform, Fuson said. Right now, the firm is using NCR Corp.'s StarSentry network management system.

Pitney Bowes, Inc., a user of the OpenView network management system, plans to evaluate OperationsCenter as a Unix systems management platform, said George Billings, manager of network computing services. "Right now, I believe data center people are managing individual boxes with no centralized management except backups."

OperationsCenter also provides links to third-party applications running under OpenView so, for example, the systems manager can notify a trouble-ticketing application of an alert. OperationsCenter intelligent agents are equipped with open application programming interfaces so that legacy management applications can hook into them, Thieman said.

HP plans to provide OperationsCenter management of other Unix systems, with Digital Equipment Corp.'s Ultrix being "a good candidate," Thieman said.

OperationsCenter is priced at $14,700 for a 12-node, 32-user environment. It is scheduled to ship in August.

Wireless LANs

Infrared device links sites up to a mile apart

By Lynda Radosevich
LANCASTER, PA.

Laser Communications, Inc. last week unwrapped network connectivity devices that can link local-area networks between buildings up to a mile apart without wires. Using laser infrared beams, the devices, which will ship in September, can transfer data at network speeds of up to 16M bit/sec., the company said.

Aimed at network managers in campus-style building complexes, the infrared laser connection is a wireless option to leasing lines from telephone companies or installing private cabling.

The new series increases operating distance from a half mile to a mile, said Michael Berman, vice president at Laser Communications. To operate, however, the devices require a direct line of sight.

Preferable to T1

Nick Blazensky, director of site design at Travelers Insurance Co. in Hartford, Conn., said he would like to connect networks in four of the company's 12 buildings using infrared laser technology. The buildings are across streets, and Travelers does not have permission to use the phone-line conduits, so the company must lease T1 circuits "that slow the line down considerably," he said.

Other wireless building-to-building connections, including microwave and spread-spectrum radio frequency, have limitations that laser infrared does not have, said Eric Zimits, an analyst at Volpe, Welty & Co., a San Francisco investment banking research firm. For example, microwave bandwidth must be licensed by the Federal Communications Commission and is subject to radio interference. Spread spectrum has limited data transfer rates and distances.

However, infrared laser connections comprise a small portion of wireless building-to-building connections, most of which are microwave connections, said Ira Brodsky, president of Datacomm Research Co. in Wilmette, Ill. Additionally, infrared links can be disturbed by heavy rain, snow or fog, Brodsky said.

The $18,500 Ethernet system, $24,000 Token Ring system and $28,000 Quad T-1 system prices have "a long way to go" before they are in line, Blazensky said.

Most users of infrared laser building-to-building network connections are located overseas, where governments that own the telecommunications companies do not allow use of microwave connections to bypass leased-line connections.

HP builds in infrared

CONTINUED FROM PAGE 1

cooperating on the OmniBook 300, a 2.9-pound "super portable" that includes HP's Serial Infra-Red technology. It will hit the market on June 7, according to sources.

In addition, IBM is interested in infrared and may join with HP if its standards effort can accommodate IBM's faster infrared technology.

According to analysts, infrared, which acts as a point-to-point wireless data path, will appeal to portable and handheld computer users because it will give them the ability to easily transfer and update data between multiple PCs. It also eliminates cables, which users "hate," according to Leslie Fiering, an analyst at Gartner Group, Inc.

In with infrared

HP confirmed last week that its future PCs will come standard with infrared (its 95LX and 100LX palmtops already have it), and its printer group said it was considering building in infrared. HP LaserJet users can purchase an infrared add-on from Extended Systems, Inc. in Boise, Idaho. HP also said it will license its Serial Infra-Red technology to other companies. Infrared "has just recently become much more accurate, and HP could play a leadership role here," said Tim Bajarin, president of Santa Clara, Calif.-based Creative Strategies Research International, Inc.

Adding infrared should not cost end users much, said John Romano, research and development manager at HP's personal information products group. Romano said infrared can be built into a PC for as little as $1.

Because of the cost and technology factors, "the time is right for infrared, and if HP can get some buy-in on this technology, infrared could be completely standard on PCs by the end of the year," Fiering said.

Users expressed interest in the technology.

"I like the idea, and in my opinion it's an enabling technology; if the software is done right it creates a lot of possibilities," said Joseph Barrett, lead technical analyst at Whirlpool Corp. in Benton Harbor, Mich.

Barrett agreed that cables deter portable users from transferring data but cautioned that without "intelligently done" software, perhaps at the application programming interface level in the operating system, infrared might just be another kludgy method of data transfer.

"You need to be able to just walk near your desktop with a portable device and have the file get updated, without calling up any programs," to make infrared data transfer work, Barrett said.

Analysts said that while some sort of middleware is needed to realize true synchronized data exchange between PCs, "the first step is a physical infrastructure, and that's what HP is trying to create here," Fiering said.

While infrared is one of several wireless technologies being considered for local-area networks, Romano said HP has little interest in using infrared for connecting LANs. Sources said HP's new LE and LM server lines, due out next Monday, will not have built-in infrared.

Romano said, however, that HP has discussed licensing agreements with phone companies, which are interested in it for both cellular and regular phones. This could enable users to send data files without cables and could make using a cellular phone less of a task.

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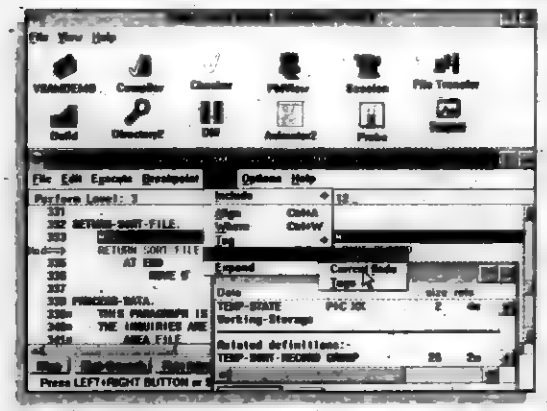

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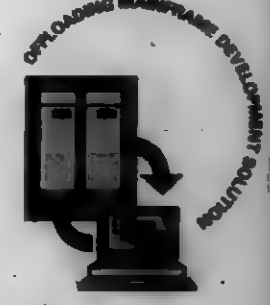

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IBM enters desktop DBMS fray

By Johanna Ambrosio
SAN FRANCISCO

IBM's recently launched Unix database is gaining acceptance at true Blue shops but may have trouble breaking into firms that have adopted a multivendor stance, according to users and analysts.

IBM used last week's Database Expo here to drum up support for DB2/2, available now. First it announced a onetime charge of $199 until Aug. 31. Then it revealed some 25 third-party vendors that are supporting DB2/2 with their applications, including Easel Corp.'s Easel Workbench, Powersoft Corp.'s PowerBuilder and Gupta Corp.'s SQL Gateway

Further, IBM is shipping Distributed Database Connection Services/2, software designed to help connect database applications across multivendor platforms. IBM also said that on June 27 it will ship software, dubbed Datahub, said to help users manage databases throughout an enterprise.

DB2/2 is being positioned as a desktop version of DB2. Another version, for the RISC System/6000 workstation [CW, March 15], will ship in late July.

Initial DB2/2 beta-test users were all DB2 shops that said they are using DB2/2 to help roll out client/server applications.

But whether IBM can succeed outside its DB2 installed base is up for debate. Omri Serlin, president of Itom International, Inc., a consultcy in Los Altos, Calif., said he is unsure. "DB2/2 will likely do well in DB2 shops, but how it will do in the real world of PCs is a question in my mind."

IBM hopes to entice corporate customers with a new pricing structure for its desktop database products. Users can license 10 copies of DB2/2 for $3,000 per month or pay a onetime charge of $2,495. A similar pricing model applies to Distributed Database Connection Services/2.

Taken effort only?

How hard IBM will target users outside its DB2 installed base is also a question.

Thomas Aser, assistant general manager for marketing for IBM's Programming Systems line of business, acknowledged that the first "major market opportunity is DB2 shops which want to go to client/server."

On the other hand, Aser said, "Every OS/2 user who needs a database is a potential client." The product does not target the single, casual user, he added.

Users at DB Expo '93 said they would give DB2/2 a chance, although for some it is too late.

"We already have Ingres in my department," said Dana Bourgeois, a systems administrator at Westinghouse's Marine Division in Sunnyvale, Calif.

Dwight Irving, a product manager at Automatic Data Processing, Inc. in Roseland, N.J., said his company is looking at DB2/2 but has not made a firm decision to buy. Similarly, he said, his group is "playing around" with Database Manager, DB2/2's predecessor product.

Beta-test users, for their part, said they like what they see so far. Jim Gutschow, director of technical services at ARA Services, Inc. in Philadelphia, said he is using DB2/2 to off-load some small DB2 applications from the company's 3090-180E mainframe. "We've been using Database Manager since 1990 for some small to medium-size applications," he said. "DB2/2 will allow us to implement some larger applications on the LAN."

He added, "For us, DB2/2 was a natural because we needed compatibility with the mainframe."

Similarly, the Royal Bank of Canada in Toronto is using DB2/2 for client/server applications, of which some work cooperatively with the mainframe and some do not. "We needed something with a high degree of stability and integrity and recoverability, and DB2/2 has them," said Jim Montgomery, manager of technical planning.

DB Expo '93

DBMS APIs ease client access

By Jean S. Bozman
SAN FRANCISCO

The goal of seamlessly connecting any client to any database server is still a few years away. However, users and analysts attending last week's DB Expo '93 said a wave of vendor support for Microsoft Corp.'s Open Database Connectivity (ODBC) application programming interface (API) is a major step in that direction.

But the ideal "any client, any server" environment would require all major database and PC vendors to support either ODBC or rival Integrated Database Application Programming Interface (IDAPI) from Borland International, Inc., IBM, Novell, Inc. and WordPerfect Corp.

Vendors are lining up slowly behind the options, however. Apple Computer, Inc., Tandem Computers, Inc. and The ASK Group, Inc.'s Ingres Products Division used the show to throw their weight behind ODBC. Microsoft also added ODBC support to its FoxPro 2.5 Xbase, a feature that will ship by next month. Microsoft said more than 70 vendors support ODBC.

"ODBC is becoming a de facto standard," said Donald Feinberg, a software analyst at Gartner Group, Inc. in Santa Clara, Calif. "Apple's support for ODBC sewed it up. It's a standard that gives you any client to any server as long as they're connected with ODBC."

More than 50 vendors have said they will support IDAPI. Some, including Oracle Corp. and Gupta Corp., also support ODBC.

Both ODBC and IDAPI are based on the SQL Access Group's Call Level Interface. Like ODBC, IDAPI supports SQL queries but adds support for non-SQL desktop databases.

Last one in . . .

Apple said it is shipping a software developer's kit for ODBC development; previously, it had placed ODBC support in the Apple-proprietary Data Access Language product. Tandem said it will deliver support for ODBC support for its NonStop SQL database this year. The ASK Group's Ingres Products Division said it has shipped the first ODBC driver for a database server, which was confirmed by Microsoft ODBC product manager Lowell Tuttman.

Limits and confusion

While ODBC uses spreads, some analysts contend it is limited as a low-level connectivity tool. "ODBC's only going to be effective for decision-support applications because it will not allow you to pass a proprietary request through to the database server," said Jeff Tash, president of Database Decisions in Newton, Mass.

Show attendees said they are encouraged by the growing middleware support from vendors but are often confused by conflicting standards. "People feel confused and overwhelmed because there's too much marketing information floating around," said Richard Yu, director of data administration at MCA, Inc./Universal Pictures in North Hollywood, Calif.

It will take several years for a more complete client/server infrastructure to evolve at most sites, said Colin White, president of Database Associates in Morgan Hill, Calif., and DB Expo '93 conference chair.

Until ODBC and IDAPI become widely installed, users will have to choose high-performance database gateways between specific databases or general, low-level access to all databases. "Open systems promises that any client can connect with any server," White said. "But it's a trade-off today."

Reporter's Notebook

Users attending a session on 32-bit operating systems were asked by panel host Jeff Tash, president of Database Decisions, to choose their favorite by standing up and applauding. IBM's OS/2 did OK, Microsoft Corp.'s Windows NT did better, and Unix did even better. But the biggest applause went to a fourth selection: toning down vendors' marketing claims about these operating systems.

To bring about the vision of "information at your fingertips," Microsoft will eventually have to quadruple the size of its operating system from today's 3 million to 4 million lines of code. Those extra lines of code will handle objects, data replication, voice processing, natural language interfaces, business rules, electronic mail, networking and security, Chairman Bill Gates said.

Borland International, Inc. Chief Executive Officer Philippe Kahn gave his Wednesday morning keynote at DB Expo '93, then rushed across San Francisco to the announcement of Sun Microsystems, Inc.'s Windows interface for Unix systems, dubbed WABI. Seemingly not even out of breath, Kahn joined a question-and-answer session about the potential market for Windows applications on Unix workstations. "It's a way for us to play in a huge market where we have not been playing," he explained.

Lots of new products were announced, demonstrated and displayed at DB Expo. Among the highlights were the following: A new client/server version of Blyth Software, Inc.'s Omnis 7.0 database and development tool supports collaborative development of graphical user interface applications. . . . Andersen Consulting revamped its Foundation tool kit for client/server applications. . . . Raima Corp.'s new database server supports fault tolerance and on-line transaction processing. . . . Apple Computer, Inc. announced that its Data Access Language software would support Transmission Control Protocol/Internet Protocol. . . . Andyne Computing Ltd. announced Pablo, a reporting tool that extracts data from database servers for colorful presentation through charts on Apple Macintoshes. . . . Uniface Corp.'s new interface driver supports Borland's InterBase database. . . . Micro Decisionware, Inc. gateway products that link PC local-area networks and IBM DB2 databases will now connect to Oracle Corp.'s databases and Gupta Corp.'s SQLWindows and Quest tools. . . . Meanwhile, Gupta announced gateways to databases from Informix Software, Inc. and The ASK Group, Inc.

Overheard in the corridor at DB Expo's phone bank: "Marketing wants to give us more data? Tell them we don't need no stinking data."

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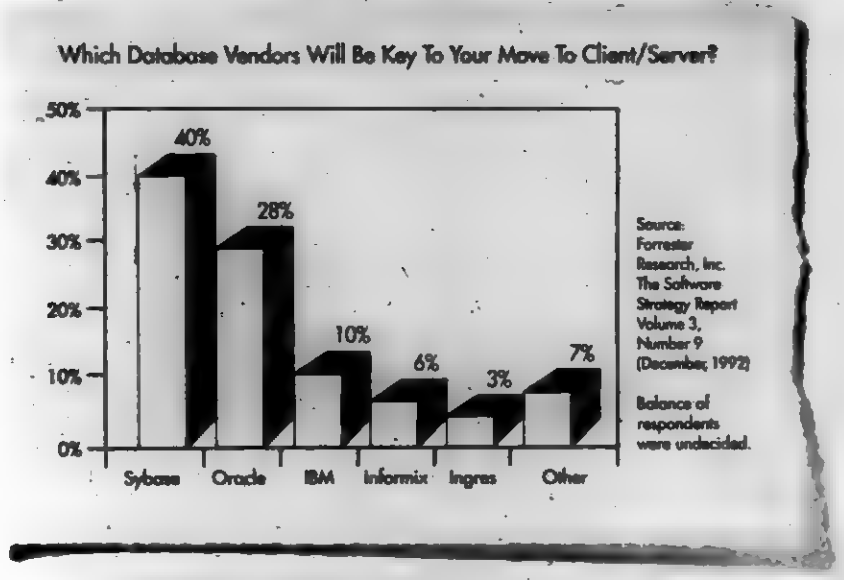

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Sun, Microsoft tangle over Windows on Unix

By Jean S. Bozman
SAN FRANCISCO

The edges between computing environments blurred a little last week as Sun Microsystems, Inc. formally announced its Windows Application Binary Interface (WABI) software, which is said to allow users to run Microsoft Corp. Windows applications on Unix workstations equipped with the X Window System [CW, May 3].

Microsoft, meanwhile, parried with plans to make Windows application programming interfaces (API) available on both Unix and Apple Computer, Inc. Macintosh platforms.

Users hailed the twin moves by Sun and Microsoft as good news because many want to distribute standard Windows applications throughout an organization, whether they are displayed on a PC or a Unix workstation.

Until now, users have paid a premium for recompiled Unix workstation versions of Windows spreadsheets and word processors. Many use emulation packages that host Windows applications on top of MS-DOS on top of Windows, causing system overhead that slows processing.

However, the Sun and Microsoft initiatives differ in that Sun is asking developers to run software binaries on top of Unix, while the Microsoft option gives developers the ability to port Windows source code to Unix.

The Microsoft approach should yield better performance because it allows Windows source code to access native compilers on reduced instruction set computing (RISC) systems, which will bog down performance, said Jeff Elperer, vice president of marketing at Machine Independent Software Corp., a San Francisco provider of tools that help migrate Windows applications to Unix. The Sun approach, however, makes it easier to move Windows applications to Unix because developers will not have to recompile source code.

Sun Chief Executive Officer Scott McNealy and Microsoft Chairman Bill Gates both argued that their Windows-on-Unix solution was superior. "What WABI allows you to do is throw RISC horsepower at what previously had been Intel-landlocked application environments, so now you're not stuck on 386s and 486s," McNealy said.

Gates said customers would have to decide for themselves which company would sell the best version of Windows: the company that wrote the original or a company forced to clone it from the ground up.

Microsoft's approach will rely on products developed by Insignia Solutions, Inc. in Mountain View, Calif., which will be based on libraries from Bristol Technologies in Ridgefield, Conn., that allow the Windows API to run on Unix.

Paul Maritz, Microsoft senior vice president for systems software, downplayed Sun's ability to run Windows applications without access to source code, saying such development does not come cheap. "It's expensive to be in the cloning business," he said.

Users, meanwhile, appeared positive. "WABI promises to allow us to run the same set of applications on all of our desktop platforms," said William R. Berry, a staff exploration systems analyst at the Amoco Production Co. in Houston.

"I just want to have a choice," added Don Bagwell, a database analyst at the Assemblies of God church headquarters in Springfield, Mo.

Users will obtain WABI by buying system software from SunSoft and other Unix vendors, including IBM, The Santa Cruz Operation and Unix System Laboratories, Inc. Sun said WABI will be bundled into the Solaris 2.2 operating system.

West Coast correspondent Christopher Lindquist and senior editor Michael Vizard contributed to this report.

Unix opens wider

Some of the most popular Windows applications are being certified to run on WABI

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Apple, Lotus offer OLE-like protocols

By Michael Vizard and Melinda-Carol Ballou

While Microsoft Corp. touts Object Linking and Embedding (OLE) 2.0, Apple Computer, Inc. and Lotus Development Corp. are trying to drum up support for protocols that provide the same functions as OLE on Unix and Macintosh systems.

Apple's equivalent to OLE, which has the backing of Novell, Inc., has been dubbed Exemplar. According to Bill Hawkins, systems architect at Interleaf, Inc. in Waltham, Mass., Exemplar will provide the same type of functions as OLE across networks consisting of Apple, Novell's NetWare and Unix systems. Hawkins was briefed on Exemplar by Novell.

OLE, by contrast, does not yet support linking and embedding services across the network. But Microsoft is working on adding this capability [CW, May 3].

In the meantime, Lotus is building a Link, Embed Launch to Edit facility that provides OLE-like functions on Unix systems, according to Imran Qidwai, Lotus' development manager for Unix.

Developers are looking to these initiatives to make it possible to integrate applications across diverse platforms and networks.

> The Object Management Group will define an object request broker service for distributing objects.

"It would certainly make our jobs a heck of a lot easier, especially in a client/server environment," said Alistair Jacques, director of support and development at Northwest Airlines, which relies on a Macintosh environment for flight operations control.

"The Apple guys are not going to try to fight Microsoft on a single machine but are saying, 'Let's try to take the high ground on networks and try to subsume OLE in doing so,'" said John Rymer, an industry analyst at the Patricia Seybold Group in Cambridge, Mass.

Thus far, IBM, which already has an OLE equivalent in beta testing for OS/2 and AIX called Distributed System Object Model, and Digital Equipment Corp. are among the vendors reportedly considering adoption of the Exemplar technology.

However, Apple is not expected to deliver Exemplar until this fall at the earliest, which means applications that make use of Exemplar technology probably will not arrive until 1994.

Due in the second half of this year, the Lotus facility is functionally equivalent to OLE 1.0 and is compatible with PC applications that support OLE, Qidwai said. A version of Borland International, Inc.'s Ami Pro for Unix that supports this facility will be available in the second half of this year, he said.

"We had to build our own facility because OLE is not distributed across systems on a network yet, and the Apple facility is a future," Qidwai said.

Senior West Coast correspondent Jim Daly and West Coast correspondent Christopher Lindquist contributed to this report.

OLE to pave road to 'Cairo'

CONTINUED FROM PAGE 1

top of the operating system's kernel. It will include an object-oriented file system, distributed object management and an updated user interface. Its underlying technology, including its Component Object Model, will be based on the OLE 2.0 application programming interface.

Developers were told that making the shift to OLE 2.0 now would make the move to Cairo far easier than having to start from scratch later. That is because their applications would already be able to take better advantage of Cairo's object-oriented features, including the file system. Also, their developers would have spent time making the leap to Microsoft's way of dealing with objects — something it said would not be easy. So much so that Microsoft fed developers predictions of a dim future for anyone who does not start developing applications that support the software giant's method for linking and embedding data objects in applications.

OLE 2.0 "will become one of the most central mechanisms in our operating systems," said Paul Maritz, Microsoft's senior vice president for systems software. That could result in independent software vendor products not being competitive in the next 12 to 18 months in the Windows NT arena if they do not support OLE 2.0 as customers begin to expect features such as Visual Editing, he added.

Maritz's projections fall into the Cairo time frame, which Microsoft said will be available by the end of 1994.

Despite some concerns about OLE 2.0, attendees generally seemed convinced that Cairo is someplace they need to visit soon.

Victor Khatutsky, a software architect at Pilot Software, Inc. in Boston, said he considered the OLE 2.0 developer's kit to be more of a "Cairo SDK." He described OLE 2.0 as a "logical next step" for his firm's product, LightShip, and a way to connect to other applications in a richer way than is currently possible with OLE 1.0 or Dynamic Data Exchange.

That improved integration implemented by OLE 2.0 was seen as vital by other attendees as well. "OLE 2.0 is in our destiny," said Jack Ozzie, senior software engineer at Iris Associates, creators of Lotus Development Corp.'s Notes groupware package.

Not an easy road

Both Microsoft and independent developers said OLE 2.0 will require considerable effort. Microsoft recommended that developers dedicate at least one full-time programmer to learn about and implement OLE 2.0 and added that developers should begin to think of their applications in terms of a component architecticture, which could be a major paradigm shift for some programmers. Most importantly, according to developers familiar with the process, OLE 2.0 allows for the development of applications one piece at a time. This means that should users decide to add more functionality later, developers' previous efforts will not be wasted.

Some developers have apparently mastered the art if applications at the conference from Shapeware, Chrisalan Designs, Inc., Wilson WindowWare and Traffic Software Ltd. are any indication.

Many were based on OLE Automation, a means of exposing the underlying features of an application to the control of other applications. By this method, a user could employ a macro language that could link two applications in such a way that they would look like a single application.

Intel's dominance could slow Alpha

CONTINUED FROM PAGE 1

PCs and other platforms. Moreover, Alpha must go up against Intel's Pentium chip. Systems with Pentium should start shipping next week (see story page 16), and DEC will unveil its Alpha PC on NT and tools.

Other users said they see both Alpha and Intel systems playing a role.

Industry analysts said DEC must do a better job of carving out its niche.

While some users praised Alpha as a "screamer" box, "DEC still has a big challenge ahead to make Alpha an attractive NT platform because Intel is so entrenched," said David Solomon, president of Solomon Software Technologies, Inc., a Nashua, N.H., consulting firm.

"Alpha has to be so much more attractive so that users and developers will take the extra step to move to it," Solomon said, adding that DEC ought to offer 486 pricing and get NT compiler vendors on board to gain a foothold.

Then there is the need to address the issue of general applications availability, as there are so far about 200 Win32 applications compiled for the Alpha system. Microsoft claimed that vendors have committed to producing a mix of more than 500 applications and tool kits for Windows NT, many of which are for the Intel architecture.

Banking on DEC

Among key banks now looking at NT on Alpha are The Chase Manhattan Bank NA, Chemical Bank and Bankers Trust Co. Because all three have significant DEC VAX installations, they are interested in client/server configurations with VAXs and Windows NT-based Alpha systems. But none are likely to move away quickly from the advantages of VMS backup and clustering until NT offers comparable capabilities, they said.

Chase Manhattan Bank has three sets of NT beta tests running now: on DEC's Alpha-based PC, on Compaq Computer Corp.'s Intel-based DeskPro and on NCR Corp.'s 3450 four-processor platform.

Banker's Trust, meanwhile, is testing Alpha servers running Windows NT for the company's PC local-area networks but is also checking out Intel. And Chemical Bank has made the decision to go all out for NT-based platforms and will this week showcase a dual Pentium NCR box running Windows NT at a technology forum for corporate executives.

Demos aside, Chase Manhattan Bank is trying to figure out how to fit Alpha into its shop. "Alpha's very fast, and now we have to see where to place it within our architecture," said Gene Friedman, a Chase Manhattan Bank vice president.

"The specs look good for Alpha, and we're very interested in checking it out, but if we had to decide today, we'd opt for Pentium since it's running our applications," said Rich Lansing, a vice president at Chemical Bank.

An application that took 15 minutes to run on a 50-MHz 486 took only five minutes on the Pentium box, he estimated. Alpha will have to better that performance and offer pricing that is "not onerous" to remain in contention.

"It's not a contest between the two; we'll leverage [both Intel and Alpha] where appropriate," said Sholom Bryski, a managing director at Bankers Trust.

Bankers Trust has brought several Alpha boxes in-house running on VMS and NT. "It looks very good, and on NT, we'd like to [start] by using it as a LAN server platform," said Stanley Rose, a vice president. "It offers speed to the applications that need it."

The attractiveness of Alpha currently lies in its performance — DEC will ship a 150-MHz system for end users and is capable of delivering a 200-MHz box, while Pentium is expected to offer a highest speed of 100 MHz [CW, May 3].

Chemical Bank will initially put in-house-developed customer service and maintenance applications onto Windows NT; the next step will be operations, risk management and business application support. Assuming these steps are completed, the bank would finally move beyond its initial pilot project to production applications in the 1994-95 time frame.

Chase Manhattan is even more conservative; it has not yet committed to NT.

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News Shorts

DEC All-In-1 upgraded

Digital Equipment Corp. announced new services, end-user options and entry-level pricing for the company's All-In-1 office automation software, as well as better integration with TeamLinks groupware products, DEC officials said last week. Additional services include migration assessment, upgrades, customization and personal assistant/teamroute start-up services.

Transarc sets channel

System software vendor **Transarc Corp.** last week announced a new distribution channel to provide "one-stop shopping" for the Open Software Foundation's Distributed Computing Environment and Transarc's own Encina products and services. With 120 customer installations of Encina today, Transarc officials said demand for a "vendor-neutral" channel prompted the company's move into the retail distributed computing marketplace.

FBI investigates stolen systems

Four companies in the San Francisco area have been searched and are being investigated for interstate transportation of stolen computers, according to a statement issued by the Federal Bureau of Investigation last week. The companies that have been searched are **Hi-Tech Computer Systems, Inc.** in Brentwood; **National Smelting and Refining Co.** in Santa Clara; **Peripheral Remarketing, Inc.** in Livermore; and **React Financial Services** in Atherton. Formal charges have not yet been filed, an FBI spokesman said.

AT&T sues MCI — again

AT&T and partner **Unitel** filed a patent infringement suit against competitor **MCI Communications Corp.** and its Canadian telecommunications partner, **Stentor.** The suit is an extension of the patent infringement litigation AT&T brought against MCI in the U.S. in January after two years of negotiation over 10 AT&T-patented technologies MCI uses in its virtual private network services and which it made available to Stentor when the two formed an alliance last May.

EDS to supply 7-Eleven ATMs

The roof may have collapsed on an **Electonic Data Systems Corp.** automated teller data machine (ATM) center last winter, but the sky did not exactly cave in on the business. The Dallas-based outsourcer last week won a 10-year deal to install and operate ATMs at **Southland Corp.** 7-Eleven convenience stores. EDS said the deal is worth approximately $100 million, based largely on anticipated transaction fees at as many as 4,000 machines it expects to install.

SHORT TAKES **Microsoft Corp.** said it has delivered Version 6.0 of its Word word processing package for DOS [CW, April 26].... **WordPerfect Corp.** is expected to announce this week that on June 28 it will deliver Version 6.0 of WordPerfect for DOS, a 32-bit implementation.... **Unisys Corp.** introduced the LINC Development Assistant III, a computer-aided software engineering (CASE) product that links upper-CASE graphical analysis and design tools with lower-CASE development and testing systems.... Unisys has also started a service called CTOS/Open Forum on the **CompuServe Information Service**, which customers can access by typing "GO CTOS."... **Penril DataComm Networks, Inc.** acquired internetworking vendor **Datability, Inc.**.... **AT&T** rolled out a nationwide network service discount plan allowing users to save 5% to 24% on local access charges in return for multiple-year contract commitments.

Microcomputing

It's almost show time for Pentium

By Michael Fitzgerald

Users will have every right to expect their first-generation Pentium hardware to be solid as a rock. After all, Intel Corp. began telling major hardware vendors about the chip's particulars almost two years ago.

Some privileged vendors, such as IBM PC Co., Dell Computer Corp., Compaq Computer Corp. and NCR Corp., will start shipping systems next Monday. Others such as Unisys Corp. must wait until early in the second half of the year for volume Pentium shipments.

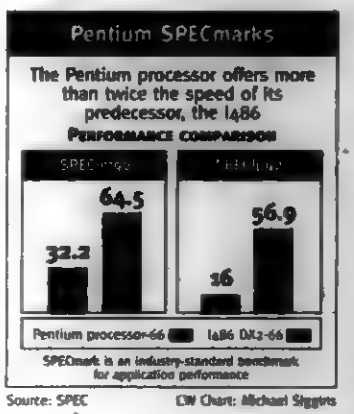
Users awaiting these systems last week said they expect to hit bumps in the road as they experiment with Pentium-based systems: Many new Pentium boxes will feature a complete architectural shift.

"We're looking for the next generation of PCs to leave behind a lot of the vestigial features of the 8088-based PC, such as the slow buses, the I/O structure and all the expansion issues that are such a nuisance," said James Hansel, vice president of investment systems at UBS Asset Management, Inc. in New York.

Hot seat

Dealing with Pentium's much-reported heat problems was another issue.

"If the chip gets too hot, it dies, and it can ruin the processor if it happens too many times," said Frank Greer, system development manager at NCR's workstation division in Clemson, S.C. Overheating can also bring early death to other parts of the system, such as the hard drive.



Source: SPEC CW Chart: Michael Siggins

Fan location may be key, Greer warned. While many vendors, including Compaq, have opted to build a small fan onto the heat sinks that help keep Pentium chips cool, Greer said, "We don't see these fans as reliable."

Compaq has an automatic fail utility built into its system software that will shut the system down if the chip begins to overheat.

Vendors may benefit from building upgradable systems. Because vendors close to Intel have had as much as two years to prepare for Pentium, many released servers and desktops last year that featured Pentium-capable motherboards. Typically, these systems came with a 64-bit processor bus and a 128-bit memory bus.

For instance, Compaq's DeskPro/M, released in September 1991, was designed with Pentium in mind. Because the DeskPro/M features removable subsystems, Compaq can simply design a new processor complex that accommodates Pentium and put it into a DeskPro/M with all Pentium-optimized subsystems.

Compaq did take one of the more radical Pentium design steps, modifying the Pentium-ready TriFlex architecture it uses in its servers for its Pentium-based DeskPro/Ms.

Users who bought systems that support an OverDrive upgrade to Pentium will be disappointed if they expect to pop in one of Intel's new 60-MHz or 66-MHz Pentiums, as Intel will not ship the OverDrive part until next year.

Another possible downer is that systems vendors not on Intel's most-favored list may not have built systems that will take full advantage of the write-back cache and pipelining features in Pentium.

Oracle, Compaq team

CONTINUED FROM PAGE 1

companies build their lock manager. A lock manager keeps one CPU from overwriting the work of another CPU in a clustered environment.

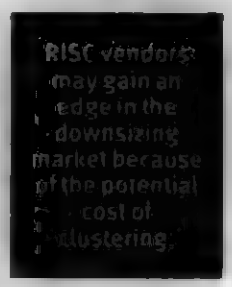
Not an easy task

Richard Finkelstein, president of Performance Computing, Inc., a database consultancy in Chicago, said the partners face an extremely complex endeavor. "This is a very, very complex environment to deploy, and I don't see how they're going to get all these systems together in a viable fashion for three to five years."

Finkelstein added, "If they could produce it, they could do good things for customers because clustering allows a lot of flexibility and growth for an organization."

The potential cost of a cluster had at least one user saying RISC vendors might gain an edge in the downsizing market over PC-based units.

Big Unix boxes "are coming down in price, while a PC cluster starts escalating costs to where it's going to be as high as a minicomputer," said George Roukas, director of systems at a major financial company. Noting that his applications are getting bigger, he said, "We're looking at going beyond the PC server world [to Unix]. Clustering is not going to change that."



Modifications a must

According to sources, Oracle and Compaq will have to modify the product to recognize both the multiple processors in an Extended Industry Standard Architecture-based system and some other performance enhancements to Compaq's network management software. The sources said Compaq will be Oracle's first partner in the PC server market.

Spokespeople at both companies neither confirmed nor denied that the two firms are working together.

Compaq and Oracle are said to be pursuing similiar partnerships with other companies as well. Oracle, for example, is known to be developing Parallel Oracle on platforms such as NCR Corp.'s 3550, a scalable, minicomputer-like server with similarities to Compaq's SystemPro/XL.

The strategy is driven both by Compaq's ongoing desire to beef up its total systems strategy as margins shrink on hardware and by Oracle's interest in getting business as PC LANs outgrow current hardware and software configurations.

Users will gain the ability to scale up their systems by either adding processors to a high-level SystemPro/XL or adding more SystemPros to the cluster.

Senior West Coast editor Jean S. Bozman contributed to this story.

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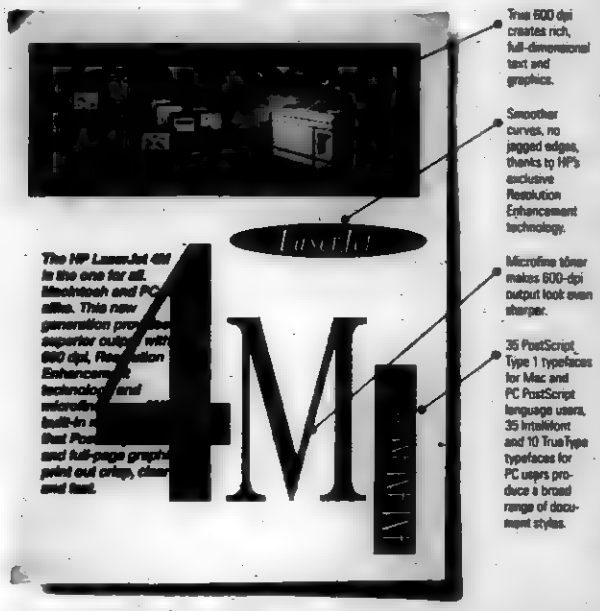

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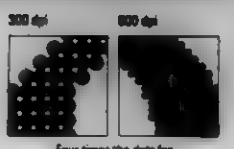

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Reporter's Notebook

Items of interest from last week's MacIS show in San Antonio.

Corporate customers developing a client/server architecture applauded last week as **Apple Computer, Inc.** finally delivered its full six-volume **Vital** (Virtually Integrated Technical Architecture Lifecycle) document. Vital is an internally developed design for integrating the Macintosh into a variety of mixed hardware and software configurations.

Curiously for a multimedia-oriented company, the $1,500, 1,000-page document is only available in luggable paper form, although Apple officials said they are considering both on-line and CD-ROM versions. Apple also announced fee-based Vital training will be available from **Bear River Associates, KPMG-ExIS, Martin Marietta Information Systems** and **RWD Technologies**.

Look for the second phase of Apple's extensive **customer support** package to be rolled out in September. This portion will be geared toward the corporate customer, and sources said it will include on-site support personnel, configuration management utilities, televised briefings for remote sites and an on-line support database.

Nagging **shortages** still remain for several Macintosh models. Users said it is still tough to get the Quadra 800 as well as the PowerBook 180, MacLC III, the MacIIVX and the Centris 610 and 650.

The next version of **AppleShare**, which is due out next month, will include a new way to crack down on software piracy. An AppleShare 4.0 protocol called License Manager will search networks for unauthorized copies of the server software. If it finds an unauthorized duplicate, it flashes a message to the network and users as they try to log on. The messages are intended to be an annoyance, but they will never shut down the server, sources said.

Look for an update to Apple's **Data Access Language** (DAL) early next year. DAL, which enables interactive data access to multiple database servers, supersedes the terminal emulation that had been the source of most Macintosh-to-host access in the past. Still desperately needed: decent connections to **Hewlett-Packard Co.**'s TurboImage database. Mike Foster, project manager at **DeLong Sportswear, Inc.** in Grinnell, Iowa, said: "It sometimes seems that HP and Apple ... are connected like two cans and a piece of string."

PowerBook owners are complaining that the screen on the popular portable computer is easily broken and that Apple is charging more than $1,000 — or half the price of some models — to fix it. Apple has apparently brushed off the problem, claiming the machines were "abused." Users disagreed and claim Apple has an engineering problem that it will not admit to.

Compiled by West Coast senior correspondent James Daly.

Number one's new number.

Mac issues

Top 10 issues for Microsoft to come out of the MacIS show

1. Improve feature and file cross-platform compatibility of Microsoft products.
4. Shortage of information on OCE/MAPI.
5. Make Microsoft upgrade costs more consistent.
7. Become more committed to Macintoshes.
8. Provide consistent support for Apple Events in all products.
10. Clarify Apple's relationship with Microsoft.

Source: MacIS — CW Chart: Janell Genvoese

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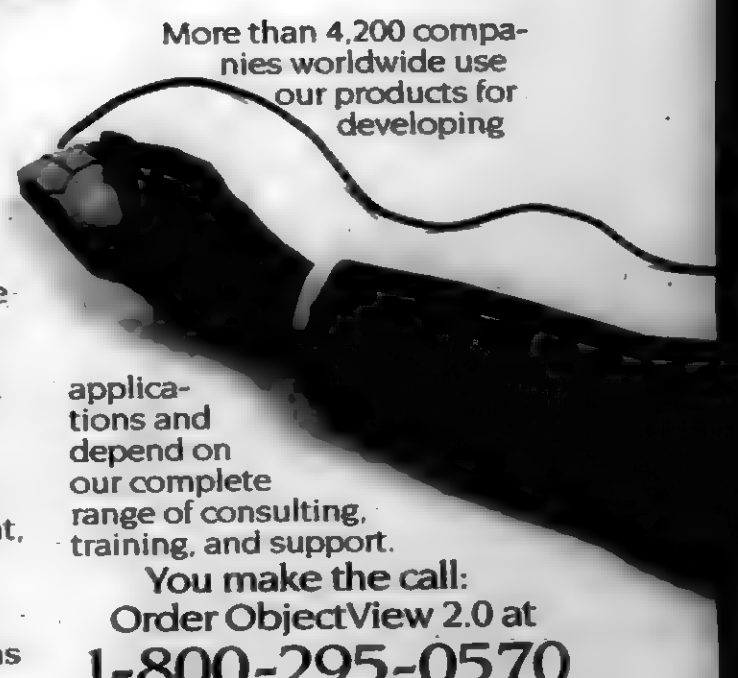

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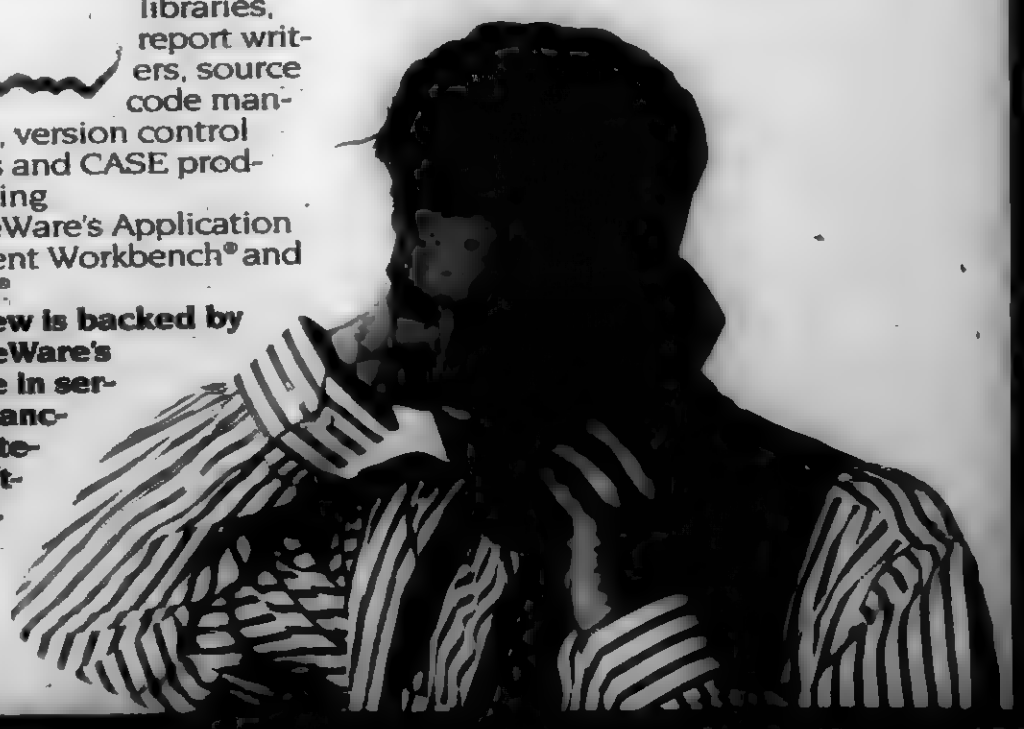

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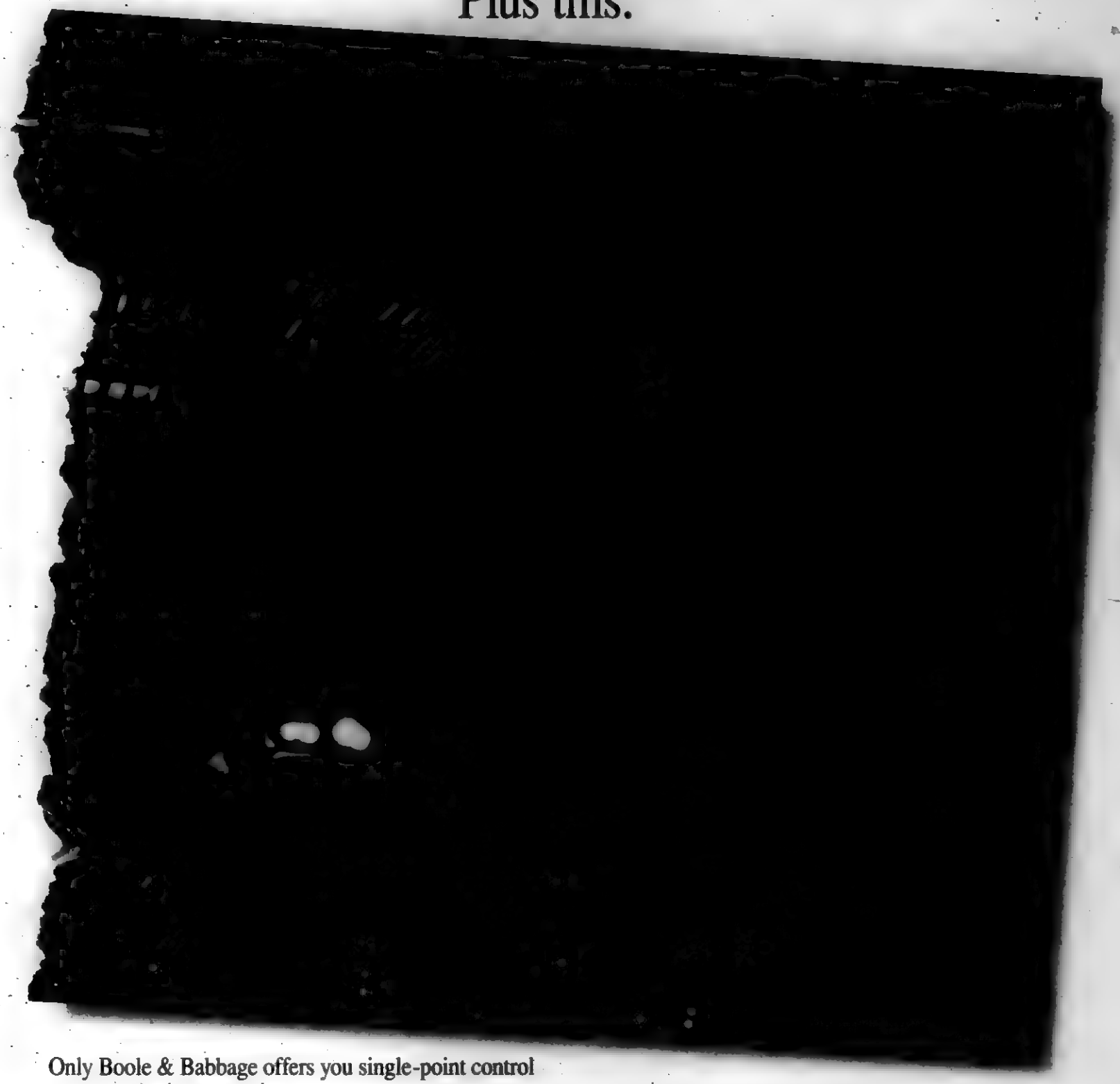

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Business process re-engineering

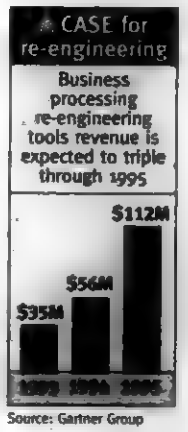
TI breaks ground with modeling tool

By Ellis Booker
PLANO, TEXAS

Already a leading supplier of computer-aided software engineering (CASE) applications, Texas Instruments, Inc. this week began shipping its first business processing modeling product.

Called Business Design Facility (BDF), the workstation-based system permits users to graphically model business procedures and organizational structures. Actual cost, quality and cycle time metrics can be defined by the user and input into the model from flowcharts.

Users can construct "as is" models and then explore alternative ones. For instance, a company might analyze all the steps used in performing customer credit checks, looking for ways to reduce the time from five to three hours.



Source: Gartner Group

According to analysts, TI, which announced BDF last September, is one of the first companies to offer such a tool.

"Of the CASE vendors, they are clearly the first with a product separate from CASE," said Al Case, vice president of application development and management strategies at Gartner Group, Inc., a consultancy based in Stamford, Conn.

Family line

BDF is based on a yet-to-be-released "metamodel" of the Information Engineering Facility (IEF), TI's popular CASE tool. Introduced in 1987, IEF is a software engineering tool currently used by nearly 700 organizations, according to TI.

CASE tools such as IEF typically work in phases, from initial planning and analysis to design and construction of the computer code.

TI's BDF supports Microsoft's Windows 3.1 or above and IBM's OS/2 Version 1 or above. It also supports the DDE feature in Windows 3.1 and OS/2 for linkage with other DDE-compliant applications.

BDF models, which represent reformulated business arrangements, feed the early stages of this CASE work. If CASE tools automate the creation of new applications code, tools like BDF help question and visualize underlying business procedures.

BDF supports an "automatic" interface to IEF but maintains its own local encyclopedia for data and models that allows uploading of models into the tool.

Version 2.0, expected at the end of this year or in the first quarter of 1994, will be able to tie directly into IEF's central or local-area network-based encyclopedia.

TI is also intent on making BDF an open utility that is attractive to users of other CASE tools. Version 2.0 will support a number of interface standards, including the CASE Data Interchange Format, enabling it to work with CASE tools from other vendors, noted Carol Maring, TI's worldwide BDF manager.

At the workstation level, BDF can already operate with other software tools because it supports Microsoft Corp.'s Dynamic Data Exchange (DDE) feature.

TI indicated it has already developed macros between BDF and Microsoft's Excel and Word, two DDE-compliant applications. The macros are being provided as "exampleware," TI said.

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Technology in Tinseltown

In its quest for special effects, Hollywood becomes a computing pioneer, testbed

By James Daly

The plot used to go like this: State-of-the-art hardware and software were shipped off only to national laboratories or a handful of leading-edge firms. But today, with federal research dollars shrinking and private companies looking twice at million-dollar information systems budgets, some of the most powerful hardware and sophisticated software in the world goes to high-rolling Hollywood film producers.

Not only is the film industry eagerly buying the computer industry's superstar systems, but it is also working hard at expanding technological frontiers in areas such as visualization and high-speed graphics. One of the tangential benefits for users outside Hollywood is that the film industry is now a testing ground for tomorrow's commercial technologies.

Feeding the monster

These days, the movie industry needs as much computational power as it can muster in order to feed that voracious monster known as special effects. Through visually stunning blockbusters such as *Ghostbusters*, *Batman* and *Terminator 2*, Hollywood has created a demand it can barely satiate in the public's increased desire for more spectacular and complex video and film effects.

IBM's eight-processor, $1.2 million Power Visualization System helped Sylvester Stallone conquer the elements in an upcoming movie.

Even the speediest computers bog down like lawn mowers in wet grass when processing color film — a single 35mm frame carries up to 20M bytes of information before data compression. At 24 frames per second, a single special scene lasting less than a minute could take four months or more to create.

The result is that IBM's Power Visualization System (PVS), a new breed of supercomputer originally designed for such computationally demanding scientific visualization projects as monitoring ozone data, has been installed at Boss Film Studios in Marina Del Rey, Calif., one of the leading lights of the special effects business. "We'll eat up all the power we can get and still demand more," said Álan Fetzer, chief operating officer at Boss.

Despite the $1.2 million price of the eight-processor PVS, it is a godsend to Boss founder and four-time Oscar winner Richard Edlund when he is trying to reify the spectacular imagination of film directors like John Landis or Tim Burton.

SPECIAL EFFECTS

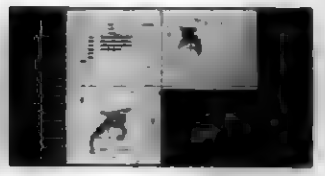
In *Death Becomes Her*, special effects created this head-turning illusion:

Final composite of Meryl Streep sitting at piano with head twisted 180 degrees. Computer graphics reflection of head in mirror.

1. Background plate.

4. Bluescreen ponytail in head element.

2. Clean plate used to fill in background behind blue hooded head.



5. Computer-generated replacement neck.

3. Bluescreen head match-moved to live action plate.

6. Precomposite; head removed and replaced with clean plate.

Source: Industrial Light and Magic

Boss' PVS is linked to a 21G-byte IBM Disk Array Subsystem that delivers sustained data transfer rates of 55M byte/sec. Special effects artists can quickly blend fantastic images on the computer screen and play them back in real time, replacing a laborious photochemical process that Edlund calls "our old sledgehammer technology."

For *Cliffhanger*, the Sylvester Stallone thriller due out later this month, Boss used a battery of Silicon Graphics, Inc. workstations linked to a PVS doing 2.5 billion floating-point operations per second. The result is a heart-stopping Rocky Mountain sequence for which special effects artists nimbly designed a scene in which Stallone scales a towering jagged cliff while battling blowing snow and attacking helicopters. Conventional image compositing would have taken weeks.

Silicon Graphics recently announced a partnership with Industrial Light and Magic (ILM), the San Rafael, Calif.-based special effects company founded by *Star Wars* director George Lucas. The pair will create a state-of-the-art research laboratory to explore new imaging technologies and evolve special effects from "a photographic process into a more painterly process," Lucas said. The venture has been fortuitously named JEDI, for Joint Environment for Digital Imaging.

Special effects artists can quickly blend fantastic images on computer screen and play them back in real time, replacing a laborious photochemical process.

JEDI will include 70 Silicon Graphics workstations and a high-speed network that will allow it to communicate with ILM clients all over the world.

The network is currently being used in the creation of *Jurassic Park*, now in production for a scheduled June release. Several times a week, ILM-created special effects are sent over the wire to director Steven Spielberg in Poland, where he is working on a new movie.

Not just creepy crawlers

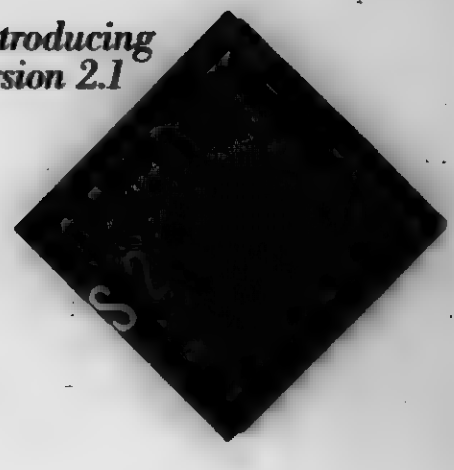
The products generated by the alliance will not be limited to large lizards chasing actress Laura Dern around the jungle. Although the ostensible goal of JEDI is to cut the cost of movie special effects to one-tenth their current rate, the system's output is expected to extend far beyond big-budget Hollywood epics.

Sophisticated modeling applications and texture mapping techniques that were designed by the Silicon Graphics/ILM partnership several years back are now used at places such as Ford Motor Co. in the design of new cars.

In addition, the ILM and Silicon Graphics international digital network could be a precursor of things to come — getting high-quality images instantaneously anywhere in the world is something the leading imaging companies have been trying to perfect for years. "This is just the beginning of the revolution that's being visited on us by digital technology," Lucas said.

David W. Bromley, news editor at the IDG News Service, contributed to this report.

Introducing Version 2.1



Not just up and coming.

No doubt, you've heard the hype about the long overdue first release of Windows NT,™ reportedly due to be shipped sometime this summer.

Perhaps you've also heard that when it finally does get shipped, NT will run only a limited number of the thousands of existing Windows™ and DOS apps, and will really put the squeeze on your hardware. It will require a lot more memory and hard drive space than originally promised.

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Multiple environments are no longer worlds apart. Even if you have Novell Netware on one network, HP-UX on another and EtherTalk on a third, the new HP LaserJet 4Si MX printer easily connects across platforms. Automatically.

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that adapts to multiple environments.

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To find out more about the multiple-network HP LaserJet 4Si MX printer and the upgradable HP LaserJet 4Si printer just call 1-800-LASERJET, Ext. 7299.† Capabilities this advanced make a world of difference—in any environment.

HEWLETT PACKARD

Not dead yet

When I hear people say mainframe computing is dead, I think of the experts who forecasted $3-a-gallon gasoline by 1982, or the doomsayers who predicted the world would end on Oct. 19, 1990.

Such predictions make for great press, but they're out of touch with reality.

Mainframe computing — as we have known it — may be on the decline, but don't forecast its demise too early. What's happening is that the economics of mainframe computing are changing. Hardware prices are plummeting, software costs are falling into line with hardware, and mainframe architectures are evolving into more cost-effective parallel models.

At DB/Expo '93 in San Francisco last week, one speaker asked the crowd of about 150 — mostly corporate developers — how many of them had a mainframe in their organization.

About 70% of the attendants' hands went up. The speaker then asked how many expected to have a mainframe in their organization five years from now. I'd say at least 70% of the hands shot up. Maybe more.

The next day I had the opportunity to ask Microsoft's Bill Gates about the future of centralized computing. His answer? "We're in the information age and that means there'll be a lot of information. There are still large economies of scale in storage costs and administration of centralizing that data, and as fiber brings communication costs down, you'll be able to pool a lot of that data in one place. . . . The productivity application world and the data center world are not separate any more."

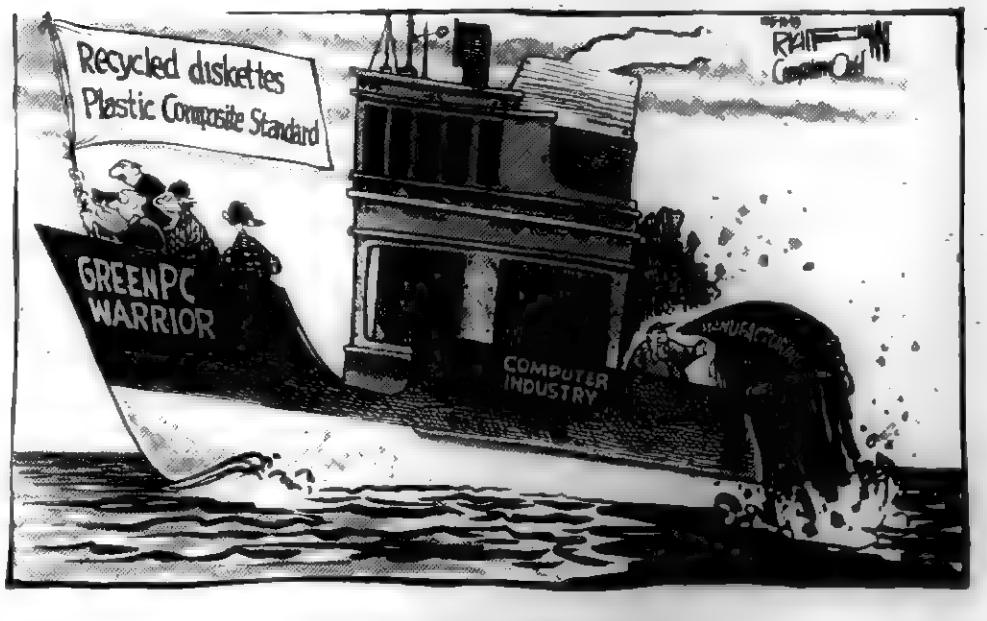
Is Gates a mainframe bigot? Hardly. But Microsoft's chairman knows that information at your fingertips doesn't necessarily mean information spread to the four winds. Gates the PC bigot understands that securing and indexing information is easier to do in one place than across a thousand servers spread throughout the enterprise and linked by a single cable.

A few weeks ago, I spoke to a user at a large insurance company who told me that when his firm's $11 million mainframe comes off lease late next year, its residual value will be about $500,000. At that price, he expects his company to hold on to the mainframe because it will be so cheap to operate. And this user isn't exactly a big iron booster. His company has been on the leading edge of client/server development.

No, the mainframe isn't dead. What's dead is high-priced, proprietary hardware from vendors whose primary competitive edge is in the headlock they have on captive customers. Good riddance. There is a lot of innovation still left to come in the data center. It will be in multiprocessing servers running Unix or Microsoft Windows NT with massive RAID subsystems.

It will come from companies like NCR, Sequent and Tricord and, yes, even IBM and DEC. But centralized computing isn't going away. If you think it is, I have some $3-a-gallon gasoline I'd like to sell you.

Paul Gillin, *Executive editor*



Free speech includes E-mail

I strongly disagree with Paul Gillin's premise that electronic mail transmitted via a quasi-public forum be held to the same legal standards as commercially published journalism ["Flame out," CW, April 12].

Messages between private parties representing themselves should have free-speech protection, regardless of the media in use. The issue isn't the size of the audience involved; it's the ground rules of the forum.

The understanding within the electronic community is that, unless explicitly stated otherwise, bulletin board service E-mail messages represent the opinion of the individual alone and have no official credence. To penalize me for using technological advances to express my opinion is unfair and throttles the adoption of the medium.

I have to wonder if the root of your objection is a vested interest in commercial journalism and communications — industries and premises threatened by the adoption of mass, private publishing.

Channels such as CompuServe and Prodigy empower individuals with the means to directly address the news events and makers and then discuss the issues within an ever-widening circle of contacts. As a result, intermediaries such as newspapers and magazines are facing a diminishing role. Perhaps your stance is rooted in self-preservation.

R.N. Carr
Project analyst
Fort Worth, Texas

Time for TeamFocus

This letter is in response to "What IBM needs is a little TeamFocus" [CW, April 5]. I couldn't agree more with Esther Dyson's views of TeamFocus.

As an employee of IBM and a facilitator who uses TeamFocus, I have seen the productivity gained in both IBM and client meetings that have used TeamFocus to do problem-solving and strategy sessions.

I would be happy to run TeamFocus meetings for Mr. Gerstner and his staff. Unfortunately, I will need to do this as a contractor because, after 12 years of service, IBM has decided my skills aren't needed at the company.

Howard S. Miller
San Francisco

AI deserves more credit

You've done it again — buried artificial intelligence prematurely ["Ghost image," CW, April 5].

There is no question that AI hasn't lived up to the "taking-over-the-world" promises that some vendors and media pushed, but AI is alive and well, working productively and expanding its influence.

The Innovative Applications of Artificial Intelligence '93 winners to be presented July 12-14 in Washington, D.C., represent impressive performance for AI technology in a wide variety of basic business functions.

I think you can provide a meaningful service to your readers by taking a current look at AI. AI expert Ed Feigenbaum is delivering a talk at the American Association for Artificial Intelligence national conference in July. He says, "It is important to our economy to free this competitive tiger, but to do so we must understand its cage."

Part of that cage is the *Computerworld* attitude toward AI, mostly in headlines that are hurtful, not in articles, which have done a respectable job of giving AI credit where due.

Jim Wattenmaker
Cleveland

Memory failure?

Charles Darnell must have misread the logo on the computer in question [WYSIWYG, CW, April 19].

The first installations of the Univac 1107 were at the Census Bureau in Suitland, Md., in 1962. The 1107 was air-cooled and did not have any internal facilities for lunch-eating or chess-playing. I suspect the device in question was an earlier Univac, possibly an 1103A or 1105.

Wayne P. Fuhrmann
Bowie, Md.

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Client/server isn't the answer for everything

Ed Toben

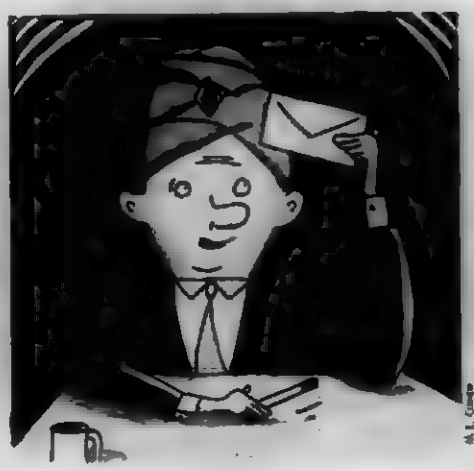
This is no time for easy answers, but sometimes I feel as if that is what IS managers are getting from those we depend on for support.

Our job is to provide information systems that support the objectives of our customers — the business "users." In order to do that job properly, we, in turn, rely on an external community of vendors, consultants, educational services, conference forums and so on. Lately, however, I've been concerned that this support group isn't fully listening, that technical solutions are being recommended and marketed to us without complete consideration of the needs of our customers.

It is popular in the business press to declare, "The mainframe is dead." At the same time, many IS consultants remind me of Johnny Carson's Karnac the Magnificent. "And the answer is ... client/server!" The difference is that, in this routine, neither Ed McMahon nor anyone else is asking any questions.

Specifically, three questions need to be asked: What information is needed, who needs it, and when? Until these questions are answered, no architecture can be determined.

At Colgate-Palmolive, we have put considerable effort into determining what information our business users need. Although the requirements are difficult to simplify, in general they are to support customer service. Our retail



M.L. Cooke

customers have clearly indicated their objectives: to lower inventories, streamline the replenishment process and cut costs.

For us, the answer to "What information is needed?" is "The information to move product from a retail point of sale through all the sales, manufacturing, distribution and financial phases leading to the next sale."

The answer to "Who needs the information?" has changed from the traditional exclusive use by a particular department to shared use by cross-functional teams. "When?" is increasingly a matter of real time.

It is also important to understand how the information is used. As a simple example, the basic information on a purchase order is used by many functions throughout the organization, but each uses it differently.

People in distribution and customer service functions need precise, timely information in an actionable format. Sales and marketing personnel need the same facts integrated with other information for analysis. And while those two departments can use the same basic information, they analyze it differently. This multiplication of requirements continues exponentially throughout the organization.

The organization's information architecture needs to provide for all of those varieties of need. The mainframe's strength is the large, efficient processing of information. PCs and workstations provide analysis capabilities on the desktop. The network and systems software must be able to move the information where it is needed, when it is needed.

These are complex issues that cannot be simplified in catch phrases such as "client/server." Instead, all of us — IS, vendors, consultants — must listen to the same speaker: the business user.

Toben is director of information systems at Colgate-Palmolive Co. in New York.

Unsupported technology: A prescription for failure

COUNTER-INFORMATION *by* Michael Schrage

Of all the passions that fuel technically brilliant IS management, none burns hotter or more pure than its utter contempt for end-user training and support.

CIOs may preach the gospel of client/service architectures and the productivity promises of groupware, but ask them about the end-user training and the support infrastructures they're building to manage it all and they'll look at you as if you had kneed them in the groin.

> IS organizations have come to resemble urban hospitals — capital-intensive, high-technology operations with atrocious bedside manners.

A thoroughly unscientific, informal survey of my Fortune 1,000 MBA acquaintances reveals that while they said their companies all offered training and support, *not one* of them knew whether their company offered a FAQs bulletin board. (For non-Internet users, FAQs stands for Frequently Asked Questions — in other words, a bulletin board that lists the answers to end users' most commonly asked questions.)

Why not? Why not create and publicize something that can make everybody's working life just a little bit easier?

In too many respects, IS organizations have come to resemble the dehumanizing aspects of urban hospitals. They are capital-intensive, high-technology operations filled with technically competent professionals working against the clock and against the odds. But their bedside manner is nothing short of atrocious. Sure, there's the rare specialist or support person who takes the time and effort to discuss and explain. But essentially, the patient/end user is viewed as a problem to be solved rather than as a person.

The more enlightened hospitals understand that, no matter how busy things get, informing and supporting patients can be just as important as treating them. No doubt, some of this is done to mitigate the risk of malpractice suits, but there's also a growing recognition that these sorts of practices make for happier and healthier patients. IS departments had better become similarly enlightened.

IS is spending a growing fortune on end-user training and support budgets. Indeed, that may be part of the problem. The idea that IS is in the best position to pay for and run training programs is absurd. If end-user computing is an enterprisewide investment, then training has to become enterprisewide investment — and that should be reflected in the budget, not just in who gets sent to training. Why shouldn't human resources and marketing have to kick in for training and support?

If I were a CIO or IS director, the end-user trend that would worry me the most is disintermediation of support — the IS group being bypassed as end users increasingly rely on vendors for support.

On the surface, this seems to be merely another example of outsourcing. Dig deeper, however, and what you find is that, bit by bit (pun intended), IS begins to lose any core competence it has in understanding the organization's technology culture and use.

Forget the la-di-dah frothings about customer service; bringing creativity to the challenge of end-user training and support is turning into an issue of survival. In this day and age, a hospital can have great doctors and terrific equipment but still not be assured of either profitability or continued existence. The same holds true for IS.

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990). His Internet address is schrage@media-lab.media.mit.edu.

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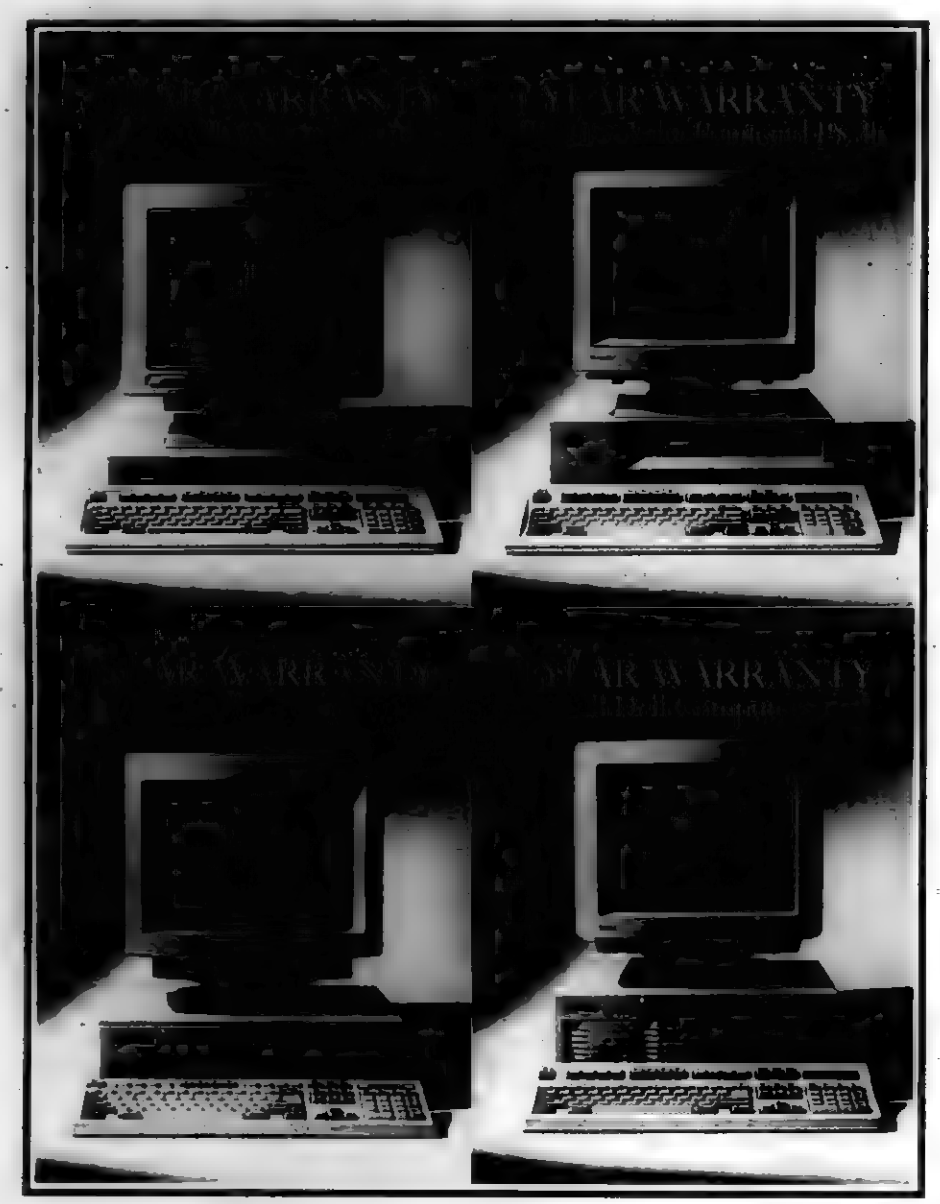

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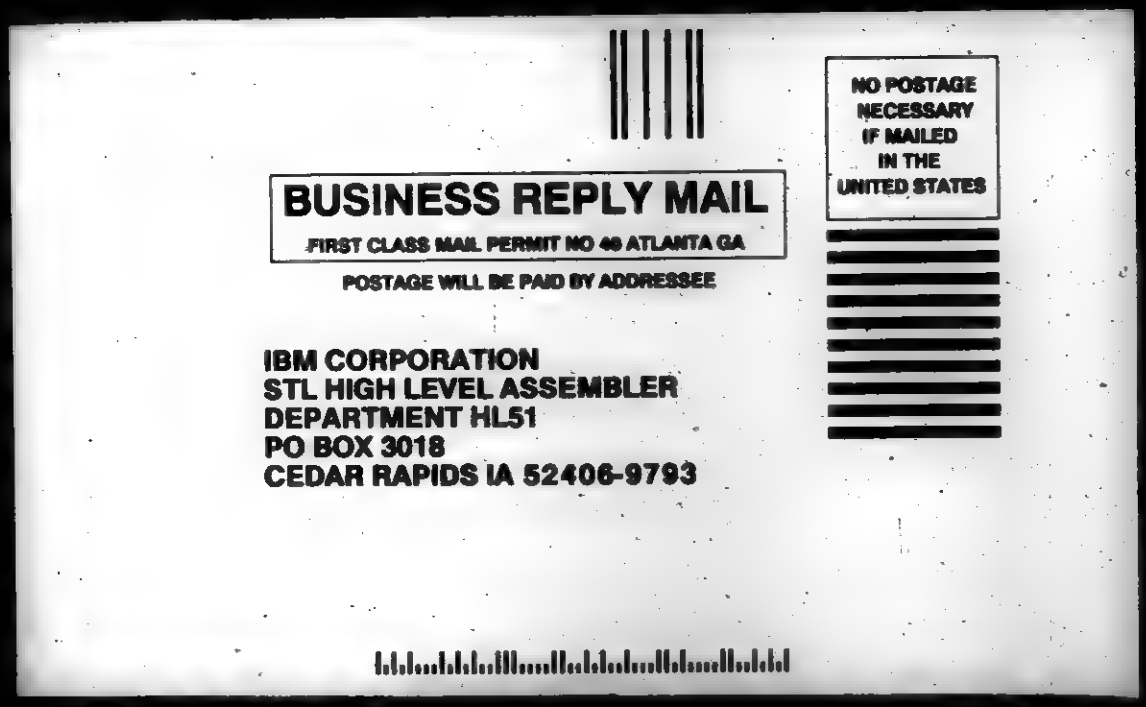
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Charles Babcock

Teamwork in action

The latest flowering of what Novell President Ray Noorda likes to call "coopetition" is a pact that has one of the features of the competing Banyan Vines being sold as an add-on to NetWare. Banyan is making its StreetTalk global directory available under the name Enterprise Network Services for NetWare.

Such a move required technical collaboration, and Banyan officials praised the engineering relationship the two firms enjoy at the Banyan user group meeting in San Francisco recently.

Lest anyone think they are getting too cozy, the Banyan spokesmen didn't miss a beat as they switched to bashing NetWare 4.0's Directory Services. Banyan has 8% of the LAN market compared with Novell's 70% or more, so it seems "coopetition" retains its competitive edge, especially for the smaller party.

Novell networks have been restricted by their binderies and other single-server characteristics. The latest version of NetWare, 4.0, overstepped those restrictions, but it is a more complicated installation than its 3.X and 2.X predecessors. In addition, 4.0's NetWare Directory Services don't work with servers running NetWare 3.X or 2.X. So creating a global directory with 4.0 requires either upgrading all existing NetWare LANs to 4.0 or turning to Banyan's alternative.

A key challenge for any enterprise LAN is keeping the global directory updated for all locations. As the network grows to hundreds or thousands of users, the large amount of information about each user and resource becomes unwieldy to send around the network. So far, Novell and Banyan have come up with different answers, with Banyan's showing its edge in experience.

NetWare 4.0 creates a global directory on the X.500 model that can produce a network address with as many elements to the name as needed. The directory, or some fraction of it, is then transmitted to each network server with accompanying descriptors. Because of the amount of information, the task of keeping directories current escalates as the network grows, and it's not clear how close to simultaneously NetWare 4.0 executes the updates.

Banyan has taken what Stan Schatt, senior analyst for LANs at Computer Intelligence/Infocorp, describes as a more "elegant" approach. Instead of trying to disseminate all the information connected with each name immediately, Banyan uses a central server for the global directory and propagates a table with essential locator information to each server. Thus, if a new user comes on the network, a distant co-worker can communicate with him within seconds using a standard, three-part address — i.e., user name, department and business unit.

Within 24 hours, StreetTalk sends out all the descriptor information that goes with a name, permitting someone to search for an individual based on items such as the name of the person to whom he reports. Banyan's approach lends itself to synchronizing a network quickly without overloading the update task.

Given Banyan's greater experience at designing large networks, one might wonder why Novell has left the door open to its huge 2.X and 3.X NetWare customer base. Schatt says Banyan can provide a service to NetWare 2.X and 3.X customers that Novell may not wish to provide, while it shifts its attention to developing NetWare 4.0. It seems to me, however, that the NetWare customers who try StreetTalk on their 2.X and 3.X networks will also want to compare it to the Directory Services in 4.0.

By the time this happens, Directory Services may be able to match or better what StreetTalk can do. If not, the competitive edge in "coopetition" will come back to haunt Novell.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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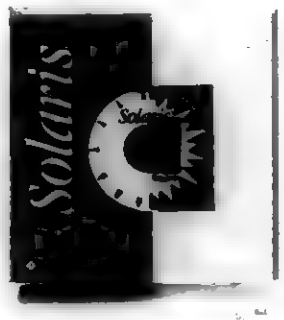

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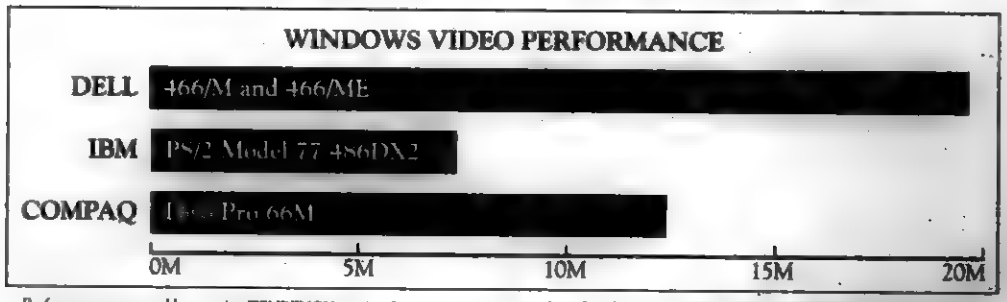

Performance measured by running WINBENCH version 3.1 at 640 x 480, 256 colors. Results measured in millions of WINMARKS. Results for IBM and Compaq as published by PC Magazine in issue dated January 26, 1993. Results for Dell 466/M and 466/ME provided by Dell Performance Measurement Lab, January 1993. DeskPro 66M configured with 8MB RAM, 210MB IDE HD, QVision 1024/E controller with 1MB VRAM. PS/2 model 77 486DX2 configured with 8MB RAM, 400MB SCSI HD, XGA-2 with 1MB VRAM and 256KB cache. 466/M and 466/ME both configured with 8MB RAM, 170MB IDE HD, local bus video with 1MB VRAM, and 128KB cache.

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IBM fills in OS/2 cracks

Enhancements and open systems thrust are potential lures

By Christopher Lindquist

Early reports from users on OS/2 2.1 indicate that the updated operating system has few blemishes but could use some additions to make it more appealing to customers. But the changes to OS/2 are only part of what is going on within IBM to help lift OS/2 from its also-ran status.

IBM has charted a course to open systems and cutting-edge technology that, when mixed with new marketing and sales strategies, will result in customer buy-in and a profitable business, the company hopes.

One of the approaches IBM is taking is an attempt to become known as an open systems vendor. "We want to be on the leading edge of open standards," said Scott Handy, program manager in market strategies for the Personal Software Products Group at IBM.

Among those standards will be full Distributed Computing Environment support and compliance with the Object Management Group's CORBA, or Common Object Request Broker Architecture, and a move to the Distributed Management Environment. (IBM is always eager to point out that Microsoft Corp.'s Windows NT will not support the former standard fully or the latter at all under current plans.)

Sound support

IBM has also enhanced OS/2 2.1 considerably in the Windows support area. The latest OS/2 can now run Windows 3.1 applications in seamless and full-screen modes at speeds rivaling, but not quite matching, Windows on DOS, according to customers using the OS/2 2.1 beta-test version. "Emulating Windows is our ante to get into the game," Handy said.

IBM will also be doing things to make money with the Personal Systems Products Group, including selling advertising space on development kit CD-ROMs and licensing technologies, such as those from the Distributed System Object Model, the IBM Microkernel and Taligent, to third-party vendors.

The company recently said some plans have changed concerning Taligent technology and OS/2. Handy noted that some customers felt they were getting mixed messages when the IBM representatives would come in and tout the microkernel for 1994, which would then be followed by Taligent people saying how wonderful Taligent would be in 1995 — with no apparent bridge between the two.

Now IBM says it is building that bridge by taking Taligent object

IBM, *page 39*

Better than ever

OS/2 2.1 will include many enhancements. The following are some examples:

- Dozens more printer drivers (more than 260 in all), including a Hewlett-Packard Co. DeskJet 500 driver that was lacking from OS/2 2.0. Adobe Systems, Inc. PostScript printer drivers will also be included.
- An "Enhanced Compatibility Mode" that will support Windows 3.1 Enhanced Mode applications.
- Increased driver support for CD-ROM drives, high-resolution video systems, including seamless Extended Graphics Array and Super VGA, and multimedia peripherals such as sound boards.
- Sounds can now be assigned to system events.
- Enhancements for portable PCs, including Personal Computer Memory Card International Association Version 2.0 support, large pointers for LCD screens and Advanced Power Management Version 1.0.
- Support for multiple AUTOEXEC configurations for DOS and Windows applications.

David Coursey

Software shark

Consider for a moment Bill Gates and the great white shark, then what they have in common and what this means to us.

For millions of years, great white sharks have roamed the seven seas, gobbling seals, growing old and enjoying their place at the top of the food chain. There have never been too many great whites — the environment wouldn't support and didn't require large numbers of such a ferocious predator. Better still, most folks didn't know about great whites, except in some abstract concept.

That, however, was before the motion picture *Jaws* created what we'll call the Great White (Shark) Myth. It's tempting to call it the Great White Lie, but it's been anything but innocent. It makes you wonder sometimes if the same thing ever happens in business.

Thanks to the image created by the movie — that of a blood-lusting fish with demonic intent — a significant portion of the great white shark population has been killed by "sport" fishermen. No one ever seemed to ask the question:

Coursey, *page 41*

DEC continues to gain in desktop market

By Melinda-Carol Ballou

Digital Equipment Corp. is continuing its march into the PC arena. While DEC was not even a blip on the market share screen a year ago, it now matches Hewlett-Packard Co. with 2% of the PC market (excluding home sales), according to the most recent figures from Computer Intelligence, a market research firm in La Jolla, Calif.

Bolstering DEC's position are persistent small and large wins, such as a deal closed earlier this spring with The Goodyear Tire & Rubber Co. in Akron, Ohio, worth up to $27 million. But DEC must follow up these initial gains to continue to make headway against the efforts of principal market leaders such as Compaq Computer Corp.

"DEC's direct-response business propelled them into the limelight, but the other companies are not standing still," said Computer Intelligence analyst Dan Ness. "DEC is now in the Top 10, and their seriousness [about the PC market] is paying off. But they still have a very small piece of the pie and a lot of work to do."

DEC's success is because of "a strong PC offering underneath the company's service and support umbrella, with which a lot of [DEC] clients are familiar and respond favorably to," said Randy Guisto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Some current PC customers said worldwide support and service were driving motivations for them in choosing DEC's PC line.

Perkin Elmer Corp. in Norwalk, Conn., chose DEC's PCs over IBM's and Epson America, Inc.'s as an early implementor four years ago.

"They were willing to work with us on a global basis," said Sabine Slavin, director of customer sales and support at Perkin Elmer. Perkin Elmer requires PCs for controller operation of the manufacturer's line of analytical instruments. DEC worked with Perkin Elmer to provide similar products and pricing for the company around the world, which the other vendors were unwilling to do, Slavin said.

Preference for PCs

Other sites contacted by *Computerworld* that previously had DEC equipment and opted for the DEC PCs included Hoffman-La Roche, Inc., a Nutley, N.J.-based pharmaceutical company, Basic American Foods, Inc. in Vacaville, Calif., and Ohio University.

Gary Gladstone, a senior programmer/analyst at Hoffman-La Roche, brought in 17 PCs several months ago to replace obsolete 286s, 386s and IBM Personal System/2s. "We had a lot of DEC equipment on the VAX side, so I said, 'Let's look at the DEC PCs,' and it all worked as advertised," he said.

Pathworks and Novell, Inc. NetWare certification of DEC's PCs was a plus for Ohio University's Tu Fuh Chiam, technology and resources manager for MIS at the college of business administration, who is bringing in 30 DEC PCs. DEC will also provide common maintenance and support for the university's configuration of IBM, DEC and Gateway 2000, Inc. PCs.

Common maintenance services and Pathworks support were also factors for Basic American Foods' Gary Hensley, manager of information support. Hensley brought in about 50 DEC PCs in a configuration of 400 platforms.

Limited availability and comparative pricing, however, caused Hensley recently to opt either for Compaq or DEC PCs, as both firms have struggled with a lack of available systems. Hensley is purchasing not only DEC PCs but networking solutions as well and is looking to Alpha AXP-based servers on Open VMS when full clustering support is available.

DEC PC sales outside of the installed base have increased from less than 10% of the total a year ago to nearly half currently, according to Computer Intelligence. In the U.S. payroll sector, DEC tied for seventh place in PC sales with 2% of the market, Computer Intelligence said.

Virus hunters look to Mac operating system

By James Daly

With a little help from Apple Computer, Inc. engineers, viruses on the Macintosh could become a thing of the past, according to some computer security experts. But don't count on it any time soon.

Apple officials said they have considered providing virus protection via a software extension or even by writing it into the next iteration of the Macintosh operating system, in much the same way as Microsoft Corp. added an antivirus feature into its recently released DOS 6.0. "But that's not real high on our priority list," said David Pakman, product manager for system software at Apple.

David Stang, director of research at the International Computer Security Association in Washington, D.C., said Apple is missing a golden opportunity.

"There are only 40 or 50 Macintosh viruses out there, compared to 2,000 or more on the PC platform. With a little legwork, Apple engineers could all but obliterate Mac viruses by the time we see System 8," he said.

Stang said applications, and especially system files, change over time. After a while, they may contain resources or code that the virus cannot identify or does not know how to handle.

For instance, a virus may try to hide a resource with a certain identifier within a file only to find that a new version of the file already has a resource with that identifier. The virus would then be unable to infect the file.

A handy extra

Users said they would appreciate the extra fire wall such an addition could provide. "It would be nice to have the added safeguard," said James Yip, manager of technical services at Ernst & Young in Toronto. "After all the talks we've given about the danger of viruses, the point still doesn't get through to some people that they have to scan their disks."

Alistair Jacques, director of support and development at Northwest Airlines in Minneapolis, said: "You can never have too much protection when it comes to viruses."

One issue delaying Apple's antivirus efforts is that its engineers are already overtaxed. Many are currently involved in the final stages of fine-tuning the upcoming Open Collaboration Environment, a system software extension due this summer that promises to foster growth in the Macintosh collaborative computing market.

"Architecturally, there are a lot more important things Apple needs to worry about than viruses, which are already provided for through a number of third-party antivirus applications," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif.

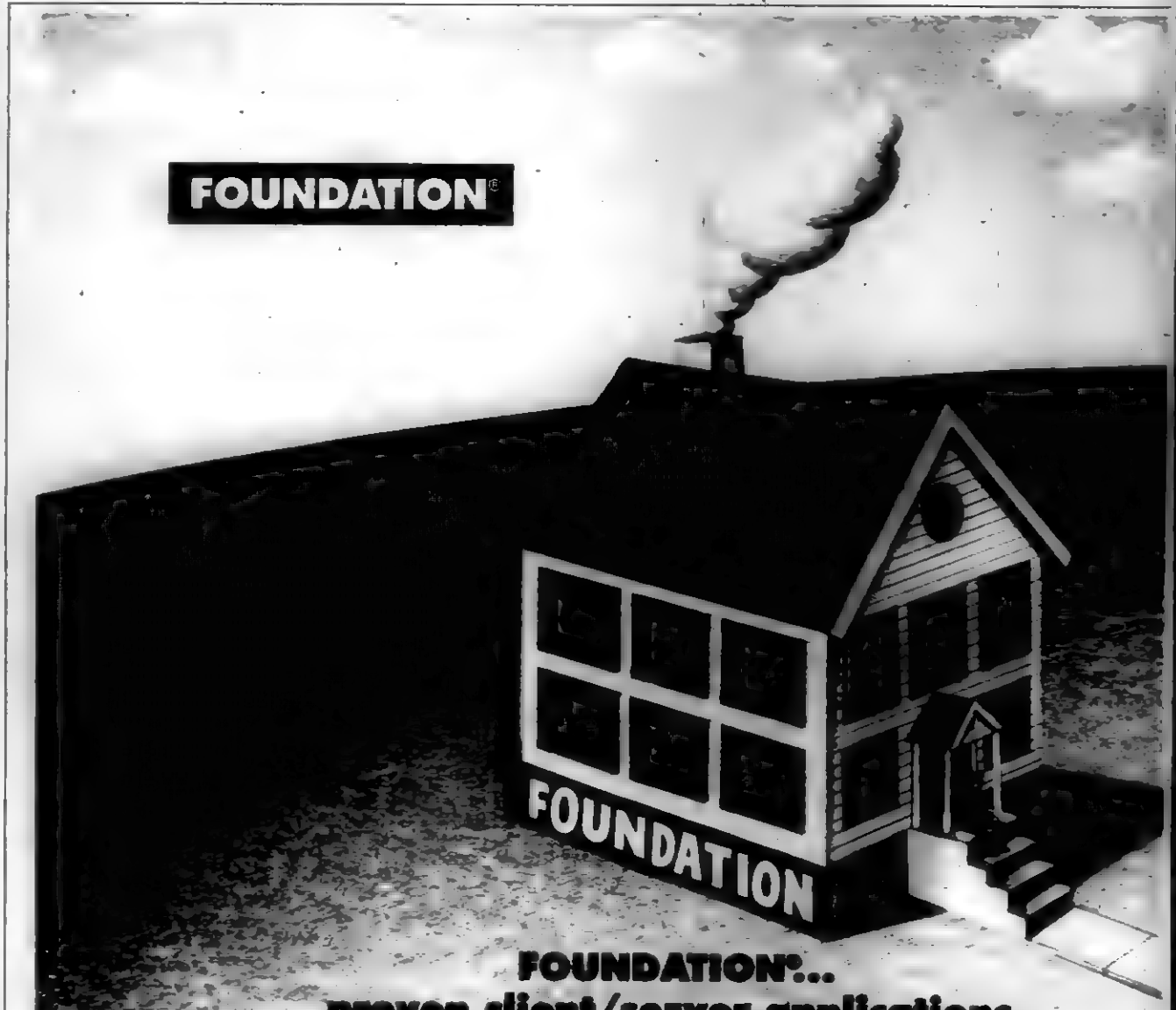
Macintosh fans also said that if Apple were to implement antivirus measures, it could not scrimp. Microsoft's implementation of Central Point Software, Inc.'s antivirus product has come under heavy fire from users who said it does not recognize or eliminate enough viruses.

"I don't want to see Apple doing it just for the sake of doing it," said Craig Danuloff, author of *The System 7 Book*. "Personally, I'd rather see them get their fonts down before I see them go after viruses."

Even if such a virus defense were initiated, there is no guarantee it would crush all Macintosh viruses. A new code may also make a virus change direction rather than eliminate it.

An example of this is the Scores virus. Macintosh systems starting with Version 6.0.4 have included a resource with the same identifier as a resource that Scores tries to install. The result is a damaged System file that will no longer operate properly and must be replaced but that is not infectious.

Similarly, the WDEF virus will cause Macintosh models from the Macintosh IIFX and later to crash because of assumptions it makes about the internal architectures.



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Utility smooths Windows path

By Michael Fitzgerald

SAN RAFAEL, CALIF.

Anyone annoyed by the process of getting in and out of Microsoft Corp.'s Windows environment will appreciate a new utility from Binar Graphics, Inc.

Fantastic Recall, one of two new utilities from Binar, gives users a way to automatically get in and out of multiple applications without having to wait on Windows. A user can click on the Fantastic Recall icon, tell it to exit, and all applications will be saved. When the system is next turned on, a simple click will return the screen to the place it was before. Binar's other new product, AnyView, offers the ability to control their display by adjusting the resolution, gaining bird's-eye view features to highlight pieces of a program and improving display calibration.

"I'm excited about these products from a productivity perspective," said Carter Lusher, program director at Gartner Group, Inc. in Stamford, Conn. Lusher said users in the DOS world might have two applications up at a time, while Windows users can have up to seven.

"Saving data and opening and shutting files will be a productivity-draining exercise, and while Fantastic Recall might save only five minutes a day, an organization with 2,000 PCs can save 10,000 minutes a day," Lusher said.

Bill Lodge, project leader at The Turner Corp. in New York, agreed. "[Fantastic Recall] may change the way people use their Windows interface."

Both products are slated to ship June 1. Introductory prices are $49.95 for Fantastic Recall and $69.95 for AnyView. Prices will increase by $30 after 90 days.

IBM fills cracks

CONTINUED FROM PAGE 37

technology and building it into OS/2 as quickly as possible, thereby giving OS/2 developers a head start on Taligent applications.

Handy noted that the first set of Object Frameworks from Taligent should be in beta-testing on OS/2 this July.

IBM apparently does not believe it can simply jump into the middle of the PC operating system fray and remain viable. Instead, Handy said, the goal is to find a paradigm shift in the industry and be on the front edge of it.

Multimedia help

While one part of that edge IBM is seeking includes object technology, another is the integration of advanced multimedia technology into the operating system. IBM has increased support for CD-ROM drives and sound boards and will include multimedia applets, such as video and sound players, with OS/2 2.1.

The video player includes support for something IBM calls "Ultimotion Video," a software-only compression standard that allows for full-motion video without requiring specific hardware. IBM said the player also supports multiple coder/decoders, which will allow it to work with different standards in the future, such as Microsoft's Video for Windows.

But IBM said it also realizes that it will be applications' support or lack of support for the new features in OS/2 that will make or break the operating system. To that end, IBM is enhancing its support programs to developers.

Both a developer's kit and a device-driver developers kit on CD-ROM will be available four times per year through a subscription service. The kits will include development tools, sample code, a newsletter, catalogs and advertising for third-party OS/2 development products.

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Price cuts

Toshiba and Zenith Data Systems cut prices across most of their product lines, and Toshiba added two notebooks with 200M-byte hard drives

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T1850/80	$1,500 to $1,650	$1,300 to $1,400
T1850/120	$1,700 to $1,900	$1,500 to $1,600
T1850C/80	$2,150 to $2,400	$1,800 to $1,900
T1850C/120	$2,350 to $2,600	$2,000 to $2,100

[illegible]		
T4400SX/120	$2,799	$2,599
T4400C/200	$4,799	$4,599
T4500/80	$2,799	$2,449
T4500/120	$2,999	$2,599
T4500/200	NA	$2,899
T4500C/120	$4,399	$3,799
T4500C/200	NA	$4,099
T6400DX2/200	$4,899	$4,199
T6400DX2C/200	$7,499	$6,499
T6400MM/200	$9,599	$7,999

Zenith Data Systems*	[illegible]	[illegible]
Z-Sport 325S Model 60	$1,299	$999
Z-Note 320L Model 60	$1,699	$1,499
Z-Station 433DH Model 200	$2,150	$1,900
Z-Station 425SEH Model 200	$2,150	$2,049
Z-433S Model 170	$1,150	$1,100
ZCM-1495 (monitor)	$629	$499

*Only a sampling of Zenith's price cuts NA: not applicable

Coursey

CONTINUED FROM PAGE 37

Is this shark really a threat to me or good to eat? No? Then why don't I leave it alone? Myth overrides common sense and, left unchecked, may ensure we soon have no great white sharks at all.

Continuing our tale of environmental havoc, let's move on to Bill Gates, who — as far as anyone can tell — has never gulped down a seal. Yet to read the business and trade press, Gates is "the most hated man in the PC industry" and the top predator in the software industry's food chain. Is this really something to say about a man just before his wedding?

Certainly Gates' Microsoft is the most successful PC software company. And the company has achieved much of its success at the expense of other companies, generally through fierce competition. Microsoft has often been accused of unfair practices — though nothing as serious as *Jaws*' depiction of a shark going after a boatload of people.

Yet for all the talk, the accusations I've heard against a large chip manufacturer are much more convincing than anything I've ever heard about Microsoft. If there is *New York Times*-grade evidence against Gates, no one has presented it in public.

Likely scapegoat

More often, what you hear are people griping about Microsoft as an excuse for having screwed up on their own, without Bill's help.

But make no mistake: As soon as there was blood in the water, Microsoft swooped right in, though it has yet to make a convincing kill. Software companies that bet on OS/2 without a covering bet on Windows are just now recovering from their colossal error. Yet we've been treated to two years of carping from people who simply didn't put good products in front of customers and suffered as a result.

Is this Bill Gates' fault? Only if you believe Microsoft invested perhaps $100 million in engineering the failure of OS/2. Folks in that camp also believe John F. Kennedy is still alive on the top floor of Parkland Hospital in Dallas and that the government has space creatures on ice at an Air Force base in Ohio.

No, I am not so naive as to believe Microsoft is without fault. Rather, Microsoft is the top predator in the software sea and will take every advantage in gulping down a competitor or technology. And like a shark, anyone who turns his back on Bill is signing up for a short, one-way trip to the cosmos.

Still, there is too much Microsoft these days. And anyone who thinks controlling the operating system market doesn't give Microsoft an "unfair" advantage in applications probably needs to get his blood sugar up.

And then there was one ...

The way things seem to be going, the software business could end up looking like commercial aviation, where a swarm of profitable companies has shrunk into an unprofitable handful intent on further collapse. If that happens in software, Microshark, er, soft, would be the last fish swimming — something that might have made Charles Darwin proud.

But survival of the fittest isn't the best way to spur the development of interesting and innovative technology, nor is having one company controlling the infrastructure the best way to build information systems.

The market needs a proper blend of technical innovation from everyone: start-up pressure from below and legitimate competition among the proven players.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 556-4460.

[redacted]

Memory

Ocean Information Systems, Inc. has introduced the Hippo IV motherboard.

The motherboard uses the company's Dynamic Cache Accelerator technology and has the ability to boost cache memory efficiency by as much as 300%, according to the company. The product has a byte-gathering write buffer that enables it to simultaneously access information in read and write modes.

A four-level deep, 32-bit wide write-back buffer is also provided. Performance is enhanced with a burst mode in both write-back operation and read operation.

Hippo IV costs $1145.

▶*Ocean Information Systems*
Suite 6
12155 Mora Drive
Santa Fe Springs, Calif. 90670
(310) 946-5888, Ext. 5

Application packages

Central Point Software, Inc. has announced PC Tools 8.0A, a maintenance update to PC Tools 8.0.

The update resolves known configuration conflicts resulting from new MS-DOS features.

A superset of utility functions is included in this version, and the product is compatible with Microsoft Corp.'s MS-DOS operating system. Updated programs include Compress, DiskEdit, PC Cache and RAMBoost, which allow users access to MS-DOS features such as Flexboot, disk compression and memory management.

PC Tools 8.0A costs $179.

▶*Central Point Software*
#150
15220 N. W. Greenbrier Pkwy.
Beaverton, Ore. 97006
(503) 690-8088

Vanguard Software Corp. has released HyperCalc 2.0, a tool designed for analysis using mathematical and logical models.

Enhancements have been made to the Hierarchical Tree Editor and in areas such as automatic model documentation, virtual memory and data import and export. The product offers basic analytic capabilities, including complex numbers, units of measure, linear programming, regression analysis, equation solving, matrices and approximately 200 other high-level functions.

HyperCalc runs on all IBM PC ATs and XTs, Personal System/2s and PC compatibles using DOS 2.0 or greater.

The product costs $495.

▶*Vanguard Software*
62 Darling Ave.
Smithtown, N.Y. 11787
(516) 979-6863

Best Programs, Inc. has announced the Capital Budgeting Manager, a software tool designed to simplify the capital budgeting process.

The product works by automatically performing capital asset analyses, depreciation projections and asset and expenditure tracking.

Users can monitor variances between actual and budgeted assets, project depreciation of future capital expenditures and compare the profitability of alternative capital expenditures.

Automatic calculation such as break-even analysis, payback analysis, net present value and internal rate of return can also be performed, according to the company.

The product is an add-on to Best's Fixed Asset Systems, FAS1000 and FAS2000 and costs $595.

▶*Best Programs*
11413 Isaac Newton Sq.
Reston, Va. 22090
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Macintosh products

Claris Corp. has announced Version 2.0 of ClarisWorks for the Apple Computer, Inc. Macintosh.

According to the company, the product extends the lead of the Macintosh "Works" program with ease of use, more functionality and superior integration. Three new capabilities have been added to the program and more than 300 productivity enhancements made to existing environments.

A Shortcuts option enables users to have push-button access to frequently used commands. A new outlining feature in ClarisWorks offers users a choice of seven outline formats. Twenty-five color painting tools and effects are also provided.

ClarisWorks 2.0 costs $299.

▶*Claris*
5201 Patrick Henry Drive
Santa Clara, Calif. 95052
(408) 987-7000

Peripherals

Scantron Corp. has introduced Scan Image, a high-speed data entry system.

According to the company, the product can read multiple symbologies such as machine-print characters, mark positions and alphanumeric hand print. Information is decoded by neural network technology, which exports it to any ASCII format, then places the information into a database.

A complete system consists of a microprocessor, Microsoft Corp. Windows-based operating software, a color monitor and a flatbed scanner.

Prices start at $19,500.

▶*Scantron*
1361 Valencia Ave.
Tustin, Calif. 92680
(714) 259-8887

Data I/O Corp. has released the CardPro Universal PC Card Drive.

The product has the ability to read and write all types of Personal Computer Memory Card International Association-compatible memory and I/O cards, the company said.

Using Microsoft Corp. Windows' point-and-click commands as well as DOS Commands, CardPro is configured as another disk drive. Parallel port connection is provided, and an additional parallel port is supplied for transparent pass-through printing operation.

The CardPro Universal PC Card Drive costs $450.

▶*Data I/O*
10525 Willows Road N. E.
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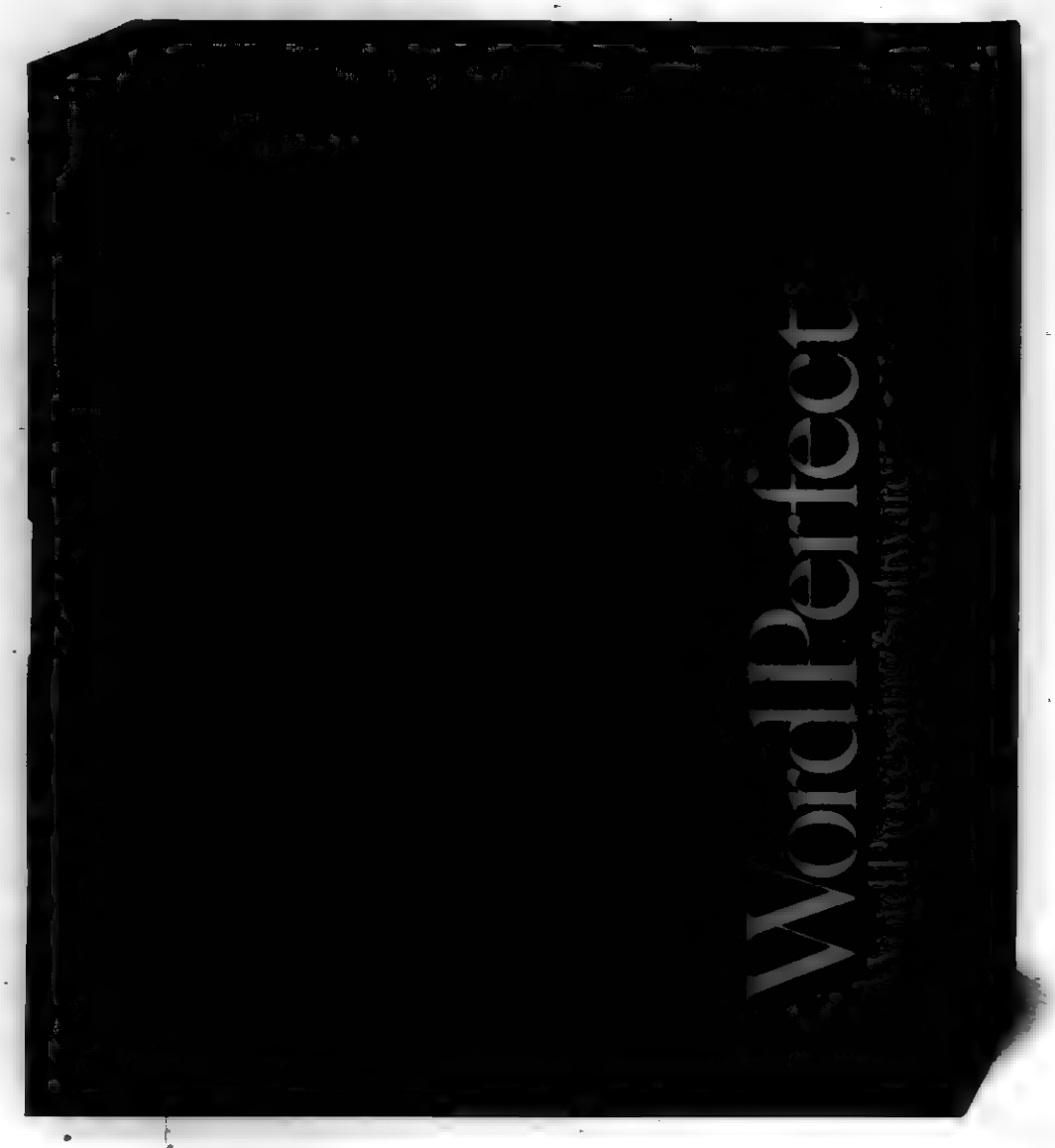
(206) 881-6444



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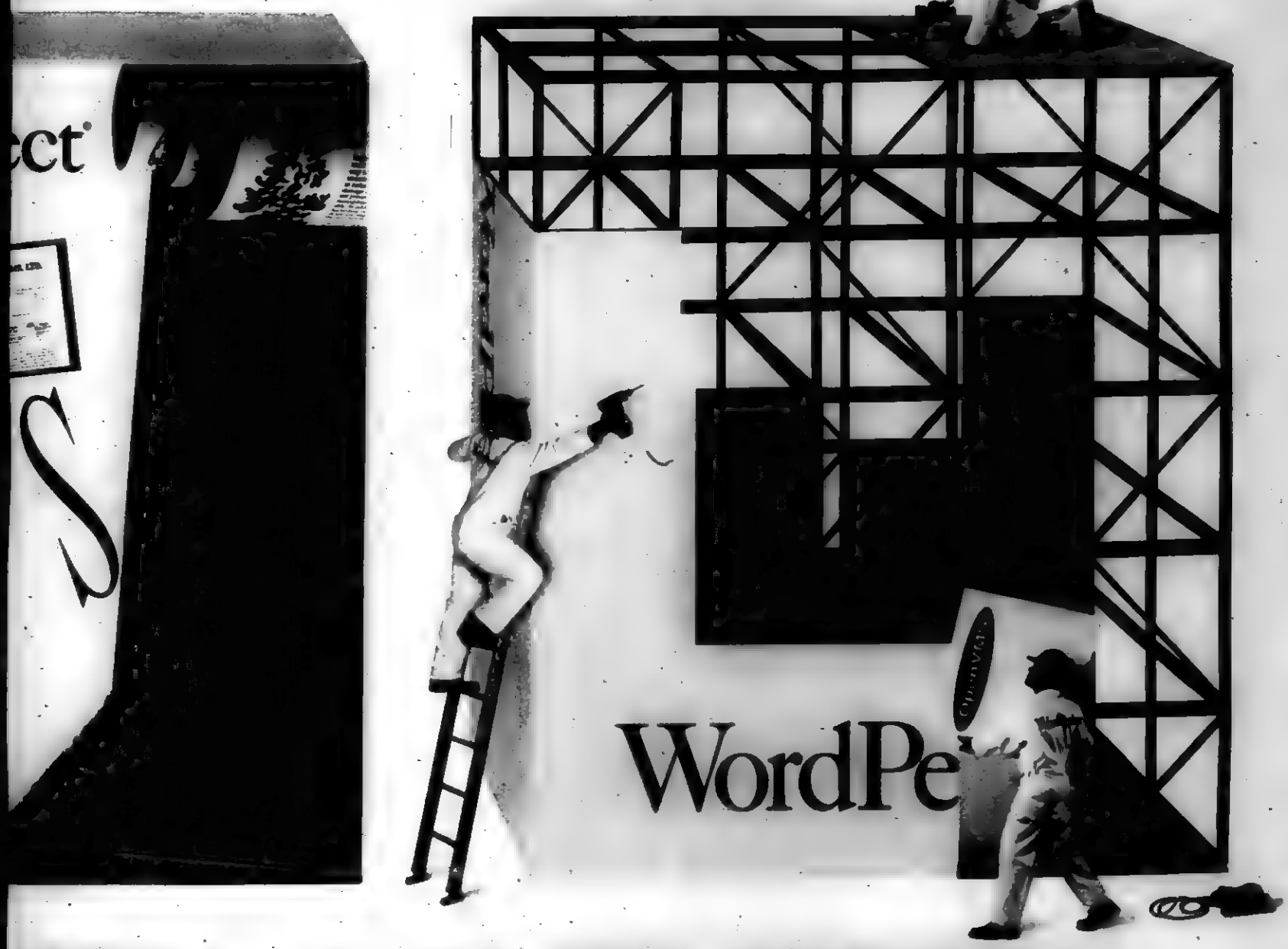

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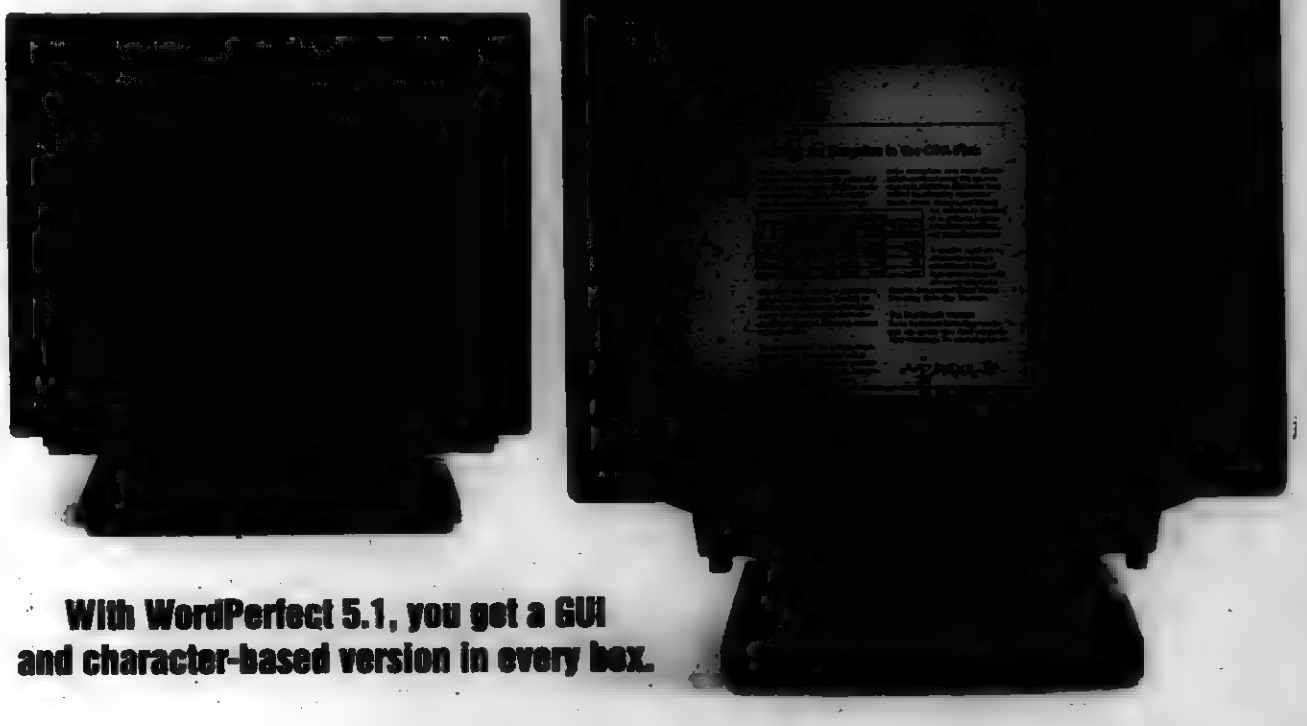

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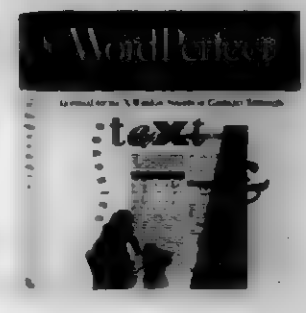

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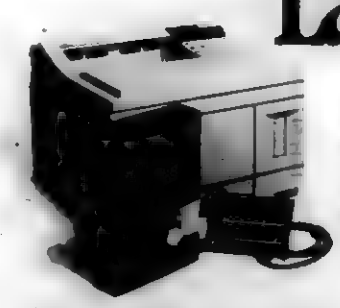

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Delrina nears release of forms for Windows

May beat Microsoft, WordPerfect

By Michael Vizard
BOSTON

■ Looking to beat both Microsoft Corp. and WordPerfect Corp. to market, Delrina Technology, Inc. in Toronto announced plans at last week's LotusWorld to deliver an electronic forms software package for Windows by June 1.

WordPerfect is slated to announce its delivery schedule for InForms this week, while Microsoft announced its Electronic Forms Designer package late last month.

However, while Microsoft and WordPerfect will bring significant marketing clout to the electronic forms market, industry analysts said Delrina and its rival, JetForm Corp. in Waltham, Mass., currently have a technological edge because they have been in this market longer.

Protocol support

For example, Delrina's FormFlow offering, a follow-on to its existing Forms software for Windows, adds work-flow software and a forms language for building custom forms. It also supports a wide variety of PC and SQL databases, Vendor-Independent Messaging (VIM), Messaging Application Programming Interface (MAPI) and Message Handling Service mail protocols.

In contrast, Microsoft has made available only a forms designer package for programmers who know its Visual Basic language, and WordPerfect's package is currently tied to Windows sites running WordPerfect Office. WordPerfect, which supports both PC and SQL databases, intends to deliver InForms on other platforms later this year, at which time it will also support VIM and MAPI interfaces.

Users at UCLA liked the Delrina package because it was client/server-based and had good security features.

"I see the electronic forms market going in two directions," said David Ferris, president of Ferris Networks, Inc. in San Francisco. "There's the client side typified by Microsoft and WordPerfect, and then there's the packages that include work-flow software on the server."

After beta-testing the Delrina and WordPerfect packages for Windows, the Department of Medicine at the University of California at Los Angeles is leaning toward the Delrina software because it supports signature encryption, multipart forms, SQL databases and other server-centric features, said Stephen Berry, director of information service.

"We'll probably go with the Delrina software because it's a client/server package," Berry said. "It also has better security features that show you if someone has updated a form after a signature has been attached to it."

Langley Steinert, director of marketing at JetForm, said the WordPerfect and Microsoft packages are just "scratching at the surface of the electronic forms problem." He said server support and cross-platform capabilities are crucial.

JetForms, which currently includes support for Windows, DOS, PC database servers, a forms designer, filler and merge modules, will add support for SQL databases with the release of Version 4.0 of JetForms this fall. An Apple Computer, Inc. Macintosh version of JetForms is due next month, with Unix support scheduled for summer and OS/2 support planned for year's end.

Pricing for Delrina's FormFlow software starts at $389 for server software, with a 10-user pack priced at $1,840.

Groupware API wars

Rivals to use Notes API

By Michael Vizard
CAMBRIDGE, MASS.

In a move that adds to the momentum behind Lotus Development Corp.'s Notes, the vendor has delivered copies of a Notes application programming interface (API) to Microsoft Corp. and WordPerfect Corp., both of which are expected to improve integration of their applications with the Notes file format.

For example, WordPerfect will integrate its WordPerfect Office and InForms electronic forms products with Notes later this year. Microsoft will use the Notes API to make it easier for developers to create Windows applications that interact with a Notes database using facilities such as Microsoft's Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) protocols [CW, May 3].

"Stuff like DDE and OLE doesn't quite work with Notes," said Norman Weizer, president of Weizer Associates, Inc., a consulting company in Lexington, Mass.

Mutually beneficial

Competitors have been positioning Notes as a proprietary environment that favors Lotus applications. For example, Coopers & Lybrand recently opted for Lotus' 1-2-3 spreadsheet for Windows over Microsoft's Excel because 1-2-3 offered better integration with Notes.

"We don't want Notes to be a barrier to purchasing Microsoft applications. We want to take that issue off the table," a Microsoft spokeswoman said.

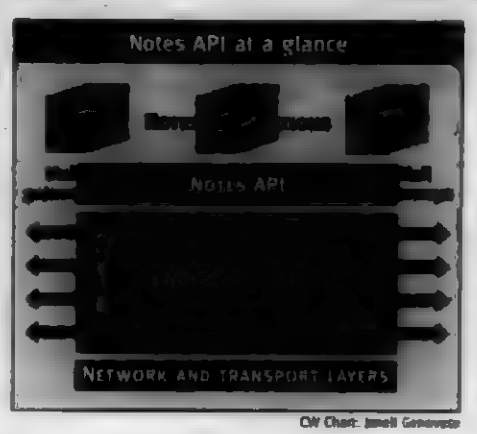
Lotus needs to deliver its Notes API to developers because while Lotus applications are better integrated with Notes, Weizer said that in general, Notes by itself has not been enough to pull in sales of other Lotus applications at the expense of rival tools.

Enhancements to come

However, with the arrival of Notes Version 3.0, Lotus is now delivering a distributed environment capable of supporting enterprise-wide computing. This year, Lotus is expected to deliver add-ons to enhance document management on top of Notes.

Weizer said he views Microsoft's support for the Notes API as a tacit admission that Microsoft is substantially behind Lotus in terms of developing a groupware strategy.

"Microsoft working with the Notes API validates Notes. Microsoft is a long way off from developing anything like Notes, and this shows that they are getting enough pressure to do something about working with Notes," Weizer said.



CW Chart: Jamell Genovese

In fact, Jesse Berst, editor of the "Windows Watcher" newsletter, recently told attendees at a Boston University conference on Windows development that he does not expect Microsoft to deliver a competitive offering to Notes until after it delivers Windows NT and Windows 4.0. NT is due to be announced later this month, while Windows 4.0, which Berst said should begin beta testing this summer, is due in the first half of 1994.

Once Microsoft delivers these 32-bit operating systems, the company is expected to focus on delivering electronic mail and database-replication services that provide the framework for groupware applications [CW, March 8].

"Replication and directory services are very straightforward concepts; it's not rocket science. However, making something like Notes that is scalable and easily configurable is where competitors will be challenged," said Ray Ozzie, president of Iris Associates, Inc., a Westford, Mass.-based Lotus spin-off that is responsible for Notes development.

"From a technology point of view, Notes is a unique opportunity to create systems you could never have created before. But whether Notes has an exclusive on that opportunity remains to be seen," said Richard LaValley, senior manager for advanced technology at MCI Communications Corp. in Richardson, Texas.

"Notes may not be the total answer for groupware applications, but it is the best thought out," added Seth Pinksy, director of scientific computing at Smithkline Beecham Corp. in King of Prussia, Pa.

Vendors release host of add-ons for Vines system

By Michele Dostert
SAN FRANCISCO

Third-party vendors introduced a bevy of add-on products for Banyan Systems, Inc.'s Vines local-area network operating system at the recent Association of Banyan Users International conference.

▪ **Image Engineering, Inc.** in Westerville, Ohio, demonstrated a new imaging and document management package that lets users of Vines and Novell, Inc.'s NetWare LAN operating systems share text and images from almost all networked applications.

The new product, called FolderExpress, will run on Vines Version 5.5 LANs or NetWare LANs that run Banyan's Enterprise Network Services and Microsoft Corp.'s Windows.

FolderExpress lets users organize text and images in individual documents or folders containing multiple files. Files from multiple applications and scanned images can be included in the same folder.

The product will be priced at $995 per server and will ship when Banyan releases its Vines 5.5 tool kit, scheduled for this summer.

▪ **CCOM Information Systems** in Iselin, N.J., announced a new version of its PhoneLine directory management product that is fully integrated with Banyan's new StreetTalk III directory.

The Windows-based product al-

Vines add-ons, *page 49*

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Graceland: Rockin' to the RS/6000

By Stephen P. Klett Jr.
MEMPHIS

Stepping into the King's castle is akin to stepping back in time. Forever frozen in 1977, the year of Elvis Presley's death, Graceland represents everything that was the 1970s: from lava lamps and big sideburns to rhinestone embroidery. However, to step into the estate's information systems department is to step right back into the '90s.

Graceland, a division of Elvis Presley Enterprises, Inc., recently began a two-phase installation of a state-of-the-art ticket and reservation system from Paciolan Systems, Inc. in Long Beach, Calif.

Since Graceland opened its doors to the public in 1982, it has managed its ticket sales manually. Workers had to hand-stamp tickets according to which attractions visitors wished to see, and tickets for tour groups had to be hand-sorted — often the night before groups were scheduled to arrive.

With nearly 700,000 Elvis worshipers flocking to the estate each year — more than 4,000 a day during peak season — this was a time-consuming and error-prone process.

Graceland's computer system gives Elvis fans quicker access to the estate's attractions

Graceland had been looking for a computerized system for several years that would integrate its equipment and provide for future scalability, according to Debbie Johnson, general manager at Graceland. "Paciolan was the only vendor we found that offered all of that," she said. "They were more diversified; they looked at everything, not just ticketing."

Blue suede software

The system is based on an IBM RISC System/6000 running VMark Software, Inc.'s Universe database management software and Paciolan Systems' Ticket Reservation and Fund Accounting software.

The RS/6000 acts as a central server connecting a network of Apple Computer, Inc. Macintoshes, IBM and Wyse Technology, Inc. terminals and Human Interface Technologies, Inc. touch-screen terminals that are located throughout the estate's corporate, reservation systems, accounting and ticket offices.

Phase one of the conversion consists of installing the RS/6000, integrating the software packages and bringing the ticketing, advanced reservation, group sales and guest services systems on-line. Johnson said the installation began in February and is on schedule to be completed by the end of this month.

Phase two will bring the retail and distribution centers on-line to track sales and inventory of gift shop merchandise. Phase two is slated to start in November 1993 and be completed by the end of April 1994. Johnson estimated that the final cost of the project will be in excess of $650,000.

Johnson said the estate expects myriad benefits from the new system. For example, reservations can be made a day ahead of time, whereas at least two days' notice was required. Johnson said visitors can now avoid up to a three-hour wait by booking a tour for the following day.

Hot attractions

Another major benefit is the ability to automatically track the revenue generated by each of the estate's attractions, Johnson said.

The attractions, which generate $15 million a year, include the Lisa Marie and Hound Dog II airplanes, Elvis' extensive automobile collection and a museum housing many of Elvis' personal mementos and stage costumes.

In addition, the reservation systems department will be able to accommodate changes more easily. Johnson said this will be most helpful during the anniversary of Elvis' death in August, when most changes occur. "Now the reservation office is looking foward to August instead of fearing it," she said.

The system offers future benefits as well, Johnson added. "We will be able to connect to other ticket companies to give us an outlet in Memphis, for example, as well as other cities," she said.

So far, Johnson said, no major snags have appeared in migrating to the new system. However, she said the system did crash on Easter weekend — the busiest weekend of the year so far. Paciolan was able to help the IS department solve the problem over the phone, and the system was brought back on-line in 20 minutes.

Sun alliance ships software for shop floor

By Stephen P. Klett Jr.

■ In a move to parlay their success in the financial arena into the manufacturing market, Sun Microsystems Computer Corp. (SMCC) and Teknekron Software Systems, Inc. recently announced shipment of a distributed software system for the factory floor.

The announcement builds on a partnership formed by the two companies in 1987 that provided the financial industry with Teknekron's Information Bus technology running on Sun Microsystems, Inc. workstations, a union that has met with considerable success on Wall Street, for example.

Analysts said the move is the latest in a string of partnerships Sun has formed with third-party manufacturing software developers. For example, Sun forged similar agreements with Promis Systems Corp. and Cimflex Teknowledge and is negotiating with SAP AG and The ASK Group, Inc. to port their manufacturing applications to the Scalable Processor Architecture (SPARC) platform.

The SMCC/Teknekron partnership will provide Teknekron's Manufacturing WorkBench suite of software tools running on Sun's SPARCstation line. The suite is based on Teknekron's Information Bus technology and is available now for the SunOS operating system. It is slated to ship for Solaris 2.0 in September.

Manufacturing WorkBench allows users to build applications in a distributed, client/server environment that can incorporate changes to data in real time, according to Teknekron. The Information Bus technology enables disparate applications to communicate.

Teknekron estimated the cost of installing the software at approximately $5,000 per workstation.

No market leader

Sun currently lags a distant fourth behind Digital Equipment Corp., Hewlett-Packard Co. and IBM in terms of installed base on the factory floor, according to industry analysts.

"Sun has not played a big role on the shop floor," said Julie Fraser, chief analyst for "The AMR Report," an industry newsletter published by Advanced Manufacturing Research Corp. in Cambridge, Mass. "However, they are getting aggressive and have developed a strategy to change that."

Indeed, Sun's third-party strategy appears to be paying dividends.

For instance, Lafarge Corp., one of the largest cement manufacturers in the U.S., is using a network of SPARCservers and SPARCstation 2 workstations to control the production of cement at its plant in Alpena, Mich.

According to Don Everett, process manager at the plant, the company chose Sun based on an evaluation by its third-party software supplier, Johnson Yokagawa. The plant runs Johnson Yokagawa's XL-Net distributed control software package.

To date, "there have been no problems with the Sun equipment, and I am positive this is the right direction to go," Everett said.

Vines add-ons

CONTINUED FROM PAGE 47

lows Vines users to quickly find and update information, including pictures, about StreetTalk objects such as users, servers and printers. The information can be pasted into documents, sent via electronic mail as image files, compiled into lists or used to dial phone numbers.

PhoneLine for StreetTalk III is available now and is priced at $795.

•**TCE Technology Group** in San Jose, Calif., introduced BanScan II, a server-based enterprisewide management product for Vines networks that allows administrators to manage servers, routers and hubs from a single Simple Network Management Protocol (SNMP) station.

The new product adds continuous, real-time server statistic monitoring, on-screen utilization trends, threshold alarm notification and custom graphing and reporting.

BanScan for Vines is available now at $795 per server.

According to TCE executives, BanScan II will be available for NetWare and SNMP LANs by the end of the second quarter, with The Santa Cruz Operation's SCO Unix version due by the end of the third quarter.

•**NetPro Computing** in Scottsdale, Ariz., introduced several Vines add-on products.

Network NewsReader is a Windows interface for accessing Internet services from Vines networks. MailPro, a DOS E-mail product for Vines, lets users handle their messages without returning to the main screen.

MailPro allows users to handle multiple messages, as well as sort, locate, filter, encrypt, spell-check and cut and paste messages. StreetWalker, a new Vines administrative tool, is a configurable, Windows-based interface that allows administrators to save frequently accessed names, groups and servers as pop-up icons that can be dragged and dropped.

•**Zoomit Corp.** in Toronto announced the release of an X.500-based directory service called Enterprise Directory Management Service (EDMS). The new product acts as a directory hub, storing and managing addresses in a central database and exporting desired information in a format that can be read by the receiving system.

EDMS can import and export from E-mail address directories in other proprietary systems.

The product is available now, with prices beginning at $800.

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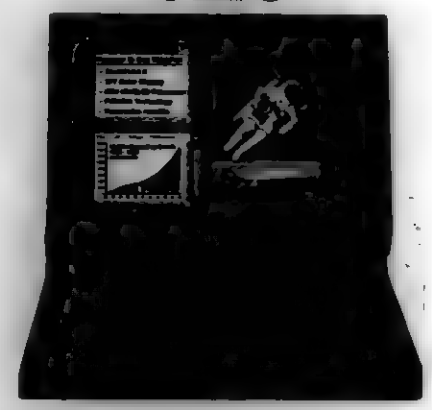
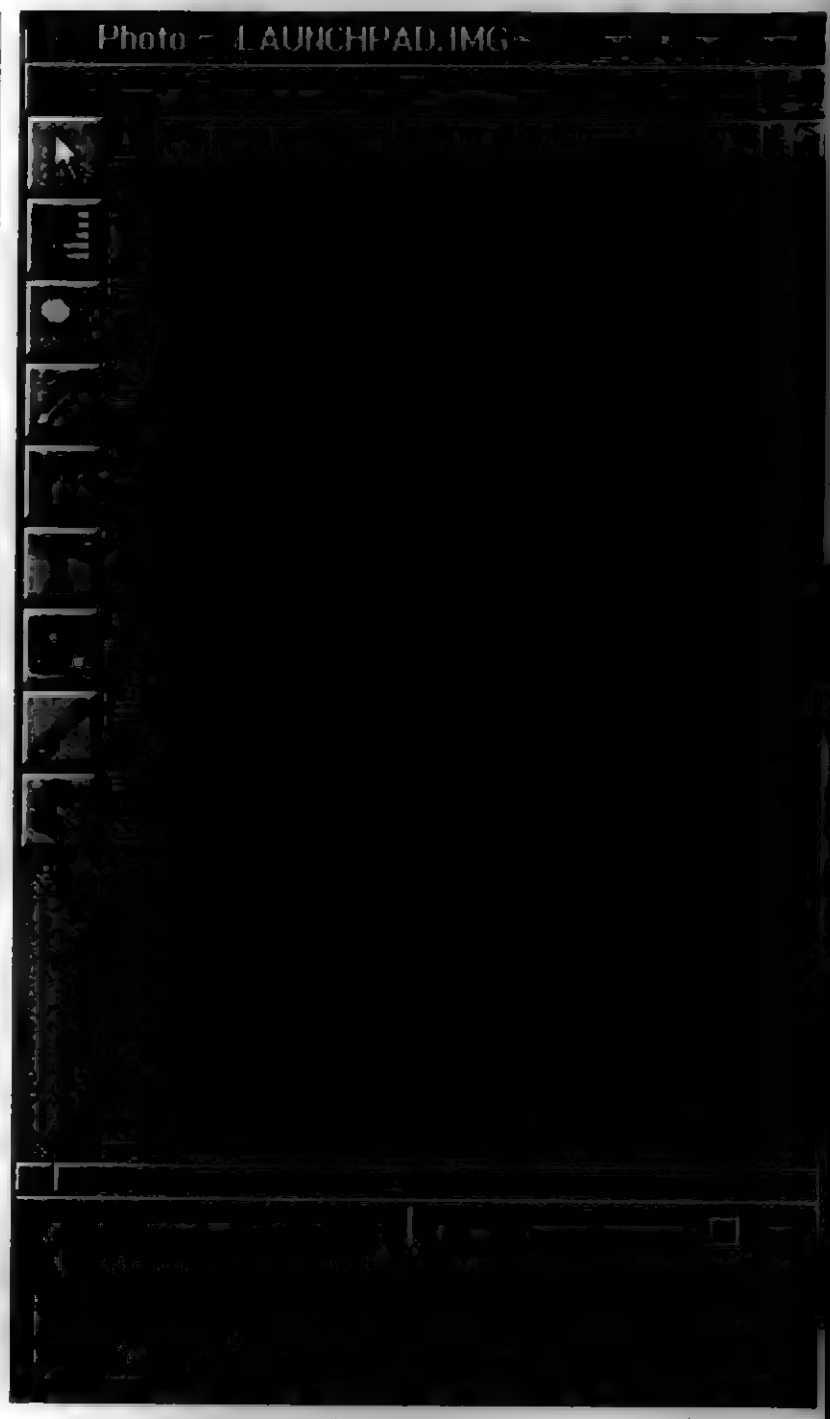


Everything about the 720 and 720C was designed to close the chasm between mind and machine. The rubberized red button on the keyboard is the exclusive TrackPoint™ II pointing device. Just a touch sends the cursor where you want it to go. The 720C draws you in even more with a dazzling 10.4" color, active-matrix, TFT display—the largest color notebook display out there.

Other forward-thinking features include the new generation



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ThinkPad	720C	720
Processor	486SLC2 50/25 MHz	486SLC2 50/25 MHz
Display	10.4" Active Matrix 256 Color @ 640x480	9.5" Monochrome 64 Grayscale Screen
Battery Life††	2.4-4.8 Hours	3.8-7.5 Hours
PCMCIA Support Release 2.01	(1) Type III or (2) Type IIs	(1) Type III or (2) Type IIs
Warranty	3 Years (International)	3 Years (International)

††Depending on usage and configuration.

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Workgroup Computing

[redacted]

Workgroup software applications

Project Software & Development, Inc. has announced Version 1.1 of Project/2 Series X (P/X), advanced project management software.

Unix support has been added to this version, including Sun Microsystems, Inc.'s Scalable Processor Architecture platforms running SunOS 4.1.3 and Motif 1.1 or Open Windows 3.0.

The Unix version runs in a client/server environment with a graphical interface that uses pull-down menus and click-and-drag project planning. Features include extensive graphics and resource management, cost/schedule integration and new customization tools.

P/X Version 1.1 prices start at $30,400 for a five-user local-area network.

▶ *Project Management & Development*
20 University Road
Cambridge, Mass. 02138
(617) 661-1444

File servers

Network Appliance Corp. has introduced FAServer, a file server appliance designed for Network File System workstation networks.

FAServer works in conjunction with FASware, the company's software running on an Intel Corp. i486 Extended Industry Standard Architecture (EISA) bus system, and it includes Snapshot, a backup feature that provides an automatic backup and file history capability.

A Small Computer Systems Interface controller, one or two Ethernet interfaces and two to seven 3½-in., 1G byte or greater disk drives are included.

A 486 CPU with a 16M- or 32M-byte EISA bus with eight slots, 2M bytes of nonvolatile random-access memory and a 1.44M-byte floppy disk drive, keyboard and monitor are also provided.

FAServer costs $16,995.

▶ *Network Appliance*
Suite 208
2901 Tasman Drive
Santa Clara, Calif. 95054
(408) 562-1900

Electronic mail

Enable Software, Inc. has introduced Higgins Mail for Windows Version 1.0, an electronic-mail package for Microsoft Corp.'s Windows 3.1.

Version 1.0 can send and receive messages and files across an assortment of local- and wide-area network environments. It notifies users of incoming mail and urgent status, the firm reported.

The product also features private lists, hot buttons to view next and previous messages, in-basket sorting, out-basket review and a keyword retrieval system.

Higgins Mail for Windows Version 1.0 costs $195.

▶ *Enable Software*
313 Ushers Road
Northway 10 Executive Park
Ballston Lake, N.Y. 12019
(518) 877-8600

SoftArc, Inc. has started shipping a Microsoft Corp. Windows-based front end for its FirstClass electronic-mail conferencing and remote access software.

FirstClass Client for Windows offers features that resemble its companion product FirstClass Macintosh client, which enables users to connect Apple Computer, Inc. Macintosh FirstClass servers by accessing network or modem E-mail and groupware.

Without dedicated Novell, Inc. file servers, Windows and Macintosh users can access the same nondedicated FirstClass server. The product can simultaneously accommodate up to 250 users with mixed combinations of connections.

FirstClass Client for Windows costs $295 for unlimited users.

▶ *SoftArc*
Suite 102
805 Middlefield Road
Scarboro, Ontario M1V 2T9
(416) 299-4723

Unix

Digital Instrumentation Technology, Inc. has introduced TransferPro for Sun Microsystems, Inc.'s Solaris 2.1 and TransferPro for Silicon Graphics, Inc.'s Motif.

According to the company, these two software programs enable Unix users to perform all standard Apple Computer, Inc. Macintosh and MS-DOS file operations between workstations and PCs and workstations and Macintoshes. Copying, renaming, creating and removing files and directories and deleting are some of the operations.

Files can be transferred to Small Computer Systems Interface devices and to magneto-optical drives.

Both TransferPro Sun Solaris 2.1 and TransferPro Silicon Graphics Motif single-user versions cost $349. A single floating license costs $849.

▶ *Digital Instrumentation Technology*
Suite 20500
127 Eastgate Drive
Los Alamos, N.M. 87544
(505) 662-1459

Storage

Micropolis Corp. has announced Raidware for NetWare 4.0.

The product is Novell, Inc. NetWare-compatible software for the company's Raidon line of fault-tolerant disk array subsystems. The software enables Raidon to provide fault-tolerant data storage for network users who have decided to upgrade to the next generation of NetWare software.

According to the firm, the disk array comprises an assortment of array modules that include a high-performance Micropolis disk drive, cooling fan and power supply. Capacity for Raidon can be configured from 680M to 65G bytes.

Prices start at $6,665.

▶ *Micropolis*
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Swiss Bank blends nets

By Joanie M. Wexler
LISLE, ILL.

When Swiss Bank Corp. and The O'Connor Partnerships officially merged last fall, one result was a sprawling wide-area financial network that carried a management load greater than the sum of its parts.

A key challenge for the new entity, which uses the Swiss Bank moniker, was getting its arms around the magnified cost control, reliability and security issues that were sure to rear their heads with the blending of two previously disparate, mission-critical networks.

Trading firm O'Connor, which had run a domestic network, merged with Swiss Bank's 35-node, worldwide Ascom Timeplex-based T1 network, which carried primarily voice and IBM Systems Network Architecture (SNA) host traffic. Meanwhile, the new entity blended the SNA/voice network with a new router-based internetwork to accommodate emerging local-area network traffic.

Consolidating O'Connor's trading traffic and Swiss Bank's financial transactions onto one infrastructure would likely require greater investments in telecommunications bandwidth, the organization realized.

Enter a low-profile device that staved off new Swiss Bank expenditures in wide-area network capacity for at least six months, said Chris Puetzfeld, a director of information technology at Swiss Bank's Capital Markets and Treasury business here.

Last November, the firm inserted compression-oriented Symplex Communications Corp. Datamizer IVs between its Wellfleet Communications, Inc. routers and Ascom Timeplex multiplexers in about nine sites worldwide.

The No. 1 reason Swiss Bank invested in the 18 $11,000 devices was the economics of the 2-to-1 to 10-to-1 data compression, which the company said effects an equipment payback in transmission savings in as little as one month.

However, some "freebies" emerged to keep the enterprise network humming, Puetzfeld said, when the firm discovered that the Datamizer also included error-detection, load-balancing, inverse multiplexing, congestion control and other smart management features.

For redundancy, the financial giant had installed dual network devices, including Datamizers, in several hub sites, as well as back-up telecommunications circuits slated to take over in the event of a primary link outage. The Symplex device found an important role in this industrial-strength configuration.

"The Datamizer watches closely for a network outage and routes all traffic over the one remaining good line," said Mike Raffety, a Swiss Bank network engineer. "It handles the big propagation delays common with satellite, should a carrier reroute us that way, so it blends terrestrial and satellite traffic well."

Raffety added that the Datamizer continuously monitors use of the company's T1 trunks. "We can set thresholds, above which the Datamizer bumps voice traffic off the T1 onto the switched network, giving T1 priority to the data."

Voice traffic from the firm's various private branch exchanges (PBX) is compressed separately; then, both Datamizer-compressed and PBX traffic flowing through the T1 multiplexers is encrypted through devices sitting between the multiplexers and telecommunications lines.

Also, where "we're running two circuits at different speeds for redundancy, the Datamizer will use both efficiently," which goes beyond the standard capabilities of most of today's inverse multiplexers, Raffety said.

While the firm's high-end multiprotocol routers perform some network reroute functions, Datamizers are more specialized for maximizing network use and uptime than routers, whose primary function is to shuttle traffic from one LAN to the next, Raffety said.

On the compression side, the Datamizer's performance depends on the type of traffic being transmitted, he added. For example, "a formatted report with lots of white space should compress extremely well, probably 6-to-1," he said. "But the Datamizer wouldn't have much effect on a file already compressed by the Unix 'compress' command and transmitted by Unix's File Transfer Protocol."

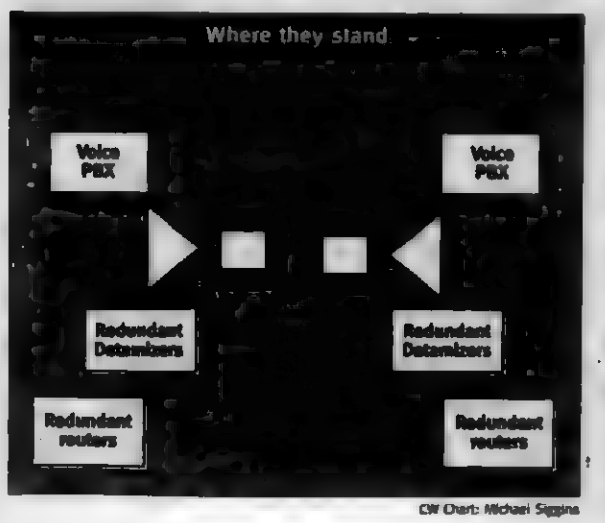
ON SITE

Swiss Bank Corp./O'Connor Capital Markets and Treasury
Lisle, Ill.

Goals: To curb telecom costs and consolidate network traffic.

Technologies: Symplex Communications' Datamizer IV compression devices.

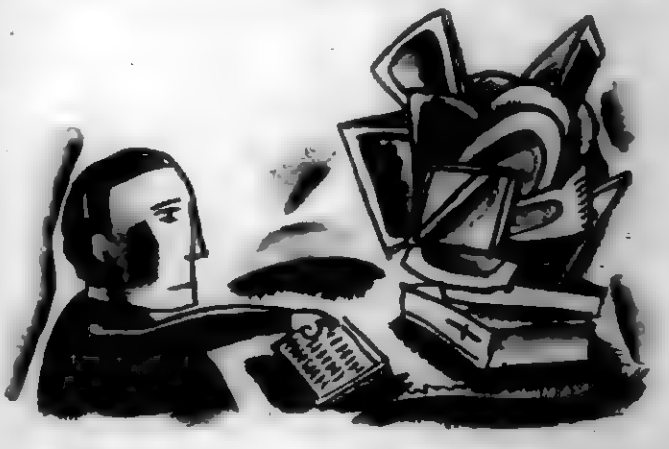
Results: New bandwidth investments delayed for six months and "freebies" provided in the area of network uptime and efficient management.



CW Chart: Michael Siggins

Fed encryption plan gets mixed reaction

Foes wonder if Uncle Sam can be trusted



By Gary H. Anthes
WASHINGTON, D.C.

Enthusiasm for Clipper, the federal government's new encryption technology, has been conspicuously absent among users, vendors and editorial writers since it was unveiled three weeks ago.

However, a few users and cryptography experts have praised the technology, agreeing with the government that it will offer robust security to users while helping law enforcement agencies fight crime through court-approved wiretaps.

Clipper, which embeds a secret encryption algorithm in a commercially available silicon chip, uses an approach called "key escrow." Two keys are needed to unscramble Clipper-encoded data or voice communications, and under the government proposal the keys would be stored at two as-yet undetermined sites managed by government agencies or private concerns. A law enforcement agency would be able to get the keys only via a court order, as is the case today under wiretapping laws.

"The good news is that the algorithm appears to be robust," said Ralph S. Poore, director of information security services at Coopers & Lybrand in Dallas. "And the approach appears to balance privacy issues with law enforcement requirements. Your conversations today — the law notwithstanding — are public. What this permits is for us to have private conversations where the only circumstance under which eavesdropping is probable is where someone has a lawful court order."

Others have been less enthusiastic — and less sure that Uncle Sam could always be trusted to do the right thing with technology. At a recent hearing on communications security and privacy, House Telecommunications Subcommittee Chairman Edward J. Markey (D-Mass.) said, "One has only to look at the Inslaw case to see the potential dangers."

Markey was referring to a case in which a federal court found that the U.S. Department of Justice stole software from a small company and covered up the theft in the face of multiple investigations.

Some have questioned the secrecy of Clipper's algorithm, saying it leads to the suspicion that it contains a hidden "trapdoor" that could allow unauthorized intrusion. The government has emphatically denied that any trapdoor exists and has offered to submit Clipper to an independent party of experts for scrutiny.

Data encryption is of vital inter-

Encryption plan, *page 60*

Encryption option

In addition to the government's official Data Encryption Standard, users can protect data communications with RSA encryption, licensed by RSA Data Security, Inc. in Redwood City, Calif. RSA is used by a number of major U.S. suppliers of computer hardware and software, including Lotus Development Corp. in Notes and Novell, Inc. in NetWare 4.0.

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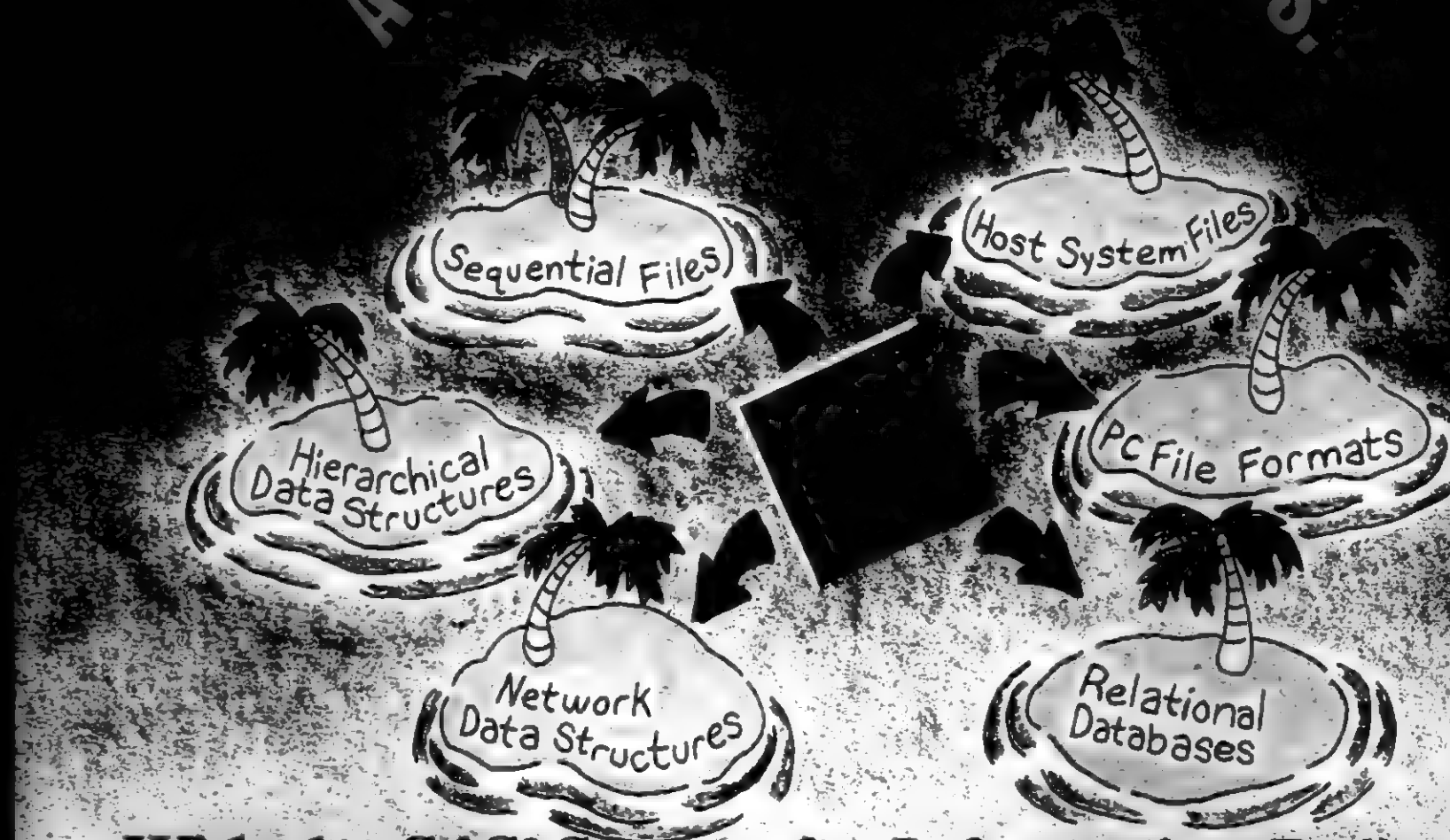

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NCD beefs up X software for Windows

By Joanie M. Wexler
MOUNTAIN VIEW, CALIF.

X Window System vendor Network Computing Devices, Inc. (NCD) said last week it intends to ship in June a reinforced PC X server application for the Microsoft Corp. Windows operating environment.

NCD's forthcoming PC-Xware will replace the vendor's existing PC X server product for Windows, PC-Xview.

Users have a choice of three local window managers with NCD's 32-bit PC-Xware for Windows: OpenLook, Motif and Windows.

NCD has ported its NCDware operating system to the native Windows environment to give general-purpose PCs the enterprise-oriented benefits of dedicated terminals optimized for X, said Judy Estrin, NCD's executive vice president. Such characteristics include faster performance and central support and administration, said Robert L. Warmack, director of marketing at the company's PC-X Division in Beaverton, Ore.

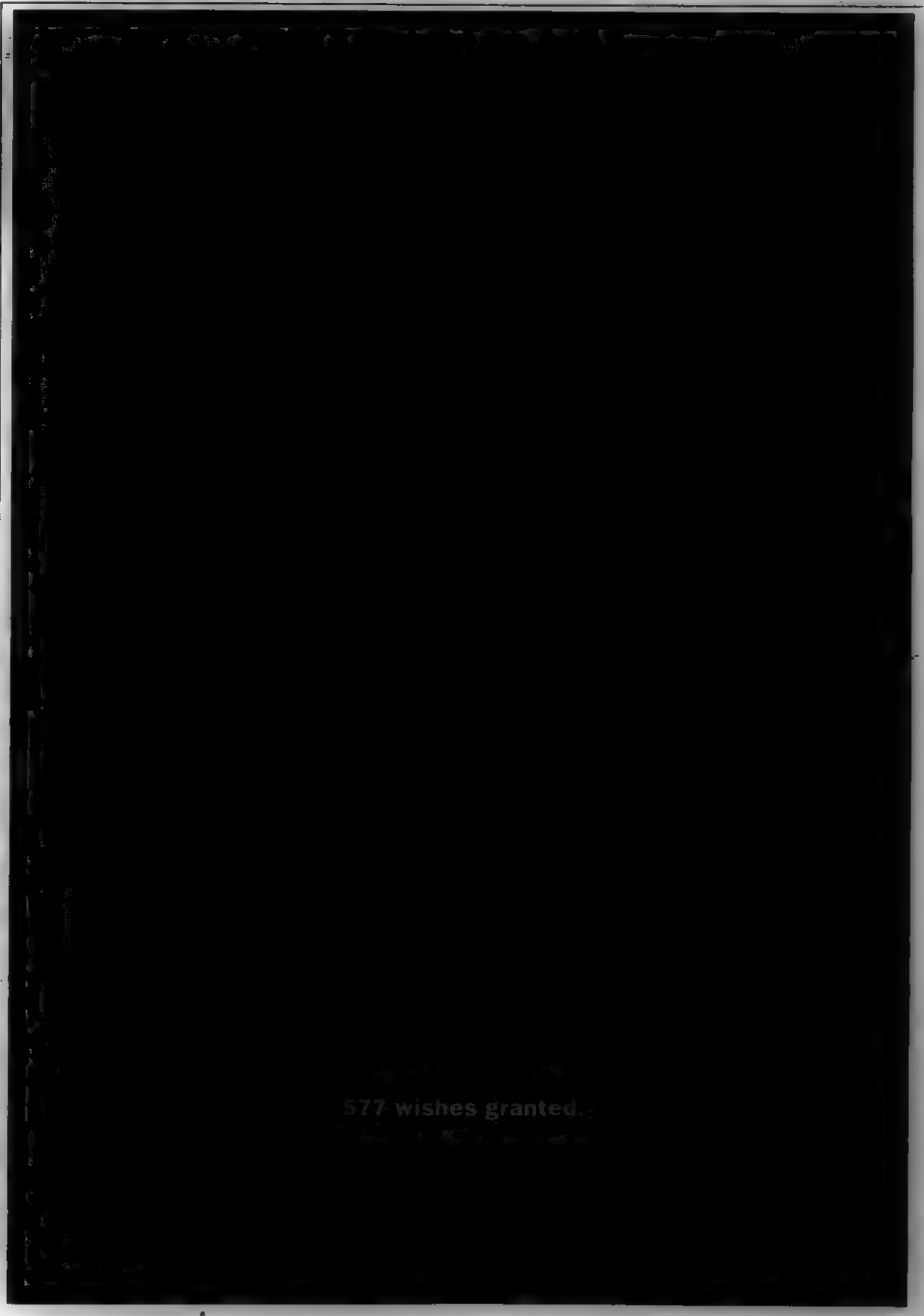
NCDware 3.0 is the latest operating system for NCD's market-dominant X terminal family. X terminals and PCs running X software (called PC X servers) can access remote applications networked across enterprise hosts also running X; applications appear to run locally in windows on high-resolution displays.

NCD's 32-bit, $545 to $795 PC-Xware software bundles functions users previously had to buy separately, such as host terminal emulators and network transport protocols, Estrin said.

The 32-bit software brings NCD up to speed with PC X server rivals Hummingbird Communications, Inc. and Age Logic, Inc. in the Windows market, said Eileen O'Brien, director of the terminals and PC connectivity program at International Data Corp. in Framingham, Mass.

O'Brien added that NCD's PC-Xware could appeal to NCD X terminal users who work at home or on the road with PCs but want the same functionality as provided by their terminals.

Age Logic said it will announce this week PC X server software for Microsoft's Windows NT technology. NCD said it plans to port PC-Xware to Windows NT.



XcelleNet unveils software tools for laptop computers

By Elisabeth Horwitt
ATLANTA

XcelleNet, Inc. is targeting mobile laptop users with new versions of the RemoteWare Applicomms family of electronic forms-generation and routing software.

Version 1.3 of RemoteWare Forms adds support for maintaining subsets of databases at remote systems. A laptop calling into the corporate computer automatically has its database updated from master files.

Version 1.3 also supports sequential, conditional routing of forms across wide-area links and embedded querying tools. The new version is priced at $7,500 plus $225 per remote node and is scheduled to ship May 28. An optional Query server is priced at $4,500.

Transmission efficiency

RemoteWare Documents 1.2 includes a new automatic data compression feature that is said to maximize the transmission efficiency of host connections using a hotel telephone or cellular modem. A new object editor allows users to include text, graphics and photographs in reports. The product is priced at $1,500 plus $125 per remote user.

RemoteWare Reports 1.2 allows users to download tables of contents and select parts of a file. RemoteWare Mail 1.3 supports access to electronic-mail services via the X.400 standard.

Availability for the latter three products is slated for June 28.

ISDN, telecommuting link studied

By Mitch Betts
WASHINGTON, D.C.

Telecommuting, already practiced by 2 million people, has the potential to substantially reduce traffic congestion, air pollution and gasoline consumption, according to a study by the U.S. Department of Transportation.

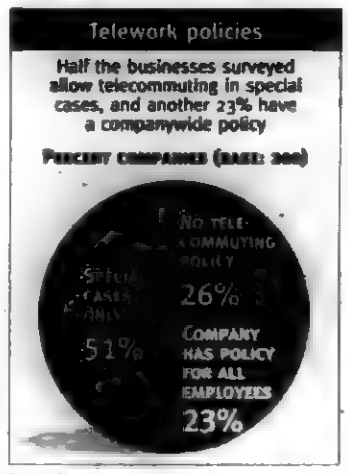
The agency conservatively estimated that by 1997, there may be 3 million telecommuters in the U.S.; that could reduce the nation's gasoline consumption by 476 million gallons a year and reduce emissions by roughly 1%.

However, the study acknowledged that telecommuting, where people work a few days a week at home or in a satellite office, is a relatively new trend full of uncertainties.

For example, the study said it is unknown whether telecommuting will stimulate "suburban sprawl" or whether the absence of telecommuters on the road will encourage other people to switch from public transportation to driving to their office in single-occupant cars.

The study, which draws on research by Link Resources Corp. in New York, was requested by U.S. Sen. Conrad Burns (R-Mont.). Burns argued that a nationwide fiber-optic network should be built so employees can "travel to work on information highways instead of our traditional highways."

The transportation study indicated that today's telecommunications services and equipment are adequate for most telework applications, but high-bandwidth networks will be needed in the future and would be beneficial even today for certain applications.



Source: Business Research Group

The adequacy of today's network infrastructure is one of the great debates in telecommuting circles, especially because upgrading the public network is expected to cost billions of dollars.

"When phone company people start talking about the telephone network necessary to support effective telecommuting, I always grab my wallet," said Michael Crampton, director of telecommunications at Hartford, Conn.-based The Travelers Corp., at a conference last October.

On the other hand, experts said the Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) would be ideal for allowing at-home customer service agents to handle voice calls and quickly call up customer data files.

The well-known problem with ISDN, however, is limited deployment.

Even the much-heralded National ISDN-1 standard "does little to encourage BRI deployment, since Southwestern Bell Corp. and US West do not plan to promote its use," according to a recent report by the Business Research Group in Newton, Mass.

Gil E. Gordon, a telecommuting consultant based in Monmouth Junction, N.J., staked out the middle ground. "We can do an awful lot with the technology we have today ... but ISDN's bandwidth will open a lot more possibilities," he said.

For example, broadband ISDN would provide faster transfers of large files and the convenience of having multiple phone lines over a single wire, Gordon said. ISDN also promises videoconferencing, but very few telecommuters really need video, he said.

According to Gordon, companies "should not hold their breath" waiting for ISDN before starting a telecommuting pilot. "I'd be hard-pressed to think of an organization that couldn't do some telecommuting without ISDN," he said.

HP, UB offer NetDirector for Unix

By Elisabeth Horwitt

Hewlett-Packard Co. and Ungermann-Bass, Inc. have entered a joint development agreement whose first fruit is a Unix version of UB's network management platform, NetDirector.

NetDirector for Unix will provide management of UB hubs, as well as Simple Network Management Protocol-based network devices, through HP's OpenView Network Node Manager, the vendors said.

The product will initially be able to call up the IBM OS/2-based NetDirector as an icon; greater integration is due in December, UB said. Thus, the Unix system will be able to act as an umbrella manager for multiple OS/2-based management systems.

Available this month, NetDirector for Unix supports Sun Microsystems, Inc.'s SunOS and HP/UX versions of HP OpenView. It is priced at $3,000, unbundled.

UB also announced FocusView, a series of graphical network management applications for its Access/One Enterprise Hubs that will run on the Unix platform. One application manages UB Ethernet links; another, Token Ring connections. Both are priced at $3,500.

A third application, Access/One FocusView, provides overall management of UB Access/One hubs, for $2,500. FocusView applications will be available on the OS/2 NetDirector later this year, UB said.

HP and UB said they plan to work cooperatively to develop integrated management of distributed local-area network installations, particularly on the data and application levels, the companies said.

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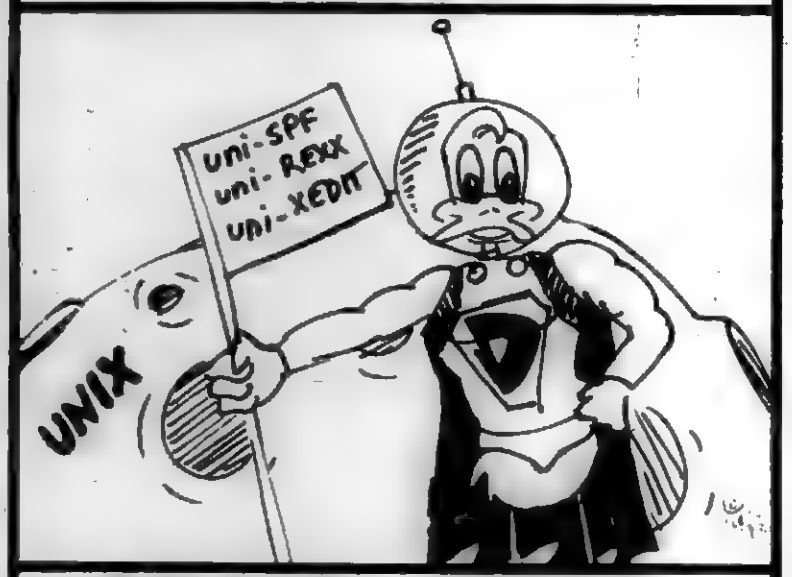

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Encryption plan

CONTINUED FROM PAGE 57

est to the banking industry, which uses the government's aging Data Encryption Standard (DES) for funds transfer and for communicating with large customers, branch offices and the Federal Reserve System. Steve Katz, an official at a large multinational bank and chairman of the information security committee at the American Bankers Association, said bankers are worried that a government-mandated change from DES to Clipper would be expensive and disruptive.

In for the long haul

However, federal officials insisted DES is not to be abandoned anytime soon. The National Institute of Standards and Technology (NIST) will recommend that DES be recertified as a federal standard for another five years, during which time NIST will work with the industry to evaluate alternatives to DES. In the meantime, "Anyone is free to buy and sell any other encryption technology in the U.S.," said Raymond Kammer, NIST's acting director.

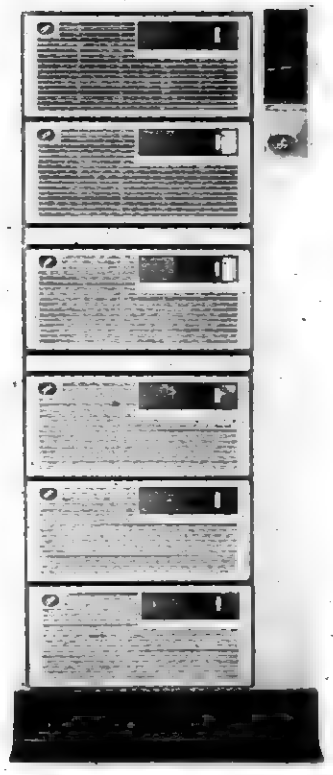
Clipper supporter Dorothy E. Denning, professor and computer science chairwoman at Georgetown University, said user and vendor concerns about Clipper can and will be worked out in a review of government policy on encryption, privacy and law enforcement mandated by President Bill Clinton. She praised the government's efforts to preserve the options of law enforcement agencies.

"Over the long term, it is extremely important that we be able to deal with serious crime in an effective way," Denning said. "If technology were to go in a direction that caused us to lose part of that capability, it could have very serious consequences for society."

In answer to criticisms that criminals will simply use encryption methods other than Clipper, Denning said, "If Clipper becomes cheap and ubiquitous, that's what people will use, regardless of who they are."

Vendors and users said they hope to play an active role in the government's review of encryption policy and practice. Oliver Smoot, executive vice president of the Computer and Business Equipment Manufacturers Association, said, "In our discussions [about Clipper] with the White House team, there was an indication of openness to the private sector that has not appeared in the past."

Look out!



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WAN software

Niwot Networks, Inc. has introduced the Niwot Digital Data Mover (DDM).

According to the company, the Niwot DDM is a PC-based product that provides nearly full use of existing bandwidth in station-to-station or local-area network file transfers. Features for the product include high link rate utilization, wild cards with full pathing options, full or selective file transfer and an optional compression co-processor.

Functions such as bulk file distribution, remote backup/restore, database updates and electronic-mail distribution are also provided.

Niwot DDM costs $895 per node.

▶ *Niwot Networks*
Suite B
2200 Central Ave.
Boulder, Colo. 80301
(303) 444-7765

Gateways, bridges, routers

Retix has introduced three additions to its RouterXchange 7000 (RX 7000) family of high-performance, reduced instruction set computing-based multiprotocol routers.

The RouterXchange Model 7550 is a five-slot chassis that holds up to four forwarding processors and offers the option of dual high-performance power supplies. Support for as many as 12 local- and/or wide-area network interfaces is provided, the company reported.

The RouterXchange Model 7250 is a high-performance feeder node for other RX 7000 models.

The 10Base-T Hub Card was designed for integrated routing and hub facilities, and it can be added to any of the RX 7000 models.

Model 7550 prices start at $11,200, Model 7250 prices begin at $6,200, and the 10Base-T Hub Card is priced at $2,000.

▶ *Retix*
2401 Colorado Ave.
Santa Monica, Calif. 90404
(310) 828-3400

Systems Network Architecture

Systems Strategies, Inc. has introduced Systems Strategies Express Integrated Desktop.

According to the company, the product is a communications software package designed to bring Unix connectivity solutions into corporate environments by enabling users to integrate data from IBM Application System/400s, Digital Equipment Corp. VAXs and mainframes to the Unix desktop.

Express Integrated Desktop has a graphical user interface that provides a common user interface across every application. The product is compatible with a variety of windowing environments and is IBM Systems Application Architecture-compliant, according to the company.

Express Integrated Desktop costs $1,000. The Workstation version is available in one-, five- and 20-user packs for $500, $2,000 and $7,500, respectively.

▶ *Systems Strategies*
1 Penn Plaza
New York, N.Y. 10119
(212) 279-8400

Micro-to-host

Firesign Computer Co. has introduced Outbound 3.0, a file-transfer program.

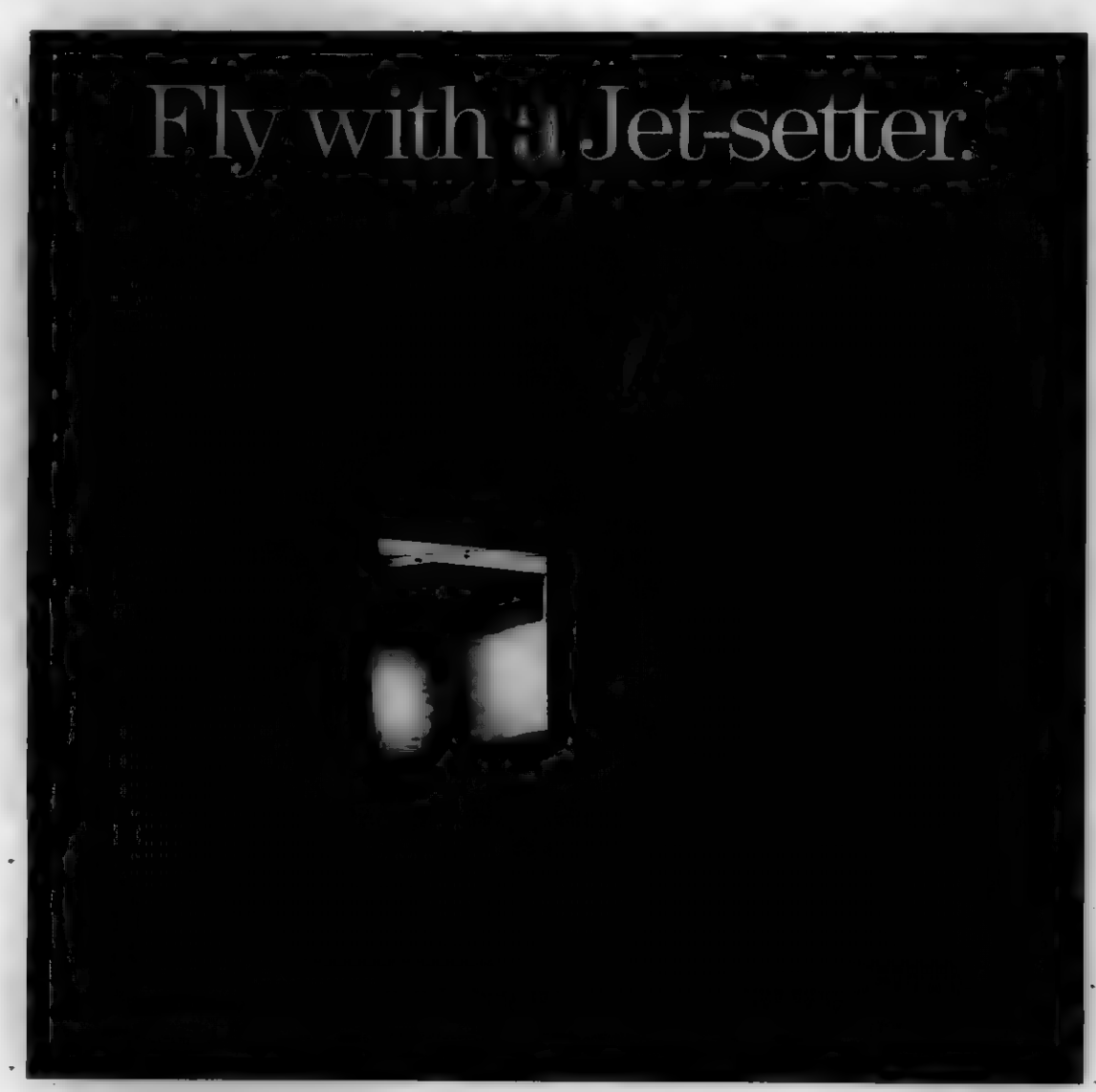
According to the company, Outbound extracts data from unattended PCs up to four times faster than its predecessors. The product is a terminate-and-stay resident application that enables the mainframe or host to initiate the transfer at any time.

The PC can be used for another project while the files are being transferred. Data is exchanged between IBM 370 or 390 mainframe systems operating on any current version of MVS or VM, the company said.

PCs with 3270 emulation, Microsoft Corp.'s Windows, OS/2 or DOS can be connected.

A typical installation costs $20,000. Individual PC software copies cost $150 for Windows and DOS and $300 for OS/2.

▶ *Firesign Computer*
480 Green St.
San Francisco, Calif. 94133
(415) 398-7228



The HP Output Stacker is a great place for documents to land after a whirlwind trip through the HP Paper Feeder and HP LaserJet 4Si or 4Si MX printer.

With the 1500-sheet *HP Paper Feeder* keeping your 17-page-per-minute printer busy on one end, the 2000-sheet *HP Output Stacker* makes sense on the other end. Especially in networked environments. Use the printer's upper output bin for smaller print jobs, the HP Output Stacker for heavier volumes. Together, the HP Paper Feeder and Output Stacker let your printer work unattended, day or night—even on weekends—without someone to put paper in or take it out. So you save both time and labor costs.

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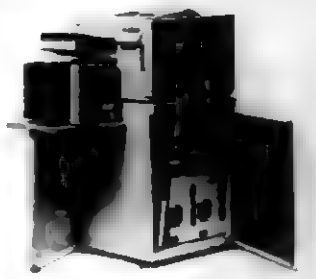

If the printer's output bin meets your needs, look into the HP Paper Feeder and the *HP LaserJet Printer Cabinet*—custom designed to hold supplies, as well as the printer.

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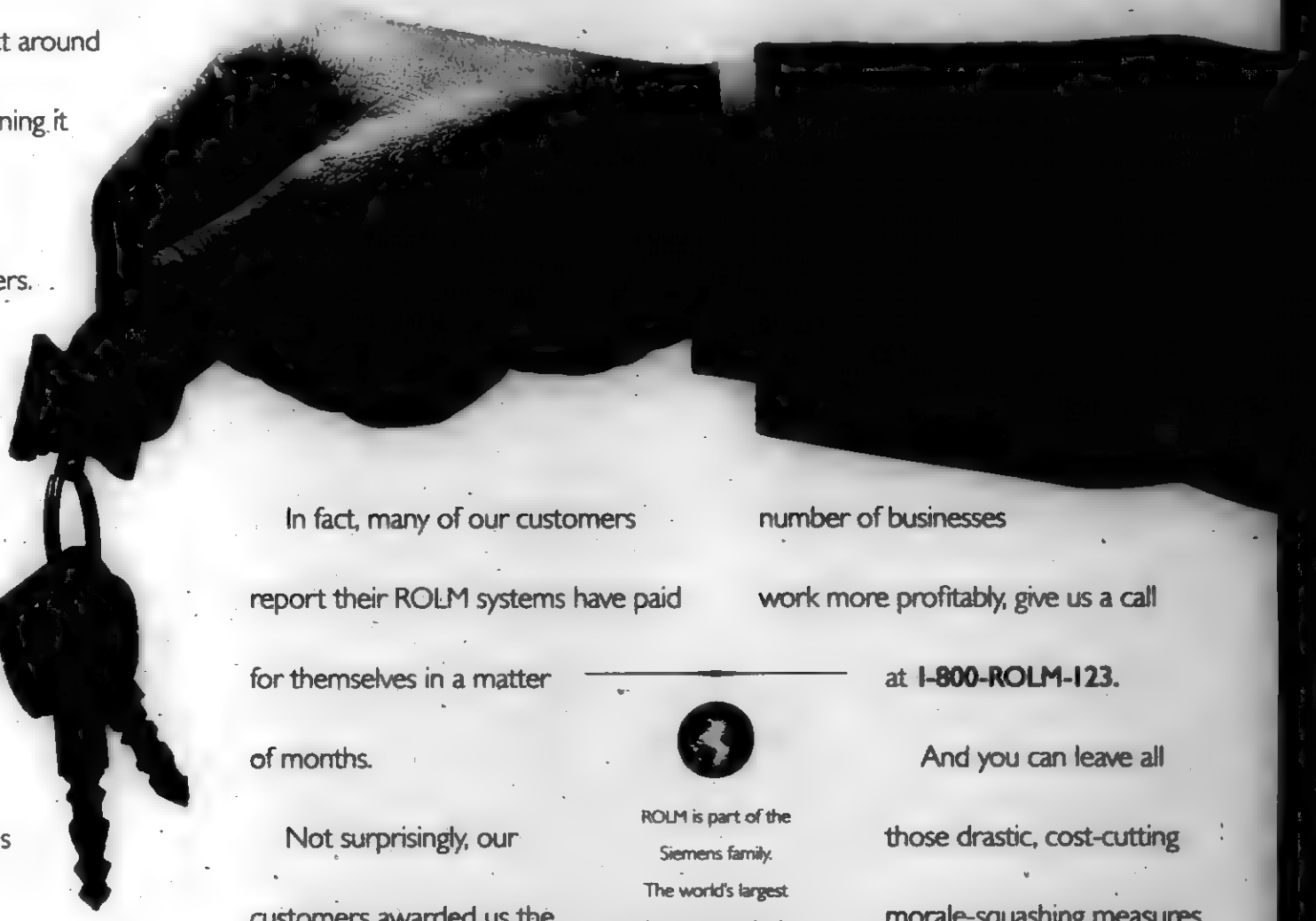

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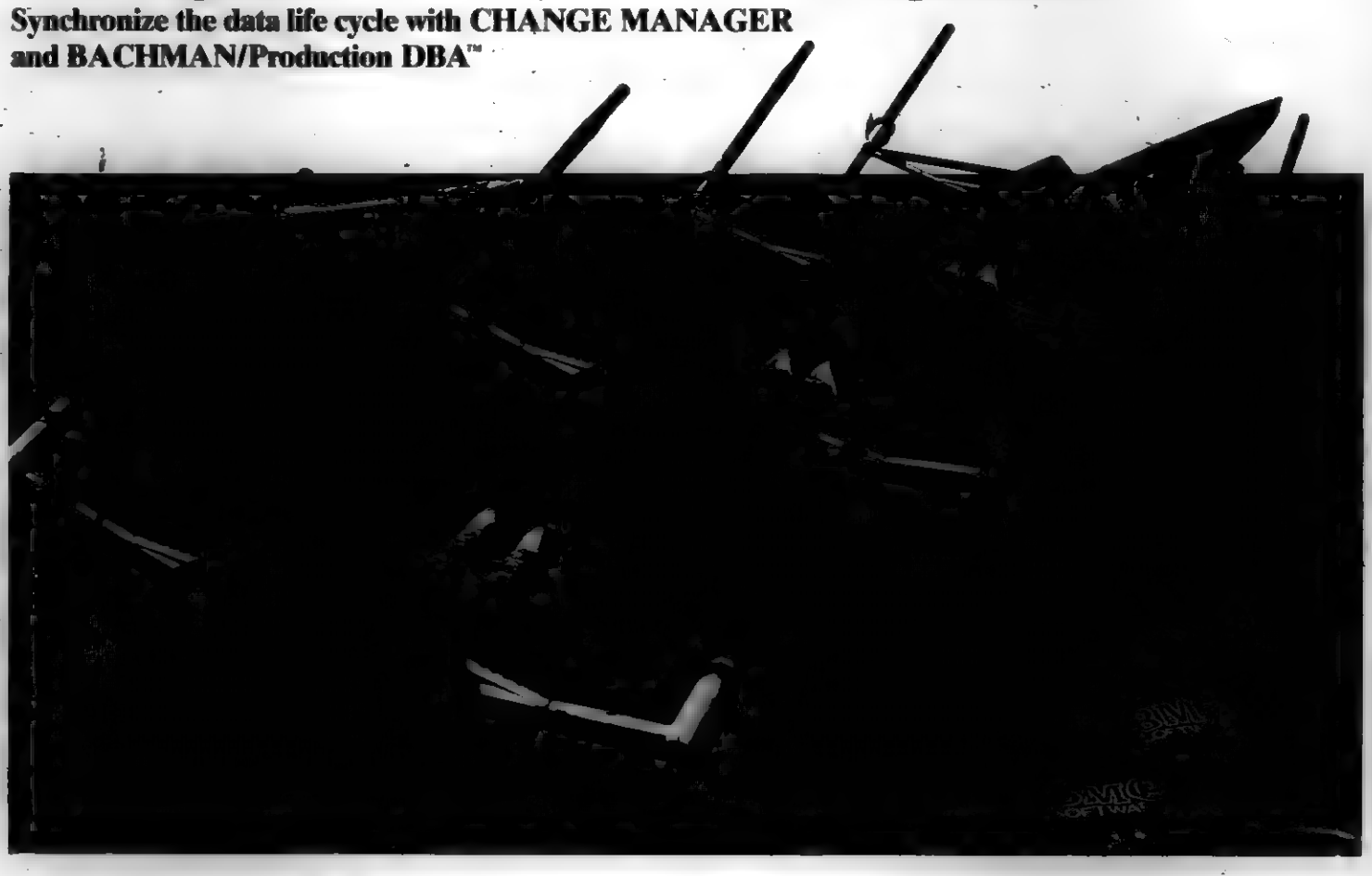

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IBM Business Partner

IBM Posix-compliant MVS, parallel processor on way

By Johanna Ambrosio
DALLAS

■ IBM is on schedule to deliver both its parallel-processing database management engine and its Posix-compliant version of MVS, according to Guy Harrison, IBM's director of enterprise products and head of the large systems laboratory in Poughkeepsie, N.Y.

In fact, Harrison said, both products are already installed in at least one beta-test site each, which he declined to name. The Posix interface was introduced in February, and the parallel computer will make its formal debut by summer, IBM executives have hinted.

Harrison disclosed some details of the coming products, which will be generally available next year. He made his remarks at a recent meeting of the Association of Computer Operations Managers here.

Keeping track of data

At the heart of the parallel-processing computer — a query engine that will hook up as many as 32 IBM Enterprise System/9000 mainframes — will be the Shared Data Facility. This will keep track of where data is and which processor is doing what work. A so-called Workflow Manager will move resources around.

"You'll be able to run work wherever there's processing power," Harrison said. The various pieces will be connected via IBM's Sysplex architecture.

Oldies need not apply

Harrison said, however, that the Shared Data Facility will not be accessible to all of IBM's older mainframes. "Not every machine we have can connect up to this. We couldn't go back as far as we would have liked," he said.

The machine will work like this: When a database query comes in, the query will be analyzed to determine whether it is a complex query and how best to break it up. The query will then be broken into pieces, or "parsed," and will then run on a series of engines under DB2. The parsing piece of the pie is coming from a third-party vendor that Harrison did not identify.

To use the parallel processing engine, Harrison said, customers probably will have to be up to date on the most recent versions of IBM

Posix-compliant MVS, *page 73*

Users cheer Unisys

By Thomas Hoffman
PHOENIX

Users of Unisys Corp. systems not only are encouraged about the vendor's financial turnaround but also are beginning to embrace Unisys' increased emphasis on delivering open systems and services, according to customers at the recent Cube and Use, Inc. joint user conference here.

For example, one of the chief reasons behind the recent purchase of a Unisys 2200/9222 mainframe server by the Massachusetts Department of Employment and Training was the system's ability to interface with Unix platforms and other distributed environments.

According to Dennis Thompson, the Boston-based agency's information systems director, the mainframe, installed March 8 to replace an aging Unisys 1100/94 mainframe, is being used to process unemployment insurance claims and other employment-related data.

Up to capacity

Thompson said he expects the mainframe to solve capacity issues while reducing maintenance and environmental costs. He said the 1100 system had been running at 95% CPU capacity and 90% memory capacity.

In contrast, the 2200 system is running at only 15% of its total capacity. "We liked the 2200 for its interoperability with multivendor platforms," said Thompson, who is looking at additional systems based on Unix, IBM's OS/2 and Microsoft Corp.'s Windows.

Unisys appears to be meeting the price/performance mark for customers with low-end requirements, too. Rick Zizak, IS manager at The Millcraft Paper Co., a $110 million paper manufacturer in Cleveland, said his firm recently selected six Unisys PW2 4256 PCs after testing them against Gateway 2000, Inc. PCs. The Unisys PCs, Zizak said, "offered a better price point and were more reliable," than the Gateway 2000 machines.

Looking at Unisys' services, Michael D. Barry, a manager in the computer services bureau at the City of Phoenix Police Department, said the law enforcement agency has tapped Unisys for a set of services under a handful of separate projects. For example, the department last year signed a $325,000 services contract as part of a bar-coding system used to track impounded property. That system is linked to Pace, or Police Automated Computer Entry, an on-line system that automates the data input and processing of police reports, field interrogations and information on arrests.

Pace, a $2.9 million system based on Unisys' LINC II fourth-generation language software, has been operational at the department since June 1989. Barry said the Pace contract included a $900,000 services agreement with Unisys for programming and systems analysis.

Barry said Unisys' services have been first-rate, leading him to consider the vendor's services for future projects. "Our experience with Unisys gives us added confidence," he said.

However, there were a few attendees who noted concerns about the vendor's escalating maintenance costs, including A. Alden Hofling,

Unisys, *page 68*

Company adding VAXs as LAN servers

By Michele Doetert

ON SITE

HealthCare Computers
Downers Grove, Ill.

Challenge: To integrate case management and preferred-provider networks into one service.

Strategy: To move PC server-based case management databases and Unix-based, preferred-provider database to large databases on VAX minicomputers.

Expectations: To improve data access and security while retaining flexible PC LAN interfaces.

Sometimes the right business decision is the opposite of the one everyone else is choosing. A case in point is HealthCare Compare, a Downers Grove, Ill., medical cost-management company that is bucking the downsizing trend by moving its databases and custom-built applications off its local-area network servers to a cluster of Digital Equipment Corp. VAXs.

Company officials stressed that the move was not prompted by dissatisfaction with LANs. "Our [Novell, Inc.] NetWare LANs were key to our success because we could expand our computing rapidly and inexpensively to match our explosive growth," said John Krakower, HealthCare Compare's executive vice president and chief operating officer.

HealthCare Compare grew from 400 employees in 1988 to more than 1,500 in 1992. "We're not throwing our LAN away; we'll just be running LAN-based client/server applications against an integrated database stored on several VAXs, rather than several databases on dozens of LAN servers."

HealthCare Compare has two lines of business and two main databases. Case management includes functions such as certifying hospital stays, and it uses applications and data stored on PC servers. Preferred-provider services use a database of providers with whom HealthCare Compare has negotiated lower fees on behalf of its clients. These applications and the database are stored on a Unix host from Pyramid Technology Corp.

The company uses Novell's LAN Workplace product to load both IPX/SPX and Transmission Control Protocol/Internet Protocol (TCP/IP) stacks on client PCs. Users thus have access to LAN servers and the Unix host without rebooting.

The company is currently integrating its two lines of business into a complete "managed care" service. To do this, both of its databases during the next year will be tied together and stored on a cluster of DEC VAX 7000s to be accessed from desktops via TCP/IP and LAN servers. Productivity applications, such as spreadsheets, will remain on the LAN servers.

Triple focus

HealthCare Compare's information systems staff's efforts are focused on three key areas: maintaining the reliability and manageability of the LANs, moving its corporate databases over to VAXs and writing client/server applications to access both LAN and VAX servers.

HealthCare Compare's *Ron Boeving (left), Janet Gawrys and Kent Campbell moved up to VAXs when their firm almost quadrupled*

Currently, 46 PC LAN servers and more than 1,400 nodes spread over several sites are managed by only seven LAN administrators and one LAN supervisor. In the last two years, the company has experienced fewer than 10 minutes of network downtime. "The keys to a stable LAN environment are centralized management and redundant components," said Ronald Boeving, assistant vice president of IS.

Boeving cited several key factors in his decision to build a centralized, minicomputer-based data center. First, he said he felt his data

HealthCare, *page 68*

VAXs as servers

CONTINUED FROM PAGE 67

was more secure in a single, central site. Second, he said he felt minicomputer technology, especially its I/O capabilities and storage capacity, was better suited to handle his 120G bytes of data than PC servers.

Both the case review and preferred-provider databases will be moved into a relational database from The ASK Group, Inc.'s Ingres Products Division running on the VAXcluster. The data will be accessed from Microsoft Corp.'s Windows on desktop PCs via the LAN.

HealthCare Compare is currently using a variety of tools, including Microsoft's Visual Basic and Ingres' Windows for 4GL to build client/server applications that will run against the database.

The custom-built applications will use Ingres' stored procedures capability, which allows triggers and business rules stored on the server to be automatically invoked to minimize network traffic. "Stored procedures let you make one call over TCP/IP instead of seven or eight," Boeving said.

Boeving stresses usability in his new applications. "The LANs established a high level of usability and reliability, which we want to keep," he said. "The human interface and responsiveness of the LAN are par excellence; it just lacks the data access and storage technology of the minicomputers. By combining the two technologies, we hope to get the best of both worlds."

Redundancy pays

HealthCare Compare IS executives attribute their remarkable network uptime to carefully planned redundant components.

"We have mirrored backup servers so that if a production server goes out, we can bring up a backup server immediately, and no more than 10 minutes of work will be lost," said Ronald Boeving, assistant vice president of IS. In the company's LANs, every transaction is written first to an intermediate server, which then duplicates the transaction to the production and backup servers.

To simplify configuration and management, the company has adopted standard desktop and server configurations.

Most of the company's desktop PCs are 486-based, with 8M bytes of random-access memory and Microsoft's Windows as the front end. All corporate servers are Compaq Computer Corp. 486/50 SystemPros.

—Michele Doetert

Unisys

CONTINUED FROM PAGE 67

vice president and corporate secretary at Concord General Mutual Insurance Co. in Concord, N.H.

On the plus side, Hofling, whose company uses two Unisys A series mainframes connected to 400 CTOS workstations, said he is pleased with the vendor's willingness to allow the proprietary CTOS workstations to run on different operating environments, particularly MS-DOS, which is popular among Concord's insurance agents.

But Hofling said he is miffed over the escalating maintenance costs for his firm's A-6 and A-10 mainframes. Concord's A series maintenance costs have jumped 50% during the past three years.

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In Brief

Parallel purchase

MasPar Computer Corp. last week said that **Lawrence Berkeley Laboratory** in Berkeley, Calif., purchased a MasPar massively parallel processing system to support imaging applications related to materials sciences, earth sciences, molecular biology and physics.

Tool goes beyond Oracle

Business Objects, Inc. said the latest release of its $600 BusinessObjects front-end data access tool has been extended to reach more relational databases. The 2-year-old product had previously supported only **Oracle Corp.** databases. Through separate gateways, Version 2.2 can now link with databases from **Sybase, Inc.**, **Informix Software, Inc.** and **The ASK Group, Inc.**'s Ingres Products Division; **IBM**'s DB2; and **Digital Equipment Corp.**'s Rdb. Version 2.2 is being shipped to users.

SAP AG to port to Windows

SAP AG has announced plans to port its suite of client/server applications to **Microsoft Corp.**'s Windows NT. The first results of the porting are expected to be displayed at the CeBIT trade show, which will be held next March in Hannover, Germany.

Mapics family to grow

Marcam Corp. unveiled what it is billing as the "next generation" of Mapics applications at its user conference last week. Mapics, which Marcam purchased from IBM, is a family of manufacturing applications. Included in the announcements were nine applications, a user interface and a pledge to continue expanding the Mapics family.

A change of force

Oracle USA President Ray Lane said Oracle will direct its thousands-strong direct sales force to work closely with indirect distributors. Oracle is reorganizing its entire sales force nationwide, giving sales representatives bigger quotas that cannot be met without large-volume indirect sales.

Control Data enhances data management

Control Data Systems, Inc. in Arden Hills, Minn., which spun off last year from the former Control Data Corp., last week enhanced an engineering package designed to speed concurrent engineering processes.

The data management software product, EDL 6.0, was intended to provide varied views of product data to users in multiple workgroups. Using the software's Networked Object Manager and relational database management system, product definition data can be created, located and distributed through a graphical user interface (GUI).

By tracking the relationships of design objects, EDL 6.0 reportedly helps ensure product design integrity for small work teams or for an entire enterprise.

EDL 6.0 is the successor to EDL 5.7 and adds GUI-based browsing capabilities as the key new feature. It includes as major modules the EDL Networked Object Manager, EDL Product Structure Manager, EDL Process Manager and Personal PDM module. It also adds client support for Microsoft Corp.'s Windows; EDL 5.7 supported only Apple Computer, Inc. Macintosh clients.

Available for platforms from Control Data Systems, Sun Microsystems, Inc., Hewlett-Packard Co., IBM, Silicon Graphics, Inc. and other Unix vendors, EDL 6.0 is priced starting at $2,000 per concurrent user.

Control Data Systems also enhanced its computer-aided design, manufacturing and engineering products by adding new modules to its ICEM CFD/CAE grid generation software and introducing a solids modeling system. ICEM Parametric Solids is the result of a joint marketing and technology agreement with Intergraph Corp.

—James M. Connolly

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Unix conversion serves up mixed brew

By Mark Halper
LACROSSE, WIS.

G. Heileman Brewing Co.'s wish list for its Unix operations just got a little shorter, if vendor promises count.

The company recently put the finishing touches on a three-year conversion of all operations from IBM and Unisys Corp. mainframes to three Pyramid Technology Corp. servers, and while it has been pleased with the results, the system has had its shortcomings.

For instance, Paul Ricker, Heileman's vice president of information systems, noted that the $1 billion brewing company has had to cobble together its own systems management software, which is now a patchwork of programs that do not communicate with one another.

Help on the way

But Pyramid has a plan to smooth things out. Next month, the multiuser computer vendor plans to introduce a graphical user interface-based administration environment that will provide end users with a consistent window to their disparate tools.

The Motif-based product, called Visual Systems Manager II (VSM), will include a rules manager, icons and point-and-click features that should enable Heileman to lower costs by reducing systems management manpower and improving efficiencies, Ricker said.

If Pyramid gets around to shipping it, that is. Ricker said he had expected the product to be available by now. Pyramid previewed it last March and now says availability looks like it is a few months out.

In the meantime, Ricker is considering other options, such as CA Unicenter, a comparable product from Computer Associates International, Inc. that CA is in the process of porting to Pyramid.

"We've been really crying out for this," Ricker said. "We've had a lot of homegrown tools for things like capacity management, tape management and distribution management. They all work separately."

However, whichever product Heileman chooses will not be the final answer to its systems management needs. The company is searching for a job scheduler and disk management tools to minimize I/O bottlenecks, for instance.

VSM will be the latest twist in Heileman's $7 million mainframe migration, begun in 1989, which Ricker said has helped lower the company's IS budget by $3.7 million, although he declined to reveal the total budget figure.

Heileman's switch to Unix resulted from an edict by its former parent, the now-defunct Bond Corp.

At the time, Bond owned companies around the world in brewing, real estate, mining, media and petroleum. Bond decided Unix systems would facilitate open communications among the various far-flung properties.

Heileman's migration of some 6,000 programs it had built during 20 years of mainframe computing has proceeded at a deliberate pace with the help of a slew of contract programmers including Minneapolis-based Software Solutions Corp., and with the installation of several off-the-shelf software programs. The company just last month pulled the plug on its last mainframe, a Unisys A12.

Among the benefits afforded by the Unix system have been system speed and flexibility. Ricker noted that under the mainframe's old Cobol financial system, "we couldn't introduce a new account into the general ledger without a week of programming."

Running Oracle Corp. financial programs, the brewery has decreased that time dramatically, he said.

Return to solvency

In fact, Ricker claimed the Unix system played a role in expediting Heileman's passage through Chapter 11 bankruptcy proceedings because the old mainframes were clumsy at tracking debtors.

"We couldn't have come out as quickly with a proprietary system," Ricker said.

It has not all gone smoothly, however.

"I probably would have waited a little longer until there were more conversion tools available," Ricker said, reflecting on what he might do differently a second time around.

Not all quarters of the company received the idea of Unix graciously, Ricker said.

"The biggest challenge was with the IS staff itself. You have a lot of die-hard IBM users who hadn't even heard of Pyramid."

The switch involved long hours of intensive training for the IS staff, which Heileman cut from about 85 to 70.

Ricker recounted another obstacle he faced during the conversion: It was difficult "keeping IBM management away from [Heileman] management to keep them from telling us that we were making a mistake," he quipped.

Heileman Brewing's Paul Ricker: *Some IS staff members were die-hard IBM users*

Scott Weidensaul

ON SITE

G. Heileman Brewing Co.
LaCrosse, Wis.

Challenge: To efficiently manage new systems after converting from IBM and Unisys mainframes to Pyramid Unix systems.

Plan: To replace a homegrown, limited-function management system with a GUI-based program, either Pyramid's upcoming Visual System Manager II or Computer Associates' CA-Unicenter systems management package.

IBM Posix-compliant MVS

CONTINUED FROM PAGE 67

software, including MVS 4.3 and DB2 3.1.

When IBM delivers the parallel processing computer, it will do so as an integrated set of hardware, software and services, Harrison added. "We'll provide customization and planning, install and verify, maintenance and anything else you want to pay us to do," he said.

> Users will be able to move their MVS applications to Posix platforms.

After the DB2 engine is delivered, Harrison said, IBM will make one available for transaction processing using CICS and DL/1 by the middle of next year.

Also, IBM will make available a tool to help users parallelize their batch programs to allow these applications to take advantage of the full horsepower of the new machines. This will likely be available later this year, he said.

Harrison said the Posix interface has been delivered to a government sector user and that it will be the basis for IBM's implementation of the Open Software Foundation's Distributed Computing Environment. "MVS isn't going to be Unix any time soon, but we are moving quickly to open it up," he said.

The Posix interface will be certified by X/Open Co. and will conform to the standard, he said, but it will do so in a way that takes the "things that are good about MVS." For example, system performance data will be in the standard MVS format, as will the hierarchical file system.

Harrison said users will be able to take their MVS applications and move them to Posix platforms.

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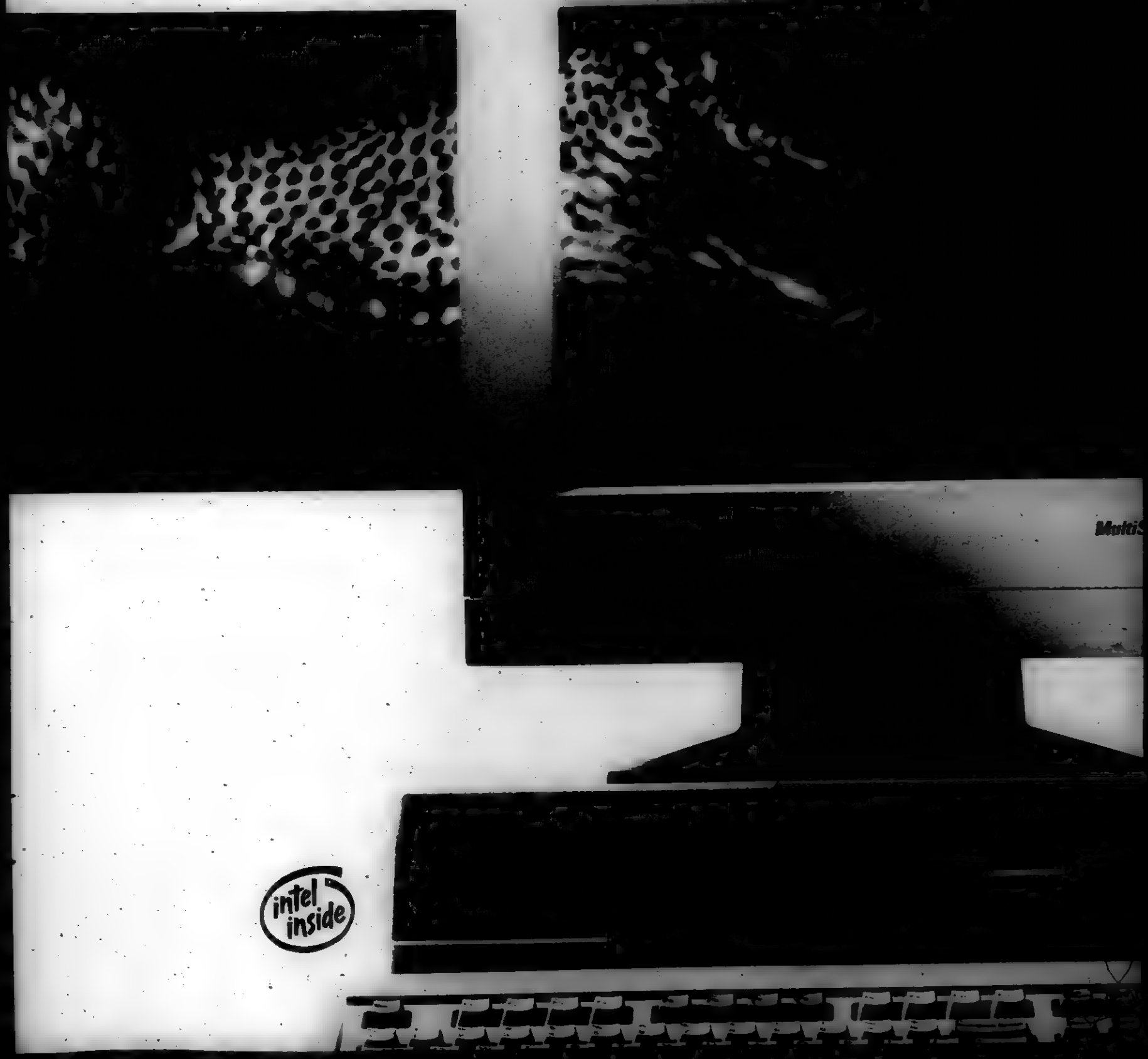

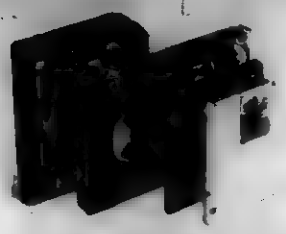

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Database management

Aston Brooke has released DB-Vision for Oracle. The product is a set of tools designed for monitoring and tuning Oracle Corp.'s relational database management system.

The product continuously monitors Oracle database operations and stores detailed performance information in a compressed history database.

More than 50 performance measures can be seen historically or in real time because of a Motif-based graphic interface. Conflicts are automatically predicted, logged, detected and corrected.

Prices start at $800.

▶*Aston Brooke*
Suite 300
Plymouth Meeting Executive Campus
610 West Germantown Pike
Plymouth Meeting, Pa. 19462
(215) 834-3960

Platinum Technology, Inc. has expanded support for the IBM Query Management Facility (QMF) by adding more products and features to its line of products for QMF.

Platinum Object Administrator is a tool that enables users to manage QMF queries, procedures and forms. The product works seamlessly with Platinum Compile/QQF and Platinum Governor Facility. QMF queries and reports can be transported into production with the Platinum Compile/QQF.

By using an interactive menu-driven interface, users can convert a QMF query into a Cobol program. According to the company, Platinum Governor Facility monitors the resources and commands used during a query session.

Object Administrator prices range from $7,084 to $28,860. Compile/QQF prices range from $10,120 to $41,228, and the prices for Governor Facility range from $19,250 to $82,455.

▶*Platinum Technology*
1815 S. Meyers Road
Oakbrook Terrace, Ill. 60181
(708) 620-5000

Software application packages

Sterling Software, Inc.'s Systems Software Marketing Division has introduced Sterling Shrink for IMS 5.2.1, a product designed to provide data compression and expansion facilities for Version 4.1 of IBM's IMS.

Without application program modification, the product can operate under OS/VS2, MVS or the Single Virtual Storage System. Shrink for IMS can also be used for variable and fixed-length methods.

Depending on the data and the compression routine used, Shrink for IMS can be applied to full-function databases, achieving data compression of up to 50%. Applied to Fast Path Data Entry databases, compression of up to 80% can be attained, the company said.

Prices begin at $14,500 for Group 30 processors.

▶*Sterling Software*
11050 White Rock Road No. 100
Rancho Cordova, Calif. 95670
(916) 635-5535

Power supplies

Exide Electronics Group, Inc. has introduced two Powerware Personal Uninterruptible Power Systems.

The products were designed for applications that include standby PCs, servers and client terminals, local-area networks, telecommunication devices and point-of-sale equipment.

The Powerware Personal Models 400 and 600 offer 400 VA and 600 VA power ratings, respectively, and feature automatic bypass and increased battery backup. The products are also furnished with LAN or serial communication options.

Prices start at $449.

▶*Exide Electronics*
8521 Six Forks Road
Raleigh, N.C. 27615
(919) 872-3020

Upsonic has announced the VR Series of uninterruptible power supply (UPS) systems for PC-based local-area networks.

The company said the VR Series protects host computers, LANs and file servers from suspect input power sources. The products include voltage regulation in addition to battery backup features and standard UPS surge protection.

Battery service, replace and overload warning lights are included. The Upsonic VR Series is available in four models ranging from 550 VA to 2,000 VA.

Prices range from $279 to $949.

▶*Upsonic*
1392 Industrial Drive
Tustin, Calif. 92680
(714) 258-0808

International Power Machines Corp. has introduced the Series 100 UPS, a single-phase uninterruptible power supply (UPS) system designed to protect PCs and local-area networks.

The Series 100 UPS has a microprocessor-based architecture that protects critical equipment and includes Power Management Software for control of individual computer or networkwide power, the company reported.

The series includes a power design that supports switch mode power supplies and offers spike and surge protection.

The Series 100 UPS is available in 300, 450, 600, 800 and 1,200 VA ratings.

Prices range from $400 to $2,000.

▶*International Power Machines*
2975 Miller Park North
Garland, Texas 75042
(214) 272-3000

Computer Power, Inc. has introduced Computersave, an on-line uninterruptible power system.

Because the product offers voltage regulation and power conditioning, a critical load can be protected continuously and prevent even a brief power outage, the company reported.

The latest advancements in pulse width modulation and line interactive ferroresonant technology are provided, and Computersave has the ability to correct damaging harmonics.

Prices start at $1,319.

▶*Computer Power*
124 West Main St.
High Bridge, N.J. 08829
(908) 638-8000

Utilities

Kisco Information Systems has introduced Smartin, a desktop utility program designed for IBM Application System/400 users.

Smartin consists of an AS/400 command line, a 200-year calendar, a personal telephone list, a personal notepad and a full-function adding machine. According to the company, when users are working with the AS/400 Attention Key processing, all utilities are instantly available by pressing the ATTN key.

The base price for Smartin is $500.

▶*Kisco Information Systems*
Suite 124
120 Beverly St.
Mount Kisco, N.Y. 10549
(914) 241-7233

BMC Software, Inc. has announced Q:Manager IMS.

According to the company, the product increases IBM's IMS/TM availability by enabling IMS data centers to bypass outages or reduce the impact of an outage by offering several exclusive capabilities for the daily or emergency management of IMS message queues.

Users can dequeue (delete) or unload problem system or transaction messages. Q:Manager IMS has the ability to lessen the impact of a scheduled or unscheduled outage by allowing IMS users to quickly requeue lost messages.

The need to manually search through systems logs and on-line data sets when recovering lost messages has been eliminated because Database Recovery Control is used and Q:Manager IMS automatically selects the appropriate checkpoints.

CPU level prices start at $15,500.

▶*BMC Software*
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Software Engineering of America has introduced Release 2.0 of FASTVSAM, a high-speed copy facility designed for VSAM users and sequential data sets.

According to the company, it replaces the Repro function of IDCAMS and has a sophisticated VSAM cluster Backup and Restore capability.

Offering both file and catalog management, FASTVSAM Version 2.0 acts as a front end for IDCAMS.

The product runs in any MVS, MVS/ESA or MVS/XA environment.

Prices range from $7,000 to $12,500.

▶*Software Engineering of America*
1230 Hempstead Tnpk.
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Now the World's Leading Mainframe C Compiler Features Some Significant Pluses

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The SAS/C C++ Development System is fully compatible with the AT&T 3.0 release of the C++ language with the exception of template support. It implements the familiar constructs of the C++ programming language—including in-line functions, operator and function overloading, references, and free store management—providing a robust and productive applications development environment.

The enhanced SAS/C Full Screen Debugger, available with the SAS/C compiler, also supports C++, allowing you to debug C++ as well as mixed C and C++ applications.

A Plus for Portability

The SAS/C C++ Development System is an indispensable tool for migrating existing C++ applications developed in other environments. Applications built on UNIX workstations and PCs can be ported to the mainframe with minimal effort. As a result, your workstation becomes an effective platform for mainframe applications development.

Find Out More In A Free Report

To learn more about the pluses of C++ programming with the SAS/C C++ Development System, simply call or fax us today.

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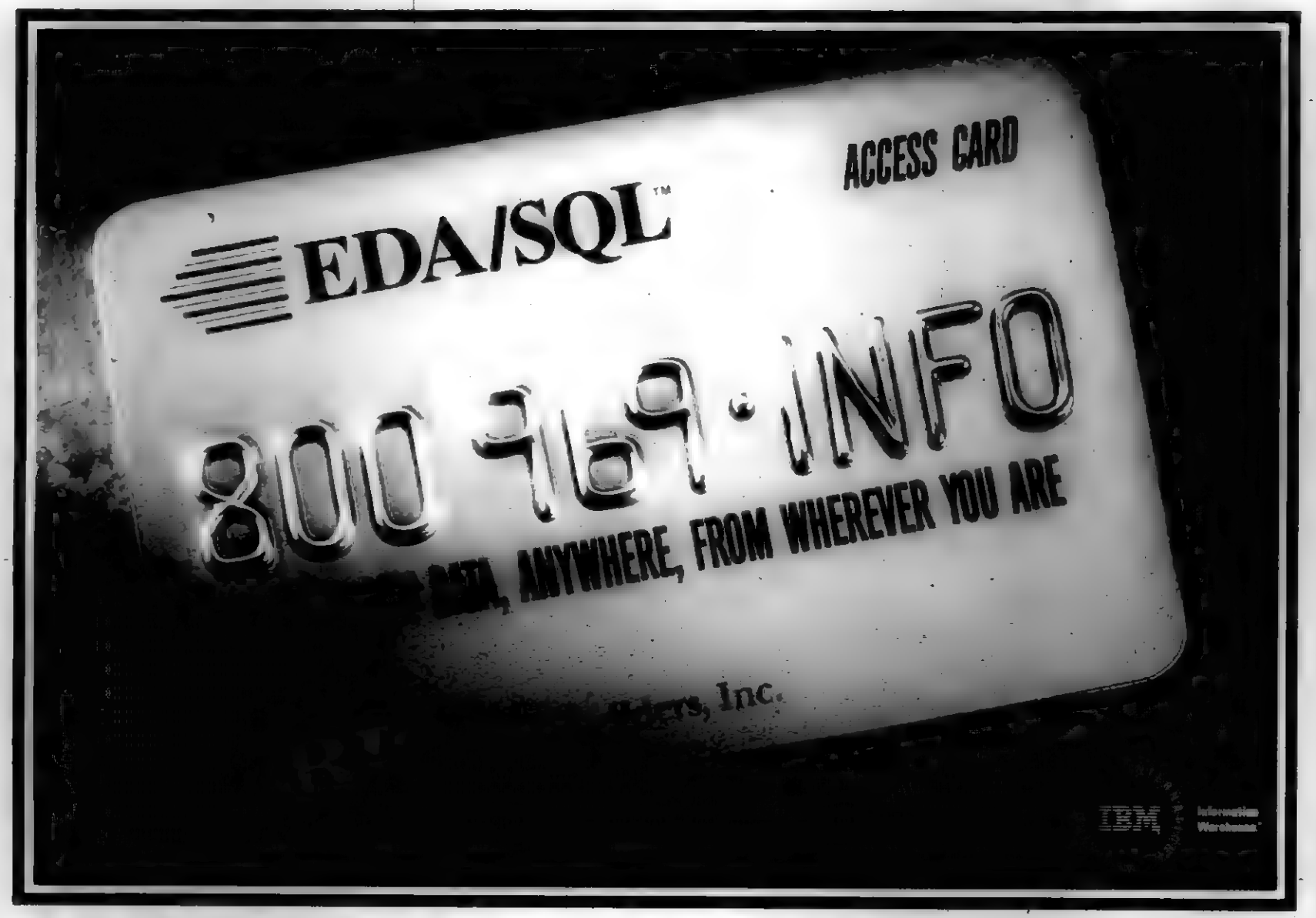

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California goes after insurance cheaters

Relational database, forms-based applications give state department timely notice of past fraud

By Jean S. Bozman
SACRAMENTO, CALIF.

California, a large state often rocked by earthquakes and seared by extensive brush fires, deals with a lot of insurance companies. But until recently, it had no consistent way to flag repeat cases of insurance fraud.

The state has created an early-warning system that searches an integrated relational database for companies and individuals that have been associated with past infractions.

Collecting information for the new database was not a problem, said Ron Kuhnel, chief at the California Department of Insurance's technology division.

Financial data on all insurance companies operating in the U.S. — some 5,000 companies — arrives quarterly on magnetic tape from the National Association of Insurance Commissioners in Kansas City, Mo. Approximately 1,500 insurance companies operate in California.

Other data points come from 50,000 calls to a consumer-complaint hot line each month and from data that is informally gathered by the insurance agency's 1,000 employees.

Accuracy was a top concern of information systems managers, who said they worried about islands of information in mainframes and PCs scattered in several sites from San Francisco to Los Angeles. Worse, because some vital data was stored on paper or index cards, it could not be shared throughout the agency.

ON SITE

California Department of Insurance
Sacramento, Calif.

Software: Oracle Version 6.0 database with 500M bytes of data. Five applications, built with Oracle Forms, use the database; a dozen will exist by mid-1994.

Hardware: Digital Equipment Corp. 5900 RISC machine under Ultrix.

Cost: $1 million, about one-fifth the cost of a similar mainframe system.

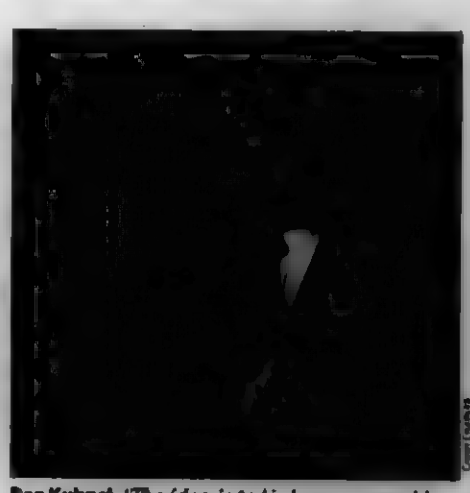
Fortunate move

Then, in 1991, the state took over operations for two multibillion-dollar insurance firms that were heading for insolvency. A 1991 directive from Insurance Commissioner John Garamendi spurred development of the early-warning system and its associated integrated database management system.

To get the development job done quickly, California turned to systems integrator Suncoast Scientific, Inc. in Fort Walton Beach, Fla., paying the firm about $1 million. Suncoast, with just 30 employees, had built similar insurance applications for the state of Florida.

Suncoast worked with state programmers to build applications that access the same sets of underlying data. "We wrote cross-functional systems," Kuhnel said. "The idea is to link every event together relationally."

Suncoast programmers, working in Florida and Sacramento, wrote 300 Oracle SQLForms 2.3 on-screen report forms because they had



Ron Kuhnel: *'The idea is to link every event together relationally'*

experience with the Oracle Corp. program. That may have been a "tactical" mistake, Kuhnel said, because all of those character-based forms had to be upgraded, one by one, to SQLForms 3.0.

The insurance agency plans to start developing new applications with the graphical user interface-based SQLForms 4.0 tool this summer.

California, *page 83*

SQL features aid programming

By Garry Ray

Database programming received a boost last week when two development tools vendors added SQL programming facilities to their current offerings.

Kaseworks, Inc. in Norcross, Ga., announced SQL support for its Kase:VIP code generation tools for IBM's OS/2 and Microsoft Corp.'s Windows.

The enhancement, to be delivered this summer in the Kase:VIP development products, includes a visual SQL Designer for prototyping and testing database applications, according to company officials.

The SQL Designer will initially support databases such as IBM's OS/2 Database Manager, Sybase, Inc.'s Sybase, Microsoft's SQL Server and other SQL databases.

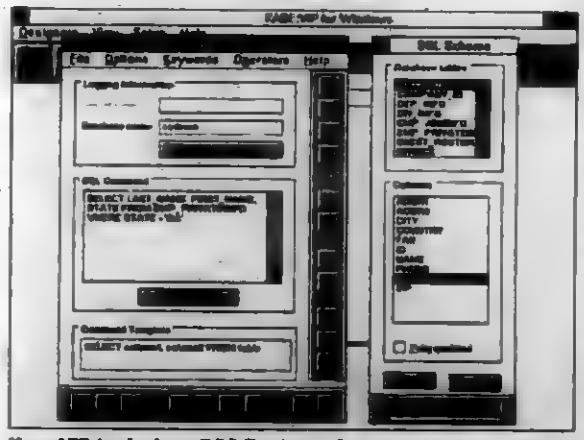
Kase:VIP offerings for Windows and OS/2 currently include tools for designing windows, menus, panels and other application components. The tool generates C, C++ or Cobol source code, company officials said.

Kase:VIP users said SQL Designer will offer them an alternative to other client/server development tools that use proprietary fourth-generation languages (4GL). "The bottom line is that you can't do mission-critical apps using 4GLs," said Louis Kahans, senior systems analyst at The Centers for Disease Control and Prevention's National Center for Prevention Services in Atlanta. "If there are bugs [in the 4GL code], you have to wait for the vendor to fix them."

Pricing for the Windows and OS/2 versions of the Kase:VIP tools will be $1,995 and $3,995, respectively, according to company officials.

Separately, Blue Sky Software Corp. in La Jolla, Calif., began previewing its Visual SQL prototyping, design and code generation tool for Windows.

According to the company, programmers can use Visual SQL to develop working Windows applications with menus, graphics, data-entry screens and electronic Help systems. These prototype applications can then be used to generate C code for subsequent compilation. A "preview mode" allows developers to test the application prior to compilation, the company said.



Kase:VIP *includes a SQL Designer for prototyping and testing database applications*

Slated for release in the third quarter, Visual SQL will support Oracle Corp.'s Oracle, Sybase's SQL Server, Borland International, Inc.'s dBase and Microsoft's Open Database Connectivity interface, company officials said.

Micro Focus offers choice in transaction processing

By Garry Ray

One path on the long march toward application rightsizing may be cleared with this week's slated announcement of a new transaction processing system from Micro Focus, Inc. in Palo Alto, Calif.

Called the Micro Focus Transaction System (MTS) and scheduled for release next month, the facility will offer an alternative to IBM's AIX CICS/6000 transaction processing system for the RISC System/6000. Currently more than 36,000 CICS licenses are in use on a variety of IBM mainframe platforms, according to an IBM spokesperson.

MTS will enable migration of mainframe-based CICS applications by providing a CICS-compatible application programming interface on AIX, Unix, OS/2 and Microsoft Corp.'s Windows NT platforms, Micro Focus officials said. Such a design allows CICS applications developed for mainframe execution to be ported to other platforms and run without alteration, according to beta-test users.

A purchasing system created for use in an MVS environment on the IBM Enterprise System/9000 ran on an Intel Corp. 1486-based system "with no modification at all," said Steve Kaplan, manager of software services at

Micro Focus, *page 84*

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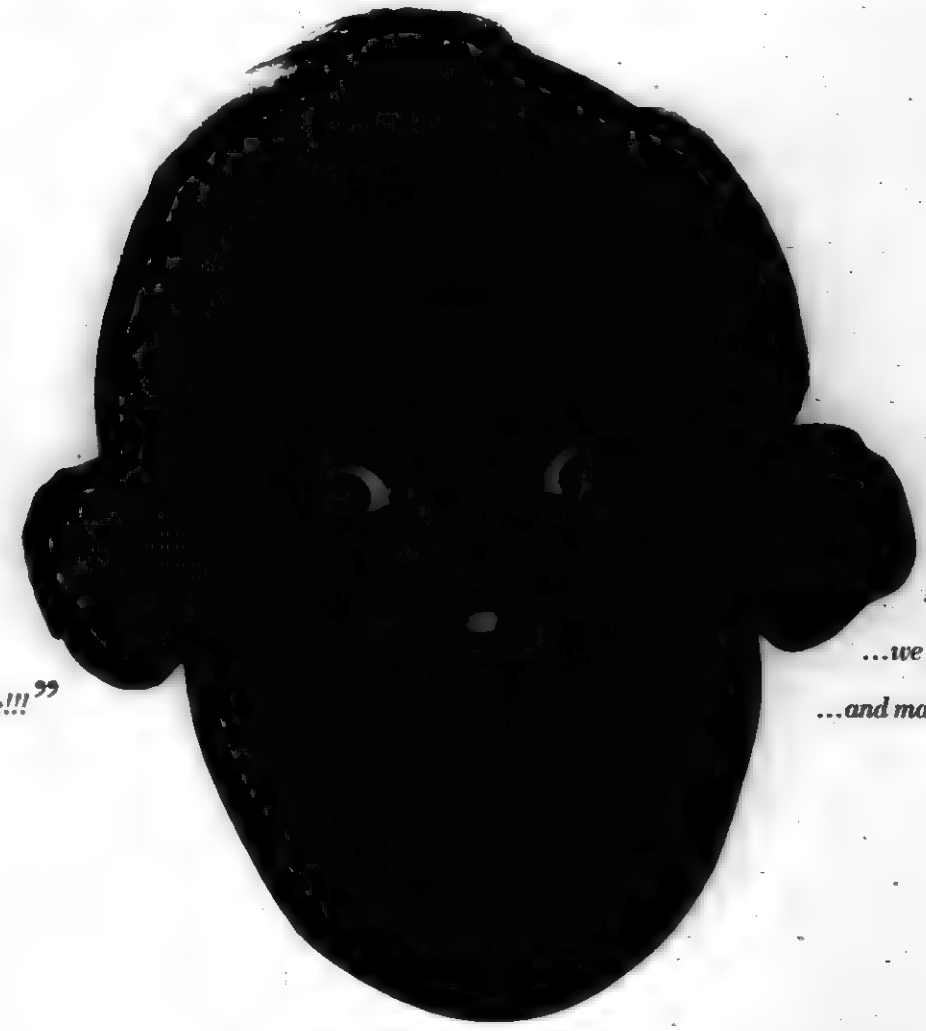

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California receives early warning

CONTINUED FROM PAGE 79

The early-warning system went into production in February. At its core is an integrated Oracle Version 6.0 relational database that holds all insurance agency data.

Several other key application systems feed on the central, integrated Oracle database. Among these are systems for tracking cases, companies and people.

The integrated system can support about 150 concurrent users on the current Unix server; if the system moves to a bigger machine, it could support many more users.

Goodbye to the mainframe

The application development work for all the integrated database applications went quickly, with the core database and several applications done by June 1992.

By August 1994, about a dozen applications will be in production, Kuhnel said, leaving few applications on an IBM-compatible mainframe and a Software AG of North America, Inc. Adabas database.

He estimated doing the same work on a mainframe would have required $5 million to $10 million — and several years.

Construction of the database was hampered by the fact that departments throughout the state agency maintained extensive but redundant records.

Steve Carter, Suncoast's vice president, said part of his firm's job was to pare down the data before adding it to the integrated database. Original estimates of the integrated database size ran to about 30G bytes; the streamlined database in production is just 500M bytes now, but Kuhnel said he expects it to grow to several gigabytes within a year. Current plans call for archiving data after five years on-line to optimize system performance.

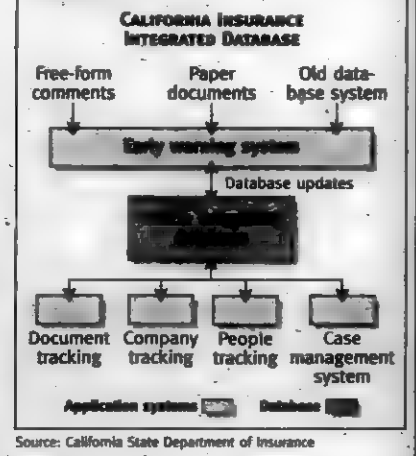
One unique aspect of the early-warning system is a "field" in which users can enter free-form comments to the central database. Any of the 800 agency employees who use PCs can record tips or rumors that may bring attention to a failing or fraudulent insurance firm, leading to proactive follow-up. Because the central database stores business "rules," cases are handled in a consistent fashion.

With the early-warning system, any of the 800 agency employees who use PCs can record tips or rumors that may bring attention to a failing or fraudulent insurance firm, leading to proactive follow-up.

"There's a whole business process wrapped around this, and the computer enforces it," Kuhnel said.

Core component

An Oracle database provides the link between management applications and varied data sources at the California State Department of Insurance



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Micro Focus offers choice

CONTINUED FROM PAGE 79

Financial Systems Associates, Inc., a contract programming firm in McLean, Va. Kaplan, who noted that MTS can also "run with existing mainframe applications," said the product could prove attractive to companies wanting additional mainframe capacity. "If you can move part of an existing mainframe application down to a local-area network, you're effectively increasing capacity on the mainframe."

At Tulane University in New Orleans, Mary Lesher, associate director of administrative computing, said MTS will aid in the effort to "get out from under the mainframe." The university, which has "several hundred CICS users," according to Lesher, has been testing MTS since March.

A top priority at Tulane is to "protect the investment" made in CICS application programming by providing workstation-based applications that appear identical to those currently running on 3270 terminals. Lesher said MTS will allow the university to port CICS source code to workstations and to "keep the system looking exactly the way it now is." That will make it easier for users to make the transition from terminals to workstations, she said.

More than what's apparent

But analyst Ed Acly said there is more to MTS than immediately meets the eye. Acly, director of software research at consultancy Technology Investment Strategies Corp. in Framingham, Mass., said, "This is not just a CICS announcement." MTS "actually is an open transaction processing monitor" with a CICS interface and over time could be enhanced by Micro Focus to support other transaction processing models, he said.

"As it matures, MTS could support CICS or Transarc's Encina or whatever is needed," Acly said.

Most important is that MTS will immediately let Cobol-based CICS shops make an entrance into client/server computing, Acly said. Because it allows CICS code to be ported to a wide variety of servers and supports client machines running MS-DOS, Unix, Windows, Windows NT and OS/2, MTS "will allow legacy systems to evolve more naturally into client/server computing," Acly said.

Versions of MTS for The Santa Cruz Operation's SCO Unix and IBM's AIX RS/6000 will be available this month, with other platforms supported "shortly thereafter," Micro Focus officials said. Pricing was unavailable at press time.

Application development tools

Born Software Development Group has announced Guide/400, a C language application.

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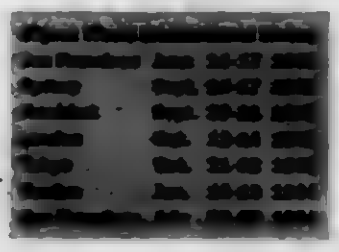

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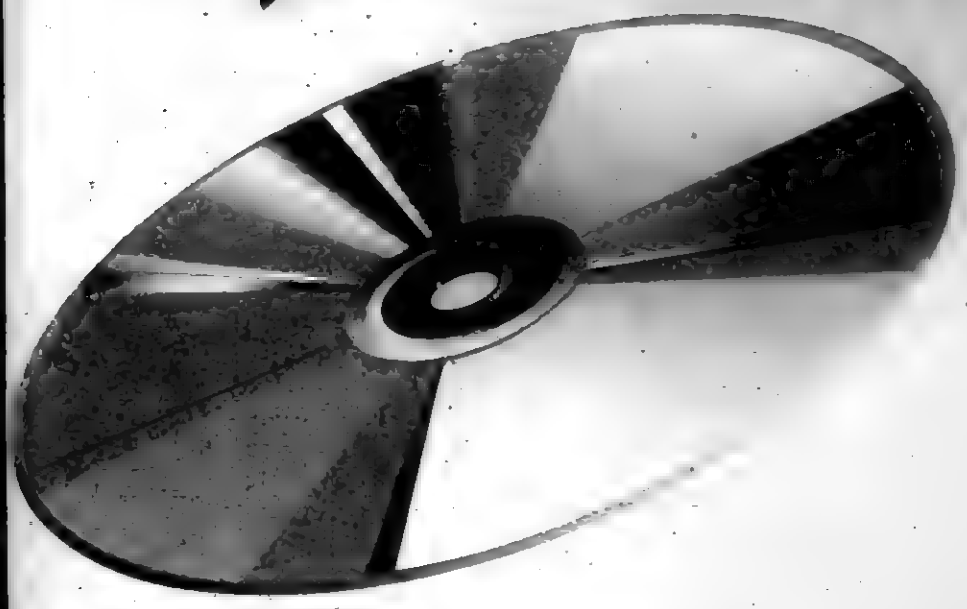

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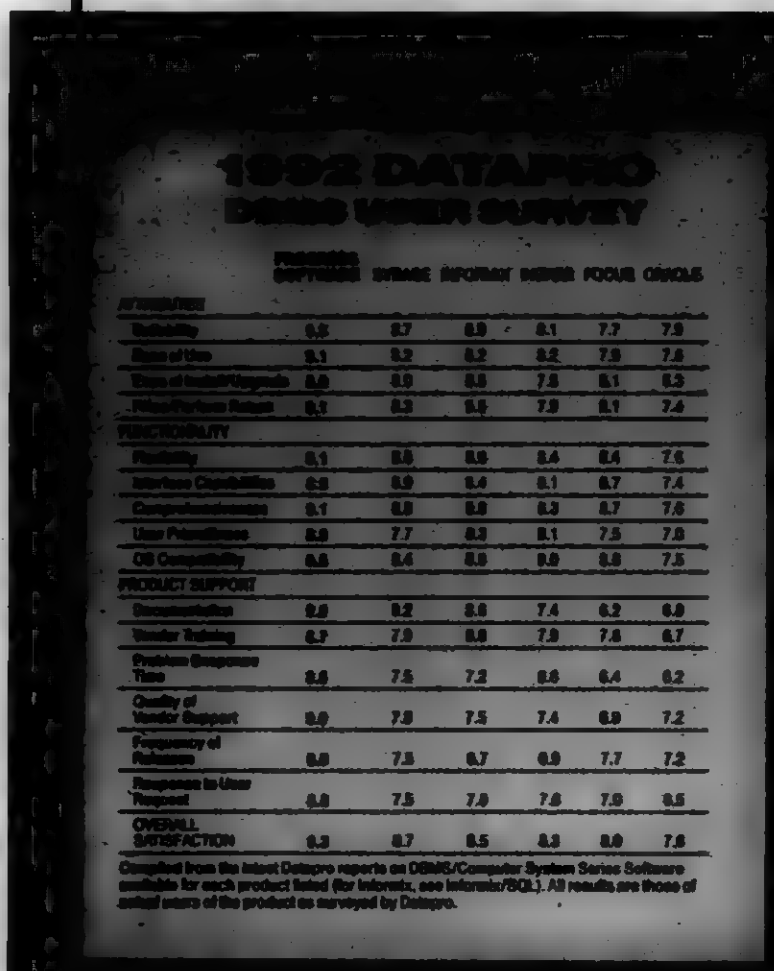
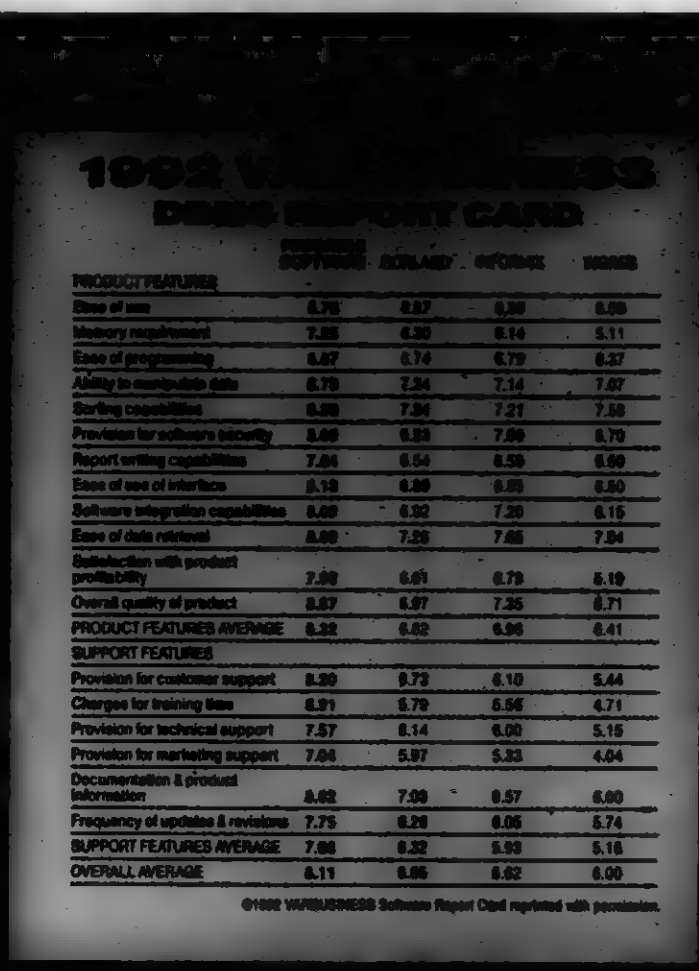


1992 DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	INFORMIX	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	8.5	8.7	8.9	8.1	7.7	7.9
Ease of Use	8.1	8.2	8.2	8.2	7.9	7.8
Ease of Installation/Upgrade	8.0	8.0	8.0	7.8	8.1	8.3
Price/Performance Ratio	8.1	8.3	8.0	7.9	8.1	7.4
FUNCTIONALITY						
Flexibility	8.1	8.0	8.0	8.4	8.4	7.6
Interface Capabilities	8.0	8.0	8.4	8.1	8.7	7.4
Comprehensiveness	8.1	8.0	8.0	8.3	8.7	7.6
User Friendliness	8.0	7.7	8.3	8.1	7.5	7.8
OS Compatibility	8.5	8.4	8.0	8.0	8.0	7.5
PRODUCT SUPPORT						
Documentation	8.0	8.2	8.0	7.4	8.2	8.0
Vendor Training	8.7	7.9	8.0	7.9	7.8	8.7
Problem Response Time	8.0	7.5	7.2	8.0	8.4	8.2
Quality of Vendor Support	8.0	7.9	7.5	7.4	8.0	7.2
Frequency of Releases	8.0	7.5	8.7	8.0	7.7	7.2
Response to User Request	8.0	7.5	7.9	7.8	7.9	8.5
OVERALL SATISFACTION	8.3	8.7	8.5	8.3	8.0	7.8

Compiled from the latest Datapro reports on DBMS/Computer System Series Software available for each product listed (for Informix, see Informix/SQL). All results are those of actual users of the product as surveyed by Datapro.



1992 VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	SOFTWARE	INFORMIX	INGRES
PRODUCT FEATURES				
Ease of use	8.70	8.87	8.80	8.60
Memory requirement	7.85	6.50	6.14	5.11
Ease of programming	8.67	8.74	8.79	8.37
Ability to manipulate data	8.70	7.34	7.14	7.07
Sorting capabilities	8.50	7.94	7.21	7.58
Provision for software security	8.60	8.53	7.89	8.70
Report writing capabilities	7.84	8.54	8.59	8.60
Ease of use of interface	8.13	8.89	8.85	8.80
Software integration capabilities	8.00	8.32	7.20	8.15
Ease of data retrieval	8.60	7.25	7.65	7.94
Satisfaction with product profitability	7.98	8.01	8.79	8.19
Overall quality of product	8.87	8.97	7.35	8.71
PRODUCT FEATURES AVERAGE	8.32	8.02	8.06	8.41
SUPPORT FEATURES				
Provision for customer support	8.20	8.73	8.10	5.44
Charges for training time	8.91	8.79	8.56	4.71
Provision for technical support	7.57	8.14	8.00	5.15
Provision for marketing support	7.04	8.97	8.33	4.04
Documentation & product information	8.02	7.09	8.57	6.60
Frequency of updates & revisions	7.75	8.20	8.06	5.74
SUPPORT FEATURES AVERAGE	7.88	8.32	8.93	5.18
OVERALL AVERAGE	8.11	8.85	8.62	8.00

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For the second consecutive year, PROGRESS resoundingly swept all 18 categories of the VARBUSINESS Report Card. And for the fourth year in a row, PROGRESS came out on top in the Datapro surveys. Once again, users rated PROGRESS superior to all competitors on everything from strength of product to quality of service and support. Which is only logical, since PROGRESS is the one development system that gives you the flexibility to build and implement high performance applications independent of platforms and database systems. It even lets you deploy any application in both multi-user and client/server environments. But don't just take our word for it. Listen to a source far more convincing. Your peers. Call 1-800-4 PROGRESS for survey results or a test drive.

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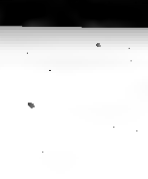
CPWADV0610

Value-revisionists

Growth-minded VARs are reinventing themselves in many ways. They could soon be knocking at YOUR door.



By Willie Schatz and Joseph Maglitta

When his company's hotel computer system died from information overload, MIS manager Gary Gartee's heart went straight into his mouth. "I put my life on the line. I was petrified," says Gartee, who manages 1,400 users on a system supplied by a value-added reseller (VAR).

The MAI Basic Four, Inc.-based system serves 10 Southern California hotels owned by Gartee's employer, Oxnard, Calif.-based Martin V. Smith and Associates.

Cap Schwartz, a database administrator at Telebit Corp. in Sunnyvale, Calif., recalls the time when a technical problem in a VAR system crippled an entire telemarketing group.

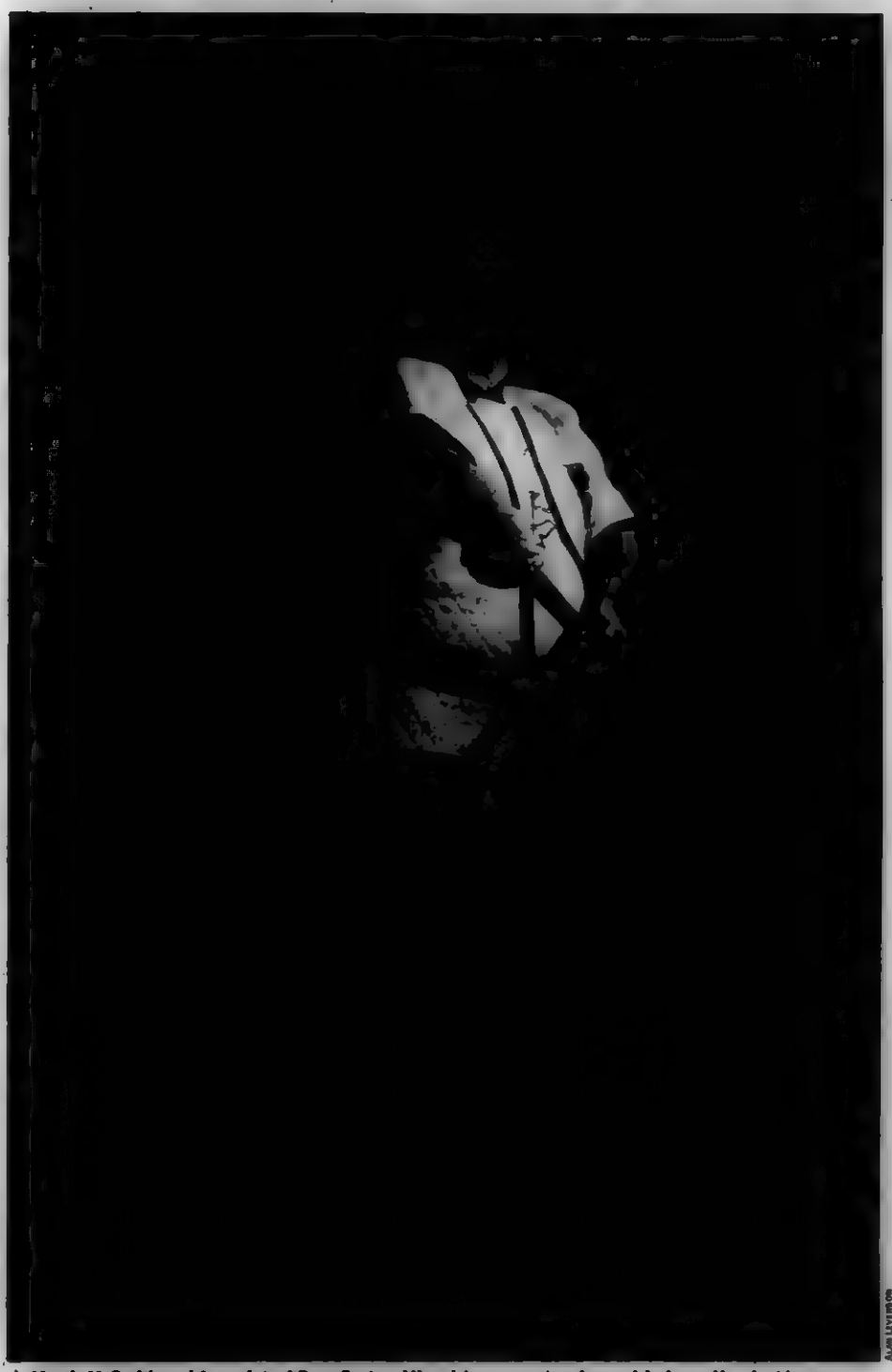
Harvey Soren, data processing systems manager at Guimarra Vineyards Corp. in Bakersfield, Calif., was in the middle of putting together a large, important deal when the VAR he was working with went out of business. "We got stuck," he says.

Admittedly, these are nightmare tales that don't do justice to the hundreds and thousands of hardware and software resellers that supply ready-to-go systems and packages to satisfied organizations large and small.

But they also embody the worst fears of many information systems executives: that VARs are unstable, undependable specialty suppliers that will never make much of a difference to mainstream computing.

However, if VARs and their high-powered partners, including Microsoft Corp., Lotus Development Corp. and others, have anything to say about it, the image of small product-push-

Value-added, *page 90*



▲ **Martin V. Smith and Associates' Gary Gartee** *likes his current value-added reseller, but he may soon have to beat hopeful competitors off with a stick*

How To Get Mo
Work Force When 10

*Beyond productivity: a major insurance company, once a corporate work-at-home pioneer, today uses "telecommuting" as a perk to attract and retain superior workers.
**That's right–"Ameritech" and "competitive prices" in the same paragraph. It's not just the technology that's innovative.

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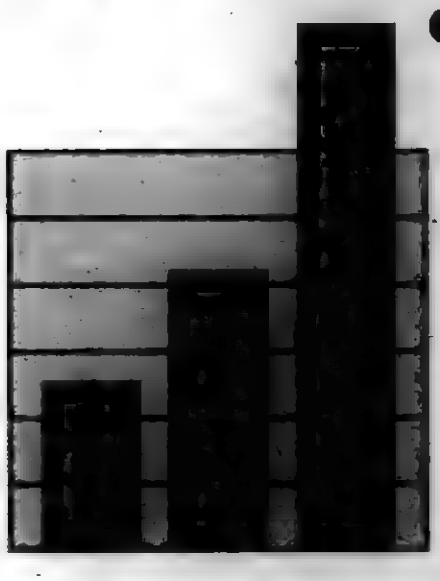
0% Of It Stays Home.



Productivity goes through the roof: Data from traffic-snarled Los Angeles' city-mandated work-at-home programs show most companies report an average increase in productivity of 20 to 30%. But many indicate increases of up to 100%

If your company is looking at a corporate work-at-home program–in response to green legislation or perhaps to tap into a new labor market–you may be on the verge of an important discovery: such programs, done well, can pay dividends in productivity. Not hard to figure; people who work at home *like* it.* And they do more work.

But there's a lot more to making work-at-home work than blocking off some of your parking places and telling the lucky 10% to leave the car in the garage and buy modems.

Fortunately, the people who know the most about implementing corporate work-at-home are standing by the phones with answers to all your questions, technical and human–Ameritech Team Data.™ Integrated across disciplines and experienced beyond their years, they're the best brains in the business of moving and managing data. And they're your contact point for innovative technology and the easiest-to-implement, ready-now solutions. And *all* of it at competitive prices.**

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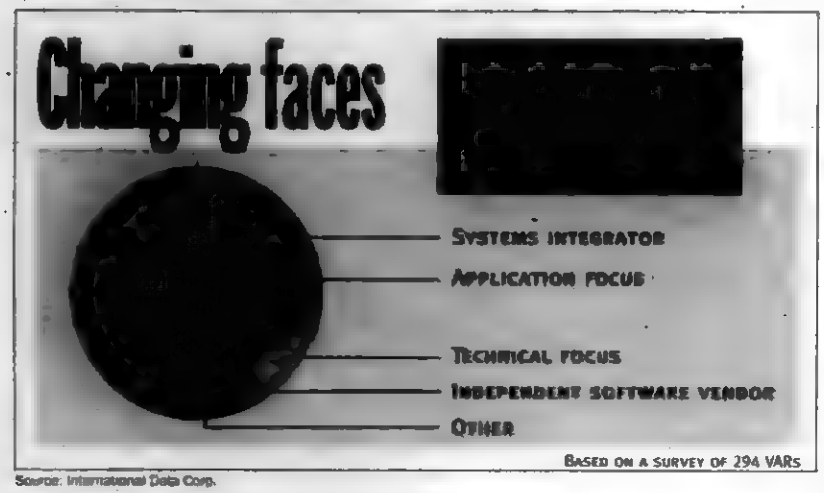
Value-added

CONTINUED FROM PAGE 87

ers will soon change drastically.

Squeezed by shrinking profit margins and more competition from indirect modes of distribution and computer superstores, both large and small VARs are scrambling to survive and thrive by diversifying and reinventing themselves.

Many VARs are working to evolve into a host of new business areas, notably groupware, electronic mail, systems integration, workstations, open systems, local-area networks, office automation and client/server systems, apparently with some success.



Source: International Data Corp.

According to a report by Market Intelligence, a Mountain View, Calif., research firm, VARs and systems integrators represent the second-fastest growing sales channel for microcomputers (behind distributors), commanding a 41% market share, predicted to reach 52% by 1998. Portable computers are a particularly hot seller as well.

Analysts say growing interest in multivendor systems, coupled with closer VAR alliances with computer products vendors, is driving this growth. In recent months, many major hardware and software makers have announced plans that appear to make VARs a more important link in their distribution strategies (see story at right).

Some VARs are also moving to expand beyond their traditional emphasis on vertical markets, such as government, banking, finance and libraries, and instead focusing on horizontal markets, specific software applications and geographic customers.

"Our value-added has become much more customer-oriented," says John Iaccarino, chief financial officer at Real-Time Consultants in Saddle River, N.J. "The ability to make things work gives you a competitive advantage. People are buying our time now."

Problems at the fore

According to analysts and VARs, the average IS manager has a far greater chance of encountering a VAR now than in the past.

A recent survey by International Data Group and Intelliquest found that 27% of the nearly 500 corporations planned to increase their use of VARs this year.

Lee Levitt, an analyst at Framingham, Mass.-based International Data Corp., says VARs are beefing up staffs in preparation for moving beyond their traditional base in hopes of attracting medium and large customers. Over the last year, for instance, RealTime Consultants, which employs 20, says it has doubled its sales and support staff.

According to Merrin Information Systems, Inc. in Palo Alto, Calif., VAR sales hit more than $7 billion last year — about 15% of all computer revenue. Many VARs had record earnings.

Such aggressive movement by VARs eager to sell an expanded array of services to corporations will undoubtedly raise new questions for IS managers, many of whom may never have dealt with resellers before.

If Gartee's early experiences are any measure, the new role could be promising. When his firm switched to an IBM RISC System/6000, he decided to stick with Computerized Logic Systems (CLS), a Long Beach, Calif.-based VAR that calls itself the world's largest supplier of hospitality systems.

Although CLS had never run on an RS/6000, it decided to give it a shot for Gartee's company, with whom CLS had worked for eight years, according to Gartee. Fortunately, Gartee says, things worked out just fine.

"I really do rely on my VARs to keep informed about what's going on in the industry," Gartee says. "I think every IS manager should do that." He adds that it makes sense to use VARs as consultants, with their wealth of industry-specific and technical knowledge.

"I can't get out to every technology conference and see what products every vendor has," Gartee says. "But VARs can do that. I also rely on them to keep prices reasonable."

Using VARs as informal consultants has also paid off for Tracy Stevens, who manages an imaging hot line at Rochester, N.Y.-based Eastman Kodak Co.

"VARs are becoming increasingly important to IS folks as resources for additional information about software, hardware, industry trends and even market research," Stevens says. "We're finding that we're being spread thinner and thinner through cutbacks and reductions in force. Using VARs enables us to get knowledge we otherwise would have gotten internally but we can't get because we no longer have the resources."

Healthy skepticism

Still, many IS directors are likely to need more than a little persuading to accept VARs in a new role.

Typical is Janet Mace, data processing director for the city of Anaheim, Calif. Mace says she doubts that VARs can reinvent themselves overnight.

"After 20 years in this business, I am very skeptical that a company can quickly take on some special expertise," she says.

Mace recalls how she once employed a VAR at $150 an hour to help upgrade to Novell, Inc.'s NetWare v3.11. After spending 40 to 50 hours, she says, the VAR still could not iron out recurring printing problems. "They would just throw hardware and software at the problem."

Finally, an in-house staffer found the bugaboo: incompatibilities between an old print server and the new Novell operating system. "My [programmer] at $18 an hour solved the problem a lot cheaper than the 'expert' outsider," Mace says.

Jeff Newman, formerly the vice president of MIS at Barclay's Bank in New York and now president of CONFIG.SYStems in New York, also has reservations. "I think VARs are between a rock and a hard place. They've got to compete on price, but they're never going to be the cheapest."

He continues, "VARs shouldn't try to sell themselves as systems integrators because the relationship is doomed to failure. More and more companies are going to their own integration teams because true integration . . . has to be handled in-house. That's more difficult than most VARs can handle."

Tips for the wise

If you decide to try one of the revamped VARs, experts say it's best to follow the usual commonsense guidelines that apply to other services.

Besides ensuring that the VAR has direct, relevant experience with your application, as well as quality products and adequate staffing, Levitt says it's smart to investigate the VAR's financial health.

"If they stock a lot of inventory and had a lot of accounts receivable," Guimarra Vineyards' Soren adds, "I would probably stay away from them."

Further down the road, some predict even further blurring between VARs and systems integrators. This, says David Coursey, editor of "PC Letter," an industry newsletter based in San Mateo, Calif., could make choosing a vendor even more confusing.

For their part, big systems integrators don't appear to be too worried about incursions into their territory, at least publicly. "I think if VARs and integrators collide at all, it will occur at the low end of the value chain," says Alan Stanford, national director for information technology services at Ernst & Young.

To make things easier for potential customers, Brad Bishop, chairman of Avcom Systems, Inc., a Sunnyvale, Calif., VAR, suggests a Better Business Bureau-type agency for resellers and consultants.

But until then, VARs have their work cut out for them if they hope to convince more than a few IS managers that what started in some cases as a horror show can have a happy ending. •

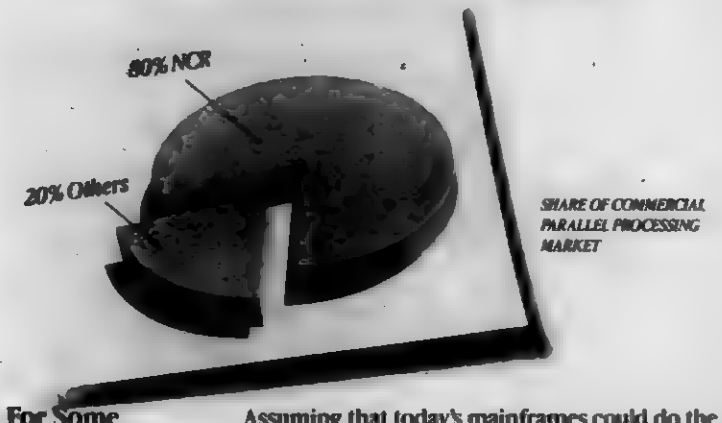
Schatz is president of The Schatz Group, a Washington, D.C.-based consultancy. Maglitta is a senior editor, management.

VAR wars

Major hardware and software vendors are helping VARs rapidly become more important to IS managers. Recent moves to expand VAR use include the following:

- **Lotus Development Corp.** hopes an expansion of its current network of 200 authorized VARs will vault Notes ahead of competing products from Borland International, Inc. and Microsoft Corp. Revenue from the reseller channel reportedly grew 600% in 1992.
- **Microsoft** has also targeted VARs to broaden sales of Windows products, Windows NT, LAN Manager and SQL Server through its Microsoft Solutions Channel Program. It is also offering discounts to resellers.
- **Novell** decided to expand distribution plans for NetWare 4.0 to include top-level authorized resellers. The Provo, Utah, developer also designated Novell-authorized service centers to help resellers handle support.
- **Apple Computer, Inc.** embarked on a massive program in 1992 to sign up nearly 1,000 VARs, a figure expected to hit 2,000 by the end of 1993. The Cupertino, Calif., firm also opened up more than a dozen market centers for VARs across the country.
- **IBM PC Co.** is also actively recruiting VARs to sell its ThinkPad and Personal System/ValuePoint products.
- **Compaq Computer Corp.** has said it plans to double its VAR force. The effort will be led by distributors Merisel, Inc. and Tech Data Corp.
- **Sun Microsystems, Inc.** has reportedly begun shifting some workstation business from direct sales to VARs and systems integrators, including Electronic Data Systems Corp. and Andersen Consulting.
- **Digital Equipment Corp.** earlier this year said it planned to implement a new strategy that will bring VARs more closely into its product development and engineering process.

While Others Are Developing A Strategy, We've Developed A Following.



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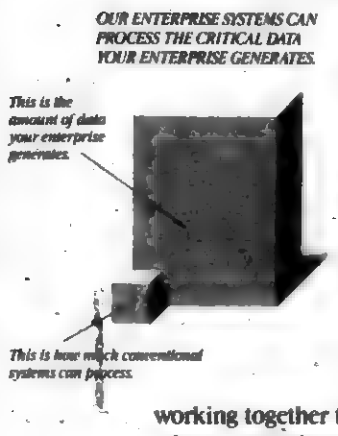

Parallel processing machines like the NCR System 3600 and DBC/1012 use hundreds of relatively inexpensive microprocessors working together to accomplish in minutes tasks that would take a conventional mainframe many hours to process serially. Assuming that today's mainframes could do the work in the first place.

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Data centers: More work, better results

By Nell Margolis
BOSTON

Courtesy of consolidation, data center workloads are up, but technology is enabling slimmer data center staffs to cope with the added work.

Those were the major findings of Nolan, Norton & Co.'s 1993 "Data Center Baseline" report, released recently.

Based on year-to-year findings from the study, Nolan, Norton senior manager Tom Hickey predicted "improved total technology cost/performance" as technological innovation continues to drive down hardware prices and savvier management practices counter software cost hikes.

The report, issued late last month, showed an 8% decrease in data center staffing, particularly among operations support and technical services. However, the consultancy also found that an average 16% increase in pay-per-information systems employee offset initial gains, knocking the personnel spending decrease down to 2.5%.

Spurred in part by the increasing corporate cry to justify data center performance and IS directors' budgets, Nolan, Norton has been tracking, analyzing and updating deviations from a 1981 baseline at hundreds of large companies and publishing the resulting benchmark on an annual basis.

The baseline consists of a set of metrics that gauge data center productivity and efficiency in mainframe IS shops.

Survey trends

- 5% average decrease in overall spending due to decreasing hardware costs.
- 7.5% decrease in overall technology spending.
- 67% median work load increase, largely a result of the consolidation of data center operations.

At least one IS chief was skeptical of the study's findings. "You can make numbers say almost anything," said John Lui, IS vice president at Berol Corp. in Nashville. "You can't prove statistics wrong, but that doesn't exactly make them right."

For instance, he said the combination of cheaper hardware and sophisticated software made approachable through graphical user interfaces is, indeed, creating slimmer IS staffs serving more highly technologized users.

However, Lui asked, "While you've reduced systems, what have you done to user productivity? The guy you hired to do financial analysis is now writing reports at his desktop workstation. Is this what you're paying him for?"

Executive Track

Darryl J. Bollinger has been named executive vice president of the clinical information systems group at Archer, Fla.-based consulting firm **Healthcare Systems Solution, Inc.**

Formerly, Bollinger served as chief information officer at Lee Memorial Hospital in Fort Myers, Fla.

Amy M. Rouse, programmer/analyst at the **McCormick Flavor Division** of Sparks, Md.-based **McCormick & Co.**, has been promoted to the position of senior programmer/analyst for the division. In her new capacity, Rouse will be responsible for software support of financial and System/36 environment applications in the spice giant's IS department.

The Herndon, Va.-based **Electronic Funds Transfer Association** recently named **Gary S. Roboff** chairman of its board of directors. Roboff, a vice president and director of business planning and strategy development in the electronic banking group at Chemical Banking Corp., is currently on leave from Chemical and serving as acting president and chief executive officer at New York Switch Corp. Its CEO died late last winter.

In Clifton Park, N.Y., consumer membership organization **Consumers' Buyline, Inc.** has a newly minted vice president and CIO post, and a person for the job: **Thomas A. Delaney**, former director of IS at New York-based Cochrane Hospital Supplies, Inc.

At Consumers' Buyline, Delaney will be responsible for overseeing an information systems enhancement that includes a $1 million investment in computer hardware, software and services.

Don Hendrix, who has served as information systems manager at *The Herald* in Everett, Wash., since early 1991, has been promoted to the office of director of systems and technology.

He will oversee the newspaper publisher's information systems as well as incorporate technology into the company's strategic plans.

The Washington, D.C.-based **Association of American Railroads** recently kicked off a move to unite its electronic information systems under one banner. It chose recently retired Union Pacific Railroad executive **William F. Hillebrandt** to head the reorganization effort.

In the newly created position of service quality improvements assistant to the president, Hillebrandt will help spearhead an attempt to coordinate work in various areas. These include automated equipment identification using transponder technology, and improved electronic methods for settling interline accounts among participating carriers to ensure accuracy of shipper billing.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at (800) 343-6474 to pass along the news.

Intelligence Files

Hail to the data czar?

The governor of Washington state is now calling his chief of staff the staff director in deference to Native Americans concerned about use of the word "chief." If the move catches on, one report said, "it could wreak politically correct havoc" for chief justices, joint chiefs of staff and editors in chief.

In the business world, executives may have to rethink such titles as chief executive officer, chief financial officer and chief information officer.

Source: *Human Resources Executive*, April 1993.

Happy customers

Improving customer satisfaction is a hot business trend these days, putting pressure on chief information officers to develop strategic information systems that produce happier customers. But did you ever wonder how that affects the company's bottom line?

Using a database of customer satisfaction surveys for businesses in Sweden, researchers found that a one-point increase in the customer satisfaction index is worth an extra $3 million in profits over five years for a firm with $600 million in assets. For larger firms, the extra profit would be $39 million over five years.

Source: Eugene W. Anderson, assistant professor of marketing at the University of Michigan.

Spatially challenged

When it comes to using geographic information systems (GIS), industries fall into two camps: geographically rooted and geographically challenged.

The geo-rooted industries have their base in the land and spatial data, including commercial real estate, transportation and environmental engineering. They have been the early adopters of GIS.

Now, advances in computer technology are making GIS accessible to the geo-challenged industries, such as retail, banking, insurance, manufacturing, health care and hotels. They can use GIS for locating stores and factories, targeting customers and identifying markets.

Source: "Currents," Joseph R. Francica, *Business Geographics*, March/April 1993.

Multimedia mandate

Almost a decade ago, the engineering school at Virginia Polytechnic Institute and State University (Virginia Tech) became the first large public institution to require its entering freshmen to purchase a PC. With the start of the 1993-94 academic year, the college becomes the first to require them to purchase a PC with CD-ROM and multimedia capabilities.

The multimedia PCs are expected to bring an extra dimension to courses, such as showing a civil-engineering class video clips of an earthquake's effects on buildings and soil.

Source: Virginia Tech College of Engineering, Blacksburg, Va.

Calendar

MAY 23-MAY 29

National Operations and Automation Conference. New Orleans, May 23-26 — Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

International DB2 Users Group Conference. Dallas, May 23-27 — Contact: International DB2 Users Group, Chicago, Ill. (312) 527-8777.

Fuse '93 Educational Conference and International User Meeting. Atlanta, May 24-25 — Contact: Fuse, Inc., Manalapan, N.J. (908) 308-9277.

American Production Inventory Control Society >1993 Remanufacturing Seminar. Oklahoma City, May 24-26 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Midwest Electronics Expo. Minneapolis, May 24-27 — Contact: Midwest Electronics Expo, Dallas, Texas (214) 239-3060.

Trade Show and Symposium on Client/Server Technology. Regina, Saskatchewan, Canada, May 25-26 — Contact: Dawn Redmond & Associates Ltd., Regina, Saskatchewan, Canada (306) 781-7300.

NextWorld Expo '93. San Francisco, May 25-27 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3870.

Open up

With some hard work and loud demands, users find they can pry open their minicomputers — to some degree

By Julie Swanson

It's the classic "want your cake and eat it, too" story. Except that in this instance, information systems managers want all their systems to interoperate, and they want their proprietary minicomputers to maintain a key role.

Minicomputer users appear reasonably satisfied with their progress toward this seemingly impossible wish. In a recent *Computerworld* survey asking IS managers and consultants to rate their satisfaction with their minicomputer vendors' move to open systems, the mean score was 7.4 on a scale of 1 to 10, with 10 being "very satisfied."

Keep in mind that there are degrees of openness. Many minicomputer users are just happy if, at this point, they can get their machine to exchange data with other platforms, such as PC local-area networks.

Minicomputer vendors are making advances on this front. "Interoperability is quite achievable with minicomputers, especially with Posix" and the Open Software Foundation's Distributed Computing Environment, says David Smith, an analyst at International Data Corp. in Framingham, Mass.

Another factor leading to improved interoperability is increased cooperation among vendors. For instance, the SQL Access Group, a consortium of software and hardware vendors, agrees on standards that allow for database access across multiple platforms. In addition, Transmission Control Protocol/Internet Protocol (TCP/IP) support on minicomputers has become a commodity, allowing for better networking among computers.

Users have had to express themselves loudly and often to get where they are today. "Vendors realize that companies are operating off of limited budgets and don't want to stop using the hardware they have," says Walt Grzasko, manager of computer resources at Dornier Aviation in Herndon, Va. But users are also demanding to move into the 21st century along with their competitors.

"Vendors will absolutely have to continue to support openness to keep their products viable," says

Open up, *page 97*

Swanson is a free-lance writer in Sunnyvale, Calif.

Inside

LAB REPORT

Lab Report: A PC LAN costs less to run but might not meet the complex needs of AS/400 or VAX sites. Page 97.

MIDDLEWARE

Middleware: Opening up the minicomputer becomes more possible with middleware. Page 98.

COMPUTERWORLD BUYERS' SCORECARD

Buyers' Scorecard: DEC rates highest in 'open systems' satisfaction among users. Page xxx.

REPORT CARD

USERS RATE THEIR SATISFACTION WITH MIDRANGE VENDORS IN MOVING TOWARD OPEN SYSTEMS SOLUTIONS

DEC VAX	HP 3000	IBM AS 400 AND SYSTEM 36
75	73	64

The Search for

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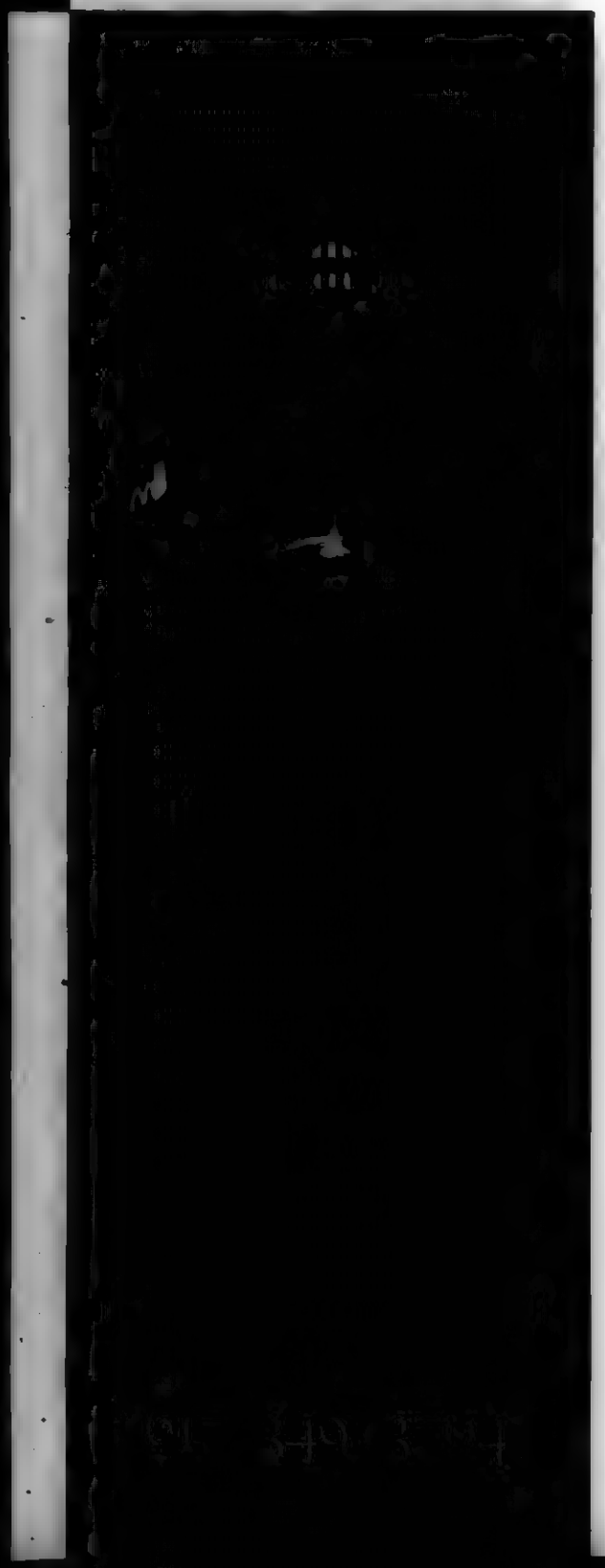

Launched in 1989, the Computerworld Smithsonian Awards Program salutes those who find answers with information technology. This annual awards program, representing a spirited partnership between Computerworld and the Smithsonian Institution's National Museum of American History, brings together the user and vendor communities in public recognition of innovation and hard work.

1993 Finalists Nominated by the Computerworld Smithsonian Awards Chairmen's Committee:

BUSINESS & RELATED SERVICES

Humanitas, Inc.
Accessibility Modules for the Visually Impaired
Nominated by Toshiba America Information Systems, Inc.

Postal Buddy Corporation
Postal Buddy Kiosk
Nominated by EDS

Electronic Retailing Systems International, Inc.
Electronic Shelf Labeling Systems
Nominated by Price Waterhouse

Syntha-Voice Computers, Inc.
Window Bridge
Nominated by Digital Equipment Corp.

McKesson Drug Co.
Acumax
Nominated by EDS

EDUCATION & ACADEMIA

Oklahoma State University
Integrated Campus Access Management System
Nominated by Diebold, Inc.

Stanford University
MAEstro Project
Nominated by Sun Microsystems

Harvard Business School Publishing
Digitized Access to HBS
Nominated by Xerox Corporation

Harvard Business School/Office of Information Technology
Custom Textbooks
Nominated by Eastman Kodak

Center for Applied Special Technology (CAST)
Gateway Programs
Nominated by Price Waterhouse

ENVIRONMENT, ENERGY & AGRICULTURE

BP Exploration
Enterprise Information System
Nominated by Sybase

Vista Environmental Information, Inc.
VISTA Report
Nominated by CompuServe

Paramax Systems Corporation
NEXRAD, WSR88-D, The Nationwide Network of Advanced Weather Radar
Nominated by Unisys Corp.

Organization for Tropical Studies
Database and Identification of Species in the Costa Rican Rainforest
Nominated by Apple Computer, Inc.

Environmental Resources Information Network
Environmental Resources Information System
Nominated by Sun Microsystems, Inc.

FINANCE, INSURANCE & REAL ESTATE

AT&T Universal Card Services
Universal Windows/Information Technology
Nominated by Sun Microsystems, Inc.

NASD
Computerized Stock Market
Nominated by MCI Communications

Philadelphia Stock Exchange
Electronic Order Book
Nominated by Borland International, Inc.

Johnson & Higgins
Use of Lotus Notes
Nominated by Lotus Development Corp.

Fannie Mae
FannieMaps [GIS Mapping System]
Nominated by Sybase Inc., Nolan & Norton Co.

GOVERNMENT & NON-PROFIT ORGANIZATIONS

Arkansas Department of Human Services
Multiple Automated Transaction Submission
Nominated by EDS

Naval Electronic Systems Engineering Activity (NESEA)
Conversion of Technical Manuals
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New

hsonian Institution thank the eir work in nominating entries and es to the finalists.

Aurora Police Department
Optical Imaging Records Management
Nominated by NCR Corp.
State of Tennessee, Department of Corrections
Tennessee Offender Management Information System
Nominated by Andersen Consulting
Los Angeles Department of Public Social Services
L.A. Automated Fingerprint Image Reporting and Matching System
Nominated by EDS

MANUFACTURING
Ruiz Foods Products, Inc.
Enterprise-wide Systems
Nominated by Andersen Consulting
Purdue Farms, Inc.
Credit Management System
Nominated by Price Waterhouse
Praxair, Inc. (Union Carbide)
National Logistics System
Nominated by Andersen Consulting
Otlcon A/S
Enterprise Wide Systems
Nominated by Andersen Consulting
United Technologies, Sikorsky Aircraft
Computer Integrated Manufacturing Planning
Nominated by Andersen Consulting

MEDIA, ARTS & ENTERTAINMENT
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ConferNet
Nominated by PictureTel Corp.

MIT Media Lab
Dorothy at a Glance
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The National Gallery of Art
Precise 3000
Nominated by Software Engineering of America, Inc.
WGBH Educational Foundation
Descriptive Video Service
Nominated by Bull HN Information Systems, Inc.
The U.S. Holocaust Memorial Museum
Multi-media Interactive System
Nominated by NetFRAME Systems, Inc.

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Clinical Research Forms, Inc.
Nominated by Excalibur
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Nominated by Sun Microsystems, Inc.
Gendex Corporation
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Nominated by Wyse Technology, Inc.
New York University Medical Center
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Nominated by Sun Microsystems, Inc.
Rensselaer Polytechnic Institute
Adaptive Current Tomography
Nominated by Price Waterhouse

SCIENCE
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Electromagnetics
Nominated by Cray Research, Inc.

Cold Spring Harbor Laboratory
QUEST Protein Database Center
Nominated by Sun Microsystems, Inc.
Eli Lilly and Company
Computational Chemistry
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Institute of Human Origins
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Nominated by Apple Computer, Inc.
The Pittsburgh Supercomputing Center
Supercomputer Simulation of Enzyme DNA
Nominated by Cray Research, Inc.

TRANSPORTATION
Covia Partnership
Integrated Software Management
Nominated by Legent Corp.
Federal Express
Command and Control
Nominated by Sun Microsystems, Inc.
Covia Partnership, Network Development Group
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SITA
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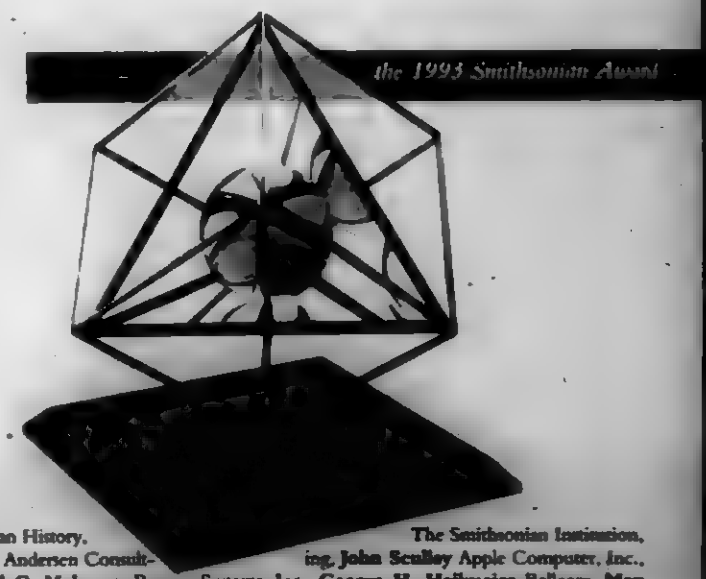

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Open up

CONTINUED FROM PAGE 93

Mark S. Peterson, director of market research at ADM Consulting in Cheshire, Conn. "This is one of the great things that's happening to users."

No cakewalk

Opening the minicomputer platform isn't without its headaches, of course. "It's still not plug and play," says Roy Wiley, geographic information systems coordinator for Pueblo County in Pueblo, Colo., which has been laying the groundwork for an open computing environment for three years. "[But] we've lived through consultants and funding roller coasters. We can certainly live through this."

Name a minicomputer, and Pueblo County probably has it: There's a Digital Equipment Corp. VAXcluster running electronic mail and some VMS applications; two IBM Application System/400s housing legal and support service applications in addition to E-mail; a Unisys Corp. 6085, which runs the sheriff's systems; and a host of other hardware, such as PCs and DEC workstations.

The county eventually wants everyone to be able to access needed data, no matter where it resides or which department owns it.

Currently, all of Pueblo County's hardware interoperates using TCP/IP running over fiber optics via Fiber Distributed Data Interface. "It was easy to get our Digital equipment to talk to each other," Wiley says. "A little more effort was required to connect to the Unisys."

In 1990, Pueblo County added the AS/400s to its family of hardware. "The communication between the AS/400 and PCs was very fragile and difficult," Wiley says. "We constantly had to change the setups in our communication. With the VAX, however, once we loaded our TCP/IP drivers, we never had to worry" about PC connections.

He says the capabilities of the AS/400 have improved over time. Recently, Pueblo County installed a TCP/IP communications board that allows for more seamless integration between PCs and the AS/400.

When asked to define "open systems," respondents' answers ranged from "the ability to move software from one platform to another with relative ease" to "the ability of heterogeneous computers to communicate well with minimal technological barriers."

The county also uses IBM's PC Support software, which is working well to facilitate communications, according to Wiley.

On the DEC side, Pueblo County uses DEC Pathworks for communications with its PCs. "Using the DECnet protocol would give us more services, such as printer and peripheral sharing," Wiley says. "But there's no TCP/IP support. We want to maintain as much transparency as possible."

Inflexible PCs

Wiley says he believes the limitation lies more in the PC architecture than in the DEC communications software. When Microsoft Corp. Windows NT's multithreaded technology is available, Wiley hopes remote PCs will be able to share peripherals.

Today, the county's extensive information systems operate in a fairly seamless manner. So far, Pueblo County has ventured into only the first two layers of the seven-layer International Standards Organization/Open Systems Interconnect reference model. "Anything beyond that is almost impossible today," Wiley says.

At Moyer Packing Co., the issue is interoperability between DEC Rdb databases and Windows applications running on the PC. The beef packer and renderer in Souderton, Pa., currently operates a DEC VAXcluster with 13 nodes. The VAXs, which house many Rdb databases, run over OpenVMS.

Because the beef industry is a high-volume, low-margin business, it needs to monitor its volatile financial information closely. "We have to create profit-and-loss statements every day," says James P. McIlvaine IV, director of corporate MIS at Moyer.

But whereas the corporate data is stored in Rdb, "the good applications for accessing data exist on the PC," says Scott Harper-Sotan, principal applications architect at Moyer.

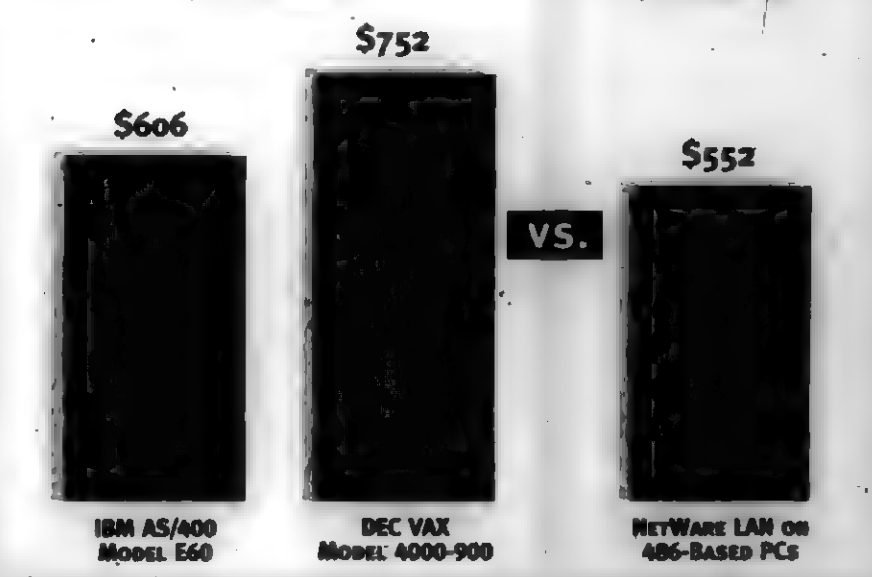
To that end, the cost accounting department currently takes reports from the VAXcluster and keys them into stand-alone spreadsheets. To eliminate this re-

Open up, *page 98*

Cost face-off: Minis vs. PC LANs

LAB REPORT

IBM's AS/400 is $54 per workstation more expensive than a PC LAN, and the DEC VAX is $200 more expensive, but the LAN can't handle sophisticated work loads or major application enhancements without increasing staff costs



Based on 150 sites running a large number of similarly configured systems with different work loads.

	MINIS	LANS
WORK LOAD SOPHISTICATION	High	Low
ABILITY TO ENHANCE APPLICATIONS	High	Low

- **CENTRAL SITE ALLOCATION:** Hardware, software, staff used to support remote sites
- **APPLICATIONS DEVELOPMENT STAFF:** Manager, programmers
- **APPLICATIONS SOFTWARE:** Accounting, office automation, PC services, support
- **OPERATIONS STAFF:** Manager, operators, technical support, specialists, help desk, administrators, outside services
- **SYSTEM SOFTWARE:** Operating system, development database, systems management tools, transaction processing monitor, compiler, robust LAN for mixed clients, SNA-based WAN connections, five-year software support
- **HARDWARE:** CPU, memory, disk/tape, terminals/workstations*, maintenance, depreciation

*Includes 60% PCs, 40% terminals

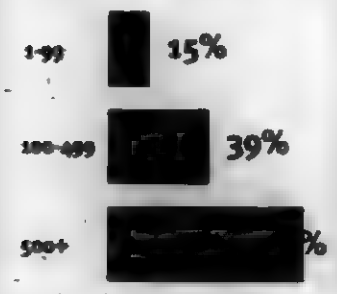
Source: International Data Corp.

LAN infiltration

In both DEC and IBM minicomputer shops, LANs are becoming a given

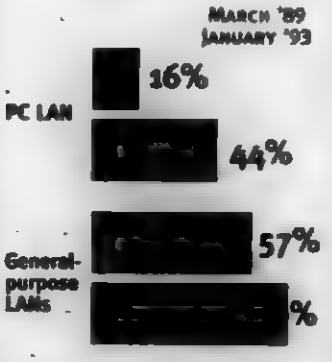
LARGE AS/400 SITES ARE IMPLEMENTING LANS FASTER THAN SMALLER SITES

LAN penetration by number of employees, based on surveys of 1,200 U.S. AS/400 sites monthly



VAX SITES SAW A JUMP IN PC AND GENERAL-PURPOSE LAN INSTALLATIONS

Percent of sites



Source: Computer Intelligence/Infocorp

Middleware to the rescue

By David Baum

Fitting a minicomputer into an open systems strategy ain't easy; luckily, there's middleware.

Middleware — an amorphous category of products that is becoming one of the hottest topics of the decade — shields developers from having to be cognizant of the physical location of each database and helps them wrestle with a host of networking details to distribute applications.

Essentially, middleware provides a software bridge between the application and the operating system, explains John Rymer, an analyst at the Patricia Seybold Group in Boston. "It helps developers sort out today's tremendous diversity of protocols, platforms and programming languages so they can spend more time focusing on what they do best: building applications."

Middleware can also encapsulate database management systems, enabling queries to many different types of DBMSs through a standard interface. This allows multiple databases to be combined into a single database view, with all distributed queries and updates appearing as local operations on a single database.

There are many types of middleware products, but the fastest growing area is message-delivery systems. Message-delivery systems use a common set of application programming interfaces to exchange messages among the pieces of a distributed application.

Remote procedure calls (RPC) are another accepted method, but because these are coded into each application, network addresses are compiled into the application code. If something changes on the network, programs must be modified and recompiled.

Message-delivery systems are much more flexible. They determine network addresses at runtime so that if network configuration changes, the programs don't need to be modified.

"Messaging systems aren't tied to a specific operating environment or networking protocol the way RPCs are," says Ken Fleming, director of technology at Encompass in Cary, N.C., a value-added reseller for Suite Software, Inc. in La Mesa, Calif., a developer of message-based middleware.

If your company is like most, you've got a slew of application code in production and have made a good start toward building intra-network infrastructures among minicomputers and PC local-area networks. What you lack is an enabling layer of software between the operating systems and the applications you use. What you lack is middleware.•

Baum is a free-lance technology writer based in Santa Barbara, Calif., who specializes in application development.

MIDDLEWARE

A sampling of message-based middleware products

COVIA TECHNOLOGIES
Communications Integrator
Rosemont, Ill.

DIGITAL EQUIPMENT CORP.
DECmessageQ
Maynard, Mass.

HORIZON STRATEGIES, INC.
Message Express
Needham, Mass.

MOMENTUM SOFTWARE CORP.
X-IPC
San Francisco

PEERLOGIC, INC.
Pipes
San Francisco

SUITE SOFTWARE, INC.
SuiteDome
La Mesa, Calif.

SYSTEMS STRATEGIES, INC.
ezBridge Transact
New York

Open up

CONTINUED FROM PAGE 97

dundancy, Moyer is looking forward to installing a gateway between its PCs and Rdb.

"We have a couple of [temporary fixes] in place now," Harper-Sotan says. For instance, PC users use DECQuery, a fourth-generation language query tool, to access files on the mainframe. "It's a fine tool for querying," he says, "but the integration into Windows applications isn't as seamless as we want."

Moyer hopes to use Open Database Connectivity (ODBC) — Microsoft code that will purportedly allow Windows and Windows NT applications to transparently access multiple databases.

ODBC comprises a standard application programming interface, as well as a standard SQL statement for accessing databases. It is based on standards set by the SQL Access Group, whose members include DEC and Microsoft.

"Our understanding is that the ODBC driver will allow our Microsoft applications to fairly seamlessly access our Rdb databases," Harper-Sotan says. "With this final piece in place, I don't think it will be too difficult to import and export data."

Coupling hardware

Carlisle Tire and Rubber's Tires and Tubes Division is also dedicated to moving toward an open environment.

"Our ultimate goal is to get [all of our hardware] on one network," says Ed Haller, manager of business systems at the firm. Carlisle's 10 divisions operate independent of one another on a range of minicomputers, from Hewlett-Packard Co. to IBM to Unisys.

Why the interest in openness? Often, minicomputers house data such as inventory levels, which PC-based employees need in order to be more responsive to customers.

"We're interested in bringing our division together," Haller says. Currently, "we have two, three or even four people that are entering data in the same place."

To accomplish this, the company is replacing its HP Series 48 and 58 computers with an HP/3000 947 series minicomputer. Eventually, 60 PCs and 15 Sun Microsystems, Inc. SPARCstations will interact with the 3000 via Ethernet running TCP/IP. "We expect our HP to run under Posix. This should allow us to integrate whatever we want," Haller says.

Although the division's strategy is still in the planning stages, the first step is to get everything hooked together. "I think that hardware vendors are supportive of this. HP is one of the leaders in service and reliability," he says. But Haller says he still wants to reserve his option to switch hardware at any time and hopes that opening up his minicomputer will allow just that.

Steep learning curve

Something that can't be overemphasized when opening the minicomputer is the very steep learning curve. "You need a large staff to get new technology in place and to train users," Wiley says. The key, he says, "is to become educated ourselves so that we can make good decisions that won't lock us in."

Even once on the path to open systems, it's still a bumpy ride. "I don't think one person is capable of figuring out how to put everything together," Harper-Sotan says. "But while it may make our job more difficult at times, we're actually doing a better job for our users."•

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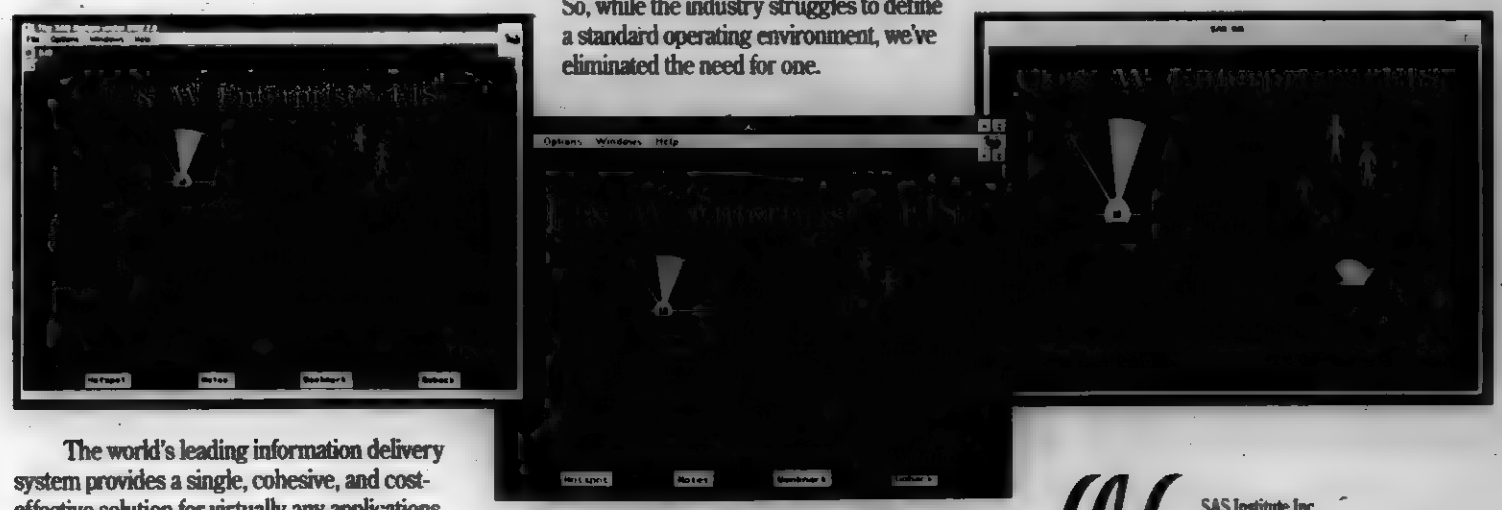

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Buyers' Scorecard: Mini vendors strong in scalability, weak in interoperability

By Mary Brandel

Here's a riddle for you: What is open but really not open, proprietary but not completely closed?

Answer: a minicomputer. That riddle is today's reality, according to users, analysts and resellers surveyed by *Computerworld*. The tide is definitely turning away from the old equation "open equals Unix." In theory, *any* platform can be an open systems candidate, as long as it can prove itself in five categories: support for major development languages, scalability, interoperability, adherence to open systems standards and software portability (see chart at right).

We spoke with 151 users, analysts and resellers of Digital Equipment Corp.'s VAX, Hewlett-Packard Co.'s HP 3000 and IBM's Application System/400 and System/3Xs, and while they seemed reasonably satisfied with their respective vendor's progress toward open systems, there are some definite sticking points (see charts below).

Scalability, language support

As it stands today, the major minicomputer lines are doing all right in scalability (scoring a 7.8 on a scale of 1 to 10) and support for development languages (7.5).

HP's MPE/IX operating system can be seen as the most scalable. HP claims 100% object-code compatibility among its platforms, and "the underlying architecture is integrated from host to desktop," says Nancy Stewart, an analyst at Dataquest, Inc. DEC's OpenVMS operating system runs on any scale from mainframe-class to desktop systems, including clustered machines. OS/400 supports the complete line of AS/400 systems.

The Big 3 are also coming on strong in their development language support. IBM has licensing agreements with object-oriented tool vendors Cognos Corp. and Object Technology, Inc., while HP supports a number of fourth-generation languages.

The HP 3000 also supports a number of client/server tools to build graphical user interfaces, enable database access and distribute application processing, including Powersoft Corp.'s PowerBuilder and Gupta Corp's SQLWindows. DEC supports C++.

Portability, open standards

Where the mini vendors score low is in portability (scoring a 6.7 overall), adherence to open systems standards (6.5) and interoperability (6.5).

Actually, according to survey results, users aren't overly concerned about consortium-based standards, such as Posix, Distributed Computing Environment (DCE) and X/Open Co.'s X/Open. However, the vendors are quite interested in vocalizing which ones they support.

DEC is probably the strongest in portability standards, as it supports three levels of Posix and is ahead of the others in DCE, a standard that promises to distribute application processing across heterogeneous platforms.

"DEC's DCE rollout schedule is comparable to [that of] the Unix server vendors," says Joseph Gottlieb, vice president and service director, open computing and server strategies, at Meta Group, Inc. in Westport, Conn. DEC also supports Version 3.0 of the X Open Portability Guide, which addresses portability in great detail — a claim neither HP nor IBM can make.

Users gave IBM the lowest score for standards compatibility, though the analysts we spoke with are quite impressed with the company's work with Posix.

"IBM has changed the underlying process model of the AS/400," says Teresa Elms, president of Elms Information Services Group in San Diego, "which means that things like the way objects are accessed are Posix-compliant now. The reengineered process model and the new hardware on the high end justify calling this a whole new machine."

Outside of these standards, portability is a tough nut to crack. On the IBM AS/400, for instance, if you write applications to take full advantage of the OS/400 operating system and relational database, they are not going to work outside

OVERALL SATISFACTION

RATINGS ARE MEAN SCORES FOR ALL THREE VENDORS, BASED ON A 1-TO-10 SCALE

7.8 Scalability

Ability to run applications without modification on larger or smaller models of the same minicomputer.

7.5 Support for major development languages

Support for common languages, such as Cobol and C, common development tools and GUIs for developing open systems.

6.7 Portability

Ability to move applications from the vendor's minicomputer to other 'open systems' operating systems or hardware platforms without radically modifying the application.

6.5 Interoperability

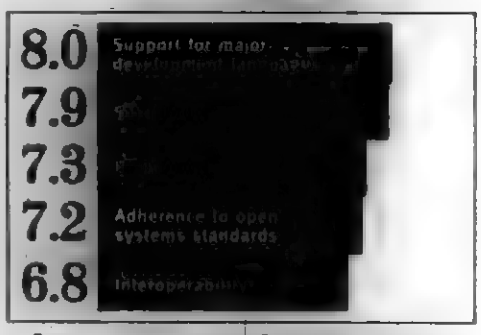
The extent to which the minicomputer can be integrated into networks with other types of processors. For example, can the minicomputer be linked with minimum effort to mainframes, PC clients running Windows, etc.?

6.5 Adherence to open systems standards

The minicomputer's support for recognized 'open systems' standards, such as standard Unix operating system SQL databases.

DEC VAX

OVERALL SCORE 75



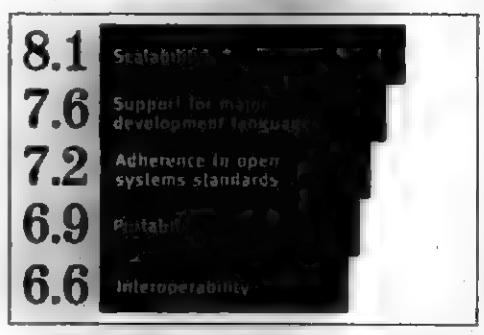
RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

Do you plan to continue using this midrange system or to investigate new technologies?

RESPONSE BASE: 51 USERS

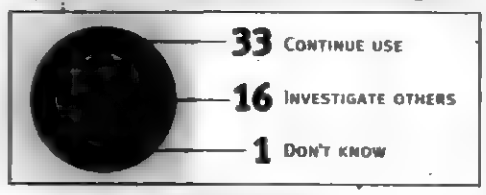
HP 3000

OVERALL SCORE 73



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

Do you plan to continue using this midrange system or to investigate new technologies?



RESPONSE BASE: 50 USERS

IBM AS/400 AND SYSTEM/3X

OVERALL SCORE 64

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

Do you plan to continue using this midrange system or to investigate new technologies?

RESPONSE BASE: 50 USERS

that environment. On the DEC VAX, application portability is possible via application calls to basic network services.

Interoperability

A nearly equal concern for users is interoperability, which represented one of the lower scores for all three systems. While it's true that pure interoperability is not achievable (at least not without a great deal of effort and probable loss of functionality), the minicomputer vendors have added a lot of support for other environments in the past six months.

The vendors all support SQL (allowing for data exchange with industry-standard databases), and they all support Transmission Control Protocol/Internet Protocol (the multivendor interoperability protocol of choice).

HP and DEC have decent support for PC environments. "DEC's PC integration has been largely dependent on Pathworks, which effectively makes the VAX look like a LAN Manager server, and support for NetWare clients is improving," Gottlieb says. In addition, DECWindows puts Microsoft Corp.'s Windows on a VAX 4000 terminal.

The HP 3000 can function as an application or network server for users in a number of environments, including DOS, OS/2, Windows, Unix, X Window System and Apple Computer, Inc.'s Macintosh.

IBM's AS/400 achieves PC integration mainly through third-party products such as Rochester Software Connection, Inc.'s Showcase and Wall Data, Inc.'s Rumba, though its PC Support does support Windows Dynamic Data Exchange.

"IBM recently enhanced its PC Support program, which pulls Windows and PCs closer to the AS/400," Gottlieb says. However, he continues, users of IBM, DEC and HP proprietary servers still rely on terminal emulation for most applications. "That's not client/server," he adds.

Unlike the AS/400, DEC and HP can put an Oracle Corp. database or other third-party database on the mini and have the front end running on the PC. "That's where customers have moved forward with client/server-type applications that go beyond terminal emulation," Gottlieb says. IBM's database is integrated with the AS/400 operating system and thus cannot be chopped up as easily.

In the end — and despite ratings that reflect reasonable satisfaction — users are pretty cynical when it comes to vendors and open systems. Chalk that up to lack of conviction that vendors are willing to cooperate to achieve that goal. As one user said when asked the biggest obstacle to achieving open systems: "[Vendors] need to maintain their proprietary income; they would lose control of their applications. That's the No. 1 problem." •

John Parker, a free-lance writer based in Wellesley, Mass., contributed to this report.

The Unisys factor

Unisys Corp. positions its low-end mainframe models — the A7 through the A11 — against IBM AS/400-level machines. In response to "open" demands, the company announced features that add a level of interoperability, scalability and portability. For instance, it now offers an implementation of NetWare for Unix; close coupling with OS/2 and Unix platforms; portability via the Link and Mapper fourth-generation languages; and the ability to run applications without recompilation up and down the line, according to Bill MacLean, program manager for A series software and networking.

METHODOLOGY

User names were obtained from a combination of vendor and nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

ACKNOWLEDGMENT

Computerworld thanks the *Computerworld* Database Division for its assistance in preparing this Buyers' Scorecard.

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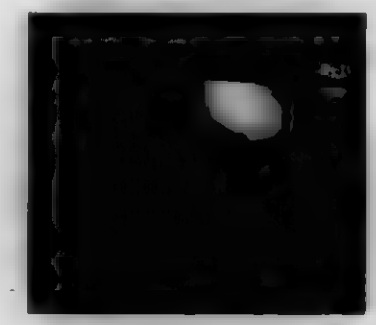

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CYC-ED UP

SKEPTICS CALLED DOUG LENAT CRAZY FOR THINKING HE COULD PROGRAM COMMON SENSE INTO A COMPUTER. BUT THE COMPUTER SCIENTIST'S 10-YEAR CYC PROJECT SHOWS HE IS SUCCEEDING IN DOING JUST THAT.

Doug Lenat is leading perhaps the most massive programming effort in the history of computing: He is infusing a knowledge base of common sense into a computer at Microelectronics and Computer Technology Corp. (MCC), an Austin, Texas-based research consortium.

Lenat's project, known as Cyc (named after the first encyclopedia), is a 10-year effort that began in 1984 with little hoopla and even less hope of success. Skeptics and cynics questioned the sanity of someone seeking to put all the world's knowledge into a computer. But others, such as Apple Computer, Inc. fellow and PC pioneer Alan Kay, think Lenat could pull it off. In fact, Kay calls Lenat one of the "two or three smartest computer scientists in the U.S."

To achieve any practical artificial intelligence in a computer, Lenat believes what many in the AI community don't accept: You have to input knowledge manually and painstakingly to create a computer system that can eventually learn on its own.

Now, nine years into the project, Lenat claims he has already achieved success. He says several MCC member firms — Apple, Digital Equipment Corp. and Microsoft Corp. — are working on products that will incorporate Cyc.

Lenat says Cyc will likely play a key role in network advice services, such as CompuServe; direct marketing, in which companies use Cyc to anticipate customer buying habits; smart spreadsheets; database cleaning, in which Cyc detects database errors or inconsistencies; and modeling new structures for companies in the rush to re-engineer work flows.

Kay says he expects computer makers will incorporate Cyc as a utility into the basic read-only memory of every machine.

The 42-year-old Lenat spoke recently with free-lance writer Glenn Rifkin about his life and work.

Q. How did you get started in computer science and on Cyc?

A. In 1971, as part of getting a master's degree in applied mathematics, I had to take one computer science course. I took a course being offered for the first time based on Nils Nilson's then brand-new book on AI. It seemed exactly the right kind of thing to get into.

I tried to build programs whose output would be capable of surprising me, which meant learning programs, programs that tried to discover things on their own. My Ph.D. thesis, in 1975, was a demonstration that you could indeed do that kind of learning on the computer in various domains.

The net result of all those years working on machine learning was realizing that learning occurs at the fringe of what you know. Namely, you learn from new things similar to what you know already. The more you know, the more easily you can learn.

So what does that mean? It means if you want to do machine learning, you have to start from an enormous base — like the world, common sense, general knowledge, probably a whole bunch of facts as well — do analogy, generalization, case-based reasoning, using this enormous library to be reminded of things.

It became clear that what we needed to do was put together this large body of knowledge.

Q. Where did you take your ideas?

A. At that point, in the early 1980s, I began consulting with Alan Kay at Atari. He was the head of the research group and was interested in what he called the Electronic Encyclopedia Project. When Atari decided it really wasn't in the research business, the project fragmented into pieces.

Luckily I got the good piece: I got the knowledge base piece.

Marvin Minsky, Alan Kay and I did some calculations and independently came up with a figure of about a million things a system would need to know if it was going to serve as the basis for this machine learning effort.

Q. How did you end up at MCC?

A. In 1984, an old friend went to MCC, which was just forming. There were about 40 employees. My friend convinced me to come and talk to him.

I met Admiral Bobby Ray Inman [the first director of MCC], who is probably the most charismatic individual I've ever met. He convinced me that there was no way we were going to do, in academia or in any one company, this million-rule expert system that would take a couple of hundred person-years of work. Even a large company is going to balk at a decade-long project that's going to cost tens of millions of dollars, that has a very low chance of success (we estimated it at between a 2% and 10% chance of success) and that, if its basic premise is correct, will have no payoff in the intermediate years.

Inman convinced me that MCC was the one and only place where this project could be started and done.

CYC DEFINED

THE MILLIONS OF ASSERTIONS (FACTS, RULES, ETC.) ABOUT THE VARIOUS EVERYDAY OBJECTS, ACTIONS AND OTHER CONCEPTS/RELATIONSHIPS THAT TOGETHER COMPRISE OUR LATE 20TH CENTURY WESTERN CONSENSUS REALITY.

Q. Have you ever thought of an analogy to what you are doing? Is it like the Manhattan Project? Is it like God creating the universe?

A. It's a lot like the effort in putting together the very first encyclopedia. Of course, we're not putting in the same kind of content. What we are putting in is completely independent to that; it's the prerequisite for the encyclopedia. It's the things that all the encyclopedia articles assume the reader already knows about the world before he reads an article.

Q. What is the current status of the project?

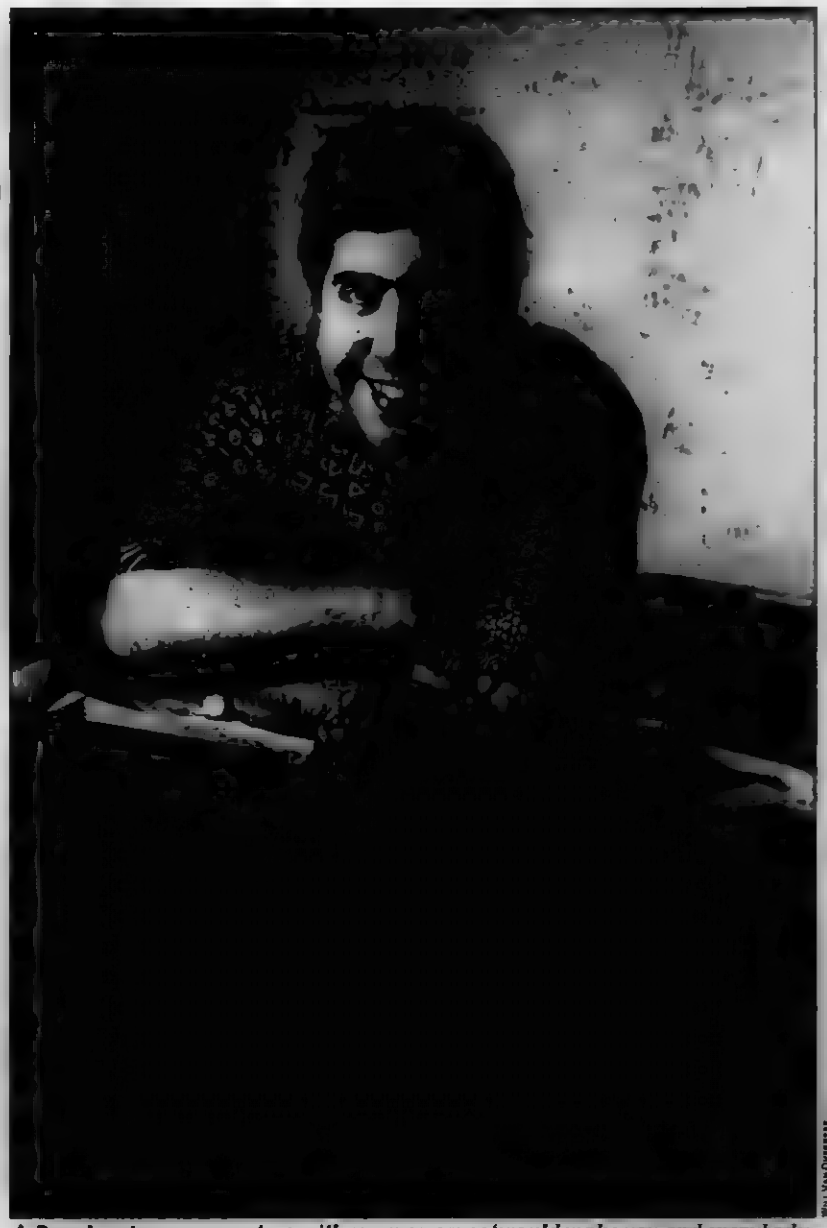
A. Most of our [member] companies are engaged in application efforts building sort of proto-products, which may hit the market in two to four years. The good news is that the probability of our succeeding has changed from 2% to 10% to 95% to 100%. We're now at the stage of finishing it up.

Q. Can you discuss what we can expect from future Cyc-based products?

A. I can talk generically about some of the classes of applications.

An important generic class of application is information retrieval and filtering. The problem I see is that everyone is going to have too much access to information. What you are going to want is filtering, getting relevant information and not this firehose of all the information you might get if you're not careful.

So, for instance, if you're a commercial photographer putting together a layout, you may want a certain image. You have access to an on-line library of 10 million images.



Will Van Overbeek

▲ **Doug Lenat** *says computers with common sense 'would make you and everybody else think better and be smarter'*

suit, which for men in modern civilization is topless.

That inference is not hard for most of us; it's fairly trivial. But the point is, if you don't have those pieces of knowledge, you're never going to draw a connection between the query and the caption the way it was stated.

When you have this massive online library of images, of text files, of mail messages, of who knows what, how will you make sense of it? How will you find relevant information?

Q. Does this idea extend beyond information retrieval?

A. The same thing applies to data that is apparently more structured in spreadsheets and relational databases. Even within a single company, people have no idea where to look for the right data. Even if they know it's somewhere in one of the spreadsheets they have legal access to, they may not be able to find it or easily interpret what a column means.

If there are sets of information that contradict each other in two different spreadsheets or databases, you might go for years or forever without realizing there is a contradiction.

Another application is database cleaning, in which Cyc is used as a kind of sanity checker for the data in the database: Is it reasonable that this person is older than his parents?

Q. Conceivably, then, would Cyc take the form of a software package that someone with a PC running a database or spreadsheet package would add to clean up the database?

A. Yes, that's exactly right. It would be a kind of add-in utility for spreadsheets and databases.

Q. Are software companies looking at this?

A. Yes. Our participants include Microsoft, Apple, Digital, Eastman Kodak Co., Motorola, AT&T, Bellcore and all the regional Bell operating companies. There is also Interval Research Corp., a company [Microsoft cofounder] Paul Allen recently started that [former IBM executive] Dave Liddle is running in Palo Alto, Calif.

Q. What are other Cyc applications?

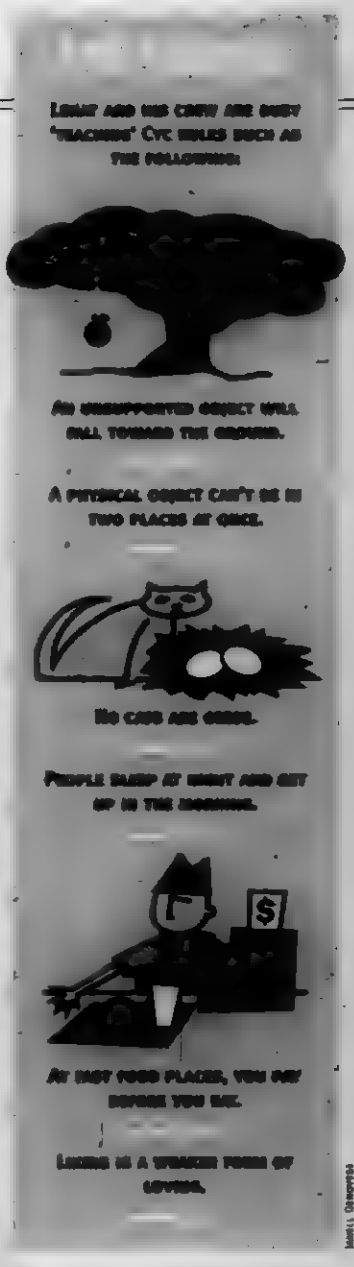
A. We're also using Cyc to do enterprise modeling to model an organization, how it spends its time and money. We look at what the flow of people and data and physical objects through the organization is.

Just as we human beings cope with one another's forms and terminologies using our common sense to allow ambiguity and terseness, businesses, by using Cyc-based models of one another, will be able to maintain their individuality and yet be able to talk to one another automatically.

Q. At what point will you feel you've accomplished what you set out to do?

A. Probably about three years from now — by mid-1996. The number of knowledge enterers [now at 28] will go down. Much of the knowledge entry will be natural language input by tutoring rather than by the brain surgery we've been doing.

The whole character of the project, as far as content, will change. Instead of putting in things about clothing and furniture and professions, we'll be putting in axioms about types of birds that live in Ecuador and other detailed, expert system-like topics. •



AT A GLANCE

Start date:	1984
Project duration:	10 years
Current number of staffers:	30
Rules entered per day:	200
Current number of rules:	2 million
Current project cost:	$25 million

How are you going to find that image? By and large, you have to rely on fairly short captions. Statistical techniques and key words and synonyms are not going to get you very far.

Suppose you are doing a *Sports Illustrated* article and you need pictures of male jocks not wearing shirts. If you put a query in like that, how would you find an image such as Pablo Morales winning the 100-meter butterfly at the 1992 Olympics? There are no words in common there.

You just somehow have to infer that the 100-meter butterfly is a kind of swimming event and that if people are in swimming events, then they are intentionally in water, and if so, they will be wearing a typical swimming

Micro managers' roles change to become all-encompassing

By Leslie Goff

At a glance

Old title: Micro manager

New title(s): Director of network services; manager of end-user computing; director of systems and technology; PC coordinator.

Role in IS: Responsible for PC hardware and software support, application development, LANs, WANs, user training, purchasing and staff management.

Typical career path: Director of IS

Requirements: Comprehensive knowledge of PC hardware, operating systems and applications; networking skills; communication skills; leadership and management ability.

JOB RESPONSIBILITIES HAVE changed so much for microcomputer managers that the title may no longer describe the position. The job name has given way to more descriptive titles such as director of network services, manager of end-user computing and director of systems and technology.

"The title micro manager was appropriate at the time [it was created] when all we managed were PCs," says Lynne Baron, director of systems and technology at Standard & Poor's Corp. in New York. "But now the position includes [responsibility for] anything that is not a mainframe."

Even in those companies that haven't updated the title, micro managers rank fairly high within the information systems organization. For instance, Jacqueline A. Bynsdorp, whose title at Jockey International, Inc. in Kenosha, Wis., is PC coordinator, reports directly to her company's vice president of IS. She oversees PC application development throughout Jockey for systems such as an IBM OS/2-based imaging system, a universal product code design system and a Microsoft Corp. Windows-based executive information system.

"I fancy myself more of a technology development analyst than a PC coordinator," she says.

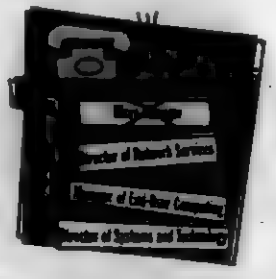
Whatever the title, today's micro managers — given the increased attention on local- and wide-area networks and client/server architectures — are prime candidates to become tomorrow's IS directors. In many cases, they have traded in hands-on support for more management responsibility, but with their increased visibility in the organization, they are under more pressure to keep up with the constant advances in software, hardware and network management.

Training and teaching

For instance, Jonathan Johnson, manager of end-user computing at Norwalk Hospital in Norwalk, Conn., has undergone network and systems administration training in addition to training in Novell, Inc.'s NetWare network operating system and all the software packages his group supports. He has also had to beef up his teaching skills to train users more effectively.

"Being able to train others, to communicate with users from the top to the bottom, is key," he says. "And we have to be more advanced in our knowledge of everything. There are no more basic solutions to users' problems. Their problems are more sophisticated."

Jo Haraf, director of network services at Booz Allen & Hamilton, Inc. in McLean, Va., says she keeps up with new technology by "pumping anyone who gets near me for information."



Haraf's career path is representative of the quintessential micro manager. She was a micro manager for four years, following an initial career in the mainframe world. She was promoted last month from director of office technology to her current title to reflect her growing responsibility for WANs.

"I started out as the person you called when you couldn't run your word processor. Now I'm the LAN/WAN and voice systems person," she says. "That's an evolution more micro managers find themselves in. We're the logical choice to manage networks because we're the ones who started out with the stand-alone PCs, integrated them into LANs and integrated those into WANs."

Haraf said her career has evolved along with PC technology and that now she is taking steps to "come up to speed on WANs."

Micro managers at mainframe-centric companies, however, may have further to go than their colleagues at such companies as Jockey, Booz Allen & Hamilton or Standard & Poor's. James Withall, an information analyst at the Arbella Mutual Insurance Co. in Quincy, Mass., says he sees his career path flattening temporarily because Arbella's IS strategy "has more of a mainframe orientation." He works outside the IS group as a computer manager in the company's finance department.

Nevertheless, he says he sees "an ongoing role for the position I'm in. In time, recognition of the role of applications developer in the PC area is going to grow, and the corporate structure is going to change with that. So, there's a good long-term outlook."

Necessary tool

"PCs started out as a novelty, a curiosity," Withall adds. "What was once a peripheral activity has become more than 100% accepted as mission-critical. Management has accepted that a PC on a desktop is just a given, like a telephone."

Job satisfaction among the micro managers interviewed runs high, as do career aspirations. But consequently, so does stress.

Bynsdorp says she works "night and day," but the payoff has been moving up three management levels in the past six years.

Goff is a free-lance writer based in New York.

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Career advice for the '90s

Phone interviews — a tough call

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles executive search firm that specializes in placing computer professionals.

Q. I am a senior software developer who recently launched a job search. I have noticed that many of my prospective employers used a preliminary phone interview. How can I best handle such a discussion?

A. Many managers resort to phone interviews in order to best utilize their time, particularly because of the industrywide downsizing of information systems staffs. It is a trial run for which you should have two goals: Convince the manager that he should meet you face to face, and gather enough information about the position so that you will do well in the follow-up meeting. Thoroughly research the company before the call and keep pertinent information by the phone. At the end of the call, if a meeting has not been arranged, directly ask for one.

Q. I work for a large manufacturing company as a senior programmer. I have extensive Cobol, CICS and DB2 skills. My position is secure, but I'm concerned that my skills are becoming less in demand. What can I do to remedy this?

A. You should be concerned that the market for your skills is steadily shrinking because of the inroads that are being made by downsized and client/server-based systems. You would be well-served to investigate diversifying your skills to other platforms. Gaining experience with midrange, Unix-based or microcomputer applications and tools will increase your marketability should you want or need to change jobs.

Q. My company develops accounting software for the IBM Application System/400. I have been a software engineer on the product for the past three years. I'm interested in selling the product, but management has blocked this because of my lack of sales experience. I know I can sell it, but how can I convince them?

A. Because of the direct impact on the company's bottom line, it is typical that a sales manager will want to hire proven talent. Your best bet is to try a two-step approach. A transfer to a technical sales support role would allow you to learn your company's sales techniques and get to know the needs of the clients. This is a very common back door into sales and allows you to inspect the position closely before jumping in.

Q. I am graduating from college next month with a bachelor's degree in computer science. I'm getting a little nervous because I still don't have a job lined up. What should I do?

A. Getting a job in this market requires determination, planning and persistent education for even a skilled professional.

Absorb yourself in your search just as you would in a job. Brainstorm your options. Make a list of target companies and call at least eight per day. Do research at the library. Ask your friends for referrals. Join professional organizations. Attend job fairs. Evaluate the myriad help-wanted databases. Drop in on company personnel offices. Do whatever is needed to meet face-to-face with someone in the company.

The more activity you generate, the more opportunities you will uncover.

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Dana Tate, management services analyst
City of Irving Finance Department, Irving, Texas

■ Our firm was very fast-growing until recently, and IS was generally reactive — we had no time to be proactive. So most ideas have been initiated informally by the users themselves. We also have a hot line they can call.

TIPS from the TIMES

Sal Merchant, PC specialist
Conner Peripherals, Inc., San Jose, Calif.

■ We have a regular user group meeting. It's a vehicle intended to break down organizational barriers and promote free exchange of information. That has probably been the most fruitful thing we've done, and it was user-initiated. It's worked extremely well.

Don Babcock, manager of user services
Cajun Electric Power Cooperative, Baton Rouge, La.

■ We've designated people in each of our departments to be on a committee. Their groups are supposed to feed them ideas. Then, they bring ideas to the meetings, where they must speak out to support them.

John Petersen,
Senior telecommunications specialist
Connectivity lab, Burroughs Wellcome Co.,
Research Triangle Park, N.C.

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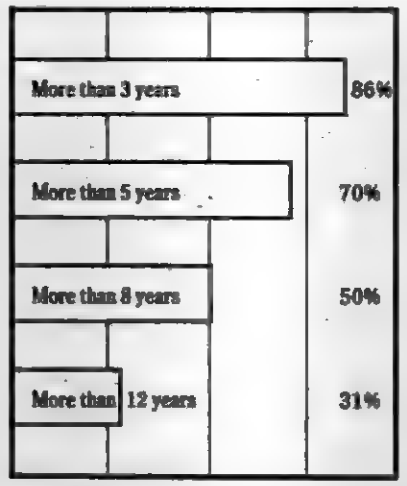

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HELP *for* HIRE

Time is money when you're looking for contract labor. The biggest expenditure is skills assessment, although it's worth the time it takes.

By Alice Bredin

Eight years ago, Larry Buran began hiring contract labor but didn't have a formal method for getting the right people. After years of hiring operations analysts who lacked the technical skills they boasted about, he changed his technique.

"I implemented a four-hour tryout period with anyone I hire," says Buran, an operations supervisor at Mervyn's Computer Center, a Plano, Texas, data center for Mervyn's Department Stores. If candidates are found unsuitable after the tryout, they go back to the agency, Buran says. "It's like Sears. If you buy something but don't like it, you take it back."

Hiring contract labor has become increasingly popular among information systems managers. It offers them the flexibility to adjust the work force as the demand for technical expertise changes, and it can help pick up the slack in shorthanded departments.

But finding the right employee is not easy. Candidates who seem perfect in an interview can turn out to be dismal, and a recruiter's best candidate can become your worst nightmare. Add the fact that you're usually under time constraints when you have to hire contract labor, and you've got the ingredients for failure.

The biggest hassle is the time needed for skills assessment, which has led many IS managers to turn to recruiters who prescreen for technical proficiency. "I use a few agencies that I really trust," Buran says. It can take two weeks to three months to find the right person.

In the IS department at Edward D. Jones & Co., a financial services company in Maryland Heights, Mo., the average hiring time is two to three weeks. The company usually interviews three or four applicants when working with a familiar recruiter, seven or eight with a newer recruiter. Each applicant interviews with a minimum of three people in the department, a process as rigorous as the one used when hiring a full-time employee, says Chief Information Officer Rich Malone.

"It may be the team leader, a senior programmer analyst or a person doing the same job as the applicant. These people know the questions and can determine if the applicant fits," he says.

Trusting your instincts about a potential employee is still one of the best ways to make a hiring decision, IS managers say. But in some cases, hard proof such as vendor certification can eliminate uncertainty about technical know-how.

At Robert Half International, Inc., for instance, all recruits claiming proficiency with Lotus Development Corp. programs are tested through an alliance with Lotus. "They're tested on construction of Lotus applications and overall Lotus proficiency," says Richard Wonder, national director of the Robert Half IS division in New York. If successful, the applicants are certified by the vendor.

Ask the right question

Even the best agency cannot know exactly what your department needs, so it's important to ask the right questions. Once an applicant's skill level is determined, ask whether he has applied these tools and completed tasks similar to the ones involved in the job in question.

"If you were hiring someone to build a house, you wouldn't hire a person who can just pound a nail well. You would ask if they'd ever built a house," says Dick Camilleri, a regional manager at Command Systems, Inc., a Hartford, Conn.-based provider of IS professionals.

You should also know what to expect from the recruiter. Most offer employers a chance to get out of a contract, no questions asked, but the time frame varies. Others provide cash bonuses to contract employees for finishing a job early.

Alternative Resources Corp. (ARC) in Lincolnshire, Ill., a specialist in staffing technical IS operations, provides health benefits for employees hired for at least nine months. "The biggest problem for companies is attrition," ARC President Larry Kane explains. "Health benefits solve the problem of having to retrain every three months because the benefits keep employees working."

Bredin is a free-lance writer based in New York.

Contract issues

The following points should be clearly outlined in the recruitment agency's contract:

SCOPE OF SERVICE
- Employee's responsibilities
- Goals
- Job time frame

PAYMENT
- Hourly or daily rate
- When invoices will appear
- When payment is due

CONFIDENTIALITY
- Proprietary information obtained by contract employees should remain confidential.

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- If it's not in the contract, consultants have copyright for anything they develop while under contract. This becomes an issue when a consultant's work is involved in a product, such as software, marketed by the hiring company.

Source: The Independent Computer Consultants Association, St. Louis

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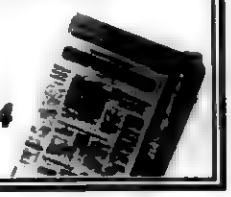

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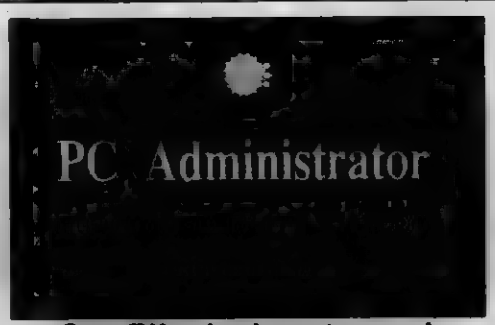

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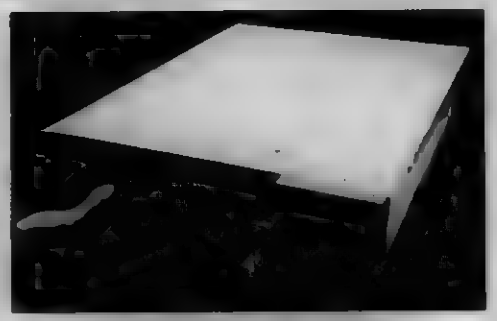

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Burlington, MA ..... (617) 270-9228

HELP DESK

The Help Desk, Inc.
Phoenix, AZ ..... (602) 460-1926

INSURANCE

Programming Resources Company
Hartford, CT ..... (203) 728-1428

IMAGING

Burns Consulting Group
Scituate, MA ..... (617) 982-1888

Laser Recording Systems, Inc.
Mountain Lakes, NJ ..... (201) 402-9500

United Systems and Software, Inc.
Maitland, FL ..... (407) 875-2120

MANUFACTURING

Bell Atlantic Software Systems, Inc.
Sudbury, MA ..... (508) 443-7311

Expandable Software, Inc.
Santa Cruz, CA ..... (408) 261-7880

GE Consulting Services, Inc.
Rockville, MD ..... (301) 340-5100

Matra Datavision, Inc.
Tewksbury, MA ..... (508) 640-0940

SPECTRUM ASSOCIATES
Woburn, MA ..... (617) 932-0932

Symmetrix, Inc.
Lexington, MA ..... (617) 862-3200

MANUFACTURING SOFTWARE

Effective Management Systems
Milwaukee, WI ..... (414) 359-9800

Intrepid Software, Inc.
Burlington, MA ..... (617) 273-2920

North Coast Automation, Inc.
Cleveland, OH ..... (216) 473-3600

Man-Trak® - Management Tracking System
Open Systems Holdings Corp.. (800) 328-2276

NETWORKING

A-net
Eugene, OR ..... (800) 444-9796

PRODUCTIVITY

Koch Productivity Consulting
Bel Air, MD ..... (410) 838-8721

Productivity Management Group, Inc.
East Amherst, NY ..... (716) 689-7724

SALES FORCE AUTOMATION

Gateway Systems Corporation
East Lansing, MI ..... (800) 333-9366

SCHEDULING/PLANNING

Summit Solutions, Inc.
Chesterton, IN ..... (219) 929-4189

SECURITY

Phase 2 Consulting, Inc.
Cumberland, RI ..... (401) 333-4536

Z-Lock Mfg. Co.
Redondo Beach, CA ..... (310) 372-4842

SOFTWARE DEVELOPERS

Cadre Technologies, Inc.
Providence, RI ..... (401) 351-5950

SPEECH INTEGRATION

Zeitech Inc.
Stamford, CT ..... (203) 359-9807

STORAGE MGMT SOFTWARE SVCS

Adept
Riverside, CA ..... (909) 688-7012

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale, FL ..... (305) 587-2270

UTILITIES

OASIS Technology, Inc.
Oxnard, CA ..... (805) 988-1020

WHOLESALE DISTRIBUTION

Arthur Ellingsen & Co.
Arlington Heights, IL ..... (708) 506-0555

ADD+ON® Software Advantage/V
Open Systems Holdings Corp. (800) 328-2276

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Storage Technology	31.1	Commodore Int'l (L)	-14.3
Compression Labs Inc.	29.4	Cambex Corp.	-15.3
Lotus Development	26.7	Group I Software	-12.9
Sequoia Systems Inc.	25.0	ChipSoft	-11.6
IPL Systems Inc.	24.1	McAfee Associates	-11.1
General Datacomm Inds.	22.6	Sapiens USA Inc.	-8.2
Network Equipment Tech.	19.4	Cordis Corp.	-7.6

Dollar

Cabletron Systems	11.13	Ben Franklin Corp.	-2.13
Storage Technology	8.63	Xerox Corp.	-2.13
Lotus Development	6.88	Southwestern Bell Corp.	-2.13
Progress Software Corp.	6.50	Sapiens USA Inc.	-2.00
Synoptics Communications (N)	6.00	Peoplesoft	-1.75
Storage Inc. (N)	5.88	Group I Software	-1.50
Cisco Systems Inc.	5.13	Novell Corp.	-1.50
Intel Corp.	5.13	Matsushita Electronics (N)	-1.50

[redacted]

Parallel prospects

Investment analysts looking at massively parallel processing systems vendor Kendall Square Research Corp. (KSRC) said they like what they see.

Kendall Square Research's stock price closed Thursday at 16 ¾, up considerably from its 52-week low of less than 6. However, the issue is still off of its recent high of 22, and Salomon Brothers, Inc.'s Jeffry Canin said the current price weakness presents a buying opportunity.

Kendall Square Research also earned a Buy rating from Alex. Brown & Sons, Inc. analyst Christopher Mortenson in an April 21 report.

Part of the analysts' enthusiasm springs from the growth potential of the massively parallel processing marketplace. Framingham, Mass.-based research firm International Data Corp. (IDC) estimated 1992 market revenue rose to $380 million, up from $292 million in 1991. This year, the market could climb to $467 million, according to IDC.

Kendall Square Research's share of that pie is climbing as well. The company shipped its first four systems in 1991 and now boasts an installed base of 25, according to Salomon Brothers. And it recently reported record quarterly revenue.

Because the company's KSR-1 systems are highly scalable and field-upgradable, Kendall Square Research's potential for recurring revenue is great. A KSR-1 system can theoretically use as many as 1,088 processors. Nearly half the firm's users have already installed upgrades to their original systems, Salomon Brothers reported.

While the market may have potential, recent events have shown that technology's cutting edge is a slippery place to stand. Deskside parallel processor vendor Wavetracer, Inc. closed up shop, while supercomputer start-up Cray Computer Corp. (CRAY) has teetered on the precipice due to continual delays in shipping its first product.

Kendall Square Research intends to break new ground by selling to commercial business users as well as to the traditional scientific computing market. One of the key entry barriers for commercial parallel systems is the difficulty of programming for multiple processors. Kendall Square Research hopes to overcome this obstacle via its patented Allcache memory system, which assigns separate memory to each processor but appears to the programmer as a single, shared memory pool.

According to Mortenson, most of Kendall Square Research's revenue in 1993 will still come from scientific computing customers. However, success in the commercial market will be the company's key to long-term growth.

—Derek Slater

Exch	52-Week Range			May 7 Bid	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	37.00	9.63	3 COM Corp.	37.00	4.25	13.0
NYS	80.25	61.38	American Info Techs Corp.	74.63	-1.38	-1.8
NYS	60.38	40.63	AT&T	56.38	0.00	0.0
OTC	3.56	0.75	Aztel Communication Corp.	2.00	0.19	10.3
OTC	24.50	10.25	Banyan Systems Inc.	14.00	-1.00	-6.7
NYS	56.75	42.38	Bell Atlantic Corp.	52.25	0.50	1.0
NYS	57.50	46.75	Bell South Corp.	51.63	-2.13	-4.0
NYS	6.25	3.63	Bolt, Beranek & Newman	4.75	0.25	5.6
OTC	18.50	9.50	Brooktrout Technology	11.75	0.00	0.0
NYS	98.50	42.13	Cabletron Systems	98.50	11.13	12.7
OTC	36.50	17.75	Chipcom Corp.	36.50	4.25	13.2
OTC	48.38	18.88	Cisco Systems Inc.	48.38	5.13	11.8
OTC	19.00	5.50	Compression Labs Inc.	11.00	2.50	29.4
OTC	4.63	0.88	Data Switch Corp.	3.38	-0.06	-1.8
NYS	22.13	12.38	Digital Comm. Assoc. (L)	13.00	0.25	2.0
OTC	12.75	4.88	Digital Systems Int'l Inc. (L)	4.88	-0.38	-7.1
OTC	35.88	4.00	DSC Communications (H)	35.88	1.75	5.1
OTC	9.50	4.75	Fibronics Int'l Inc.	6.50	0.00	0.0
OTC	27.00	8.75	Filenet Corp.	10.50	0.00	0.0
OTC	4.38	1.50	Gandalf Technologies Inc.	3.38	-0.13	-3.6
OTC	2.06	0.69	Gateway Communications	1.13	0.06	5.8
NYS	12.88	2.88	General Datacomm Inds.	12.88	2.38	22.6
ASE	4.00	2.00	Go Video	2.13	-0.06	-2.9
NYS	37.75	30.63	GTE Corp.	35.75	-0.13	-0.3
NYS	84.25	62.50	ITT Corp.	82.50	0.38	0.5
OTC	49.25	29.88	MCI Communications Corp.	48.63	1.63	3.5
OTC	11.50	2.25	Microcom Inc.	3.63	0.13	3.6
OTC	24.25	4.75	Netrix Corp.	5.88	-0.13	-2.1
OTC	19.00	8.75	Network Computing Devices	11.75	0.75	7.1
NYS	15.38	5.38	Network Equipment Tech.	7.63	1.25	19.6
OTC	23.25	8.00	Network General	8.63	-0.25	-2.8
OTC	15.75	8.63	Network Systems Corp.	8.75	-0.25	-2.8
OTC	65.25	13.63	Newbridge Networks Corp. (H)	65.25	4.00	6.5
NYS	46.00	30.50	Northern Telecom Ltd.	36.13	-0.63	-1.7
OTC	35.25	22.50	Novell Inc.	31.25	0.75	2.5
NYS	92.50	75.00	Nynex Corp.	83.13	-1.50	-1.8
OTC	30.00	14.50	Octel Communications Corp.	23.00	2.50	12.2
OTC	6.38	3.38	Penril Data Comm Networks	4.19	-0.31	-6.9
OTC	39.00	10.25	Picturetel Corp.	21.00	0.00	0.0
OTC	15.25	4.75	Proteon Inc. (L)	5.00	0.13	2.6
NYS	30.38	10.59	Scientific Atlanta Inc.	26.00	0.13	0.5
NYS	81.50	59.38	Southwestern Bell Corp.	75.25	-2.13	-2.7
NYS	33.25	21.00	Sprint Corp.	31.00	-0.25	-0.8
OTC	27.00	10.50	Standard Microsystems Corp	15.63	0.63	4.2
OTC	18.50	6.88	Stratacom Inc.	12.88	-0.38	-3.0
OTC	137.50	25.50	Synoptics Communications (N)	137.50	6.00	5.4
OTC	7.13	4.13	Telebit Corp. (L)	4.63	0.00	0.0
OTC	9.38	2.13	Telematics Int'l Inc.	5.88	-0.13	-2.1
OTC	25.50	13.38	US Robotics	21.50	0.75	3.6
NYS	45.00	34.38	U S West Inc.	41.50	-1.13	-2.6
OTC	48.00	12.00	Wellfleet Communications	48.00	4.75	11.0
OTC	16.25	7.00	Xircom	10.75	1.50	16.2
PCS AND WORKSTATIONS						Up 4.3%
OTC	7.25	2.50	Advanced Logic Research	2.75	-0.13	-4.3
OTC	65.25	41.50	Apple Computer Inc.	54.50	2.75	5.3
OTC	24.25	11.25	AST Research Inc	15.25	1.25	8.9
NYS	12.50	3.75	Commodore Int'l (L)	3.75	-0.63	-14.3
NYS	58.50	23.13	Compaq Computer Corp.	50.50	2.13	4.4
OTC	49.88	15.00	Dell Computer Corp.	32.13	2.88	9.8
NYS	80.63	50.25	Hewlett Packard Co.	78.50	4.25	5.7
NYS	35.38	16.13	Silicon Graphics (H)	33.75	0.25	0.7
OTC	41.00	22.50	Sun Microsystems Inc.	26.63	-0.63	-2.3
NYS	32.13	22.25	Tandy Corp.	30.25	0.63	2.1
OTC	11.00	2.75	Zeos International Ltd.	4.06	-0.31	-7.1
LARGE SYSTEMS						Up 1.5%
ASE	18.38	4.75	Amdahl Corp. (L)	5.00	0.00	0.0
NYS	9.75	6.25	Convex Computer	6.75	-0.38	-7.3
OTC	6.13	1.88	Cray Computer	2.75	0.25	10.0
NYS	39.75	19.00	Cray Research Inc.	29.25	0.63	2.2
NYS	13.88	7.13	Data General Corp.	9.50	0.00	0.0
NYS	49.25	30.38	Digital Equipment Corp.	45.88	1.88	4.3
NYS	38.63	26.63	Harris Corp.	37.75	1.13	3.1
NYS	100.38	65.88	IBM	68.00	-1.00	-2.0
OTC	22.00	5.50	Kendall Square Research	16.00	-0.50	3.2
NYS	127.50	83.00	Matsushita Electronics (N)	124.00	-1.50	-1.2
OTC	17.00	6.00	Pyramid Technology	15.13	0.50	3.4
OTC	24.00	11.13	Sequent Computer Sys.	21.75	2.50	13.0
NYS	16.38	1.38	Sequoia Systems Inc.	2.50	0.50	25.0
NYS	68.38	39.50	Stratus Computer Inc.	34.50	1.00	3.0
NYS	16.88	9.88	Tandem Computers Inc.	10.88	0.00	0.0
NYS	13.88	7.75	Unisys Corp.	11.00	0.13	1.1
SOFTWARE						Up 4.0%
OTC	63.50	26.25	Adobe Systems Inc. (H)	59.00	2.00	3.5
OTC	22.00	10.25	Aldus Corp.	15.25	0.75	5.2
OTC	14.25	5.63	American Software Inc.	5.88	-0.13	-2.1
OTC	28.13	9.75	Ask Computer Systems	12.63	1.63	14.8
OTC	56.50	29.75	Autodesk Inc.	45.25	5.00	12.4
OTC	14.25	2.50	Bachman Info. Systems	2.88	0.00	0.0
OTC	43.00	34.75	BGS Systems Inc.	38.00	1.50	4.1
OTC	84.13	37.25	BMC Software Inc.	51.50	1.38	2.7
OTC	28.25	17.00	Boole & Babbage	22.75	0.00	0.0
OTC	54.50	17.50	Borland Int'l Inc.	20.13	3.38	14.8
OTC	6.50	3.00	CE Software	4.13	1.00	32.0
ASE	27.50	6.25	Cheyenne Software Inc. (H)	27.25	0.75	2.8
OTC	19.50	8.25	ChipSoft	10.50	-1.38	-11.6
OTC	9.75	5.63	Cognos Inc.	6.25	-0.25	-3.8
NYS	27.38	10.88	Computer Associates	26.00	2.88	12.4
NYS	12.38	2.75	Computervision Corp.	3.13	0.00	0.0
OTC	34.25	19.25	Compuware Corp.	26.75	2.00	8.1
OTC	14.25	5.75	Comshare Inc.	6.75	0.25	3.8
OTC	17.25	10.75	Corel Corp.	14.25	0.00	0.0
OTC	29.25	6.00	Easel Corp.	7.00	0.00	0.0
OTC	25.25	17.00	4th Dimension	19.25	1.50	8.5
OTC	20.25	6.00	Frame Technology	7.13	0.38	5.6
OTC	20.75	10.50	Group I Software	10.50	-1.50	-12.5
OTC	35.25	18.75	Gupta (L)	20.25	-0.25	-1.2
OTC	8.75	3.50	Hogan Systems Inc.	7.38	0.00	0.0
OTC	25.75	11.25	IMRS	14.50	0.00	0.0
OTC	34.75	18.50	Information Resources	32.50	1.25	4.0
OTC	42.00	12.13	Informix Corp.	39.88	3.38	9.3
OTC	17.75	9.50	Intergraph Corp.	10.63	0.38	3.7
OTC	13.63	6.88	Interleaf Inc. (L)	8.75	0.50	6.1
OTC	18.00	6.75	Intersolv Inc.	8.25	0.75	10.0
OTC	16.00	8.25	Knowledgeware Inc.	10.88	1.25	13.0
OTC	54.75	26.00	Legent Corp. (L)	30.75	1.25	4.2
OTC	32.63	16.75	Lotus Development	32.63	6.88	26.7
OTC	23.00	7.75	MathSoft	11.75	1.50	14.6
OTC	23.25	5.25	McAfee Associates	6.88	-0.88	-11.3
OTC	31.63	1.88	Meca Software	11.25	0.13	1.1
OTC	15.00	5.25	Mentor Graphics	9.50	0.38	4.1
OTC	46.00	27.25	Micro Focus	35.38	3.38	10.5
OTC	19.00	4.38	Microgram Inc.	5.25	0.63	13.5
OTC	95.00	65.50	Microsoft Corp.	86.63	0.38	0.4
OTC	39.50	14.00	Oracle Corp. (H)	39.50	3.88	10.9
OTC	31.88	15.38	Parametric Technology	30.25	2.75	10.0
OTC	60.50	22.50	Peoplesoft	29.00	-1.75	-5.7
OTC	9.50	3.50	Phoenix Technologies	5.25	0.00	0.0
OTC	40.00	25.38	Powersoft (L)	29.50	1.25	4.4
OTC	41.50	17.00	Platinum Software	23.75	0.75	3.3
OTC	25.00	11.25	Platinum Technology	14.50	0.75	5.5
OTC	61.50	29.00	Progress Software Corp.	44.00	6.50	17.3
OTC	16.50	2.94	Quarterdeck Office Sys.	3.19	-0.09	-2.8
OTC	24.50	11.75	Rainbow Technologies Inc.	20.00	0.00	0.0
OTC	15.75	4.00	Rasterops	7.38	0.88	13.5
OTC	15.25	3.61	Ross Systems	11.50	0.75	7.0
OTC	27.25	8.50	Sapiens USA Inc.	22.50	-2.00	-8.2
OTC	15.00	6.75	Software Publishing Corp.	7.88	0.38	5.0
OTC	9.13	2.00	Software Toolworks Inc.	8.50	1.00	13.3
OTC	4.50	0.75	Spinnaker Software	1.56	-0.06	-3.8
OTC	12.75	3.25	State of the Art	8.50	-0.63	-6.8
NYS	24.63	13.75	Sterling Software Inc.	20.00	0.25	1.3
OTC	18.25	8.00	Struct. Dynamics Research	16.50	1.25	8.2
OTC	64.00	21.00	Sybase Inc. (H)	63.75	5.88	10.2
OTC	44.25	5.88	Symantec Corp.	15.38	2.50	19.4
NYS	12.50	5.25	Systems Center Inc.	10.50	0.25	2.4
OTC	25.50	10.00	System Software Assoc.	13.50	1.00	8.0
OTC	7.00	2.50	Tomzic Corp.	3.63	-0.25	-6.5
OTC	22.75	9.13	Viewlogic Systems	16.50	1.63	10.9
OTC	23.50	6.75	Walker Interactive Systems	8.25	1.00	13.8
OTC	3.19	1.38	Wordstar	2.31	-0.06	-2.6
SEMICONDUCTORS						Up 1.0%
NYS	32.88	7.38	Advanced Micro Devices	29.00	0.75	2.7
NYS	21.38	9.00	Analog Devices Inc.	19.38	0.25	1.3
OTC	22.63	7.63	Atmel Corp.	22.63	3.38	17.5
OTC	9.38	2.75	Chips and Technologies	3.13	0.06	2.0
OTC	39.75	13.00	Cirrus Logic	16.63	-1.38	-7.6
NYS	12.38	7.38	Cypress Semiconductor Corp	10.25	-0.13	-1.2
NYS	16.13	7.75	Dallas Semiconductor	14.00	0.88	6.7
OTC	121.25	46.50	Intel Corp.	101.88	5.13	5.3
NYS	14.13	4.88	LSI Logic Corp.	12.00	1.00	9.1
NYS	28.50	13.13	Micron Technology	24.50	1.38	5.9
NYS	76.50	37.13	Motorola Inc. (H)	76.50	3.13	4.3
NYS	14.50	8.50	National Semiconductor	14.50	1.50	11.5
OTC	18.25	6.50	Sierra Semiconductor (L)	7.50	0.00	0.0
OTC	38.50	22.25	SynOptics	36.50	1.75	5.0
NYS	63.38	32.25	Texas Instruments	61.50	4.25	7.4
OTC	8.88	6.00	VLSI Technology	7.00	0.25	3.7
OTC	7.63	2.13	Weitek	6.75	0.50	8.0
ASE	9.63	4.13	Western Digital Corp.	5.25	0.50	10.5
OTC	37.50	14.50	Xilinx	34.88	2.88	9.0
OTC	27.84	12.50	Zilog Inc.	22.00	1.75	6.9
PERIPHERALS AND SUBSYSTEMS						Up 1.1%
OTC	33.75	11.75	American Power Conversion	31.50	4.75	17.8
OTC	20.16	13.06	Banctec Inc.	19.00	-0.25	-1.3
OTC	18.00	6.25	Cambex Corp.	6.50	-1.00	-13.3
ASE	18.38	6.50	Cognitronics Corp.	7.38	-0.13	-1.7
NYS	25.50	12.00	Conner Peripherals (L)	12.50	0.13	1.0
OTC	38.50	10.75	Creative Technologies Inc.	28.63	2.63	10.1
OTC	30.75	14.25	Data Race Inc.	22.00	2.00	10.0
ASE	17.00	4.75	Databank Corp.	9.50	0.25	2.7
NYS	33.50	9.50	EMC Corp (H)	33.50	2.00	6.3
OTC	10.50	5.38	Emulex Corp.	6.50	-0.13	-1.9
OTC	19.00	13.25	Evans & Sutherland	16.63	0.00	0.0
OTC	35.75	12.00	Exabyte	14.13	-1.13	8.7
OTC	26.00	7.09	Intelligent Info. Systems	23.00	0.75	3.4
OTC	8.88	3.88	Iomega Corp.	4.63	-0.38	-7.5
OTC	22.75	5.75	IPL Systems Inc.	9.00	1.75	24.1
OTC	24.00	10.75	Komag Inc.	19.25	2.00	11.6
OTC	19.63	5.88	Maxtor Corp.	6.63	0.38	6.0
OTC	11.25	5.75	Microbotics Corp.	7.50	1.00	15.4
NYS	116.00	93.00	3M Corp	113.88	1.63	1.4
OTC	7.75	4.00	Printronix Inc.	6.88	-0.50	-6.8
NYS	17.25	6.88	QMS Inc.	15.13	0.38	2.5
OTC	17.88	11.63	Quantum Corp.	13.88	0.13	0.9
OTC	12.75	3.38	Radius Inc.	4.00	-0.13	-3.0
NYS	16.25	7.50	Recognition Equipment	14.00	0.50	3.7
OTC	13.88	4.50	Reton Inc. (L)	5.75	-0.38	-6.1
OTC	22.38	12.00	Seagate Technology	15.50	0.50	3.3
NYS	40.88	18.00	Storage Technology	36.38	8.63	31.1
NYS	27.88	16.88	Tertronix Inc.	26.50	1.13	4.4
NYS	88.88	66.75	Xerox Corp.	74.50	-2.13	-2.8
SERVICES						Up 1.4%
OTC	23.75	14.25	American Mgmt. Systems (H)	19.75	1.25	6.8
NYS	4.75	3.00	Anacomp Inc.	3.00	-0.50	-14.3
OTC	35.75	16.25	Analysts Int'l	26.25	-0.25	-0.9
NYS	56.13	38.75	Auto Data Processing	49.50	0.00	0.0
NYS	17.25	9.84	Ceridian Corp.	14.50	-0.25	-1.7
NYS	17.38	13.13	Compisco Inc.	15.13	-0.38	-2.4
OTC	8.00	4.50	Computer Horizons	7.75	0.25	3.3
NYS	80.50	57.00	Computer Sciences	72.38	-0.75	-1.0
NYS	9.63	6.75	Computer Task Group (L)	7.25	0.00	0.0
NYS	40.50	22.00	CompUSA Inc.	31.25	1.38	4.6
OTC	17.50	6.00	Corporate Software	12.00	1.00	9.1
OTC	24.25	7.38	Egghead Discount Software	9.25	0.88	10.6
NYS	35.88	25.25	General Motors E (EDS)	31.38	0.00	0.0
OTC	25.50	9.25	Ingram Corp.	17.88	1.75	10.9
OTC	15.38	6.25	Intelligent Electronics	14.88	1.25	9.2
OTC	14.00	6.63	Merisel	11.00	0.50	4.8
OTC	14.75	5.75	Microage Inc.	13.38	0.13	0.9
OTC	43.00	21.75	Paychex	38.00	-0.75	-1.9
NYS	87.25	37.00	Policy Management Sys.	45.00	4.88	12.1
NYS	37.88	16.81	Reynolds and Reynolds (H)	37.88	3.38	9.8
OTC	32.00	22.00	SEI Corp. (H)	32.00	3.50	12.3
OTC	24.38	16.88	Shared Medical Systems	20.13	-0.25	-1.2
OTC	13.88	5.75	SHL Systemhouse	11.75	0.75	6.8
OTC	29.25	18.25	Software Spectrum Inc.	26.50	3.13	13.4
OTC	33.75	22.25	Sungard Data Systems	29.00	0.13	0.4
NYS	4.00	1.13	Ultimate Corp.	3.25	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

CSC profits up

Computer Sciences Corp. posted fourth-quarter net profits of $26.1 million, up 10% from the same period last year. Revenue was up marginally to $650 million. For the year, the El Segundo, Calif., systems integrator earned $78 million on revenue of $2.4 billion, increases of 15% and 17%, respectively, from a year earlier.

Informix acquisition

Informix Corp. last week agreed to acquire 15% of application tools vendor Intellicorp in Mountain View, Calif., for $200 million. The deal will give the San Jose, Calif., database vendor better access to Intellicorp's computer-aided software engineering and object-oriented tools. Intellicorp, a once high-flying expert systems company, will get needed cash and credibility. It has been looking for an investor since early last year, when a merger with KnowledgeWare, Inc. fizzled.

Symantec to buy firm

Symantec Corp. in Cupertino, Calif., has agreed to acquire Contract Software International, Inc., a Carrollton, Texas, developer of contact management software, for $40 million in stock. The deal, which is expected to be consummated next month, would broaden Symantec's reach in the growing sales productivity and mobile professional market.

SHORT TAKES IBM tapped Chrysler Corp. Chief Financial Officer Jerome B. York to become its new CFO.... Kalpana, Inc. has received $9.1 million in mezzanine financing.... Sapiens International Corp. in Cary, N.C., has agreed to acquire SmartStar Corp., a client/server tools developer in Goleta, Calif.

Bachman bets on full make-over

Mainframe CASE firm struggles to get a handle on client/server, PC worlds

By Kim S. Nash
BURLINGTON, MASS.

Bachman Information Systems, Inc. is twisting through some painful gyrations as user exasperation with CASE and tough competition from young development tool vendors force the company to remake itself.

The traditionally mainframe-reliant firm has lost money for the past three quarters (see chart) and cut 15% of its staff. It now hopes a recent reorganization and several downsizing products will lift the dark clouds.

Thus far, the results are so-so, according to both users and analysts.

Like other computer-aided software engineering (CASE) firms, such as KnowledgeWare, Inc., Bachman now has two mandates: break into the client/server circle with point-and-click, PC-based products, and support users' continuing mainframe development [CW, May 3]. But Bachman's financial troubles — combined with a tumultuous market full of eager development tool makers — have made users cautious.

Jim Knisley, database engineer at The Forethought Group, Inc., said he will delay making a decision about a client/server development platform until the market settles down.

Overall, Knisley said he is happy with the two Bachman tools he has used for more than two years, saying he will keep them for mainframe development.

Decisions, decisions

But 1993 will be a pivotal technology year for the Batesville, Ill., insurance firm, which plans to add Unix-based servers and databases but has yet to decide which ones.

That means development choices are up in the air, too.

"A shakeout is coming. We're in no rush," Knisley said. That attitude has eaten into Bachman's sales, acknowledged Alan Sarasohn, vice president of North American operations.

It is no comfort, either, that Chief Operating Officer Bob Hughes resigned in March after four months on the job, said Ed Acly, an analyst at International Data Corp. (IDC) in Framingham, Mass. Hughes, who left to "pursue other interests," according to a Bachman spokesman, will not be replaced; Chief Executive Officer Arnold Kraft has assumed Hughes' duties.

Alan Sarasohn, *Bachman VP of North American operations*

Bachman is not alone in its struggles or in its scramble to build and buy client/server development utilities. But Bachman's barrage of new products for non-IBM systems, such as Oracle Corp. and Sybase, Inc., confuses users, Acly said.

For example, Bachman is trying to address situations similar to Knisley's — which are growing in number — by teaming up with Powersoft Corp. to link Bachman's front-end tools to PowerBuilder, a Windows application generator. The link is due out next month, according to Sarasohn.

Bachman will not get into the generator business, he explained. Instead, it will build links to various code generators, such as "any that our customers desperately want to use," Sarasohn said.

Bold attempts

Other moves to break out of the IBM mainframe world include the following:

- Acquiring WindTunnel Software, Inc. puts Bachman closer to having a Windows tool. WindTunnel's product lets developers take unfinished applications on a dry run to test performance and find design errors. However, no time frame has been announced for releasing WindTunnel products.
- Releasing Database Design Kit. The $9,500 kit is aimed at helping users remodel DB2 applications for Oracle, The ASK Group, Inc.'s Ingres and DB2/2 databases, among others, and it requires IBM's OS/2 2.0 and OS/2 Database Manager. Current customers can get the kit for $3,500.
- Unveiling DBA/Converter for SQL Server. Priced like Database Design Kit, the product was designed to bring Bachman data structures into Sybase databases. Oracle, ASK and Informix Corp. converters are due this quarter.

Behind the pack

Bachman's new tools are playing catch-up with users who are shifting development priorities to client/server systems, observers said. If the first wave of client/server tools took Bachman by surprise, the company is now walking down the right path.

However, Bachman has to put forth a clearer message, according to Acly, who said Bachman's spray of links to other vendors' products seems haphazard. "That's not to say that they can't [be successful in client/server], but they have to find a niche," Acly said.

And while Bachman searches for that pocket, 1993 is make-or-break time, the IDC analyst predicted. The company has to continue to rein in operating costs, especially now that it is no longer buoyed by the IBM AD/Cycle partnership in the U.S., Acly said.

Strong support

Customer support generally was not hurt by Bachman's layoff of 50 of its 340 employees worldwide late last year, users said. Bachman recently won Sentry Market Research, Inc.'s user choice award for best support in the computer-aided software engineering business. Alan Sarasohn, vice president of North American operations, said he expects no further layoffs at the company.

Chips are down

BACHMAN IS HOPING ITS TOOLS STRATEGY WILL EVENTUALLY REINVIGORATE ITS BOTTOM LINE

Bachman financials

FY 91 Revenue	FY 92 Revenue*	Q1 — Q3 93 Revenue
$31.6M	$47.9M	$26.2M
$2.36M	$2.79M	$(16.1)M

*Includes IBM's $2.3 million purchase of Bachman products
**Includes a $1.8 million restructuring charge

Source: Bachman Information Systems, Inc.

On track

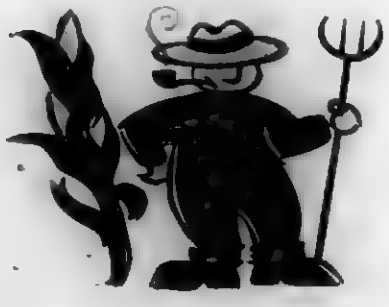
In late 1992, Bachman's board enlisted investment banking firm Morgan Stanley Group, Inc., which backed Bachman's 1991 initial public offering "to look at [financial] alternatives to get us back on track," said Alan Sarasohn, vice president of North American operations. The company rejected a takeover bid by another firm; Sarasohn denied KnowledgeWare was the secret bidder, as has been rumored.

Bad blood?

IBM invested $25 million in KnowledgeWare products in mid-1992, about the same time it agreed to buy just $2.3 million worth of products from Bachman. Some observers said Bachman had fallen out of favor with IBM. KnowledgeWare's "$25 million deal means something," said IDC analyst Ed Acly. Bachman, which left IBM's AD/Cycle inner circle in the U.S. in January, denied there was bad blood. Bachman exited AD/Cycle because IBM's client/server direction was too Blue, officials said.

Wysiwyg

IF you were not in computers, what would YOU have done FOR A LIVING?



Dick Pick, president of Pick Systems, bred horses and worked on a dairy farm while growing up, so he says he could have seen himself taking that experience and becoming a farmer on a large produce farm. But computers entered his life, and he's been happy tending to technology for the past 30 years.

Harry Saal, CEO and president of Network General, could have been the next Al Unser, had he been introduced to race car driving earlier in life. Saal began race car driving two years ago. He took lessons and bought himself an NSX race car. He claims he hasn't won a race yet because he is still mastering his skills. Saal can be found racing at the Sears Point Race Track and the Laguna Seca Race Track in California.

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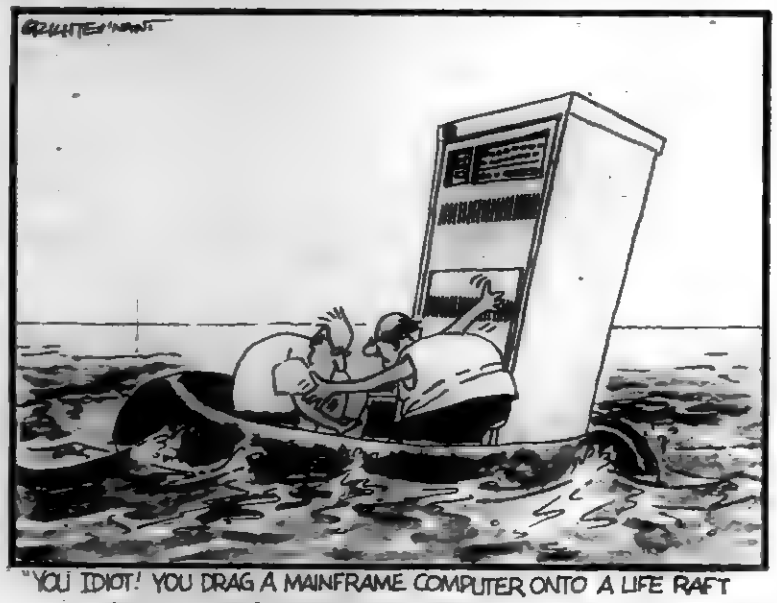
The Fifth Wave *by* Rich Tennant



"YOU IDIOT! YOU DRAG A MAINFRAME COMPUTER ONTO A LIFE RAFT AND YOU FORGET TO BRING A SURGE PROTECTOR?!"

Inside Lines

Remotely annoying

Early users of the recently released remote version of Lotus' CC:Mail who take their notebooks on the road and slip them into docking stations at the office are finding that they have to keep two copies of the mail package on their hard drives — one for the road and one for the office. The problem, according to one user, is that the remote version was designed to be used over a modem and doesn't retain a network connection. To send and receive messages conveniently from the desktop, users need the traditional CC:Mail. Additionally, messages read and disposed of on the road show up as unread when the user returns to the office. A CC:Mail official said Lotus is working on a fix for next year.

Work flow gone awry

Action Technologies — the company that sold Message Handling Service to Novell and received a lot of ink in the past year for its work-flow addition to Lotus' Notes (expected this summer) — recently laid off about 25% of its 100-plus staff, including Fritz Dressler, director of marketing. Troubles include heavy work-flow research and development costs and an embryonic market. Additionally, Action Technologies' relationship with Lotus is cooling: Lotus backed away from plans to resell Action Technologies' work-flow engine. Also, Action Vice President Brownell Chalstrom recently left the company only several months after he had transferred there from the Notes division of Lotus. Reportedly, Chalstrom's opinion on Action's direction differed from that of management.

A GUI mess

It looks like the copyright infringement suit Apple slapped on Microsoft and Hewlett-Packard five years ago may finally be coming to a head. Last week, a federal judge said the case will go to trial on June 28 in San Francisco. Apple attorneys even hinted that they may call Microsoft CEO Bill Gates to the stand.

Staying put

DEC users of Computer Associates' DISSPLA graphics software, disgruntled by encrypted code that shuts off software if licensing terms are abrogated, are not in for the relief recently given to mainframe users [CW, March 15]. CA officials said they have "no plans" to change the encryptions in the applications, which they said were present in the software before it was acquired.

Decked out

DEC plans to ship the company's EISA-based PC platforms with PCMCIA slots later this month. These EISA-based platforms are an addition to the company's MTE family of PC servers, sources said. They are expected to be bundled with 120M- or 240M-byte hard drives, S3 local bus video and SCSI support.

Stand clear

Personal digital assistants will provide a breeding ground for infrared data transfer, sources say. The Zoomer, from Tandy and Casio, will have built-in infrared to do point-and-click data transfer, as will Apple's Newton, sources close to the projects said.

There hasn't been a whole lot to cheer about over at Data General lately, but a battle of the bands contest at LotusWorld brought out the DG faithful. Cheering DG supporters, led by DG founder Ed deCastro, helped the members of the Talking Propellerheads win top honors at a charity benefit for Common Ground, which raises money for disadvantaged children. Losing bands included Citadel, made up of DEC employees, Outta Bounds, consisting of Computervision employees, and Look and Feel, which drew members from Lotus, Mathsoft, Tom Synder Productions and Humans Research. Although Look and Feel didn't win, its members consoled themselves by reminding the crowd that they were the only band drawn from profitable companies. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 70537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 620-8555.

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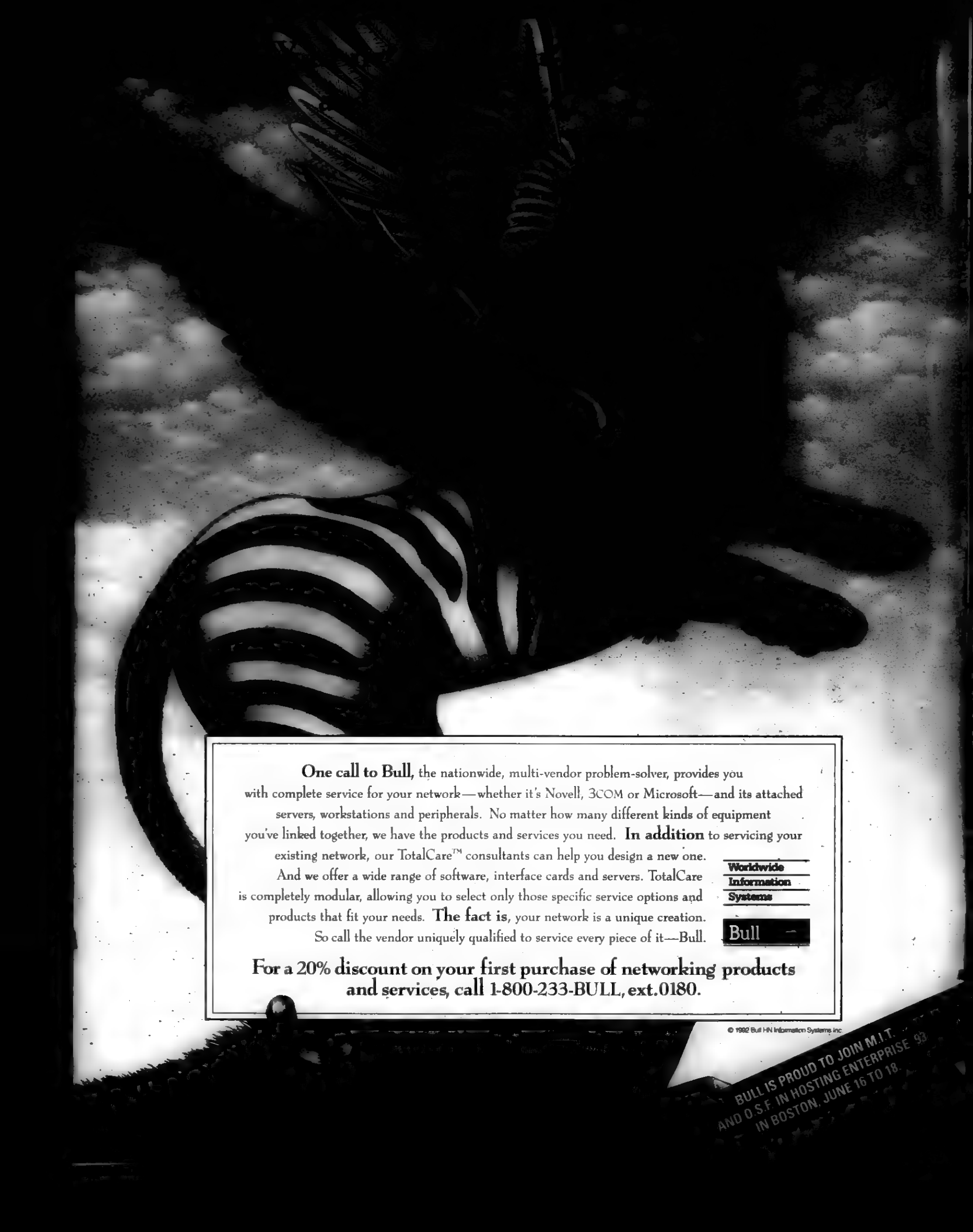
THE STORAGE ARCHITECTS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COMPUTERWORLD

Inside

INFO HIGHWAYS
Cable TV's wide pipes are opening up to data transfer needs, a situation that could offer users lower costs and more options. *Page 1*

HANDHELD COMPUTING
The American Stock Exchange is taking a unique approach to using handheld computers by purchasing off-the-shelf equipment at a fraction of the cost spent by its rivals. Amex has one pilot under way for options trading and is planning a June pilot for equities trading. *Page 6*

OLTP MONITOR
NCR unwrapped Top End Release 2.0, an upgraded open systems transaction processing monitor that includes LU6.2 connectivity and is the first to provide 3270 support. *Page 21*

IN DEPTH
Vendors used to deliver technology every three to five years; now it is every 12 to 18 months. To cope with this change, IS must adapt to continuous learning and rely more on users. *Page 89*

Vendors get caught up in middle(ware)

By Elisabeth Horwitt
BOSTON

■ A newly formed vendor consortium is ready to take on both the Open Software Foundation and wary information systems managers. It hopes to prove that message-oriented middleware is the optimal foundation for distributing many business-critical applications across heterogeneous environments.

Seven leading players got together last week under the newly formed umbrella of the Message Oriented Middleware consortium to determine how, in one spokesman's words, "we can convince users that Oracle or [the OSF's] DCE is not the way to go."

Middleware products in general were designed to take care of the communications chores involved in distributed applications. This includes translation among different operating systems and networking environments. They also provide management services to ensure that queries and responses get to their destinations.

Such products are beginning to catch on as users get more and

Middleware, *page 12*

RISC start-up taps NT

Netpower offers low-cost alternative to Pentium boxes

By Mark Halper
SUNNYVALE, CALIF.

The former head of Mips Technologies, Inc. has resurfaced as chairman of a start-up that plans to market RISC workstations based on Mips' chips and running Microsoft Corp.'s Windows NT.

The company, founded by Robert Miller, joins a growing list of reduced instruction set computing workstation suppliers that will try to rival PC vendors in selling NT desktop systems and servers to corporate users once Microsoft makes the operating system available later this year.

Netpower, Inc. has scheduled its coming out to coincide with Microsoft's anticlimactic NT introduction at Comdex/Spring '93 next Monday, sources close to Netpower said. Netpower plans to start shipping products comparable to Intel Corp. Pentium-based systems running Windows NT this fall, the sources added.

Pricing for Netpower's line is expected to start at $4,000 to $6,000 for a model rated at about 55 SPECint with 16-bit color graphics, 16M bytes of random-access memory, 200M bytes of hard disk storage and CD-ROM support. The top of the line is expected to offer 24-bit color, three-dimensional graphics, 32M bytes of RAM and 500M bytes of hard disk storage.

PCs based on Intel's Pentium processor running NT are expected to sell at prices starting at about $5,000.

Analysts were quick to note that, except for a niche market of power-hungry users, Intel will have an early advantage. That is because of the widely established software base already running on Intel machines that use MS-DOS and Windows.

"For two times the power, I'd take a look at RISC, but only if I were a speed demon power user," said analyst David Card at International Data Corp. "For 10 times the power, I'd take a real good look at it."

Netpower will position the low end as a desktop workstation for design and financial analysis and will market the high end as a network, application and database server and a high-performance workstation.

Officials at Netpower declined to comment on

RISC start-up, *page 14*

Powering up

Netpower founder: Bob Miller, former Mips chairman.

Base: Sunnyvale, Calif.

Financing: $6 million to $7 million, the bulk from venture capitalists and the balance from co-founders, Silicon Graphics and Stanford University.

Product: Mips-based workstations running Windows NT to compete against Pentium-based NT machines.

Price: Around $5,000 for an entry-level system.

Manufacturing: Working with Acer in Taiwan.

DHL hits client/server turbulence

CIO leaves over strategic revamp of downsizing plan

By Elisabeth Horwitt
SAN FRANCISCO

Two and a half years after he was hired to re-engineer DHL Airways, Inc.'s information systems organization, Michael Lanier quietly resigned last month. The chief information officer left after it became clear that major pieces of the distributed client/server architecture he instigated were being canceled outright or relegated to the back burner.

"It seemed that priorities were becoming more focused on other infrastructure items, such as airplane acquisition and other investment opportunities," said Lanier, who is now consulting for DHL.

Michael Lanier: *'Priorities were becoming more focused on other infrastructure items'*

Lanier said that while the rest of the package-handling industry has been "going full tilt toward client/server," few companies, if any, have succeeded in implementing such systems on a global basis.

Before he left, Lanier had completed the design and testing of a client/server architecture that consists of IBM RISC System/6000 servers and a variety of client workstations residing on

DHL, *page 16*

Cross-platform planning

Apple details open approach

By James Daly
SAN JOSE, CALIF.

Apple Computer, Inc., whose Macintosh interface once attracted the sharpest software developers in the business, last week fought to retain those loyalties at a developer's conference peppered with bullish forecasts, major strategy shifts and provocative new technologies.

Apple Chairman John Sculley told developers that his company is transforming itself into a more diverse business that will be better able to address the needs of mobile, cross-platform users. He is trying to divert developers from the potent lure of writing to widely installed Microsoft Corp. and Intel Corp. platforms.

To that end, Apple executives promised to bury the company's proprietary scepter. Senior Vice President David Nagel announced that "no major technology will be introduced from Apple

Apple, *page 8*

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CLIENT/SERVER

DHL Airways' new CIO is less bullish on client/server architecture than his predecessor, who has quietly stepped down. *Cover 1.* Managers building distributed systems are searching for just the right strategy for dealing with data from legacy systems and how to blend that data with data residing on new systems. *Page 65*

WORKSTATION WARS

The latest round in workstation pugilistics has **Sun** unveiling a desktop symmetrical multiprocessor box capable of anchoring a multigigabyte relational database. **IBM**, meanwhile, is expected this week to announce seven RS/6000 workstations targeting niche applications. *Page 14*

NT PLATFORMS

Microsoft will unveil Windows NT next week, but box makers are already hawking their platforms. As **Mips Technologies** and NEC introduce a 64-bit R4200 microprocessor aimed at providing Pentium-class performance for an NT notebook *(Page 15)*, former Mips Chairman **Robert Miller** resurfaced at a start-up that is marketing a Mips-based workstation running NT. *Cover 1.* As **DEC** gears up for a **Comdex/Spring '93** launch of its NT-based Personal Systems Series, a slow ramp-up for **Intel's Pentium** breeds hardware vaporware and a better 486 market. *Page 4.*

NETWORKING

IBM SNA users trying to link LANs into a central host get a more fitting design from **CrossComm. Cisco** hones routing algorithms on its routers to give greater control and performance over growing internetworks. *Page 12*

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Cable TV's wide pipes opening to data transfer

By Lynda Radosevich
MAYNARD, MASS.

■ Digital Equipment Corp. and internetworking start-up LANcity Corp. will announce today an Ethernet bridge that will allow computers to communicate across 70 miles of existing cable television wiring. With interconnecting bridges, the connections can span even further.

The bridge is being used by end users and cable TV companies in several pilot projects around the country. DEC said it is talking with most major cable TV companies, including Time Warner, Inc. and Tele-Communications, Inc., about offering Ethernet connectivity services.

One of the main benefits the cable TV infrastructure offers to information systems managers is abundant bandwidth, ubiquity and public access because the cables already pass by more than 95% of homes and businesses, according to the National Cable Television Association in Washington, D.C.

Additionally, opening cable TV channels to native network-speed data transfer will mean more choices and lower prices for end users, according to analysts.

"Just as the long-distance market saw dramatic reduction in prices after deregulation in 1984, this will drive down local-exchange prices over the next five years because of increased competition between cable companies, the regional telephone companies and competitive access providers," said Rob Rich, director of public network equipment and services at Dataquest, Inc.'s Framingham, Mass., office.

Cable companies, however, said it was too early to lay out pricing plans.

Many options, many users

Applications for Ethernet over cable TV cabling will include interactive video, teleconferencing, group medical imaging or simply higher speed data transfer, according to DEC. Initial users will include city and local governments, educational organizations, health care providers and businesses.

For example, the city of Worcester, Mass., is linking its school, fire, police and city administration networks using the local cable TV infrastructure and DEC's Channelworks Ethernet bridges.

The flagship application will be a geographical information system that comprises information from all departments.

"We looked at cable TV, fiber and options with the phone company. What brought us to cable was the price and the 10M bit/sec. transmission speed, which is the throughput we need," said Ricardo Valdes, project director of the IS department.

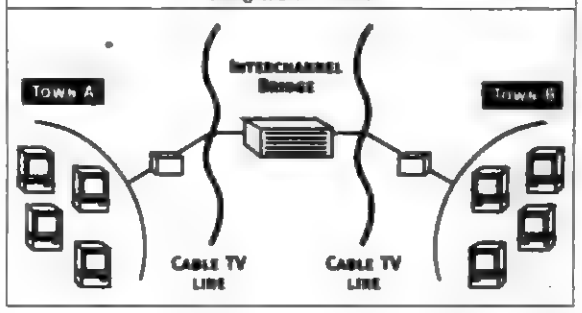
For the Huntsman Chemical Corp., a $1.3 billion producer of plastic resins and polymers in Salt Lake City, selling videoconferencing to capital planners would be a lot easier if the cost of the associated bandwidth was less using cable TV, said Redge Cook, MIS manager.

Pricing is just one hurdle they must overcome to attract network users. Other hurdles include a perceived lack of reliability and recognition in the data networking market. Partnering with DEC could help the latter issue, Rich said.

Additionally, cable TV faces regulation by regional commissions, said Brian Moir, legal counsel for the International Communications Association and partner at Fisher, Wayland, Cooper and Leader in Washington, D.C. However, he said he expects local regulations will not

Building bridges

DEC's Ethernet bridge links networks across communities using cable TV lines



CW Chart: Ismell Genovese

Corrections

- Due to an editing error, a statement attributed to Jeff Elperer at Machine Independent Software Corp. in the May 10 issue was garbled. Elperer said source code implementations yield better performance than do binary code.
- A news brief in the May 10 issue misstated the value of Informix Corp.'s 15% equity interest in Intellicorp. The correct figure is $2 million.
- Due to a reporting error, a story on Bachman Information Systems, Inc. incorrectly stated that products from WindTunnel Software, Inc. are not available. Bachman is currently reselling and supporting WindTunnel development tools.
- Due to a typographical error, Contact Software International, Inc.'s name was misspelled in the May 10 issue.
- A product announcement in the May 10 issue incorrectly cited the name of Project Software & Development, Inc.

Groupware

WordPerfect offers groupware scheme

By Michael Vizard
SAN FRANCISCO

■ Looking to firmly establish a role in the rapidly emerging groupware arena, WordPerfect Corp. last week outlined an information systems architecture that revolves around WordPerfect Office 4.0 and system services provided by other vendors.

Specifically, WordPerfect executives said they plan to integrate applications that make use of WordPerfect Office with work-flow services provided in NetWare from Novell, Inc. and replication services in Lotus Development Corp.'s Notes database.

But because these services will not be tied into WordPerfect Office until the end of this year, the company still has a long way to go before it can be considered a major supplier of groupware software, said Krystyna Filistowicz, an industry analyst at Dataquest, Inc.

In particular, she noted that the Orem, Utah, company has thus far only alluded to delivering a document management system and is relying on third-party developers to deliver imaging applications.

Due early next month, WordPerfect Office 4.0 is the company's long-awaited groupware offering that combines electronic mail with a calendaring and scheduling facility.

"Providing electronic mail isn't enough anymore. You need to provide calendaring and scheduling that is tightly integrated with electronic mail," said David Clare, WordPerfect senior director of marketing for workgroup applications.

Oops

One of the major features of WordPerfect Office 4.0, according to company officials, is the "save your job feature": WordPerfect Office allows users to retract electronic messages after they have been sent.

"We're here today to take another stab at showing the world that we're more than just a word processing company," added WordPerfect Chairman Bruce Bastian.

Although WordPerfect already has 2 million WordPerfect Office users, the arrival of WordPerfect Office 4.0 will mark the first time the company has bundled calendaring and scheduling software with E-mail.

According to Bradley Boyt, systems manager at Baylor University in Dallas, the major benefit of the WordPerfect approach is that a single directory service can function as the user name and address database for both E-mail and scheduling applications.

Taking advantage

In the short term, Clare said WordPerfect will leverage the fact that WordPerfect Office is the only offering that runs on DOS, Windows, Macintosh and Unix platforms, supports a variety of SQL databases and is aggressively priced. In addition, Clare said a NetWare Loadable Module version of WordPerfect Office will be available this summer.

But Filistowicz noted that Microsoft Corp. has committed to making its Windows Application Programming Interface available on Unix and the Apple Computer, Inc. Macintosh, which means that WordPerfect's multiplatform strategy may be only a short-term advantage once Microsoft begins to expand its fledgling groupware effort sometime in 1994.

Partly with Microsoft in mind, Clare said WordPerfect has priced its product aggressively to compete with E-mail systems that do not have calendaring and scheduling.

WordPerfect Office server software is priced at $295. A client pack, which supports five users, is priced at $495. Also, WordPerfect is bundling the client software for its WordPerfect InForms electronic forms software free for 90 days.

Visual Basic gains access

Development tool gets database links

By Christopher Lindquist
REDMOND, WASH.

Microsoft Corp.'s latest version of Visual Basic blurs the line between the graphical development tool and the Access database by providing increased, easier-to-implement database functionality.

Microsoft said it hopes the result will be a product that crosses over from an easy-to-use tool for stand-alone applications to one that is a full-scale client/server development environment.

Microsoft also said it expects initial Visual Basic 3.0 interest from developers trying to connect Visual Basic applications to a variety of databases — a task that, while possible, was sometimes daunting with previous versions.

Visual Basic 3.0 *eases the building of database applications*

To make database connectivity easier, Visual Basic 3.0 includes the Microsoft Access Version 1.1 Engine, through which developers can retrieve data from a variety of back ends, including Access, Borland International, Inc.'s dBase and Paradox, SQL Server and Oracle Corp.'s Oracle. The engine also supports Microsoft's Open Database Connectivity interface for connection to other host systems.

The advantage of combining Visual Basic with the Access Engine, according to Microsoft group product manager Thomas Button, is that users get full database functionality with general-purpose development tool flexibility.

That connectivity may prove useful to at least one Visual Basic beta-test user, who said he plans to put Visual Basic 3.0 and Access on a laptop that can then go to an end-user location for requirements analysis. The interfaces could be developed quickly with Visual Basic and tested against Access, said Jim Clark, a systems analyst at California's Sacramento Municipal Utilities District.

The developer could then go back and finish developing the application by detaching the Access tables and reconnecting the Visual Basic interface to SQL Server tables on a host, resulting in a decrease in the time to prototype, create and test applications.

"We're faced with trying to release applications within a reasonable time constraint before the requirements change," Clark said. The means of implementing data tables in Visual Basic are also much improved, he added.

Other enhancements include Database and Table objects, as well as "data-aware" controls that can be used to access and manipulate data from within Visual Basic applications.

The announcement of Visual Basic 3.0 comes barely seven months after the shipment of Version 2.0 and coincides with Microsoft's unveiling of the Object Linking and Embedding (OLE) Version 2.0 developer's kit [CW, May 3]. The timing is significant: Visual Basic 3.0 is also intended to be the "glue" that will attach OLE 2.0-compliant applications together via OLE 2.0 Automation.

Visual Basic will allow developers to manipulate applications via object-oriented OLE 2.0 interfaces, effectively functioning as a common macro language.

It will be some time before there are significant OLE 2.0 applications to control.

Visual Basic 3.0 is due next month for a list price of $495.

Borland prices suite to move, ups ship date

By Michael Vizard
SCOTTS VALLEY, CALIF.

In a bid to aggressively grab market share in a category dominated by Microsoft Corp., Borland International, Inc. last week announced a 90-day introductory price of $399.95 for its Borland Office application suite.

In addition, Borland began delivering Borland Office several weeks ahead of its previously announced schedule.

At $400, Borland Office includes the Paradox for Windows database; the Quattro Pro for Windows spreadsheet, which includes a graphics capability; and a modified version of WordPerfect Corp.'s namesake word processing package. The modified version of WordPerfect allows files to be merged between WordPerfect and Quattro Pro.

Borland Office is priced about $550 less than the version of Microsoft Office that includes the Access database, Word word processing program, Excel spreadsheet, PowerPoint presentation graphics software and electronic-mail client software [CW, May 10].

The hub of Borland's overall effort to compete with Microsoft is Paradox for Windows. Borland is slated to deliver a SQL interface for Paradox this summer that will allow Paradox to function as a front-end query tool for multiple relational database offerings. In addition, Borland has already provided an Integrated Database Application Programming Interface (IDAPI) that allows applications to make calls to navigational databases such as dBase IV and SQL databases.

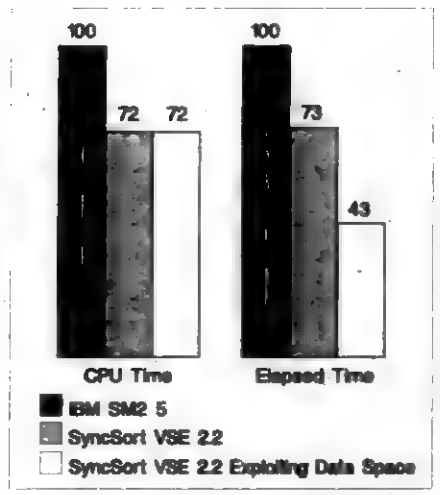
With these interfaces in place, Borland expects to be able to leverage Borland Office sales at sites that have developed custom client/server applications using Paradox and dBase IV.

According to Vince Casarez, Borland product manager for Windows, more than 5 million developers are currently creating applications on top of PC databases from Borland. "The SQL and IDAPI interfaces will give us a way to move these people into client/server development," Casarez said.

This means that in the short term, Borland expects to compete directly with Powersoft Corp. and Gupta Corp., while in the long term Borland will add more robust features to its tools to compete with fourth-generation language providers such as Cognos Corp., Information Builders, Inc. and SmartStar Corp., he said.

Users of a DOS or Windows office automation application can upgrade to Borland Office for $299.95.

HERE'S WHERE WE LEAVE THE COMPETITION.



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Next-generation PCs

Pentium dearth slows system delivery

By Michael Fitzgerald

Today's announcements of Pentium-based systems will breed hardware vaporware, as most users will be unable to get systems until the fourth quarter.

Demand will not drive the delay, as it has in the 386/486 market. Rather, Intel Corp.'s inability to produce chips in any quantity is what will slow system delivery. Pentium chips, which are about as easy to find as the proverbial hen's tooth right now, can be found in systems from a few large vendors as of today, but only for their most prized customers. Smaller vendors will simply have to wait.

"All that's going on right now is flag-waving by the vendors who can get chips," said Richard Zwetchkenbaum, analyst at International Data Corp. (IDC) in Framingham, Mass. IDC forecasts that only 80,000 single-processor Pentium PCs will ship in the U.S. this year.

The hardware delays may map nicely with the coming of 32-bit application software. While Pentium will improve the performance of today's software, applications will need to be recompiled to achieve performance differences. Still, users will not gain the full benefit of Pentium performance until software vendors recompile their applications for the chip.

While Intel has worked hard to speed the recompiling process, major application vendors contacted last week said they would probably optimize software for Pentium in the course of updating products to work in 32-bit operating environments such as Microsoft Corp.'s 32-bit Windows or Windows NT.

"It makes sense to include Pentium code scheduling as part of our standard development for the 32-bit environment since that appears to add value for 486 users, and it doesn't hurt the 386 too much," said Alex Morrow, general manager of cross-product architecture at Lotus Development Corp. "But you don't get the value from just recompiling current 16-bit applications for Pentium."

Neutral parties

Many users are indifferent to the wait, saying they need to test systems before implementing them anyway.

"We'll run it through tests for a while," said Kenneth Lomasney, president of Market Knowledge, Inc., a research firm in Oak Brook Terrace, Ill., that will get an early Unisys Corp. box.

"Even a 30% performance increase will let us do more and move what have been traditionally large applications down to smaller systems. We think Pentium will have a dramatic impact on our efficiencies, both internally and for other firms," Lomasney said.

Intel claimed a 66-MHz Pentium-based system will boost application performance by almost double a 33-MHz/66-MHz DX2 and eight times that of a 33-MHz 386DX.

Those few users who have seen Pentium systems have been impressed.

David Koptik, staff software engineer at Baxter Healthcare Corp. in McGaw Park, Ill., tested a Compaq Computer Corp. DeskPro/M running Pentium. "It screamed," Koptik said.

Most announced uniprocessor systems will range from $5,000 to $8,000 when they do appear, although Advanced Logic Research, Inc. announced a desktop system that starts at $2,495 (see story at left). Many vendors, however, said pricing would be set when they ship their systems or upgrade boards. Some higher end multiprocessor configurations will cost tens of thousands of dollars.

Pentium products

A number of vendors will mark the availability of Intel's Pentium chip by announcing new product families or enhancing current lines. Notable among the announcements are the following:

- Digital Equipment Corp. last week began shipping a Pentium-upgradable line of PCs, making it the first vendor to include Personal Computer Memory Card International Association drives in a server. While the new DECpc MTE systems are 486-based, they will be Pentium-upgradable. DEC will also build the Video Electronics Standards Association's VL local bus into its PCs.
- Advanced Logic Research will go the low-price route, announcing today a base price of $2,495 for the Evolution V/60, a Pentium system with 8M bytes of random-access memory and no hard drive ($3,445 with a 340M-byte hard drive). The company will also announce the Evolution V-Q file server family.
- IBM PC Co. is expected to announce processor upgrade cards for its Server 295, Server 195 superservers and Personal System/2 Model 95 servers as well as for its Model 90 desktop.
- Compaq will introduce its DeskPro 5/60M and 5/66M desktops, which will start at less than $5,000, three new ProSignia configurations and a Pentium-based version of its SystemPro/XL. The company will also announce processor upgrade cards for its M, ProSignia and XL products.
- Dell Computer Corp. will introduce its 4000/XE servers, Pentium-capable systems initially based on the 486. Dell will ship these systems next month.

Compiled by Melinda-Carol Ballou and Michael Fitzgerald.

Chemical Bank names new CIO

By Nell Margolis

NEW YORK

Still in the throes of a so-far successful information systems consolidation following one of the largest mergers in the annals of banking, Chemical Banking Corp. has tapped one of its merger architects to spearhead the implementation.

Chemical's 1991 "merger of equals" with Manufacturers Hanover Corp. created a bank with $137 billion in assets and hugely redundant IS operations.

Denis J. O'Leary, 36, who rose quickly through Chemical's executive ranks to his current post as head of merger and strategic planning at the company's Regional Bank, will become the bank's chief information officer in two weeks. He succeeds executive vice president and chief technology officer Barbara D. Capsalis, who is resigning effective June 1 to pursue alternative career plans.

Denis J. O'Leary, *Chemical's new CIO*

Last week, as he prepared to take charge of an approximately 4,000-strong IS shop in mid-meld, O'Leary said maintaining the merger momentum would be one of his heftiest challenges.

A slew of IS initiatives undertaken to unite Chemical's and Manny Hanny's IS shops are on or ahead of schedule, O'Leary said. Most recently, the bank completed the IS consolidation of its approximately 402-location New York branch network, hooking in Manny Hanny's retail branch operations.

In addition, Joseph Ziskin, a consultant who studies technology leadership issues at the Ernst & Young Center for Information Technology and Strategy in Boston, said signals such as the bank's widespread use of Lotus Development Corp.'s Notes groupware indicate that "they realize the importance of building a skill base in the distributed computing area where [large-scale] banking is headed."

Such signals may be reassuring to those industry observers who question the wisdom of putting a nontechnologist at the helm of a huge IS operation at a time of extreme — and very fast-paced — technological change.

"If I could offer one piece of generic advice to Mr. O'Leary or anyone else about to become a bank's CIO," said New Orleans-based IS/banking consultant M. Arthur Gillis, "it would be this: Please, please do not follow the landslide of current advice that talks up business skills to the exclusion of technology smarts."

Ziskin conceded that "the perception that he's a businessman who downplays technology" could hobble a CIO. In the case of Chemical, however, he said he doubted that would happen. Citing Merrill Lynch & Co. and Nationsbank Corp. as instances of financial firms at which nontechie CIOs are earning high marks among industry observers, he noted that "the issue here isn't technology skills or business skills; it's leadership skills."

Windows NT systems push to begin at Comdex

By Melinda-Carol Ballou

MAYNARD, MASS.

Digital Equipment Corp. will go all out at Comdex/Spring '93 next week when Chief Executive Officer Robert Palmer and PC Vice President Enrico Pesatori preside over the official unveiling of the company's Windows NT-based Personal Systems series.

DEC will offer Microsoft Corp.'s NT on both Intel Corp.-based and Alpha reduced instruction set computing AXP-based platforms. The lineup of NT-based Alpha systems is expected to include two configurations.

An entry-level PC will have a 230M-byte disk, a monochrome monitor, 16M bytes of memory and an NT end-user license, with pricing at around $5,000, sources said.

A 150-MHz Alpha-based PC with SPECint92 of about 75 is expected to ship with 32M bytes of memory, CD-ROM, six Extended Industry Standard Architecture-bus slots in a tower with five bays. Pricing is expected to begin around $6,995, sources said.

"DEC's major task ahead is to communicate the advantages of Alpha over Pentium. . . . What they're saying is that they will give the customers a choice [of Intel or Alpha], but ideally they want to steer them toward Alpha," said Randy Giusto, an analyst at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H. [CW, May 10].

But DEC is doing well with applications — the company is expected to announce more than 250 packages that will ship for Alpha AXP by July, DEC sources said (see story page 38).

Meanwhile, all of its PCs — regardless of chip architecture — will be coordinated and marketed by the company's PC business group, DEC sources said.

Previously, the Windows NT PCs were handled by Vice President Bill Demmer's computer systems engineering group. DEC will use DECdirect, indirect sales channels and the growing muscle of its PC marketing organization under the leadership of Pesatori to market the NT-based PCs.

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News Shorts

Bank taps EDS for net management

Republic National Bank of New York last week struck a selective outsourcing deal with **Electronic Data Systems Corp.** under which EDS will take over management of the $17 billion bank's data and telecommunications networks. EDS also picks up responsibility for telecom equipment purchases and installation. The bank is in the process of consolidating its data centers.

High-tech council outlines 'Vision'

The Council on Competitiveness last week unveiled its "Vision for a 21st Century Information Infrastructure." The infrastructure is intended to enable all Americans to access information and communicate with one another easily, reliably, securely and cost-effectively in any medium — voice, data, image and video — anytime, anywhere.

Microsoft minces Word differences

As part of an overall drive to better integrate its applications, **Microsoft Corp.** announced last week that the next version of its Word word processing package for Windows will share about 90% of its code base with its Word for Macintosh offering. The two products will have the same file format, commands and look, and both will be numbered Version 6.0. The new version of Word will also support ObjectBasic, which is the common macro language that Microsoft is developing for its applications. In addition to upgrading Word for Windows, Microsoft also intends to deliver Version 5.0 of its Excel spreadsheet in the fall time frame, according to reports.

Banyan plans Solaris support

Banyan Systems, Inc. in Westboro, Mass., and **Sun Microsystems Computer Corp.** (SMCC) announced plans to port Banyan's Vines operating system to run with Sun Microsystems, Inc.'s Solaris operating system on its Scalable Processor Architecture-based computers. The agreement is similar to one announced between Banyan and Hewlett-Packard Co. two weeks ago, under which Vines will run on HP's Precision Architecture-RISC platforms.

Data-over-cellular matures

An updated version of the emerging Cellular Digital Packet Data (CDPD) specification was released last week. CDPD is endorsed by several carriers for transmitting data packets in the "blank" spaces of cellular voice conversations. The latest version, 0.9, provides specifications for functions such as security and network management. Contributing companies are reportedly expecting the final version, 1.0, to be released in July.

SHORT TAKES SMCC is in the market for a new president, as Sun Chief Executive Officer and President Scott McNealy relinquishes his role as acting president of the hardware subsidiary so he can focus on Sun's strategic direction.... **Digital Equipment Corp.** introduced the StorageWorks product line, including a StorageWorks redundant arrays of inexpensive disks subsystem, optical storage libraries for Small Computer Systems Interface and Q-bus-based systems and expansion cabinets for Alpha AXP-based platforms.... James C. Goetz, president and CEO at **Northgate Computer Systems, Inc.**, resigned as the company posted a $2.1 million loss on sharply lower revenue in its fiscal first quarter.... **Unisys Corp.** announced that F. Ron Jenkins has been named vice president of worldwide systems integration.

News shorts, *page 16*

Amex seeks wireless trades

Stock exchange hopes to benefit from generic handheld devices

By Thomas Hoffman
NEW YORK

The American Stock Exchange was not the first exchange to test the use of handheld computers in its trading pits when it began a pilot project late last month. But analysts said they believe Amex is taking a more pragmatic and cost-effective approach in using the wireless communications devices than its predecessors at the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange.

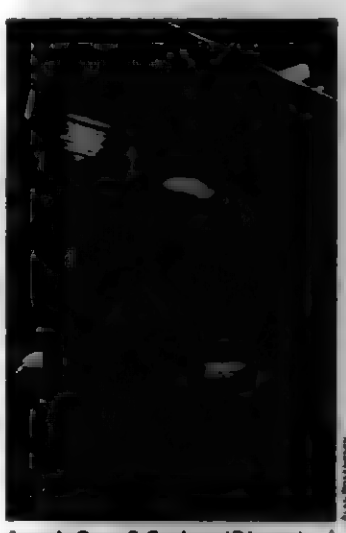
By conducting simple transactions with off-the-shelf equipment instead of the highly customized terminals used by its Midwestern peers, Amex is likely to avoid the expenses and problems experienced by the Chicago exchanges (CW, Feb. 10, 1992). For example, analysts said CBOT has struggled to deploy feature-rich terminals for parts of its trading environment under a four-year, $7 million prototype (see story below).

Meanwhile, Amex expects to spend less than $100,000 for a generic six-terminal prototype for Options Index trading that member Spear, Leeds & Kellogg is testing.

The end of paper

The project is the first in a series designed to make Amex a paperless trade floor. "For our member firms, the biggest benefit is to get real-time market position analysis," said Omer F. Soykan, director of technical planning at Amex.

"Starting out with cheaper and simpler systems is a good idea," said Kenneth Dulaney, vice president of mobile business strategies at Gartner Group, Inc. in Santa Clara, Calif. Dulaney, who worked with one of the dozen vendors that bid on the CBOT pilot, said that project became too complex. He said CBOT had asked the competing vendors to develop highly customized handheld devices, including certain features the vendors were not able to deliver in a 1-pound terminal.



Amex's Omer F. Soykan: *'Biggest benefit is to get real-time market position analysis'*

Amex targeted non-mission-critical applications for its handheld terminals after reviewing projects conducted by CBOT and other exchanges. "We're not out to solve all of our trading floor applications with handheld computing," Soykan said.

Spear, Leeds & Kellogg is testing six VP5 handheld terminals from Granite Communications, Inc. in Amherst, N.H. The terminals, which are linked to a Granite base station, are used by market specialists to transmit options trades to a PC-based risk analysis software system developed by Micro Hedge in Villa Park, Ill.

The pilot, which is expected to reduce the time and paperwork spent on options trading, should be completed by midsummer. Once full redundancy is incorporated into the Options system by early fall, the service will be offered to Amex's 19 Options specialist units. Amex's total options contract volume last year was 42.3 million.

On to equities

Next month, Amex will proceed with its second handheld pilot. Eight Lehman Brothers, Inc. brokers and clerks will conduct equities trades using Fujitsu-ICL Systems, Inc. pen-based devices and Grid Systems Corp. Palm Pads over spread-spectrum communications.

Stephen R. Schoenfeld, a managing director at Lehman Brothers who is responsible for all equities and options exchange floors and specialists operations at the firm, said he believes the wireless technologies will be considerably more cost-effective and faster than the paper-and-pencil trading mechanism that has been the status quo for the past 200 years.

"Faster speeds to our trading desks means faster communications to our customers," Schoenfeld said.

Soykan said the equities pilot should be completed by this fall and will be offered later this year to the 462 member firms.

Pitching 'pens' in the pits

Efforts begun in 1989 by the CBOT and the Chicago Mercantile Exchange (Merc) to investigate the use of handheld computers for trading have thus far received mixed reviews.

The pilots have been criticized by some analysts as lengthy, expensive and overly complex. But Dale Lorenzen, chairman of the CBOT handheld committee and a vice president at Merrill Lynch & Co., said the $6.8 million pilots are nearing completion and will eventually cut costs and increase productivity for the traders.

CBOT/Merc recently completed the first of two pilots, in which 70 traders used Spectrix Corp. keyboard and touch-screen-equipped handheld devices to input trades, ranging from soybean options to 10-year notes, directly to a central computer system using infrared communications. Those technologies will be matched against a current pilot testing pen-based handheld devices from Synerdyne in Santa Monica, Calif. The pen-based devices have complete handwriting recognition capabilities and run over spread-spectrum radio communications.

Currently, brokerages at the Chicago exchanges use keypunch operators after hours to enter paper-based trades, which are then transmitted to a clearinghouse for processing. Using wireless technologies, operators will no longer be needed, and trades will be rectified in minutes, Lorenzen said. "This should result in huge cost savings to our traders," said Lorenzen, who could not offer projected returns, even after four years of testing.

Lorenzen said a decision between the two communications formats and a hardware vendor will be made by the end of this month. He said production-ready systems will be rolled out by year's end.

—Thomas Hoffman

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W-CWX-930517

PowerPC delivery dates set

By James Daly

Apple Computer, Inc. and IBM last week said they will unveil within a year PowerPC microprocessor-based workstations.

The chip — produced through an alliance between Apple, IBM and Motorola, Inc. — could be used in computers that sell for as little as $3,000, analysts said.

Apple plans to incorporate the powerful reduced instruction set computing (RISC)-based microprocessor into a PC in the first half of 1994, while IBM is expected to have a PowerPC-based workstation by January, company officials said.

The first chip, the PowerPC 601, will be available in 50- and 66-MHz configurations, but Apple also demonstrated an 80-MHz version running on a Macintosh.

Application migration is not expected to be an issue. Apple Chairman John Sculley said the new PowerPC architecture will be 100% compatible with Apple's current line of Macintoshes based on the Motorola 68000 family of microprocessors. "It will be able to run native apps as well as existing apps without having to recompile code," Sculley said.

Apple officials also demonstrated at a developer's conference in San Francisco that existing Macintosh programs can work in such PowerPC-based systems at about the speed of the high-end Macintosh Quadra, a machine based on Motorola's 33-MHz 68040 processor. Native PowerPC applications are expected to run up to three times faster.

The 601 is the first of four planned PowerPC microprocessors and is targeted at low-end to midrange desktop systems, said Paul Ledak, microprocessor development manager for IBM technology products.

IBM and Motorola last week introduced the PowerPC Tools Catalog, which provides OEMs with a list of tools and products for building PowerPC-based applications and systems.

Models to follow will include the 603 for portable systems; the more powerful 604 for servers and high-end desktop systems; and the 620, a high-performance 64-bit microprocessor.

IBM, meanwhile, will sell both PowerPC and Intel Corp. Pentium-based systems. Ledak claimed the two product families will interoperate: The PowerPC will be IBM's high-end RISC line, while Pentium will run more desktop-oriented machines.

Apple officials said they also plan to offer upgrade boards for the Macintosh Centris 610 and 650, Macintosh IIVX and IIVI, Performa 600 and Quadra 800 systems.

Apple details open approach

CONTINUED FROM COVER 1

that won't have cross-platform, near simultaneous release." The announcement was met with enthusiasm from the roughly 3,000 developers in attendance, who are aware of the installed base disparity between 10 million Macintoshes and 25 million Windows-based PCs.

Developers said such cross-platform moves are crucial. "Apple is a realist. It has to be if it's going to survive," said Jeffrey Cherniss, executive vice president at Avanti Software, Inc.

Thus far, Apple's repositioning effort has been very ambitious. The Cupertino, Calif.-based firm is winding down the life cycle of its bread-and-butter Macintosh line and gearing up to replace it with a new PC line based on the PowerPC microprocessor (see story above).

Apple is also developing larger servers and handheld personal digital assistants. Sculley said he envisions all these disparate units tied together over a client/server network.

Apple's many tentacles sometimes muddy the waters for users. "It often seems as if Apple is going in too many directions at once," said Eric Joa, manager of information systems at BC Hydro in Burnaby, British Columbia. "I just hope they don't lose focus on the business needs of today while they're chasing down sexy technologies like Newton."

PowerPC plans

John Sculley boasted that Apple will ship 2 million computers based on the PowerPC chip in 1994. By contrast, analysts said only about 150,000 of Intel's Pentium chips are expected to ship this year.

John Sculley

Nagel also unveiled a technology called Amber that was designed to make it easier to write programs that will run on both Apple systems and machines running Windows.

Amber is a set of publicly available, object-oriented source code layers that developers can write to in order to interconnect applications. Currently, developers must rewrite code to run it on a different platform.

Sculley said Amber is an intermediary step to products from Taligent, the Apple/IBM joint venture charged with creating an object-oriented operating system. It will also compete with Microsoft's Object Linking and Embedding.

Amber code is expected to be seeded to developers by year's end, with Amber-generated products arriving by the middle of 1994.

Apple also announced that it is cooperating with IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and Unix System Laboratories, Inc. to put the Macintosh user interface on machines running Unix. The payoff, said Morris Taradalsky, general manager of Apple's Enterprise Systems Division, would be that programs written for the Macintosh would be able to run unchanged on Unix workstations.

Taradalsky said Apple will provide a free published set of application programming interfaces that would allow both Macintosh and Unix developers to tailor their products for client/server computing.

Kash n' Karry picks Sun, Siemens for POS project

After a year of intense evaluation involving seven vendors, Kash n' Karry Food Stores, Inc. in Tampa, Fla., last week announced the selection of Sun Microsystems, Inc. and Siemens/Nixdorf Information Systems, Inc. to develop its "Store 2000" project.

At an estimated worth of $10 million, the grocery chain's project involves a companywide rollout of open systems-based point-of-sale terminals and in-store processors to 115 grocery stores. Kash n' Karry's own object-oriented development tools gave the retailer an extra edge in bargaining with the vendors.

Sun and Siemens will have access to Kash n' Karry's object expertise, although details of the joint development work were not disclosed.

"About this time next year, Sun and Siemens are going to be exceedingly dangerous [to competitors] in the retail market," said Jim Stikeleather, director of systems development at Kash n' Karry.

—Maryfran Johnson

Symantec, Apple team on tools

PowerPC programming goal

By Garry Ray

CUPERTINO, CALIF.

Taking another step on its long march toward interoperable, cross-platform applications, Apple Computer, Inc. last week announced a variety of technology partnerships with development tools vendor Symantec Corp.

Last June the companies said they would co-develop Symantec's Bedrock application framework to allow simultaneous Apple Macintosh and Microsoft Corp. Windows software development. Last week they upped the ante by announcing plans to jointly produce a programming environment for Macintosh PowerPC systems.

"Apple will work with Symantec on native PowerPC development tools," said Steve Weyl, Apple's director of developer tools.

Bedrock is a C++-based application framework that includes preprogrammed application templates; components such as windows, buttons and menu bars; and functions for string handling, memory management and other activities. Developers can write application code to the Bedrock framework and then compile the code for deployment on Windows or Macintosh systems.

In addition, the two companies began to make good on earlier partnership announcements with last week's release of Symantec's C++ 6.0 for Macintosh.

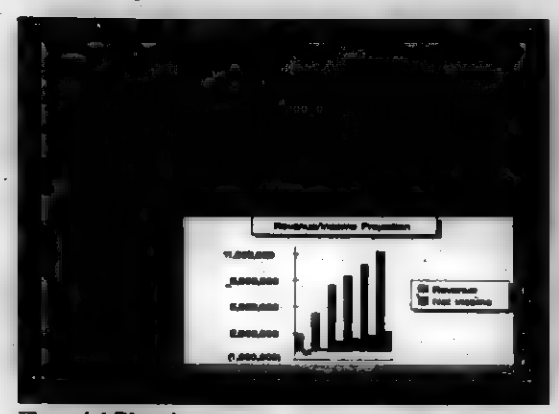
The compiler, which Symantec Executive Vice President Eugene Wang called "the first native C++ compiler for the Macintosh," includes Apple's SourceServer — a source code management system — and ToolServer, which provides access to the Macintosh Programmer Workshop (MPW), Apple's own application framework for Macintosh programming. MPW will be replaced by Bedrock for PowerPC application development next year, according to Weyl.

In addition to the partnership, Symantec announced an upgrade to its Think C compiler and a version of C++ specifically for MPW programming. The firm also delivered its Bedrock Architecture CD-ROM to the more than 3,500 developers attending last week's conference. The CD-ROM disk contains Bedrock documentation, C++ header files and sample programs, company officials said, and is available free of charge to registered Bedrock developers.

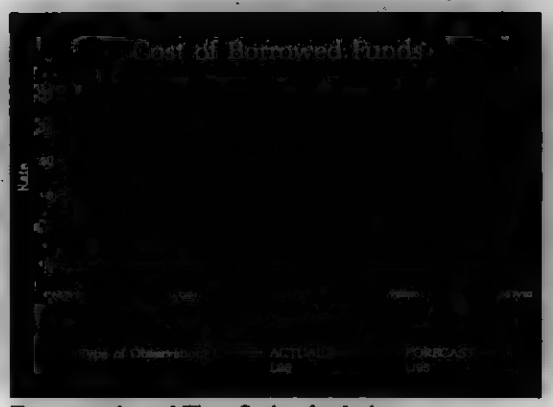
Application mortar

Symantec Corp. and Apple Computer, Inc. are working together to create an easy development path that will allow quick conversion of an application to either Windows or Apple formats. Here is how the scheme fits together:

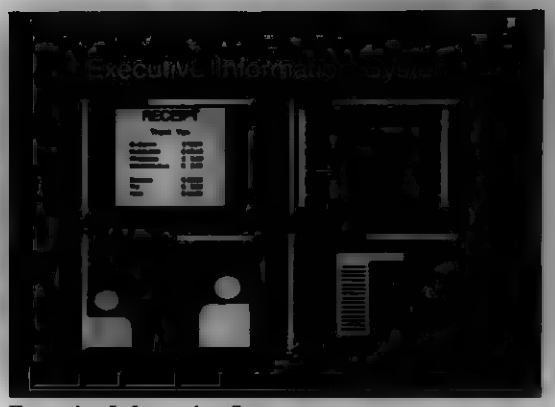
LAYER	COMPONENTS
APPLICATION FRAMEWORK	APPLICATION • CHORES • DOCUMENT • CLIPBOARD
GRAPHICAL USER INTERFACE	CONTROLS • VIEWS • STANDARD DIALOGS • EVENTS
OPERATING SYSTEM	FILES • MEMORY • GRAPHICS • RESOURCES
FOUNDATION	COLLECTIONS • STRINGS • EXCEPTIONS • INTERNATIONAL



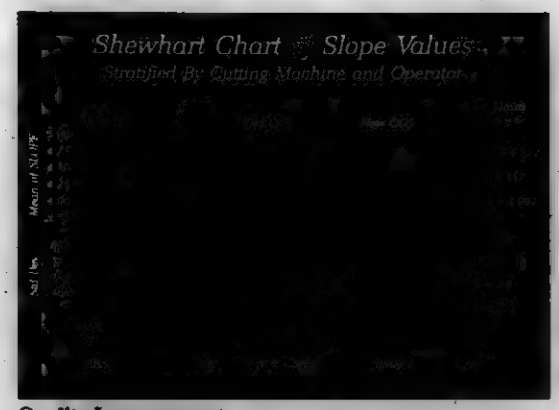
Financial Planning



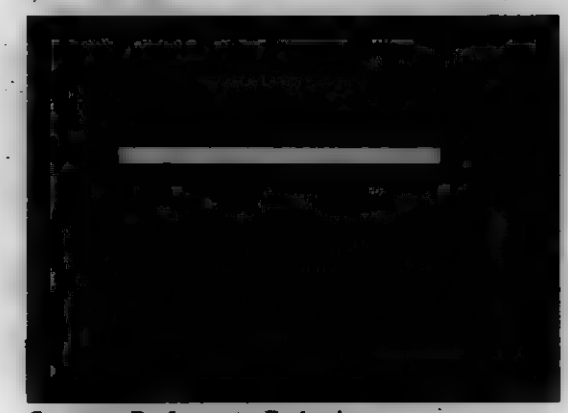
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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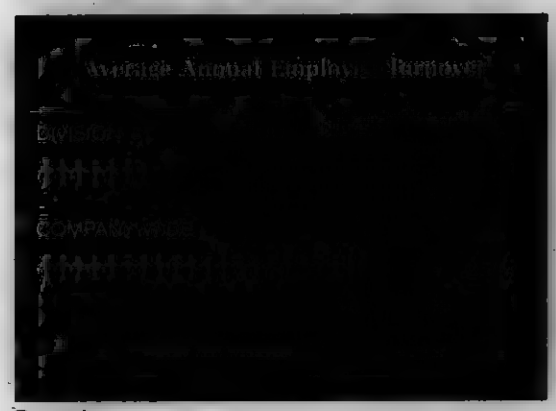
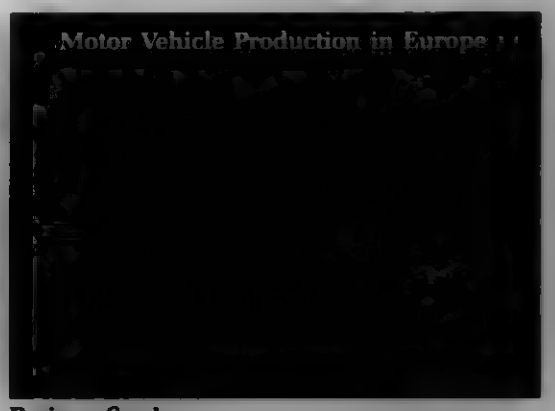
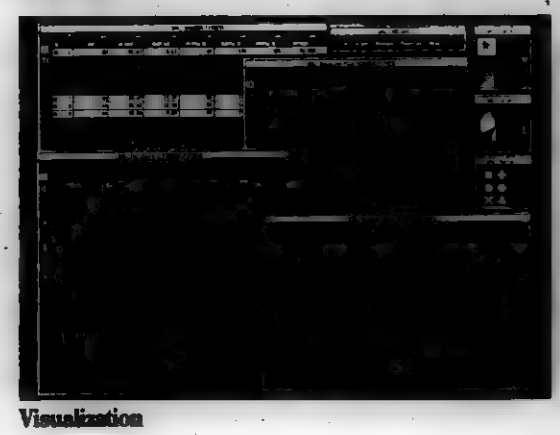


Reporting

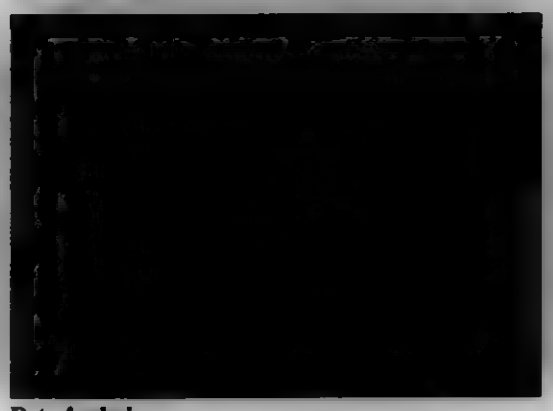
Market Research



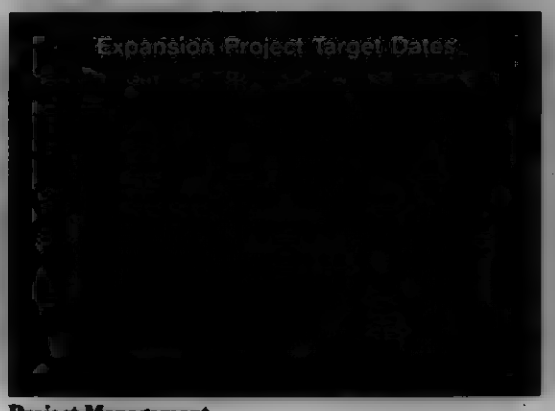
Business Graphs



Visualization



Data Analysis



Project Management

Cincom shows distributed database with multimedia support

By Melinda-Carol Ballou

CINCINNATI -

Cincom Systems, Inc. celebrated its 25th anniversary last week by revealing a distributed version of its Supra Server database that will support multimedia applications.

At its user conference here, the company also announced Microsoft Corp. Windows support for its AD Advantage application development system and a graphical user interface for Control:Manufacturing.

The new version of Supra, which is slated to ship in the fourth quarter, lets users distribute data across multiple processors on client/server networks.

Distributed features supported under this version of Supra include transaction management, updateable views, integrity enforcement and optimization and server-to-server connections.

The distributed Supra Server will run on platforms ranging from Digital Equipment Corp.'s OSF/1 and Microsoft's Windows NT-based Alpha systems to IBM's OS/2 2.0 and Hewlett-Packard Co.'s HP/UX. It also supports MS-DOS, Windows and Apple Computer, Inc. Macintosh clients.

Cincom's distributed transaction management goes further than the two-phase commit options supported currently by most relational database management system vendors, according to company officials and industry analysts.

Avoiding lockup

Two-phase commit is the process whereby transactions are finalized across nodes to ensure data integrity. Under Cincom's approach, three transaction partners can equally finalize a transaction, avoiding the lockup that occurs when a coordinator fails under two-phase commit.

Distributed updateable views let users have read/write views and access to multiple tables that are geographically dispersed across multiple nodes, according to Marco Emrich, director of system software at Cincom.

These capabilities proved attractive to a number of users.

For example, "We're very much interested in distributing data ... out to the shop floor so that people can have access to it where they most need it," said John Hall, a database development manager at Rolls Royce Power Engineering Ltd. in Newcastle on Tyne, England.

"We could use a distributed database for common tables and common entities ... to take the Mantis load off of the VAX and distribute it to PCs, which are replicating like rabbits," said Michael Dion, analyst at Canada's Maritime Command Data Center in Halifax. Distributed database support would be useful for sharing information about ships across the east and west coasts of Canada, Dion noted.

Perhaps of even greater significance is Cincom's support of multimedia data types and the announced ship date this summer of an Early Adopter's Software Developers Kit for developing multimedia applications for Supra Server.

Cincom's tool kit complies with Microsoft's Media Control Interface API, which will allow developers of Windows and Windows NT who use the application programing interface (API) to access and manage the data types with Supra.

"With Supra, multimedia applications which were previously stand-alone can now become enterprisewide applications," Emrich said.

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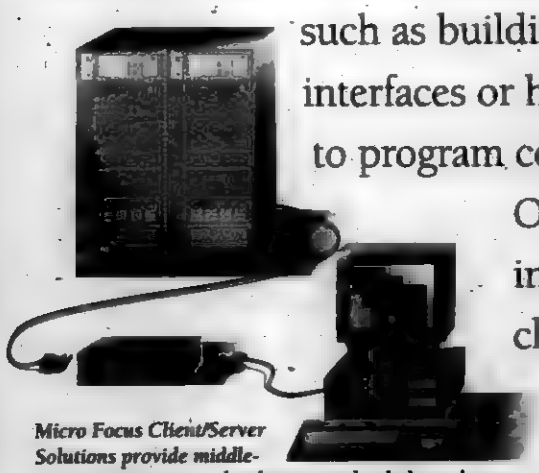

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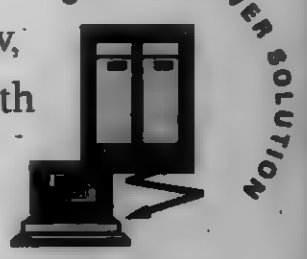

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Cisco to up router IQ

By Joanie M. Wexler
MENLO PARK, CALIF.

■ The low-profile yet powerful routing algorithms embedded in routers are poised to get smarter in Cisco Systems, Inc. devices.

Market leader Cisco said last week that it intends to hone the major routing algorithms it supports on its routers to give network administrators greater control in specifying data paths through complex networks.

This means, for example, that companies could better design their networks to take advantage of tariff-based economies or protect sensitive data from insecure routes, Cisco said.

Routing algorithms — known by such alphabet-soup names as Interior Gateway Routing Protocol (IGRP), Intermediate System-to-Intermediate System (IS-IS) and Open Shortest Path First (OSPF) — are the means by which routers exchange network configuration and traffic priority information. These communications keep internetworks running and making smart reroute decisions when there is a network change.

Both IGRP and OSPF, which Cisco is enhancing on its own devices, are used in Transmission Control Protocol/Internet Protocol networks, as is an older algorithm known as Routing Information Protocol.

Cisco said it intends to incoporate the enhancements it makes on its proprietary IGRP in its implementation of OSPF and IS-IS — the standard algorithm for Open Systems Interconnect networks. However, when operating with other vendors' implementations, capabilities will default to the lowest common denominator.

Cisco has dubbed the enhancements — due on its routers throughout the first half of 1994 — "policy routing" because they allow a network administrator to implement companywide rules for traffic and route priorities.

Timely shipment

The 1994 delivery date is none too soon, as "in 1993, you'll see the first 1,000-router network," said Todd Dagres, vice president of data communications research at The Yankee Group, a Boston consultancy. "When IGRP goes down today, it can still take minutes to update routers," while the enhanced IGRP will take seconds, he said.

The update delay, which gets propagated proportionally the larger the network grows, means "routers that aren't updated yet still route to old places, which could mean dropped packets" and other network inefficiencies, Dagres explained.

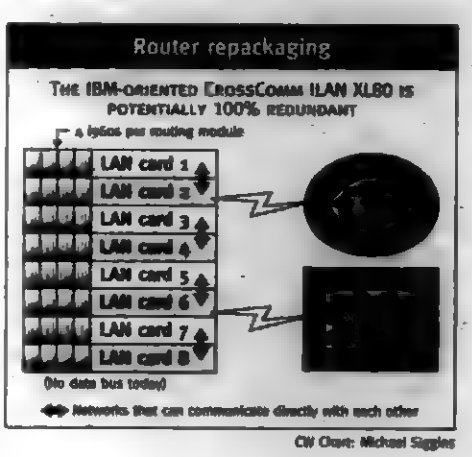
Cisco is also developing a more sophisticated version of IS-IS to allow users with mixed protocols to use one integrated algorithm on their networks. "This lowers the cost of ownership by reducing complexity of network operation," said Paulina Knibbe, Cisco product manager.

CrossComm adds high-end link

By Joanie M. Wexler
MARLBORO, MASS.

CrossComm Corp. moved into the high-end router market last week by repackaging some familiar internetworking design components that enhance reliability and allow for network growth.

The CrossComm ILAN XL80, available now, puts an added spin on hardware architectures from high-end competitors such as Wellfleet Communications, Inc. and start-up Coral Networks Corp. by focusing on the specialized needs of hierarchical IBM Systems Network Architecture (SNA) shops. The traffic patterns at such sites lean toward individual local-area networks communicating directly to a central host rather than to one another, explained Gary Wood, director of product marketing.



CW Chart: Michael Siggins

The XL80 reportedly addresses these environments with its "hublike" nature: LANs supported within the router communicate only via an external backbone to the host, not with one another over an internal backplane. "Our focus is hierarchical, not peer-to-peer, today," Wood said.

The LAN/mainframe connection

To date, internetworking between LANs and mainframes has been largely achieved using Token Ring LANs as the "glue," with source-route bridges on either side.

"This has been pretty bad," said Rick Villars, director of network architectures at International Data Corp. in Framingham, Mass. "Source-route bridges have never been at the high end of performance and have been difficult to manage."

The XL80 could help "a significant number of SNA customers who are hesitant to move to router backbones," Villars said, because "SNA networks aren't large mesh configurations," as are LAN internetworks.

However, CrossComm shop Travelers Insurance Co. in Hartford, Conn., said it runs a balanced mix of SNA and peer-to-peer LAN traffic. "By numbers of sessions, it's true that more go to mainframes over a LAN internetwork than are crossing bridges and routers over a WAN," said Steve Simon, senior telecommunications engineer. "But in terms of actual traffic volume, that is not true. Peer-to-peer networking is still pretty heavy."

CrossComm said the XL80 does have a dormant internal high-speed switching backplane that will eventually support both packet-switching and Asynchronous Transfer Mode cell switching — the purported "nirvana" network of tomorrow.

The XL80 aims to provide the high network availability that SNA sites are accustomed to by giving users the option of dual components throughout the system, as does competitor Coral, and by rerouting around failures or congestion in three seconds on average, Wood said.

Its distributed processor architecture, which prevents a centralized processor from being drained as internetworks grow, was introduced to the industry by Wellfleet in 1991.

Vendors get caught up in middle(ware)

CONTINUED FROM COVER 1

more into downsizing and distributing applications: Between 20% and 40% of the cost of developing application code comes from the code that handles communications, according to a recent IBM customer survey.

What differentiates message-oriented middleware from remote procedure call-based technology is its "queued messaging" function, which allows an application to send a request or a file to another application across the enterprise, then do something else while it waits for a response, said John Mann, senior analyst at The Yankee Group in Boston.

Message-oriented middleware products "absolutely deserve to be taken seriously" as the answer to many of the application development problems faced by downsizing corporations, Mann said.

"I know of a customer spending a million dollars to write [message-oriented] middleware of their own, then hearing about one of these products in a presentation and dumping their implementation on the spot," Mann said. The justification: "the money they would save in future development and maintenance costs" when having to expand the homegrown system to handle additional system and network environments.

Improved credibility

However, the industry has suffered from user cynicism and press inattention, primarily because it is made up mostly of small, young companies, analysts said. IBM gave the industry a much-needed credibility boost recently when it announced Message Queue Interface (MQI), a proposed standard for interfacing applications to message-oriented middleware. Last month, IBM shipped its first product based on the interface.

State Street Bank in Quincy, Mass., has been using Systems Strategies, Inc.'s message-oriented middleware, Ez-Bridge Transact, to interconnect applications running on Tandem Computers, Inc., IBM, Digital Equipment Corp. and Unix systems, said Richard Ross, a vice president at the firm. Systems Strategies will shortly provide customers with a free upgrade to IBM's MQI.

The product "guarantees message delivery and allowed us to cut development time for complex applications from several months to several weeks," Ross said. "Message and queueing is critical to us as we globalize and distribute applications, since it frees application developers from the vagaries of telecommunications."

Message-oriented products have attracted a number of user companies in the Consortium for Object Oriented Technology. They address a broad niche of corporations whose distributed applications need to exchange messages on an occasional basis, with guaranteed delivery, across wide-area connections, said Bob Marcus, coordinator of object-oriented technology at Boeing Computer Services and consortium founder.

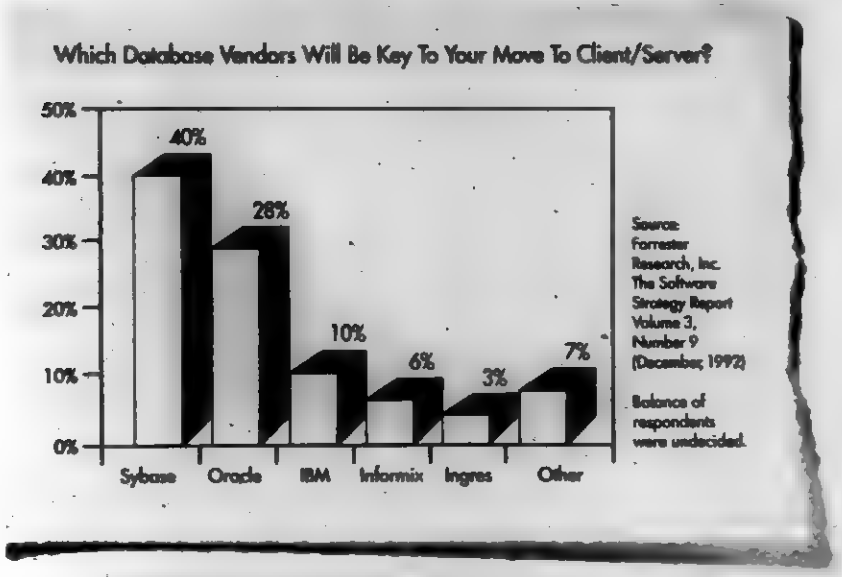
Examples of ideal message-oriented applications include concurrent engineering and financial environments where a single customer query might need to get back information from a half-dozen applications on different systems, Marcus said.

Take a message

The initial meeting of the message-oriented middleware consortium, sponsored by International Data Group publication *Network World*, involved seven companies: Horizon Strategies, Inc.; Digital Equipment Corp.; IBM; Momentum Software Corp.; PearlLogic, Inc.; Systems Strategies, Inc.; and Covia Technologies. The following motions were passed:

- Maintain ongoing communications with user groups such as the Consortium for Object Oriented Technology.
- Meet on a regular basis. Ideally, this would result in vendors implementing some of their rivals' best ideas in their own products, said The Yankee Group's John Mann.
- Produce a white paper that includes a glossary defining the terms and concepts of middleware technology and how it fits into the middleware landscape.

The analysts have graphed the future of Client/Server computing.



And they have also spoken.

In recent issues of their ongoing reports, four of the most respected computer industry analysts have taken an unbiased look at Sybase, and its vision of enterprise-wide client/server computing.

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IBM plugs gaps in RS/6000 line

By Jean S. Bozman
AUSTIN, TEXAS

■ IBM is expected to announce seven additional models to its IBM RISC System/6000 workstation line tomorrow.

The boxes include an entry-level deskside server and workstation-to-host three-dimensional graphics and low-end desktop workstations. The announcements follow a nine-model RS/6000 rollout in February.

"This really is a continuation of what we started in February, which is more specialization in the RS/6000 family," said Dave Cassano, marketing vice president at IBM's Advanced Workstations and Systems group.

Low-end workstations will get a performance boost of 35% to 40%, while some desktop workstations get special graphics capabilities.

Greater choice may help some users make buying decisions, said Terry Daniels, resource manager at BP Exploration Alaska's data center in Anchorage. "There have been instances where we have gone to another vendor because of special needs IBM couldn't meet," he said, including support for visualization features.

Of 90 workstations at the BP site, nearly 40 are IBM RS/6000s; many others are Sun Microsystems, Inc. workstations.

The special packaging may make it easier for users to configure their systems, but it also may confuse the market, said Nancy Stewart, senior industry analyst at Dataquest, Inc. in San Jose, Calif.

However, Susan Morpeth, associate director for midrange systems at Infocorp in Santa Clara, Calif., said the fine-tuning should help IBM compete with workstation rivals Hewlett-Packard Co. and Sun. "The RS/6000 group knows they can't compete in the old IBM ways," Morpeth said.

Pricing for a low-end base RS/6000 with 16M bytes of memory is expected to dip below $5,000, IBM said, although the AIX operating system will cost an additional $850. The new desktop models are expected to range in price from $9,000 to $27,000, and the new entry-level deskside server, configured with 32M bytes of memory and 1G byte of disk memory, is expected to cost about $28,000.

Line expansion

New RS/6000s include the following:

	PowerStation 230	PowerServer 550L
Processor	Power RISC architecture	Power RISC architecture
Clock speed	45 MHz	41 MHz
Memory range	16M-64M bytes	32M-256M bytes
Hard disk	Diskless	2G bytes
Micro Channel slots available	2	4
Expected price	Under $5,000	$26,000

Source: IBM — CW Chart: Nancy Kowal

Symmetrical multiprocessing

Sun adds oomph, shrinks box

By Jean S. Bozman
SAN FRANCISCO

Sun Microsystems, Inc. likes to talk about the way it delivers pizza-box computing to users' desktops, but this time it has cooked up a deep-dish pie.

Sun's SPARCserver 1000, announced at SunWorld here last week, is a symmetrical multiprocessing (SMP) server that can support 50 to 500 users concurrently, Sun said.

The machine, which is 19 in. wide and 21 in. long, runs up to eight 50-MHz SuperSPARC chips in a desktop or deskside configuration. It can be configured with 135 to 1,000 reduced instruction set computing million instructions per second and up to 2G bytes of memory, allowing it to anchor large relational databases. Sun began shipments immediately.

Whatever its performance, the new server's packaging breaks new ground, said David Smith, director of Unix systems research at International Data Corp. in Framingham, Mass.

"The fact that you can now get an eight-way SMP system on a desktop is significant," Smith said. "That's not been done before. It's an extension of their innovative packaging into the server area."

Industry analysts were quick to note that Sun said the SPARCserver 1000 outguns a series of workstation servers from IBM, Digital Equipment Corp. and Hewlett-Packard Co.

But some analysts said a closer comparison would be to data center SMP machines from Sequent Computer Systems, Inc. and Pyramid Technology Corp. or to the NCR Corp. 3500 SMP machine.

"They've implemented true SMP," said Paul McGucken, a program director at Gartner Group, Inc.'s Midrange Computing Strategies Group, of Sun's new server. "Any processor can service any interrupt and any [Unix] system call."

The high-end SPARCcenter 2000, introduced in November, also supports SMP. However, Sun's older 690 server was not truly an SMP machine, McGucken said, noting that the Sun 690 had TPC/A benchmark results about one quarter that of the SPARCserver 1000 running Oracle Corp.'s Oracle 7 database.

Last week, Sun also announced a 20-processor model of the SPARCcenter 2000 that uses 50-MHz chips.

Users who knew about the machine said it is a cost-efficient alternative to buying scores of workstations. "We can keep adding processing and DASD to it," said Jim Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion grocery chain in Tampa, Fla. His firm installed a four-processor SPARCserver 1000 two months ago.

"Rather than adding additional SPARCstation 2s or SPARCstation 10s, which we use to run from five to 10 users, we'll probably put out SPARCserver 1000s and run 50 to 60 users off of them," Stikeleather said.

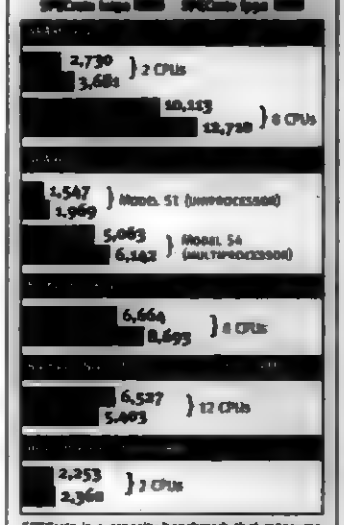
The 115-store chain is preparing to roll out a point-of-sale and in-store processing network that will be jointly developed with Sun and Siemens/Nixdorf Information Systems, Inc. to automate the flow of information from the cashier level up to corporate offices (see story page 8).

More than a few wistful Sun server users were amazed at the new Scalable Processor Architecture machine's price/performance compared with older, tower-type Sun servers. The new server costs from $56,700 to $131,300.

"It would replace the Sun 630 multiprocessor we bought," said Jerold T. Hahn, computer specialist at the U.S. Forest Service in St. Paul, Minn. It also bridges a gap between desktop workstations and a high-end Sun host, some said.

Peer pressure

PITTING SUN'S NEW SPARCSERVERS AGAINST THEIR PEERS



SPECrate is a capacity benchmark that measures how much CPU-intensive work a system can do

Source: SPEC

RISC start-up

CONTINUED FROM COVER 1

company or product plans.

Netpower's plans help to set the stage further for a square-off within NT circles of Intel vs. RISC platforms.

Microsoft NT product manager Rich Barth maintained last week that neither the Intel nor Mips architecture would run NT better than the other, noting that Microsoft has used both platforms for NT development.

Other RISC platforms should also optimize NT use, Barth said, provided that the companies developing their own ports — Digital Equipment Corp. and Intergraph Corp., for example — effectively recompile NT source code.

Mips in mind

Meanwhile, some PC companies are also making plans to use the Mips chip set for building Windows NT-based systems. For example, Acer America Corp. plans an R4000-based Windows NT machine priced around $3,500, and an R4400 Windows NT machine priced around $4,500.

Robert Miller *to lead start-up*

Companies that plan RISC-based Windows NT machines, along with the chip they will use, include the following:

Alpha: DEC, Ing. C. Olivetti & Co.

Mips: Acer America, Netpower, AT&T Federal Systems, Carrera, Deskstation Technology Corp., Silicon Graphics, NEC Technologies, Inc.

Other: Intergraph (Clipper).

Miller is a former Data General Corp. executive who ran Mips and stayed on with Mips after it merged with Silicon Graphics, Inc. early in 1992. He formed Netpower in February of this year with a number of ex-patriots from other workstation vendors, including former Sun Microsystems, Inc. Vice President of Research and Development Ed Frank.

Other founding executives include Ralph Mele, vice president of sales, who joins from massively parallel systems vendor Maspar Computer Corp. and who was previously with Silicon Graphics; Edward Stritter, vice president of development, who joins from Mips; Craig Martin, vice president of manufacturing, who ran materials and manufacturing at Mips; Walter Pienkos, vice president of administration; and Jorge Tittinger, director of operations, who also joins from Mips.

Nonfounding officials include Lynda Hargrove, vice president of marketing, who was marketing director for Hewlett-Packard Co.'s Unix minicomputer operations. And the company plucked at least one staff member from the Intel camp, naming former Intel Pentium marketing director John Novitsky as director of product marketing.

About 80% of Netpower's capital reportedly comes from venture capital backers.

IBM, Intel revamp joint chip plans

By Michael Fitzgerald
BOCA RATON, FLA.

A 10-year joint development effort started by IBM and Intel Corp. in November 1991 is searching for a reason to exist.

Spokeswomen for both companies said the Noyce Development Center's employees were told a month ago that the focus of the center would be changed from its original charter. Intended to develop ways to integrate more functions into the microprocessor, it will now concentrate on developing low-power chips. To do this, the center is being moved from its base here to Folsom, Calif.

But a source close to the effort disputed this, commenting that "they can say whatever they like, but Intel has picked up its toys and gone home."

In addition, both companies already produce low-volt versions of their processors, and it was unclear why they would continue to fund development of such products.

Sources within IBM said Intel was unhappy with IBM's aggressive push into the microprocessor market, and this, coupled with Intel's relative lack of success in its SL processor line, had caused Intel to pull out. Currently, IBM personnel remain here, while Intel's engineers have gone back to California, the spokeswomen confirmed.

Industry analysts were not overly surprised by the change in focus and said the development center had started with a good idea that went in the wrong direction for the market.

"Intel's experience with the SL has shown that there really isn't a lot of need for integrated processors," said Michael Slater, editor and publisher of the "Microprocessor Report," an industry newsletter published in Sebastopol, Calif.

Intel had touted its SL processor family, which integrated several other logic components into the microprocessor, as a way to build better portable systems.

Mips' chip targeted at NT notebooks

By Stephen P. Kiett Jr.

Mips Technologies, Inc. is slated to announce today a low-power, low-cost reduced instruction set computing (RISC) chip aimed primarily at notebooks running Microsoft Corp.'s Windows NT.

The 64-bit, RISC-based R4200 microprocessor will initially be manufactured by NEC Corp. It may also show up in Unix desktops and portables if such a market develops, said Dave Corbin, director of marketing at Mips.

The chip is scheduled to ship to system makers late this year.

The chip was designed to reduce the power consumption of portable computers, Corbin said.

For example, he said, notebook users running applications that require lesser amounts of processing power will be able to switch to a reduced-power mode that allows the chip to operate at one quarter the normal frequency. Unused portions of the chip are automatically turned off.

High-power performance

Corbin said Mips' goal with the R4200 is to provide performance comparable to high-power chips such as Intel Corp.'s Pentium processor.

The R4200 measures 9.2mm by 8.6mm — roughly one quarter the size of Intel's 32-bit Pentium chip. It will run at 80 MHz and deliver performance of 55 SPECint92 and 30 SPECfp92.

Pentium, expected to debut in systems this week, runs at 66 MHz and delivers 64.5 SPECint92 and 56.9 SPECfp92.

While analysts said the R4200's price/performance level was impressive, they were skeptical of how ripe a market the chip would enjoy.

"Low cost/high performance is a good thing, but how practical is it?" asked Ted Julian, an analyst at market research firm International Data Corp. in Framingham, Mass.

Mips would not say when R4200-based notebooks would begin to appear.

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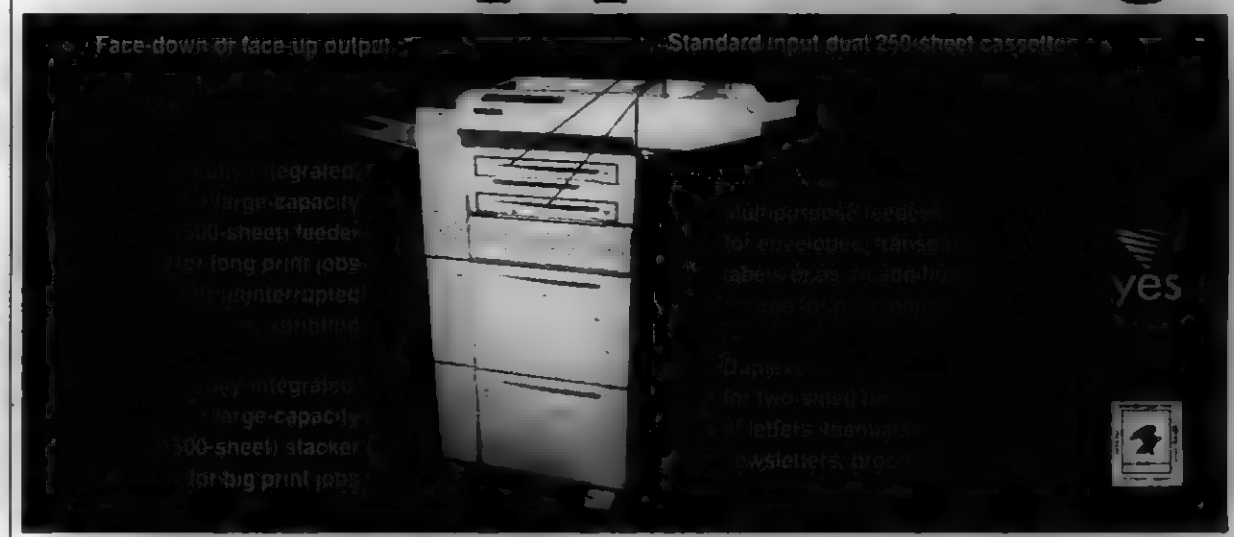

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News Shorts

Ingres previews development tools

The ASK Group, Inc.'s Ingres Products Division last week said it is partnering with IBM to optimize Ingres software for IBM's RISC System/6000 workstations. The two companies will also jointly market products. At its user conference, Ingres also previewed enhanced features of its Ingres/Windows 4GL graphical application development tool set. Ingres said it plans the following enhancements within 24 months: Ruby, a graphical report writer; Amethyst, a graphical user interface-based code generator; and Jade, an enhanced version of the basic Ingres/Windows 4GL tool set.

Intel targets notebook maker

Intel Corp. last week asked the U.S. International Trade Commission to investigate Twinhead International Corp., a Taiwan firm that makes computers based on chips from Intel competitors Advanced Micro Devices, Inc. and Cyrix Corp. Intel charged that Twinhead's AMD- and Cyrix-based notebooks are built in such a way that they infringe on an Intel patent involving the way the microprocessor works with memory and paging software, such as Microsoft Corp.'s Windows.

Legent plans TCP/IP transfers

Legent Corp. will this week announce an XCom file-transfer product for Transmission Control Protocol/Internet Protocol networks. It had been usable only in IBM's Systems Network Architecture networks. Legent will also unveil five workstation products for Microsoft's Windows, including Paramount, a new product for graphical display of mainframe performance data, and N-Vision, a new VTAM application for network access management.

NCR extends wireless network

NCR Corp. announced a wireless adapter for notebook computers with Personal Computer Memory Card International Association Type II sockets. The $695 adapter will transfer data to other wireless computers or to a wireless hub at speeds up to 2M bit/sec. across 800 feet of open space or 200 feet blocked by walls and other barriers using spread-spectrum technology.

IBM fires up LAN access beta

IBM stuck its toe into the remote local-area network access market waters last week when it encouraged users to beta-test its nascent offering code-named "Thunderbird." Thunderbird software can be downloaded off CompuServe, Inc. or IBM bulletin boards.

SHORT TAKES **ObjectDesign, Inc.** in Burlington, Mass., announced ObjectStore, an object-oriented database for Novell, Inc.'s NetWare LAN environments; it is scheduled for release next month. . . . **CNA Insurance Cos.** in Chicago installed an NCR/Teradata Corp. DBC/1012 parallel processing system and 20 NCR 3445 servers for decision support applications and to complement its IBM mainframes. . . . **Transarc Corp.** announced pricing, availability and distribution plans for its DCE and Encina on-line transaction processing products on SunSoft's Solaris operating environment. Separately, **Digital Equipment Corp.** announced DCE for OSF/1 software. . . . **BT North America, Inc.** fortified its network by offering customers a security products portfolio. . . . Internetworking vendor **Wellfleet Communications, Inc.** said it is building dial-up flexibility into its routers by implementing a three-phase rollout plan during the next year that allows users to leverage the economies of public switched network services.

DHL client/server turbulence

CONTINUED FROM COVER 1

Token Ring local-area networks at various locations of DHL Worldwide Express' western hemisphere division [CW, Nov. 30, 1992].

An IBM Enterprise System/9000 mainframe acts as a repository for master files, including customer files and historical package shipment data.

A telemarketing application that has been running in a production environment since last October helped boost user productivity by 138%, Lanier said in an earlier interview.

Despite these successes, DHL is putting off or canceling client/server implementations of major pieces of its track-and-trace and customer service systems. DHL is not abandoning the new architecture but rather is going into an "evolutionary rather than revolutionary" mode of implementation, according to Alex Aycinena, Lanier's successor. Aycinena was formerly head of DHL Systems' global application development group.

Mirror Image

DHL Airways' parent, DHL Worldwide Express, is working on its own open systems architecture. Michael Lanier said that the architecture is likely to be a "mirror image" of DHL Airways' IBM RS/6000-based client/server system. However, a source at DHL Systems said DHL Worldwide is looking at other types of Unix systems.

No enthusiasm

Indeed, sources close to the company indicated that management may never have been totally gung ho about Lanier's sweeping migration plans. DHL was never totally committed to "throwing out all the old stuff and putting in new," according to Aycinena.

DHL Airways cannot afford to hold on to outmoded systems or become less technologically aggressive if it wants to compete effectively in the U.S. market, according to Jim Eckler, a partner at KPMG Peat Marwick's transportation group in Toronto. Neither of the two market leaders, Federal Express Corp. or United Parcel Service, Inc., is slacking off on its drive to implement the latest computing and networking technologies in order to better serve customers. Key areas include "the need for timely, up-to-date information on shipment status: where it is, and when it's going to arrive," Eckler said.

Since Aycinena came on board, there have been no major changes to the original $15 million budget that was allocated this year for migrating several systems to the new architecture.

Nevertheless, some applications that were slated for re-engineering and downsizing under Lanier's original plan are staying as they are. For example, customer service applications that were originally slated for migration to the RS/6000-based architecture this year will remain on centralized Pyramid Technology Corp. hosts at a DHL data center in Tempe, Ariz., Aycinena said. "We have no problem with those applications."

The applications provide users and customer service agents with current and historical information about package shipment status. Lanier had originally planned to move the applications down to the more scalable RS/6000 platform and to a different database system.

The current nonindexed file structure makes it extremely time- and system-consuming to generate a report on, say, the last three weeks' shipments for a dozen customer sites, Lanier said in an earlier interview.

Still flying

DHL Airways is going ahead with some of its original plans for migrating some key systems to the IBM RS/6000 client/server platform.

One such system is Easyship customer service centers, which respond to local customer queries about package status and billing issues. Migration should be completed on schedule, by year's end, said Alex Aycinena, vice president of IS.

Also on schedule, Aycinena said, is a rollout of electronic links to the Easyship system, which would enable customers to call up invoices, generate shipping labels, do package track-and-trace queries and order pickup and delivery from local workstations.

Still hanging in the balance, however, are PC systems in some 200 field offices where couriers go to enter the latest data on package status. Those systems were originally slated to migrate to the RS/6000 Token Ring architecture this year, said Michael Lanier, Aycinena's predecessor. Their current status is uncertain.

—Elisabeth Horwitt

Oracle, US West plan info service

By Kim S. Nash
SAN FRANCISCO

Oracle Corp. and US West stepped into the hotbed of interactive television last week with plans for a "software engine" that will manage the many thousand transactions and terabytes of data to be generated by blue-sky concepts such as video on demand and multimedia at-home services.

Blueprints call for massively parallel servers — from an as-yet undetermined vendor — running Oracle databases to anchor the system, which will convey signals to consumers via US West telecommunications gear, the firms said.

Interactive TV might be too new and fast-paced for "old-line, industrial-strength" companies such as Oracle and US West to handle, said Joseph Garber, management consultant at A. T. Kearney, Inc. in Redwood City, Calif.

"The business belongs to smaller, nimbler firms used to dealing with desktops, not great galumphing companies used to dealing with MIS types," Garber said.

The companies hope to unveil in September the guts of a database server system based on current Oracle software and massively parallel hardware designed to manage voice, video and data transactions.

The goal is to let users in home, education and business arenas download customized information using hardware devices from any vendor, including palmtop computers, PCs, TVs and Nintendo sets, among others.

For example, traveling executives could tap into a multimedia messaging network from a laptop computer to see parts of a videotaped speech from the boss, then read and respond to electronic mail appended to the speech by colleagues.

Such an interactive system, which would have to handle many terabytes of data both quickly and accurately, is best run on massively parallel computers, according to Larry Ellison, chief executive officer at Oracle.

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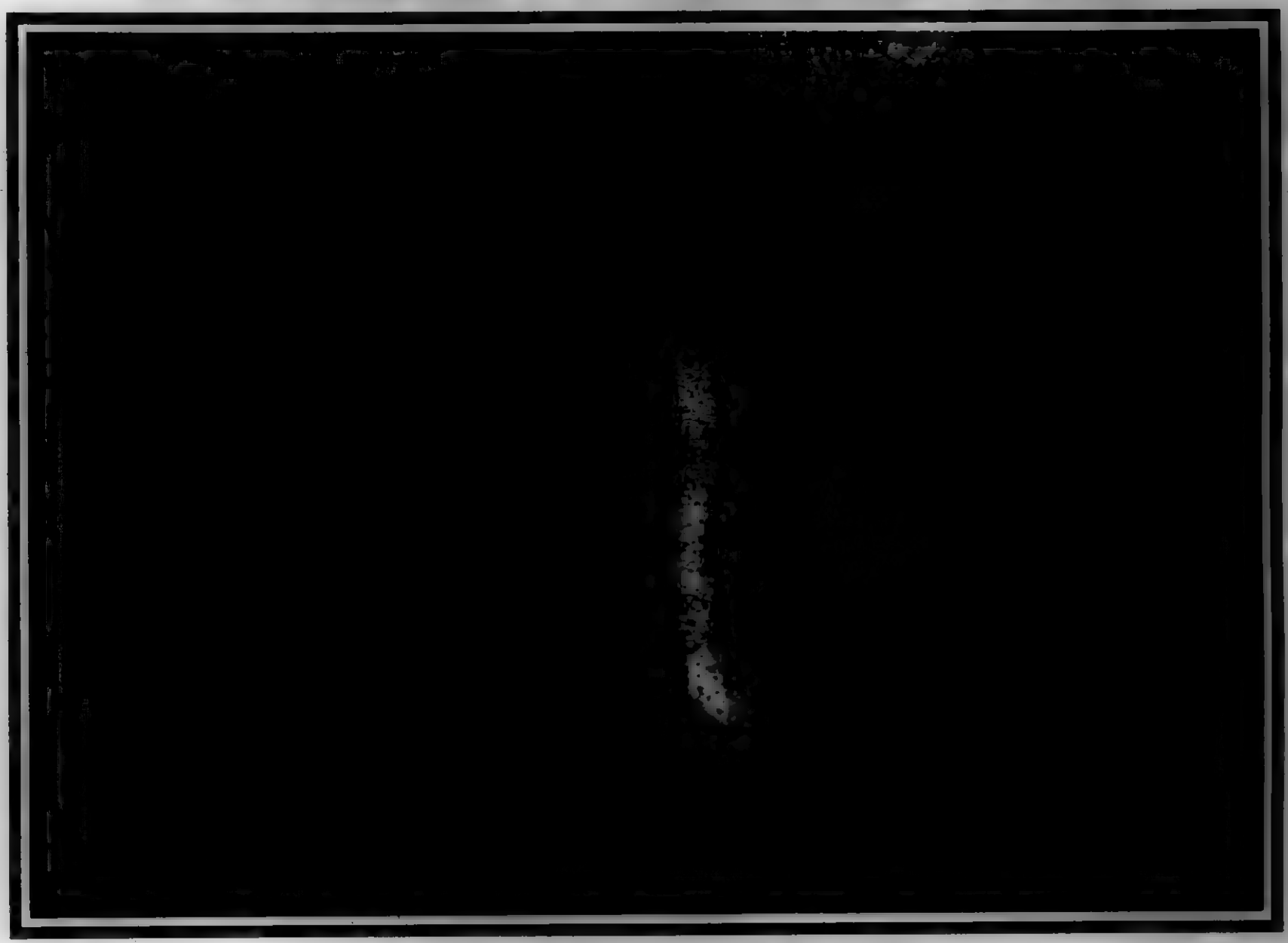

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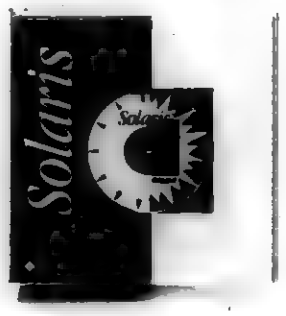

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TOCK

Reach out and see someone — with no extra network charge

By Joanie M. Wexler
NEW YORK

AT&T last week presented the industry with a telephone that brings a second human sense — sight — to the public telephone network.

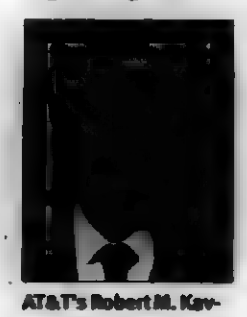
AT&T's $3,295 Picasso Still-Image Phone allows users to combine near-TV-quality color pictures with voice traffic across the phone network without subscribing to any special services, such as switched 56K bit/sec. lines or Integrated Services Digital Network (ISDN), said Robert M. Kavner, group executive of AT&T Communications Products.

Users press a "send image" button on their Picasso phone to transmit images stored in a PC, camcorder, VCR, photo CD player, electronic camera or document scanner. A television, PC monitor or color PC printer receives the image in about 10 seconds, he said.

Kavner said Picasso is initially meant for businesses "without high-capacity networks" but with far-flung colleagues wishing to discuss images in real time, rather than traveling or waiting for overnight delivery services.

Helpful for discussion

For example, Joseph Barba, project director at worldwide manufacturing and engineering firm Foster Wheeler U.S.A. Corp. based in Clinton, N.J., bought two Picasso systems for viewing and discussing his blueprints with colleagues and with customers located across the globe.



AT&T's Robert M. Kavner *said Picasso aids businesses with far-flung colleagues*

Barba said he can "pay for Picasso by saving one trip to the Middle East," where he is currently supervising a refinery upgrade project for a client that is attempting to make its factory processes more environmentally safe.

Barba described his phone system as so old, he "doesn't even remember what kind it is." And to use ISDN (a switched service) to see images, his private branch exchange would have to be ISDN-capable, and he would have to pay for ISDN services, which generally cost about 1½ times as much as "plain, old telephone service," or "POTS."

Meanwhile, upscale department store Nieman Marcus said it will soon begin testing Picasso for "collaborative shopping." Picasso should allow customers in its 27 stores nationwide to examine high-quality merchandise, such as precious jewelry, that is available only in a particular store, said E. Dean Liles, chief information officer.

And Marriott Corp. announced that it will make Picasso available at its convention center hotels in meeting rooms or private chambers.

Kavner mentioned several other possible Picasso applications:

- **Insurance adjustments, where photos are sent back to headquarters directly from an accident scene, "and an estimate is made on the spot."**
- **Advertising and photography agencies, for sharing photos and designs with remote customers and colleagues.**
- **Long-distance learning.**

Picasso has a "zoom" feature that allows a user with a mouse to circle a portion of a picture and enlarge that section for closer inspection. "This is a capability I can't get with the actual document," Barba noted.

There is no extra network service charge for an image-enhanced phone call using Picasso, Kavner said.

The phone's compression techniques and processing power — equivalent to four Intel Corp. I486 chips — mix the media across low-speed analog or digital lines comprising today's POTS network, Kavner said.

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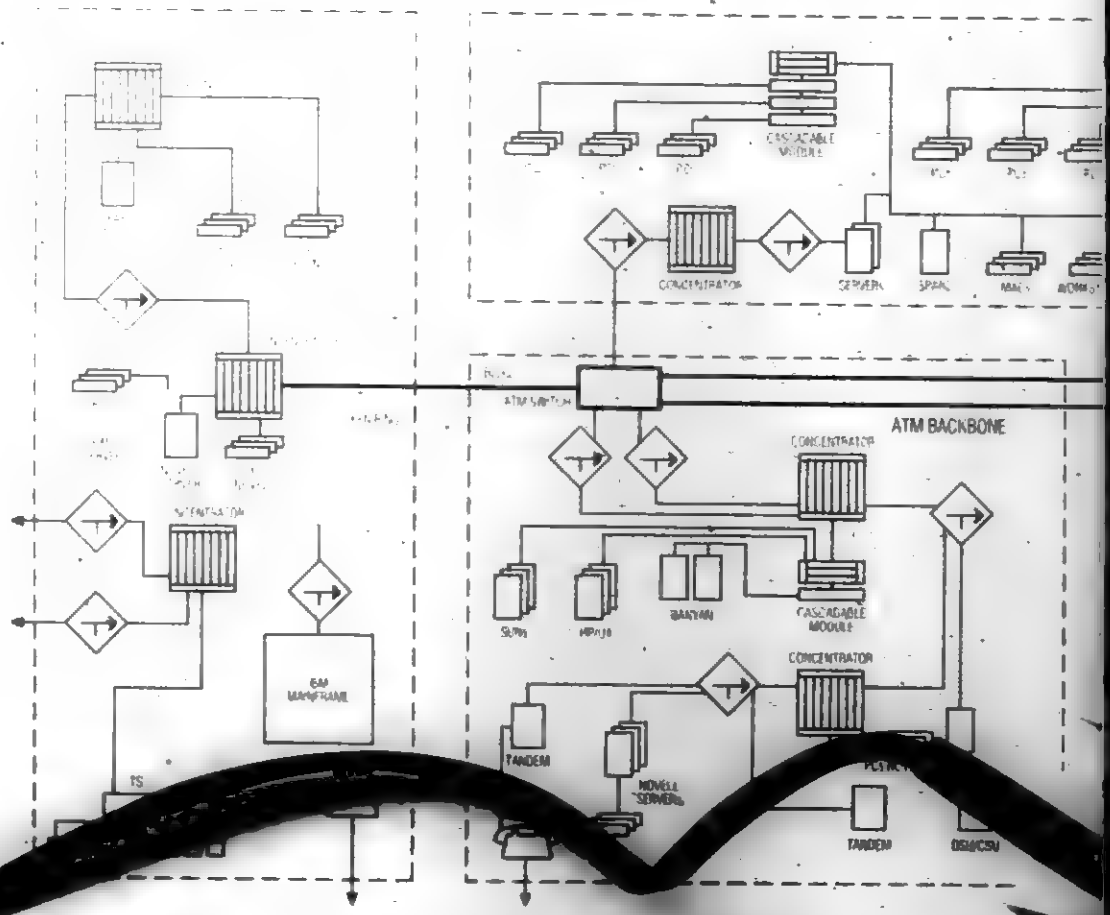

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NCR adds 3270 features to OLTP monitor

By Thomas Hoffman
SAN DIEGO

NCR Corp. last week added LU6.2 connectivity and 3270 terminal support to its Top End transaction processing monitor, garnering analyst kudos in the process.

Top End Release 2.0, which manages transactions within mixed hardware environments and operating systems, is the first distributed on-line transaction processor (OLTP) monitor to offer 3270 terminal support, analysts said.

The 3270 support will enable Top End to help IBM mainframe shops downsize to distributed platforms while retaining their investment in 3270 terminals.

"The 3270 support is clearly unique," said Peter Kastner, vice president at Aberdeen Group, a consultancy in Boston. He noted that competitors such as Unix System Laboratories, Inc.'s Tuxedo, IBM's CICS/6000 or Transarc Corp.'s Encino transaction processing monitors do not offer this feature.

Conversely, providing LU6.2 links allows Top End 2.0 to catch up with the competition. Analysts said its inclusion is important for NCR.

"LU6.2 is an absolute requirement for these monitors to interoperate with IBM-based systems," noted Donna Bleakley, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Top End Release 2.0 was designed to run on NCR's System 3000 line of Unix machines and is in the process of being ported to a slate of Unix platforms from Hewlett-Packard Co., Sun Microsystems, Inc., IBM and Pyramid Technology Corp. Release 1.0 has been available since April 1992.

NCR is working with Independence Technologies, Inc., a Fremont, Calif., software developer, to create those ports, noted Jim Fischer, NCR Top End program manager. The Top End ports to the HP and Pyramid ports have been completed and are available now; the Sun port is done but will not begin shipping until June; and the IBM RISC System/6000 port is expected by September, Fischer said.

Since Top End began shipping last year, NCR has signed up 50 to 60 customers, Fischer said. Early users include a major U.S. airline and a large retailer, both of which are using Top End to run between an NCR/Teradata Corp. DBC/1012 parallel processing host and several IBM MVS-based systems.

Added support

Other features added to Top End Release 2.0 include workstation support for Microsoft's Windows Dynamic Link Library and IBM's OS/2 2.0 operating system. Top End earlier supported Microsoft's DOS and Windows and multivendor Unix remote clients.

Though the customer base seems small, analysts said that is a healthy start for the first release of a Unix transaction monitor.

"For an early product like this, that's pretty good," Bleakley said. "In the Unix world, there aren't that many transaction monitors. Plus, there are multiple nodes at the sites that are using Top End."

Top End Release 2.0 will become available this month on NCR platforms, including the System 3000 machines. Availability for the non-NCR platforms has not yet been determined, Fischer said. Pricing for a typical Top End configuration will range from $4,000 to $18,000, depending on the size of the server.

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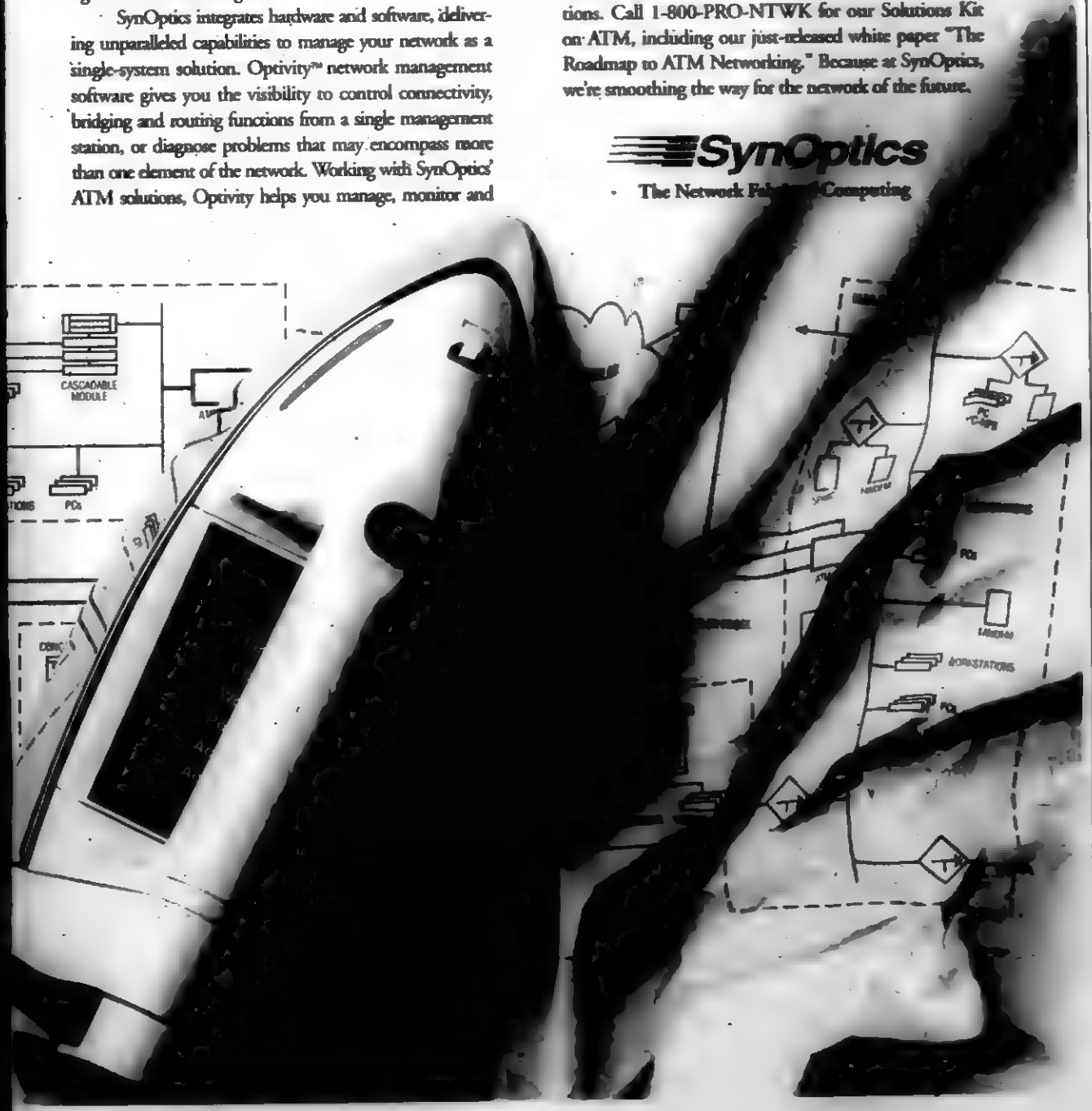

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8:00 Home *Over breakfast, you check your calendar on your PowerBook Duo. The day looks like it'll be a breeze. You'll put a few finishing touches on the Q2 forecast presentation that's due in a couple of days, return a few calls, and have a free afternoon-(for a change).*

9:15 Your Office *You slide your PowerBook Duo into the Duo Dock and start working. Suddenly, your e-mail chimes. Your boss wants you on the noon shuttle to Boston, to present the Q2 forecast to his boss. Also, a client wants to see you ASAP. You hit the eject button and go.*

2:50 Borrowed Office *A colleague is at lunch, so you borrow his Duo Dock. You log onto e-mail back at the home office and learn your group has just won a new piece of business. You incorporate this news into your presentation (and change a few colors while you're at it).*

3:30 Conference Room *You clip on the Duo MiniDock and run the presentation from your PowerBook Duo. Everybody's impressed — especially the guy who asks you a series of tough questions about a six-month-old project. You've got all your files, so you've got all the answers.*

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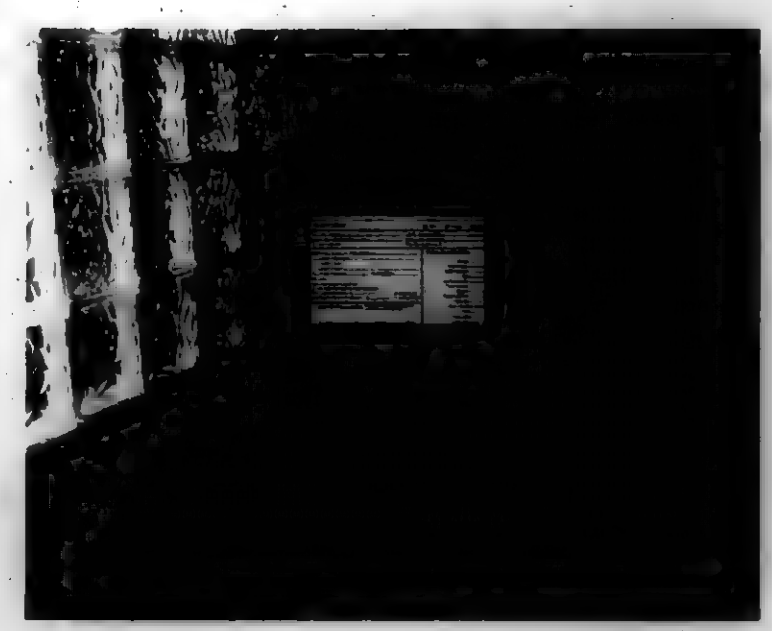
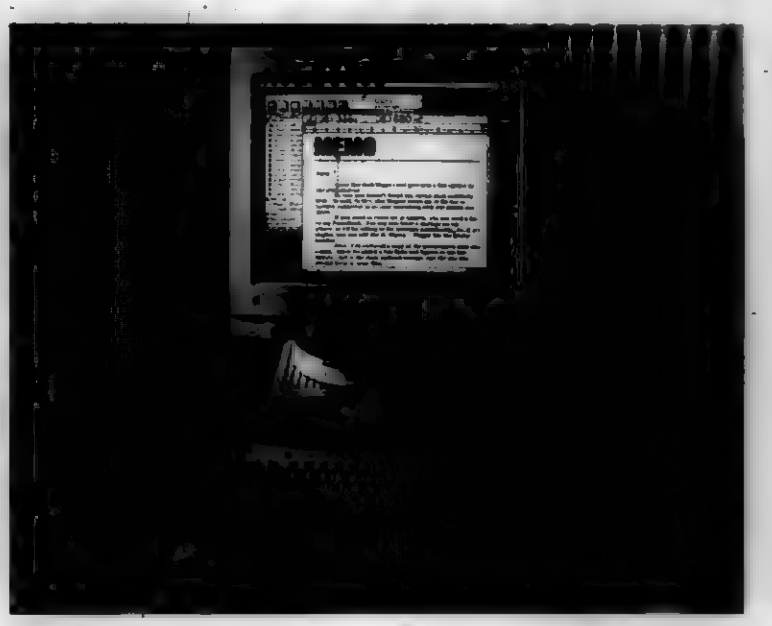


11:10 Your Client's Office *That $5 million project the client told you was off last week? It's on again. And due in two weeks. You type up a few job orders, which you'll fax from your PowerBook when you get to Boston. Now, however, you have to catch a cab for the airport.*

12:40 Noon Shuttle *All the files and software you use at your desktop are right here with you. You pull up the Q2 presentation and make the revisions to reflect the new assignment. Then you write a quick memo to your team, to make sure that everything's on schedule.*



7:00 Your Office *On the way home, you swing by the office to tie up a few loose ends. You see your boss. He heard the meeting went extremely well, and wants you to fly out and present to the people in London. Tomorrow. You send out a quick memo to update your staff.*

8:30 Living Room *Since you've got all your files and software right there with you, you could write a report, study the new research data or finish up those performance reviews. But hey, enough is enough. You settle back in your recliner and play a few rounds of Tetris.*

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When storage is state of the art

Systems need opens door for new magnetic, optical, flash memory products

By Ellis Booker

While storage technologies somewhat lag behind the performance gains of microprocessors, vendors are rushing a variety of the technologies to meet three broad market needs: affordable peripherals for desktop multimedia computers, very small devices suitable for the new generation of handheld computers and specialized storage subsystems able to manage the terabytes of data that will feed the next generation of massively parallel processing supercomputers.

From a technical standpoint, the most significant achievements are in the last two categories. Interestingly, there is wide consensus that "storage" will not consolidate to a single media but will continue to comprise a variety of often-competing technologies. These include the following:

Magnetic

The venerable hard disk and magnetic tape have not stood still amid the onslaught of the optical disc and other storage media.

According to Jim Porter at Disk/Trend, Inc. in Los Altos, Calif., optical technology has been a "severe disappointment" to the vendors that thought it would eclipse the magnetic hard disk marketplace. "At any given capacity, [optical] still costs three times as much, is slower and has a larger form factor," Porter explained. He estimated that 263,000 5¼-in. and 185,000 3½-in. rewritable optical drives will ship this year, compared with 40 million hard disks in 1992.

Recent developments in magnetic include the following:

Hewlett-Packard Co. last year took the lead in developing the smallest commercially available hard disk, a package weighing a single ounce. In March, HP announced a second version of its Kittyhawk Personal Storage Module, increasing the capacity of this 1.3-in. device from 21.4M bytes to 42.8M bytes. The Kittyhawk conforms to the Personal Computer Memory Card International Association (PCMCIA) Type III format with a height of 10.5mm, and future systems for the 3.3mm-tall PCMCIA Type I standard are projected.

HP's Kittyhawk II PSM, *labeled the world's smallest disk drive, can store the equivalent of 28,778 typed pages of information*

Surprising some, magnetic media has continued to make gains in the age of optical storage.

HP has already announced agreements with two makers of pen-based systems — EO, Inc. in Mountain View, Calif., and Dauphin Technology, Inc. in Lombard, Ill. — and it will imminently announce relationships with major camera manufacturers that will use the drive to replace film in digital cameras.

Meanwhile, IBM recently announced a 1G-byte 3½-in. drive that is just 1-in. thick. The IBM unit reportedly has the highest "areal density" in the industry, some 350M bytes per square inch.

Optical

Complaints about the speed of optical disc storage are diminishing, as the capacity and transfer rates of this storage technology increase.

Semiconductor-based flash memory will not overwhelm magnetic or optical but could win the portable computer-personal digital assistant arena.

"Not long ago, it wasn't unusual for optical to work at 200K bit/sec.," said Randy Dieterle, vice president of engineering at Qstar Technologies, Inc. in Rockville, Md. Today, he reported, transfer speeds have doubled, and the capacity of 5¼-in. media, which had been standardized at 640M bytes, now approaches 1.3G bytes.

Analysts observed that breakthroughs in optical will be tied to breakthroughs in semiconductor lasers. A number of companies, notably 3M Co. and Sony Corp., are working on semiconductor lasers that emit blue light. Current systems emit 780 nanometer red light, a wavelength that is twice as long as the blue. Blue laser semiconductors would increase storage of CDs and CD-ROMs 2.2 to 2.8 times.

Semiconductor flash

More rugged and less power-hungry than disks, flash memory cards are now sold with eight 1M-bit chips, providing a total of 1M byte of storage. Intel Corp., the leading proponent of the technology and now on its fourth-generation product, predicted flash memory will cost $1 per megabyte, down from about $30 per megabyte, by the year 2000.

Chips with 16M bytes of storage are expected to be feasible by then as well.

But most analysts predicted that the cost per megabyte of magnetic media will beat flash memory for the foreseeable future. On the other hand, flash could win the day for portable systems — pen-based notepads and digital cameras — that require less than 50M bytes of storage.

The speed of flash, which is measured in the fractions of milliseconds compared with the tens of milliseconds for magnetic hard disks, could be an ace in the hole for other uses.

"This is part of a larger plan of Intel's [to use flash] as a transfer device," said Linda Helgerson, president of The Disc Co., a consulting and publishing firm specializing in storage in Falls Church, Va. Unlike magnetic or optical media, Helgerson said, only flash has the speed and I/O needed to hold and process large amounts of data, such as the contents of two to four CD-ROMs.

'Volumetric' storage

What if bits could be recorded not only on the outer surface, as is the case with tapes and disks, but also through every plane of the media? This volumetric, or three-dimensional, approach to storage, still very much in the laboratory, is under investigation at Tamarack Storage Devices, Inc., a commercial spin-off of Microelectronics and Computer Technology Corp. in Austin, Texas.

Tamarack, formed last November, now expects its first holographic storage system to be available in the first quarter of next year. If its technique of stacking multiple holograms in one place works, Tamarack's storage system could be 10 times denser than existing disks or tapes and could offer data access and data transfer 10 to 1,000 times faster than existing media.

Supercomputer need 'urgent'

A pressing issue is how to make storage systems that are massive enough and fast enough to feed the next generation of massively parallel supercomputers. Work in this area is urgent, according to experts in the field, who contend that today there are not any storage systems capable of running with the massively parallel processing architectures that will soon be commercially available.

"There's a crude rule that for every gigabyte you need to move a megabyte/sec.," said Dick Watson, a project coordinator at the National Storage Laboratory (NSL), a consortium formed last May at Lawrence Livermore National Laboratory in Livermore, Calif. "So, if you're doing a teraflop, you need at least a gigabyte/sec. of I/O."

Transfer rates in the 500M byte/sec. to 1G byte/sec. range will be needed for conducting so-called Grand Challenge supercomputer projects such as world weather modeling and analysis. For instance, Lawrence Livermore climatologists now wait more than 10 hours to retrieve a month's worth of atmospheric modeling data from storage. Those same researchers would like to access this data in minutes.

The NSL is looking at ways to run hierarchical storage systems in parallel to create what it calls a High Performance Storage System. This goal, Watson noted dryly, involves "a lot of serious software issues related to mapping the data."

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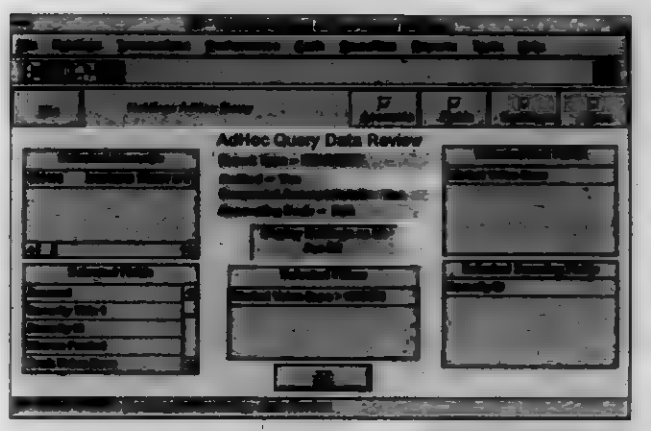

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Just 30 days

We'll leave out some names to protect the innocent. But a big company with thousands and thousands of PCs wants to place a very large hardware order. The company has lots of large and small iron, much of it carrying a blue, three-letter logo. So it solicits bids from IBM and a much smaller clone maker.

IBM, with roughly six or seven times the PC sales volume of the clone maker, should have far lower unit costs. And because the customer is also a big user of other IBM products, IBM should look at this deal in a much broader context than just the sale of some Personal System/2s.

The bids come in. The clone maker's is a lot lower. Furthermore, the clone maker will flex its unit price (likely downward) over the life of the contract should hardware prices drop. IBM has no such provision in its contract proposal and remains immovable in further discussions. "Here's our price; here's our terms; take 'em or leave 'em."

The customer leaves 'em.

IBM CEO Louis V. Gerstner Jr. is relatively new at IBM. But the pledge of decentralization at the company and the corresponding nimbleness and flexibility are not. Customers have been promised a departure from the account-controlled, mainframe-focused forces of the past.

If nothing else, stories like this — and rest assured, there are others — should give Gerstner a clear sense of the challenge ahead of him. It is clear that many of the old ways are indelibly ingrained in some people at IBM.

To date, Gerstner has been concentrating on a corporate overhaul, bringing in key executives to head areas such as finance and accounting. Published reports have him planning meetings with Microsoft about a possible warming of relations between the two companies.

Mr. Gerstner, here's a piece of free advice: Set aside a solid month with nothing to do but visit major customer sites. The company will run itself in your absence, more or less, and other people at IBM can speak in your stead to the Wall Street analysts. Things won't get much worse.

You'll learn more from IS directors in 30 days than you'll glean from a year's worth of boardroom meetings in Armonk. The customers will tell you that after 30 years of budget growth, their budgets today are flat or declining. That's why they can't tolerate inflexibility in contract negotiations.

They'll tell you that pricey mainframes have a definite place in their future plans, but not unless the mainframes are more easily integrated into a world of emerging standards in which IBM is a player, not the standards setter.

They'll tell you that, with 25% turnover in their ranks, they don't have much time to clean up their rat's nest of noninteroperable systems.

And therefore neither do you.

Bill Laberis

Bill Laberis, *Editor in chief*

Regulation debate

In a proceeding apparently aimed at "900" services such as chat lines and stock quotes, the Federal Communications Commission is considering ways to regulate the advertising and billing for dial-up computer services.

And in another proceeding aimed at developing more regulations for "video dial tone," the FCC is considering, for the nth time, whether to subject computer service providers to telephone access charges similar to the access charges that long-distance companies pay to local telephone companies.

Computer service providers, such as CompuServe, have long been exempt from access charges due to the rate shock that likely would ensue if such providers suddenly were required to pay high access charges instead of the comparably lower business rates they now pay.

While the access charge exemption may be relatively safe, the regulation of advertising and billing for dial-up computer services is unpredictable and will most likely be determined by input received from the computer industry and end users.

Susan J. Bakr
Gaithersburg, Md.

Scoop on OOP

Don Burleson's article on object-oriented phenomenon, "Getting the GOOD GOOP on OOP" [CW, April 5], was both amusing and disturbing. Too many IS managers are nontechnical as it is. We should not promote "buzzword-reliance" in any form — much less with respect to a phenomenon as significant as object-oriented programming (OOP).

In my days as a lowly programmer, I was amazed at my supervisors' lack of technical sophistication. After listening to a soliloquy saturated with object-oriented buzzwords from my manager, I asked her to define OOP. All she could do was spew out a list of canned phrases. This clearly demonstrated there was no real understanding of OOP or any acronym that begins with OO.

As a paradigm that binds problem-solving with the problem at hand rather than through the limitations of structured tools, object-oriented thought can propel all facets of computer technology to a new level of excellence. This will only happen if we rise to the challenge.

David B. Ciolkowski
New York

Talking software

I for one do not view contracting for software as an adversarial process, as described in "Licensing plea gets mixed reviews" [CW, April 26]. Customers want to use our software; we want to license it. Where's the conflict? Free market economics teaches us that there is a price point that will let our customers profit from our software while letting us earn a profit.

My company would welcome a level licensing playing field that lets software compete on features, performance and price and not give a competitive advantage to those firms that obtain their revenue through "unreasonable upgrade fees, rigid licensing options and inflexible contracts," in the words of your editorial "Fighting back." We would prefer to negotiate price and options with customers and to stop spending time negotiating defensive contract terms with which customers feel they need to protect themselves from "some software suppliers."

Charles A. Mills
President
Firesign Computer Co.
San Francisco

Buyer beware

They say "If you want something done right, do it yourself," but even this cliche doesn't apply to the situation described in "Do your own number-crunching" [CW, April 19].

The writers are "working under the assumption that dumb terminals cost one-third less than workstations," but where do they buy their equipment? A good-quality dumb terminal costs roughly $600, whereas a ready-to-run workstation in a client/server environment costs no less than $5,000 and often closer to $10,000.

Caveat emptor!

Steven Salomé
Santa Fe, N.M.

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This is freedom from drudgery?

David A. Kelly

Once upon a time, computers were supposed to free us from the drudgery of work. We would all have a supermainframe on our desk and in our pocket, and all the nitpicky items on our to-do lists would be crossed off automatically.

As a result, we would be free to explore one area that few of us ever had the luxury to investigate: creative thinking. Computers would carry the firewood, draw the drinking water and provide the milk and honey while human beings conceptualized fantastic new products, ideas, services and solutions.

That was the plan. But if you're like me, you haven't arrived in this promised land.

To be sure, there have been some revolutionary changes: Most workers now have desktop PCs more powerful than the mainframes universities had in the mid-1970s. But has this increased processing power translated into a reduction of grunt work? Have computers provided us with time for creative, human-only type work? The answer is a resounding no.

Instead of computers reducing work, they have, paradoxically, increased most people's work loads. The reduction of grunt work has been limited to a few small areas, such as calculation and repetitious tasks.

But, in the vast majority of areas computers have affected, the result is that a small number of menial steps have been replaced by a new

and broader collection of more complex tasks. We've been given high-tech lawn mowers that allow us to cut our grass in half the time, but we're now told we have to mow all the yards in town.

Computers' ability to crunch numbers and re-array them for different scenarios, to revise and retype documents in a flash, has also created more work.

Unless it is carefully controlled, the computer's ability to create information fast outpaces the user's ability to absorb it. Instead of using computers to save time, people use them to shift and recompile information. The explosion of information generated by computers has not dramatically increased our productivity. Rather, it is weighing us down.

In the past, a business might have wanted a monthly report on the number of customers, sales and so on. However, with the latest computers, the business now has the ability to generate weekly, daily, hourly reports. It can create reports tracking individual employees' sales per day, sales per hour, sales per minute.

Undoubtedly, computers have simplified the basic tasks of accounting, but they have also given rise to whole new options and potentials. They have decreased people's work loads by 30% while adding 300% more work.

Computers have expanded people's jobs sideways, not upward. Instead of just typing a document, secretaries are expected to typeset it, size it and graph it. They now must know publishing, graphic design and aesthetics.

Don't get me wrong. I love computers. But I

think the utopian idea of computers performing all of our menial tasks and freeing our energy for creative thinking has just been crushed by the weight of this hour's latest sales reports.

Kelly is a client/server and systems integration consultant based in West Newton, Mass.

Airlines could teach manufacturers a thing or two

OPEN MIND *by* Esther Dyson

Manufacturing productivity and revenue could both be improved if manufacturers used information as aggressively as some service industries do.

Take PCs as an example: Except for increasingly frequent price cuts and some retail discounting, a certain model will cost the same wherever you purchase it. Moreover, if it is back-ordered, you'll just have to wait and take your turn; you can't pay a premium to have it delivered early (unless maybe you are a very big customer).

Suppose you start to think of selling goods as selling time on your manufacturing line. Suddenly your manufacturing line is something to be scheduled as tightly as an airline.

This applies to a broad range of goods, not just PCs. But isn't it a little silly? Why not create a clean and honest market for people willing to pay the extra charges?

One reason, of course, is that the requisite software and pricing systems would be extremely complex. Consider the airline business: If you want to fly from Dallas to Austin, about 200 miles, it may cost you $200 or $20, depending on when you're going, what day of the week, when you buy your ticket, how long you're staying and so on.

The science (and art) of pricing airline seats is called yield management. This means airlines attempt to maximize the total yield (revenue) by a carefully managed trade-off between units sold and prices charged. The Saturday night stay doesn't interest airlines, but it's their way of separating people who are price-conscious from those who aren't.

This balancing of supply, demand and pricing is good business for airlines because their product is transitory. If an airline doesn't sell a seat at any price, it vanishes forever. That, of course, does not apply to tangible things like computers. Or does it?

Suppose you start to think of selling goods as selling time on your manufacturing line — embodied as products. Suddenly your manufacturing line is something to be scheduled as tightly as an airline.

Until recently, that didn't make much sense. The cost of developing and managing the information was too high compared with the potential gains. But, in our increasingly efficient (or competitive) economy and with increasingly powerful and cheap information systems, those trade-offs are beginning to change.

Some manufacturers are already starting to do it in a small way. Just as some transit systems and utilities, such as the phone company, have always had peak and off-peak times, manufacturers are beginning to quote a rush price and a regular price.

But most manufacturers aren't acting from good information. They just know that they have a four-week lead time and they quote that regularly. They don't know how to price a two-week order or whether they could make money delivering next Friday but not next Wednesday. They don't manage for underutilized capacity or overbooking the way airlines do. The time management function has been more an issue of moving things from warehouses, rather than making them to order.

But that is about to change. Goods are expensive to inventory even when they're cheap to make. New products, such as Intellection's Rhythm production scheduling tools, let manufacturers not just change schedules, but work

fast enough to do what-ifs, reallocate resources and see the impact on their schedules and costs right away.

The next step will be for them to adjust their prices accordingly.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.

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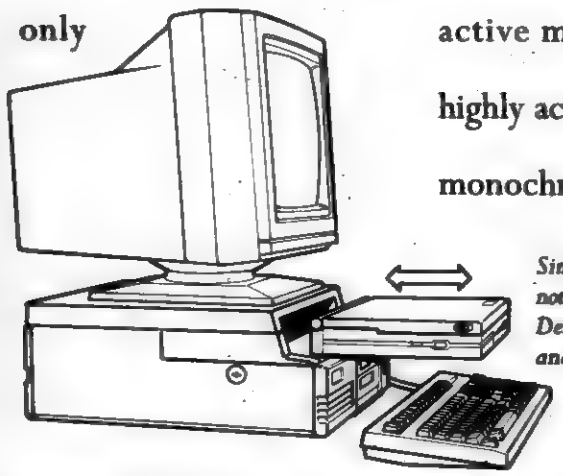

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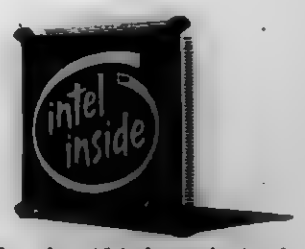

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Charles Babcock

The reach of NT

Microsoft's reach with Windows NT extends far beyond the desktop. In the company's own vision of the future, NT will reside on powerful servers and manage everything between the PC and the mainframe — if it doesn't replace the mainframe altogether.

Some of the features that will be built into NT show such a commitment to becoming the manager of this space that the established aspirants, VMS, MVS/ESE and Unix, should consider themselves put on notice.

Microsoft is not making any secret of these ambitions. At DB/Expo '93 in San Francisco May 4, Bill Gates cited the scalability of Windows NT from the smallest PC to minis and mainframes: "For the first time, there will be a top-to-bottom system."

Microsoft is not merely talking big; it is acting big with a massive commitment to make NT an integrating force. The Advanced Server version will be a scalable operating system that can function as a powerful network manager and application server. Two good examples: IBM's SNA Server and the Hermes system management application, both of which will be built into NT Advanced Server. For those who think of Windows NT as an extension of the fumbling Windows 3.0 environment, consider this: SNA Server in NT will make the full resources of the IBM SNA network available to users of MS-DOS, Windows, Windows NT and OS/2.

If the writer of a client/server system for the desktop wanted her program to connect to data generated by a mainframe IMS application, she could tap an application programming interface on the SNA Server, using a standard LU protocol such as LU0. The LU protocol "is the only thing the writer needs to worry about. The SNA Server takes care of the connections to the mainframe and IMS application," said Vesa Soumalainen, SNA Server product manager.

Soumalainen logged onto an IBM NetView session from his Windows NT desktop, generated a NetView session and managed a neighboring Windows NT server from it.

Right connection

The SNA connectivity is not focused on one or two specifications and protocols from SNA's sprawling laundry list. On Soumalainen's desk sit stacks of specifications for suppliers of specific hardware device drivers and 3270 terminal emulators. SNA's Advanced Peer-to-Peer Networking is one of a few areas not supported because "it's an evolving area."

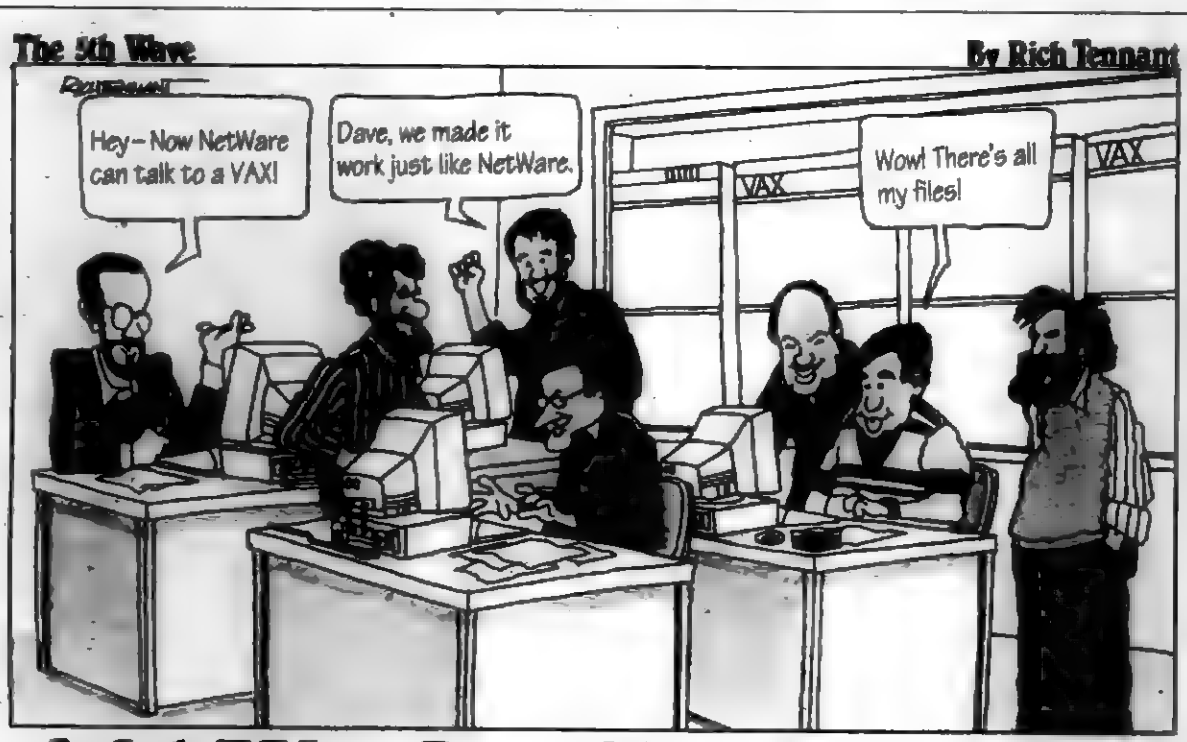
SNA Server allows a client to connect to one or many hosts over a variety of connection paths. It supports LAN protocol Named Pipes over NetBEUI, TCP/IP and others, and NetWare's IPX/SPX.

The other major feature mentioned earlier, the Hermes system management application, will become part of NT Advanced Server in the fourth quarter. Named for the Greek messenger of the gods, Hermes will deliver messages to NetView or an NT Advanced Server for network management. It will also give network managers the ability to inventory resources allocated to each PC on the network, to automatically distribute and install copies of software, to roll back an incomplete installation or to perform remote diagnostics and controls.

Other parties can claim to do pieces of what is being integrated into Windows NT Advanced Server. NetWare for SAA gives the NetWare user access to the SNA network. But no one is integrating as many system management capabilities.

Let the buyer beware: NT in its Advanced Server form is big. You may be getting more than you bargained for if you aren't planning on managing your whole shop with NT. On the other hand, if enough copies of client NT are installed, all this functionality will come in handy.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.



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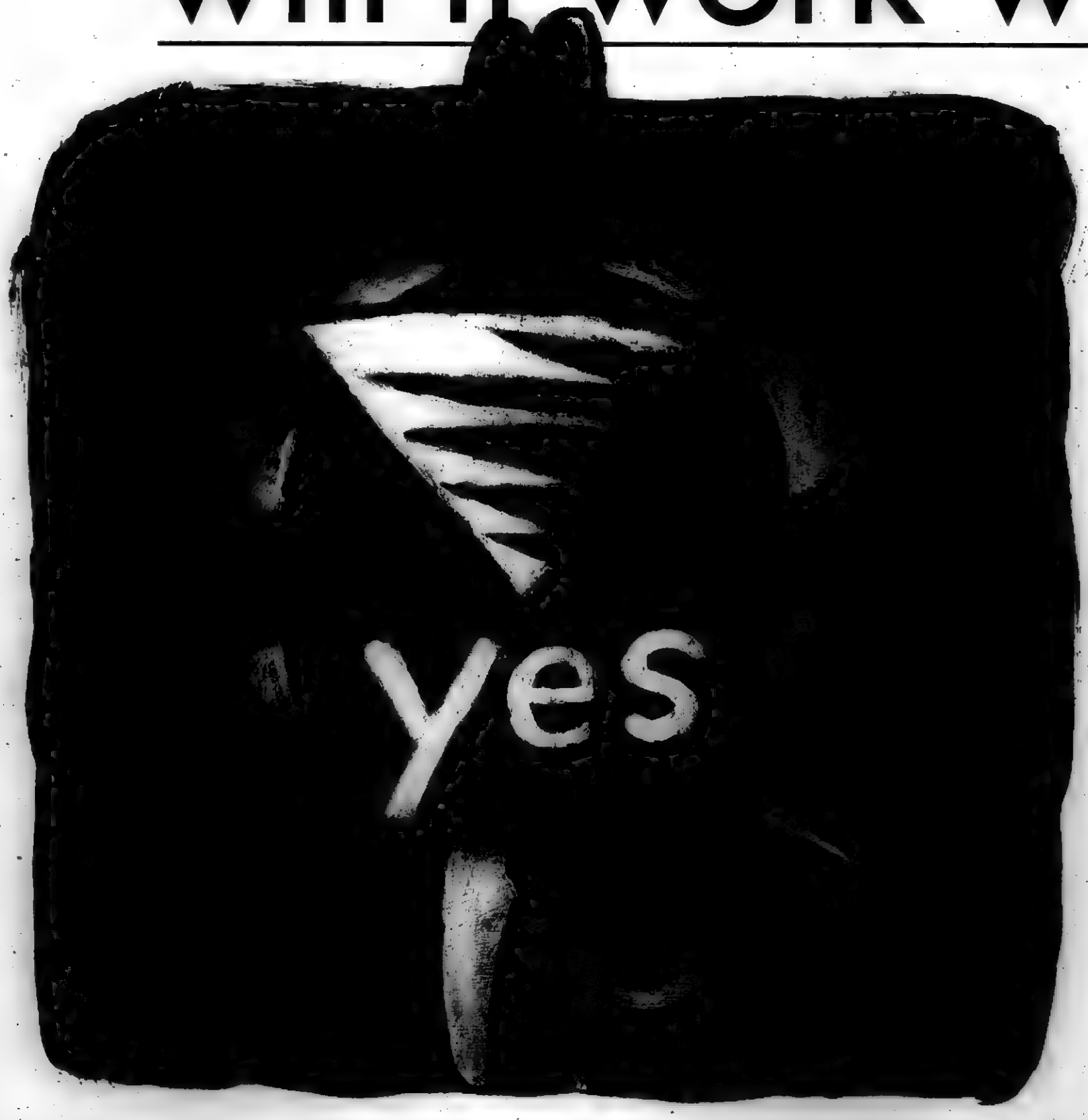

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DOS 6.0 sales not bitten by reports of bugs

Microsoft claims product has 90% satisfaction rating

By Christopher Lindquist

Despite claims of having shipped some 3 million copies of MS-DOS 6.0 in its first two months, Microsoft Corp. still faces complaints that the product is not exactly ready for prime time.

Published reviews and bulletin boards are reporting serious, sometimes crippling, bugs in the new version of an old operating system — for example, data files being irreparably corrupted.

However, other users are reporting that they have seen no cause for concern with the product. One CompuServe user, who requested responses from satisfied MS-DOS 6.0 users, said he received a number of replies from customers who had installed multiple copies of the operating system with little or no incident.

DOS use has been estimated at 40 million copies worldwide.

Microsoft, meanwhile, is claiming that MS-DOS 6.0 maintains a satisfaction rating of 90% and has fewer bugs per unit reported than any of the Top 10 Microsoft applications. However, the company has acknowledged that the technical support lines for MS-DOS 6.0 are still being flooded with calls, and it noted that the MS-DOS 6.0 development team had been placed on the phones to help with the more serious problems.

In general, user response to the bug reports, both on the CompuServe support forum and on other bulletin boards, ran the gamut from outrage to contentment, with many customers maintaining a wait-and-see attitude toward purchasing MS-DOS 6.0 until the truth is wrung from the situation.

Among the trouble reports are problems with MemMaker, the Microsoft memory optimizer, and DoubleSpace, the data compression utility. The most noticeable complaint is with cross-linked files, which can result in data loss.

While some users noted that cross-linked files were the result of using DoubleSpace, others indicated they had noticed the problem without the data compression utility being installed.

For their part, Microsoft technical representatives advised customers experiencing difficulties to check for incompatibility between certain BIOS versions and memory managers. Several users reported that turning off write caching, a means of speeding disk access, had seemingly solved the problems.

However, still other users said they were going back to MS-DOS 5.0. And a few noted that they felt they were being ignored by the technical support staff.

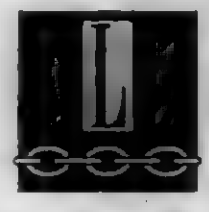
Object orientation

Move to OLE no easy task

By Christopher Lindquist

Attendees at the recent Object Linking and Embedding (OLE) 2.0 Developers Conference in Seattle came away with a software development kit, OLE 2.0 shoelaces and few illusions about the scope of the task in front of them. That task will no doubt result in OLE 2.0-compliant applications — but not likely anytime soon.

The developer's kit contained a large number of tools; documentation, including the OLE 2.0 marketing slides; a programmer's reference; and source code for OLE 2.0-compliant applications — all intended to aid programmers in their attempts to create OLE 2.0 applications.



But even with that assortment of aids, Microsoft Corp. made it clear to developers that the job ahead was not going to be easy — even telling independent software vendors that they should devote a full-time programmer to the task of preparing for the move to OLE 2.0.

The complexity of programming for OLE 2.0 may limit the number of applications supporting it in the near future, though several companies, including Corel Corp., Shapeware Corp. and Microsoft, have promised OLE 2.0-compliant applications by year's end. Just what functionality will be implemented first remains to be seen.

Possibly the biggest challenge facing developers will be the shift to an object-oriented, specifically a Component Object Model (COM), framework for their applications. COM defines a specification for "Windows Objects" that allows applications to communicate via object-oriented interfaces. For example, an OLE 2.0-compliant word processor could tell an OLE 2.0 graphics package to create a graphical representation of a written outline.

However, for this functionality to work well, developers said, many applications will have to be rewritten to properly expose the OLE 2.0 interfaces. That will be a challenge, according to several developers at the conference.

It is not an insurmountable challenge, however. "It's another universe," said Steve Schauer, a developer at Wilson WindowWare in Seattle. "But once you understand the model, it's not bad." Schauer added that OLE 2.0 did have one advantage for developers just learning to work with it: It allows you to build in a block-like manner. "You don't blow your work as you go," he said, explaining that a developer can start with a basic OLE 2.0 application and add more features without having to start over.

Stuart Wyatt, chief executive officer at Chrisalan Designs, Inc. in Wenatchee, Wash., agreed and added that OLE 2.0 also handles "passive responses" very well. In other words, if a developer chooses not to implement a certain OLE 2.0 feature, the system will know how to handle the situation — something very different from first learning to program for Windows, where forgetting one piece could collapse the whole application.

Developers indicated that writing applications that take advantage of OLE 2.0's Automation capabilities, which allow one application to take advantage of another's functionality transparent to the user, would be one of the easier features to begin with. Indeed, Microsoft is due to ship Visual Basic 3.0 next month as the "glue" that will connect OLE 2.0 applications.

'Visual editing'

But the first noticeable impact of OLE 2.0 will probably be with Visual Editing, where users activate an object by double-clicking on it. Once activated, only the menu structure of the "container" application will change instead of an entire second application having to load a new interface.

At least one analyst questioned how important Visual Editing will be, however. "Who do you know who's dying to use compound documents?" asked Jesse Berst, publisher of "Windows Watcher," a newsletter in Redmond, Wash. Berst said that COM, with its ability to modularize applications for use by other programs, and the programmability provided by OLE 2.0 Automation had far more exciting implications than in-place editing of compound documents.

But even with the possibilities of OLE 2.0, Berst said, it will take the next step — distributed OLE, Microsoft's "Cairo" operating system — to take full advantage of the functionality.

OLE in its current form supports only communications within a machine, which limits its capabilities for applications such as collaborative document creation. Cairo, due in 1994, according to Microsoft, will allow for object communications across enterprise networks. "It really takes off when you can distribute it," Berst said.

The OLE automation feature of OLE 2.0 will allow applications to communicate with one another in a variety of ways. One way that Microsoft hopes will be the most pervasive is through the soon-to-be-released Visual Basic 3.0. Microsoft is touting the upgraded (Visual Basic as the "glue" that will connect OLE 2.0 applications. However, it may be several months before these applications begin to appear in any number.

Videoconferencing viability on way

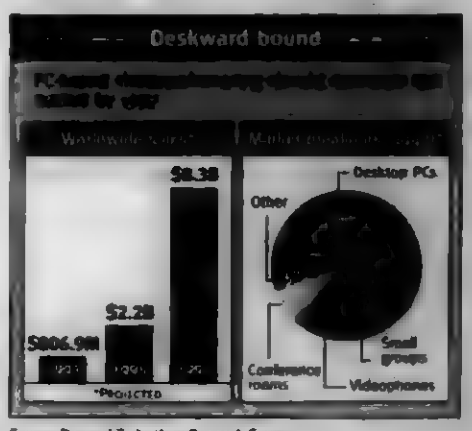
By Michael Vizard

The integration of real-time videoconferencing with desktop applications looks like it will become a reality in 1993 through the efforts of established players such as PictureTel Corp. and several start-up companies.

During LotusWorld earlier this month, PictureTel demonstrated a prototype of its conferencing software running under Lotus Development Corp.'s Notes groupware offering (see story page 58).

The demonstration of the PictureTel software for Notes, which is still early in its beta-testing cycle, consisted of a live teleconference between Boston and an IBM office in Paris over a phone line that complies with the H.261 CCITT international standard for videoconferencing.

However, Picture-
Video, *page 40*



Source: Personal Technology Research Group

Vendors support faster EISA

Compaq, AST among those backing EMB extension for data transfer

By Stephen P. Klett Jr.

A coalition of hardware vendors, including Compaq Computer Corp., AST Research, Inc. and Intel Corp., recently announced support for an extension to the Extended Industry Standard Architecture (EISA) bus aimed at dramatically increasing data transfer rates.

While the vendors acknowledged that there is minimal demand for the new bandwidth today, they expect user needs to grow tremendously as technologies such as multimedia mature.

The two-mode extension is called Enhanced Master Burst (EMB) and was designed to provide transfer rates of 66M or 133M byte/sec. for bus master expansion boards, according to BCPR Services, Inc. in Spring, Texas.

Mode one will double the EISA bus' current 33M byte/sec. transfer rate to 66M byte/sec., and mode two will widen the data path to 64 bits resulting in a 133M byte/sec. rate, BCPR said.

Mike Perez, vice president of product development at Compaq's Systems Division, called the EMB announcement a "road map of where EISA is going, leading over time to the quadrupling of current throughput rates."

Perez said EMB-ready systems will debut from Compaq within a year, but he declined to mention specific products.

Future demand

While Perez said users' current needs do not require this additional throughput — he estimated data and file server environments use 30% to 40% of their available bandwidth — he predicted this would change as communications and video-intensive applications catch on and begin to push EISA's limits.

"As acceptance of industry-standard systems goes up for roles other than plain servers and moves into functionality of routers, bridges and gateways, EMB's acceptance will increase," Perez said.

Analysts agreed, saying EMB would take off when multimedia applications begin to arrive in force, but they added that cost was a major hurdle in EMB's acceptance.

"Users are clamoring for [increased throughput] in the area of video applications," said Ted Julian, an analyst for International Data Corp.'s (IDC) PC hardware program.

Indeed, for some users, the need for increased throughput has arrived.

"I/O width is a big issue for us," said Bill Lodge, project manager at Turner Corp., a construction management firm in New York that uses servers from Dell Computer Corp. and Compaq. Lodge said EISA with EMB is appealing because Turner has been looking for ways to increase throughput levels due to increases in the use of Microsoft Corp.'s Windows and electronic-mail applications.

"We'd like to see [improved bandwidth] on a server," Lodge said. "It just makes sense with Pentium coming out. It's definitely something we'd look at and use — depending on cost considerations."

Data road map

1992 U.S. unit shipments, according to IDC:

EISA: 16-bit, 8.3M byte/sec. transfer rate; 758,000 units.

XT/AT bus: 32-bit, 33M byte/sec. transfer rate; 6.8 million units.

Micro Channel Architecture: 32-bit, 66M byte/sec. transfer rate; 961,000 units.

Working both ways

According to BCPR, XT/AT bus and EISA expansion boards will operate in EMB systems and vice versa. EMB specifications from BCPR are available to developers for $200.

Other firms announcing support for the EMB extension include the following: Adaptec, Corollary, Inc., Distributed Processing Technology, Hewlett-Packard Co., NEC Technologies, Inc., Ing C. Olivetti & Co. and Wyse Technology, Inc.

Several software firms, including Microsoft, Novell, Inc. and The Santa Cruz Operation, also announced support.

HELP LINE

Part of an occasional series of columns aimed at providing users with answers to technical questions. This week's questions and answers are provided by Corporate Software, Inc. in Canton, Mass.

Microsoft Corp.'s Access 1.0 database software

Q. How would I include a field with blanks in it as part of a query?

A. You must specify that you want to show records with blanks. First, specify the criteria and then add "or is null." For example, to specify that the query should include only those records for which the state is not "MA" or a blank, the criteria would be as follows: o"MA" or is null.

Q. I installed Microsoft Access onto my hard drive, and I noticed there is an MS-SETUP.T directory there. What is this? Do I need it?

A. This MS-SETUP.T directory remains on the hard drive when you choose to reboot your system after completing setup. You can safely delete this directory and all the files in it. If you return to Windows after setup instead of rebooting, Access removes this directory itself.

Q. I've gone into my Access database and changed some permissions. Now I find that I am having trouble accessing and changing objects.

A. Adding security information after the objects have been created can sometimes cause unusual and unwanted results. You should set up your users, groups and permissions when you begin designing your Access database.

If you do have problems after changing permissions, highlight the object in the Object window, choose Edit/Copy and then Edit/Paste.

Access will prompt you for a new name. Your security arrangements should work properly with the new object. You can then delete the old object.

Borland International, Inc.'s Paradox for Windows 1.0 database software

Q. Is it possible to use a Paradox for DOS Paradox Application Language (PAL) script in Paradox for Windows?

A. Paradox for Windows does not provide a conversion path for Paradox for DOS PAL scripts. You can, however, create an icon for your Paradox for DOS scripts and launch them from Paradox for Windows.

First, use the Windows File Manager to associate the .SC extension with your Paradox for DOS .PIF file. Next, open a folder from your Paradox for Windows desktop. Add the script to the folder by choosing Folder/Add Item or clicking on the Add Item icon on the Speedbar.

Choose the proper path, and for File Type, choose ‹Files›. Click on OK, and the file will appear as an icon in your folder. You can then double-click on the icon to launch Paradox for DOS and your application.

When you exit your application, you will return to Paradox for Windows. Your Paradox for DOS program directory must be in your path for this to work properly.

DEC prepares for NT application deluge

More than 250 apps to be ported to Alpha on NT

By Melinda-Carol Ballou

Digital Equipment Corp.'s progress on the applications front for Windows NT will be demonstrated at Windows World next week.

DEC will announce the release of more than 250 applications that have been ported or are in the process of being ported to NT on Alpha by the end of next month, and DEC officials will demonstrate Insignia Solutions, Inc.'s SoftPC emulation software running on Alpha and tools for producing binary executable images of Alpha code from Intel Corp. source code.

Sources said the company is negotiating with major suppliers of compilers, such as Borland International, Inc., Zortec, Inc. and Watcom, to add support for NT running on Alpha AXP platforms.

While DEC refused to confirm details, it said that it was "in negotiation," and DEC's group manager for NT, Jeff Schriesheim, noted, "Today, in order to be a chip supplier, you also need to be a compiler technology supplier — the two are tremendously intertwined."

Missed in March

Microsoft Corp. did not ship SoftPC emulation for DEC's Alpha-based NT platforms in the March beta-test release of Windows NT because the product was only recently released outside of Insignia for evaluation.

SoftPC will provide 16-bit emulation for Intel, Mips Technologies, Inc. and Alpha-based systems; product support for the three architectures is being coordinated, according to Schriesheim.

"We're still working through the remaining issues — there are significant changes going on to the NT system. There are pieces being done which are architecture specific and pieces which are shared across Intel, Mips and Alpha, which need to be resolved," he said.

The early performance measurements for PC emulation are causing a little concern, he said, but in general, the product looks "quite good."

DEC has already done "significant work as to put software onto OpenVMS and OSF/1, so some shakeout has occurred for the software on Alpha," Schriesheim said. "The real performance benefits will obviously only come from native applications, yet the reality is there are thousands of [16-bit] applications that run on Windows. Microsoft's efforts to bring in the 32-bit [application programming interfaces] to other platforms will greatly help [the development of 32-bit applications]," he added.

Nice

Try.

DOS 6.0 unleashes compression tizzy

DoubleSpace utility unsettles users as well as compression market

By Michael Fitzgerald

The rise of "fatware" led to Microsoft Corp.'s decision to put the DoubleSpace compression utility into DOS 6.0, and that in turn has created a serial melodrama: Users have found themselves somewhat uncertain about the sidney on compression utilities.

The much-publicized legal spat between Microsoft and Stac Electronics, Inc., which makes the Stacker compression utility, has had little impact on new product releases. But Microsoft subsequently revealed that its coming Windows NT operating system will not recognise compressed files.

Current users of compression software have found that it is difficult to convert files from one compression form factor to another.

"I'm a little confused [in part] because IBM is going to be coming out with IBM DOS 6.0, and there was some discussion that they're going to put their own compression software in there," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co.

For now, Nelson said, New York Life is testing DOS 6.0 because it would "like to be able to save on the expense" of buying Stacker for its new PCs. At the same time, he said that New York Life will not do a mass upgrade to DOS 6.0 and will continue to support its raft of current Stacker users.

Making room

Compression software such as Stacker or SuperStor is aptly named; it lets users stuff files down into a smaller space, creating more room on hard disks. While most vendors bill their products as doubling the space available on the hard drive, users report that they generally get between 1.5 and 1.8 times more room on their hard disk after they have compressed files.

There is also widespread speculation that Microsoft's decision to include the DoubleSpace utility in DOS 6.0 means third-party compression vendors will go out of business. "I think it kills all the compression utility makers," said Andrew Seybold, editor of the newsletter "Outlook on Professional Computing."

Some compression vendors agreed. AddStor, Inc., which makes the SuperStor Pro compression package, introduced DoubleTools, which was designed to give users a better way to manage compressed disks. Unlike Stac, which is trying to out-feature Microsoft, AddStor positioned DoubleTools as a DoubleSpace extension, not as a competing compression tool.

Still, many users expressed loyalty to their current compression software vendor.

"We don't have any plans to implement DOS 6.0 at this point because we have [Stacker] in place, and we see [compression] as the major reason to buy the upgrade," said Greg Feeler, information systems manager at Employer's Resource, Inc. in Boise, Idaho.

There may be some practical reasons to avoid switching. Dan Ness Jr., an analyst at Computer Intelligence in La Jolla, Calif., said, "When you've got something compressed under one format and you need to decompress and recompress it in another format, it's a pain." Ness cited a letter Microsoft sent customers informing them that reconfiguring a hard disk from Stacker to DoubleSpace could take six to seven hours on a 486-based system.

For the current 4 million compression users, DoubleSpace may be a nuisance they are stuck with. Even Seybold said Microsoft should have made it easier to deinstall DoubleSpace.

Charlie Russel, computer-integrated monitoring system administrator at New United Motors Manufacturing, Inc., the Fremont, Calif.-based joint venture between Toyota Motor Corp. and General Motors Corp., is using Stacker and DOS 6.0 in his environment. He said he would like to deinstall DoubleSpace on his new machines because "I have a long history with Stacker, and I trust it."

NT left out — sort of

The revelation that Windows NT will not recognise any compressed files came in the weeks after the release of DOS 6.0. Brad Chase, general manager of MS-DOS at Microsoft, said this would affect only users who wanted to use DOS 6.0 and NT on the same PC, and that a future version of NT would work with DoubleSpace.

For now, "the piece of advice Microsoft would give to users is not to use DoubleSpace if you want to use NT and MS-DOS 6.0 on the same PC, unless you have no need to use those files under NT," Chase said. He added that Microsoft built a number of operating system hooks into DOS 6.0 to allow users to be able to install other vendors' compression software.

The long-standing issue of whether compression software is reliable has some users avoiding compression software altogether.

Steven Adas, director of MIS at States Niteware, Inc. in New Bedford, Mass., said he has no plans to use DoubleSpace after having previous problems with Stacker. "If I need space, I just zip the file," he said.

Videoconferencing viability

CONTINUED FROM PAGE 37

Tel, which dominates high-end teleconferencing applications, is not the first company to integrate videoconferencing with desktop applications over standard international phone lines.

DeskVision, Inc. in Peabody, Mass., currently offers a CCITT-compliant videoconferencing system that takes CCITT signals and packetizes them for distribution across Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines, Digital Equipment Corp.'s Pathworks and Integrated Services Digital Networks, according to company President Phil Taylor.

The package includes a video camera and related PC hardware and sells for about $10,000.

However, in order to promote the adoption of teleconferencing, some vendors are offering less expensive proprietary solutions that are incompatible with the CCITT standard.

For example, ViewPoint Systems, Inc. in Dallas will demonstrate its Personal ViewPoint for Windows at Windows World in Atlanta later this month. Priced at $1,995, which includes software and a video camera, the ViewPoint offering transmits video images at 30 frames per second over a Transmission Control Protocol/Internet Protocol link, which is the same speed as the DeskVision product.

However, because the ViewPoint system does not support CCITT, users cannot integrate it with other teleconferencing packages such as PictureTel's offering. To solve this, ViewPoint executives said they will provide protocol converters sometime next year.

Taylor said he plans to provide a $2,000 software-only CCITT offering by year's end.

In general, the performance of these products is determined by the amount of network bandwidth and hardware processor horsepower available. "Basically, the quality of these images is going to be dictated by the speed and horsepower you throw at it. If you're going to run this stuff over Ethernet alongside other applications, you better have one hell of a compression algorithm," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh.

"If you keep your expectation low, products like the ViewPoint software are reasonably good. If you expect fluid motion, however, you'll be disappointed," said Sayeed Rashid, an engineer at NEC America, Inc. in Dallas.

NEC recently demonstrated the ViewPoint software running in conjunction with its Asynchronous Transfer Mode (ATM) router offerings alongside a $9,000 package for Unix systems created by InSoft, Inc. in Mechanicsburg, Pa. According to Rashid, the more expensive InSoft software provided more fluid motion running on a dedicated card attached to a Sun Microsystems, Inc. workstation.

Moore said he will likely start evaluating desktop teleconferencing software when he finds an application requiring it. He said he sees a need for creating desktop conferencing across multiple cities, but as yet these technologies are all point-to-point solutions. Multipoint solutions are expected to be available later this year.

"These applications are sensitive to the amount of bandwidth available. We see this market taking off when the new network architectures like ATM are in place. We're very encouraged that Novell is working with AT&T in this area," said Sarah Dickenson, program director for visual telecommunications at Personal Technology, Inc., a market research firm in Waltham, Mass.

"In the future, we see this as becoming a very valuable technology," Moore added.

Application packages

Landmark Research International Corp. has introduced Speed Test for Windows.

The product is a Microsoft Corp. Windows-based software program designed to give accurate measurements of a system's CPU, floating point unit and video performance.

Speed Test for Windows measures system performance as if various application software programs such as AutoCAD or Microsoft's Excel were running. This version has added a data capture feature that saves all test results to an internal database, the company said.

The product costs $49.

▶ *Landmark Research International*
703 Grand Central St.
Clearwater, Fla. 34616
(813) 443-1331

Utilities

TouchStone Software Corp. has introduced CheckIt PRO: Tests & Tools.

The company said CheckIt PRO: Tests & Tools is a flexible, troubleshooting diagnostic utility that tests PC hardware, providing explicit interpretation of results to identify faulty components. An assortment of diagnostic suites can be constructed by using TouchStone's custom test applets.

The product offers the ability to test PC hardware such as controllers, drives, input devices, memory, motherboard, peripheral devices, video components and more.

A two-volume set costs $149.95.

▶ *TouchStone Software*
Suite 250
Huntington Beach, Calif. 92648
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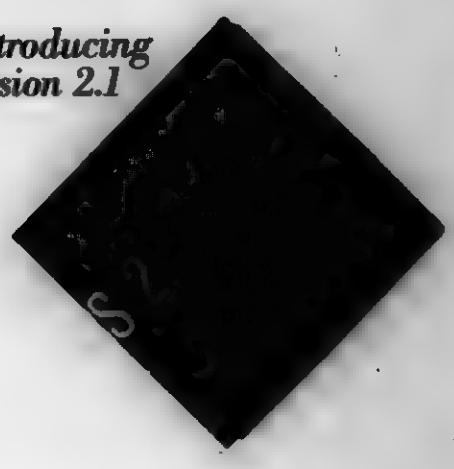
Introducing Version 2.1



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Perhaps you've also heard that when it finally does get shipped, NT will run only a limited number of the thousands of existing Windows™ and DOS apps, and will really put the squeeze on your hardware. It will require a lot more memory and hard drive space than originally promised.

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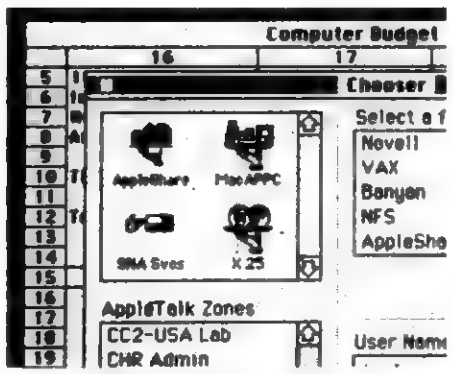

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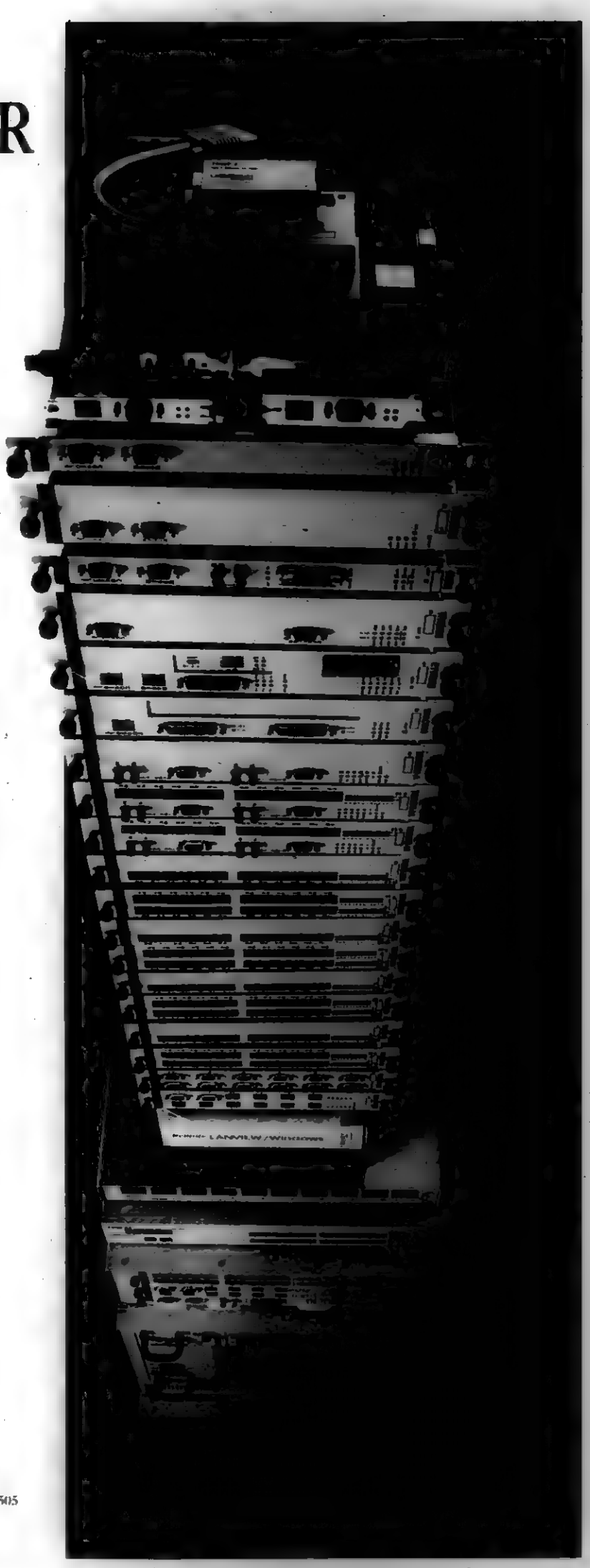

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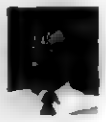

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Keys to successful LAN management

By Michele Doetert

MANAGING LOCAL-AREA NETworks involves more than measuring network packets running across a cable. Good network managers strive to make their networks reliable, responsive and as user-friendly as possible.

The first key to doing this, according to those in the trenches, is having all the network information at your fingertips. "Many LANs grew up so quickly that no one had the time to document them," said Kris Gronert, a senior LAN analyst at the Quaker Oats Co. in Chicago. "If you don't know exactly what's on your network, you can't manage it; all you can do is fight fires."

The second key to successful network management is being proactive — identifying and correcting incipient problems before the network crashes.

In the last two years, efficient network management has become easier, users said, as vendors have released a spate of new products designed to help them compile information about their networks and head off small problems before they become big ones.

Whether the LAN has five users or 500, is managed locally or from a remote central location, is state of the art or a 10-year-old legacy, the person or persons responsible for it must manage the same three basic areas: the user desktop, the network server and the physical cabling connecting the two.

Managing the desktop

The first step to managing the user desktop, network managers said, is finding out exactly what is on it. A simple table of users and their network addresses is not enough.

Ideally, a user database should display both hardware and software information, including brand of PC, type of processor, amount of random-access memory, type of network card, version of network drivers, capacity of hard disk, applications stored on hard disk, BIOS version, client operating system and version and the network shell version.

If such a desktop database does not already exist, several products can autodiscover some or all of the information for you, including the LANDesk Manager from Intel Corp. in Santa Clara, Calif.; Saber LAN Workstation from Saber Software Corp. in Dallas; NetCensus from Talley Systems Corp. in Hanover, N.H.; Network H.Q. from Magee Enterprises in Norcross, Ga.; and LANExam from Network Computing, Inc. in Dallas.

Secondly, tracking the physical location of users can save a lot of time. In some organizations, users seem to move every quarter; a physical map can save hours of wandering around cubicles looking for John Doe's PC and its faulty network card.

Thirdly, upgrade everything at once. If some users run DOS 5.0 and some DOS 6.0, some run Windows 3.0 and some Windows 3.1, and some run one version of the network client software and others run another, troubleshooting user problems becomes a major headache.

Network-based software distribution packages, such as the SoftWare Update and Distribution System from Frye Computer Systems, Inc. in Boston, let managers upgrade all user desktops with a few keystrokes, instead of having to carry disks around.

Managing the server

Although network servers have necessarily been more tightly controlled than user desktops, a complete inventory for each server is a necessary network management tool.

Server inventories should include the same hardware, software and configuration information as desktops, as well as network operating system configuration and listings of attached devices, such as printers, modems, CD-ROM players, optical jukeboxes, tape drives and device driver information.

"If your network backup failed, you'll save a lot of time if you have all the information about the device itself, the device driver, the network operating system and the backup software in front of you before you start calling for support," said Ron Rosen, manager of LAN support and planning at American Express Co.'s corporate headquarters in New York.

Secondly, in order to plan for network capacity increases, managers must be able to track server use historically. Server management products such as Xtree Tools for Networks from XTree Co. in San Luis Obispo, Calif.; Frye's Frye Utilities for Networks; and LAN Server Watch from Brightwork Development, Inc. in Tinton Falls, N.J., can take "snapshots" of server processor use during the course of an hour, day or week and graph the information.

Some of these products can identify server use by user, enabling managers to identify, and possibly move to another server, power users who eat up network resources. "Two or three database users could be eating your server alive, and moving them to their own server will greatly boost your entire network performance," said Craig Anderson, information systems director at Lutheran Brotherhood Insurance Corp. in Minneapolis. "But you won't know that unless you have a history of server usage."

Most important, users say, network managers who install server monitoring packages can be automatically alerted when server use and performance statistics exceed or fall below user-definable parameters.

"Having our server monitors set up to page us when parameters are exceeded lets us fix the server before it crashes and takes down our mission-critical applications," said Wayne Robertson, network supervisor at St. Agnes Medical Center in Fresno, Calif.

Managing the network

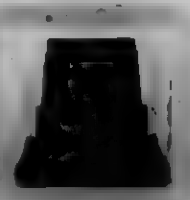
According to network managers, the key to managing the physical network cable, whether it is coaxial, twisted pair or the latest in fiber optic, is, once again, information. An up-to-date plant wiring diagram that includes the location of hubs, repeaters, wiring closets and network terminations can eliminate lots of crawling around on the floor with a cable tester.

"Don't trust your memory and don't trust the map drawn by the guy before you," said Jim Queen, network manager at Enron Gas Services in Houston. "You can't fix a break in a cable you can't find; so start from your server or backbone and trace everything down."

Configurable, proactive monitoring of network cable via the use of manageable hubs, made by companies such as Synoptics Communications, Inc., Cabletron Systems, Inc., 3Com Corp. and many others, can greatly simplify network management. These hubs contain management software that can pass status and traffic information up to either vendor-specific management stations, network-specific management programs such as Novell, Inc.'s Network Management Service or Simple Network Management Protocol-based systems such as OpenView from Hewlett-Packard Co. or SunNet Manager from Sun Microsystems, Inc.

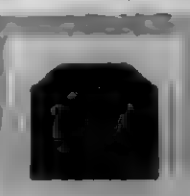
Most network management programs can provide a history of cable traffic compiled from a series of scheduled "snapshots," which can be invaluable tools for identifying bandwidth bottlenecks caused by mass simultaneous logins, bad network cards and the like.

closer look: LAN management



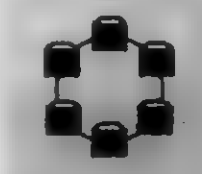
Managing desktop PCs:

- Inventory of hardware and configuration.
- Inventory of all software.
- Logical map including network address.
- Physical map overlaid on office floor plan.



Managing servers:

- Up-to-date hardware configuration information.
- Up-to-date software configuration information.
- Resources inventory.
- Configurable, proactive performance monitoring.



Managing networks:

- Configurable, proactive capacity monitoring.
- "History" monitoring to identify peak use.
- User monitoring to identify source of network traffic.

Integration: The missing element

Network managers said they are pleased by all of the newly released network management tools but would be much happier if their new tools could work together.

For example, it would be useful if desktop inventory, cable monitoring and server monitoring packages could run on the same terminal and share information. This would allow a network manager who has identified a bad network card via a cable monitoring package to instantly pull up, on the same terminal, the card information from his desktop inventory.

"Currently, we have four different monitoring and management packages running on four different terminals, and none of them can share information," said Wayne Robertson, network administrator at St. Agnes Medical Center in Fresno, Calif. "If someone would come up with a single package to manage and monitor the cable, desktop, server, operating systems and applications, I'd buy it tomorrow."

— Michele Doetert

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Once upon a time, mainframes and networks didn't get along. They were so different, they feared each other. But now, with the upswing in downsizing, client/server and PC networks, mutual cooperation is in order. So you're probably asking: *"How can I leverage my investment in mainframe applications and data to benefit my network clients?"* Which is tough enough to say, let alone do.

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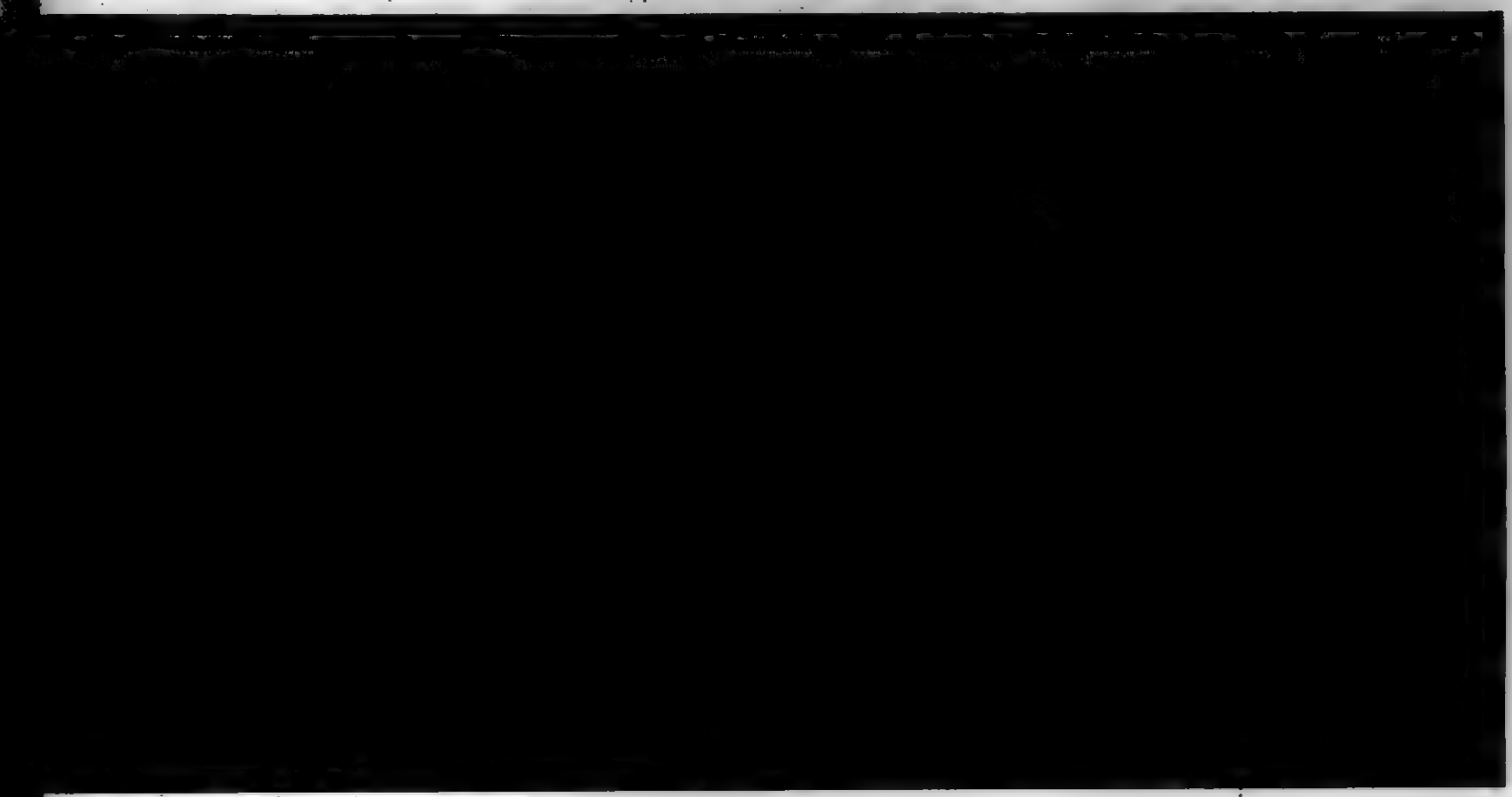

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Electronic publishing

Pharmaceutical industry automates drug approval

By Michael Vizard

As players in one of the most regulated industries in the world, pharmaceutical companies have always faced numerous bureaucratic challenges when applying to the Food and Drug Administration (FDA) for approval of a new drug.

And while most people might think this process has become highly automated, the fact remains that the preponderance of new-drug applications to the FDA are still filed and reviewed on paper.

"Over the last 10 years, we've only had about 85 computer-aided new-drug applications," said Gary Green, director of strategic system planning at the FDA.

Mallinckrodt's Bill Woods: *Electronic filing can cut approval time by 8.7 months*

But in the last several months, pharmaceutical companies have been enhancing their on-line filing capabilities in response to FDA calls for all new drug applications to be voluntarily filed by electronic methods by 1995.

Taking the lead

One of the first companies to comply was Mallinckrodt Medical, Inc. in St. Louis, which is using Worldview electronic document distribution software from Interleaf, Inc. in Waltham, Mass.

Mallinckrodt, which generates about $800 million in revenue annually, is a supplier of isotopes for diagnostic procedures. The company used the Interleaf publishing system to create its proposal and then delivered workstations and Interleaf's viewing software to the FDA, which then reviewed the proposal on-line.

Mallinckrodt has to deliver systems to the FDA because the agency does not have the systems required to run document publishing software. As a result, each pharmaceutical company delivers its proposal on whatever system it uses internally, which requires FDA personnel to learn different computer systems for proposals from different companies.

Neck and neck

Interleaf, along with Frame Technology Corp. in San Jose, Calif., and Xyvision, Inc. in Wakefield, Mass., are the leading providers of electronic document systems vying for pharmaceutical contracts.

Time is money

Despite the costs associated with providing the FDA with systems, Mallinckrodt officials said the expense is well worth the return on investment. It normally takes about 30 months for a new drug application filed on paper — anywhere from 10,000 to 1 million pages in length — to be approved by the FDA. "But the FDA studies show that electronic filing can reduce the approval time by 8.7 months, and when you're dealing with products that have revenues of $100 million a year, this is a significant savings," said Bill Woods, manager of project administration at Mallinckrodt.

Because the pharmaceutical industry is highly regulated, Woods said there is no compelling competitive drive to maximize earnings by investing in automation. However, this situation is likely to change as the Clinton administration focuses on lowering health care costs.

And while dealing with new drug applications on-line is a step above handling paper documents, Green said the FDA is in the early stages of developing a standard information system infrastructure. Under the auspices of a recently started Submission and Review Tracking (SMART) initiative, Green said the FDA will define a set of electronic data interchange formats as part of the SMART initiative to revamp the FDA information system architecture during the next seven years.

"The FDA has a task force in place, but no formats have been defined," noted Mark Walter, a senior editor of Johnathan Seybold's *Report on Desktop Publishing* in Media, Pa.

"The FDA wants a tougher standard where they can be the information gatekeeper using an information standard," said Michael Hawotte, a vice president at Computer Sciences Corp., a consulting firm in El Segundo, Calif.

Woods added that electronic filings also enhance the thoroughness of the review because reviewers can annotate the documents and use hyperlinks to navigate through portions of a filing.

Another taker

Following Mallinckrodt's lead is F. Hoffman-LaRoche AG, which is one of the Top 5 pharmaceutical companies in the world.

"We anticipate that filing electronically with the FDA and European agencies will reduce the time it takes for approval by allowing us to respond to regulatory queries faster," said Garteh Owens, international Interleaf coordinator at Hoffman-LaRoche in Welwin Garden City, UK.

Unfortunately for the pharmaceutical companies, however, it is unlikely that worldwide agencies that approve drugs will ever standardize on the same format, Walter said. As a result, international pharmaceutical companies will probably have to maintain multiple electronic document formats, he noted.

Bank sets financial records straight

Client/server move to support firm's asset boom

By Gary H. Anthes
APPLETON, WIS.

■ Valley Bancorp, a $4.5 billion bank holding company, is surely among the few large financial institutions never to have used a mainframe for financial reporting.

ON SITE

Valley Bancorp
Appleton, Wis.

Challenge: To give non-technical end users rapid and flexible access to financial data.

Technology: Client/server environment gets accounting data from mainframe and offers it to users via financial reporting software from Comshare, Inc.

Results: Users can produce own reports in minutes; bank has avoided hiring new staff.

Over the years, the bank progressed from paper and pencil to minicomputers to stand-alone PCs to a client/server solution. A close encounter of a brief kind with the company's big iron flopped and was recently scrapped.

As part of an expansion from 96 to 153 banking offices in 1991 and 1992, Valley Bancorp converted its mission-critical systems from NCR Corp. mainframes to IBM mainframes. It replaced a system for internal reporting, which ran on Digital Equipment Corp. MicroVAXes, with general ledger and financial reporting packages from the former Management Science America, Inc.

The bank had hoped that accounting, financial and tax personnel would be able to use the mainframe report writers and get same- or next-day response to their information needs. But it was not to be, said Dave Stoehr, financial reporting officer.

"We had planned on a very responsive environment, [but] the report writers weren't that flexible. If we wanted to make a change to something, we were talking two to three weeks," Stoehr said.

Sinking ship

Stoehr said the bank's efforts to port its mission-critical systems for loan- and deposit-processing to the IBM environment stood in the way of his getting the kind of support he wanted for the less critical reporting functions.

"I saw us sinking real deep on the priority list," he said.

Stoehr scrapped plans to move external reporting, which had been running on stand-alone PCs using Lotus Development Corp.'s 1-2-3, to the glass house. Instead, he selected Comshare, Inc. in Ann Arbor, Mich., to install its Commander FDC product for financial consolidation and reporting on an IBM Personal System/2 server in a local-area network. After 15 months of unsuccessful parallel operations, internal reporting was also moved to the LAN, using Comshare's One-Up product for modeling and reporting.

The moves to client/server took less than six weeks, Stoehr said.

Speedy delivery

Now, the mainframe-based general ledger system is relegated to a "debit/credit collection device," Stoehr said.

It sends detailed account data at the end of each month to the LAN server, and reports are out in two to four business days — more than a week sooner than had been the case with the old minicomputer and stand-alone PC systems.

And the bank's end users are able to initiate their own canned reports as well as produce ad hoc reports.

For example, Stoehr said, a tax accountant can produce a custom report showing planned vs. actual expenses for a specified period in about 10 minutes.

Stoehr said it is difficult to quantify cost savings associated with the new client/server approach. However, he said it would allow the bank to grow from $3 billion in assets to $6 billion without having to add to the financial reporting staff.

"I saw us sinking real deep on the priority list."
—Dave Stoehr, Valley Bancorp

Less staff

With the old systems, the bank faced steady staff increases as the pace of business increased, he said.

Stoehr said banks are increasingly moving from custom mainframe systems to off-the-shelf LAN solutions.

"They have frustrated groups of accounting and finance people who are sick and tired of waiting a week to get a report. For a reasonable price, they can control that," he said.

Stoehr said the bank considered outsourcing but decided against it. "We wanted to remain ... an independent banking holding company," he said.

yes

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Bus-Tech also offers high speed controllers for channel attachment of existing SAA servers, and host based TCP/IP connectivity solutions.

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Symbus changes image of scanned-in forms

By Michael Vizard
WALTHAM, MASS.

Symbus Technology, Inc. has unveiled an imaging system that automates the process by which data is transferred from paper forms to standard ASCII format.

Based on neural network technology running on a PC server, Inscript differs from other imaging solutions in that the form is stored as an ASCII text file and thus takes up considerably less storage space than a form stored as an image. If required, the ASCII files can also include pointers that will link them to the original form stored on an optical disc system.

This solution was designed primarily for applications where maintaining an exact record of the form in electronic format is not required. For example, Consolidated Edison Co. of New York, Inc. has adopted Inscript running on 50-MHz Intel Corp. 1486 systems to automate the processing of data collected by its field workers.

Mistaken identity

Con Edison recently experienced a tragedy when one of its field workers was killed during a robbery. The killers apparently mistook the employee's handheld computer for a valuable consumer electronic device, according to Con Edison's Tom McCormack.

A home in the Big Apple

Con Edison has 11 sites in the New York area using Inscript to process forms including time sheets, expense reports and work action items, said Tom McCormack, manager of the productivity systems group.

Each of these sites processes about 100 forms a day, and McCormack estimated that Inscript has reduced the time spent rekeying these forms into Con Edison systems by 75% to 80%. The time savings helped Con Edison eliminate and redeploy a number of employees as part of an overall downsizing effort at Con Edison, McCormack said.

"We finished the pilot project last September, and we expect to have 23 sites up by the end of the year," he said.

Prior to adopting Inscript, McCormack said, Con Edison experimented with giving its fieldworkers handheld devices and laptop computers, but this solution proved impractical from a cost perspective.

"Surprisingly, they did better with the laptops than the handheld devices, but the laptops cost $5,000 and got abused in the field or stolen. So we decided to go back to paper," he said.

According to Martin Greif, Symbus' vice president of marketing, Inscript packaged on a 50-MHz PC with an optical character recognition scanner will cost customers about $20,000.

"We figure that the payback for this will take about a year," McCormack said.

Electronic distribution to take Swift route to users

By Michael Vizard
PROVIDENCE, R.I.

After nearly two years of development, the Society for World-wide Interbank Financial Telecommunications (Swift) plans to go live with an electronic delivery system for manuals that teach network managers how to maintain and monitor their Swift networks.

By adopting the Dynatext electronic publishing system from Electronic Book Technologies, Inc., Swift plans to deliver six manuals in an electronic format starting this September.

Those manuals will be created by taking documents currently created in Interleaf, Inc. publishing systems and Digital Equipment Corp. DECwrite word processors and stored in a standarized general markup language format (SGML), according to Deb Mukhaerje, a project engineer at Swift.

Because the documents are stored in an SGML format, an International Standards Organization standard, Swift can then import those documents into Dynatext for electronic distribution in an SGML format.

Swift, which is a nonprofit company based in Brussels, maintains an international network dedicated to transferring bank funds. It plans to be able to deliver up to 20 manuals electronically within a year of going live.

Communicating to users

According to Mukhaerje, the Dynatext software will make it easier for Swift to provide documentation on new features in the network. Currently, Swift must distribute new hard-copy manuals for each update.

In addition, network managers in Brussels will be able to concurrently view documentation when trouble arises on the network.

Dynatext, which is available for Microsoft Corp.'s Windows, is priced at $1,000 for each title created using Dynatext. Dynatext read-only software is free, but a full version of the reader software that supports annotation of documents is priced at $350. Apple Computer, Inc. Macintosh support will be available in July, the company said.

[redacted]

Workgroup software applications

Pacer Software, Inc. has released Version 2.0 of PacerForum, a project collaboration and communication application for networked Apple Computer, Inc. Macintosh users.

According to the company, PacerForum is a client/server product that employs a flexible button board structure to give workgroups a means for distributing and sharing documents and information.

A variety of features have been included, such as improved remote access performance for mobile computer users and personal folders with bulletin boards that permit users to customize the organization and presentation of information.

A five-user pack costs $549; a 25-user pack costs $1,995.

▶*Pacer Software*
Suite 402
7911 Herschel Ave.
La Jolla, Calif. 92037
(619) 454-0565

Insignia Solutions, Inc. and Hewlett-Packard Co. have announced SoftPC 3.1 with Windows for HP 9000 Precision Architecture-RISC and Motorola, Inc.-based workstations.

According to the company, the product allows HP users to run MS-DOS and Microsoft Corp.'s Windows applications on their workstations.

The functionality of a 286 PC is emulated at up to 486 speeds, and support is provided for real and protected mode, enabling PC applications that need more than 640K bytes of conventional PC memory to run.

Windows 3.1 and MS-DOS 5.0 come preinstalled, allowing personal productivity applications, including Microsoft's Word and Borland International, Inc.'s Quattro Pro to be used.

SoftPC 3.1 costs $549.

▶*Insignia Solutions*
526 Clyde Ave.
Mountain View, Calif. 94043
(415) 694-7600

LAN software

Verdix Corp.'s Secure Products Division has announced VSLAN III.

According to the company, the product was designed for users who need security on networks with PCs, minicomputers and workstations that process sensitive or proprietary information.

The product supports a variety of Apple Computer, Inc., Digital Equipment Corp., IBM and other PCs, minicomputers and workstations that already support VSLAN and VSLAN II. VSLAN III is available in Token Ring and Ethernet implementations.

The product is priced at $799 per node.

▶*Verdix*
205 Van Buren St.
Herndon, Va. 22070
(703) 318-5800

Unix

Network Security Systems, Inc. has introduced LanSafe II for Unix, a power management software package.

The product incorporates an X Window System and the Open Software Foundation's Motif graphical user interface (GUI) and was designed to manage and control power in a heterogeneous network environment.

Users can configure, manage and monitor every power protection node from both local and remote workstations, the company reported.

Features such as total power management on every network device, real-time configuration and automatic and orderly shutdown of all network devices are included.

Support for the X Window and Motif GUIs is provided, and a "PowerPro" feature is offered for setting upper and lower voltage limits.

A single-seat version of LanSafe II for Unix costs $149.

▶*Network Security Systems*
9401 Waples St.
San Diego, Calif. 92121
(619) 587-7060

Bristol Technology, Inc. has introduced HyperHelp 3.0, an on-line Unix Help product.

Key enhancements to HyperHelp 3.0 include character-based HyperHelp, a component that enables users to construct on-line, context-sensitive Help for Unix character terminals, and History, a feature that permits users to retrace their path through a Help session, the company reported.

Secondary windows, segmented bitmaps and support for Microsoft Corp.'s Windows 3.1 Help are also provided.

Additional capabilities such as improved memory management, a midtopic jump capability, a partial key word-searching capability and improved performance are also offered, according to the company.

HyperHelp 3.0 costs $5,000.

▶*Bristol Technology*
241 Ethan Allen Highway
Ridgefield, Conn. 06877
(203) 438-6969

XSoft, a division of Xerox Corp., has introduced Rooms for X Windows, a Unix-based version of its Rooms for Windows utility software.

According to the company, the product helps users arrange their work by using multiple desktops or rooms that are customized for specific projects or tasks with the applications and files the users need.

Unix-based graphical user interfaces, including Sun Microsystems, Inc.'s OpenLook and the Open Software Foundation's Motif in the X Window System environment, can be enhanced, organized and simplified.

Rooms for X Windows has a $40 registration fee.

▶*XSoft*
3400 Hillview Ave.
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(415) 424-0111

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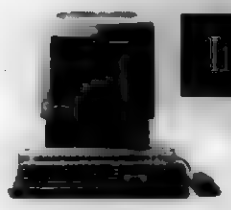

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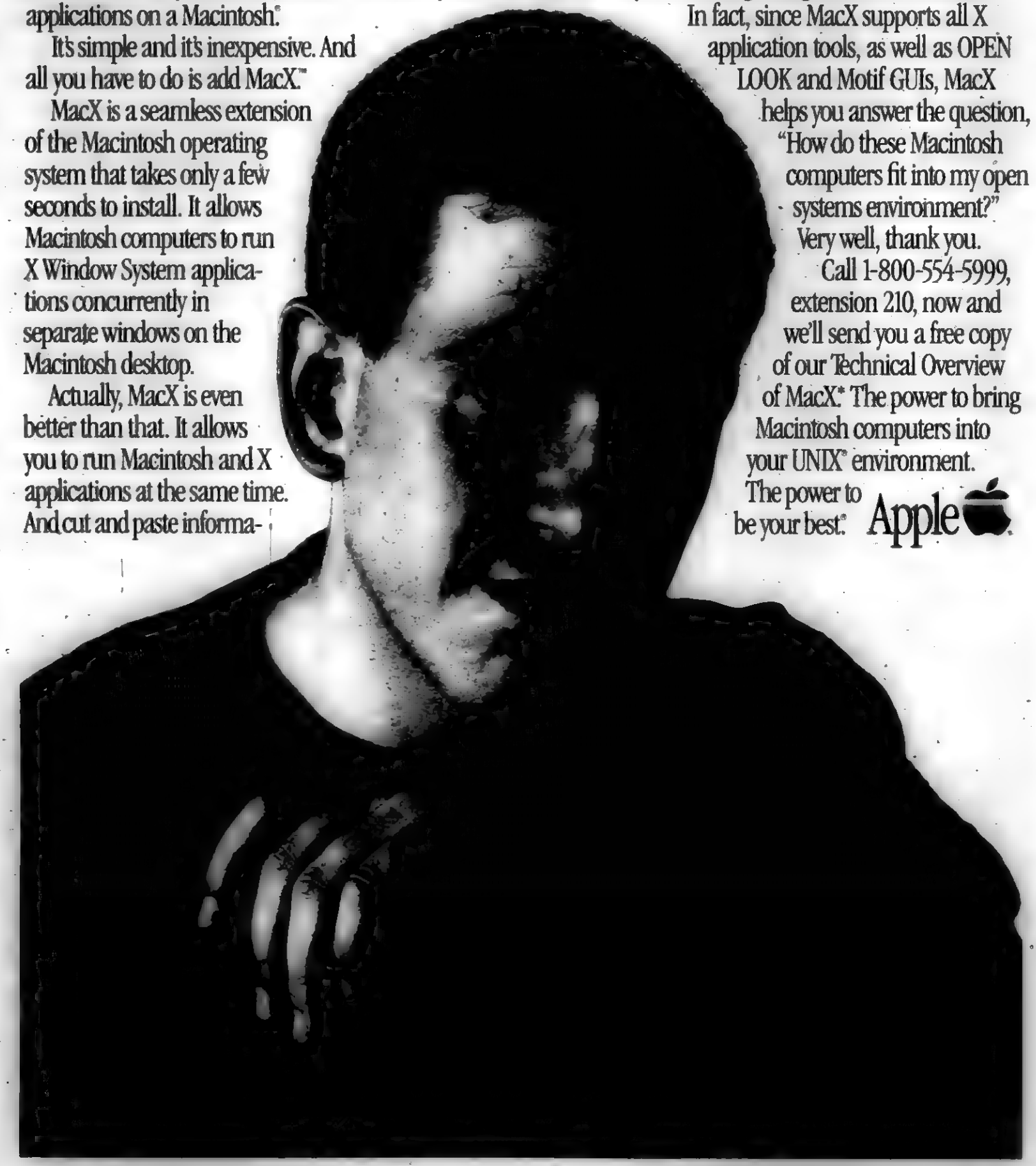

Coping with the deluge

Effective management key when nonstop E-mail hampers productivity

By Mitch Betts
WASHINGTON, D.C.

Electronic mail is a wonderful productivity tool, allowing users across the company and across the world to quickly share vital intelligence, memos, FYIs, research, queries, announcements and personal notes.

But some folks get too much of a good thing.

Consider Dick Adams, assistant director for fire operations at the U.S. Forest Service. He receives about 100 E-mail messages a day during the summer forest fire season. Some messages are really 20-page documents, some are mission-critical, and about one-third are useless, he said.

Adams is not alone. Many users are finding themselves mired in a state of E-mail overload, swamped with 100 to 200 messages a day waiting in their in-box, according to Ira Chaleff, a consultant on white-collar productivity.

Experts such as Chaleff warn that unless users learn to effectively manage their E-mail — through better work habits and E-mail filtering technologies — the productivity gains possible from electronic messaging will be lost.

All full

Chaleff, who is president of the Institute for Business Technology, Inc. in Washington, D.C., said he has come across a variety of E-mail problems in the course of working with overloaded users. For example, it is common to find "maxxed-out" in-boxes, which then lock up.

"We found one individual with 4,000 messages in his electronic in-box," Chaleff said. Some systems get so clogged with undeleted messages that information systems departments frantically beg users to clean out their old files.

"We have users here who are constantly getting blown off the system because of lack of disk space because they haven't kept up reading their E-mail," said Davis B. Conley, director of computer services at Hartwick College in Oneonta, N.Y.

The E-mail deluge threatens to get worse as companies begin to link multiple E-mail systems, explore wireless E-mail and tap into that vast web of electronic mailing lists known as the Internet.

E-mail, *page 60*

Don't be overloaded

Here are some tips for fighting E-mail overload from the Institute for Business Technology:

FOR SENDERS:

- Cover one topic per message, making it easy for recipients to file, forward, delete, store or answer.
- Use clear subject headers so the recipient can quickly gauge the message's importance.
- Do not overdistribute. Prepare distribution lists thoughtfully for different clusters of people.
- Post general-interest reports in a common file or electronic bulletin board.

FOR RECIPIENTS:

- Delete it now! Do not clog your in-box with messages you have read.
- Create electronic folders by topic for easy retrieval.
- Shut off the "beep" notification feature. Look in your in-box several times a day, but do not let the alarm interrupt you every few minutes.

PG&E relocates without pain

By Elisabeth Horwitt
SAN FRANCISCO

Pacific Gas & Electric Co. (PG&E) may have broken new ground in data center consolidation: It moved operations from San Francisco to its backup center 55 miles away with no downtime and only about four hours of interruption for major user applications.

Even better, PG&E accomplished the move without major impact on budgets for either networking or computing equipment, according to Chang Liu, senior network analyst at the Fairfield, Calif., facility, its former backup computer center.

About a year ago, PG&E's information systems staff began discussing consolidation as a way to increase reliability and decrease the overhead of maintaining and upgrading the data center. The San Francisco facility was not only subject to earthquakes but was prone to hardware or facility failures about twice a month, said Nancy Wong, manager of computer and network operations.

"It was an older environment, not robust by today's standards," Wong said. In addition, PG&E shared the building with other companies, so it had less control of environmental factors. "At 8 a.m., when everyone turned on the equipment, we'd get electrical spikes," she said.

PG&E decided to move operations to its center in Fairfield and began searching for ways to minimize the hazard, hassle and expense of the move.

Trucks too risky

PG&E was determined not to use the common modus operandi of physically moving direct-access storage devices (DASD) and tape drives on trucks between data centers, Wong said. "If our truck ran into an embankment, we'd be dead in the water," she said.

It also would take too long, given the utility's goal of 24-hour, seven-days-a-week operations. "We support our own company's information systems, in terms of maintaining gas and electricity availability," Liu said. Another company in California managed a similar relocation in one night with the help of 50 people from the vendor, but typical downtime would be 24 hours, Liu said.

ON SITE

PG&E
San Francisco

Goal: To move data center to a less earthquake-prone, more cost-effective environment with minimum service interruption.

Solution: Set up a mirrored CPU and DASD configuration at existing backup center; transfer data and programs from old data center electronically.

Technology: Computer Network Technology's Channelink channel extenders, NET Adaptive STM 18 Sonet switches, DS3 leased-line connections.

PG&E found it could avoid such problems by creating a "mirrored" CPU, DASD and tape drive setup in the Fairfield facility and then transferring all data and programs from the old to the new system using high-bandwidth switches and links, Liu said. This meant installing an Amdahl Corp. 5995 in the new center, providing about 106 million instructions per second to match the processing power provided by the old center's Amdahl 5880 and 5860.

The new Amdahl host caused no extra bulge in PG&E's IS budget because the company had already allocated $3 million to $4 million for an upgrade at the old center, Liu said. Also budgeted were the upgrades to provide the new center with 700G bytes of DASD.

Pipeline in place

Nor did PG&E need to invest in new leased lines or switching equipment to transfer the programs and data to the new facility. The pipeline for carrying programs and data between the two facilities consisted of Computer Network Technology Corp.'s Channelink network processors, which interconnected host channels at multimegabit-per-second speeds.

The Channelinks fed into Network Equipment Technologies, Inc.'s (NET) Adaptive STM 18 switches, which support the Synchronous Optical Network (Sonet) standard. The STM 18s took care of allocating chunks of 45M bit/sec. pipeline among the IBM 3380 and 3390 host and DASD, so that as one job finished, another job took up the freed bandwidth, Liu said.

The Computer Network Technology devices were originally installed to support the switchover to the Fairfield backup center when a disaster took down the primary San Francisco center. PG&E originally installed the STM 18s to efficiently allocate the 45M bit/sec. DS3 pipelines among some 300 Cisco Systems, Inc. routers that were interconnecting Banyan Systems, Inc. Vines local-area networks to one another and to the data center. The STM 18s will soon be allocating bandwidth to PG&E's voice network as well.

The transfer took place on schedule; major applications were taken down during the data transfer, between midnight and about 4 a.m. on Feb. 14.

PG&E's move to a new facility is saving the company an estimated $5 million to $10 million that it

PG&E, *page 58*

ENTERPRISE MANAGEMENT

Managing Change and Complexity

Two opposing forces in modern business are on a collision course: the need for specialized, localized hardware and software solutions, and the need to cost-effectively unite those information resources into a manageable business asset.

As IT managers respond to this challenge, they must cope with explosive growth in the number and diversity of devices and systems. Enterprise systems are becoming profoundly more complex.

Organizations today have a mixture of older, centralized systems and new, distributed systems—a wide variety of technologies provided by an even larger number of vendors.

The challenge is managing this diverse collection of resources. The nature of the problem requires a "best-of-breed" multi-vendor solution.

That's why the leaders in information technology listed here are committed to creating and providing Enterprise Management solutions.

What Is Enterprise Management?

Enterprise management is a strategy for integrated monitoring, measurement and control of multi-vendor networks and computer systems to serve enterprise business needs. It is a technological framework into which multiple management tools, applications and displays can fit, providing end-to-end management of network elements and resources.

Enterprise management requires an organizational commitment to, and consensus on, a common open management platform and a set of open management standards for use throughout the enterprise.

The Benefits

Implementing an enterprise management strategy provides considerable benefits:

- Continuously high levels of reliable and responsive service.
- Smooth incorporation of new client-server solutions with existing mainframe approaches. Your investment in existing mission-critical applications is preserved and augmented.
- Change and increasing complexity can be accommodated more quickly, without jeopardizing system and network availability.
- Greater optimization of network and system resources ensures high quality service is maintained at the lowest possible cost.
- Automation of management processes allows systems administration and operational costs to reduce steadily as your enterprise grows.
- Network and data security is enhanced.

What You Can Do Today

To achieve the benefits of enterprise management, take these steps:

- Develop organizational consensus on a strategy and on a management platform:
  - working with your key vendors and carriers, develop a strategy for implementing this enterprise management architecture within your organization.
  - establish purchasing guidelines that all parts of your organization can follow so that their evolving information systems can fit into the enterprise management approach.
- Select a common open management platform for use across your enterprise that:
  - enables management of products and services from multiple vendors.
  - is standards-based.
  - enables integration of management tools and applications from multiple vendors.
- Review existing management tools and interfaces and prioritize upgrades that move the organization toward enterprise management in the most cost-effective and rapid manner possible.
- Favor distributed and object-oriented management solutions.
- Use management solutions that incorporate open management standards such as the Simple Network Management Protocol (SNMP), the Common Management Information Protocol (CMIP) and the OSF's Distributed Management Environment (DME).
- Automation is a key element in effective enterprise management. Move toward "self-managed" systems.
- Require the use of open management protocols in new information system purchases and deploy open management protocols in existing network elements, distributed systems and vendor-specific management systems.

Contact the leading vendors listed here. They can provide you with additional information on the enterprise management strategy that's right for your organization, and the products and services you need to implement it.

These industry leaders have come together to promote the business benefits of an Enterprise Management Strategy. They can be contacted directly or by using the reply card below.

The Partnership Legend illustrates relationships that have formed to provide these complex, multi-vendor solutions.

The Management Solutions Legend denotes some of the types of products and services each of these vendors contributes to a complete solution.

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American Power Conversion

APC is the leader in power protection for networks. APC solutions include: UPS systems, automatic shutdown and monitoring software, and remote management via SNMP. 1-800-800-4APC

Data General

Providing the tools to build your enterprise management foundation. For information, call your local Data General sales office or 1-800-DATA GEN.

JBL

JBL's X-Server, developed to manage and monitor ChatterBox systems in a Novell network, can be accessed from any SNMP management station. 1-818-709-1778

SNMP Research

Produces a family of network management products based on SNMP, SNMP Version 2, and other protocols including agent and network management station source code. 1-615-573-1434

UNISOL SOLUTIONS

UNISOL Site Management Utilities performs system and network management, security auditing, backup and restore, performance monitoring, and resource accounting charge back. 1-310-542-0068

ACD Applied Computing devices, Inc.

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Partnership Legend

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- ▲ NMF OMNIPoint
- ✦ Novell NMS
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- ● SunConnect SunNet Manager
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Management Solutions

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Publication

COMPUTERWORLD

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Organizations

NMA Forum, a consortium, sponsors OMNIPoint, a multi-technology, multi-domain blueprint for end-to-end service management of LAN/WAN Networked Information Systems. 1-908-766-1544

OSF

The Open Software Foundation is a non-profit software research and development organization working to further open system development and adoption. Call OSF Direct Channels. 1-617-621-7300

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Please send me additional information on tools I can order to help educate and enroll others in my company on the need for an Enterprise Management strategy.

- ❑ Scripted presentations in various formats.
- ❑ A full-color reference poster on Enterprise Management and the leading vendors.

My company is most interested in receiving more information on:

- ❑ Systems Management
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Mail to: Access Media, c/o LDI, 19026 72nd Ave. South Kent, WA 98032 EM-CW-A

Cabletron routers allow mixed backbones

By Joanie M. Wexler
ROCHESTER, N.H.

Cabletron Systems, Inc. is forging ahead with plans it outlined last fall to migrate users of traditional packet-switched local-area networks to high-speed backbones such as cell-based Asynchronous Transfer Mode (ATM) networks.

The vendor said last week that it is integrating homegrown routing into its smart hub line with two new products that, when combined with Cabletron Bridge Router Interface Module (BRIM) technology, "allow users to pick a backbone as they see fit — like building a product with Legos," said Michael Skubisz, director of product management.

The company implements BRIM technology in the form of 32-bit PC cards for its hubs; the BRIM cards snap onto the company's EMM-E6 bridge/routing hub module or stand-alone NBR-620 scalable bridge/router, announced last week, to determine the "flavor" of backbone the peripheral LAN will feed into, such as ATM, Fiber Distributed Data Interface or a T1 wide-area network.

The EMM-E6-plus-BRIM and the NBR-620-plus-BRIM are compatible with high-end routers from Cisco Systems, Inc. and Wellfleet Communications, Inc., which are devices likely to constitute the core of a corporate network infrastructure, Cabletron said. In addition, an ATM BRIM will allow users to style their wiring closets to feed into pure ATM switch backbones, such as those from Cabletron partner Fore Systems, Inc. in Pittsburgh.

Cabletron already offers low-end routing modules for its hubs from both Cisco and Wellfleet for interconnecting the LANs supported in a given hub. A question lingers as to how many users desire integrated routing and "hubbing," given the recent cancelation by LAN heavyweights SynOptics Communications, Inc. and Cisco of their joint RubSystem, a project to combine the vendors' high-end hub and router chassis.

The vendors aborted all but the net management portions of the 18-month-old project last month [CW, April 19], reportedly due to "lack of user interest" in combining hubbing and routing functions at the high end.

On the other hand, the Cabletron endeavor targets the peripheral LAN segments off the corporate backbone and "longer term, some type of switching integrated into wiring hubs is clearly necessary," said Val Sribar, a senior research analyst at Meta Group, Inc., a consulting firm in Reston, Va.

"The more users want to segment their networks for higher speeds, the more expensive it gets to use stand-alone routers to extend that traffic back from the hub to a server that is, say, in a cluster in a data center," Sribar said.

ATM update

Cabletron said that next December or January, it will announce a "superhub" with a 2.5G bit/sec. backplane for carrying traditional packet-switched traffic as well as ATM cells.

The hub will have ATM LAN card modules available, and the company will develop corresponding ATM network adapters for PC platforms, such as Extended Industry Standard Architecture and Micro Channel Architecture, according to Michael Skubisz, director of product management.

Cabletron said it will continue to look to its partner, ATM vendor Fore Systems, for supplying the pure ATM switches that form a high-end backbone, as well as for adapter cards for high-end workstations.

Skubisz said Cabletron will eventually produce a stand-alone ATM switch, but it will be a smaller capacity device that sits in the wiring closet and feeds into a backbone of high-end ATM switches.

—Joanie M. Wexler

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SYSTEMS MANAGEMENT

Meeting the new demands posed by Distributed Computing

Distributed systems demand the same level of management and availability that IS has historically provided in a mainframe environment. Yet the technical approach to distributed systems management is fundamentally different from that applied to centralized systems.

Hardware and software resources to be managed tend to be more numerous, widely-dispersed and provided by a wide variety of vendors. Put simply, old approaches to systems management cannot be incrementally extended to manage these new distributed systems. A new approach is required.

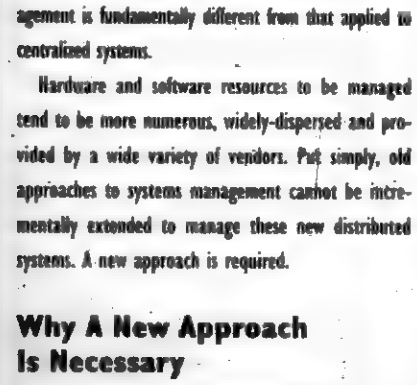
Why A New Approach Is Necessary

When compared to the centralized mainframe environment, tracking and intervention tools for distributed systems management still appear somewhat primitive - even as the number and variety of systems IS professionals must manage is increasing. At the same time, IS professionals are expected to provide backup and recovery services, fault isolation and repair capabilities, and updating procedures that provide levels of service similar to those users have come to expect from centralized systems. These demands all threaten to increase administrative and support expenses. And if these systems are poorly managed, there's a real chance such expenses may actually erase the cost reductions achieved through downsizing.

Effective distributed systems management addresses these issues. It provides the considerable business benefits of distributed computing within a context that allows for effective management of IT resources and costs.

What You Can Do Today

▶ Implement remote management solutions that bring the problem to the troubleshooter, not the other way around.



▶ Develop organizational consensus on an enterprise-wide open management platform that can interface with your legacy systems and newer distributed systems.

▶ Acquire management tools and applications for distributed systems that integrate with the open management platform you choose.

▶ Favor object-oriented management solutions.

▶ Place open management agents on systems, clients and servers throughout the enterprise that will communicate with your management platform.

▶ Take an application-oriented view towards the utilization of system resources. This allows you to target your management focus on areas likely to provide the biggest and quickest return to end users.

▶ Create automated responses to system problems - responses that automatically alert system managers when problems occur, or which resolve problems at the same speed they occur.

▶ In the switch from centralized to distributed processing, leverage the expertise, skills and methodologies of existing MIS personnel. And remember that legacy systems are likely to play a key role in mission-critical applications for many years to come.

The following companies are leaders in developing products and services that provide you with a solid foundation for effective distributed systems management. Contact them now for more information about the powerful systems management solutions they have to offer.

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PictureTel makes videoconferencing cheaper

By Joanie M. Wexler
DANVERS, MASS.

PictureTel Corp. last week attempted to stimulate the technically advanced but slow-to-gel videoconferencing market by reducing the price of interoperability with other vendors' gear and introducing lower end equipment for casual users.

The firm slashed from $5,000 to $2,500 the cost of adding the CCITT H.320 worldwide video compression algorithm to the proprietary compression software that runs on PictureTel's System 4000. H.320 is unofficially called "px64," indicating multiples of 64K bit/sec. circuits.

PictureTel also said that this fall, users can add H.320 to the vendor's M-8000 bridge, a device that allows multiple locations to participate in electronic meetings. Users would pay about 15% of the original purchase price for the capability, said James S. Idelson, a PictureTel senior director.

However, most PictureTel systems are installed for internal use and talk only to one another, a situation that could continue to stymie user expenditures in H.320 software. For example, pharmaceutical firm Hoechst Celanese Corp. in Bridgewater, N.J., runs 17 PictureTel videoconferencing systems and internetworks them through the M-8000.

"We've only done a bit of intercompany conferencing, and for that we go through AT&T's bridge" service, said Hal Howard, senior telecommunications analyst. "While the drop to $2,500 [to add H.320] is getting more appealing, with 17 systems, we're talking a lot of money."

"This is a chicken-and-egg syndrome," observed Tim McElgunn, an associate analyst at Datapro Information Services Group in Delran, N.J. "If you don't have the standard, it's tough to do interenterprise videoconferencing."

He added, though, that "companies have seen what happens, say, during acquisitions and mergers when parties come in with incompatible systems."

PictureTel also made the following moves:

- Reduced the price of the 16-port M-8000 from $75,000 to $60,000.
- Introduced a smaller version of the M-8000, starting at $45,000, that supports three to six conferenced locations.
- Added a Microsoft Corp. Windows interface to the M-8000 management console and gave network administrators the ability to perform remote diagnostics and call setup.
- Added still-image capabilities to the System 4000 and a $5,000 annotation capability for collaborative document work to ship next month.

PG&E relocates

CONTINUED FROM PAGE 53

would have had to spend to upgrade the San Francisco center to an acceptable reliability level, Wong said. "We would have had to put in bracing and redo the flooring because of the new equipment we would be bringing in. It's a chilling thought," she said.

PG&E's Nancy Wong *saved time, money*

In addition, the company is cutting staff by four to six people in the old center, which now houses peripherals, particularly the printers that output billing, Liu said. The new center is reducing staff from 22 to 12 people. This is primarily because of the implementation of Commensa, an automated systems management package from Votek Systems Ltd. in Toronto, which was adopted at the same time as the move.

Reliability and processing levels at the new center are far superior to the old, Liu said. "I had transaction processing running on the new system without outage for 45 days; then we had some minor hardware glitch." And with the new Amdahl host, jobs that used to take seven hours now take just three, Liu said.

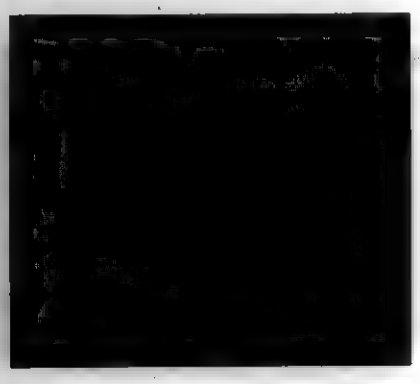
NETWORK MANAGEMENT

Ensuring flexibility, consistency and reliability

What Is Open Network Management?

Even if your network copes with your enterprise needs now, is it prepared to handle the way your organization will move and use information tomorrow? Your network will need to support applications far more complex and powerful than those you're using today. And it will need to do this flexibly and reliably, across organizational and geographic boundaries.

Without an integrated, open approach to network management, building and managing a network that will evolve successfully to meet these demands is impractical. Without effective network management, cost control is impossible.



The Benefits

Networks have become a crucial determinant of enterprise efficiency and competitiveness, which is why effective network management is now more essential than ever to the health and success of your organization.

Network availability, for example, is essential to mission-critical applications such as customer service, inventory management, EDI and product development. Network management enables consistent, reliable network service that organizations can depend on. An integrated network management approach will enable your enterprise to quickly respond to requests for new services to meet evolving business needs. This is especially crucial in a period when use of network-based applications is growing rapidly.

Integrated network management provides a foundation for higher levels of automation of administrative and operational tasks. It also improves responsiveness to user needs while substantially lowering support costs. Integrating your network management solution into a broader enterprise management strategy is far more cost-effective than investing in closed, vendor-specific solutions on an ad hoc basis. And it provides your IS department with the information necessary to track costs and optimize network resources while maintaining desired service levels.

What You Can Do Today

- Address network management from a strategic perspective. Ad hoc solutions and their incompatibilities will ultimately cripple your network.
- Choose an open platform for managing your enterprise network that is compatible with other enterprise management choices. Gradually, eliminate proprietary management interfaces, instead choosing new equipment based on open standards such as SNMP and CMIP.
- Place standards-based management agents on existing network devices.
- Make the use of open management protocols a requirement for new network purchases.
- Acquire management tools and applications for networks that integrate with the open management platform you choose.
- Favor object-oriented network management solutions.

Contact the leading vendors listed here for more information. They are committed to helping you implement an integrated management approach to building and managing open, interoperable, multi-vendor networks.

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E-mail deluge

CONTINUED FROM PAGE 53

Peter Lutz, chairman of the Department of Information Technology at the Rochester Institute of Technology in New York, made the mistake of getting on an Internet distribution list on educational computing. He was quickly inundated with hundreds of messages per day.

After one week on the list, Lutz said he found that even deleting all the messages was time-consuming, so he got off the list.

Part of the solution to message overload is E-mail filtering technology, which automatically puts incoming messages into certain electronic folders (including the "trash" folder), depending on the sender or subject. For example, Microsoft Corp.'s Mail Version 3.0 for PC Networks permits filtering and filing.

At what point does the volume of E-mail require some automated filtering? "It seems to me that somewhere around 20 to 30 messages per day you begin to feel the need for tools to manage it," said Thomas W. Malone, an MIT professor.

Malone and other MIT researchers developed a prototype filter in the mid-1980s, called the Information Lens, that allows users to set up if-then rules for sorting information. "A typical rule might be: If this message is from my boss, put it into my urgent folder," Malone said.

The MIT prototype has since been commercialized and incorporated into two available products: BeyondMail from Beyond, Inc. in Cambridge, Mass., and Personal Assistant for Digital Equipment Corp.'s All-In-1 system.

For Unix, there is a public-domain program called ELM that can filter E-mail by name or subject. In addition, several public networks have "squelching" features or "bozo filters" that block recipients from receiving messages that are from certain people or on certain topics.

Monster database

Another approach is to dump E-mail messages into a "monster text database" and then use one of the many text-retrieval software packages to find what you really need.

Monte Davis, a corporate speech writer in South Orange, N.J., who gets 200 messages a day, uses this after-the-fact approach. He said he lets some messages sit on his hard disk for a few weeks and then uses a personal information manager called Ize — an orphaned product formerly sold by Persoft, Inc. in Madison, Wis. — to flag keywords.

But filtering technology is not the whole solution to E-mail overload. Users also need to apply to electronic information the same work habits that prevent paperwork overload, Chaleff said.

Users should adopt a "do it now" philosophy of reading, filing and deleting E-mail quickly, Chaleff said. "It is foolish to think you will have more time later" for disposing of E-mail, he said.

Be selective

Two of the most important survival skills for the information age are to get off electronic mailing lists that are not critical to your work and to file important E-mail in subject files for easy retrieval, experts said. E-mail senders can help by putting clear subject headings on their missives and keeping each message to one subject.

The volume of E-mail can also be reduced if users refrain from sending "cc:" copies and forwarding E-mail unnecessarily. IS departments can help by training workers on how to use the E-mail housekeeping features, Chaleff added.

The underlying problem is that users never learned how to control their paperwork overload and transferred their poor work habits to the E-mail world, Chaleff said. Even people who are good at throwing out paper may not have made the "mental leap" to be ruthless with E-mail as well, he said.

"Workflow technology now provides a [illegible] platform for the critical business process of organizations all over the world."

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With the emergence of distributed, multi-vendor computing environments, the creation of a standards framework to facilitate their effective management became a top priority. As a result, leading vendors, working through the Open Software Foundation (OSF), have developed a set of open, vendor-neutral standards known as Distributed Management Environment (DME).

DME was conceived to get the most out of today's advanced distributed computing technologies, open standards, interoperability and object-oriented technologies. Its standardized framework represents an industry consensus on application program interfaces (APIs) and protocols for open management. DME is a 'living' standard, evolving as technologies evolve, enhancing the latest industry developments.

Why DME Works

DME builds on existing standards. It is not an alternative to other standards. Rather, it represents a complementary approach that encompasses existing SNMP and CMIP standards and endorses interfaces devised by the Network Management Forum, X/Open and others.

DME is the product of a multi-vendor, consensus-based process. As a result, DME maps to your computing environment and manages growth in multi-vendor systems and networks. And because DME is the product of industry consensus, it accelerates the process of reaching consensus within your organization.

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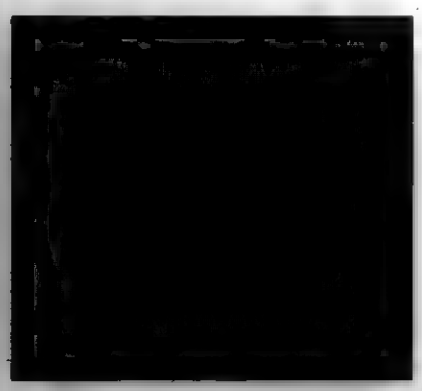

The Benefits

DME's wide-ranging benefits include:

- A scalable, distributed architecture that can accommodate growth in multi-vendor networks and distributed systems.
- Better management, interoperability and integration through the implementation of common management services and standardized protocol and object definitions.
- Reductions in time and costs for system administration and training.
- Tightly integrated solutions utilizing object-oriented design, for easier and more flexible integration of scalable, distributed, multi-vendor architectures.
- Greater longevity of systems resulting from standards-based, backwards compatibility.

What You Can Do Today

No matter where you are in the development of your network, we suggest evaluating DME as you build your enterprise management strategy. Portions of the DME will be available during 1993 from a number of vendors. Complete implementations of DME will begin appearing in 1994.

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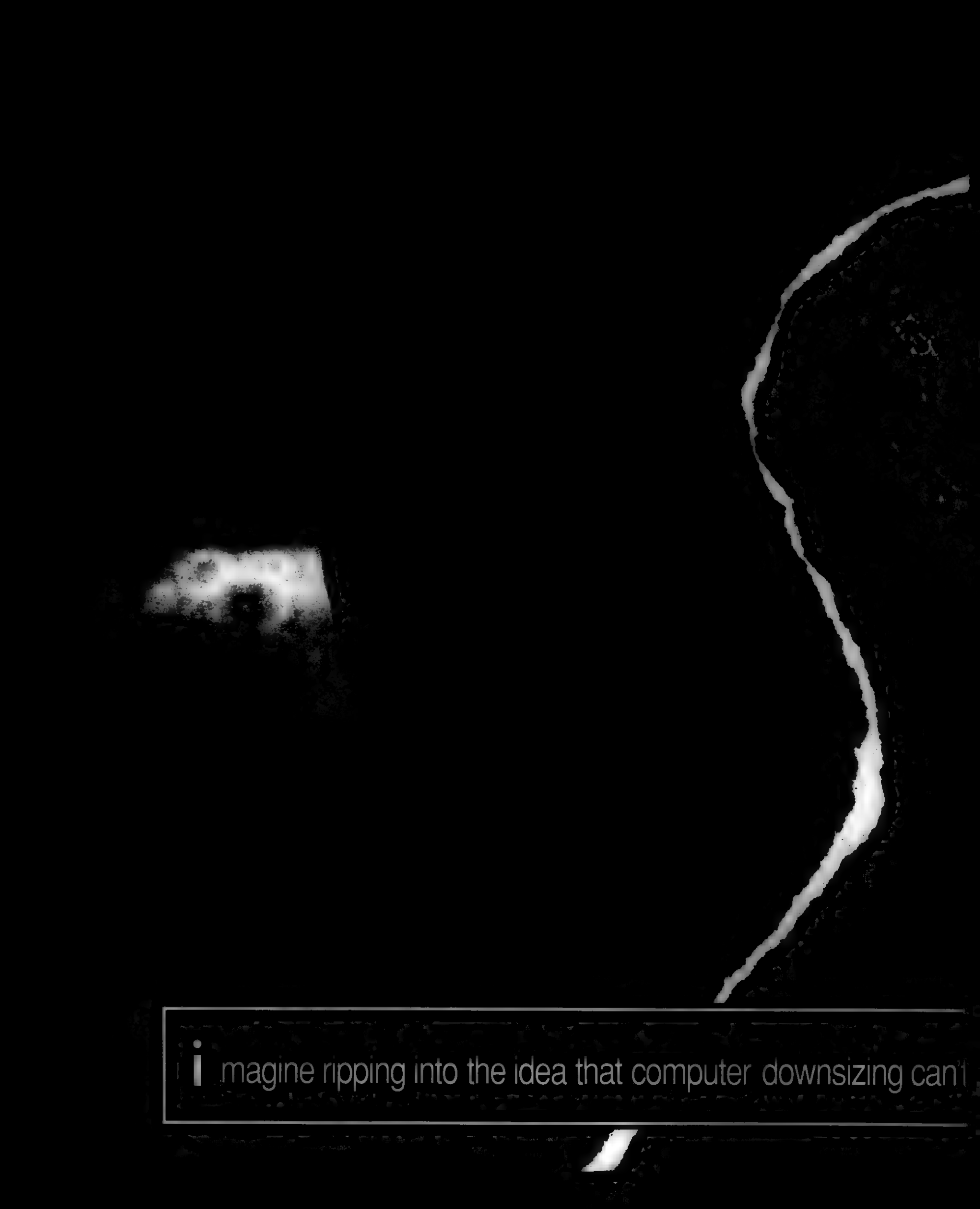
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Windows Magazine WinAward, February 1992

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LAN Times Reader's Choice, March 1992,
January 1993

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InfoWorld Product of the Year, March 1992

•

BYTE Magazine Reader's Choice, June 1992

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BYTE Magazine Award for
Cross-platform E-Mail, March 1993

•

Network Computing's Certified Interoperable
Application Award, December 1992

•

Network World's Enterprise
Technology Award, December 1992

•

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

•

MacUser Editors' Choice Award, 1992

•

MacWEEK 1992 Editors' Choice
Diamond Award, December 1992

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UNIX World's Best Product of the Year for
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'In' sourcing saves utility $600,000

Savings paid for new networked desktop systems

By Thomas Hoffman
NORTH BRUNSWICK, N.J.

For a company that designs and builds turbine generators and electrical power plants, it's hard to believe that ABB Power Generation, Inc.'s information systems operations were mired in the Dark Ages of computing as recently as three years ago. But much has changed since Patrick B. Carney took charge of IS at the engineering firm.

Carney, who became ABB Power's IS director in 1990 after a stint as a senior consultant at Wang Laboratories, Inc., did not realize how much of a challenge he had taken on until he rolled up his sleeves and looked under the hood.

In 1990, the $500 million, privately held subsidiary of the Swedish/Swiss-owned engineering conglomerate ASEA Brown Boveri was outsourcing all of its financial applications to Sungard Recovery Services, Inc. for $70,000 per month.

In addition, only 30 of 600 users had network access between the firm's primary offices here and in Richmond, Va., and more than half of the $4 million-plus IS budget was being spent on consulting services.

"When I came here, there was almost no infrastructure to speak of," Carney said. Since then, he and his six staffers have fine-tuned the firm's IS operations through a series of successful projects.

ABB Power's Patrick Carney: *In three years he built an infrastructure from scratch*

The company has since reinvested the savings from that fine-tuning in new standardized, networked desktop systems.

Streamlining redundancies

Carney and his staff started in mid-1990 by conducting a four-month study of the outsourced financial systems, including general ledger and accounts receivable. They found outdated software, redundant system calls and the need to narrow down financial processing to its core requirements.

"We took a pure, back-to-basics approach. For example, did we really need to do two accounts payable runs each week? No, so we streamlined along those areas," Carney said.

Those changes pared ABB Power's outsourcing costs from $70,000 to $35,000 per month. Then ABB Power put the contract up for bid between Sungard and ABB Power's sister company, ABB Information Management Services, Inc. in Windsor, Conn.

In March 1991, the sister company won the bid and began processing those applications on two IBM 3090 and 3081 mainframes. Those

ABB Power, *page 68*

ON SITE

ABB Power
North Brunswick, N.J.

Goal: To save money by insourcing financial processing; to develop an IS infrastructure.

Strategy: Standardized hardware and software; networked offices in North Brunswick, N.J., Richmond, Va., and Windsor, Conn.

Result: Renegotiated a third-party data processing pact, resulting in savings of more than $600,000 annually.

Managing data in a new world

By Rosemary Cafasso

Of all the technical challenges that client/server implementation and downsizing can bring, some users are finding that data management is one of the more time-consuming chores.

Baxter Healthcare Corp. has developed decision support client/server applications but recently began the more difficult task of integrating production client/server systems with the existing mainframe host.

At issue for Baxter was data synchronization. While decision support client/server applications can essentially borrow a copy of mainframe data and work with it, a production application typically needs host data and makes real-time updates.

DISTRIBUTED DATA

No clear-cut path

But the problem for Baxter was that the issue is a relatively new one and so there are few proven approaches or products.

Without an obvious solution, Baxter had to evaluate several techniques to integrate IBM IMS and DB2 host data with the new client/server platform. It ended up selecting a change database strategy in which it would modify the mainframe database environment to send updates to a separate database and then download those changes to the local-area network database at regular intervals.

But Michael Purcell, a staff software engineer, said the decision was not easy. Each approach has its good and bad points. The change database, for instance, requires programmers to develop mechanisms to ensure updates are delivered in a timely fashion.

The team also evaluated other mechanisms, such as rebuilding the entire local database each day. Purcell said Baxter has tried this with other applications and found that it took too long. It also explored the option of two-phase commit technology, a mechanism that essentially keeps track of updates and double-checks each database to ensure it is aware of the change before it is executed.

This technology is just emerging in the IBM DB2 world, and other companies offer it with their database management system, but "it would usually require a pretty homogeneous environment," Purcell said. "I'm not counting on it for this year."

The Department of Transportation's Federal Highway Administration (FHA) is another user slogging through the task of evaluating multiple options for its DBMS environment. Unlike Baxter, however, the organization is focused on downsizing its operation. The idea is to offload processing from the mainframe-based Computer Associates International, Inc. CA-IDMS to lower cost systems. The organization relies on centralized mainframe processing from the Transportation Department's computer center.

Working with CA-IDMS/PC, the FHA just completed a feasibility study on downloading extracts of host data. The project seemed promising, and the staff even ironed out transfer issues with data compression techniques.

But after close scrutiny, the staff decided to eliminate this option because the synchronization issues were too daunting, and it would have required too much continued reliance on the mainframe, said Jack Reinhart, chief of the programming systems branch.

New offering

Meanwhile, the organization is testing a newer CA offering that may do the trick, Reinhart said.

A new release of IDMS/PC provides cooperative processing extensions and will work with the latest release of the host-based IDMS. The idea would be to use the mainframe strictly as a data repository and count on the front-end PCs for nearly all processing.

The approach would leave the data management issues to the mainframe and remove potential problems with synchronization. It could also cut the organization's mainframe costs by almost two-thirds, Reinhart said.

Yet it still has a downside because "we would still have some mainframe costs," he added.

Squeaky user gets $10,000 price break

By Mark Halper
BOISE, IDAHO

It can pay to speak up, as Hewlett-Packard Co. user Intermountain Gas Co. recently learned — to the tune of about $10,000.

By its own assessment, Intermountain is a satisfied HP 3000 shop, but it was none too pleased when HP recently wanted to charge the gas utility $35,000 for a 1,600-line-per-minute impact printer.

The same HP-made printer, which HP calls the 2567C, was available from an HP OEM vendor, Data-Products, Inc. in Woodland Hills, Calif., for $25,000.

So, during a gripe session at a conference run by the user group Interex last month in Seattle, Mike Farrell, Intermountain data center operations supervisor, posed the obvious question to a data full of HP executives: Why couldn't he get the printer at a lower price directly from HP?

After explaining that the pricing disparity was a consequence of the "significant change" sweeping computer distribution circles and noting that HP's price takes into account superior support levels, Manuel Diaz, HP Americas sales chief, promised Farrell he would look into the situation.

While Farrell never heard back directly from Diaz, he ultimately received what he sought — a large price break.

An HP sales representative recently

Price break, *page 66*

Electronic news services

News in real time

Financial firms use networks to keep dispatches current

By Thomas Hoffman

In their ongoing efforts to differentiate themselves from their competitors by adding value to their products, financial services firms are turning to electronic news services. Users said these services provide market makers with the latest information about what is shaping the business sectors their analysts track.

For example, Coopers & Lybrand, one of the Big Six accounting firms, has developed a network designed to provide news service reports on industry-specific markets to its 4,000 desktop-enabled partners and managers in the U.S. As a result, a Coopers & Lybrand partner who provides accounting information to major oil companies, for instance, is better equipped to inform his clients of the most recent changes in their industry.

The system, known at Coopers & Lybrand as The Knowledge Network, comprises news and wire services from Dow Jones & Co. Use of The Knowledge Network by Coopers & Lybrand partners "shows our customers that we're tracking those industries closely," noted Andrew B. Zimmerman, a partner at Coopers & Lybrand who helped set up The Knowledge Network.

As an extension to The Knowledge Network, Coopers & Lybrand began subscribing last July to DowVision, a Dow Jones electronic news service that provides automatically filtered, real-time business news and information through corporate computer systems directly to customers' desktops. Included on DowVision is the Dow Jones News Service, its international news service, Capital Markets Report, Professional Investor Report and Federal Filings.

New news service

In March, the New York-based accounting firm selected DowVision to serve as a core component of a new electronic information news network Coopers & Lybrand plans to provide to tax and financial entrepreneurs. It is called the Tax News Network.

Zimmerman said DowVision has provided his firm with several benefits.

In addition to maintaining news information on Coopers & Lybrand and other Big Six competitors, DowVision tracks information about customer markets. Zimmerman said this has been helpful in landing new customers, although he noted that he has no empirical evidence to support this. "Within a matter of minutes, you can get up to speed on a company's industry and sound fairly intelligent without investing a large amount of time doing research," Zimmerman said.

Ahead of the printed word

An end user of the service, Fred Quattlebaum, a tax manager at Coopers & Lybrand, said DowVision has been helpful for users.

"Most of my clients are multinational firms in rapidly changing industries, such as pharmaceuticals and high tech, which are looking to expand their opportunities in Latin America and Eastern Europe. To help them assess these various opportunities, I really have to stay on top of their industries, and this service has been extremely helpful. I was often days behind by using newspapers and industry periodicals," Quattlebaum said.

Ark Asset Management Co., a New York-based investment adviser, uses multiple data feeds from Dow Jones, Knight-Ridder, Inc. and Reuters Ltd. to route financial news stories to its 25 to 30 consultants over a Novell, Inc. NetWare v3.11 Ethernet network.

Paul Cucurullo, MIS manager, said DowVision offers a feature that enables Ark Asset Management to merge all the data feeds into one database so that users need only one front-end tool — DowVision — to access data from a range of sources. Ark Asset Management, which has been running DowVision on Sun Microsystems, Inc.'s SPARCstations for eight months, has compiled one financial quarter of investment information in its database.

The electronic news feeds have been a real benefit to Ark Asset Management, Cucurullo said. "There's so much news out there now. It's so easy to miss out on a story or a wire release," he said.

Plenty of platforms

DowVision runs on Microsoft Corp.'s Windows and DOS, Unix, Apple Computer, Inc.'s Macintosh, Lotus Development Corp.'s Notes and Next, Inc.'s NextStep operating environments.

Less dialing up

Electronic news services are also gaining popularity outside of the financial services industry. Take New Jersey's largest public utility — the Public Service Electric & Gas Co. (PSE&G) — which uses Dow Jones' DowVision service for timely updates on alternative fuels.

PSE&G runs DowVision over a 500-node Lotus Development Corp. Notes network for its engineers to gather data on the latest scientific breakthroughs in areas such as natural gas vehicles, according to Brian Connolly, a knowledge engineer in PSE&G's strategic information systems group.

PSE&G, which paid $300,000 for the system with a 100-user license starting in late 1992, has already saved an unspecified amount of money by reducing costs that had been tied to dialing up public databases. Though Connolly could not quantify the systems' payback, he said the investment has been worthwhile.

"It saves our people a tremendous amount of time, since they don't have to read through all the newspapers and trade journals," he said. — *Thomas Hoffman*

HP changes 'elite' eligibility

By Mark Halper

PALO ALTO, CALIF.

Hewlett-Packard Co.'s proprietary minicomputer division has changed the rules for becoming an elite customer, shifting from criteria based purely on business volume to reliance on a willingness to open kimonos.

Under the old criteria, a company would gain special status by purchasing 100 or more HP 3000 minicomputers, which run on HP's MPE operating system. Knighted members of the 100 Plus Club — there were fewer than 20 — were honored with special access and input to HP's research and development operations.

But according to HP product line manager Pat Adamiak, the unit volume criteria became antiquated as HP rolled out larger machines that perform the job of several smaller machines.

What is more, some users said privately, as HP's 3000 business slows at the hands of a booming Unix-based HP 9000 business, fewer customers are likely to reach the 100-machine plateau.

So HP has quietly dissolved the esteemed 100 Plus Club and replaced it with what it now calls the Customer Advisory Council.

As with the 100 Plus Club, the Customer Advisory Council members benefit from R&D privileges.

But they also pay a price. The members are expected to share with HP intimate knowledge of their own business plans, which Adamiak said helps HP formulate strategic information systems plans for the customer. They are also expected to devote ample time and energy to providing HP with input and feedback.

Adamiak claimed that membership on the council is based largely on a company's willingness to enter an open, two-way relationship.

The elite circle still includes some hefty accounts, however: HP offered membership to all of the 100 Plus Club members, and most of them accepted.

Those who declined did so because they are migrating to HP Unix platforms, Adamiak said.

The entire Customer Advisory Council meets once a year with HP and recently held its first annual gathering last month in Cupertino, Calif.

Some members who asked not to be identified said HP's new criteria assure more of a representative cross-section of user types.

"The 100 Plus Club was geared to large HP sites," one member noted. "That concept got rolled into a council that tries to more accurately represent HP customer needs."

Adamiak said that under the new system, HP hopes to provide a more sophisticated level of advice that takes into account more factors than what was available to HP in the past.

"We may have been suggesting planes when all someone needed was trains," he noted.

The participants, according to those familiar with the membership, include Hertz Corp., Northern Telecom, Inc., Procter & Gamble Co., the city of Tempe, Ariz., 3M Co., the California Department of Corrections, Medstat Systems and Revlon, Inc., among others.

Adopt-a-customer

As part of its user relations plans, HP is considering an "adopt-a-customer" program in which hundreds of HP R&D engineers would each work closely with an assigned customer.

Price break

CONTINUED FROM PAGE 65

told Farrell that Intermountain could have the printer either for $21,000 or for $23,000 with hardware modifications that would outfit the printer with a font readable by U.S. Postal Service scanners. Compliance with the postal standard yields hefty discounts on postal rates.

Farrell said he will send off his order for the $23,000 printer as soon as he gets all the purchase approvals from Intermountain.

What is not clear is whether HP is prepared to offer the printer to other customers at the same reduced price.

A spokesman for HP's network printing division said Intermountain is a long-standing HP customer for which HP decided in this "unique" case to increase its discount. The spokesman also said some OEM vendors are able to offer end users prices lower than HP's because they buy in large volumes from HP's Guadalajara, Mexico, manufacturing plant and therefore receive price breaks, which they pass on to end users.

Farrell noted that DataProducts profits by volume because it replaces the HP interface in its HP-made printer with an interface compatible with several computer brands and therefore sells into a larger market than does HP.

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ABB Power

CONTINUED FROM PAGE 65

moves further reduced ABB Power's monthly financial processing costs to less than $20,000, which translated into more than $600,000 in annual savings compared with the original deal.

Now ABB Power plans to bring its financial applications in-house onto a less costly IBM Application System/400. The transfer of the 350,000 annual financial transactions onto a cheaper platform, Carney said, could save the firm $150,000 per year.

ABB Power used the savings from its financial systems revamp to update its desktop and network environments. Portable, user-friendly PC environments are essential for ABB Power's engineers, Carney said, because the company's project managers often work off-site to brainstorm with other technicians when designing generators and power plants.

Carney and his staff delivered an integrated desktop environment early last year by standardizing on several distributed platforms, including Compaq Computer Corp.'s SystemPro LT file servers and notebooks, Lotus Development Corp.'s CC:Mail, Novell, Inc.'s NetWare v3.11 network operating system and Microsoft Corp.'s Windows 3.1

Some rough spots

Still, the standardization strategy did not come about without a hitch. Carney said the software was plagued with the Jerusalem B virus, resulting in more than 20 hours of downtime per month in early 1992. Carney blamed the contamination on frequent international travel by ABB staff members, who loaded infected disks onto U.S. systems.

ABB Power attacked the problem by standardizing file servers, disks and antivirus software. Since June, the networks have been 99.8% operational.

ABB Power is now what Carney called "a 100% Windows shop." In addition to Windows 3.1, ABB Power has standardized on Microsoft's Word for Windows word processing system, Excel spreadsheet and Office software suite.

Among ASEA Brown Boveri's 100-plus U.S. subsidiaries, ABB Power appears to have taken a leadership role in standardization. Carney said several ABB U.S. sites and the parent company in Zurich have embarked on similar projects.

ABB Process Automation, Inc., which manufactures process control equipment, has leveraged ABB Power's success in these environments and embarked on standardization plans of its own, said Larry Hiemenz, director of IS at the Columbus, Ohio, firm. He said ABB Process is in the midst of a two-year project to standardize on Windows and is exploring Notes.

"The issue with a conglomerate is to leverage synergy with other units wherever possible while maintaining autonomy at a local level. Since the parent company's management philosophy gives precedence to local needs, that's smart," Hiemenz said.

Candle's performance monitor for SMS debuts

By Jean S. Bozman
SANTA MONICA, CALIF.

Candle Corp. is putting its Candle Technology (CT) object-oriented technology to work in a product aimed at supporting IBM's System Managed Storage (SMS) software-based storage manager.

Called Omegamon II for SMS, the product fits alongside the other modules in Candle's Omegamon series of data center performance monitors.

Omegamon II for SMS is the first storage-related product in the Candle line, said Vince Niedzielski, Candle's vice president of IS systems management. "We collect monitoring data and store it in a CT server," he said. That data tracks the storage of SMS "data sets" on disk drive hardware. "On the display, you can see how the storage use is related to the applications you're running," he said. Users set thresholds that warn them of system imbalances.

Now in early-release sites, Omegamon for SMS is slated to ship in the fourth quarter. It is priced at $17,000 to $70,000 for a single license.

Late entry

Industry analysts said that while the Omegamon product takes a unique approach to managing SMS, it will compete with other storage management software from Computer Associates International, Inc., Legent Corp., Boole & Babbage, Inc. and Sterling Software, Inc. Candle is considered to be late in entering the storage management arena, some analysts said.

Even as information systems managers are working to downsize mainframe applications, the amount of data stored in IBM-compatible disk drives is growing at more than 20% a year, according to Gartner Group, Inc. in Stamford, Conn. IBM introduced SMS about four years ago as a way to "stage" data into and out of appropriate storage devices according to access patterns and cost.

Candle is using its SMS monitor as a building block that complements existing Omegamon modules, said Fred Joy, a senior research analyst at Meta Group, Inc. in Stamford, Conn. "If you already have Candle monitors for [IBM's] CICS, MVS, DB2 and VTAM products, you're now getting another major subsystem within the same Omegamon suite," Joy said.

He added that the new Candle monitor, which tracks data storage in disk drive "volumes," would also help manage mainframe data not stored under SMS.

[redacted]

Database management systems

Landmark Systems Corp. has introduced Version 1.2 of The Monitor for DB2 (Tmon for DB2).

According to the company, Tmon for DB2 is a performance monitoring and analysis tool for IBM's DB2 relational database management system.

A history of performance data is maintained, and the product offers features that include on-line analysis, a report writer, an Explain utility and quick-access menus.

Prices range from $18,000 to $38,000 per CPU.

▶ *Landmark Systems*
8000 Towers Crescent Drive
Vienna, Va. 22182
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Software application packages

Systems Design & Development, Inc. has introduced its new line of Seamless Integrated Solution (SIS) telecommunications software products.

According to the company, all of the products operate on IBM's Application System/400 and were designed to integrate with the company's Telecommunications Call Manager/400 call accounting system.

The SIS products consist of the Toll Free Analyzer, a toll-free demographic analyzer and a toll-free abuse reporter; an on-line, long-distance phone bill reconciler called Recon/400; Toll Fraud Tracker; TCM Convention Telephone Bill Processor; TCM Staff Phone Directory and TCM/400, a call accounting system.

Prices range from $8,000 to $50,000.

▶ *Systems Design & Development*
Suite 412
Atrium Financial Center
1515 N. Federal Highway
Boca Raton, Fla. 33432
(407) 367-1648

Utilities

Allen Systems Group, Inc. has announced the Statistical Interface and Reporting Facility (SIRF).

The product is a performance reporting tool designed for Computer Associates International, Inc.'s CA-IDMS environment.

According to the company, SIRF collects statistics from IDMS on-line transactions, local-mode jobs and Central Version batch. The information is stored on the IDMS journal and/or the Systems Management Facility.

Users can write their own customer reports or choose from more than 30 standard SIRF reports. The ability to capture local-mode IDMS run-unit statistics is also provided.

Prices range from $15,300 to $22,560.

▶ *Allen Systems Group*
750 11th St. South
Naples, Fla. 33940
(813) 263-6700

Unix

Computer Information Systems, Inc. has added Unix support to its RoboCharge software for OpenVMS resource accounting, chargeback and project accounting.

According to the company, the new Unix facility automatically accumulates Unix accounting file data, connect time data and disk storage data.

The collected data is posted to RoboCharge data files that are obtainable for image accounting, integrated OpenVMS/Unix resource accounting, chargeback, graphics and reporting.

Support is also provided for Unix project accounting. Users can enter, change and leave projects with the project accounting facility, according to the company.

CPU prices range from $300 to $8,000.

▶ *Computer Information Systems*
120 Wells Ave.
Newton, Mass. 02159
(617) 527-1550

ASK's Manman/X upgrade expands support, offers tools

By Melinda-Carol Ballou
MOUNTAIN VIEW, CALIF.

The ASK Group, Inc. unveiled Manman/X Release 2 manufacturing software earlier this month, which offers support for a greater range of platforms, along with a suite of development tools.

Manman/X Tools is a set of tools that allow users to customize applications. It is able to interoperate with other tools, such as ASK's Ingres Products Division's Ingres/Windows 4GL. In this way, users can develop applications that are complementary to Manman/X.

The Foundation, Customizer and Developer tools offer the following features: version control, a central data dictionary to specify fields for applications, a program generator for easy modification and prototyping of transaction-specific code and a modular approach to modify the application without changing source code.

Manman/X Release 2 will support Oracle Corp.'s Oracle relational database management system, Hewlett-Packard Co.'s MPE/IX and Digital Equipment Corp.'s OpenVMS and OSF/1 platforms on Alpha.

The new version also offers international fields to support the European Single Market requirements, along with currency checks and variances; manufacturing enhancements to optimize operations for repetitive manufacturers and extended inventory, engineering change order and finance controls. In addition, it now supports third-party products, including Interactive Software Systems, Inc.'s UDMS-ReportWriter, Paradigm implementation procedures and Sigforms.

Release 2 of Manman/X and the tools are due to ship in 60 days. Pricing starts at $25,000 for an eight-user system.

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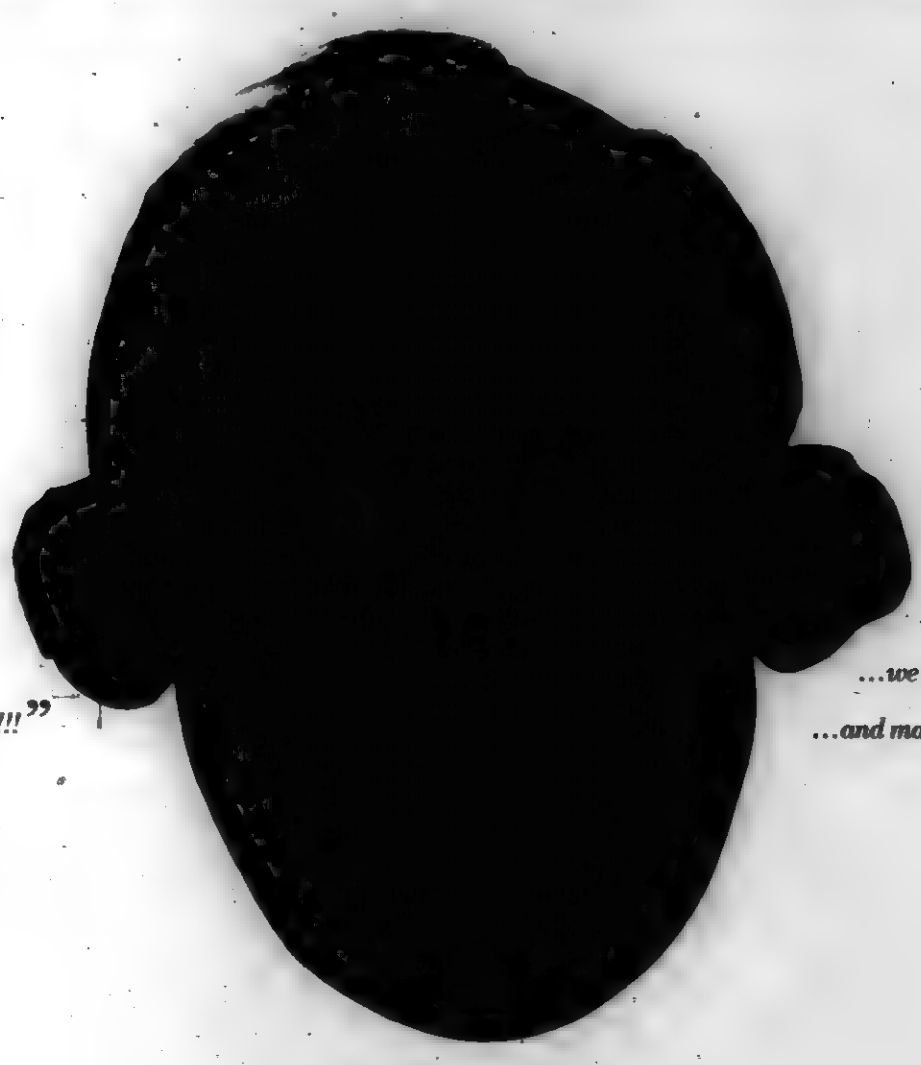

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Application Development

DANGEROUS PHRASES, 75
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'Stress test' for systems

By Gary H. Anthes

Ken Craiker, computer systems analyst at the Internal Revenue Service, outlined an application testing scenario that might strike some as a little farfetched: Get several hundred tax examiners to come in the middle of the night to sit at CICS terminals and enter test transactions.

Fortunately, the IRS did not have to test that scenario; instead, it installed Compuware Corp.'s CICS Playback and accomplished the same thing with four people.

Craiker said Playback — an automated testing tool for on-line applications — is helping the IRS convert its Automated Collection System from IBM 4300 mainframes running DOS/VSE to IBM Enterprise System/9000s running MVS at its 10 service centers. Playback is being used to "stress test" the local networks by simulating the action of hundreds of simultaneous CICS users.

"We wanted a product that would let us capture exactly what we've done in the old system, put it on the new system, run it again in the exact same way and then make a comparison," Craiker said.

Without a product like Playback — and absent the midnight horde of tax examiners-turned-testers — the IRS would have had to resort to a "Mickey Mouse" approach consisting of a handful of systems people entering a dozen or so accounts each, Craiker said. Instead, the IRS can push through 20,000 to 50,000 test transactions at a time in a way that is relatively easy to monitor, repeat and control.

According to Farmington Hills, Mich.-based Compuware, Playback was designed especially for large applications that are difficult to rigorously test for production conditions prior to system implementation. For $35,000 to $106,000, depending on the host machine, Playback performs the following tasks:

- Builds realistic test cases by capturing actual transactions and related database and file activity.
- Executes repeatable tests in a simulated production environment. Avoids the need to rekey transactions and restore test databases between tests.
- Aids analysis of test results by flagging all screen and database differences.
- Documents test results.

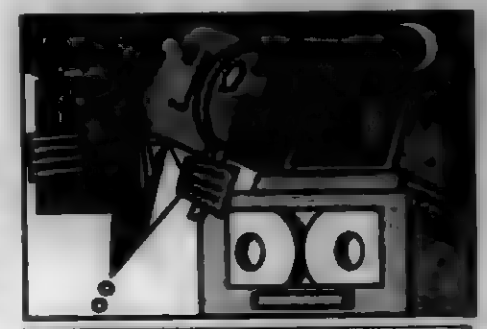
Playback can be run in an unattended mode,

'Stress test,' *page 75*

Simulcast

After debugging and stress-testing applications using Compuware's Playback, users can employ the company's CICS Simulcast, a help desk and training tool. Simulcast enables:

- Troubleshooters to monitor a user's CICS session.
- Trainers to broadcast training sessions.
- On-line conferences among end users and systems personnel.



Not just for testing

▶ Playback was designed to aid in testing on-line mainframe applications, but it can be put to broader use, said Rick Whitham, senior programmer/analyst at USA Group.

For example, it can capture and maintain user scripts for setting up a database or defining a printer, he said. "Our CICS guy automates some of the things he does, and then he plays them back interactively in a fill-in-the-blanks kind of way." The alternative had been to write the scripts on paper, which could never be found when needed.

Andersen gains object advantage

By Kim S. Nash
CHICAGO

■ Andersen Consulting's upgraded application development workbench — including object-oriented repository — pushes the firm ahead of other computer-aided software engineering (CASE) makers in the client/server race, observers said. But Andersen still has work to do, such as getting the workbench to run on platforms other than IBM's OS/2.

Andersen's Foundation for Cooperative Processing (FCP) Version 2.0, announced recently at DB/Expo '93, sports enhanced object-oriented features, including an improved local-area network-based repository. Designed to store and manipulate more complex objects than the previous version, the repository lets users create reusable objects from the business process level down to the level of individual data names.

Such a flexible, object-based repository is key for Daniel Spirek, senior business analyst at Comprecare Healthcare Services, Inc., a $200 million health maintenance organization in Aurora, Colo.

Using the new product, the company was able to build a specialized customer survey application "in no time and without lots of training," said Spirek, whose client/server baptism occurred five months ago when a beta-test version of FCP 2.0 arrived.

Comprecare spent 2,600 workhours building a 12-user OS/2-based system for a task that used to be done manually, he said. The product let him design and generate the application "in far less time than it would have taken to hand-code," he said.

Moreover, users and analysts said, FCP 2.0 adeptly blends traditional CASE-style front-end planning and analysis tools with faster object-oriented aids. Other client/server tools, such as Powersoft Corp.'s PowerBuilder, lack analysis and design features.

Powersoft is addressing this issue by building links between PowerBuilder and front-end CASE modules, such as those from Bachman Information Systems, Inc., Popkin Software and Systems, Inc. and LBMS, Inc.

At the same time, traditional workbenches from KnowledgeWare, Inc., Texas Instruments, Inc. and other CASE makers lack fast, easy-to-use generators, unlike Andersen's product, observers said.

However, a potential stumbling block for Andersen is that FCP 2.0 runs only on OS/2, neglecting the fast-growing Microsoft Corp. Windows development tools market where PowerBuilder, for example, has gained momentum.

Still, FCP 2.0 goes further than many other CASE developer aids in terms of being able to generate for multiple platforms, which is critical to building client/server systems, said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

For example, FCP 2.0's ability to generate programs for Hewlett-Packard Co.'s HP/UX and Digital Equipment Corp.'s Ultrix platforms is "an important first step" in getting into true multiplatform development, Hurwitz said.

Other enhancements in FCP 2.0, which is now shipping, include a Rapid Application Builder to prototype and error-check applications before building them. Support for IBM's AIX and DEC's OSF/1 is in the cards, according to Don Dall, managing director of the Foundation unit. He declined to give a time frame but added that Microsoft's Windows NT will come first, "in the very near future."

PC client/server tools gaining adherents

By Garry Ray
SAN FRANCISCO

Client/server reconnaissance was the mission for many visitors to DB/Expo '93.

There to assess the viability and progress of client/server technology, users with mainframe and minicomputer backgrounds said the 200-plus vendors that displayed client/server tools, utilities and databases were becoming better equipped to handle enterprise application development.

"The PC vendors are working up to enterprise computing with more serious application development tools," said Mark Fetherolf, a manager at consultancy Aston Brook in Plymouth Meeting, Pa. His company has increasingly been using PC-based development tools for its downsizing projects using Oracle Corp.'s Oracle database.

Fetherolf said the best tools were coming from PC-based tools suppliers, not from traditional mainframe suppliers. "The mainframe world didn't respond" quickly enough to downsizing trends, he said.

Other users remained cautious about PC-based client/server development tools.

"All of the primary vendors are saying, 'Don't do mission-critical systems today,' which we wouldn't do anyway," said Mark Jordan, a database administrator at Electronic Data Systems Corp. in Goleta, Calif.

Jordan said his goal was to determine "which client/server products are out there" for the anticipated downsizing of a Digital Equipment Corp. VAXcluster environment to as-yet-undetermined Unix systems. But Jordan said his search

PC client/server, *page 75*

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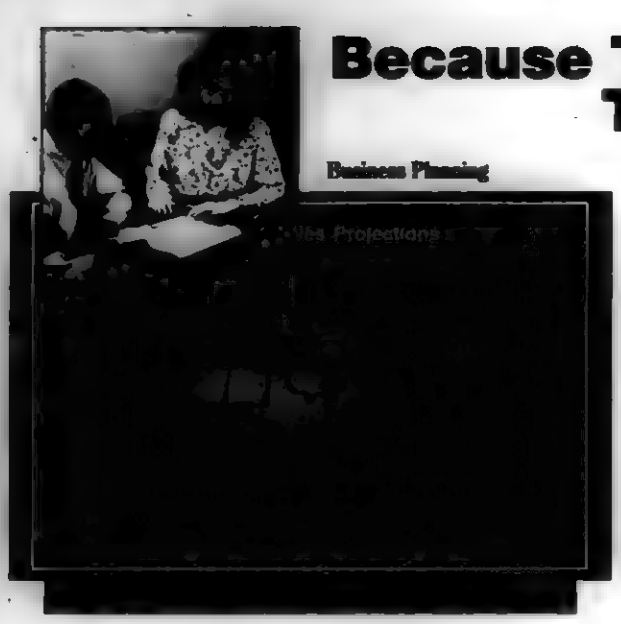

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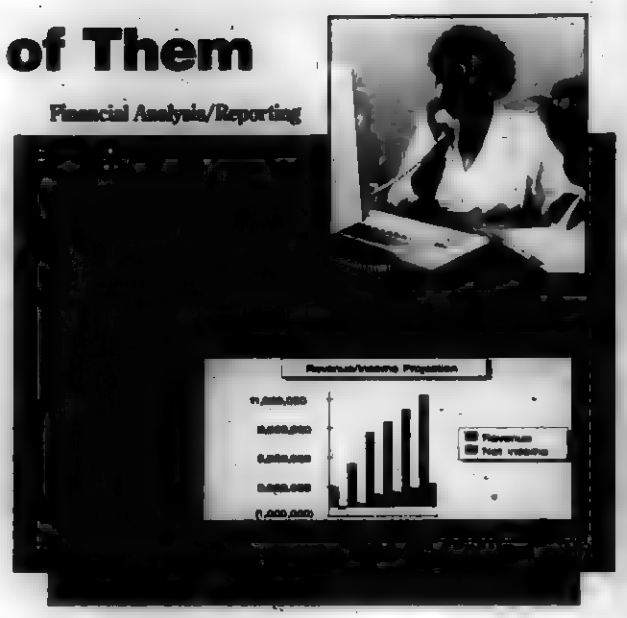

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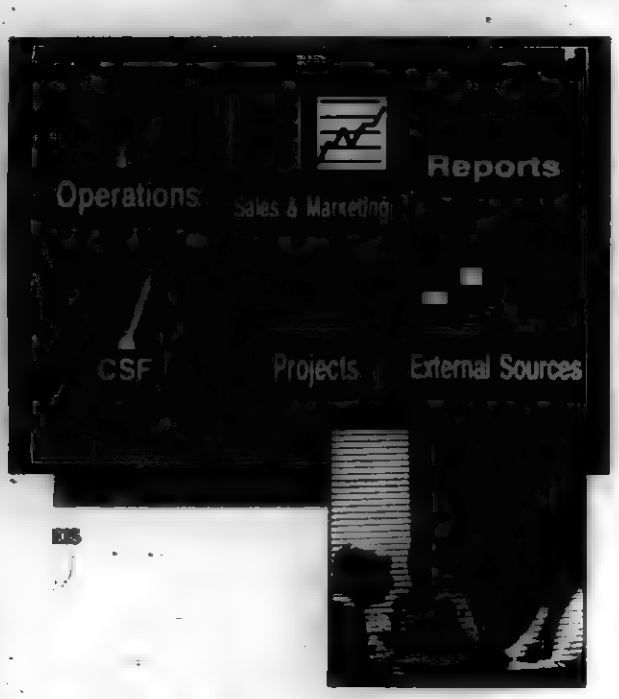

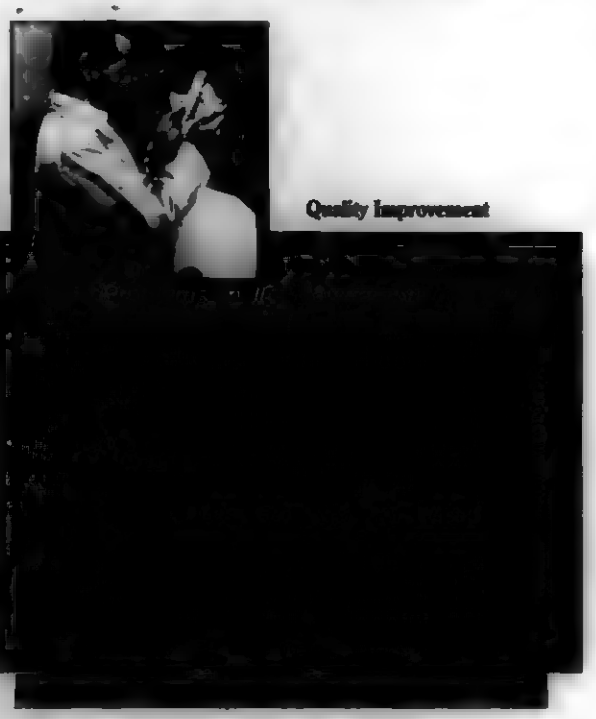

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Data Visualization

Jon Friedman

'Mission' ill-defined

I nominate "mission-critical" as one of the most dangerous phrases of 1993. To see why, let's take a short multiple choice quiz.

Question: When will Microsoft's Windows NT be ready for "mission-critical" applications?

Answers:

A. Now.
B. First-quarter 1994.
C. 1996.
D. Not in our lifetime.

What kind of mission-critical do you mean?

I was asked recently to obtain expert views on exactly this question. By asking several knowledgeable people, I was cleverly able to narrow the responses down to A, B, C and D.

You can get exactly the same result if instead of "Windows NT" you say "client/server 4GLs," "Unix transaction monitors" or "object-oriented databases," among other emerging technologies.

Further probing revealed that many respondents had a fairly consistent timetable in mind for the maturation of Windows NT. The problem was with my original question. "Mission-critical" led different observers to think of different combinations of the following definitions:

1. Important. An application is "mission-critical" if it provides significant value to an organization. You can tell someone has this meaning in mind if he makes statements such as, "We'll be fired if this doesn't work."

2. High-volume. "Mission-critical" is sometimes equated with "big," as in supporting many people or a large number of transactions, sometimes with strict performance goals.

3. High-availability. "Mission-critical" is frequently used when even a small amount of application downtime is very costly.

4. Requiring high data integrity. The accent is on "critical" for applications where the loss of even a single transaction is unacceptable.

An application can have one or more of these characteristics but not all of them. A decision-support application may be critical for a retailer, even if it is used by only a few people and occasionally suffers from an aborted query (criteria 1 and 4). An order-entry system might need to handle large volumes of data and be continuously available, but absolute data integrity might not be cost-justified (criteria 1, 2 and 3).

Note that if you are evaluating, say, software development tools, the requirements differ depending on the kind of "mission-critical" you mean.

"Important" applications call for tools that are functional and reasonably reliable and that deliver good development productivity. Tools for "high-volume" applications need to provide for tuning and efficient execution and must work with other elements of a high-volume environment — say, transaction monitors. High-availability systems must be built with explicit strategies for redundancy.

High data integrity applications require tools that can flawlessly provide facilities for backup, recovery and the end-to-end tracking of transactions.

Because no set of tools provides all of these things, it is important to make trade-offs based on the real application requirements. A general requirement of "mission-criticalness" blurs important distinctions.

What is the moral of this story? I don't suggest banishing the term "mission-critical" because it does serve as a useful shorthand for a set of related characteristics. However, it is dangerous to assume that someone else means the same thing you do when using the term. So just make sure that when someone is saying "mission-critical," he is referring to the mission that is critical for you.

Friedman is manager of industry and competitive analysis at Unisys Corp.

PC client/server

CONTINUED FROM PAGE 71

was not an easy one. "With so many vendors and products, it costs time and money tracking down the tools" for client/server development, he said.

Among the products cited by users as important to enterprise-wide client/server projects were the following:

Caution still prevails among users.

•**Scientific and Engineering Software, Inc.** in Austin, Texas, unveiled its $14,900 Client/Server Model for simulating client/server systems. A specialized front end to the company's SES/workbench, a general modeling and simulation environment, the Client/Server Model allows users to enter parameters for the computing devices, network topology, work loads and application behavior within a client/server system. Systems designers can then alter and refine the model to obtain maximum overall performance, a company spokesman said. Release is slated for late June.

•**Logic Works, Inc.** in Princeton, N.J., previewed its data modeling and database design tool, Erwin/ERX for Powerbuilder. The $2,995 tool, which will be released this summer, will allow Powerbuilder developers to create entity-relationship diagrams from a variety of SQL databases. The models can then be used to generate Powerbuilder applications.

•**Cognos Corp.** in Burlington, Mass., announced Version 2.0 of its Impromptu query and reporting tool for Microsoft Corp.'s Windows. The $595 Administrator Edition allows database administrators to create predefined "catalogs" of queries and joins for SQL databases and limit the number and types of records that users can retrieve. The $395 Enterprise Edition allows users to perform database queries and create reports. Both versions are slated for release in August.

•**Information Builders, Inc.** outlined plans to link its EDA/SQL query tool with KnowledgeWare, Inc.'s Application Development Workbench (ADW). KnowledgeWare will build two links: Model/EDA, to let ADW users work with relational and nonrelational database models; and ADW/Construction Workstation-EDA, to let users generate applications using Information Builders' SQL messaging interface and business models built with ADW.

•**Trinzic Corp.** demonstrated Aion Development System and KBMS, products designed to create graphical, distributed applications that can access information stored on PCs, network servers or mainframes. Trinzic also showed InfoPump, a middleware product inherited from Channel Computing, which Trinzic bought earlier this year. InfoPump helps users move data between databases to ease the information flow in client/server systems.

•**Natural Language, Inc.** in Berkeley, Calif., said its ad hoc query tool Natural Language will support The ASK Group, Inc.'s Ingres ODBC Database Driver and Informix Software, Inc.'s Informix database management system.

West Coast correspondent Kim S. Nash contributed to this report.

'Stress test'

CONTINUED FROM PAGE 71

which is especially suited for long tests with high transaction rates. Or it can be set to run interactively, allowing testers to change transaction input and view output before processing the next transaction.

While the IRS uses Playback to stress test mostly debugged applications, USA Group, Inc. in Fishers, Ind., uses it further upstream in the development cycle to help the company find bugs in unit and systems tests.

USA Group has two huge MVS applications — for student-loan guaranteeing and student-loan servicing — written in Cobol and ADS/Online, using the IDMS database from the former Cullinet Software, Inc., now Computer Associates International, Inc. The applications and related subsystems are supported by about 300 developers at two locations, according to Rick Whitham, senior programmer/analyst.

"The ADS/Online debugging environment was virtually nonexistent, so we needed something to ease our testing burden," Whitham said. Playback is used about equally for developing applications and for maintenance.

Whitham described the pre-Playback testing approach as one in which test cases were laboriously constructed, executed and re-executed, with test databases rebuilt each time. Now, test cases are saved by Playback so that whenever a program goes from production back into testing, the same proven tests can be applied again and results compared to earlier runs. Playback knocks about 50% off total testing time, he said.

A time saver

Keystone Insurance Co. in Philadelphia uses Playback for unit testing, systems testing, stress testing and maintenance of production systems. Al Daubert, assistant vice president for technical services, said it is most popular in unit testing because of the time it saves in reconstructing and repeating tests.

In maintenance, especially for critical programs, Keystone uses Playback to compare output screens before and after changes are made. "It's saved us some real embarrassments," Daubert said. "It's hard to stay out of trouble in this business, so you need all the help you can get."

Tool helps team development efforts

By Jean S. Bozman
FOSTER CITY, CALIF.

Blyth Software, Inc. said it will support collaborative programming with its new Omnis 7 Version 2.0 client/server application development tool for Apple Computer, Inc.'s Macintoshes and Microsoft Corp. Windows-based PCs.

The new Version 2.0, which includes a database and fourth-generation language tools, is set to ship this summer. As announced at DB/Expo '93 in San Francisco, the basic price is $3,750. However, Blyth will sell it at an introductory price of $3,000 until September. Upgrades from previous Omnis releases cost $500 to $2,250.

New features in Version 2.0 include a Version Control System that prevents programmers from writing over code written by others in their development team. A Change Management System helps maintain applications after they have been written. Software modules written with the Omnis system are really a series of linked "objects" that can be sent over a network to update remote workstations, the company said.

Omnis 7 client/server applications can be deployed using Apple's Data Access Language and Microsoft's Open Database Connectivity application programming interface. Client applications can reach SQL data stored in relational databases from Oracle Corp., Sybase, Inc., Informix Software, Inc. and The ASK Group, Inc., as well as IBM's DB2 and Digital Equipment Corp.'s Rdb. The Omnis database can also serve as a local-area network relational database, according to Blyth.

[redacted]

Application development tools

Lattice, Inc. has announced CodeProbe, an interactive source-level debugger for Lattice RPG on the PC.

According to the company, the product provides the same debugging power found in PC languages such as C and Pascal.

Debugging features include command-logging to create test scripts for repeating keystrokes, menus with mouse or accelerator keys support, cross-debugging support and independent display windows for simultaneously viewing field contents, indicator usage, source and CodeProbe commands.

The product runs under DOS 5.0 or higher and operates in extended memory.

Lattice CodeProbe for RPG costs $350.

▶ *Lattice*
Suite A
3010 Woodcreek Drive
Downers Grove, Ill. 60515
(708) 769-4060

Integrated Systems, Inc. has added three extensions to the pSOSystem's C++ environment.

The Object Register is a specialized tool for embedded C++ systems and provides memory garbage-collection functions. The C++ Source Code Explorer enables users to graphically display and edit call trees, display class inheritance structure and interact with other C++ development tools, the company said.

Support for Intel Corp.'s 80386 and 1486 microprocessors is also provided.

Prices range from $4,395 to $4,750.

▶ *Integrated Systems*
3260 Jay St.
Santa Clara, Calif. 95054
(408) 980-1500

Comtrol Corp. has introduced the Developers Toolkit II, software productivity tools designed for users who want to integrate multiport serial boards with their DOS or Microsoft Corp. Windows-based software applications.

The Developers Toolkit II includes the Developers Libraries that offers library routines of proven code that can be accessed by the user via simple, high-level C language calls, the company reported.

Also included are on-board debugging capabilities that can be used with Borland International, Inc.'s Turbo Debugger, a Development Controller option and a programmers' reference manual.

All versions support synchronous serial communications and cost $695 each.

▶ *Comtrol*
2675 Patton Road
St. Paul, Minn. 55113
(612) 631-7654

Computer-aided software engineering

Evergreen CASE Tools, Inc. has introduced Version 4.0 of both EasyCASE Professional and EasyCASE Systems Designer, computer-aided software engineering tools for the PC.

EasyCASE Professional 4.0 supports a large selection of available structured methodologies for event, process or information modeling. The product includes an integrated data dictionary, an on-line methodology monitor for analysis and checking and a chart editor.

EasyCASE System Designer 4.0 has the same features as EasyCASE Professional plus an automatic database scheme generation for X Base and SQL and is available for MS-DOS and Microsoft Corp.'s Windows.

EasyCASE Professional 4.0 costs $795, and EasyCASE System Designer costs $1,195.

▶ *Evergreen CASE Tools*
8522 154th Ave. NE
Redmond, Wash. 98052
(206) 881-5149

"Staying on top of document imaging technology is critical for organizations seeking to use a global competitive weapon."

Jack Lacy
Chairman
International Information Management Congress (IMC)

"Document imaging, defined as the storage, retrieval, and manipulation of images of documents, may well be the fastest growing sector of information technology today. Regardless of the system — single-user or enterprise-wide — document imaging transforms every organization that adopts it.

"The Computerworld White Paper on "Enterprise-Wide Imaging" appeared in two IDG publications — Computerworld and its German counterpart, Computerwoche — to coincide with our 30th year and the IMC Conference in Berlin. Both the global event and the White Paper were a great success with the industry leaders who attended from 31 countries. We look forward to working with Computerworld, other IDG publications and the next White Paper on "Workflow Technology" in 1993.

"IMC's mission is to educate IS management on how document imaging enables organizations to reshape the way they function and work. The Computerworld White Paper Program is helping us meet that objective by reaching key influencers in the international IS industry."

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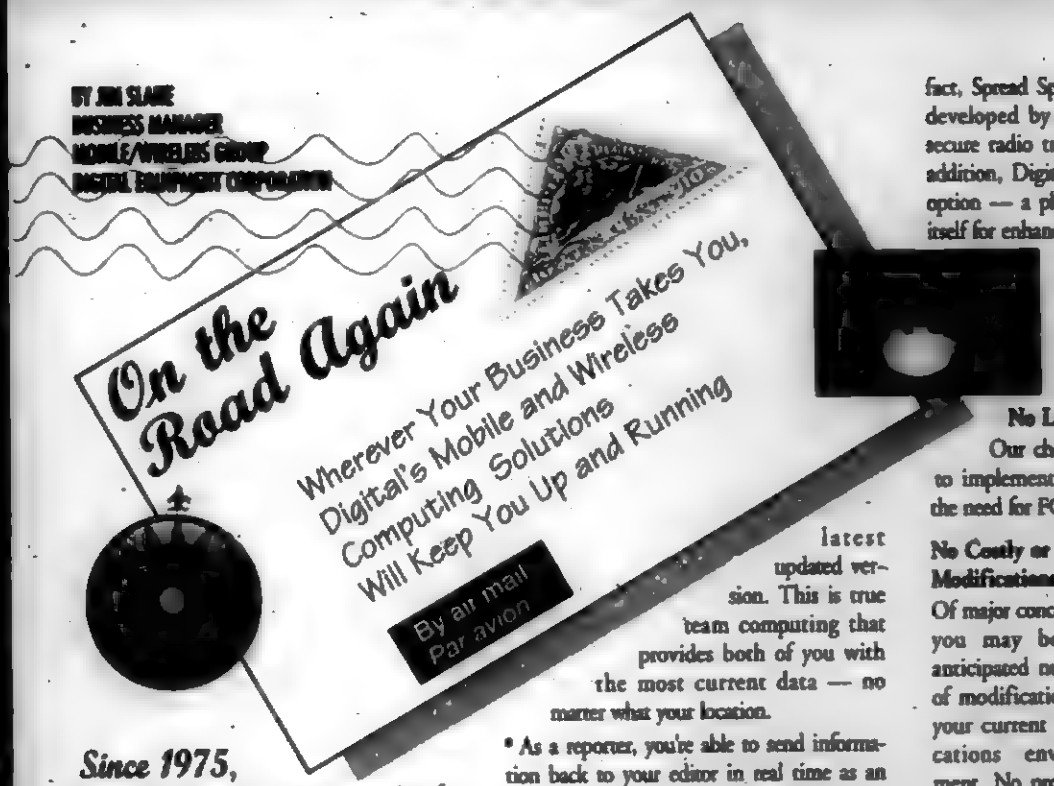
BY JIM SLAKE
BUSINESS MANAGER
MOBILE/WIRELESS GROUP
DIGITAL EQUIPMENT CORPORATION



Since 1975,

Digital has built a strong reputation for the design and manufacture of leadership network products. Almost 20 years later, we're using our networking and integration expertise to shape the future of business computing.

Today, our Networks Engineering Unit has set up a team focused on developing products and solutions for emerging and new network technologies in the areas of mobile and wireless networking, cable TV, public telecommunications data services, and multimedia. Working together, these technologies will allow you to work faster, smarter — and more competitively.

You will be able to access and exchange information no matter where you are — at home, in your office, on the road, across the country, or across the globe. This is Digital's vision. This is Digital's innovation at work — for you.

Working Toward True Computing Freedom

Imagine having the freedom to connect to your network from anywhere, anytime — and operate as if you were sitting in your "home" office.

- Perhaps you're a doctor accessing Patient A's records with your computing device. No need to go to the patient's bedside to find the chart. You can call for the information from wherever you are. In your office — or on the other side of the medical center.
- Or, you're a business professional working on a project with a colleague who is traveling across the country. A short time after you make some critical edits, she plugs in her laptop, hits a few keys, and receives the latest updated version. This is true team computing that provides both of you with the most current data — no matter what your location.
- As a reporter, you're able to send information back to your editor in real time as an important interview progresses. Or, your can access a database that will furnish you with historical information as you formulate your next questions.

Mobile computing is here today — and here to stay — as the next paradigm of computing. In doubt? Look at the statistics. Almost 25 percent of all PCs sold worldwide today are laptops or notebooks. In Japan, that figure is greater than 50 percent. And, by 1996, notebooks and laptops are expected to outsell desktop PCs.

Unfortunately, what's not here today are the networking products to address the needs of mobile computing users. That's where Digital plays a critical role.

Unlike our competition, we're not offering simply point products. Instead, we're working on solutions that encompass front-line information technology.

What You Should Know about Wireless Local Area Networks (LANs)

Today, companies are using wireless LANs for ad hoc workgroups, temporary locations, disaster recovery projects, or to overcome a facility's physical restrictions.

Whatever the reason, Digital understands that you are trusting your most critical applications to your wireless LAN. That's the reason why we insist on delivering wireless products that work as well as, if not better than, any wired network. We're accomplishing this goal through:

Spread Spectrum Technology

The radio frequency technology that Digital has chosen for its wireless LANs has a proven record of security and reliability. In fact, Spread Spectrum technology was first developed by the U.S. government as a secure radio transmission methodology. In addition, Digital offers an encryption chip option — a pluggable option on the board itself for enhanced security.

In terms of safety, our wireless LAN product rates 17 times better than the ANSI radiation emissions standard.

No Licensing Hassles

Our choice of technology allows you to implement your wireless LAN without the need for FCC licensing.

No Costly or Time-Consuming Modifications

Of major concern to you may be the anticipated number of modifications to your current applications environment. No problem. Digital's wireless LAN products — based on the TCP/IP networking protocol — require no modifications to your computing infrastructure whatsoever. What's more, these products are all customer-installable — providing you with both savings and convenience.

Mobile Computing for a Wide Area Environment

It should be noted that the terms "wireless" and "mobile" are not synonymous. Wireless is a transmission medium that becomes an enabling technology for mobile computing. However, mobile computing — the concept of being able to connect to your network no matter where you are — does not necessarily dictate that you use wireless.

Once you begin to think about mobile computing for your wide area network (WAN) environment, there are specific issues to consider, including what type of transmission service to utilize. Your choices include telephone, cellular, and packet radio services, or some type of satellite offering. Whereas service costs are not a concern with wireless LANs, they become important when considering wide area communications.

All the wide area services offered are tariffed based on the amount of time you're on the network or the number of packets you send across it. Digital is listening as you describe your need for the most cost-effective technology possible. To that end, we're designing products that will help you get the most out of your selected service.

An example is our plan to build products that allow you to operate your system in a disconnected fashion — right up until the time you need access. This style of computing utilizes the least amount of time or packets on the network, and ultimately results in cost savings for you.

With the rapid convergence of the communications, computing, and media industries comes the birth of exciting new technologies. Mobile and wireless computing products are only part of Digital's vision to design and implement innovative solutions around these emerging technologies — solutions that are turning today's vision into tomorrow's reality.

When you're ready to get started, Digital's Professional Services Group will help you plan and design comprehensive mobile computing solutions to suit your business needs.

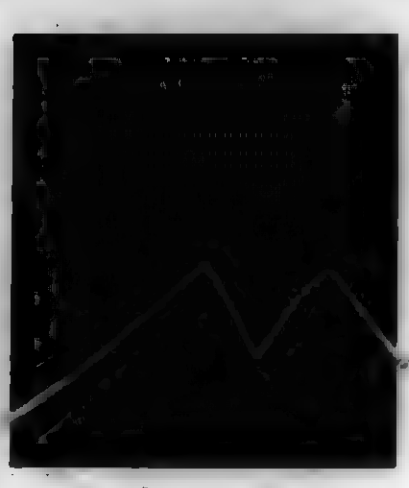
Today's Vision, Tomorrow's Reality

Today, Digital offers products to address many of the needs associated with wireless and mobile computing. These products, including wireless LANs and SLIP (Serial Line Interconnect Protocol) — a dial-up support for TCP/IP networks — are pieces of Digital's mobile computing mosaic.

Our strategy focuses on providing global connectivity for you and your business. That means addressing your needs at all levels — in the office, across town, across the country, or on the other side of the world. And, we plan to deliver mobile and wireless products based on a very aggressive schedule — providing you with one reliable source for all your mobile and wireless networking needs.

For more information on Digital's mobile and wireless computing solutions, call 800-332-4636 and reference ext. MOVE. ■

PUTTING IMAGINATION TO WORK



Make Sure Your DSSI Storage Subsystem Is a Business Asset

Let Digital's Solid State Disk Help GROW YOUR BUSINESS

All the CPU power in the world can't provide the expected return on investment unless you add speed to your I/O. You need a better solution — Digital's EF5x family of solid state disks.

If your applications aren't running at optimal speed, you may need a boost in I/O. Digital's EF5x series of solid state disks — with prices as low as $19,000 — can enhance your I/O throughput and allow your applications to bolster your bottom line.

To help you gain a better understanding of the benefits of Digital's family of solid state disks, we're offering answers to some of your most often asked questions.

Q. *What types of symptoms indicate that my system is in need of solid state disk?*

A. If application I/O demand exceeds the storage system's ability to respond, the system is I/O-bound. Key symptoms include long I/O queue lengths, prolonged user and batch response times, and low CPU utilization rates. Unacceptable application throughput also suggests an I/O-bound condition.

Q. *How do I optimize the CPU power of my Digital Storage Systems Interconnect (DSSI) system?*

A. To optimize CPU, your I/O subsystem's ability to provide data to your CPU must match your CPU power. Adding CPU power to fix your I/O problem isn't the answer. Adding a high-performance I/O device to fix an I/O problem is more cost-effective and offers better performance.

Q. *Won't the throughput capability of solid state disks saturate my DSSI bus?*

A. No. In the real world, the typical I/O throughput of a solid state disk is approximately 200 to 250 I/Os per second. It's the access time of 0.25 milliseconds that provides the real benefit. The I/O throughput realized is a function of the CPU type, application, and load. The lightning-fast access time of solid state disk — the time it takes to access frequently requested data — is what really matters. Solid state disk and magnetic disk can be mixed and matched on a single bus.

Q. *How many EF5x solid state disks can I put on a DSSI bus?*

A. The answer depends on a number of factors, including the number and types of host DSSI adapters and the request throughput performance goal. Approximately 200 I/Os to 600 megabytes can reside on a single bus. Approximately 1,400 I/Os to a 400-megabyte database should be spread across 2 buses. Spreading EF5x solid state disks across multiple buses to achieve load balancing can reduce queue lengths — allowing for improved overall response time.

Q. *Can the EF5x solid state disk be integrated into a broad range of systems?*

A. Yes. In fact, its plug-and-play ability as well as its size (the EF5x solid state disk fits in the palm of your hand) allows this solid state disk to be easily integrated into systems in a number of ways, including integration into VAX 4000 cabinets and storage expansion boxes, and into SF storage array cabinets. This solid state disk can also be imbedded in VAX 7000 and VAX 10000 system cabinets.

In addition to integration flexibility, the EF5x solid state disk demonstrates dramatic performance features, including an integrated Data Retention System that allows for safe, secure, nonvolatile storage if power is lost.

To order any of Digital's solid state disks, call 800-DIGITAL (800-344-4825) and press 1. ■

Order #	Product	Price
EF51R-AA*/AF**	107 MB DSSI solid state disk with integrated Data Retention System	$19,000
EF51R-LA**	Two 107 MB solid state disks and modular mounting shelf for VAX 7000 and VAX 10000 systems	$33,250
EF52R-AA*/AF**	205 MB solid state disk with integrated Data Retention System	$32,000
EF52R-LA**	Two 205 MB solid state disks and modular mounting shelf for VAX 7000 and VAX 10000 systems	$56,000
EF53R-AA*/AF**	267 MB DSSI solid state disk (no Data Retention System)	$35,000

*Factory-installed option **Field-installed option

MSDS EASI Access: The Document Management Solution for Regulatory Compliance

Managing hazardous materials documentation to keep pace with federal and state regulatory requirements is becoming increasingly burdensome — especially in manufacturing. The paperwork involved is staggering, and the trend is toward more regulation and reporting, not less.

Come out from under that mountain of paperwork with the MSDS EASI Access solution from Digital and EA Systems, Inc. Now, you can minimize emergency response time while maximizing MSDS document management growth.

With MSDS EASI Access, personnel in Environmental Health & Safety, Operations, and in Maintenance can:

- Access current MSDS information quickly and easily
- Modify or update current MSDS documents to meet new regulations
- Manage MSDS information centrally
- Respond to emergencies with simple, comprehensive tools.

The MSDS EASI Access basic system enables you to convert paper-based material safety data sheets into a standardized image format and store them for electronic distribution, viewing, annotation, and management. For example, each MSDS can be filed by its trade name, CAS number, chemical name, manufacturer, or any other identifier. You can add a location marker to indicate where hazardous materials are in use at your site. Plus, other workstation or PC users on the network can find the MSDS information they need and print it locally from a single, centrally managed source.

For more information on the MSDS EASI Access solution, call EA Systems, Inc. at (510) 748-4753. ■

Begin 21st Century Application Development Today — With PowerHouse and Alpha AXP

If you're looking for the fast route

to the future of application development, the search is over. Cognos, Inc. is now shipping its PowerHouse 4GL application on Digital's Alpha AXP platform. It's the first 4GL with native-mode availability to ship on Alpha AXP and OpenVMS systems. In short, the most widely used 4GL in the Digital marketplace is now better than ever — running on the world's fastest microprocessor.

"Our Alpha AXP strategy is part of the Cognos commitment to provide powerful solutions to Digital users and our VARs who have written applications in PowerHouse," says Ron Zambonini, president and COO of Cognos, Inc. "This commitment has made us one of Digital's largest COHESION solution providers. We're also fully committed to support Digital's strategic direction with Alpha AXP, DEC OSF/1, and Windows NT platforms."

Whether you choose to move to the Alpha AXP platform today or tomorrow, change all your systems or just a few, the flexibility and compatibility of PowerHouse can help you succeed.

"Digital and Cognos made it possible for us to take advantage of the latest in technology without changing a single line of code."
Brian Deppeise
Vice President of Technology
StarGarden Corporation

"We went the extra mile, ensuring that PowerHouse applications are completely binary compatible between VAX systems and Alpha AXP systems," Zambonini explains. "Customers can build applications on the VAX system today and run them on an Alpha AXP system later. Or, they can use the power and speed of Alpha AXP systems to develop applications of the future right now."

Cognos/Digital Solutions Get Rave Reviews from Customers

PowerHouse applications have already been ported to the Alpha AXP platform — with positive results for Cognos' value-added resellers and customers alike.

"Digital and Cognos made it possible for us to take advantage of the latest in technology without changing a single line of code," says Brian Deppeise, vice president of Technology, StarGarden Corporation. "For us, the move to OpenVMS on Alpha AXP was very simple."

Lou Anne Strickland, VAS Software president, explains that "with PowerHouse on Alpha AXP, we can now offer our customers VAS financial packages running on a very powerful alternative within the Digital family."

For the Marketrieve Company, the porting of its MarketrievePlus marketing and sales automation system was completed with ease. "The process couldn't have been more straightforward thanks to Cognos and Digital," says company president Edward Lucia. "This opens up a new market for our PowerHouse-based software and lets Marketrieve get in on the ground floor."

For information on PowerHouse, the StarGarden Human Resources Information System, VAS Software financial packages, or the MarketrievePlus marketing and sales automation system, call 800-4COGNOS (800-426-4667), ext. 81.

Get Ready for Savings on Alpha-ready VAX Upgrades and Software Applications

The pathway to your business future just got brighter with price break offers extending through July 2, 1993, on Digital's Alpha-ready VAX 6000 in-cabinet upgrades and Easy VAX Upgrade packages. You can get a guaranteed Alpha AXP price with your upgrade and savings on selected software applications.

Digital is offering the lowest prices to date on in-cabinet upgrades for the VAX 6000 system — by packaging CPU and memory together and pricing them for value.

You'll get a fast VAX 6000 Model 600 system — an Alpha-ready VAX system that offers more performance now and can be traded for a DEC 7000 Model 600 AXP system. You can even lock in an Alpha AXP upgrade price now and purchase the system later. And, when you order software with your upgrade, you'll receive 50 percent off on Digital layered products — upgrades or new products.

The new Easy VAX Upgrade program enables you to upgrade your older VAX systems to Alpha-ready VAX 4000, VAX 7000, or VAX 10000 systems. You can also upgrade or purchase new Digital layered products at a 50 percent discount and receive up to 15 percent off selected disk, tape, and memory products. You can even trade in additional systems to be applied toward the purchase of your new Alpha-ready VAX system. In addition, take advantage of 20 percent savings on applications from selected Digital partners such as Cognos when you upgrade. The list of software partners participating is growing daily and includes:

Software Partner	Application
Argent, Inc	DCLFAST, DiskSaver, SUZIE, FileChief, JAMS
Cincom Systems, Inc.	SUPRA SERVER*, AD/Advantage*
Cognos, Inc.	PowerHouse 4GL, Architect**, InQuizitive**, PowerPlay**, Impromptu**
Cortex Corporation	CorVision
Dun & Bradstreet	Millennium series
EA Systems	PASCE, Re:Solution
EEC Systems, Inc.	SUPERCACHE
Executive Software	Diskeeper/Plus, I/O Express
Information Builders, Inc.	FOCUS 4GL (new orders only)
Ross Systems, Inc.	Renaissance Series, Renaissance CS Series, PROMIX, Human Resources, Tools
Smartstar Corporation	SmartStar VMS, SmartStar Vision
Target Systems Corporation	TARGET>HOTLINE, TARGET>ASSET TRACKING, TARGET>BATCH, TARGET>SENTINEL, TARGET>MENU

** Cincom has already reduced the prices of their complete family of products by up to 38 percent.*
*** When purchased with a PowerHouse 4GL license*

To find out if the application you want is available — and for details on this limited-time upgrade sale — call 800-DIGITAL (800-344-4825) and press 2.

PUTTING IMAGINATION TO WORK

digital

Digital's Alpha AXP Workstation Companion Solutions

Serving Up OUTRAGEOUS POWER at INCREDIBLE VALUE

What's the idea behind Digital's Alpha AXP Workstation Companion solutions? It's simple. You want to extend the availability of your primary applications to a broad base of users. And you need a cost-effective approach. The answer? Add Digital's Alpha AXP™ workstations and VXT 2000+ X Window terminals to your computing environment.

The teaming of Alpha AXP systems with our VXT 2000+ X Window terminals brings the power and performance of the Alpha AXP platform to your desktop users at a fraction of the cost of other workstations. And, you get the same windowing capabilities and presentation.

All the Advantages of GUI Computing — for Less

Your business may run a number of graphical user interface (GUI) applications, such as publishing, process planning, statistical analysis, and low-end CAD/CAM applications — the kinds of applications that don't require the dedicated processing power of a workstation. The most cost-effective way to take advantage of GUI computing at a low cost per seat is to distribute system computing power via a networked display device, an X Window terminal.

Digital's Alpha AXP workstations are high-performance platforms for graphics applications — providing excellent responsiveness to users. In fact, the combination of Alpha AXP systems and VXT 2000+ X Window terminals provides you with:

- High user productivity
- Highly responsive applications
- Freedom from user system management tasks
- Simplified system management
- Low cost per seat
- Data security
- Growth paths.

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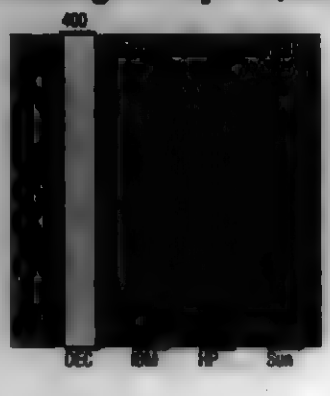

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PUTTING IMAGINATION TO WORK

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How are we doing?

Sure, it's dangerous to invite users to complain about IS. But **SmithKline, American Express** *and* **Texas Instruments** *say that polling users is well worth the risk.*

▲ **SmithKline Beecham's Katherine Holland:** *User polls are invaluable in keeping IS tuned in to what's happening in the trenches. '[They've] helped us get our hands around intangible comments.'*

By Michael L. Sullivan-Trainor

MOST USER SATISFACTION SURVEYS might as well be thrown away (and often are) by the very people they're supposed to help. That's because surveys usually fail to stimulate change.

The problem, says Richard S. Mathews, president of Mathews & Co., a customer satisfaction consultancy in Stamford, Conn., is that it's often tough to turn user feedback into improved service. Lack of top management commitment and the absence of measurable goals, Mathews says, are major obstacles.

Yet experts say that without a thorough survey program, information systems managers — especially those in centralized IS groups — are flying blind. Besides making you vulnerable to complaints about poor service, a lack of solid user feedback can also cripple or even scuttle efforts such as business process redesign and total quality management, which depend on user feedback and participation.

Even so, skepticism about the value of user surveys runs deep. Robert Gilmore, executive vice president at CoreStates Financial Corp., sums up a common sentiment: "If you have to ask the users what they think of your services, you're not working closely enough with them."

Another hindrance is fear of risk. No question: It's dangerous to invite users to vent complaints about IS. Especially when feedback is reported to senior management, who can press, often uncomfortably, for corrective action.

Alan Kornbluth, a vice president in the IS group at American Express Co.'s headquarters in New York, affirms that asking people to rate your services can be a frightening experience. "[It is] like coming home from school again with your report

Satisfaction surveys, *page 82*

Satisfaction surveys

CONTINUED FROM PAGE 81

card," he says.

Overexposure and apathy are also problems, says Naomi Karten, president of Karten Associates, an IS management consultancy based in Randolph, Mass. "People have been surveyed to death," she says, noting that often "users have no stake in the responses because they never hear about them again."

Plus, many surveys are poorly designed, which leads to misinterpretation and misguided action, Karten adds.

Then there's another harsh reality: Problems unearthed by surveys might not be that easy to fix. With all the pressure these days to cut costs and reengineer, understandably few IS managers are interested in inviting more attention to weak areas.

So it's no surprise that IS managers who survey users regularly are pretty rare. When studies are conducted, they are usually in response to crisis situations or major changes in organization or technology.

For IS managers willing to risk the consequences, advocates say end-user surveys can do the following:

•Rally IS staffs. Supporters say survey feedback can really illuminate and animate an insulated IS staff.

When quantifiable complaints from a large number of users grab the attention of senior management, even the most self-contented, phlegmatic IS staffs can suddenly become focused on solving the problems.

•Prevent surprises. In an atmosphere of change, top management often wants to examine every service and function to ensure that it's in sync with company goals. If IS isn't ready for such heavy-duty scrutiny, outsourcing or staff downsizing can easily rise to the top of the executive agenda.

Katherine Holland, director at SmithKline Beecham's U.S. Technology Services, says user polls can be valuable in helping IS stay tuned in to what's happening in the trenches.

Surveying, she says, "helped us get our hands around intangible comments from the business unit programmers."

As part of a self-evaluation strategy, backers say, surveys can provide fast (and convincing) answers to top management's questions about how well IS is supporting the organization's mission.

•Improve services. With the right techniques, IS managers and consultants say, it's possible to determine how to further improve user satisfaction, achieve peak performance and prevent IS complacency.

At Texas Instruments, Inc., for example, Gary Pollard, director of quality for IS, says surveying "really helped us focus our efforts on problems to get corrective action."

Following are accounts of how some world-class companies have used end-user surveys to achieve high levels of user satisfaction.

Create a savvy survey

So you've decided to try surveying your end users. Experienced hands say it's critical to carefully design your satisfaction survey if it is to be of any value. Experts recommend that you do the following:

- Focus on what's important to the customer/user. Aim at the services he cares about most.
- Thoroughly prepare for the survey as a service improvement process, not just a survey exercise.
- Measure results accurately and carefully. Then benchmark against other internal and external measures.
- Develop and execute plans to address problem areas as quickly as possible, and communicate with users about them.
- Re-engineer processes as necessary. Nothing is unchangeable; some things might just take more time than others.

SmithKline Beecham

Hoping to prevent yourself from being replaced by an outsourcer? Trying to gain control of a changing picture? Need to assess the effects of a major reorganization?

Any one of these would be sufficient cause to consider launching a user satisfaction survey. Katherine Holland is facing all three — at once.

To meet these triple challenges, she's employing several types of self-evaluation tools in hopes of gaining valuable information for action. But there's a twist: Instead of concentrating on users, she's surveying IS staff members themselves.

"The programmers are our harshest critics because of reorganizations that have taken place," Holland explains.

The first major step was to poll some 186 application programmers who report to business units and serve as intermediaries for the data center's end-user customers.

The center, located in King of Prussia, Pa., runs the company's entire applications portfolio, from companywide financial systems to clinical, pharmaceutical and consumer brands systems.

Consolidation issues arise

The reorganization began two years ago, when SmithKline's merger with UK-based Beecham led to the consolidation of four data centers into one. Staff was halved, and a single IBM Enterprise System/9000 Model 900 replaced four IBM 3081s and one 3090 Model 200.

Although Holland says price/performance improved, a funny thing happened during consolidation: The ES/9000 was partitioned into four areas, each with a different operating system and applications to match the company's four businesses.

But it turned out that programmers were unhappy because each business unit no longer had its own data center. Holland explains: "We still run [the center] as if it were four data centers with four different staffs. We've accomplished the physical consolidation. Now we're working on the logical consolidation."

All this was going on while processing volume (measured by increased business systems to support new product and services) grew between 30% and 40%.

> Holland says the ISSC evaluation provided some insurance in case the plan changed.

Holland wanted to know how the consolidated data center was doing, so she initiated a multipart self-survey.

A comparative benchmarking study was conducted by Compass America to determine where SmithKline stood against similarly sized companies in key purchasing, staffing, processing and management areas.

This was coupled with an "operational readiness study" done by IBM's outsourcing unit, Integrated Systems Solutions Corp. (ISSC), to see what an outsourcer would improve if the services were turned over to one.

Also, a programmer satisfaction survey was conducted to corral some of the intangible concerns and determine how much was based on current service.

The benchmark comparisons documented what Holland already knew: "We were paying a higher price for CPU utilization than our demand said we should."

The reason was that each of the four different environments had its own operations personnel and direct-access storage devices backup.

Consultant adds credibility

Holland says she believes that calling in an outsourcer lent further credibility to the efforts, even though SmithKline had already decided to keep processing in-house. Nonetheless, Holland says the ISSC evaluation provided some insurance in case the plan changed, as well as further ammunition to advance data center consolidation.

As it turned out, the satisfaction survey was a major piece of the program. That's because the poll targeted the data center's performance on *business* needs and applications, rather than examining only internal efficiency measures. The bottom line: Programmers were quite satisfied with data center services.

Another interesting finding was that a particular account representative was disliked by programmers in his unit. So Holland replaced the problem person with a manager who "smothered the unit with attention."

The new approach worked, and the group's satisfaction ratings increased.

Eventually, Holland was able to use the survey data to garner management approval to start a common operating environment for all the business areas. This in turn ultimately helped reduce data center costs even further. Today, follow-up surveys are conducted annually by outside consultants.

"There's still a lot of politics and dynamics," Holland says. "But the results validated what we were doing."

USER SURVEYS that SATISFY

SmithKline Beecham

- **Goal:** To improve control and assess effects of major corporate reorganization in midst of 30% to 40% annual processing growth.
- **What they did:** Mixed evaluations by Compass America and ISSC with internal survey of business unit application programmers.
- **Payoff:** Company management OK'd establishment of common operating environment to reduce data center costs.

'There's still alot of politics and dynamics, but the results validated what we were doing.'
Katherine Holland, director of U.S. Technology Services

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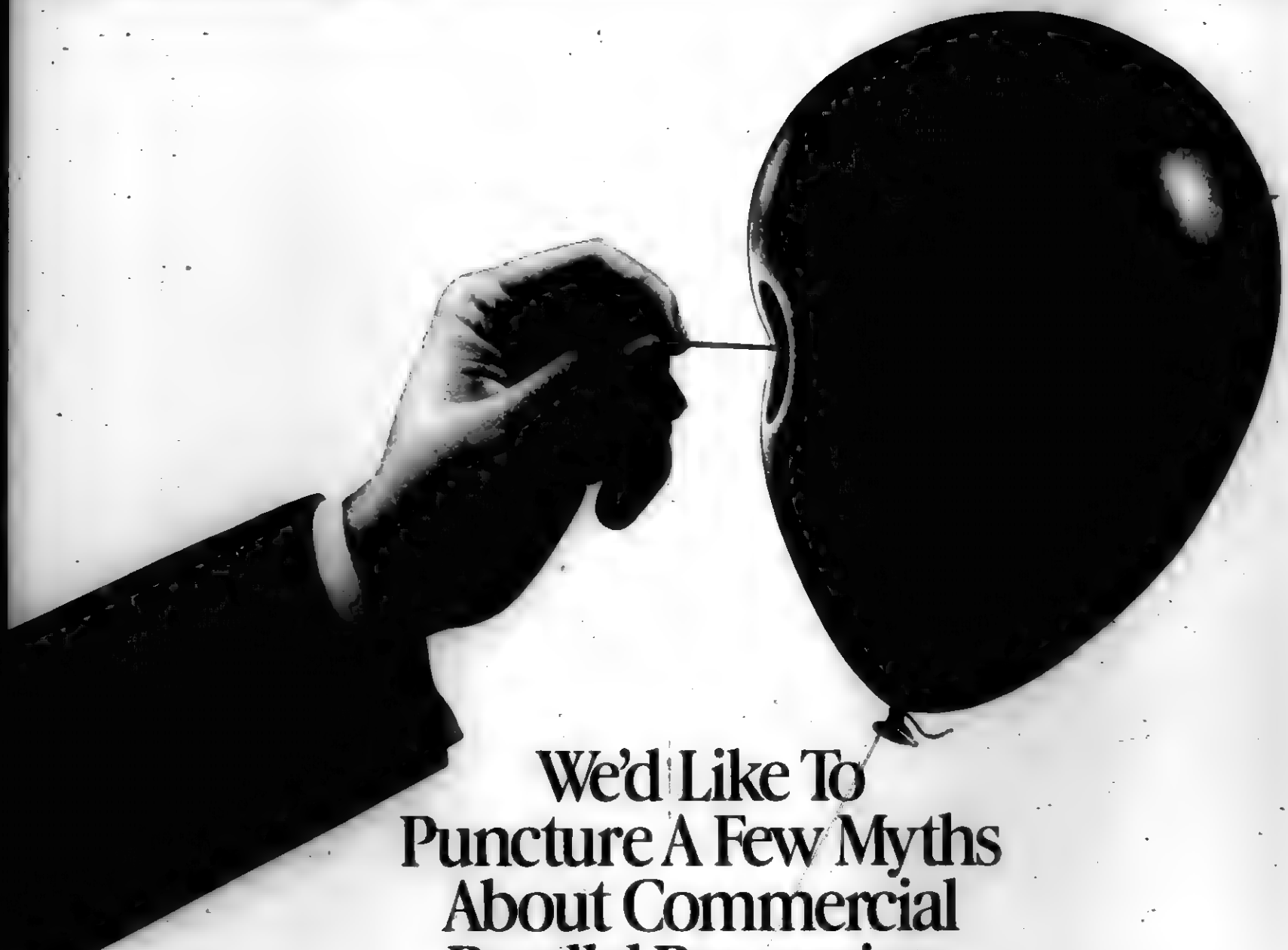

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American Express Co.

Imagine being handed responsibility for providing IS services to 700 people at the parent company of one of the world's largest financial services firms. Now imagine asking those people what they think of you and your IS team.

If just the *thought* of this makes you nervous, think how Alan Kornbluth felt when he actually *lived* this experience at American Express.

When he came on board two years ago, Kornbluth knew it would be important to determine how satisfied users had been with the former IS group. He figured a survey would help target his group's efforts to improve services.

So, aided by Mathews & Co., he initiated a series of user satisfaction surveys. The firm also employed a benchmark that compared Amex's results to those collected from other large companies.

All 700 data center clients were surveyed. The survey was administered to all departments, with extra lobbying by Kornbluth to get the opinions of key executives. Users rated accuracy, distribution, timeliness and quality of services such as report generation, as well as other key areas such as on-line availability, response time, system support, problem resolution and attitude. Some 30% of those polled responded.

> The survey showed top management that IS staffers were doing a good job in users' eyes.

Kornbluth says the survey met his goals and provided two other major benefits. The first, he says, was expected: showing top management that his staffers were doing a good job in the eyes of users and illustrating that they were operating on a "world-class" level compared with other companies.

The second benefit Kornbluth says he didn't expect: better IS staff "buy-in" for addressing user concerns.

The process started with IS completing the same survey as users. Kornbluth then presented user and IS survey results to his own staff. "The customers didn't care where the problem was, but they were seeing it as an IS problem, and IS wasn't seeing it that way," he says. Some differences were striking.

Avoiding finger-pointing

For example, data center staffers believed they were producing reports on time. But users didn't think they were getting the reports very quickly. The discrepancy prompted Kornbluth to investigate, and he discovered that the courier service that delivered the hard-copy reports to various buildings and offices was dropping the ball, but IS was getting blamed.

Rather than let the problem deteriorate into finger-pointing, Kornbluth used the example to underscore a key point: IS is responsible for user satisfaction during the whole process, not just its own piece.

There were other surprises. Users and IS, for example, also had very different views of average response times. Users were unhappy with the wait required for certain applications, but IS felt response times were acceptable and so did not make that concern a priority.

Another example was that although IS knew the PC support center was understaffed, the survey helped identify just how understaffed it was. By gauging the strength of user feelings on the issue, Kornbluth says, his staff was able to direct attention to the most critical areas.

"We have a lot of balls in the air, and we know how hard we're working," he says. "The survey is a good tool that lets you know the balls that get dropped."

Besides the concrete payoffs he's enjoyed, there are other, less tangible payoffs to surveying, Kornbluth adds.

Perhaps the most important, he says, is how the survey can help manage user expectations. "That's very important because the expectations are getting higher all the time," he concludes.

"If IS looks around and says, 'I did my job' and they have unhappy customers, then they haven't done their job," Kornbluth said.

USER SURVEYS that SATISFY

American Express

- **Goal:** To gauge satisfaction with previous IS group and better focus efforts to improve service.
- **What they did:** Surveyed 700 users with customized forms, then compared results with those of other large companies.
- **Payoff:** Was able to show company management that users were happy with 'world-class' IS group; better IS 'buy-in' in addressing user concerns.

Asking people to rate our services 'was like coming home from school again with your report card.'
Alan Kornbluth, vice president, IS group

Texas Instruments, Inc.

As useful as American Express' and SmithKline's satisfaction surveys were, they fell short in one important area: revealing key spots on which IS could focus to achieve the highest user satisfaction.

By and large, these other surveys confirmed what managers already knew: Users were less satisfied with weak IS services. In most cases, the only surprise was how the units compared with those at other companies.

To go one level deeper, Gary Pollard, director of quality for IS at Texas Instruments, uses an alternate survey approach to pinpoint where his organization can make the greatest improvements. The method was developed by Gordon S. Black Corp. after a variety of homegrown surveys failed to provide the information managers needed.

"We weren't making significant improvements," Pollard says. "The managers didn't have confidence in the results. We were seeing the gaps between users and IS areas, but we didn't know what caused the greatest dissatisfaction."

To avoid this focus on "gap analysis," Pollard distributed a survey to 22,000 users across TI worldwide. The 6,000 responses yielded quantifiable information about where IS should focus.

As expected, Pollard says, weaknesses in documentation and training became apparent. He continued: "But as an engineering company, our bias is to give users every bell and whistle we can think of. We didn't think we would have to work on functionality, but that's what the users wanted." In fact, increased application functionality was cited as the most important improvement users desired.

Next step: Teamwork

As a result of the survey, an IS "corrective action team" was assembled. This team met with each manager to find out what could be done to improve functionality. In many cases, users identified the main problem as missing functions. Others complained about poor ease of use. So IS management moved to have functionality-boosting projects pushed to the front of project backlogs.

Pollard notes that a big factor in the survey success was strong support from John White, chief executive officer of TI's information technology groups, and Chief Information Officer Ralph Szygenda, who heads IS. The teamwork doesn't end there: A human factors team from another TI division has been brought in to consult with IS to improve application usability.

"The use of a consultant and top management attention," Pollard says, "raised the credibility of the survey results and the importance of addressing user requests."

Good technique also helped. For starters, users were asked directly about their problems. Then analysts used a regression analysis that allowed problems and categories to be compared using an "impact index."

Despite the careful planning, Pollard says, there was still resistance. "Some managers felt we would be asking for lower ratings because we were telling users to look for problems. Others said it wasn't good public relations to tell users we know they've had problems with IS."

But ultimately, the proof was in the pudding: The direct approach method surfaced problems in areas in which IS felt it was strongest.

And that reality, Pollard says, helped some to come to the important realization that continual improvement, not a fixed view of the world, is the only way to make end users truly happy. •

USER SURVEYS that SATISFY

Texas Instruments

- **Goal:** To pinpoint highest payoff areas for IS improvement.
- **What they did:** Enlisted management support for custom poll of 22,000 worldwide users; aligned with human resources.
- **Payoff:** Identified better application functionality as top factor in user satisfaction; formed 'corrective action team.'

'[Opponents] said it wasn't good public relations to tell users we know they've had problems with IS.'
Gary Pollard, director of quality for IS

Feds take ride on outsourcing express

By Gary H. Anthes
WASHINGTON, D.C.

Like the private sector, federal government agencies have discovered the rewards and heartaches of outsourcing. But a recent study shows that the government has a different set of challenges and priorities when it seeks help in developing or operating information systems.

Professional staff shortages top the government's list of reasons to outsource, according to a report from the Information Technology Association of America (ITAA) in Arlington, Va., which in turn cited a survey of federal agencies by Input in Vienna, Va. Lowering IS costs, often cited in the private sector as the first reason to go outside, ranked No. 4 on Uncle Sam's list.

"In the private sector, the top three reasons for outsourcing are cost containment, cost containment and cost containment," said Susan McGarry, a vice president at The Yankee Group in Boston. A recent Yankee Group survey of companies that had outsourced listed "control of IS costs" as the No. 1 reason for outsourcing, followed by "to accomplish change" and "to get expertise."

Olga Grkavac, vice president of the systems integration division at ITAA, challenged surveys showing that commercial enterprises rank cost savings as the top reason for outsourcing. "Outsourcing is now done for strategic mission goals because cost-savings can be very temporary," she said. "We think outsourcing is now really more successful when done for strategic purposes."

Federal agencies do not have to cope with pressure from a profit-and-loss statement, but they have other challenges. According to the ITAA, hiring ceilings may force an agency to use its best talent on work otherwise more appropriate for less skilled staff. "By constantly back-filling for its technical talent requirements, the agency runs the risk of achieving slower . . . progress in more mission-critical areas," the association's Federal Systems Integration Committee wrote in its report.

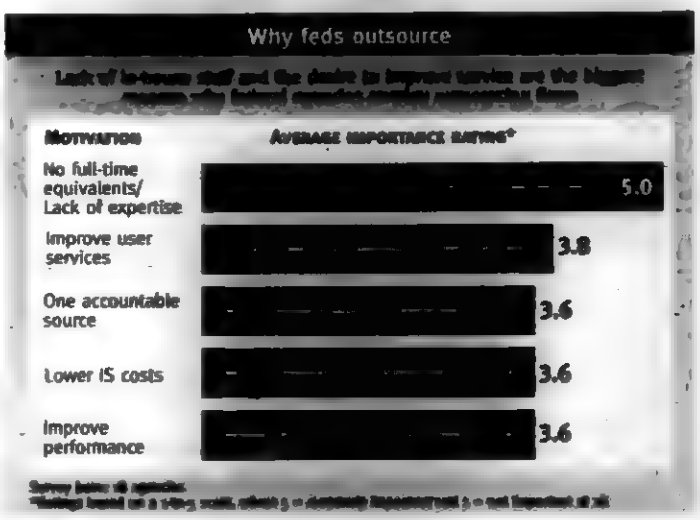
Bill Dvoranchik, president of the government services business unit at Electronic Data Systems Corp., said agencies are smart not to see outsourcing as primarily a way to cut costs. "When we have a government buyer who's buying low-bid [rather than best-value], they are focused on the wrong issues," he said.

At your service

Government managers are more concerned with offering the public better service, Dvoranchik explained. "In government, you won't lose your job if you overspend your budget; you can always roll that into next year's budget." He said outsourcing also appeals to the risk-averse federal IS manager who can take credit when it works but blame a contractor when it does not.

In the face of ever-shortening technology life cycles, protracted government procurements mean agencies risk buying outdated technology, Dvoranchik said. "By outsourcing, instead of saying you want to buy this or that box, you can say you want a desktop solution, and you can put the risk into the private sector."

Outsourcing is becoming more common in government, according to Grkavac. "It is more in keeping with government of the 1990s. The government is looking for better ways to deliver services, and it is focusing more on things that only government can do, just as commercial firms outsource those things that someone else can do better."



Source: Input

Other reasons

Also cited as reasons for outsourcing in the ITAA report:
- Improve organizational flexibility.
- Reduce development time.
- Enforce standards.
- Improve user control.

Executive Track

Former United Airlines information systems executive **J. Donald Karmazin** is the new vice president of IS at **The Chicago Board of Trade**.

Karmazin, who has headed United's IS department for the past 12 years and spearheaded the airline's strategic application of information technology, will be responsible for all trade board management information functions.

Robert K. Ramaden has been named senior vice president and chief information officer at Saks Fifth Avenue in New York. Ramaden, who formerly served as vice president of worldwide systems at Burger King Corp., will be the first person to hold the newly created position. His responsibilities include all of Saks Fifth Avenue's information systems and technical services.

Five new international officers will be in place at the **Association for Systems Managers (ASM)** as of June 1. Heading the 5,000-member Cleveland-based association as president will be **William D. Munch**, an IS consultant in Pleasant Hill, Calif. **Ross Flaherty**, Texas Wesleyan University's director of IS resources, will step into the role of president-elect. He is slated to assume the top spot on June 1, 1994. **Ann Purr**, manager of systems and information processing at LOMA in Atlanta is the ASM's new vice president.

The association's new treasurer and secretary, respectively, are **Martha Butler**, L. L. Bean, Inc.'s information technology planner, and **Michael Fisher**, manager at Indianapolis consultancy Technology Management, Inc.

Fleet Finance, Inc. in Atlanta recently created a vice president of systems support post and brought **Mark Roland** on board to fill it. Roland, who formerly served as vice president of operations at San Diego-based Security Pacific Financial Services Corp., oversees his new firm's on-line accounting systems and technical operations.

Charles W. Snodgrass is now serving as European business executive of **The Chase Manhattan Bank NA**'s global cash management division. A former **Electronic Data Systems Corp.** executive, Snodgrass heads a Chase operation responsible for all of the bank's cross-border cash and treasury management products, multicurrency clearing, payments and information services in Europe.

Calendar

MAY 30-JUNE 5

Usatech '93. Caracas, Venezuela, June 1-5 — Contact: International Exhibitions, Inc., Houston, Texas (713) 529-1480.

Joint Application Design User Conference. Hershey, Pa., June 2-4 — Contact: Anthony Crawford and Associates, Oakville, Ontario (416) 845-3844.

Transforming the Organization: Integrating Business, People and Information Technology. Wellesley, Mass., June 2-4 — Contact: Babson College, Wellesley, Mass. (617) 239-4354.

Annual Personal Communications and Computing Show. Chicago, June 3-6 — Contact: Electronic Industries Association, Washington, D.C. (202) 457-8762.

JUNE 6-JUNE 12

Equipment Resources Planning Institute. Albuquerque, N.M., June 7-8 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2997.

Xhibition '93. San Jose, Calif., June 7-11 — Contact: Ed Chuang, Integrated Computer Solutions, Inc., Cambridge, Mass. (617) 621-0060, Ext. 111.

Autodesk Expo '93. Anaheim, Calif., June 8-10 — Contact: AEC Systems, Inc., Newington, Conn. (203) 666-6097.

Successful Mainframe Downsizing in the Financial Industry. Chicago, June 8-10 — Contact: Uniforum Association, Santa Clara, Calif. (408) 986-8840.

First Government Help Desk and Computer Training Conference. Washington, D.C., June 8-11 — Contact: Ruder Finn, Inc., Cambridge, Mass. (617) 577-0007.

Retail Systems '93. Boston, June 9-11 — Contact: Candace Cutler, Retail Systems '93, Newton Highlands, Mass. (617) 527-4626.

Windows Programming Using C++. Boston, June 10-11 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-4200.

New England Systems Seminar. Waltham, Mass., June 11 — Contact: Merrill Davidson, New England Systems Seminar, Waltham, Mass. (617) 328-0724.

JUNE 13-JUNE 19

Seventh Natron Users Conference. Toronto, June 13-16 — Contact: Leslie Connell, Natron, Inc., Toronto, Canada (416) 636-8333.

The Outsourcing Conference. San Francisco, June 14-15 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Electronic Messaging '93. Atlanta, June 14-17 — Contact: Electronic Mail Association, Arlington, Va. (703) 875-8620.

International Teleconferencing Association (ITA) Conference '93. Washington, D.C., June 14-17 — Contact: ITA, Washington, D.C. (202) 833-2549.

They tell you they need imaging. You tell them they need Wang. Here's what happens next:

They say: "Wang is finished."

You say: "Guess again. They're putting a ton of money into their imaging group. They're shipping products. And the word is, there's a lot more coming."

They say: "Yeah—Proprietary platform stuff, right?"

You say: "Wrong. PC- and UNIX-based stuff. Windows. NetWare. *Open* stuff."

They say: "Well . . . So what? They can't image-enable *our* system, anyway. We've got multiple platforms, multiple languages, *all kinds* of networks . . ."

You say: "Wang can image-enable any environment. IBM. DEC. HP. UNIX. Windows. Anybody."

They say (after a pause): "No kidding?"

John L. Sullivan
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FIRST: We have more imaging solutions installed—and more experience—than any other vendor. Period.

SECOND: We have always been—and still are—the leader in the development of imaging solutions on multiple platforms, databases, and languages. Wang specializes in connecting imaging to the application. Nobody else does it as well. No matter what they tell you.

THIRD: We just shipped some incredible products. And we're getting ready to ship some more. What makes our new OPEN/image software so great is that it strengthens existing databases and applications. Seamlessly. So you don't have to discard existing hardware, replace software, or rewrite applications. That's the kind of technology that isn't going away. It's the kind of technology that revolutionizes industries. And revitalizes companies.

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   - 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Programming Management, Software Developers
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   CORPORATE MANAGEMENT
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   DEPARTMENTAL MANAGEMENT
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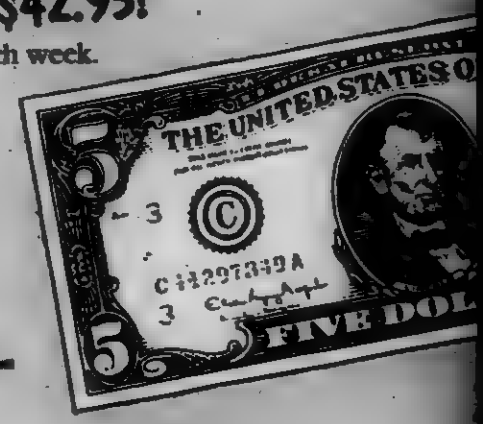

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   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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   CORPORATE MANAGEMENT
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Welcome to WARP SPEED

Technology is hurtling out of the chute almost too fast for us to absorb and, when compared to what's coming, this is slow. To cope, we will have to change our mental clocks, adapt to continual learning and rely more on users.

BY MICHAEL S. HOWARD

Technological change is no longer passing us by; it is crushing us.

In the "old days" of the 1980s and earlier, vendors delivered computer technology every three to five years. Today, we get significantly changed computer systems every 12 to 18 months.

By itself, such rapid delivery is a good thing. So what's the problem? The problem is that this accelerated pace changes everything about how we manage computer technology, staff and projects and how we interact with users. No longer can we view computer systems as a capital resource, like cars and heavy equipment, which we replace when they wear out.

Howard is president of Clove Consulting, Inc. in Cobleskill, N.Y. Previously, he taught computer science at the State University of New York.

Stretching the wardrobe

Forward-thinkers approach computer resources as if they were a wardrobe of clothing, adding and discarding new items constantly. They view the system as something that evolves, not as something to discard wholesale and replace.

When computer technology evolved at the slow rate of three to five years per generation, there were long periods of stability prior to upgrading to a new system. Because of the long cycles, we could manage computer installations as a series of discrete projects that did not overlap.

We would figure out what we needed and write that down. We would request bids from contractors and vendors and evaluate them. We would purchase equipment and schedule installation and training. We would run old and new systems in parallel for a while and then convert to the new system and train staff. Then we would settle down to run the system — with periodic upgrades — typically for five years or so.

Setting things up this way was OK because we would buy new equipment at the beginning of its life cycle, which lasted two or three generations. At any one time we would be blending in two generations, with the third waiting in the wings as a replacement. With approximately three years per generation, we had at least six to nine years before we had to convert to a new system. Everything remained fairly stable.

Even though we typically exhausted two to five years of those nine years on planning and installation activities, it was no big deal. After all, we still had plenty of time — four to six years — to get the most out of the system.

The capital equipment concept assumes that the useful life of the equipment significantly exceeds

Warp speed, *page 93*

MENTAL SHIFT

A whole new way of managing systems and staffs emerges when you switch from thinking of systems as capital equipment to thinking of them as evolutionary resources

Activity	Capital equipment model	Evolutionary model
Needs analysis	Periodic	Ongoing
Systems acquisition	Project-oriented	Continual change
Staffing	Periodic training	Ongoing education
Software conversion	Project-oriented	Ongoing/Piecemeal

The Results

Computerworld congratulates in the 1993 IS Brand on Local-Area Networks

Computerworld's IS Brand Preference Study on LOCAL-AREA NETWORKS

UPS

Best Technology	Best Power Technology
Best Price/Performance	American Power Conversion
Best Service/Support	Best Power Technology
Best Documentation	Best Power Technology
Prefer to Do Business With	American Power Conversion & Best Power Technology

PC Communications Software

Best Technology	Microsoft Corporation
Best Price/Performance	Datastorm Technology
Best Service/Support	Microsoft Corporation
Best Documentation	Microsoft Corporation
Prefer to Do Business With	Microsoft Corporation

Backup Hardware/Software

Best Technology	Exabyte
Best Price/Performance	Mountain Network Solutions
Best Service/Support	Mountain Network Solutions
Best Documentation	Mountain Network Solutions
Prefer to Do Business With	Mountain Network Solutions

RAID Storage Systems

Best Technology	Compaq
Best Price/Performance	Compaq & EMC Corp.
Best Service/Support	Hewlett-Packard
Best Documentation	Hewlett-Packard
Prefer to Do Business With	Hewlett-Packard

Electronic Mail/ Messaging Software

Best Technology	Lotus cc:Mail
Best Price/Performance	Lotus cc:Mail
Best Service/Support	IBM
Best Documentation	Lotus cc:Mail & WordPerfect Corp.
Prefer to Do Business With	IBM

Gateways

Best Technology	Novell
Best Price/Performance	Novell
Best Service/Support	Novell
Best Documentation	Novell
Prefer to Do Business With	Novell

Servers

Best Technology	Compaq
Best Price/Performance	Dell Computer
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Bridges/ Routers

Best Technology	Cisco Systems
Best Price/Performance	3Com
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Portable PC Network Adapters

Best Technology	Xircom
Best Price/Performance	Xircom
Best Service/Support	Xircom
Best Documentation	Xircom
Prefer to Do Business With	Xircom

Ethernet Adapters

Best Technology	3Com
Best Price/Performance	3Com
Best Service/Support	3Com
Best Documentation	3Com
Prefer to Do Business With	3Com

Token Ring Adapters

Best Technology	IBM
Best Price/Performance	3Com
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Intelligent Wiring Hubs

Best Technology	IBM
Best Price/Performance	Synoptics Comm.
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Network Analyzers

Best Technology	Novell
Best Price/Performance	Novell
Best Service/Support	Novell
Best Documentation	Novell
Prefer to Do Business With	Novell

Cabling Systems

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Terminal Emulation

Best Technology	IBM
Best Price/Performance	Novell
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

Groupware/Integrated Office Systems

Best Technology	Lotus Notes
Best Price/Performance	WordPerfect
Best Service/Support	WordPerfect
Best Documentation	WordPerfect
Prefer to Do Business With	WordPerfect

Client-Server Operating Systems/ PC LAN Operating Systems

Best Technology	Novell Netware 3.x
Best Price/Performance	Novell Netware 3.x
Best Service/Support	Novell Netware 3.x
Best Documentation	Novell Netware 3.x
Prefer to Do Business With	Novell Netware 3.x

Peer-to-Peer Operating Systems

Best Technology	Microsoft Windows for Workgroups
Best Price/Performance	Microsoft Windows for Workgroups
Best Service/Support	Microsoft Windows for Workgroups
Best Documentation	Microsoft Windows for Workgroups
Prefer to Do Business With	Microsoft Windows for Workgroups

Are In...

these top ranking companies Preference Studies and Wide-Area Networks.

IS Brand Preference Study on WIDE-AREA NETWORKS

Common Carriers

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Value-Added Carriers/Services

Best Technology	AT&T
Best Price/Performance	AT&T
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Satellite Carriers

Best Technology	AT&T Tridom
Best Price/Performance	AT&T Tridom
Best Service/Support	AT&T Tridom
Best Documentation	AT&T Tridom
Prefer to Do Business With	AT&T Tridom

V.32/V.32bis/V.42/ V.42bis Modems

Best Technology	Hayes Microcomputer
Best Price/Performance	Hayes Microcomputer
Best Service/Support	Hayes Microcomputer
Best Documentation	Hayes Microcomputer
Prefer to Do Business With	Hayes Microcomputer

Facsimile Machines

Best Technology	Canon USA
Best Price/Performance	Panasonic
Best Service/Support	AT&T
Best Documentation	Panasonic
Prefer to Do Business With	Canon USA

Facsimile Boards/ Gateways

Best Technology	Intel
Best Price/Performance	Hayes Microcomputer & Intel
Best Service/Support	Hayes Microcomputer
Best Documentation	Hayes Microcomputer
Prefer to Do Business With	Intel

T1/T3 Multiplexers

Best Technology	AT&T Paradyne
Best Price/Performance	AT&T Paradyne
Best Service/Support	AT&T Paradyne
Best Documentation	AT&T Paradyne
Prefer to Do Business With	AT&T Paradyne

Channel Extenders

Best Technology	IBM
Best Price/Performance	IBM
Best Service/Support	IBM
Best Documentation	IBM
Prefer to Do Business With	IBM

PBX Equipment

Best Technology	AT&T
Best Price/Performance	Northern Telecom
Best Service/Support	AT&T
Best Documentation	AT&T
Prefer to Do Business With	AT&T

Diagnostic/Test Equipment

Best Technology	Hewlett-Packard
Best Price/Performance	Hewlett-Packard
Best Service/Support	Hewlett-Packard
Best Documentation	Hewlett-Packard
Prefer to Do Business With	Hewlett-Packard

CSU/DSU

Best Technology	AT&T Paradyne
Best Price/Performance	AT&T Paradyne
Best Service/Support	AT&T Paradyne
Best Documentation	AT&T Paradyne
Prefer to Do Business With	AT&T Paradyne

Packet Switches

Best Technology	Motorola/Codex & Northern Telecom
Best Price/Performance	Motorola/Codex
Best Service/Support	Northern Telecom
Best Documentation	Telematics
Prefer to Do Business With	Motorola/Codex & Northern Telecom & Sprint International

The 1993 IS Brand Preference Studies on Local-Area Networks and Wide-Area Networks were conducted among Computerworld subscribers to determine which brands of products are preferred among information systems professionals.

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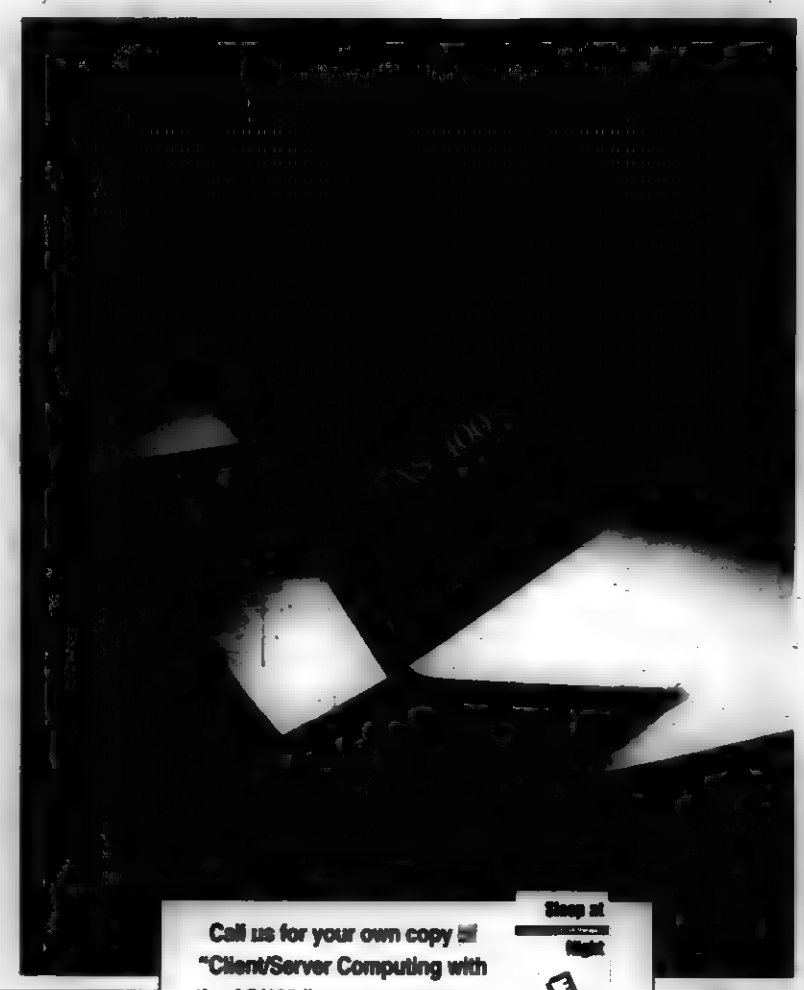

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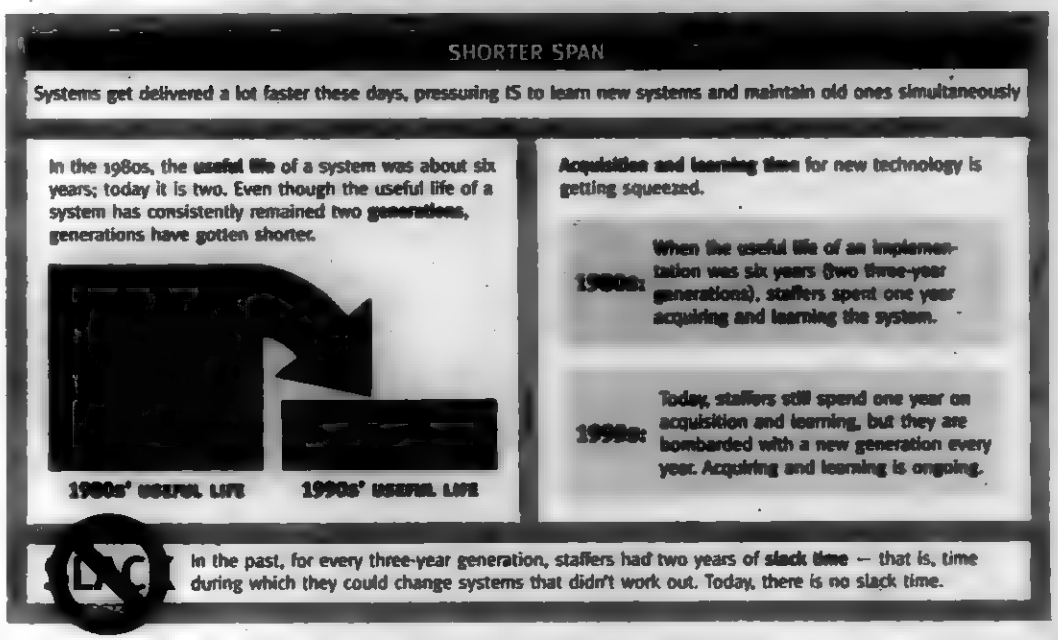
Continued from page 89

the time and cost to acquire it. Unfortunately, this is no longer true. Because a new generation of technology now appears every year or year and a half, most companies hold on to technology for only two or three years. Unfortunately, two or three years is the approximate time required to plan, budget, acquire, implement and learn a new system.

The time to acquire and learn a system has become comparable to the lifetime of one complete generation of technology.



Technology overlap

With technology's shortened useful life, information systems can't manage computer installations discretely anymore. Generations of technology overlap and blur together. Staffs are continually maintaining the current system while trying to replace it and learn a new one.

If we don't want to sink under the crushing weight of keeping up, we have to change our expectations for our computer installations. We have to break out of our outmoded way of thinking so we can manage systems and staff properly. The following beliefs are now sacrilege:

➧ **Users and IS don't mix.** Forget it. This may have been true in a stable computing environment, but it is not in a volatile one. Users have to become IS staffers' eyes and ears. They have to take on a greater role in system reliability.

The more sensitive users are to monitoring software reliability and reporting problems accurately to systems administration staff, the more time they can save technical staff. Every blind alley the technical staff goes down places the entire business in jeopardy.

➧ **We can hire someone who knows the system.** This is no longer possible. The system is too complex and changing too rapidly.

When a company kept its equipment for five to eight years, it didn't have to worry about education. Companies promoted the best one or two staff members to manager positions and replaced lower level staff along with the equipment. In this way, it saved on training costs while retaining the generalized knowledge of the previous generation of technology.

It won't be long before companies won't be able to buy trained staff. Bidding will be fierce for the few hired guns who are able to stay on the technological edge. That's because most of the already employed will be too busy keeping up on the job to study ahead.

We'll have to stop thinking of training as a luxury — something that is an easy first cut when money is short. Most importantly, the essence of training has to change. Training can't be about teaching a person to be competent to operate a machine or program. The objective is to help students become intellectually independent and skilled problem-solvers.

With the short life of equipment and associated software, not to mention the ease of use of modern graphical user interfaces, it may be cost-effective to hire self-training people.

➧ **Let the "Other Guy" work out the bugs.** When a generation of technology had three to five years of useful life, it made no sense to buy the latest untried technology. We could wait up to two years before committing. We can't do that anymore. We have to learn how to use and live with buggy technology.

➧ **Needs analysis lasts six months to two years.** We need to be able to put off needs analysis until it was time to upgrade the system. We knew it was time because the equipment was on the verge of being obsolete and users were complaining.

In today's evolutionary systems, with computer resources mutating in new directions very quickly, needs analysis is ongoing. Avant-garde IS groups will create a new job title for this all-consuming task.

➧ **Acquisition is handled by the RFP.** We know the request for proposals (RFP) ropes — prepare, advertise, get responses, review and score. We've all been involved in large, expensive, long-life acquisitions.

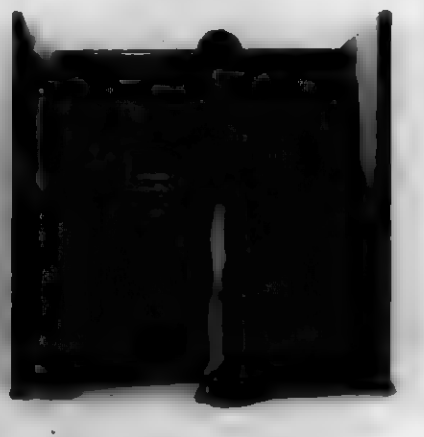
Throw all that out. Today, acquisitions need to be more like purchasing inventory for a department store.

Buyers establish long-term relationships with vendors, shop at trade shows and rely on their experience to get good deals, not on how well they handle the bid process.

The bid process will be reserved for decisions about long-life items only, however few there are. Even once-sacred cows — operating systems, CPU architecture and network protocols — are becoming commodity items as interoperability becomes possible.

"*#+@✸!"

"YESSS!"



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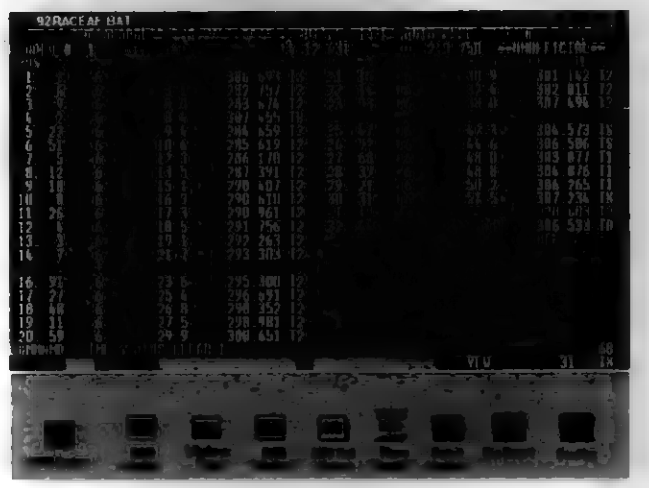

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In business since 1968, Computer Reserves, Inc. of Pine Brook, NJ, is the leading nationwide locator of computing services. According to President Don Seiden, the company acts as a broker of computer services, representing hundreds of data centers throughout the U.S. which have virtually every combination of hardware, software, and peripheral services to sell. Whether it's called remote computing, timesharing, or outsourcing, their mission is to help potential buyers locate data centers that best meet their exacting mainframe specifications in the areas of overflow, backup, disaster recovery, production, and software development.

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Computer Careers

Generalists find increased opportunity

By Candee Wilde

IS THE AGE OF the specialist over? Yes and no. There's still room for some folks with a depth of expertise in a narrow technology band, particularly in the PC realm, but for maximum employability, broader is better.

For example, The Dow Chemical Co. in Midland, Mich., is moving away from employing a programming specialist, an analysis specialist and a design specialist. Instead, explains Scott Brown, manager of global systems, Dow has combined the three posts. Brown describes the position as a "whole job."

The company is moving away from specialized programmers and analysts because it buys much of its software off the shelf. "We still write code, but we do analytic work as well," Brown says.

> **"We still have a use for specialists to provide reusable interfaces to the various technical platforms."**
>
> *—Dennis Margel, Pennsylvania Blue Shield*

Fred Catalayud, manager of application development services at the Community Health Care Plan in Wallingford, Conn., also sees the number of specialist positions shrinking and suggests that this reality should be reflected in academic training programs.

"Going through a very technical program at the undergraduate level is not enough now," Catalayud says. Information systems professionals need more education in understanding business basics: debits and credits, profits and losses and the functions used to run a particular business.

At Pennsylvania Blue Shield in Camp Hill, Pa., demand for people with language- and platform-specific knowledge is dwindling.

"We still have a use for specialists to provide reusable interfaces to the various technical platforms," says Dennis Margel, director of information technology. "But we want analysts and programmers to concentrate on the business we're in rather than the technology [the IS department] is associated with."

The health insurer is now concentrating on teaching IS staff members enough about the business so they can spot ways of enhancing it with more or better information. One way this is being done is through a series of seminars in which employees from different areas of the business, such as marketing, accounting and operations, make presentations to IS employees about what they do.

Business knowledge

"The goal is to increase the programmers' knowledge of that business function, the terminology and how it relates to other areas of the corporation," Margel explains. "Over a period of time attending seminars on different areas of the business, analysts and programmers get a broader and broader view of how the business operates and how different functions interrelate."

Specialized platform skills aren't all that relevant now, according to Margel. "The intent is that all code is platform-independent, so that whatever direction we choose, we should be in a position to make that move without too much effort." What is really important is having a knowledge of the business intimate enough to know where and how IS can make significant contributions, Margel explains.

At Piedmont Hospital in Atlanta, Cobol veterans such as programming manager Percy Williams are juggling old duties, such as maintaining the hospital's extensive database, with learning about PCs, PC application software and computer-aided software engineering tools.

Emphasis has clearly shifted away from mainframe pursuits to development of client/server systems.

But even these systems probably will not require the same level of ongoing specialized attention. The expectation is that users will be able to take over many of their own report creation chores once much of the critical information has been moved onto PC file servers.

Wilde is a free-lance writer in Easton, Conn.

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End-user support pros need networking know-how

career up

By Emily Leinfuss

End-user support is mostly about connections — network connections, that is. "The move toward distributed client/server computing implies the need for communications and integration. This means understanding how everything is connected," says Jerry Bryan, assistant director of user support at WVNET in West Virginia, an off-campus computing center supporting 16 state colleges.

Gary Stephens, manager of end-user computing at the Art Institute of Chicago, is a case in point. Stephens recently moved into his end-user support position from that of network manager. He says he believes those skills help him in his new job. "Networking is very marketable."

While Stephens' networking skills are self-taught, many companies offer employees computer-based training and the chance to attend seminars and classroom training to get them up to speed on local-area network management and unfamiliar technologies such as Novell, Inc.'s NetWare.

Stephens gets great satisfaction from resolving complex problems in innovative and cost-effective ways. For example, the company was recently investigating how it could get its PCs and Apple Computer, Inc. Macintoshes to communicate. Third-party solutions cost more than $10,000. "I found a solution in public domain software, which we had to configure from scratch, but it was a zero-cost solution," he explains.

Complex problems seem to be a given in end-user support.

Scott Henderson, PC hardware technician at the Massachusetts Bay Transit Authority (MBTA) in Boston, experienced a problem at the MBTA, which caused three days of crashing servers. He eventually isolated a virus on 16 different PCs and some servers. The virus had started from a nonauthorized disk.

End-user support career ladder

MANAGER OF END-USER COMPUTING
Responsible for strategic and technical planning for networks, PC integration with legacy systems and system design. Manages personnel.
SALARY RANGE: $50K TO $100K

SENIOR PC SUPPORT ANALYST
Responsible for ad hoc troubleshooting. Researches and evaluates products to solve user demands. Assists in network design and installation. Limited supervisory responsibility.
SALARY RANGE: $45K TO $60K

PC SUPPORT ANALYST
Fixes basic user problems but troubleshoots more complex problems involving LANs. Assists with network installation and maintenance.
SALARY RANGE: $30K TO $40K

ASSOCIATE PC SUPPORT ANALYST
Fixes user problems such as broken keyboards, hard disks and printers. Maintains hardware and software. Supports basic spreadsheet and word processing applications.
SALARY RANGE: $20K TO $29K

Jack of all trades

In smaller firms, the end-user support function is wrapped in with other responsibilities such as programming.

For example, at Kelly-Springfield Tire Co. in Cumberland, Md., the titles for end-user support personnel are programmer and systems analyst, says Rod Horning, manager of information technology and security.

Typically, advancement potential seems to fall either one of two ways: Move up through the ranks of end-user support into more and more senior positions, ending in a managerial role; or move back into information services, like Scott McCollum, manager of user support services at Sinclair Community College in Dayton, Ohio, is about to do.

McCollum started as a programmer at the college in 1983, moved into applications programming and, after 4½ years, stepped into his present position. During the past five years, his staff has grown from two to 18.

Burnout is a problem

But burnout has gotten the best of him. McCollum says he is tired of putting out fires and listening to users' problems. He is moving back into a technical role at the college.

Westinghouse's Sanchez: *Best foundation for the job is knowledge of DOS, Windows and Novell*

"If you don't care about helping people resolve problems, you can get fed up quickly. Even with that desire, you get to that point," he claims.

Gus Sanchez, a senior network PC specialist at Westinghouse Broadcasting Co. in Shelton, Conn., says most people stay in end-user support for four to five years before moving on to something else, although he has not yet reached that point.

Instead, he is challenged by the day-to-day variety. "The best foundation [for the job] is a good working knowledge of DOS, Windows and some concept of Novell," Sanchez says.

Sanchez's boss, Mark Zito, manager of end-user computing at Westinghouse, adds that a typical end-user support job would also require support of applications such as Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3.

Like many end-user support professionals, Zito says his real role at the company is serving as network manager for wide-area networks and LANs. While Zito's staff members are putting out fires, such as downed printers or servers or problems with the network shell, Zito's job entails strategic and technical planning.

Entry-level salaries for end-user support positions range from $20,000 to $40,000, and senior-level people earn $45,000 and up.

On the technical side, landing a job as an end-user support professional requires proficiency with PC operating systems, including DOS, IBM's Personal System/2 and Microsoft's Windows, most major applications software, PC hardware, plus whatever mainframe or minicomputer-based operating systems are used at a company.

Leinfuss is a free-lance writer based in Sarasota, Fla.

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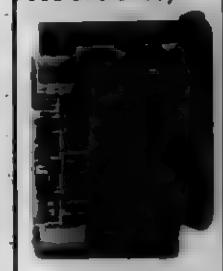

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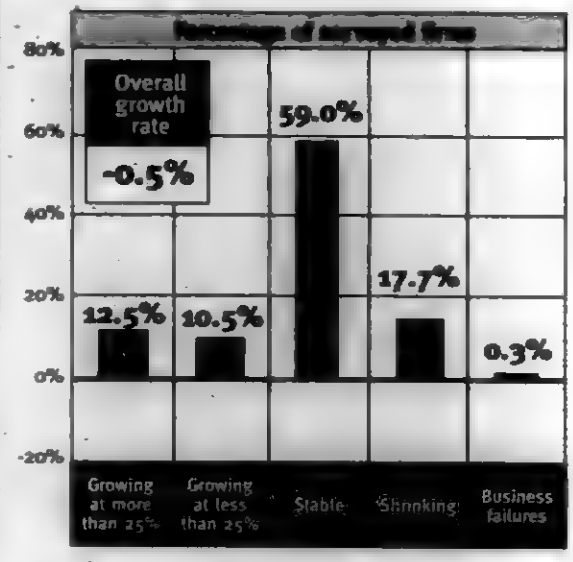

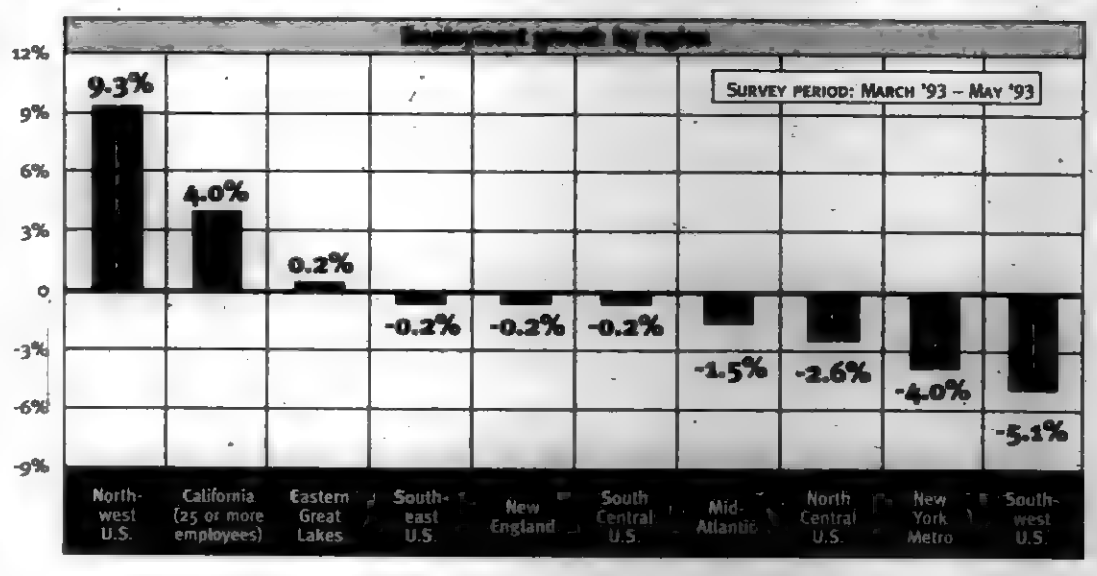

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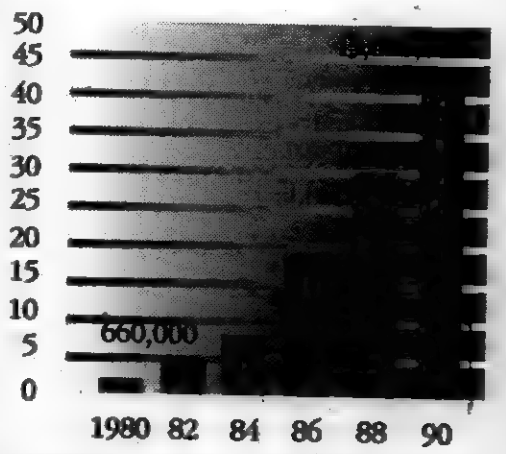

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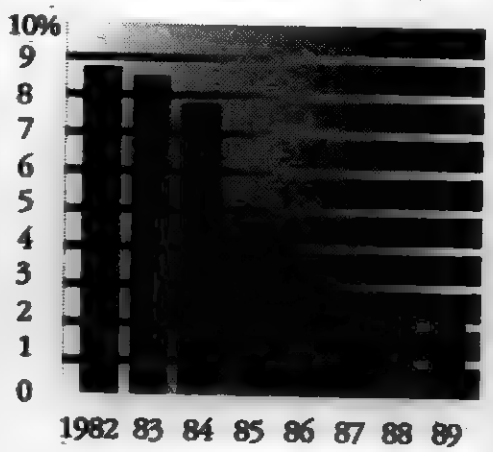

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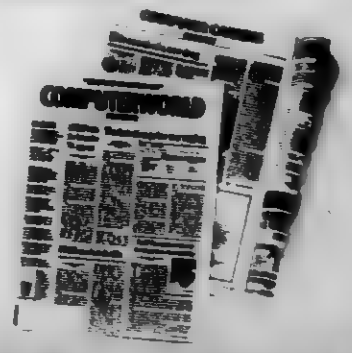

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How to add productive years to older PCs

By Todd Henschell

A lot of people have had to ditch their 80286- and 80386SX-based PCs to run Windows programs. Now, even DOS stalwarts are finding their applications too bloated to run on the older machines. Luckily, such sluggishness doesn't have to spell the end of your system. A few careful changes could buy you a few years and save you the cash to pay for the move to a graphical user interface operating system.

Which version of DOS are you using?

To buy some time, look at what DOS version you're using. If you're not already running it, you should upgrade to DOS 5.0, which can be purchased for as little as $30 a copy. Wholesale vendors are eager to move it off the shelves as DOS 6.0 becomes the standard.

Checked your disk cache?

If you're not using a disk cache, your system isn't running at top speed. Roughly 80% of the PCs I serviced in 1992 didn't have a cache.

Most 4-year-old or newer 286 systems were shipped with at least 1M byte of random-access memory. They were also sent out the factory door with sluggish Modified Frequency Modulation (MFM) hard drives. If your aging system has at least 1M byte of RAM, the 384K bytes of cache you gain using the high memory area (640K to 1,024K bytes) will help. On small files that fit within the cache size, expect a 10% to 25% improvement in disk access speed.

DOS 5.0 and 6.0 ship with Smartdrive. Although it's a fairly slow cache that is missing some important features such as keyboard control, it's better than no disk cache at all. The fastest cache I've run across is the $50 HyperDisk from Hyperware in San Francisco. On a system with DOS 5.0 or higher and at least a 286 processor, HyperDisk can usually load itself out of the lower 640K bytes, freeing more memory for your applications. Plainly described, it is *blazing fast*, consistently scoring high on cache benchmarks.

With a 2M-byte cache, expect fivefold improvement in disk response depending on the types of files you load during the day. If your PC has 2M bytes or more of RAM, allocate 1M byte to a disk cache and you'll see immediate improvement.

Compacted your hard disk lately?

Another glaring problem with a high percentage of older PCs is that the files on the hard disk have not been compacted since the machine was first installed. When it writes files, DOS makes no effort to keep the file in one chunk, which results in the spreading of data all over the hard disk surface.

A slow hard disk will have to jerk the read head across the platters to pick up pieces of the file you want to load. It's akin to getting dressed with your shoes in the basement, your tie on the roof, your pants in the backyard and your shirt in the kitchen. Not the speediest of methods.

A good disk compactor is Norton Speed Disk, which ships with Symantec Corp.'s Norton Utilities. Speed Disk can be instructed to put directories that rarely have new or changed files at the beginning of your hard disk.

That way, fragmentation happens mostly at the end of the disk. The next time you compact the drive, only the portion that's fragmented will need to be rewritten. Speed Disk will compact a moderately fragmented 40M-byte MFM drive in five to 30 minutes, depending on the speed of the CPU.

Counted your device drivers?

I'd like to mention something about the "minimalist" PC, a slow 286 or 386SX with less than 4M bytes of memory and an older hard disk. Look at the drivers and other devices that are only needed occasionally. Each device takes memory, and with most 286 machines, they often can't be loaded above the 640K-byte mark. This means applications will have to dip into the hard disk more often to get the data they need, or they might not load at all.

While it's tempting to install things such as fireworks screen savers, pop-up calculators and so on, resist the urge. The slower the hard disk in a low-memory situation, the more the system will feel bogged down.

Avoid undelete tracking utilities such as Datamon, which ships with Norton Utilities, or any of the safe delete programs. They force the disk to perform copy and delete operations for every file you delete. The target file gets copied to a hidden directory, and only then does the original get deleted. These utilities hog space, and you won't need them if you've backed up your system.

Equally demanding on the slower system are antivirus terminate-and-stay-resident (TSR) programs, which can triple the time it takes a program to load. If you want maximum speed, dump the undelete tracking software and check for viruses with an interactive program, not a TSR.

If you must load network drivers or other devices on a 286 PC, take a look at QRAM from Quarterdeck Office Systems in Santa Monica, Calif. With shadow RAM or certain chip sets such as Chips and Technologies, Inc.'s Neat and Leap units, QRAM allows the 286 to load drivers and TSRs above 640K bytes, keeping that precious 640K bytes clear.

Henschell is a free-lance writer based in Burbank, Calif.

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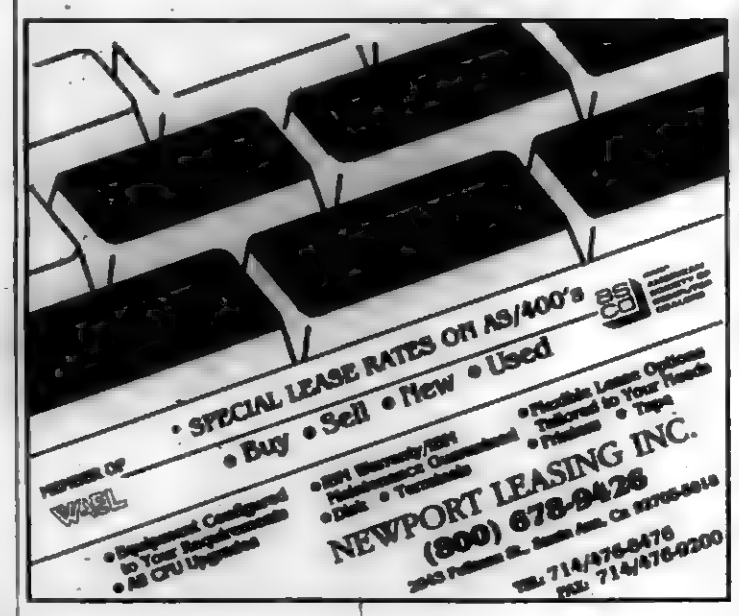

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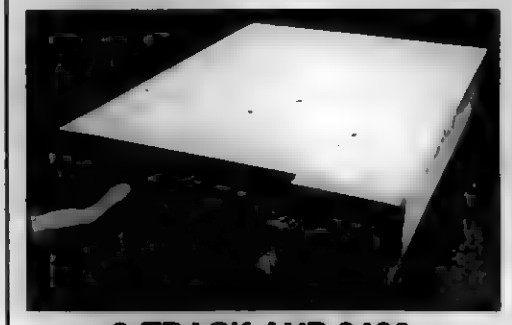

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Computervision Corp.	44.0	Knowledgeware Inc.	-21.8
Microcom Inc.	31.0	Epsilon Inc.	-17.4
Convex Computer	23.7	Wonderware	-13.5
Cypress Semiconductor Corp	23.3	Policy Management Sys.	-13.0
Advanced Logic Research	18.1	Brooktrout Technology	-12.8
Go Video	17.6	Exabyte Corp.	-12.5
Bachman Info. Systems	17.4	Stratacom Inc.	-11.7
Datatec Corp.	17.1	Progress Software Corp.	-11.4

Dollar

MAC Software Inc.	4.00	Policy Management Sys.	-5.75
Autodesk Inc.	3.50	Progress Software Corp.	-5.00
Storage Technology	2.75	Intel Corp	-3.88
Symantec Corp.	2.63	Matsushita Electronics	-3.88
Cypress Semiconductor Corp	2.38	DGS Systems Inc.	-3.00
Informix Corp.	2.38	Exabyte Corp.	-2.50
Ramtron Technologies Inc.	2.25	Kentek Information Inc.	-2.38
Atomic Systems Inc.	2.13	Harris Corp.	-2.25

Unplugged

Will wireless communications provide the next rags-to-riches opportunity on Wall Street?

Bridge and router stocks such as Cisco Systems, Inc. (CSCO) and Synoptics Communications, Inc. (SNPX) have provided the current wave of sudden wealth for shrewd stock-market investors. Some analysts and industry watchers said they believe that as the wireless communications market matures, it may provide a similar gold rush somewhere in the future.

A recent report by analyst Eric Zimits at Volpe, Welty & Co. projected a mobile data user base in excess of 13 million within the next 10 years.

Zimits noted heavy demand in recent years for numerous products and services that enhance mobile productivity, such as notebook computers, cellular phones and pagers. The companies that provide standards and products for connecting the mobile work force to corporate databases and electronic-mail networks should present a tremendous investment opportunity, he said. Zimits likened the situation to the PC scene several years ago, just prior to the boom in demand for local- and wide-area networking and internetworking equipment.

However, the confused current wireless picture provides few sure bets. Vendors and technologies are moving in numerous different directions (cellular, spread spectrum, radio frequency, laser and infrared, to name a few) and proposing various standards [CW, May 3].

"It's very complicated. Just in wireless LANs, companies are moving in three directions. And suddenly you're into Federal Communications Commission issues, bandwidth issues. It's like peeling back the layers of this onion, knowing very well there must be a market for this stuff somewhere," said James Wade, an analyst at Alex. Brown & Sons, Inc.

"There are going to be a lot of companies that jump out in front in terms of setting standards, and they're going to get a lot of arrows in their backs," Wade said.

Investors who want to dive in immediately will find few pure plays in the wireless area.

Wade nodded toward Motorola, Inc. (MOT) as the current technology leader. "They're definitely way out in front in terms of what they're doing in wireless," he said.

Zimits mentioned Intel Corp.'s (INTC) alliance with RAM Mobile Data and BellSouth Corp. to develop future mobile data products. Start-up General Magic, Inc. is backed by Motorola. Apple Computer, Inc. (APPL) and others in its attempt to build a communications-oriented operating system for portable computing. —*Derek Slater*

Exch	52-Week High	52-Week Low		May 14 '93 Close	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	37.63	9.63	3 COM Corp. (H)	35.63	1.38	4.0
NYS	80.25	61.38	American Info Techs Corp.	72.50	-2.13	-2.8
NYS	60.38	40.63	AT&T	54.75	-1.63	-2.9
OTC	3.56	0.75	Artel Communication Corp.	2.00	0.00	0.0
OTC	24.50	10.25	Banyan Systems Inc.	14.50	0.50	3.6
NYS	56.75	42.38	Bell Atlantic Corp.	52.50	0.25	0.5
NYS	57.50	46.75	Bellsouth Corp.	51.50	-0.13	-0.2
NYS	6.25	3.63	Bolt, Beranek & Newman	4.63	-0.13	-2.6
OTC	18.50	9.50	Brooktrout Technology	10.25	-1.50	-12.8
NYS	98.75	42.13	Cabletron Systems (H)	97.00	-1.50	-1.5
OTC	19.50	3.75	Centigram Communications	17.75	0.25	1.4
OTC	38.50	17.75	Chipcom Corp. (H)	37.25	0.75	2.1
OTC	50.25	20.00	Cisco Systems Inc. (H)	49.88	1.50	3.1
OTC	18.75	5.50	Compression Labs Inc.	10.38	-0.63	-5.7
OTC	34.00	11.00	CrossComm	30.00	-1.25	-4.0
OTC	4.63	0.88	Data Switch Corp.	3.50	0.13	3.7
NYS	22.13	12.38	Digital Comm. Assoc.	13.38	0.38	2.9
OTC	12.75	6.50	Digital Systems Int'l Inc. (L)	5.25	0.38	7.7
OTC	36.50	6.00	DSC Communications (H)	36.25	0.38	1.0
OTC	9.50	4.75	Fibronics Int'l Inc.	6.75	0.25	3.8
OTC	26.00	8.75	Filenet Corp.	10.38	-0.13	1.2
OTC	4.38	1.50	Gandalf Technologies Inc.	3.25	-0.13	-3.7
OTC	2.06	0.69	Gateway Communications	1.16	0.03	2.8
NYS	13.38	2.88	General Datacomm Inds. (H)	12.75	-0.13	-1.0
ASE	4.00	2.00	Go Video	2.50	0.38	17.6
NYS	37.75	30.63	GTE Corp.	35.25	-0.50	-1.4
NYS	84.25	62.50	ITT Corp.	81.13	-1.38	-1.7
OTC	49.25	29.88	MCI Communications Corp.	48.38	-0.25	-0.5
OTC	11.50	2.25	Microcom Inc	4.75	1.13	31.0
OTC	24.25	4.75	Netrix Corp.	5.50	-0.38	-6.4
OTC	19.00	8.75	Network Computing Devices	11.25	0.00	0.0
NYS	15.38	5.38	Network Equipment Tech.	7.75	0.13	1.6
OTC	23.25	8.00	Network General	9.75	1.13	13.0
OTC	15.75	8.50	Network Systems Corp. (L)	8.88	0.13	1.4
OTC	66.25	14.38	Newbridge Networks Corp. (H)	64.63	-0.63	1.0
NYS	46.00	30.50	Northern Telecom Ltd.	34.25	-1.88	-5.2
OTC	35.25	22.50	Novell Inc.	29.75	-1.50	-4.8
NYS	92.50	75.00	Nynex Corp.	82.88	-0.25	-0.3
OTC	30.00	14.50	Octel Communications Corp.	20.75	-2.25	-9.8
OTC	6.25	3.38	Penril Data Comm Networks	4.13	-0.06	-1.5
OTC	38.75	10.25	Picturetel Corp.	22.25	1.25	6.0
OTC	15.25	4.88	Proteon Inc.	4.88	-0.13	-2.5
NYS	30.38	11.50	Scientific Atlanta Inc.	27.50	1.50	5.8
NYS	81.50	59.38	Southwestern Bell Corp.	75.63	0.38	0.5
NYS	33.25	21.00	Sprint Corp.	30.00	1.00	3.2
OTC	27.00	10.50	Standard Microsystems Corp	15.63	0.00	0.0
OTC	18.50	6.88	Stratacom Inc.	11.38	-1.50	-11.7
OTC	130.50	25.75	Synoptics Communications (H)	115.63	-1.88	-1.6
OTC	7.00	4.13	Telebit Corp	4.50	-0.13	-2.7
OTC	9.38	2.13	Telematics Int'l Inc.	4.13	0.25	4.3
OTC	25.50	13.38	US Robotics	22.25	0.75	3.5
NYS	45.00	34.38	US West Inc.	41.25	-0.25	-0.6
OTC	50.00	12.00	Wellfleet Communications (H)	49.00	1.00	2.1
OTC	14.50	7.00	Xircom	10.50	-0.25	-2.3
PCS AND WORKSTATIONS						
OTC	7.25	2.50	Advanced Logic Research	3.25	0.50	18.2
OTC	65.25	41.50	Apple Computer Inc.	55.38	0.88	1.6
OTC	24.25	11.25	AST Research Inc.	14.50	-0.75	-4.9
NYS	12.50	3.50	Commodore Int'l (L)	4.38	0.63	16.7
NYS	58.50	23.13	Compaq Computer Corp.	51.38	0.88	1.7
OTC	49.88	15.00	Dell Computer Corp.	31.25	-0.88	-2.7
NYS	79.88	50.25	Hewlett Packard Co.	78.75	-0.25	-0.3
NYS	35.38	16.13	Silicon Graphics	34.13	0.38	1.1
OTC	61.00	22.50	Sun Microsystems Inc.	25.88	-0.75	-2.8
NYS	32.13	22.25	Tandy Corp.	29.63	0.63	2.1
OTC	11.00	2.75	Zeos International Ltd.	4.00	-0.06	-1.6
LARGE SYSTEMS						
ASE	18.38	4.63	Amdahl Corp. (L)	5.25	0.25	5.0
NYS	9.75	4.25	Convex Computer	5.88	1.13	23.7
OTC	6.13	1.88	Cray Computer	2.88	0.13	4.5
NYS	32.88	19.00	Cray Research Inc.	29.38	0.13	0.4
NYS	13.88	7.13	Data General Corp.	9.75	0.25	2.6
NYS	49.25	30.38	Digital Equipment Corp.	46.63	0.75	1.6
NYS	38.63	26.63	Harris Corp.	35.50	2.25	6.8
NYS	100.38	45.88	IBM	47.88	-0.13	-0.3
OTC	22.00	5.50	Kendall Square Research	15.00	1.00	6.3
NYS	127.50	83.00	Matsushita Electronics	120.13	-3.88	-3.1
OTC	23.75	8.25	Netframe	17.00	0.38	2.3
OTC	15.50	9.25	Parallan Computer (H)	15.50	2.00	14.8
OTC	17.00	6.00	Pyramid Technology	16.75	1.63	10.7
OTC	24.00	11.13	Sequent Computer Sys.	20.00	-1.75	-8.0
OTC	16.75	1.38	Sequoia Systems Inc.	2.34	-0.16	-6.2
NYS	48.38	29.50	Stratus Computer Inc.	34.25	-0.25	-0.7
NYS	16.88	9.88	Tandem Computers Inc.	12.50	1.63	14.9
OTC	19.00	10.63	TeleCard Systems (H)	16.75	-0.75	-4.3
NYS	13.88	7.75	Unisys Corp.	12.00	0.13	1.1
SOFTWARE						
OTC	63.50	25.25	Adobe Systems Inc.	61.13	2.13	3.6
OTC	21.00	10.25	Alous Corp.	16.50	-0.75	-4.9
OTC	14.25	5.50	American Software Inc. (L)	6.75	0.88	14.9
OTC	28.13	9.75	Ase Computer Systems	12.25	0.13	1.0
OTC	56.50	30.75	Autodesk Inc.	48.75	3.50	7.7
OTC	13.00	2.50	Bachman Info. Systems	3.38	0.50	17.4
OTC	43.00	34.75	BGS Systems Inc.	35.00	-3.00	-7.9
OTC	84.13	37.25	BMC Software Inc.	55.50	4.00	7.8
OTC	28.25	17.00	Boole & Babbage	21.25	-1.50	-6.6
OTC	54.50	17.50	Borland Int'l Inc.	26.00	-0.13	-0.5
OTC	6.50	3.00	CE Software	3.88	0.25	6.1
ASE	28.25	6.25	Cheyenne Software Inc. (H)	27.00	-0.25	-0.9
OTC	19.50	8.25	ChipSoft	9.75	0.75	7.1
OTC	9.75	5.63	Cognos Inc.	6.25	0.00	0.0
NYS	27.38	10.88	Computer Associates	26.38	0.38	1.4
NYS	12.38	2.75	Computervision Corp.	4.50	1.38	44.0
OTC	34.25	19.25	Compuware Corp.	27.00	0.25	0.9
OTC	14.75	5.75	Comshare Inc.	7.25	0.50	7.4
OTC	17.25	10.75	Corel Corp.	14.75	0.50	3.5
OTC	29.25	6.00	Easel Corp.	6.13	0.88	13.5
OTC	25.25	17.00	4th Dimension	20.25	1.00	5.2
OTC	20.00	6.00	Frame Technology	7.75	0.63	8.8
OTC	20.75	10.00	Group I Software	10.00	0.50	4.9
OTC	35.25	18.50	Gupta	18.50	-1.75	-8.6
OTC	8.75	1.50	Hogan Systems Inc.	7.63	0.25	3.4
OTC	25.75	11.25	IMRS	13.25	1.25	8.6
OTC	34.75	18.50	Information Resources	32.50	0.00	0.0
OTC	42.25	12.13	Informix Corp.	42.25	2.38	6.0
OTC	17.00	9.50	Intergraph Corp.	10.00	-0.63	-5.9
OTC	13.63	6.88	Interleaf Inc.	8.63	-0.13	-1.4
OTC	18.00	6.75	Intersolv Inc.	8.13	-0.13	-1.5
OTC	16.00	8.25	Knowledgeware Inc.	8.50	-2.38	-21.8
OTC	54.75	26.00	Lotus Development Corp.	28.25	2.50	8.1
OTC	32.75	14.75	Lotus Development (H)	30.50	-2.13	-6.5
OTC	23.00	7.75	MathSoft	10.75	-1.00	-8.5
OTC	23.25	5.25	McAfee Associates	6.75	-0.13	-1.8
OTC	11.63	1.88	Meca Software	11.13	-0.13	-1.1
OTC	15.00	5.25	Mentor Graphics	9.63	0.13	1.3
OTC	46.00	27.25	Micro Focus	33.75	-1.63	-4.6
OTC	19.00	4.38	Micrografx Inc.	5.75	0.50	9.5
OTC	95.00	65.50	Microsoft Corp.	85.13	-1.50	-1.7
OTC	40.25	14.00	Oracle Corp. (H)	38.50	1.00	2.5
OTC	31.88	15.38	Parametric Technology	29.13	1.13	3.7
OTC	40.50	22.50	Peoplesoft	30.50	1.50	5.2
OTC	9.50	3.50	Phoenix Technologies	5.00	-0.25	-4.8
OTC	40.00	25.38	Powersoft	28.25	-1.25	-4.2
OTC	41.50	17.00	Platinum Software	21.25	-0.50	-2.3
OTC	25.00	11.25	Platinum Technology	15.75	1.25	8.6
OTC	61.50	29.00	Progress Software Corp.	19.00	-9.00	-11.4
OTC	15.50	2.94	Quarterdeck Office Sys.	3.19	0.00	0.0
OTC	24.50	11.75	Rainbow Technologies Inc.	22.25	2.25	11.3
OTC	15.75	6.00	Rasterops	7.06	-0.31	-4.2
OTC	15.25	3.63	Ross Systems	12.25	0.75	6.5
OTC	27.25	8.50	Sapiens Intl. Corp. N.V.	21.75	-0.75	-3.3
OTC	15.00	6.75	Software Publishing Corp.	7.88	0.00	0.0
OTC	9.75	2.00	Software Toolworks Inc. (H)	9.00	0.50	5.9
OTC	6.50	0.75	Spinnaker Software	1.56	0.00	0.0
OTC	12.75	3.25	State of the Art	9.25	0.75	8.8
NYS	24.63	13.75	Structured Software Inc.	19.25	-0.75	3.8
OTC	18.25	8.00	Struct. Dynamics Research	17.50	1.00	6.1
OTC	65.50	31.00	9Wave Inc. (H)	63.25	-0.50	-0.8
OTC	44.25	5.88	Symantec Corp.	18.00	2.63	17.1
NYS	12.50	5.25	Systems Center Inc	10.00	0.50	4.8
OTC	35.50	10.00	System Software Assoc.	14.50	1.00	7.4
OTC	7.00	2.50	Trimlic Corp	1.50	-0.13	3.4
OTC	22.75	9.13	ViewLogic Systems	15.00	-1.50	-9.1
OTC	23.50	6.75	Walker Interactive Systems	7.50	-0.75	-9.1
OTC	3.19	1.38	Wordstar	2.00	-0.31	-13.5
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices	28.50	0.50	1.7
NYS	21.38	9.00	Analog Devices Inc.	17.88	-1.50	-7.7
OTC	23.25	7.63	Atmel Corp. (H)	22.63	0.00	0.0
OTC	9.38	2.75	Chips and Technologies	3.38	0.25	8.0
OTC	39.75	13.00	Cirrus Logic	16.50	-0.13	-0.8
NYS	12.63	7.38	Cypress Semiconductor Corp	12.63	2.38	23.2
NYS	16.13	8.00	Dallas Semiconductor	14.63	0.63	4.5
OTC	121.25	46.50	Intel Corp.	98.00	-1.88	1.8
NYS	14.13	6.88	LSI Logic Corp.	11.75	-0.25	2.1
NYS	33.25	13.75	Lattice Semiconductor	20.25	-0.50	-1.9
NYS	28.50	13.13	Micron Technology	24.25	-1.25	-1.0
NYS	78.00	37.13	Motorola Inc. (H)	74.63	-1.88	-2.5
NYS	15.00	8.50	National Semiconductor (H)	14.00	-0.50	-3.4
OTC	18.00	6.50	Sierra Semiconductor	8.00	0.50	6.7
OTC	38.50	22.25	SynOptics	35.75	-0.75	-2.1
NYS	65.00	32.25	Texas Instruments (H)	61.88	0.38	0.6
OTC	8.88	6.00	VLSI Technology	7.75	0.75	10.7
OTC	7.88	2.13	Weitek (H)	7.38	0.63	9.3
ASE	9.63	4.13	Western Digital Corp.	5.13	-0.13	-2.6
OTC	37.50	14.50	Xilinx	34.25	-0.63	-1.8
OTC	27.84	12.50	Zilog Inc.	26.25	0.75	2.8
PERIPHERALS AND SUBSYSTEMS						
OTC	33.75	11.75	American Power Conversion	31.25	1.75	5.6
OTC	20.16	13.66	Banctec Inc.	18.25	0.75	4.9
OTC	18.00	6.25	Cambex Corp.	6.50	0.00	0.0
ASE	10.38	6.50	Cognitronics Corp.	7.13	-0.25	-3.4
NYS	25.50	12.00	Conner Peripherals	12.50	0.00	0.0
OTC	38.50	10.75	Creative Technologies Inc.	29.00	0.38	1.3
OTC	30.75	18.25	Data Race Inc.	22.00	0.00	0.0
ASE	17.00	6.75	Databam Corp.	11.13	1.63	17.1
NYS	33.88	9.50	EMC Corp. (H)	33.25	0.25	0.7
OTC	10.50	5.38	Emulex Corp.	7.25	0.75	11.5
OTC	19.00	13.25	Evans & Sutherland	16.88	0.25	1.5
OTC	33.63	12.00	Exabyte	13.75	0.38	2.7
OTC	26.00	7.09	Intelligent Info. Systems	21.75	1.25	5.4
OTC	8.88	3.88	Iomega Corp.	5.00	0.38	8.1
OTC	21.75	5.75	IPL Systems Inc.	8.00	1.00	11.1
OTC	24.00	10.75	Komag Inc.	20.50	1.75	6.5
OTC	19.63	5.88	Maxtor Corp.	7.00	0.38	5.7
OTC	11.25	5.75	Micropolis Corp	7.75	0.25	3.3
NYS	116.00	93.00	3M Corp	113.88	0.00	0.0
OTC	7.75	6.00	Printronix Inc.	6.50	0.38	5.5
NYS	17.25	6.88	QMS Inc.	14.75	0.38	2.5
OTC	17.88	11.63	Quantum Corp.	13.88	0.00	0.0
OTC	12.75	3.38	Radius Inc	3.88	-0.13	-3.1
NYS	16.25	7.50	Recognition Equipment	13.50	-0.50	-3.6
OTC	13.88	4.50	Reuon Inc.	4.75	-1.00	-17.4
OTC	22.38	12.00	Seagate Technology	15.88	0.38	2.4
NYS	39.13	28.00	Storage Technologies	39.13	2.75	7.6
NYS	27.88	16.88	Tektronix Inc.	26.25	0.25	0.9
NYS	88.88	66.75	Xerox Corp.	75.63	1.13	1.5
SERVICES						
OTC	21.75	14.25	American Mgmt. Systems	19.50	0.25	1.3
NYS	4.75	2.88	Arbitron Inc. (L)	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	25.75	0.50	1.9
NYS	50.13	38.75	Auto Data Processing	49.00	0.50	1.0
NYS	17.25	9.84	Ceridian Corp.	14.75	0.25	1.7
NYS	17.38	13.13	Comdisco Inc.	14.38	0.75	5.0
OTC	8.25	4.50	Computer Horizons (H)	7.25	-0.50	-6.5
NYS	80.50	57.00	Computer Sciences	71.88	-0.50	-0.7
NYS	9.38	6.63	Computer Task Group	6.63	-0.63	-8.6
NYS	40.50	33.00	CompUSA Inc	38.88	0.38	1.0
OTC	16.00	6.00	Corporate Software	12.00	0.00	0.0
OTC	23.75	7.38	Egghead Discount Software	9.25	0.00	0.0
NYS	35.88	25.25	General Motors E (EDS)	30.00	1.38	4.4
OTC	25.50	9.25	Inacom Corp.	18.50	0.63	3.5
OTC	15.38	6.25	Intelligent Electronics	13.25	1.63	10.9
OTC	13.63	6.63	Medisys	12.00	1.00	9.1
OTC	14.75	5.75	Microage Inc.	12.75	-0.63	-4.7
OTC	43.00	21.75	Paychex	36.25	-1.75	-4.6
NYS	87.75	37.00	Policy Management Sys.	39.25	6.75	17.8
NYS	38.00	16.81	Reynolds and Reynolds (H)	33.63	-2.25	-5.9
OTC	32.75	22.00	SEI Corp (H)	31.50	-0.50	-1.6
OTC	24.38	16.88	Shared Medical Systems	20.75	0.63	3.1
OTC	13.88	5.75	SHL Systemhouse	11.25	-0.50	-4.3
OTC	29.25	18.25	Software Spectrum Inc.	26.75	0.25	0.9
OTC	33.75	22.25	Sunbard Data Systems	29.25	0.25	0.9
NYS	4.00	1.13	Ultimate Corp.	3.75	0.50	15.4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Loss posted

KnowledgeWare, Inc. last week reported a fiscal third-quarter loss of $30 million attributed to charges related to layoffs and the acquisition of Mateeya Corp. and Ernst & Young's European distribution centers. Sales slipped 5% — from $27.2 million to $25.8 million — compared with third-quarter 1992. The Atlanta developer recently laid off 99 of about 800 employees.

Trinzic ekes out profit

Trinzic Corp. posted fiscal fourth-quarter earnings of $143,000, after accounting for a $1 million restructuring charge. Trinzic, which was formed via the merger of Aion Corp. and AI Corp., lost $1.1 million in the like period last year. Fourth-quarter sales were off slightly to $11.1 million. For the year, the Palo Alto, Calif., firm lost $8.9 million on revenue of $41.3 million. Last year, the combined companies lost $11.7 million on revenue of $39.7 million.

Poison pill zapped

Ceridian Corp. stockholders voted to eliminate the firm's shareholders rights plan. Such plans are also known as poison pills and can help a company's board of directors determine whether an unsolicited takeover offer is in the best interests of a company or its shareholders. These plans make unsolicited bids costly for a potential buyer and strengthen the board's negotiating position.

SHORT TAKES 21CenNet, Inc. in Richardson, Texas, has received $5 million in venture financing from InterWest Partners, Sevin Rosen Funds and Compaq Computer Corp. to develop technologies to enable portable computers to access corporate information systems via wireless and wired media.

Progress strategy paying off

Firm eschews database engines, focuses on application development tools

By Derek Slater
BEDFORD, MASS.

When the little guy takes on the big guys, it is wise to try an end run rather than go straight through the line of scrimmage.

That is the tactic Progress Software Corp. is employing in its battle against massive Oracle Corp. and other big players in the "open" database management system market.

Although Progress sells a complete relational DBMS, the company is focusing on the application development tools market. The strategy makes sense given that Progress is ranked a distant fifth in the $1.2 billion Unix DBMS market with a 4% share, according to International Data Corp. (IDC).

Joseph Alsop: *'We actually generate cash as we grow, which is pretty unusual'*

"Compared to Oracle, we tend to focus more on selling to the individual lines of business within a big company," explained Joseph Alsop, president and co-founder of Progress Software. According to Alsop, individual departments tend to require more customized applications. While central accounting at a big conglomerate may purchase Oracle Financials, Alsop said, the arms of the company may each require customized applications that Progress relies on.

Applications written with Progress tools can run on top of an Oracle database as well as over the Progress engine.

Healthy growth

If growth is any measure, then Progress' strategy is succeeding. For the first fiscal quarter of 1993, the company tallied a 35% revenue gain to $25 million, with net income up 55% to $3.8 million. The firm has maintained a 15% profit margin for the past two fiscal years.

Recently, though, investors on Wall Street have shown some concerns about Progress Software. The company's share price eroded from a 52-week high of 61 to a value in the mid-30s earlier this month. Christopher Mortenson, a software analyst at Alex. Brown & Sons, Inc., said the drop-off likely stemmed from delays in the delivery of the next generation of Progress products. Version 7 of Progress was originally announced for late 1992 delivery; it is now due in the third quarter of this year.

Progress shares rebounded to the mid-40s last week, and Mortenson said he expects continued improvement. "I don't think it damages them in the long term, or even in the short term, except for their credibility," Mortenson said, refering to the product delays. Progress has a solid cash base and is positioned to support continued growth, which Alsop attributed to an extremely conservative management policy.

"If anything, we actually generate cash as we grow, which is pretty unusual," Alsop said.

More than two-thirds of Progress' revenue stems from its Unix products, though the company recently raised the curtain on a native version for the IBM Application System/400. The company depends heavily on a network of more than 2,000 resellers that build custom applications with Progress tools; roughly 60% of the company's revenue comes from that channel.

Clarence Johnson, director of information services at Herndon, Va.-based air transportation company WorldCorp., said the company relied heavily on reseller-supplied Progress applications when it began a transition from mainframes to a Unix-based client/server architecture.

"Today, though, our programmers are handling everything in-house, and they're delighted with it," Johnson said, noting that the company's longtime Cobol programmers had relatively little difficulty moving to the Progress fourth-generation language.

New challenges lay ahead; the RDBMS heavyweights are unlikely to leave Progress Software's niche undisturbed. Oracle's recently announced Cooperative Development Environment products indicate renewed attention to developers.

The advantage of Progress' tools lies not in advanced features but in tight integration with the database, noted Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "What they have is a reasonable 4GL that works well with their engine and is easy to use," Finkelstein said. "As far as tool features and capabilities, they are in the middle of the pack."

Tools may not be enough to sustain growth, analysts said. Progress lags behind Oracle and Sybase, Inc. in offering leading-edge RDBMS features such as stored procedures and referential integrity, Finklestein said. Such features are one way vendors can differentiate themselves, he said. Progress may choose to emphasize tools, but that does not mean engine technology is irrelevant, he noted.

"It's very expensive to compete with Oracle, and I don't even think [Progress] management is interested in getting into the technology race" at the engine level, Finkelstein said. Progress Software bumped up its research and development spending last year from 12% of total revenue in 1991 to 15% in 1992. However, a significant portion of the additional expense went toward the release of the AS/400 version of Progess, not the development of advanced engine features.

Alsop said the company will not be distracted from its tools orientation. "We plan to focus on speeding up the development process. The competitive landscape is tilted more in our favor than ever," Alsop said.

Source: Progress Software Corp. CW Chart: Nancy Kowal

Portability key

Progress touts portability of its applications as one of its strengths. An application developed under DOS can be moved to Windows, VMS, Unix or CTOS and deployed as a Novell, Inc. NetWare Loadable Module — all without rewriting any code. Progress also supports IBM's OS/2 and OS/400 operating systems. Applications written with Progress tools can run on top of Oracle and DEC Rdb databases as well as RMS file structures.

Revenue up

Progress' Unix revenue grew 46% in 1992, keeping pace with the overall 47% expansion of the Unix RDBMS market, according to IDC. Among the Top 10 vendors, only Informix Corp. and Sybase, Inc. grew faster than Progress. Sybase's 1992 Unix revenue jumped 91%, to $480 million. Oracle remains the front-runner with $901 million in Unix revenue, up 40% from the previous year. IDC says Oracle's share of the total Unix RDBMS market at more than 44%.

Wysiwyg

ACHY BREAKY FEET
At last fall's Comdex, Marisa Verson (left) and Cathy Brooks of S&S Public Relations, Inc. in San Francisco covered the 9 1/2 miles of convention floor with roller-blades. What's up for this year? Look for the pair at Comdex/Spring '93 flying by on "snake boards," a souped-up version of the skateboard.

From our reader files:

Eek! A user was complaining that a newly set up PC and menu system weren't working. The user was unable to select choices with the mouse and had no control over the cursor position, other than moving it slightly. After diagnostics and checking setup files and the PC connection, I asked a seemingly obvious question: "Is the mouse on a flat surface?" "Why no," the user replied, "I am waving it in the air."

— Steve Knechtly, Systems Administrator, Cincinnati Belting and Transmission Co.

OVERHEARD

at a recent KnowledgeWare user group show:

DOS Perot — You boot it up and a message appears saying, "I'm THINKING about running."

GREAT BOOK NAMES

THE JOY OF X:
AN OVERVIEW OF THE X WINDOW SYSTEM
By Niall Mansfield
(Addison-Wesley, 1993)

HAVE ANY ODD STORIES ABOUT YOUR BOSS? WE WANT TO KNOW ABOUT THEM. CALL LORY ZOTTOLA DIX AT (800) 343-6474 EXT. 236 OR FAX TO (508) 875-8931.

The Fifth Wave *by* Rich Tennant

"I'm waiting for my AUTOEXEC file to run, so I'm gonna grab a cup of coffee, maybe make a sandwich, check the sports page, regrind the brake drums on my truck, balance my checkbook for the past 12 years, learn Swahili...."

Inside Lines

Summertime blues?
Microsoft has been feeding off rumors that Windows NT will arrive later than its announced end-of-June time frame. Some analysts and users said NT could be as late as Labor Day. But at least one analyst said Microsoft may have one force on its side of the fence pushing hard to get NT out on time — DEC. DEC wants to sell Alpha hardware, but to do that in any quantity requires Windows NT, and every delay will cost DEC money, the analyst explained. Another view comes from John Dunkle at WorkGroup Technologies, who said Microsoft is willing to take the marketing hits if NT is late in order to ensure the operating system is as bug-free as possible.

Safety in numbers
When IBM formally unwraps OS/2 2.1 at a biocastal announcement this week, several PC makers, including Zenith Data and AST, are expected to reveal plans to preinstall OS/2 2.1 on some PCs. However, another source said that not only is 2.1 not in the channel yet, but as of last week, IBM had still not mastered the code. IBM also may have to address reports that efforts to provide faster and seamless cut and paste between OS/2 2.1 and Windows 3.1 have hit snags with nonconforming Windows apps and difficulties with DDE, OLE and the Super VGA driver.

And storage for all
Later this week, IBM's Advanced Workstations Division and Emass Storage System Solutions in Dallas, a unit of E Systems Corp., will announce an agreement to link RS/6000 computers to Emass' data storage systems. That will give RS/6000 users access to up to 10,000T bytes of information through Emass' Data Tower and Data Library storage devices.

Developing a spine
Router rivals Cisco and Wellfleet are reportedly poised to gain new-generation IPX code from Novell for beefing up routing of the NetWare transport protocol across WANs, according to a source close to Novell. An analyst interpreted this to mean that Novell is enhancing its IPX routing algorithms — software that allows multiple routers to exchange key network configuration information — to position IPX as a potential backbone protocol suited to today's sprawling enterprise networks.

Still kicking
Contrary to rival-spread rumors, DEC is still very much on the ball with its Pathworks strategy for selling VAXs and Alphas as LAN servers. Pathworks for NetWare is slated to ship on schedule next month, which will allow Novell clients to use IPX to access DEC VAX file-sharing and E-mail services. Next week at Comdex/Spring '93, DEC will announce a Microsoft Windows NT version of Pathworks. And later this year, DEC will debut its "next generation," which is supposed to provide interoperability and integrated management across NetWare, AppleShare and LAN Manager servers.

One-upmanship
While DEC introduced PCs with PCMCIA options last week, Hewlett-Packard will top that by putting PCMCIA drives into all of its PCs, sources said. Driven by HP's compute-everywhere strategy, its new Vectras, due out June 1, will support either two Type III PCMCIA cards or four Type II cards. Look for a slew of vendors to follow suit in the near future, including the IBM PC Co.

Microsoft seems to be big on city names as code names for operating systems projects. The two most recent are "Cairo" and "Chicago." When asked the reason behind the names, Microsoft Chairman Bill Gates said that Cairo, the company's object-oriented operating environment, was supposed to be exotic sounding. As for Chicago, otherwise known as Windows 4.0, he said they were looking for something between Cairo and Microsoft's home in Redmond, Wash. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8556.

The One You Haven't Done Could Be Your Undoing.

As you move to client/server computing, you'll undoubtedly spend countless hours evaluating GUI tools, sorting through network solutions and resolving platform issues. But past experience will tell you that managing your data is just as important. In fact, it's key to delivering information to your users when and where they need it–and making sure it's the right information.

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Successfully implementing client/server computing isn't easy. But if data management is high on your list, you'll be well on your way to getting the job done.

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COMPUTERWORLD

Inside

SHOW TIME
The big focus at **Comdex/Spring '93** this week will be platforms. The introduction of Windows NT will prove it is finally ready for prime time — maybe. **IBM**, meanwhile, gets the jump on NT by unveiling OS/2 2.1. And look for third parties to line up behind both operating systems and OLE 2.0. *Pages 28, 29*

NETWORKED MACINTOSHES
The Mac Finder is unable to address server data volumes larger than 2G bytes. **Novell** offers a workaround in NetWare 4.0, but users hope **Apple** will address the storage problem directly. *Page 1*

SQL DATABASES
Lotus is evaluating several strategies for better integrating its applications with data stored on back-end SQL database servers. *Page 7*

IN DEPTH
1994 is the year wireless technology will take off: Prices for sending E-mail and faxes are expected to fall in the 10-cent to 50-cent range, respectively. *Page 137*

NT critical to Microsoft's client/server battle plan

By Christopher Lindquist
REDMOND, WASH.

■ Microsoft Corp. is turning up the volume on its plan for helping businesses re-engineer using client/server computing, according to analysts, consultants and information systems managers briefed by the company.

During the past several months, Microsoft has announced a variety of programs, products and services aimed at priming the client/server pump. The programs are expected to lead to a point this year when Microsoft will have the tools in place to begin pushing firms to re-engineer based on a client/server architecture made up of Microsoft products in conjunction with "open" standards.

Central to the strategy are Windows NT and the Windows NT Advanced Server, which will debut this week (see story page 29).

Surrounding Windows NT will be a variety of other recently unveiled technologies, including Object Linking and Embedding Version 2.0 and ObjectBasic, a macro language that

Microsoft, *page 28*

Special section

Windows of opportunity

SHOSHANA WALTERA

For Rich Davisson, systems manager at Con Edison, implementing a Windows application meant outflanking his own mainframe-centric IS shop. For other developers, the sticking points are reluctant users and managers. *Computerworld* offers advice on how to sell homegrown Windows projects as well as avoid costly purchasing pitfalls. Stories begin on page 85.

IBM to cut host software prices

Big Blue hopes to extend mainframe use

By Johanna Ambrosio and Thomas Hoffman
CHANTILLY, VA.

IBM's mainframe customers won a major victory last week when the company announced it will for the first time offer widespread choice-in-pricing options for many different host software packages.

The goal is to cut the cost of host computing, thereby extending the mainframe's longevity.

Revealed at a meeting of 200 chief information officers from IBM's largest accounts, the new pricing plans include payments based on the number of end users attached to the mainframe or on how much of the host is actually used to run the software.

At the same time, IBM said it will hold the line on mainframe software price increases until at least 1995 and will waive its usual annual increases this year and next.

Furthermore, the company said, customers who choose traditional tiered pricing will not have to pay more than processor Group 60 charges, even if they use IBM's largest capacity machines.

IBM is also offering flexible payment terms and conditions for large customers. IBM's Enterprise Agreement includes items such as a license to run software across an entire organization vs. on just a particular box, and it offers the ability to upgrade from an old to a new version of software without additional cost.

Independent software vendors had different responses to IBM's

IBM, *page 14*

Sharpening the knife

IBM's new per-user charges for some mainframe software can really add up the savings. Some examples of monthly licensing charges:

			NEW PRICE/ 200 USERS*
OfficeVision/MVS OfficeVision/VM	$2,400	$3,295	$1,300 ($5/user PLUS $300)
Search Manager/370	$4,100	$6,410	$2,700 ($10/user PLUS $700)

*REGARDLESS OF PROCESSOR

Source: IBM — CW Chart: Nancy Kowal

Ethernet options broaden

Vendors to offer 'two-way' transmission

By Joanie M. Wexler

If choice is good, and you can't get too much of a good thing, then the Ethernet community should welcome another option for pumping more life into its local-area networks.

LAN switch vendor Kalpana, Inc. is due to announce this week an embryonic "two-way" Ethernet switching technology for its internetworking devices. The move will kick off a series of announcements from other vendors, including IBM and smart hub vendor Cabletron Systems, Inc.

Called "full-duplex Ethernet," the two-way scheme will allow users to send and receive signals at the same time over 10Base-T (unshielded twisted-pair) or 10Base-F (fiber) Ethernets. These LANs already use one cable for transmitting and another for receiving, although the functions occur one at a time.

In the new implementation, senders and receivers alike get a dedicated 10M bit/sec. of Ethernet

Ethernet, *page 8*

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Distributed databases

Chase unifies view

By Jean S. Bozman
NEW YORK

Chase Manhattan Bank NA is quietly building a client/server layer on top of an extensive global PC network, and it plans to deploy the first wave of related applications — including one distributed database program — on a worldwide basis by year's end.

The $96 billion bank intends to use relational databases and intelligent workstations to give dispersed business units better access to customer data stored in central database repositories, Chief Information Officer Craig Goldman said.

The goal is to import data from mainframes onto local-area networks to present a unified view of large corporate accounts across the bank's far-flung operations. "We have multiple business units, each of which has its own customer file," explained Gene Friedman,

SUSAN HALEY

Chase Manhattan's *Craig Goldman is extending client/server reach*

Chase, *page 16*

Recent events suggest the administrative burdens of your network could grow substantially.

Are You

Ready?

It's a jungle out there. And your people are demanding bigger, faster and more diverse services, like LAN interconnection and high-speed data transmission. This means your network is growing in size and complexity. That's why you should call on your local phone company. Your phone company is backed by the products and services of AT&T and AT&T Bell Laboratories. That makes it easier for them to give you the quality and reliability you need. So it'll be easier for you to get your service up. To get all your people hooked up. And to keep your network up. Plus, your phone company can provide all the bandwidth you demand, on demand. So call your local phone company. Because it could mean the difference between data networking and data not working.

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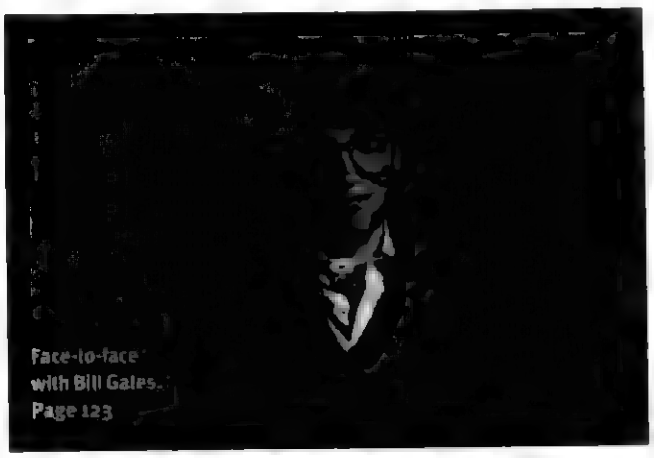
Network Systems



CLIENT/SERVER

Microsoft seeks to encompass client/server with an architectural framework built around **Windows NT**. In another bid to solicit IS support, the company is beefing up support options for NT. *Cover 1 and page 28.* **Chase Manhattan Bank** has anointed **Sybase** databases as its global standard for client/server computing. Chase executives said the new client/server systems would extract key data from transaction-processing systems for use in geographically dispersed business units. *Cover 1*

ENTERPRISE NETWORKING

IBM takes over the DME integration effort, setting an optimistic new release schedule. *Page 2.* Big Blue also said it will make its 3174 SNA cluster controllers more LAN-supportive. *Page 8.* On the **Ethernet** front, users can expect yet another twist on that venerable technology — "two-way" networks that allow simultaneous sending and receiving. *Cover 1.* Meanwhile, **ATM LAN** pioneer **Fore Systems** forges ahead with more price cuts and faster adapters *(Page 8)*, while **US West** and **Time Warner** make history with the boldest telephone/cable TV company coupling to date. *Page 12*

MAINFRAMES

IBM has decided to offer per-user options for mainframe packs, promising usage-based pricing in 1994. Some customers have already raised red flags about possible problems, but competitors are expected to follow IBM's lead. *Cover 1 and page 14*

RESERVATION SYSTEMS

In a bid to keep their reservation system on-line, **Hilton Hotels** and **Budget Rent A Car** have opened talks with little-known service provider Litton Computer Services. Charges continue to fly between the two and their former outsourcer, **AMR**. *Page 4*

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BEST COMPUTER NEWSPAPER 1992 COMPUTER PRESS ASSOCIATION

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Networked Macs hit wall

By Michele Dostert
TUCSON, ARIZ

Doug Crowder, a systems manager at Hughes Missile Systems here, had Apple Computer, Inc. Macintosh users howling in his ear recently, demanding to know why they suddenly could not access their Novell, Inc. NetWare v3.11 servers.

Frantic research revealed an unsuspected wall in the Macintosh's data access capabilities — one that could impede or reverse Apple's push to put Macintoshes on corporate desktops.

Crowder had recently reconfigured his NetWare servers, expanding the server volume to more than 3G bytes in the process. "The problem is, the Mac Finder [Apple's file manager] in System 7 can't address data volumes larger than around 2G bytes, so the Macs couldn't see the data," Crowder said last week.

He said he was especially irritated because the only way out of the problem was to spend a recent Sunday repartitioning his NetWare servers once again.

Problems evident

The Mac Finder data access limit was discussed in detail by attendees at the Apple developers' conference in San Jose, Calif., early this month. Indications of Macintosh data access problems come amid reports that large companies such as the Boeing Commercial Airplanes Group, General Motors Corp. and the U.S. Department of Energy's nuclear weapon facility in Savannah River, Ga., are considering suspending Macintosh purchases.

Crowder said that while the data access limitation would not force him to throw away his current Macintoshes, he would hesitate to add new ones to his network.

Crowder said Apple's response to the problem was to suggest that 2G-byte server volumes were too large for efficient data retrieval anyway. "That's just not true anymore, thanks to fast SCSI disk drives and redundant arrays of inexpensive disks technology," he said. "I have one server volume holding 8G bytes of data, and it works fine."

An Apple spokeswoman said the company is working on a fix. "Apple is aware that some of its customers need to address these large data volumes, and we're working very hard to make this happen," she said.

"We're running our Macs against DEC VAXs, and so far the largest partition we've used is 1.5G bytes, so it hasn't affected us yet," noted Bob Anderson, a senior analyst at A. O. Anderson Automotive Products in Milwaukee. "But we certainly expect to have data volumes 2G bytes and larger in the future, especially if we move to PC servers. So I hope Apple fixes this problem before we get there."

Novell is aware of the Macintosh data access problem. "We started hearing reports about it from our larger or more technical customers, with larger or more technical environments demanding large server volumes," said Susan Hanson, marketing manager for Novell's Macintosh product line. "We are talking with Apple, hoping they'll up the 2-gig limit in future system releases," Hanson added.

Meanwhile, Novell has devised a workaround for the Macintosh data access limit. It will be available in the NetWare 4.0 Macintosh NetWare Loadable Module when it ships next month.

The new fix, however, is not scheduled for release on the NetWare v3.11 platform anytime soon. Until it is, network administrators running Macintoshes against large NetWare v3.11 servers will have to artificially limit the size of their server partitions and continue petitioning Apple to raise the 2G-byte bar.

Late Breaking News Briefs

IBM cuts PS/2 server prices

IBM PC Co. cut prices on five of its Personal System/2 servers last week. The 33-MHz 486SX-based PS/2 Model 85s now cost between $3,800 and $4,765 — or $25 to $240 less than before — while the 50-MHz 486DX-based PS/2 Model 95s now cost between $11,300 and $12,385 — $695 less than before. IBM cited a need to respond to competition in the server market.

StorageTek to acquire Amperif

Storage Technology Corp. last week said it has agreed to acquire Amperif Corp. in Chatsworth, Calif., maker of the Viking disk array. Viking would complement Storage Tek's Iceberg redundant arrays of inexpensive disks system. Storage Tek also said that in-house testing of Iceberg has been pushed back to July — about a year after the system was originally scheduled to ship. It is now expected to ship in the fourth quarter.

IBM opens BIOS

IBM will today give new meaning to the term "IBM-compatible" when it announces that it will license its BIOS to other companies. IBM has tapped Phoenix Technologies Ltd. to market its BIOS and eventually merge the code into Phoenix's BIOS.

UK megadeal finalists

Inland Revenue Service, the UK's equivalent of the Internal Revenue Service, late last week selected a Computer Sciences Corp./IBM team and Electronic Data Systems Corp.'s EDS-Scicon Ltd. as finalists for a 10-year outsourcing project valued at around $2 billion. The project involves data center operations and application development at a total of 16 sites, and the transfer of 2,100 information systems employees.

Correction

Due to a production error, the last sentence of the story on page 1 in the May 17 issue was cut off. It should have read: However, he said he expects local regulations will not hamper the cable networking.

Unix performance test published

By Jean S. Bozman
PARSIPPANY, N.J.

Unix International said last week it has published a one-size-fits-all standard for measuring system performance in mixed-vendor enterprise networks.

The Universal Measurement Architecture (UMA) proposal is a set of specified interfaces that will allow users to "harvest" performance data from operating systems, including non-Unix systems and databases. The data would be used in real-time performance monitors, application-tuning tools and data center consoles.

Shane McCarron, project manager for technology and product planning at Unix International, a consortium of open systems vendors, said UMA is the result of two years of work by 150 people from member firms.

"We've created a set of enablers that would allow the development of portable performance management applications," McCarron said. "If you've got this architecture in place, you could write an application that runs on one machine on a network but that monitors the performance of all the machines on that network."

Crucial support

To make any impact, according to McCarron, UMA will need broad support. Industry analysts agreed.

"It's going to have to be adopted by everybody to be effective," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. "What we've seen in the past is a bunch of vendors sitting on standards bodies just to make sure the standard doesn't go against them." This time, she said, "we don't know if they're going to implement the specs."

But there is a need for an open systems specification that gathers performance information from operating systems and database managers in a consistent way.

"If that's what it is, I applaud it," said John Morrell, research manager for Unix software at International Data Corp. in Framingham, Mass. "That's because there's no universal way of interfacing to the [different] system components to get these statistics." Otherwise, users will have to buy multiple monitors to get a single view of their operations.

Amdahl Corp., which supports both IBM's MVS operating system and its own UTS Unix operating system on mainframes, said it intends to release UMA-compliant products later this year.

"The intent of UMA is to capture data on a running system," explained Tom Littaner, a program manager in Amdahl's open systems group. "You can write it out to disk or call some vendor's utility, and UMA lets you do both."

Among the other vendors participating in the UMA project are AT&T, Digital Equipment Corp., Hewlett-Packard Co., IBM, Informix Software, Inc., Oracle Corp., the Open Software Foundation, Unix System Laboratories, Inc. and Tandem Computers, Inc.

Vendors will use the specification by writing interfaces to the UMA standard, allowing open systems monitors to gather data from their products' operating systems.

IBM becomes DME integrator

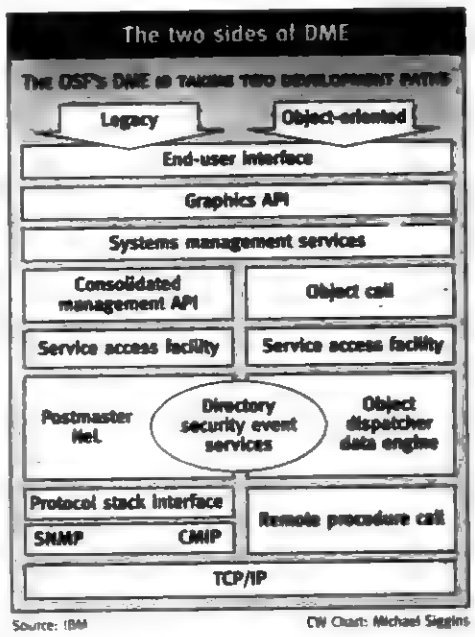
Release date for object-oriented manager delayed until Q2 '94

By Elisabeth Horwitt

Having taken control of the Distributed Management Environment (DME) development effort from The Open Software Foundation (OSF), IBM is eyeing second-quarter 1994 as the likely release date for the object-oriented, Corba-compliant version of the system.

Compliance with the Object Management Group's Common Object Request Broker Architecture (Corba) standard would provide a "much richer management environment" because it would extend the range of services and applications that could communicate under the DME umbrella, said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

The object-oriented DME will provide a common framework for interconnecting different vendors' systems management platforms and applications.



Source: IBM — CW Chart: Michael Siggins

Delays inevitable

However, the time frame, like preceding timetables put out by the OSF, may be a wee bit optimistic, Hurwitz said. "Add a year or two or more to what IBM says; this stuff is really complicated."

On the other hand, few users have expressed a burning desire to get their hands on object-oriented DME. More important are common application programming interfaces (API) that allow independent software vendors to port their management applications across all the major management platforms, users said.

The OSF has already addressed this need with a nonobject-oriented version of DME, with a common API for managing both Simple Network Management Protocol- and Common Management Information Protocol-based systems.

However, the object-oriented version of the distributed systems management standard has been widely reported as seriously behind schedule.

The primary problem, according to the OSF and analyst sources, lies in integrating different pieces of the architecture, supplied by different vendors, into the object-oriented framework. This is the job now on IBM's plate.

The new release schedule is "not cast in concrete," IBM systems manager Tom Dow conceded.

Team effort

DME contributors IBM, Hewlett-Packard Co. and Tivoli Systems, Inc. have been working with the OSF for some months to replace Tivoli's object request broker with one developed by IBM and HP that is Corba-compliant.

An object-oriented platform allows different services — "anything from electronic mail to a database holding management facts to a trouble-ticketing system" — to share data and cooperate on systems management tasks, Hurwitz said.

The object request broker treats each service, or managed system, as an object and takes care of delivering queries and responses. It also provides a common platform for application developers to write to because it eliminates the need to "write to a different API" to interconnect an application to each different service, Hurwitz said.

IBM took over the integration of the various pieces of the DME platform with the blessing of the OSF, as well as DME partners HP and Tivoli, Dow said.

PC enhancements

Fifth Generation widens utilities

By James Daly
BATON ROUGE, LA.

Fifth Generation Systems, Inc. went on the offensive in the increasingly combative utilities market last week with the introduction of nine new utility and security applications, including its first OS/2 offering and the expansion of its entry-level Express line.

The lineup represents Fifth Generation's return salvo against Microsoft Corp., which started hearts racing among third-party vendors when it introduced a utilities-packed MS-DOS 6.0 in March. President Barry L. Bellue said news of DOS 6.0's additional utilities caused a 35% drop in sales of utility applications among all manufacturers in a recent quarter.

But Bellue added that Microsoft may face trouble.

"Microsoft just doesn't know what it is getting into," he said. "All utility products require an extensive amount of support, and as a result, I predict that DOS 6.0 will become one of the most unsuccessful products Microsoft will ever release." Since its release, DOS 6.0 has had mixed reviews.

Bare-bones DOS

Several users also noted that the rudimentary utility offerings of DOS 6.0 will not replace the more meaty products of third-party vendors.

"DOS 6.0 will give us a quick and easy way to get better backup, data compression and virus protection to the average Joe, but there's no way it's going to satisfy our power users," said Rich Pickett, who has installed more than 300 copies of DOS 6.0 as director of computing services at the Oregon Institute of Technology in Klamath Falls, Ore. "We're still going to be looking toward third-party vendors."

Fifth Generation's additions include the following:

- Fastback Plus 6.0, the latest version of its best-selling DOS backup and restore program. The $149 package provides a simplified interface as well as added virus protection, tape support and network functionality.
- Fastback Plus for OS/2, which offers features similar to the DOS version, including scheduling capabilities, quarter-inch cartridge tape support and error correction. It will sell for $199.
- MacPak, a $149 collection of utilities for the Apple Computer, Inc. Macintosh that includes access security as well as backup and file management.
- Fastback Express for the Macintosh Version 2.0, an upgrade to the firm's entry-level backup program. Its retail price will be $99.

All new products are expected to ship by next month, said Vice President of Marketing Dick Miller.

Bellue added that Fifth Generation's next frontier will be to replace standalone utilities packages with network-based utility applications.

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Microsoft talks groupware options

Looks to eradicate groupware applications

By Michael Vizard
REDMOND, WASH.

Despite Microsoft Corp.'s recent pledge to better integrate its applications with Lotus Development Corp.'s Notes offering, the company's ultimate objective is to eliminate the need for separate groupware applications.

Microsoft is pursuing a strategy in which all applications will be inherently group-enabled through its Object Linking and Embedding (OLE) protocol and services in its operating systems, databases and mail services.

To accomplish this goal, Microsoft intends to revamp its Windows and Windows NT operating systems to make it easier to find documents and files, said Lewis Levin, Microsoft general manager for the Excel business unit.

In addition, Microsoft executives said they intend to enhance their databases to handle objects and unstructured text and bolster support for replication services in their file systems, databases and mail services. They will also concentrate on linking their applications via Version 2.0 of OLE, according to Shane Kim, Microsoft product manager for workgroup applications.

Get to work

Microsoft's and Lotus' groupware approaches

Microsoft

- Windows 4.0
- Microsoft's Mail
- Enterprise Messaging Server
- MAPI
- Access
- SQL Server
- OLE 2.0

Lotus

- Notes user interface on Windows, DOS, Unix, NetWare
- OLE 2.0
- Notes Mail
- VIM
- CC:Mail
- Notes File System

Microsoft will also likely use the technology from its still-under-development Cairo object-oriented operating system to create an object-oriented database that will handle different data types more efficiently than Notes or SQL databases, said Gary Voth, Microsoft senior product manager for corporate and network systems.

Taken together, these enhancements will give Microsoft's product line groupware capabilities that are very similar to the features in Lotus' Notes (see chart).

"Products like Notes are a special class of software designed to make it easier to find documents. We don't think you should require people to buy a separate piece of software to accomplish this," Levin said.

Notable Notes

However, information systems directors said Microsoft is sorely underestimating the impact Notes has already made.

"Notes is more than just groupware; it's an application development environment," said Michael Mendelbaum, a vice president at Chase Manhattan Bank NA.

Notes has moved way beyond documents, said Alex Morrow, general manager for cross-platform architecture at Lotus. "It provides a way to store objects that have relationships to each other," he noted.

And Dave Marshak, an industry analyst at the Patricia Seybold Group, noted that it will probably be 1997 before Microsoft will see independent software vendors providing groupware applications on top of its model.

"I don't think people are going to wait that long for Microsoft," Marshak said.

Despite the half-million Notes licenses that Lotus has delivered to more than 2,000 companies, Microsoft executives maintain that Notes will be a relatively short-lived phenomenon.

"Notes is a clever front end, but it has a weak data store model," Voth claimed.

Still, Notes' success has forced Microsoft to promise to better integrate its applications with Notes (CW, May 10).

"Microsoft is a pragmatic company. But in terms of our overall groupware strategy, our support for Notes will be a footnote," Levin said.

"When you don't have anything to sell, it's easy to sell promises. What's driving Notes is that people need a cross-platform architecture," Lotus Chief Technology Officer John Landry countered.

In the group

In the first quarter of Lotus' current fiscal year, Notes and CC:Mail accounted for 15% of Lotus' $227 million in revenue. And these products currently account for 50% of Lotus' research and development budget, according to Jim Manzi, Lotus CEO.

AMR calls Confirm partners selfish

By Mark Halper
DALLAS

■ Rancor continued to run deep through the erstwhile Confirm partnership, as AMR Corp. expanded on earlier allegations that Hilton Hotels Corp., Marriott Corp. and Budget Rent A Car Corp. undermined the computerized reservation project by acting in their own self-interest.

In a May 14 amendment to its complaint filed in state court here last September, AMR claimed the three user partners deviated from an agreed-on plan to define specifications for a common reservation system and instead pressed AMR "to build three separate reservation systems under the Confirm rubric."

AMR alleged that because the three partners had failed to negotiate a contract limiting AMR's profit from building the system to 20%, they embarked on separate self-serving strategies designed to exploit the fixed-priced contract for more than their share of the contract's worth.

The filing does not quantify the fixed-price fee, although AMR said the three user partners agreed to pay $80 million. AMR declined to elaborate. Hilton said it had no comment on the suit, and Budget and Marriott did not return phone calls by press time.

AMR was the development partner in the Confirm consortium, which fell apart last summer. AMR subsequently sued the user partners, each of which has separately countersued AMR to settle financial compensation and rights to software code.

As in its original complaint, AMR's May 14 filing singles out Marriott for secretly formulating a plan to blame AMR and withdraw from the project in favor of enhancing Marriott's own Marsha reservation system.

AMR's amended complaint cited an internal Marriott investigation in February 1991 in which Marriott allegedly concluded: "We can apply what we've learned [from Confirm] to Marsha for an investment comparable to Marriott's share of the remaining balances on the Confirm projects and deliver at least the same functions."

The filing portrays a discordant group of partners and notes that "in 1990, Marriott described the attitude of Budget's supervisor as 'negative, accusatory and self-serving.'"

To back up earlier assertions that the partners insisted on incorporating functionality with little value and developing redundant programs, AMR stated that although the "vanilla" Confirm system had a feature for tracking frequent travelers, Hilton and Budget insisted that AMR develop another technique for the same purpose.

Likewise, Marriott requested development of a special rates program for its Residence Inns and Fairfield Inns properties only, AMR stated.

"In demanding functionality of limited value, the user partners each sought to custom-design the system to their specific needs," AMR stated.

The filing reasserted earlier allegations that the user partners "bombarded [AMR] with an unending flurry of change requests," failed to provide information on a timely basis or did not provide it at all, made poor staffing assignments by seeking compensation and rights to code and failed to make payments.

Hilton, Budget pick Litton to run reservation system

Faced with a worst-case scenario system shutdown, Hilton and Budget Rent A Car have selected a dark-horse candidate that they hope will take over operation of their aging North reservation system.

The hotel and rental car company said last week that they have entered into contract negotiations with Litton Computer Services with the intent of replacing AMR Corp. as their reservation systems outsourcer by July.

AMR notified Hilton and Budget last fall that it would withdraw as their reservation system provider effective this month.

That notification came as a rift widened between the truculent parties over AMR's alleged failure to develop a next-generation reservation system called Confirm (see story at left).

It also set off a frantic search by the two companies for a replacement reservations provider (CW, April 5). And with time running out — AMR has agreed to extend its services until July 9 — Hilton and Budget are still sweating out signing with a replacement provider.

On a short list were IBM's Integrated Systems Solutions Corp. outsourcing subsidiary and AMR. The two travel firms had considered AMR for the short term to spare themselves the travails of changing horses while they scouted longer term, next-generation alliances.

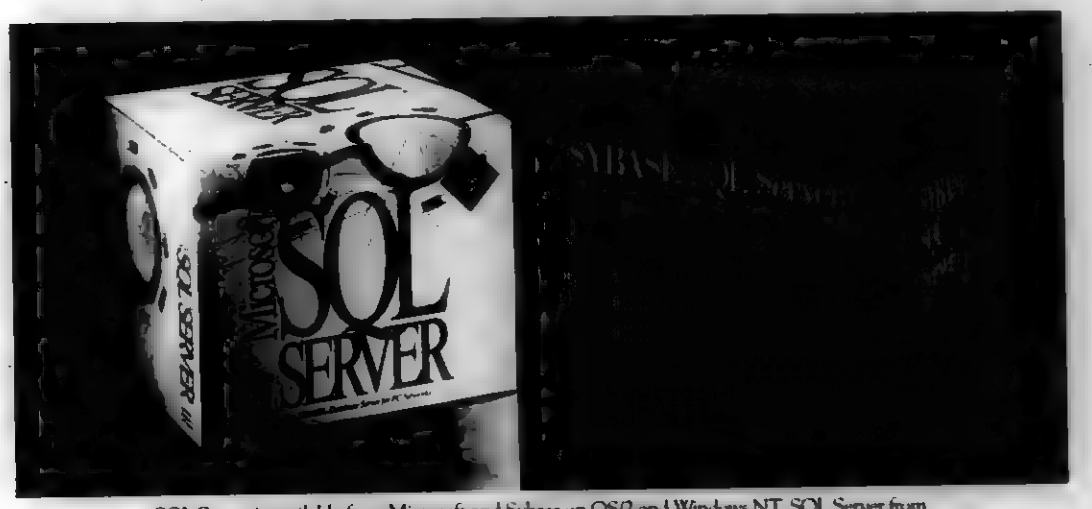
Hilton spokespeople have repeatedly referred to the "sensitivity" of discussions when declining to comment. Budget did not return phone calls last week.

San Jose, Calif.-based Litton, a subsidiary of Litton Industries, Inc., said the prospective contract would probably run for seven years at a value of about $100 million. The agreement would call for Litton to take over management of Compass Computer Services, Inc., based in Carrollton, Texas, and jointly owned by Hilton and Budget, to run the North reservation system.

Litton declined to elaborate on what details remain to be fleshed out in the Hilton/Budget arrangement.

—Mark Halper

Here's Everything You Need To Know About Windows-based Client/Server Computing.



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News Shorts

Sales, profits boom for CA

Pretax income for **Computer Associates International, Inc.**'s fiscal year ended March 31 rose an impressive 44% to $383.7 million, compared with $267.1 million in 1992. Revenue jumped 22% to $1.8 billion. For the quarter ended March 31, revenue was $540.1 million, a 15% increase over the year-earlier quarter. Quarterly pretax income grew 64% to $155.31 million. Sanjay Kumar, CA's executive vice president of operations, said CA's international sales kept pace. Sales of systems management products and application development tools also flourished, Kumar said.

Rollwagen backs off Commerce job

Former Cray Research, Inc. Chief Executive Officer John Rollwagen withdrew his name from nomination to the second highest post at the U.S. Department of Commerce. Rollwagen, who has been questioned by the U.S. Securities and Exchange Commission in connection with trading in the stock of Cray Research spin-off **Cray Computer Corp.**, said the resulting delay in his confirmation had given him time for personal reflection, during which he concluded he could serve his country better as a private citizen. Rollwagen has not been cited for any wrongdoing.

Adstar expands storage line

IBM's Adstar storage subsidiary, as expected, introduced a new model of its 3390 disk drive that triples the current capacity. Also announced was a new model for the 3990 controller, Model 6, which is not field-upgradable from the current Model 3; new low-end models of optical servers; and a version of the 3495 tape library that does not require Systems Managed Storage software. Adstar also introduced a money-back guarantee on all new products, as well as on existing members of the 3390 and 3990 families, among others. The products, new or old, must be installed after June 1.

Hot boxes recovered

The **Federal Bureau of Investigation** has seized more than $10 million worth of computer equipment that it claims was stolen from several Silicon Valley firms, including **Tandem Computers, Inc.**, **IBM** and **Unisys Corp.** An FBI spokesman said agents seized thousands of computers, memory boards, documents and computer parts that were headed for sale at cut-rate prices. No arrests have been made, U.S. Attorney John Mendez said.

SHORT TAKES Add **MCI Communications Corp.** to the growing list of large customers that have signed flat-fee, enterprisewide licensing agreements with **CA**. ... As it heads to market with a new line of NT machines, **Sequent Computer Systems, Inc.** has replaced Senior Vice President of Marketing Dennis Peck and named Mark Miller as its new marketing vice president. ... The networking vendor team of **AT&T**, **Cisco Systems, Inc.** and **StrataCom, Inc.** announced shipment of the documentation specifying their common technology for Asynchronous Transfer Mode-to-frame-relay networking, announced in January. ... In an effort to compete more effectively in world markets, the **New York Mercantile Exchange** and the **Chicago Mercantile Exchange** announced a three-year plan to share information in their attempts to develop separate integrated systems environments. ... **Hitachi Data Systems Corp.** plans to unveil a souped-up direct-access storage device with disk-mirroring capabilities this week. ... **NCR Corp.** introduced work-flow process management software designed to run on **Microsoft Corp.** Windows-based client PCs that are hosted by NCR servers.

News shorts, *page 16*

Health care data network fires up

On-line service allows information to be shared in real time

By Nell Margolis
SECAUCUS, N.J.

An on-line service that will allow health care organizations to exchange data in real time went live in three geographic pilot areas earlier this month.

A fourth area will be added within days, according to James Pickering, managed care vice president at National Electronic Information Corp.

The beta test of the Healthcare Information Network (HCIN) is bound to be scrutinized by eager eyes throughout the medical and technological professions, several health care information systems leaders said last week.

"We're not on the HCIN yet, but we're seriously thinking about it," said Ron Barrow, assistant vice president of electronic data interchange (EDI) services at the Baton Rouge, La., headquarters of Blue Cross/Blue Shield of Louisiana and Mississippi. "Everyone is. This is the way we're all eventually going to go."

Launched last July by PCS, Inc., a National Electronic and McKesson Corp. information technology subsidiary, HCIN weds National Electronic's 330-vendor, 100,000-plus-subscriber automated claims network to PCS' prescription drug management software. It offers real-time routing of a broad slate of managed health care transactions nationwide. AT&T delivers leased lines and 800 numbers.

Old habits never die

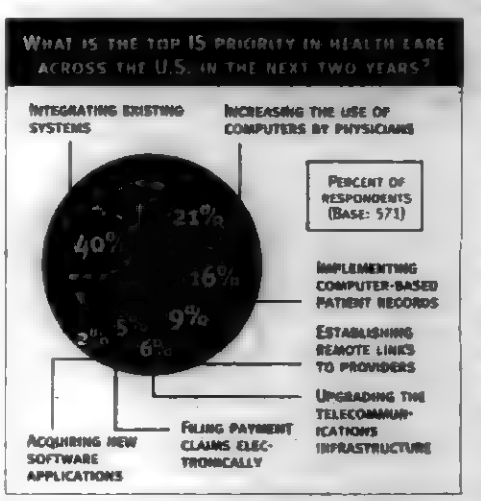
But Barrow noted that ready access will go only so far in luring health care administrators, especially doctors, away from habits ingrained over decades.

"No matter how easy the technology gets, technology is part of business, and a lot of doctors are still very resistant to getting involved in the business end of medicine," Barrow noted. "The same doctor who will spend $50,000 on a Mercedes won't spend $4,000 on systems because the car is a symbol of being a doctor and the computer is a symbol of being a businessman."

At the moment, HCIN's first fruits — instantaneous electronic exchange of eligibility information for benefits coverage — are being sampled at sites in Texas, Southern California and Virginia, with two Ohio sites preparing to go live this week, Pickering said.

User enthusiasm for HCIN, Barrow said, goes beyond the considerable benefits of automated payment information. "We're looking ahead to automated patient records."

The automated patient record is a complete, heavily cross-referenced on-line document containing every known fact and transaction that affects any patient's past, present or future care. While it is not yet a reality, industry observers said they believe that it will be within the next several years.



Source: Healthcare Information and Management Systems Society/ Hewlett-Packard Co. study

"In an automated environment, care can happen a lot faster and a lot better," Barrow said. And those who become network-ready early on, he added, will be best positioned to take advantage of the full-scale automated record technology as soon as it arrives. "That's why we're so interested in HCIN," he said. "These are all building blocks."

"Networks and automated patient records are the future for everyone in health care," said Barbara Mings, manager of user support at Austin, Texas-based Austin Diagnostic Clinic.

National Electronic is poised to expand HCIN into 10 more strategic market areas later this summer, Pickering said. "Their feedback is especially critical in this particular instance because HCIN is the first of its kind. We're trying to build a mousetrap to the homeowner's specifications."

Pickering declined to identify the target markets. However, he hinted, "a demographer would have no trouble figuring them out." Major urban areas with large health care establishments — Boston, Chicago and New York, for instance — are likely candidates for HCIN's second round.

Health care payers, providers and vendors in the test markets can currently reach HCIN 18 hours a day, five days a week, plus eight hours on Saturday. Round-the-clock availability and service are slated for summer, Pickering said. As a further enticement, National Electronic is offering a homegrown, Microsoft Corp. Windows-based front end that lets users build their own tables and files, using English-language descriptors, he added.

Court halts sale of SPARC clones

By Cara A. Cunningham
BOSTON

A California superior court last week enjoined a Hyundai Electronics of America subsidiary from selling Scalable Processor Architecture (SPARC)-based clones that Sun Microsystems, Inc. alleges contain unlicensed components.

In a preliminary injunction, a superior court judge in Santa Clara, Calif., ruled that Axil Workstations, Inc., a San Jose, Calif.-based division of Hyundai, can no longer sell its Model 230 and Model 310 workstations, which are clones of Sun's SPARCstation 10 reduced instruction set computing workstation. These clones include boards designed by Sun but not yet released by the company, according to Chuck Molloy, a Sun spokesman in Mountain View, Calif.

Sun filed a civil suit in March alleging that Axil obtained the layout and manufacturing blueprints of the board, code-named Ambush, by hiring a Sun engineer. Sun is seeking a permanent injunction and monetary damages for misappropriated trade secrets and theft.

"The rationale behind the suit is that we were concerned, and continue to be concerned, about [maintaining] a level playing field in the SPARC market," Molloy said. Because Axil included this board in its workstation before other SPARC clone makers were granted access, Sun said Axil had an unfair advantage over its competitors, he explained.

Sun has not yet decided whether it will bring the board used by Axil to market or not, Molloy added.

Cunningham is the IDG News Service's Boston correspondent.

Office automation

Lotus seeks suite spot in app market

By Michael Vizard
CAMBRIDGE, MASS.

Looking to deflect competitive pressure incurred by the arrival of software suites from Microsoft Corp. and Borland International, Inc., Lotus Development Corp. is working to better integrate the applications that make up its SmartSuite offering. It is also casting about for a way for users to access data from back-end databases from within its applications.

Lotus has begun briefing customers on SmartSuite Version 2.0, which will allow users to more easily integrate files across applications. In addition, Lotus has long-term plans to integrate the version manager technology in 1-2-3 for Windows across the entire suite.

"You'll be able to send a message out of Ami Pro without having to go out and open another application," said Krystyna Filistowicz, an analyst at Dataquest, Inc. SmartSuite 2.0 is due this summer.

SQL integration

Meanwhile, Lotus' database effort is currently focused on integrating its Notes environment with SQL databases using technology from a project called Notebook, which will allow applications to call data from both SQL and Notes databases [CW, April 26].

"Clearly, we're evaluating a strategy for accessing back-end data," a company spokesman said.

However, because Notes is currently installed at only about 2,000 companies, Lotus has been evaluating potential acquisitions of database companies that would provide technology that could be deployed alongside the larger installed base of Lotus applications.

Lotus declined to comment on "speculation" regarding acquisition plans, but Lotus Senior Vice President Robert Weiler has previously noted that Lotus would rather acquire a database vendor than build its own database product.

Weiler attributed this decision to the assumption that the need for PC databases will eventually be subsumed by distributed databases. This means that Lotus would rather have an installed base of customers than have to develop a product and then build a following.

In the past, Lotus executives have strongly dismissed the need to purchase or build their own database, at one point folding an internal development project. An investment in Sybase, Inc. yielded a $33 million windfall but no products. The company had previously maintained that providing data linking and access tools, such as DataLens, was sufficient.

Last week, however, industry analysts said Lotus is one of several firms evaluating a potential acquisition of Approach Software, Inc. in Redwood City, Calif., which markets a Windows database that includes hooks to both SQL and PC databases. Approach officials declined to comment.

Sales of Microsoft's Access and Borland's Paradox for Windows databases have been brisk at information systems shops that are deploying these databases as front-end query tools for accessing data on distributed databases.

"Microsoft raised the bar by adding Access. Companies are going to have to add databases to their suites because they provide enabling technology for integrating the suite. Vendors also have to encourage the use of databases by end users," Filistowicz said.

Lotus Chief Executive Officer Jim Manzi has shown a bent toward acquisitions during the past several years. For example, the company acquired Samna Corp. for its Ami Pro word processor, which is now part of Lotus' office software suite, as well as its CC:Mail electronic-mail package. In addition, Lotus licenses Notes from Iris Associates in Westford, Mass.

"Manzi is hungry for growth, and in the past, that has meant an acquisition for Lotus," noted Norman Weizer, president of Weizer Associates, Inc.

IBM makes 3174 LAN-ready

Big Blue hopes to hold on to users who prefer multivendor networks

By Elisabeth Horwitt
WHITE PLAINS, N.Y.

■ IBM has made its 3174 SNA cluster controller into a multiprotocol local-area network server in hopes of dissuading users from putting the aging workhorse out to pasture as they move from SNA to multivendor LAN environments.

The new Networking Server models of the 3174 family will for the first time support direct attachments to Ethernet, as well as be able to translate 3270 and ASCII terminals' Systems Network Architecture (SNA) data streams into Transmission Control Protocol/Internet Protocol (TCP/IP) remote networking protocols such as Telnet and TN3270.

The 3174 can thus provide a TCP/IP-based host connection to users' 3270 installations, either remotely via a router backbone or locally via an Ethernet LAN, according to an IBM spokesman. The lack of Ethernet support has caused a number of users to turn to vendors such as McData Corp. that support both Token Ring and Ethernet connections for SNA devices.

Indeed, IBM's announcement could pump some much-needed new blood into the 3174, which is widely installed but losing ground fast to SNA-compatible controllers from Memorex-Telex, Idea Associates, Inc., Apertus Technologies, Inc. and McData, said Nancy Meachim, a senior analyst at International Data Corp. (IDC) in Framingham, Mass.

While IBM has done very little for the 3174 until this spring, competitors have provided features such as Ethernet connections, access to multiple IBM hosts, links to the vendor's Escon fiber channel and improved price/performance.

Preliminary 1993 data from IDC shows that IBM's market share in the 3174-compatible market dropped about 10% in 1992.

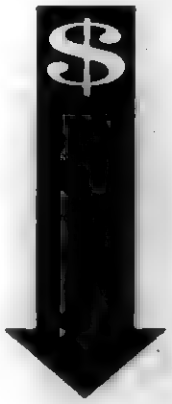
Luring users

In another attempt to boost sales, IBM shifted its 3174 sales from direct-sales channels to a telemarketing 800 number last month and is offering users 30% off the products' prices through mid-September.

Moreover, IBM announced full 3174 support for its Advanced Peer-to-Peer Networking (APPN) Network Node protocol. This will enable the cluster controllers to communicate with other APPN Network Node devices, such as 6611 routers and hosts running the soon-to-be-shipped VTAM Version 4, Release 1, the IBM spokesman said.

APPN Network Nodes coordinate routing and resource directories across an APPN network. So far, none of IBM's competitors provide APPN Network Node support.

Since June 1991, the 3174 has been able to act as an APPN Network Node, but only over bridged Token Ring LANs. The APPN enhancements for the 3174 are scheduled to ship on June 25.



Sales sliding downhill

The 3174 installed base in 1991 was 333,020. It was approximately 12% less in 1992, according to preliminary International Data Corp. 1993 data.

In other news

Also announced was 3174 support of the Simple Network Management Protocol (SNMP) Management Information Base II protocol, which enables SNMP-based systems such as IBM's NetView/6000 to manage 3174s.

IBM also revealed that it would implement multiprotocol frame-relay support on the 3174 Network Server. This will enable users to "pump SNA, APPN or TCP/IP traffic through the 3174 and out over a frame-relay network," the spokesman said.

Frame relay provides users with more effective use of wide-area links by eliminating error-detection and correction functions and their associated overhead. The feature could ship as early as first-quarter 1994, according to the company.

Also slated for shipment within a year is Escon support for the 3174.

The Networking Servers range in price from $9,160 for a base model to $14,580 for support of 64 ports. An adapter that allows a 3174 to be upgraded to Network Server capabilities is priced at $4,045.

The servers and adapter are scheduled for December shipment.

Ethernet options broaden with 'two-way' data transmission

CONTINUED FROM COVER 1

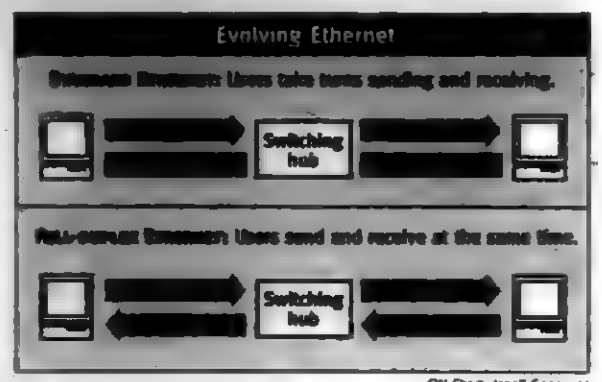
bandwidth, doubling the LAN's performance to 20M bit/sec. and eliminating collisions. This could be useful in allowing Ethernet to carry real-time applications such as videoconferencing, which entail simultaneous sending and receiving, said Michael Skubisz, director of product management at Cabletron.

His company plans to introduce full-duplex Ethernet PC cards and a switching module for its smart hubs early next year at prices "not much higher" than today's Ethernet.

An IBM spokesman said IBM will announce full-duplex adapter PC cards next month with availability "immediately following." He was not able to confirm, however, whether a corresponding switching module for the company's 8250 smart hub is under construction.

While users said they were intrigued by the technology, they acknowledged that the barrage of investment-protecting, high-speed LAN alternatives hitting the market today will make them hesitate to be guinea pigs with any one of them.

"I'll look at [full-duplex], but I'm also waiting for 'fast' Ethernet," said Robert Gullett, information center manager at Allied Van Lines in Naperville, Ill. "With so many things coming out, I don't want to spend a lot of money right away and be first on my block."



CW Chart: Janell Genovese

"I'm interested in faster Ethernet of some sort. But we might wait for 100M bit/sec. Ethernet or CDDI [Fiber Distributed Data Interface over copper wiring] because the speeds are higher," added Matt Repko, operations administrator at Firmenich, Inc., a chemicals company in Plainsboro, N.J.

In January, Cabletron submitted a full-duplex technology proposal to the Ethernet standards committee, where it is queued up behind 100M bit/sec. "fast Ethernet" for standards consideration. Products for fast Ethernet, which retains the speed-lowering, shared nature of today's LANs, are expected in the second quarter of 1994, according to analysts.

LAN vendors offered varying opinions. "If you're going to change Ethernet, why not go to 100M bit/sec.?" asked George Prodan, high-speed product line manager at 3Com Corp. After all, "100M bit/sec. Ethernet could be implemented as a switched technology, too."

However, "Ethernet switching provides a model for ATM," said Mark Juliano, director of marketing at Fore Systems, Inc., an Asynchronous Transfer Mode (ATM) LAN start-up in Pittsburgh. "When we say ATM is 155M bit/sec., we mean 155M bit/sec. in both directions. Now the 10M bit/sec. speeds attributed to Ethernet mean 10M bit/sec. in both directions, too."

Price cut takes ATM technology Fore-ward

By Joanie M. Wexler
PITTSBURGH

Progress will continue this week with fledgling Asynchronous Transfer Mode (ATM) technology as Fore Systems, Inc. said it plans to reduce the price of its ATM local-area network switch by nearly 40% today.

The company also said it will roll out a high-end ATM adapter card, developer's kit and wide-area switch interface module during the next few weeks. ATM is an emerging high-speed switching technology designed to carry a mix of data, video, voice and image traffic and to eventually blend LANs and wide-area telecommunications networks.

Fore intends to drop the price of its 16-port ForeRunner ASX-100 switch to $27,950, or about $2,995 per port. Earlier this year, the company slashed per-port charges for its high-end, 64-port switch to $2,500 [CW, March 8].

"It's amazing to see a technology barely a year old dropping at these rates," said Nick Lippis, president of Strategic Networks, Inc., a consultancy in Rockland, Mass. "This is a good sign of things to come."

Meanwhile, Fore said it will announce next week a $2,495 network adapter card for Sun Microsystems, Inc. SPARCstations that can saturate an ATM network at 100M or 140M bit/sec. speeds. To date, the S bus saturates Ethernets but causes a bottleneck on 100M bit/sec.-and-above LANs, Lippis said.

Fore also plans to roll out a developer's kit this week that lets programmers write applications to Fore's proprietary ATM application programming interface and bypass Transmission Control Protocol/Internet Protocol to alleviate application bottlenecks, said Mark Juliano, director of marketing. Also on deck is a $6,900, four-port Synchronous Optical Network wide-area interface for its switch, slated to ship in three weeks, he said.

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PC Week - May 10, 1993

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Study: Computer ROI averages 54%

MIT report disputes contention that technology is not helping productivity

By Rosemary Cafasso

CAMBRIDGE, MASS.

A soon-to-be-released study from MIT contradicts the theory that there is little payback from information systems spending by claiming that major corporations are showing average annual returns on investment (ROI) of 54% on their computer purchases.

The study, completed by the Center for Coordination Science at the MIT Sloan School of Management, is certain to stir up even more debate on an already controversial topic.

Several earlier published reports show no meaningful productivity improvements from technology investments, and experts differed as to why. Some claimed the reason technology is not showing much return is because it has been mismanaged for years. Further, they now detect some productivity improvements because of better management.

Industry experts who reviewed this latest study last week said the MIT work provides a new perspective on IS spending and productivity, but they also said it was a limited view of a complex issue. The report targeted spending of centralized IS organizations at Fortune 500 companies only. It also failed to measure the impact of distributed systems, PCs, telecommunications or personnel.

"My first take is it is narrow and [focused] on an area where the action isn't," said Michael Ashmore, a vice president at CSC Index, Inc., who heads up his firm's Information Systems Practice Group.

The MIT study, conducted by Erik Brynjolfsson and Lorin Hitt, will be released late this year at the International Conference on Information Systems. It tracked IS spending at 400 of the Fortune 500 companies between 1987 and 1991. It collected data on all major spending categories — or inputs — that potentially effect a company's output, or revenue.

Using statistical modeling and regression analysis techniques, the study isolated computer capital purchases from all other inputs. After accounting for the other inputs, it then determined that when changes to computer capital were made, revenue would either rise or fall.

Computer/revenue ratio

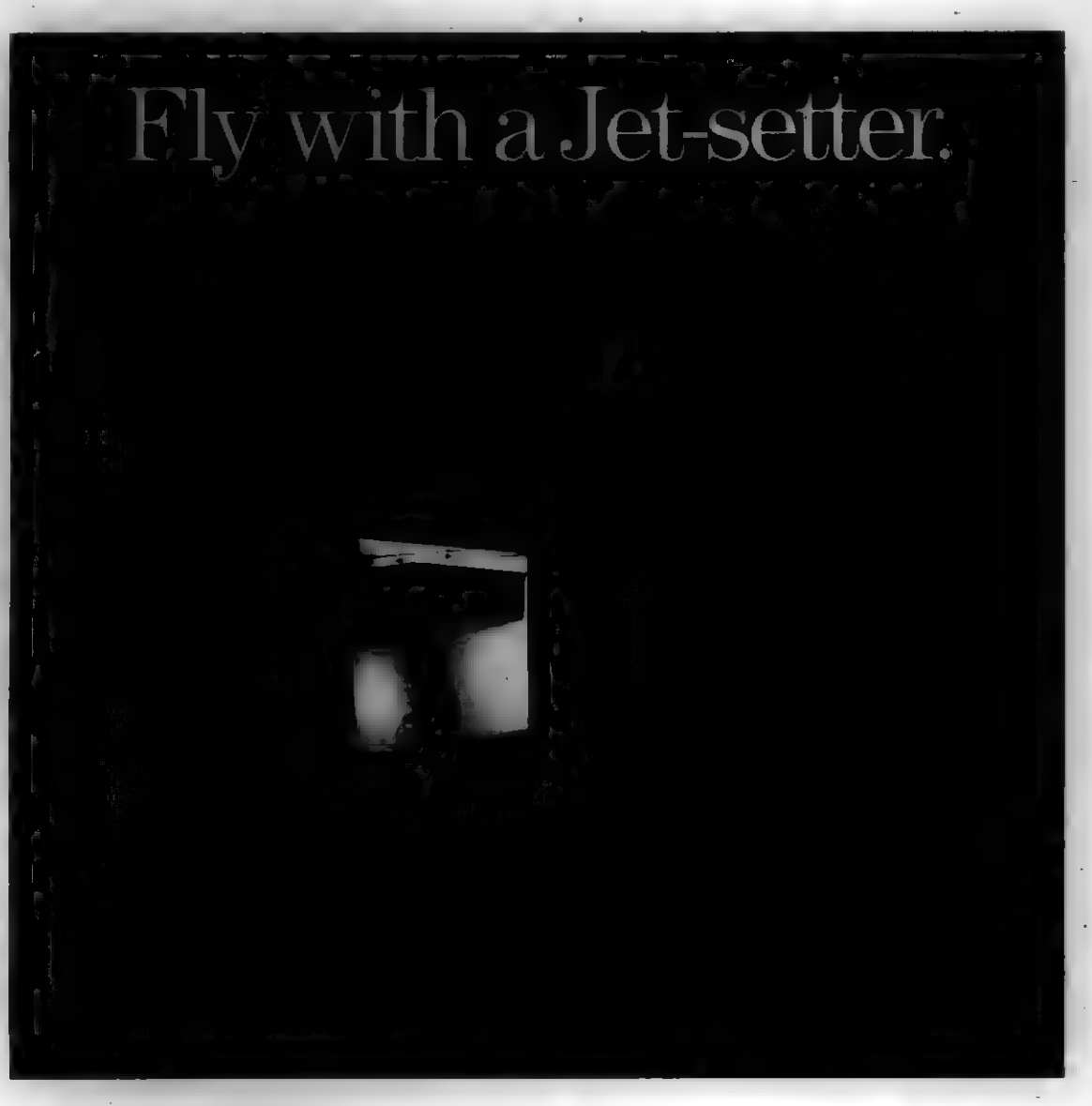
For those companies that increased computer capital, revenue increased. Therefore, the study suggests that the so-called "productivity paradox" has disappeared, at least for this group of companies. Further, it states that computer capital annual ROI in manufacturing companies averaged 54% and 68% when manufacturing company data was combined with service company data.

The productivity paradox was supported by earlier studies from industry experts such as Stephen Roach, co-director of global economic analysis at Morgan Stanley & Co.; Paul Strassmann, former chief information officer at the Department of Defense; and Gary Loveman, professor of business administration at the Harvard Business School.

Last week, Brynjolfsson pointed out that his work focused on firm-level data, which provides more insight than many previous studies that focused on industry averages. And, he said, it is more current than studies that used data from the late 1970s and early 1980s.

However, Loveman said that while the MIT study shows "there is some evidence that some companies have been able to make better use of technology," he also had some concerns with it. For instance, the study's focus on central IS spending cannot tell the whole story because of the increases in total IS spending that went to decentralized computing between 1987 and 1991.

Further, Strassmann said he found the study to be "fundamentally flawed" because it did not focus on the full labor input, which can account for upward of 90% of a company's total inputs.



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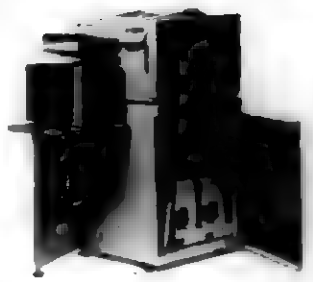

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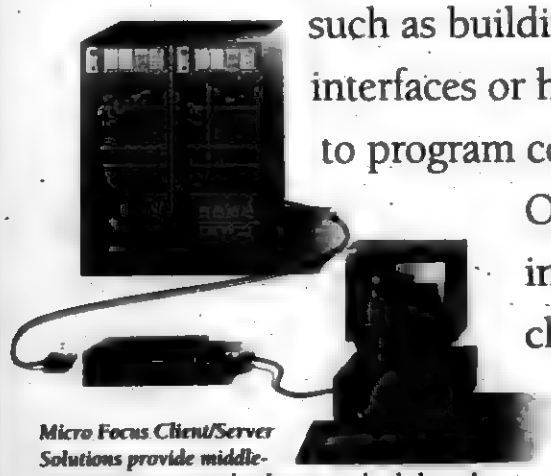

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Broadband networking

Telco, TV could broaden local-loop options

By Joanie M. Wexler
NEW YORK

■ US West and Time Warner Entertainment are skillfully maneuvering around regulatory mines to jointly build interactive switched broadband networks — a coup for businesses stifled by a largely uncompetitive local telephone market.

US West's $2.5 billion investment in Time Warner, Inc.'s entertainment business, announced last week, means users should eventually see broader choices in local-area providers and services. It could also mean lower prices, spurred by the mass deployment of broadband technology, users and analysts agreed.

"Such alliances have the potential to catapult the new 'gigabit' transmission technologies we keep hearing about, such as ATM and SMDS, into affordability for the business community," said Plato Demos, manager of telecommunications planning at Union Carbide Corp. in Danbury, Conn.

This is because the industry needs the economies of scale to make these services affordable, which could result from deploying broadband networking on a mass market basis, he said.

Ready to entertain

The initial thrust of the venture will be to deliver interactive entertainment and information services to Time Warner's 7 million subscribers and to give US West access to Time Warner's entertainment and other software.

Eventually, though, the team effort to proliferate broadband networking among the islands of cable television networks "could put the local loop in the same competitive environment we've enjoyed in long-distance for almost 10 years now," said Steven A. Taylor, president of Distributed Networking Associates, a Greensboro, N.C., consultancy.

He pointed to the cost-lowering benefits from long-distance deregulation. For example, the approximate cost of coast-to-coast T1 services has dropped from $70,000 in 1987 to "at most, $20,000 today — and probably less," he said.

David Eisenlohr, vice president of telecommunications at the Pacific Stock Exchange, noted that telephone/cable TV company teamings "will give businesses whose clientele is residential more opportunities." For example, he said, "it would be a natural for a Charles Schwab or a Merrill Lynch to provide a PC connection off a TV that gives clients the real-time stock value of their portfolio's worth."

Separated at birth?

Alliances between telephone and cable TV companies will form to deliver new telecommunications services

A PROFILE OF TODAY'S NETWORKS

Geographic coverage	Ubiquitous	More residential/ less business
Number of end points	145 million	93 million
Transmission	Narrowband	Wideband
Direction	Two-way	One-way
Number of long-distance providers	700	300
Number of local providers, including resellers	1,400	2,500

Source: Insight Research Corp.

First of its kind

The bold US West/Time Warner effort is the largest coupling to date of a regulated local telephone company with a cable TV operator. However, telephone company/cable TV trials have been simmering in various regions across the country, and Southwestern Bell Telephone has made moves to purchase small cable companies outside its regulated region [CW, May 17].

Most of the telephone companies have been pushing for a reversal of Modified Final Judgment rules, which were issued at the time of AT&T's divestiture in 1984 and prohibit the regional Bell operating companies from running cable TV services or owning cable TV companies in their regions and from participating in the long-distance telephone service market (see story at right).

Some users said the phone companies have good reason. "The telecommunications business can't get its act together for love or money, and the cable companies are more market-driven," said Ron Neely, a network planner at the University of Missouri Medical Center in Columbia, Mo.

"The potential here is mind-boggling. For example, it would be extremely useful to move multimedia patient data, such as radiology, charts and ultrasound scans, from anywhere to a physician's desktop. Today, those services are not available from a single source. And we're all looking for one-stop shopping," Neely said.

Agenda

Public-switched telephone network backbones and cable TV networks can handle broadband traffic. To deliver large-scale communications and information services on demand, the cable companies must upgrade their networks to include switching and transaction data collection and billing, Insight Research Corp. said. This will represent a large role for US West in its relationship with Time Warner.

Cry-Baby Bell?

The 1984 Cable Act prohibits local telephone company spin-offs from the Bell system from providing cable TV services within their regulated geographical territories.

To comply with these restrictions, the US West/Time Warner venture will sell the eight Time Warner companies in the US West region, which serve just 85,000 of Time Warner's 7 million subscribers.

This is no great loss, considering US West's territory is the most sparsely populated Baby Bell region, said Brian Moir, a Washington attorney who provides legal counsel to the International Communications Association user group.

However, he expressed concern that this US West tack — jumping ship on cable services within its own region — would weaken the unified front the seven Baby Bells have presented in their attempts to overturn the federal restrictions barring them from delivering in-region cable TV and interstate telecommunications services.

"There may be a split within the RBOC community about whether they want a waiver on the bans, which pulls the legs out" from under the effort, Moir said.

However, US West spokesman Steve Lang said, "We're not changing our push to ban these restrictions. We think we should be able to offer the same kinds of entertainment services that cable TV companies offer. After all, they aren't restricted from offering phone services."

In addition, Lang said, the venture is setting up separate entities in which US West will have no financial interest to own and maintain the satellite dishes that transmit signals across regional boundaries.

These are assets the Baby Bells are legally unable to hold because they communicate electronic signals beyond their regulated regions.

—Joanie M. Wexler

International X.500 directory demonstrated

By Lynda Radosevich
FAIRFAX, VA.

Efforts to create a global directory-assistance-type service for electronic-mail addresses got a boost last week when nine international vendors demonstrated the interoperability of their X.500-based directory service products.

Currently, users are installing X.500 directory products to synchronize addressing across their own organization. The next step — which requires interoperability among different X.500 products — is to make directories from external organizations available to one another. And users and pundits said they hope to establish within the next five years worldwide, electronic-mail, directory tree-based X.500-standard products.

Last week's demonstration was held under the auspices of OSInet Corp., a consortium of Open Systems Interconnect protocol users and vendors. Control Data Systems, Inc., Hewlett-Packard Co., The Wollongong Group, Inc., four European groups, Digital Equipment Corp. of Australia and others practiced looking up E-mail addresses in one another's directories.

Locally, the vendors connected over Ethernet local-area networks and used X.25 connections to communicate across the continents.

While it seems that standard-compliant products should work together, users cannot be certain of interoperability unless it is tested, said Greg Cline, research director at IDC Government in Vienna, Va.

Meanwhile, the government is stepping up its involvement in X.500. Last month an international standards group appointed the Defense Information Systems Agency's Joint Interoperability Test Center to coordinate an international testing structure. However, X.500 testing is not expected until late this year.

X.500 test results will be maintained by OSInet and are available from the Internet at coinrs6000@cos.com.

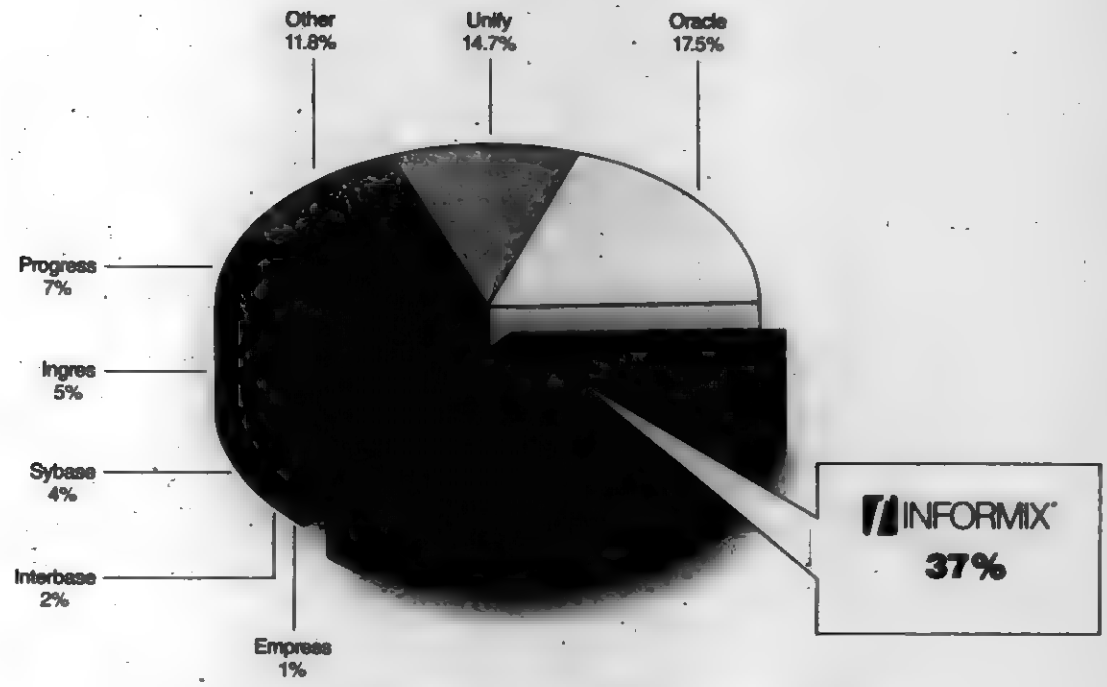
What's the meaning of this?

Compliance is when the vendor says a product meets the X.500 standard.

Conformance is when the government says it meets the standard.

Interoperability is when OSInet has demonstrated that products can connect, IDC Government said.

The UNIX Database Leader Now Does NetWare.



Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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Host users seek license details

Some observers wonder whether usage-based pricing plan will be fair

By Johanna Ambrosio and Thomas Hoffman

IBM may not be rolling out its usage-based pricing until 1994, but some customers have already raised red flags about possible problems, including what happens with fluctuating usage patterns and the possible overhead the measurement mechanism itself might incur.

Adding to the uncertain user reaction is the fact that IBM has not yet released specifics of how the usage model will work because it is still being developed. What is known so far is that the model will be based on a "service unit," which is similar to the more familiar millions of instructions per second (MIPS) usage measurement. But instead of measuring the overall capacity of an entire machine, as the MIPS benchmark does, the service unit will measure a specific work load and the throughput of that work load, according to William McNee, an analyst at Gartner Group, Inc. in Stamford, Conn.

IBM will work with 800 customers worldwide and with other software vendors during the next six to eight months to determine specific pricing for the new usage model and to develop a tool to help measure and bill for what customers use.

The tool will be akin to IBM's existing mainframe measuring system, called Resource Measurement Facility, which until now most users have used to help with capacity planning and other tasks. The measurement tool might be included inside the MVS operating system, or it may be included with DB2, said Marty Clague, a general manager at IBM U.S. in Somers, N.Y.

Bob Pouliot, vice president of information systems services at Mass Mutual Life Insurance Co. in Springfield, Mass., said he fears that the metered usage model could cause charges to spike wildly, especially for those shops that are transaction-processing-intensive.

"It's going to be difficult to predict software charges if you've got heavy CICS or DB2 activity," Pouliot said.

Jim Cheland, director of information processing at Kmart Fashions in North Bergen, N.J., said, "If software is needed to run this, great, but I'm not going to pay for it. I really need more meat about how this is going to work and how this will affect me."

Third parties follow IBM lead

By Johanna Ambrosio and Thomas Hoffman

Some of the major third-party software vendors that weighed in immediately after IBM's announcement last week said they will follow in its footsteps in at least some aspects: no general price increases for a while and a rollback of the processor Group 90 and 100 prices to Group 80 levels.

In the case of Boole & Babbage, Inc. in Sunnyvale, Calif., that means refunding money to the 20 to 30 users who have already paid at the Group 90 or 100 levels, according to Dave Porter, marketing manager for business development. How that will work is unclear, but Porter said they might apply the money toward future purchases by Boole.

Porter added that the company is working with a "few" customers to develop a pricing structure that is based on the number of million instructions per second actually used by the software.

"We're working with customers to get the terms and conditions applicable to a broad base," Porter said. "As customers reach agreements with IBM on usage-based pricing, we'll piggyback on that."

Some of the other independents have already rolled out new pricing policies that typically include per-user pricing.

Arnold Mazur, executive vice president at Computer Associates International, Inc. in Islandia, N.Y., which made its new pricing schedule available earlier this year, said CA will introduce usage-based pricing and "will adopt the same or similar models for licenses" that IBM creates.

Vince Niedzielski, vice president at Candle Corp. in Los Angeles, said IBM's announcements do not really apply to Candle because the company introduced its Flexible Pricing model in February. Nevertheless, he said, Candle has no plans for a general price increase for at least the next year.

Legent Corp. in Vienna, Va., has been moving toward usage-based pricing and will continue to do so, according to senior executives. Further details were not available at press time.

BMC Software, Inc. in Sugar Land, Texas, is working with customers and with IBM to develop a measured-usage model. "We, like IBM, haven't quite figured it out," said Russ Caccamisi, director of marketing. BMC already allows customers to pay based on the partitioning of the machine, he added.

Getting to know you

For most of the 200 customers gathered at a conference center in Chantilly, Va., last week, it was their first exposure to Louis Gerstner, IBM's new chief executive officer.

Thomas Woods, information systems director at Halliburton Co. in Arlington, Texas, said he "liked" what he heard. "Lou Gerstner said the most important thing IBM will focus on is the customer." At the same time, Woods said, Gerstner "admits they have some work to do. He said they're going to become experts in the industry so they know more than the customer about that business."

In general, Woods said, the tone of the meeting was "very open, very frank. Customers asked all kinds of questions, but I didn't perceive a theme."

Most of the top IBM executives attended, including James Cannavino, who heads the PC and workstation business, and Nick Donofrio from IBM's mainframe business. Robert LeBlant, who is in charge of the U.S. marketing and sales force, hosted the meeting.

Another IBM executive who attended, Ed Zschau — chairman and CEO of the Adstar storage subsidiary — said Gerstner was pretty clear about his intention to keep IBM as one large company, even while decision-making continues to be decentralized into various lines of business. "It doesn't make sense to break up the IBM organization. By being a leader in various areas of information processing, we can offer more complete solutions to customers."

Still, some users said they remember hearing this before, when former IBM Chairman John Akers declared 1988 to be the "Year of the customer." That year was also the last time IBM gathered its major customers together and provided unrestricted access to all the company's top executives.

— Johanna Ambrosio

IBM to cut prices

CONTINUED FROM COVER 1

announcement, but most said they will follow suit with no general price increases for at least a year and that they will hold the line at Group 80 tiered prices for customers who want to go that route.

Customers said they are pleased about the pricing changes, which are meant to lower the total cost of mainframe computing. As a whole, however, users reacted more cautiously to the usage model and said they will reserve final judgment until IBM provides more specifics early next year.

Rich Malone, a partner in charge of data processing at Edward D. Jones & Co., a Maryland Heights, Mo., brokerage firm, said IBM's price increases in the past have been "borderline excessive for the value that you receive. I'm hoping this is an indication that IBM has been listening to their customers."

Price choices

IBM announced two major new pricing options for host software. Per-user pricing is available for OfficeVision, SearchManager/370, DisplayWrite/370, ImagePlus/MVS and a couple other packages.

Irwin Bernstein, vice president of planning and administration at Maidenform, Inc. in Bayonne, N.J., agreed. "They seem to have done something intelligent. It all sounds very good to me," even though he said Maidenform will continue most of its new development on the PC local-area network platform.

Nevertheless, IBM is hoping that these moves will entice customers to keep their big iron around longer. "We had created an environment that was causing 'adverse selection,' " said Marty Clague, general manager at IBM U.S. in Somers, N.Y. "Our intention is to make the System/390 more competitive in the client/server environment and to allow customers the ability to run software wherever they want."

Charges played a part

Clague acknowledged that some customers had deferred consolidating two or more machines into one because doing so could dramatically increase software-license charges.

The strategy might work, some observers said. "IBM may be giving new life to the System/390 platform," said William McNee, an analyst at Gartner Group, Inc. in Stamford, Conn. "This is dramatic, and it will make it advantageous for customers to move to a bigger box." He predicted that the pricing moves will position IBM software for the company's move into parallel processing.

Although IBM has offered some options for mainframe software pricing on a limited number of packages in the past year, last week's announcement marks the first major departure from IBM's tiered-pricing model. Introduced in 1987 and widely adopted by many independent software vendors throughout the industry, tiered pricing breaks IBM's mainframe family into groups, or tiers. Whenever users move from one tier to a higher one, they pay upgrade fees.

IBM's changes follow in the path already plowed by Digital Equipment Corp. and Computer Associates International, Inc.

Downsizing dilemma

Du Pont shake-up keeps IS safe — for now

By Nell Margolis
WILMINGTON, DEL.

Du Pont Co.'s recent decision to pare a middle management layer from its $3.6 billion chemical and specialty operations is unlikely to result in the cancelation of any major information systems projects currently afoot, the firm's top IS executive said last week.

Announced earlier this month, the restructuring eliminates six business sector organizations that currently stand between Du Pont's 23 strategic business units and Chief Executive Officer Edgar Woolard.

Cinda A. Hallman, *DuPont's vice president of IS, would not rule out the possibility of job cuts in IS*

Effective June 1, the strategic business units will report directly to the firm's vice chairman or one of four senior vice presidents. Each unit will also absorb any mission-critical aspects of the business sector organization to which it formerly reported.

Cinda A. Hallman, vice president of IS, did not foreclose the possibility that a projected 200- to 300-person job cut resulting from the move would nick IS' current complement of 2,500 employees.

"There may be excesses," she said. "I can't make any judgments at this time."

However, she said, large-scale initiatives under way are unlikely to die. "If a project was ongoing in or around a sector that's now no longer in existence, certainly that project will *change*," she said. But, she added, "It probably won't be eliminated." To a great extent, IS projects owe their state of grace to the fact that they were pretailored to the slimmed-down, postreorganization Chemicals Division, Hallman said.

Proper planning

The restructuring "doesn't exactly take us by surprise," she noted. The IS forces have been aware of the coming reorganization for about a year, Hallman said, "so we've been able to do all our planning consistent with it."

Acting on the early warning, she said, initiatives launched or advanced during the past year have been tagged as either leveraged projects — i.e., those widely shared across strategic business units, such as information utilities — and unit-specific initiatives.

While she declined to detail specific projects that might change, Hallman said Du Pont's long-standing partnerships with Digital Equipment Corp. and IBM will be unaffected by the reorganization.

Du Pont has streamlined its operations during the last three years, not out of desperation but because it works, said Duff & Phelps, Inc. analyst Jonathan Sherman. "They've been able to cut out about $1 billion [in costs] over the past two years," he said.

He added, "I wouldn't read too much into the reorganization. It's about the 10th one in three years."

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IBM

News Shorts

RS/6000 gets boost

IBM unveiled seven new models of its RISC System/6000 workstation line last week, using a 45-MHz processor to boost performance in four of the low-end models by 35% to 40% [CW, May 17]. The seven models represent the second wave of RS/6000 introductions in three months. Two models have enhanced support for three-dimensional graphics, and one is an entry-level deskside server. Meanwhile, **Banyan Systems, Inc.** and IBM announced an agreement to port Banyan's Vines local-area network operating system to RS/6000 servers running IBM's AIX.

House targets antitrust worries

The U.S. **House of Representatives** approved legislation designed to encourage joint production ventures between rival high-tech firms by reducing their antitrust liability from treble damages to actual damages. Current law allows joint ventures, but the legislation is intended to overcome business reluctance to form consortia because of antitrust concerns, Rep. Jack Brooks (D-Texas) said. The bill, supported by the Clinton administration, now awaits passage by the Senate.

Saranga signs with Informix

Informix Corp. hired ex-IBM executive Mike Saranga, who was key to DB2 and AIX development, to plan future database and tools products at the Menlo Park, Calif., database company. Saranga, who took an early retirement from IBM earlier this year, reports to Chief Executive Officer Phil White. Separately, Informix announced a deal with IBM to comarket RS/6000 workstations and servers.

Suite deals

Microsoft Corp. and **Lotus Development Corp.** scored wins last week in their respective battles over software suites. Microsoft announced that **Sprint Corp.** has licensed Microsoft's Office for Windows and the Apple Computer, Inc. Macintosh and plans to deploy Microsoft application software on DOS and Windows NT as well. The value of the deal was not disclosed. Lotus, meanwhile, announced that **Zurich Insurance Group** will deploy SmartSuite and Notes. Lotus CEO Jim Manzi valued the deal at $5.8 million.

SHORT TAKES **Associated Credit Bureaus**, the credit-reporting industry trade group in Washington, D.C., said that beginning July 31, its members will adopt stricter procedures on the resale of credit reports in order to better protect consumer privacy.... **Gupta Corp.** plans to announce a special promotion for **Microsoft** and **Sybase, Inc.** SQL Server users interested in Gupta's SQL Windows development tool, cutting the usual price from $1,995 to $199 through July 31, according to a Gupta source.... **Network Systems, Inc.** in Minneapolis has anounced Greenline-IP, which is said to be the first host channel networking product to use the Internet Protocol as a native transport protocol.... **Computer Associates International, Inc.** and **Hewlett-Packard Co.** announced CA's plans to develop a CA-Unicenter for Unix systems management port to HP Apollo 9000 Series 700 Unix workstations. CA said Unicenter software designed for the HP 9000 Series 800 servers will ship this week.... **Aspect Telecommunications Corp.** in San Jose, Calif., has licensed object technology from **Edify Corp.** in Santa Clara, Calif., for use in a call transaction processing system.... **Borland International, Inc.**'s submission of an Xbase language reference manual has been accepted by X3J19, the technical committee for the **American National Standards Institute**, which is creating an Xbase language standard.

Chase unifies database view

CONTINUED FROM COVER 1

Chase's vice president of applied technology. "Now the question is, if we are one Chase, how do we make that seamless? All of our systems efforts are designed to do that."

That would mean the bank could supply a multibillion-dollar corporate customer in New York with an up-to-the-minute snapshot of investments made in many countries. It would also mean Chase could provide as much support and service for that customer's Asian and European operations as it does for its New York headquarters.

Banking industry analysts said Chase's move to client/server reflects broad changes in the worldwide banking landscape. While intensive transaction processing continues in centralized data centers, geographically dispersed business units provide banking services closer to customers and must be able to grab customer profiles and account data quickly.

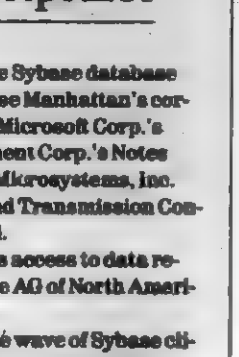
"Making better use of the data from transaction systems is a very high priority for most banks, and [using] relational databases in a client/server environment is one of the best ways to do that," said Diogo Teixeira, president of The Tower Group, a banking technology research firm in Dover, Mass.

No big surprise

The move to distributed information systems in large banks is inevitable given the industry deregulation that allows banks to operate from coast to coast — and around the world, added James Moore, president of Mentis Corp. in Salisbury, Md. Client/server architectures will, in effect, surround the tried-and-true mainframes that process and guard vital financial data.

The chief benefits of the client/server strategy, Chase IS executives said, will be more flexible systems that can be adapted to changing business conditions, the elimination of data errors caused by re-entering data into different applications and easier maintenance of applications. Costs should also decrease, Friedman said, "purely from the reduction of mainframe usage," but he declined to provide exact numbers.

Savings will stem from some aging mainframe applications that are being re-engineered to run on the less costly client/server platform and from reduced development time.



But the re-engineering process challenges both programmers and end users. "It is no longer enough to just do a functional specification," Friedman said. "You must have an application architecture, and you must have a data architecture."

Beyond that, there will be a cultural change in the way people view their work, according to Friedman. "It's a change in the paradigm that the doers and the maintainers of this technology are used to working in," he said.

The bank has made extensive investments in client/server technology to gain a competitive edge (see chart). "We got a real jump on the rest of the industry when we started to apply client/server technology back in 1988, putting our infrastructure in place," Goldman said, referring to an enterprise network of linked Novell, Inc. LANs. Of 22,000 PCs in Chase offices worldwide, some 12,000 are already on Novell LANs.

LAN foundation

The client/server layer is being built on top of the NetWare LAN using Sybase, Inc.'s SQL Server relational database management system. Sybase's System 10 will soon have a "replication" server that can copy critical data across multiple servers for use in remote offices worldwide.

Sybase System 10 Replication Server, which is not yet shipping, will be used for selected time-critical applications such as global securities trading. "One [type of] application may very easily accommodate replication every 24 hours," Goldman said, "but if you're dealing with customer inquiries, you damn well better have the last transaction."

Although Replication Server is unproven technology, Peter Kastner, a vice president at Aberdeen Group in Boston, said using it is not a risky proposition for Chase because it is an extension of working technology that propagates database updates.

"Computer scientists have been writing about the whole topic of [replication and] database locking for years. The Replication Server is an innovative use of well-understood technology," Kastner said.

Banking on IS

Chase Manhattan Bank's substantial investment

Source: Computerworld Premier 100

Bank spices enterprise with client/server potpourri

Besides Novell LANs and the Sybase database management system, Chase Manhattan's corporate standards include Microsoft Corp.'s Windows, Lotus Development Corp.'s Notes groupware package, Sun Microsystems, Inc. workstations, Ethernet and Transmission Control Protocol/Internet Protocol.

The architecture also supports access to data residing on IBM's DB2 and Software AG of North America, Inc.'s Adabas databases.

With New York as a test bed, the wave of Sybase client/server applications will flow around the globe. Additional applications are already being piloted in Europe and are planned in Asia. Sybase systems are currently being used in New York by several hundred bank employees.

—Jean S. Bozman

Tried and true

Chase designers are building new systems that empower business units to make data extracts of IBM DB2 databases at data centers. New trading applications are being written to run on Sun workstations. Other database-intensive applications may use some powerful NCR Corp. Unix machines with parallel processing. Some of the client/server applications are rewritten versions of aging mainframe and minicomputer applications.

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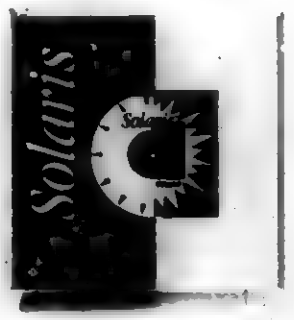

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TOCK

Users seek fit for Pentium boxes

By Michael Fitzgerald
ATLANTA

Comdex/Spring '93 will give users their first looks at Intel Corp. Pentium boxes — on display, if not yet for sale — from a number of vendors.

Users contacted in advance of the show expressed little interest in deploying Pentium-based systems, citing high costs. Some, however, said they eagerly anticipate both Pentium and its reduced instruction set computing processor rivals, such as the IBM/Motorola, Inc./Apple Computer, Inc. PowerPC initiative and Digital Equipment Corp.'s Alpha. These bleeding-edge users said they expect to gain the ability to do things they have been unable to do before.

For instance, at the Atlanta-based Centers for Disease Control and Prevention (CDC), the Pentium-led next generation of hardware technology is expected to help the agency take a big step into the future.

"We want to build a database running on a virtual network that creates a single intelligent machine across multiple databases so that the system making the query doesn't need to know where the database is and doesn't need a central index; it will just find the information," said Louis Kahn, a network administrator at the CDC. "That isn't going to work on a 486," he added.

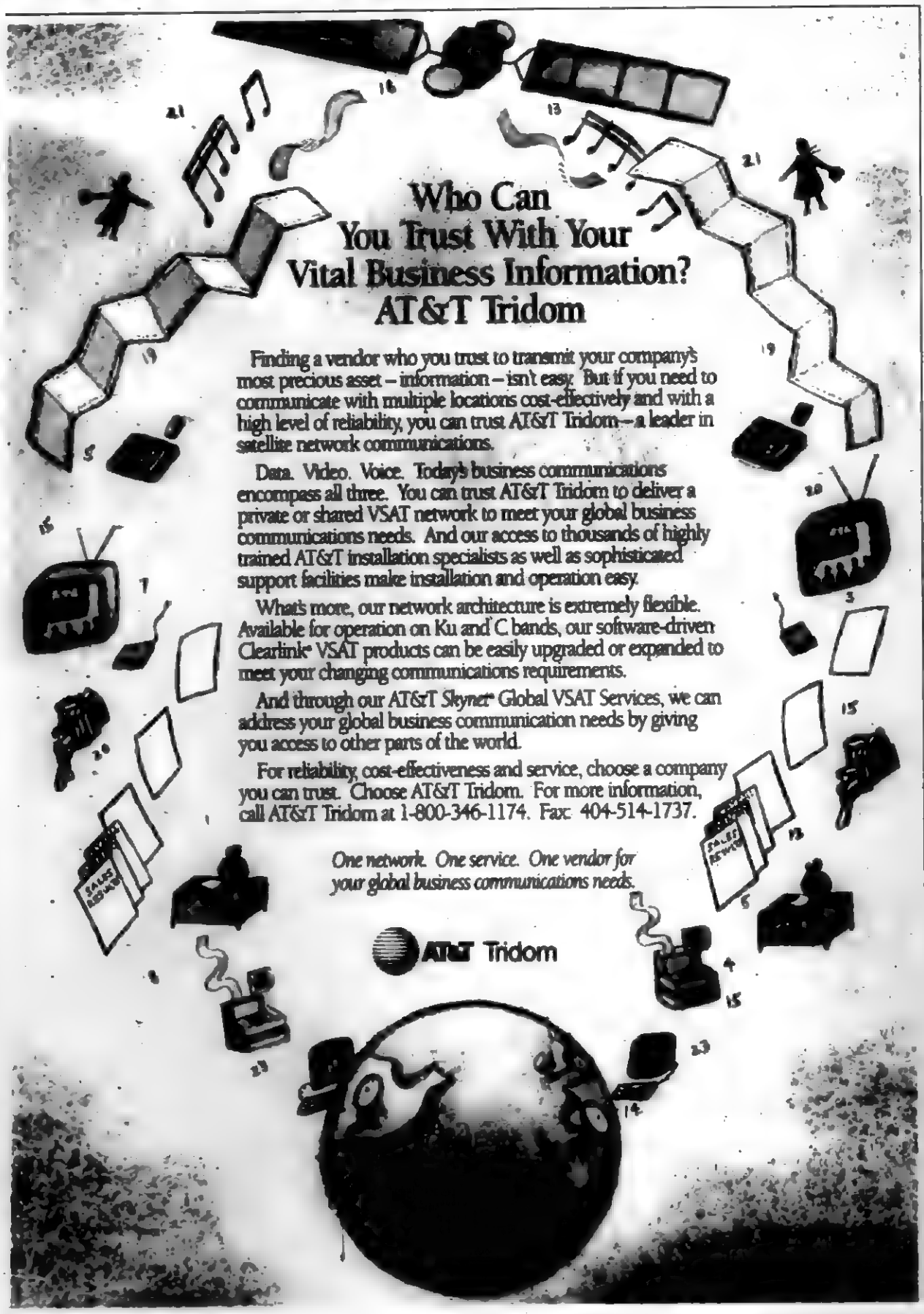
A familiar path

For the most part, though, Pentium-based systems (see chart page 40) are expected to follow the same server-to-desktop adoption cycle as did earlier Intel chips. Even early adopters of Pentium are looking to the chip to gain a power boost for day-to-day applications.

John Miller, director of office systems technology at Irving, Texas-based GTE Telephone Operations, said that while his company "sees [Pentium] as the processor that lays the foundation for us to build multimedia applications," systems will initially be deployed to boost local-area network performance.

"It took about four years for the 486 [to become the best-selling processor], and the 486 to Pentium will have the same cycle," said Richard Zwetchkenbaum, an analyst at International Data Corp. (IDC) in Framingham, Mass. IDC predicted that the crossover will occur in late 1996, with 1997 being the first year when Pentium is the best-selling chip.

Most users said they will begin buying Pentium boxes in bulk when prices get down to today's 486 levels. Most Pentium systems will cost more than $5,000 in base configurations, while 486 systems can be found for less than $2,000.



Upgrade uncertainties

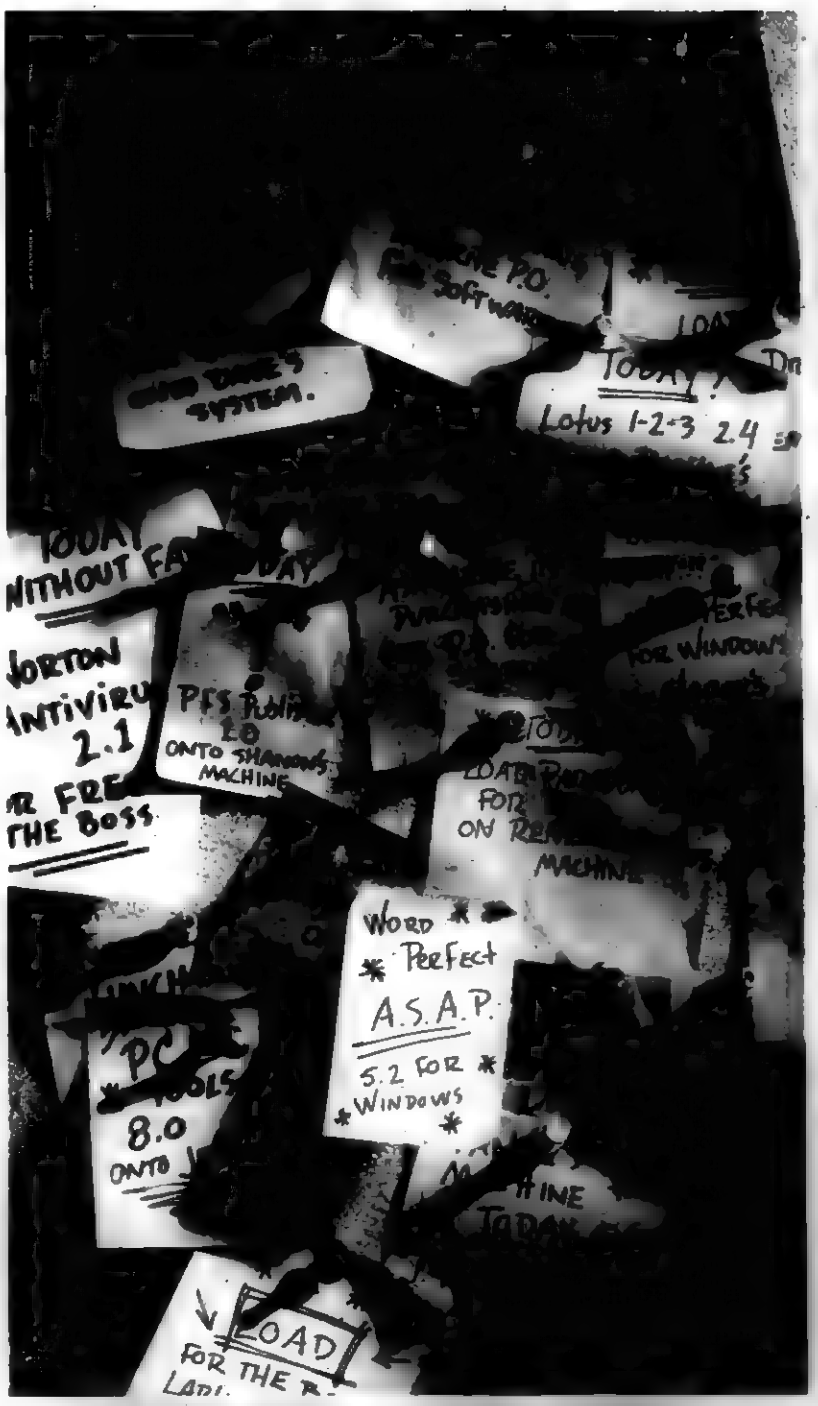
A side issue for Pentium is the upgrade socket in existing PCs. Most vendors are billing as "Pentium-ready" PCs that have a version of Intel's OverDrive chip upgrade socket, which was designed for a stripped-down version of Pentium known as the P24T. Analysts said the P24T may not be an effective way to upgrade to Pentium.

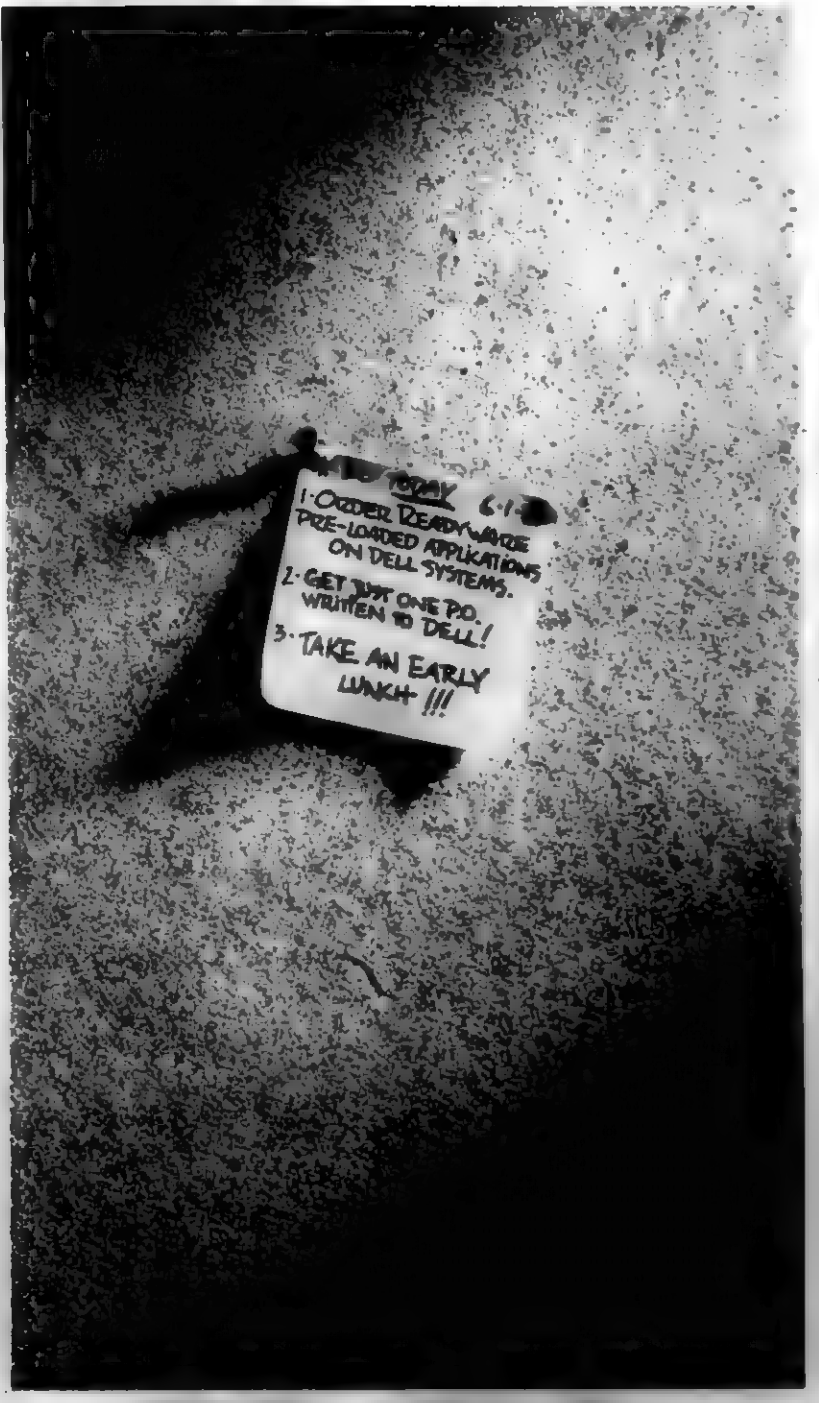
"How many of those systems have been tested with a P24T? Zero," said Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. The P24T will not ship until 1994.

Intel acknowledged that it has not kept tabs on systems vendors to make sure they are correctly implementing the P24T upgrade socket. The company said it believes most vendors have implemented the P24T socket correctly, adding it had previously established a program to work with vendors that did the job wrong.

Problems with the P24T may be moot, though, as users have tended not to upgrade systems.

—Michael Fitzgerald





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HEWLETT PACKARD

486 notebooks step into the limelight

By Michael Fitzgerald

Driven by price drops and megabyte-thirsty Windows software, notebook buyers are shifting to the 486 processor.

Looking to catch this wave in time for Comdex/Spring '93, NCR Corp. introduced its first 486-based notebooks last week, and Toshiba America Information Systems, Inc. today will expand both its low- and high-end lines with 486 processors.

They join vendors such as Compaq Computer Corp. and Texas Instruments, Inc., which also expanded their 486 product lines recently (see story page 40).

"This is the year of the 486 in notebooks," said Jeffrey Friedericha, group manager of product marketing at Toshiba, which expects 486 notebooks to make up 55% of its sales this year.

NCR introduced three models of the 3150, a 25-MHz 486SX-based notebook, and became much more aggressive on pricing. For example, a 5.5-pound monochrome version sells for $1,925, and NCR's 386SL-based 3170 currently has a base price of $2,000, down from $5,399 when it was announced in March 1992.

The Toshiba systems — color and monochrome versions of the T4600 and the Satellite T1900—have Personal Computer Memory Card International Association (PCMCIA) drives. The Satellite line has an impressive new passive-matrix color screen technology that greatly improves the display and will sell on the street for as little as $2,495.

Several corporate information systems managers reinforced the shift to the 486, saying 386-based systems frequently bog down when running Microsoft Corp. Windows applications.

The Torrington Co., a billion-dollar division of Ingersoll-Rand Co. in Torrington, Conn., intends to outfit its 120 sales representatives with notebooks, and 386-based units will not be considered, said Enrique Crespo Jr., Torrington's manager of corporate sales systems.

"Prices on the 486 have dropped so much that it doesn't pay for us to buy a 386, especially given the way technology is changing," Crespo said.

"It's only $200 or so more for a 486, and if you run Windows on your notebook, it's worth the extra money," said William Lodge, a project leader at The Turner Corp., which is also buying 486s.

The 486 portable market will grow from 100,000 units last year to 1 million this year, making up all the growth in the U.S. notebook market, according to BIS Strategic Decisions in Norwell, Mass. BIS analyst Jeffrey Henning forecast that 386 sales will fall from 1.5 million last year to 1.1 million this year, virtually identical to the number of 486 unit sales.

The T4600 refreshes Toshiba's T4400 notebook line, adding Intel Corp.'s new 33-MHz I486SL chip and the potential for a 340M-byte hard drive. It also includes support for the not-yet-official PCMCIA Type IV specification. The base price with a 120M-byte hard disk is $4,699. Monochrome versions start at $3,299.

For NCR, a 6.1-pound 3150 with a double-scan, passive-matrix color screen and a 120M-byte hard drive costs $2,815, while the 6.3-pound, active-matrix color version with a 170M-byte drive is $3,805.

The 3150 line has a floppy and a PCMCIA drive and will be the first product that works with NCR's new WaveLAN/PCMCIA card, which will give wireless connection to a local-area network.

The color versions come with nickel-metal hydride batteries, BitFax 2.0, AT&T Mail AccessPlus 2.4, Windows 3.1 and on-line documentation. The products are due to ship next month.

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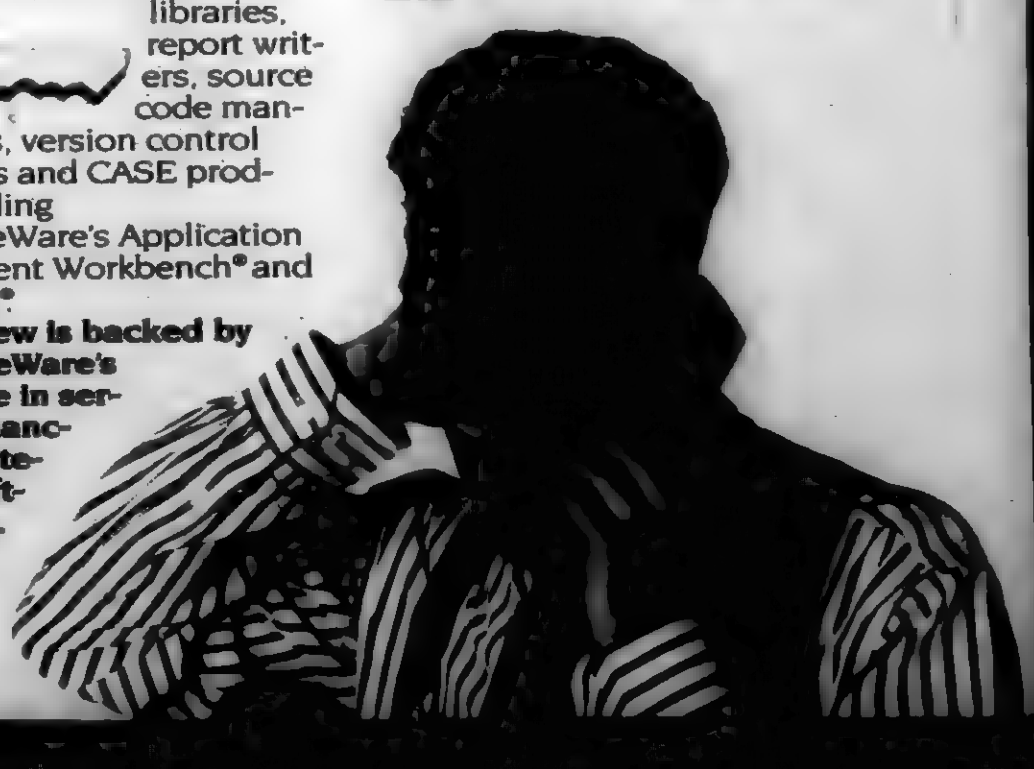

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NT: Not quite ready for prime time

By Christopher Lindquist
ATLANTA

■ On the eve of Windows NT's formal — and long overdue — introduction, it appears that the anticipated Windows NT revolution may turn out to be more of an evolutionary event.

For starters, while Windows NT will be the subject of much fanfare at Windows World here this week, after the bombast dies down, customers can expect to walk away with little more than promises.

That is because Microsoft Corp.'s next-generation operating system may not be widely available for 90 days.

Once it does ship, users will encounter yet another wait while Microsoft addresses what is perhaps the biggest issue with Windows NT today: its hefty size, which at the moment lacks a suitable platform.

Cautious rough road

And even if everything else were copacetic, analysts always recommend against a sudden shift to a new operating system.

In interviews last week, analysts said they were quick to caution anyone who thinks Windows NT may be anywhere near 100% solid when it first ships.

"Anything of the complexity and size of NT has to be looked at in the early stages as completely experimental" and in need of large interactions with a large number of users in order to catch all the bugs before it can be deemed solid, warned Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa.

Where angels fear to tread

"Anyone who uses NT as an operating system in '93/'94 is foolish," Wohl added, noting that she has told her clients to buy a few copies and "beat the heck out of it." They should find the bugs and tell Microsoft to do something about them, Wohl advised.

Meanwhile, Windows NT as of this week is still in beta testing, even as a lengthy line of third parties queues up to sing its praises and offer support. "Microsoft will have something out by the end of summer," Wohl said, noting that the company is under great pressure to do so.

One of the first significant hurdles for Windows NT is one that will not be addressed, at least not in the first version. When Microsoft began discussing the requirements for Windows NT some months ago, NT was described as needing a 386 with 8M bytes of memory to run properly. That is much more than IBM's OS/2 2.1.

The shipping version comes in a bit hefty: Users will need at least 12M bytes of memory to run it (see chart).

Focus on brawn

Size and performance are indeed the first words out of most mouths concerning Windows NT. It would "be nice if it were a little faster, be nice if it was a little slimmer," one beta-test user said. "It's not that there's anything functionally missing now; [it is a] question of performance optimization and getting all the weird things to run on it."

Getting "weird things" to run on Windows NT points out the second major issue some beta-test users have with the product: its support for 16-bit Windows and DOS applications.

While beta-test users reported that support for applications has improved and is far beyond the "100 top applications" Microsoft originally said it would support, certain applications with device drivers, such as fax and scanner software, will have to be rewritten to work under Windows NT's security scheme.

Another area that has improved for Windows NT is Novell, Inc. NetWare support. NetWare users who have tested the newest version of the NetWare NT Requester said it appears solid.

However, none of the users contacted said they plan to adopt NT on a broad scale anytime soon, citing as reasons desktop hardware limitations and indecision about which 32-bit operating system to choose.

West Coast correspondent Michele Dostert contributed to this report.

Nowhere to run

According to Bill Higgs, vice president for software research at Computer Intelligence/Infocorp in Santa Clara, Calif., Windows NT "lacks a hardware installed base that's able to run it. It needs an amount of RAM that's on less than 1% of the systems out there."

Tale of the tape

Who wins? It all depends on what you're looking for.

	Windows NT	OS/2 2.1
[illegible]	12M-16M bytes	2M-4M bytes
[illegible]	80,000+	30,000
[illegible]	130	IBM claims more than 1,200
[illegible]	Runs most 16-bit Windows and DOS applications; some require special "Virtual Device Drivers"	Runs most 16-bit Windows, DOS and OS/2 applications, including Windows 3.1 programs
[illegible]	June 1993, but could be as late as September	June 1993
[illegible]	$495; Upgrade $295	$249

Microsoft

CONTINUED FROM COVER 1

will allow OLE 2.0-compliant applications to communicate.

In addition, Microsoft will support non-Microsoft systems, such as Unix clients and hosts and Apple Computer, Inc.'s Macintosh, in order to keep things as flexible as possible for customers.

We are "trying to put into place a multivendor, open computing environment," said Dwayne Walker, Microsoft's director of Windows NT and networking products.

The open question

Despite Microsoft's claims of "openness," some still view the company as quite proprietary, demanding complete control of core technologies.

"Open client/server architectures are going to be here this year," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

At least one Microsoft customer said he had little faith that open systems could solve his problems.

Not what it seems

Microsoft will showcase more than 130 Windows NT applications at Windows World this week, with at least half of those packages falling into the realm of application development tools. About one quarter of the software is system utilities and networking software. End-user applications account for only about 10% of the mix.

"What I'm interested in is solutions, not theory," said George Roukas, systems director at a Fortune 50 financial services company. "Microsoft makes things work; the Unix world does not."

Microsoft acknowledged that it cannot support a client/server infrastructure on its own. Instead, the company will focus its efforts on its strength — writing software — and on working with partners at all levels to develop and support installations, Walker said.

More support staff

That does not mean Microsoft will not work directly with customers. The company has expanded its support staff to more than 2,200 people, including some 280 Windows NT support engineers. In addition, it reportedly is hiring support staff from the Unix, minicomputer and mainframe worlds to increase its ability to deal with enterprise systems.

But making things work on as wide a scale as Microsoft is attempting is problematic. The company hopes to succeed by offering individual pieces of the architecture that provide value in and of themselves.

Windows NT still lacks some features necessary to make it a truly rich client/server operating system, according to some users and analysts. In particular, it lacks a distributed file system that would allow networks to be treated as one system rather than as a series of drives. And Windows NT is a rather large system to be run as a client.

Microsoft has announced Chicago, a 32-bit, multithreaded operating system that will combine peer-to-peer functionality and solid networking in a smaller package than currently exists with Windows NT.

At least one customer at a large financial institution does not think Microsoft fully understands the size of its task. "They don't have the resources," he said. "And it will take us man-years and man-years to be able to get ready to [re-engineer] just internally."

Other observers were more optimistic.

"I think that Microsoft has a very good handle on what is necessary to move the industry to client/server," said Tom Kucharvy, president of Summit Strategies, Inc. in Boston. It is "one of the few vendors that can mobilize the infrastructure and PR to make it successful."

Support adds target IS needs

Microsoft's commitment to Windows NT support extends to a variety of new and expanded programs, including the following:

- 30 days' free support for setup and installation.
- Support via various electronic bulletin boards and subscription services.
- A Certified Professional training program under which support personnel can be trained and certified on Microsoft products.
- A list of known bugs will be shipped with every copy of Windows NT; patches and workarounds will be provided electronically.
- A Premier support option that provides a designated Microsoft engineer with as little as one-hour response times available 24 hours a day, seven days a week.

— Christopher Lindquist

OS/2 2.1 sneaks past NT

Enhanced 32-bit system fights to stave off Microsoft challenge

By Christopher Lindquist
NEW YORK

IBM beat Microsoft Corp. to the punch by announcing the latest version of OS/2 a week before Microsoft's scheduled unveiling of Windows NT. But observers questioned whether OS/2 Version 2.1 has what it will take both to counterattack the Windows-dominated desktop and to hold off an assault from the upcoming Windows NT on the server.

When it ships June 14, a faster OS/2 2.1 will come with a variety of enhancements, including much-improved video performance, support for Windows 3.1 applications, integrated multimedia and power management (see chart page 28).

IBM also demonstrated future products that allow workgroup collaboration with an electronic white board, speech recognition/translation and "drag-and-drop" network management with LAN NetView.

On the front line

IBM will also pump up OS/2 on the marketing end, fielding a dedicated sales force for the first time ever. "We now have a dedicated sales force that will be on the front line in large accounts," said Lee Reiswig, president of IBM's Personal Software Products Division.

Other innovations include software incentives for resellers and possible bundling deals with application developers and hardware manufacturers — all of which are intended to give IBM a more visible presence in the market. Reiswig said he feels a "critical mass" for OS/2 would be about 3 million copies. The most recent figures from IBM put the total number of OS/2 copies at about 2 million.

Lee Reiswig: *Count on OS/2 marketing to be pumped up*

Vendors such as AST Research, Inc. will offer OS/2 preloading as an option. Reiswig noted that the current trend by hardware vendors is to custom-configure systems. When asked whether IBM support for NT in some areas plays to Microsoft's advantage, he said, "It has to be as disturbing for Microsoft for IBM to have AST, ALR and Dell offering OS/2."

Reiswig also said built-to-order systems will help level the playing field for operating systems by taking away some of Microsoft's advantage. Windows is preloaded on a great many PCs.

While Microsoft dribbles out Windows NT products in phases, IBM, too, will spend the rest of the year releasing various OS/2-related components, Reiswig said. Among these pieces will be a summer release of the DOS version of the Workplace Shell and delivery of the System Object Model and Distributed System Object Model later this year, along with beta testing of peer-to-peer networking support.

Also slated for a fall beta test is an early Taligent layer, "object technology frameworks," that will be ported to OS/2 and AIX, IBM's Unix version.

OS/2 2.1 will be available at a promotional price of $99 on CD-ROM or $119 for floppy disks. OS/2 users who upgrade will be eligible for a $30 rebate.

Despite these efforts, Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa., cautioned IBM against slowing down. "If they take their eye off that ball, it's going to melt again," she said.

Utilities

Windows NT management to work with third parties

By Elisabeth Horwitt

■ Microsoft Corp. has fitted Windows NT with some of the most sophisticated management utilities available for any commercial operating system, according to one beta-test user. However, the vendor is counting on third parties to provide centralized, real-time management of distributed enterprisewide NT installations.

Fortunately, there seems to be no lack of candidates for the job, including Tivoli Systems, Inc., Computer Associates International, Inc., Digital Equipment Corp. and, reportedly, Candle Corp.

Microsoft is giving systems administrators "all the essential ingredients" for managing Windows NT clients and servers through a series of utilities built into the operating system, said Claude King, senior systems analyst at the University of Florida in Gainsville.

One key utility logs system events so that the administrator can analyze the causes of a system crash or overload. A second utility monitors performance parameters such as CPU use; a third tracks software and hardware configurations.

The utilities are accessible remotely so that, for example, an administrator on a central Windows NT console can run a performance check or initialize a series of remote NT workstations.

The NT Advanced Server will ship with graphics-based applications for centrally managing user access to network servers and applications, as well as backup and uninterruptible power supplies, a Microsoft spokeswoman said.

Slated for a later introduction is a product code-named Hermes, which was designed to centrally manage a network of NT, Windows 3.1, IBM OS/2, Novell, Inc. NetWare and DOS client/server systems, the spokeswoman said.

"Hermes is designed to help people better support [client/server] networks, to track and respond to user concerns and effectively run applications off the server," she said. However, the product does not provide "full-blown, real-time monitoring of multiple network systems or mapping of the network," she added. Third parties will provide that.

Nor is Microsoft providing network management. "We'll integrate with third parties to do that," via support of the Simple Network Management Protocol, the spokeswoman said.

Tivoli plans next week to be first out of the gate with an NT management platform. The Austin, Texas, firm will announce an NT version of its object-oriented framework for managing distributed systems that already manage Unix.

Also to be announced is a Windows NT version of Tivoli/Works, the first in a series of NT systems management applications for configuration and performance management, troubleshooting and job scheduling.

The applications, from Tivoli and its partners, will roll out through next year.

Comdex Preview

If there are three, is it still a keynote?

With an estimated 75,000 attendees, one keynote speaker is not enough for Comdex anymore. Monday's keynote is James A. Cannavino, senior vice president and general manager of Personal Systems at IBM. Windows World's keynote, Microsoft Corp. Chairman and Chief Executive Officer Bill Gates, is introducing Windows NT. On Tuesday, Robert Palmer, CEO of Digital Equipment Corp., and Jim Manzi, Lotus Development Corp. president and CEO, will give the CEO's perspective.

Is Clinton helping?

Panelists will talk about how Clinton administration technology policies might help or hinder the global computer industry in the next few years. The discussion is at the Crystal Ball Plenary session on Wednesday.

Computerworld honors Windows users

Computerworld will present awards to outstanding developers of custom Windows applications. Finalists' applications will be demonstrated at a *Computerworld* booth, and Bill Gates will present the awards at a special ceremony at 3 p.m. on Tuesday.

OLE 2.0 demonstrations

Twenty-four application developers will demonstrate at Windows World that Microsoft's Object Linking and Embedding (OLE) Version 2.0 is more than just a concept. They will show OLE 2.0 working across Microsoft's Word and the Excel spreadsheet. Third parties demonstrating OLE 2.0 applications include Blue Sky Software Corp., Calera Recognition Systems, Inc., Corel Corp., Labtech, Inc., NCR Corp., Shapeware Corp. and Summit Software Co.

Where voice and E-mail meet

VMX, Inc. in San Jose, Calif., will announce a product that delivers voice-mail notifications as part of the user's electronic-mail system. Called VMXmail, the client/server-based system works with Lotus Development Corp.'s CC:Mail and Microsoft's Mail and runs under Microsoft Corp.'s Windows 3.1 clients. On the network side, the system supports Novell, Inc. NetWare or Microsoft LAN Manager networks.

When it has to get there overnight

The fastest ships in the business and two big technology users, United Parcel Service, Inc. (which has sunk $1.8 billion into information technology) and Federal Express Corp., are exhibiting the technologies they use. Federal Express will also preview products due this summer that will let customers track packages in-house and on-line.

Put your graphics on TV

IBM will play a multimedia card by announcing, with VideoLogic, Inc., a $500 stand-alone box that converts PC graphics into video that can be displayed on projectors or televisions. IBM will also feature the latest in ergonomic design at its booth: chairs from Formimco that were designed to help people avoid problems such as carpal tunnel syndrome.

Lost in space

Sergei Krikalev, the Russian cosmonaut stranded in space for 313 days, will show how he used Videx, Inc.'s bar code reader to track inventory aboard the Russian space station.

A cooperative, productive future

Council on Competitiveness unveils vision of a 21st century information infrastructure

By Willie Schatz

THE COUNCIL on Competitiveness has seen the future, and it is a 21st century information infrastructure that will enable all Americans to access information and communicate with one another easily, reliably, securely and cost-effectively in any medium — voice, data, image or video.

The council, a nonprofit, nonpartisan group of chief executives from business, education and organized labor, unveiled its "Vision for a 21st Century Information Infrastructure" at a press conference earlier this month. (It is a capital offense to confuse this council with the Competitiveness Council, a defunct creation of the Bush administration.)

The council claims that a new information infrastructure would enhance worker's productivity and lead to dramatic improvements in social services, education and entertainment.

Four-pronged approach

The group's infrastructure is divided into four parts: 1) a set of widely accessible and interoperable communications networks; 2) digital libraries, information databases and services; 3) information appliances and computing systems that are easy to use; and 4) trained people who can build, maintain and operate these resources.

But can council members such as Cray Research, Inc., IBM, Pacific Bell, Ameritech Corp., Electronic Data Systems Corp. and Microsoft Corp. — firms that take no prisoners in the daily competitive jungle — come together to create the private sector consensus?

"The council has brought together a lot of competing industries, which will do their best to develop a common ground," said Robert Thomson, senior vice president of communications policy and planning at Tele-Communications, Inc. in Denver, the country's largest cable television station provider. "We will do that because the new information infrastructure is so important to the companies and to the country."

It is important to the country, Thomson argued, because such an infrastructure would allow everyone — from the most erudite techie to the newest neophyte — to communicate freely via an interactive, high-speed nationwide network. In Thomson's vision, such a network will guarantee that all elements of society can be heard and therefore make the country more open to diversity.

According to the council's vision statement, the means to achieving those ends include establishing short-term goals and programs that accelerate progress toward a variable-bandwidth, digital, interoperable set of networks that are easy to use and widely accessible. And rather than picking winners among technologies or choosing one technology platform, the council contends that the U.S. should pursue a multifaceted strategy that is ambitious but also flexible and realistic.

Focus on key projects

The council says it intends to profile key pilot projects and demonstration programs in areas such as health care, education and manufacturing.

Then, the group plans to set up a process to isolate make-or-break concerns and develop a core private sector consensus about what the group calls "several thorny policy issues that cut across the communications networks, computing systems and databases that constitute the physical infrastructure."

Finally, the council will work with other organizations to address questions related to the status of the information infrastructure's underlying technologies.

Schatz is a free-lance writer based in Washington, D.C.

Easing the transition

The Council on Competitiveness' most immediate objective is to make users comfortable with the technology and applications the current network can readily deliver.

Beyond that, the council has proposed three methods to provide digital service to a broad audience:

- **Target the underlying technology that will create a new platform for the delivery of goods and services.**
- **Redirect federal research and development programs toward practical U.S. business and consumer needs.**
- **Champion specific regional proof-of-concept experiments that hold promise for stimulating encouraging applications, such as "Smart Valley," Silicon Valley's attempt to bring together information services, digital devices, advanced infrastructure and people who are trained to use them.** — *Willie Schatz*

Can I borrow the keys to the dirigible?

ONE HUNDRED years ago this month, the World's Columbian Exposition opened in Chicago. Showcasing American invention and energy, this grand exposition embodied the widely held belief that technological marvels — such as commercial electrical power and telephony — had the power to transform society.

Heralding the exposition, the American Press Association (APA) in New York commissioned the nation's leading lights to predict what the world would be like 100 years hence — in 1993. Their predictions have been compiled in *Today Then* (American & World Geographic Publishing, 1992, 226 pages, $12.95), featuring 74 of these essays.

"As with futurists closing the 20th century, the 1890s APA writers frequently fell victim to two beliefs: that technology could and would solve society's problems [and] that human nature would change dramatically for the better," Dave Walter wrote in his introduction to the book.

With its mixture of accurate and wildly inaccurate forecasts — sometimes appearing in the same sentence — *Today Then* belongs in the library of any prospective prognosticator.

Its predictions include the following:

"Each reasonably well-to-do man (and there will be lots of them in the 1990s) will have a telephote [sic] in his residence. By means of this device, the entertainment of any place of amusement in that city may be seen as well as heard." — *Octavus Cohen, newspaperman, lawyer and musician.*

"It will be as common for the citizen to call for his dirigible balloon as it now is for his buggy or his boots.... The electric telegraph will be supplanted by the telephone, which will be perfected and simplified. Telephone instruments, located in every house and office, will permit the communication of business and society to be conducted by the voice at will from Boston to Moscow and Hoang-Ho, just as readily as now between neighboring villages." — *John James Ingalls, politician and orator.*

"Free [mail] delivery will be universal.... Also, the telephone and the telegraph ... will be extended to within everyone's reach." — *John Wanamaker, Philadelphia merchant and postmaster general (1889-93) under President Benjamin Harrison.*

"I presume that a [railroad train] speed of from 90 to 100 miles an hour could be secured with modern locomotives and with the improvements which are sure to come." — *George Westinghouse, inventor.* (In 1992, Amtrak's Metroliner traveled at 125 miles per hour.)

"Considerable traveling will be done by the air route.... Man has simply to invent the kind of boat.... This boat may be guided from city to city by a wire strung about 100 feet above the ground, so as to let the balloon pass over trees and houses." — *David Swing, editor and Presbyterian minister.*

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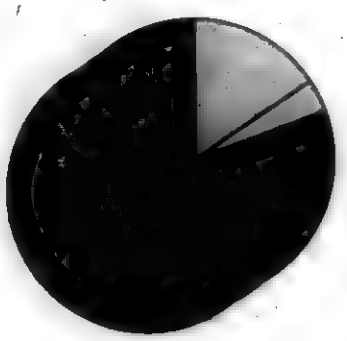

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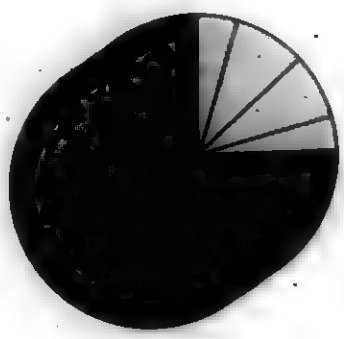

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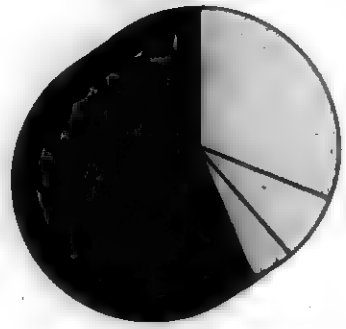

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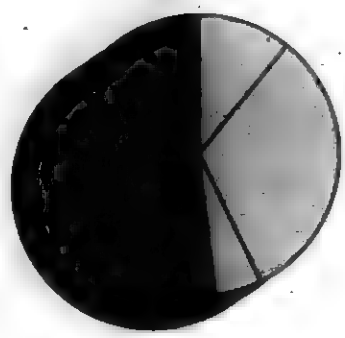

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Great expectations

You'd have to go back to the marketing foreplay of IBM prior to its announcement of the PCjr, the ill-fated home computer, to find an event as extraordinary as Windows NT.

The Peanut, as the home computer was called, got such incredible media coverage before its arrival that it actually froze sales of competing machines during the crucial December selling season, as IBM did nothing more than orchestrate a few well-placed media leaks. Of course, the home market never materialized, and Peanuts shriveled on store shelves or were sold at fire sales.

Back to NT. In the last two weeks, our office has logged scores of phone calls from vendors clamoring for attention at this week's Comdex/Spring '93 extravaganza. It seems many, if not most of them, are hawking products claiming to be NT-compatible — whatever that means.

IS publications, including this paper, have been jammed with NT stories. Market research companies have already made "firm" predictions of NT's market share in 1996.

This much is known: Hundreds of application developers have been beta-testing versions of the product. Microsoft has repeatedly said the actual ship date of NT (which a year ago was set for late 1992 or early 1993) would depend on input from the beta-test users. There are no firm ship dates in sight. Put two and two together.

Also, Microsoft originally announced Windows in late 1984 but did not have a version that was ready for prime time — namely Windows 3.0 — until 1990, after which Windows achieved outrageous successes. Windows was more or less a DOS shell. NT is more or less an entirely new, multiplatform operating environment.

This much, too, is known: The needs of corporate developers for highly functional cross-platform operating environments are both great and immediate. Developers cannot wait two or three years for a new environment to ripen, should that be the case for NT — which is not to say it will be. All that can be determined is that the development of solid NT 1.0 has been a more daunting task than Microsoft had realized. Otherwise, the product would be on sale today.

If Microsoft can deliver an operating system that successfully manages data on everything from PCs to high-performance servers to minis and mainframes, I will say right here that such a feat would be the single most significant technological achievement in the history of computing. In fact, NT needs to be nothing less than that if it is to live up to its preshow billing.

Bill Laberis

Bill Laberis, *Editor in chief*

Double trouble

I don't know where you got your information for removing MS-DOS 6.0 DoubleSpace, but it obviously is not from reading the instructions ["Bugs: A fact of life," CW, May 3]. In the README.TXT file, Section 7, Part 6 are the complete instructions for removing DoubleSpace, neither of which involve reformatting the hard drive.

If all else fails, read the instructions; words most PC users don't want to hear.

Dongo Tull
Cincinnati

Strong case for CGI's PacBase

We have been running CGI Systems, Inc.'s PacBase in this shop for about two years, and I have been curious why more shops weren't selecting this particular computer-aided software engineering tool.

Without being too specific for fear of violating my nondisclosure agreement, I've found that CGI has been and continues to be dedicated to AD/Cycle requirements. If IBM wants to make AD/Cycle happen, all they have to do is close this deal and start pushing it into the Big Blue shops.

Let's hope they close this deal quickly. I'd love to be in the cat-bird seat on this.

Dan Alexander
Programmer
Computer Sciences Corp.
Tacoma, Wash.

Right support

Under ideal conditions, Richard Finkelstein's commentary "Don't forget support" in your Integration Strategies section [CW, May 3] makes IS management's life appear to be pretty straightforward. Unfortunately, most firms don't have ideal conditions.

Once the client/server hardware is up and running, that part of the equation is fairly stable. Problems are seldom hardware-related because today's hardware is so reliable that it seldom breaks down.

On the other hand, if a firm expects software suppliers to support software that must interact with many other software packages and is used by less than technically competent users, it will be doomed to failure.

The trend is not to rely on others to provide the support but to retain greater ownership of user support. In this way, the IS organization can serve itself — at least for the majority of the frequently asked problems/questions.

With the right help desk system in place, IS management may become intelligence management for their firms.

Greg Chambers
Sunnyvale, Calif.

Matter of metrics

"Measurement programs need vision" [CW, May 3] emphasizes the need for the strong support of senior managers if a metrics effort is to succeed. How do you get that kind of enthusiastic backing?

Many metrics programs never get that kind of support because the originator at the lower management level doesn't consistently deliver a clear message about how the organization will benefit.

One way to gain support is to just start collecting facts about one or two processes that you know are problem areas and to make a few graphs.

Let the senior manager take the public credit for the program. Just keep your graphs in a folder marked "salary review." They could make for a profitable private discussion in your future.

Bob Moran
Systems engineer
Electronic Data Systems
Piscataway, N.J.

Licensed to manage

Regarding "Users align on license demands" [CW, April 19]: What IS executives should employ is a software asset manager responsible for an inventory and budget management system. This should also include a well-planned strategy for handling negotiations with vendors for the acquisition of new software and a strategy to eliminate redundant software within a portfolio.

Until this happens, vendors will continue "laughing" all the way to the bank.

Mary Jo Hodgen
Novato, Calif.

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Forget the handcuffs: Focus on sensible licensing

Priscilla Tate

On my way out of New York on business recently, I focused for a moment on something other than the traffic. It was a billboard featuring handcuffs and a toll-free phone number. Bored but curious, I wondered what kind of "bring 'em to justice" program was being advertised. I moved closer and discovered the Software Publishers Association (SPA) was trying to tell me what they do to people who don't pay for software.

Many people think reasoned discussion makes more sense than this kind of hysteria. In 1991, for example, the Microcomputer Managers Association (MMA) published a position paper on network software licensing, partly as an antidote to propaganda put out by SPA's Anti-Piracy Committee.

In that paper, we pointed out the difficulties users face trying to understand how copies of their software may be used and distributed. We noted that there are as many different software licenses as there are software publishers, and the language of most licenses is largely based on first-edition software "legalese" written for a single-machine, single-user, non-networked environment.

Organizations such as yours and mine don't steal software. We do our best to comply with convoluted and sometimes conflicting software licenses. But we are technology managers, accountable for the smooth business functioning of our organizations. We aren't software auditors and disciplinarians whose primary purpose in life is to see that software publishers collect what is legally due them.

What we need is a path of least resistance for software use — standards that are easily understood, not threats of litigation.

Granted, it's a legal mess. But the MMA took the lead, and others have joined us to make a series of constructive recommendations about distributing documentation and metering software for concurrent use. A few software publishers have requested and are using these guidelines.

What irks me is that there is a vocal group within the SPA that plays only one note. I have two questions I'd like to ask:

1. If this committee has initiated a new case a week for the past two years, all of which have been settled out of court, what has it done with all the money? Has it used it to buy billboard space and fund toll-free phone numbers for rats?
2. What does the SPA think litigation accomplishes? As far as I can see, the answer is nothing. Some countries outside the U.S. are moving to legalize copying of software to avoid costly litigation.

Software piracy is an ethical and social problem, raising issues that litigation alone can't solve. Instead of pointing fingers, we should be working together to put software licensing in perspective.

We can negotiate software support agreements that specify not just price but also how software is used, how documentation is distributed, the number of upgrade releases that will be handled during a given time, the level of support and how it will be provided.

The issues are complicated. But if we approach them as collaborators rather than combatants, we can all get what we want.

Tate is executive director of the Microcomputer Managers Association.

Have tools, lack talent

LISTEN UP! *by* Elaine Bond

For as long as I can remember, there has been frustration over the lack of progress in improving application development productivity. We should be over this hump by now or at least, given some of the new application development enablers I've seen recently, close to getting somewhere. But, for a number of reasons, I don't think relief will come for quite a while.

There are products emerging that could dramatically improve application productivity. The holdup has to do with our current population of application developers.

The problem isn't a lack of quality tools. There are some very powerful and promising products emerging that could dramatically improve application productivity. The holdup has to do with our current population of application developers, which is split into two camps — the old guard of mainframe-centric programmers and distributed computing types.

The old guard currently has responsibility for the so-called mission-critical applications, and because they are frequently the only ones who know how these applications work and how to tweak them for day-to-day changes, they wield considerable power.

They are the masters of what "has been" and have absolutely no incentive to try new tools or invest in learning new approaches.

Meanwhile, scattered across decentralized departments are the PC LAN cowboys. These frontier riders are willing to try just about anything that is certifiably new, but they also disdain discipline and pick up and discard with dizzying frequency. They speak C++, they think objects, and they don't know flowcharts or even what software life cycles are all about. They lack not only the power but also the experience and the skill to tackle large, complex applications.

So here we are with promising productivity aids (all of which require some investment in time, money and attitude change) and a marketplace that is seriously misaligned. Experienced application developers and analysts in powerful positions could benefit from the products now emerging but have no motivation to undertake the complete retraining required.

Receptive eager beavers in the distributed setting are willing to try these products but have no application portfolio on which to show off the tools and, therefore, cannot justify the investment.

This situation isn't hopeless, but it does require more and better leadership from the senior levels of IS management.

Top-level IS managers need to find and empower frontline managers who are willing and able to make the kinds of changes necessary to achieve higher application development productivity.

More must also be done to blend the skills of the two development camps. Mainframers and PC LAN types can learn from each other if given a push. Left to their own devices, however, they will never mingle. IS managers must be willing to dedicate some resources to scouting technologies and overseeing implementation.

Eventually, these new tools will find their way inside. The only real question is whether they will be brought in rapidly by developers able and willing to use them or find their own way in slowly, after having been equipped to replace the recalcitrant human element.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank NA. She is a founder of the user advocacy group Open User Recommended Solutions (OURS).

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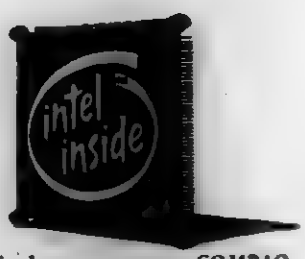

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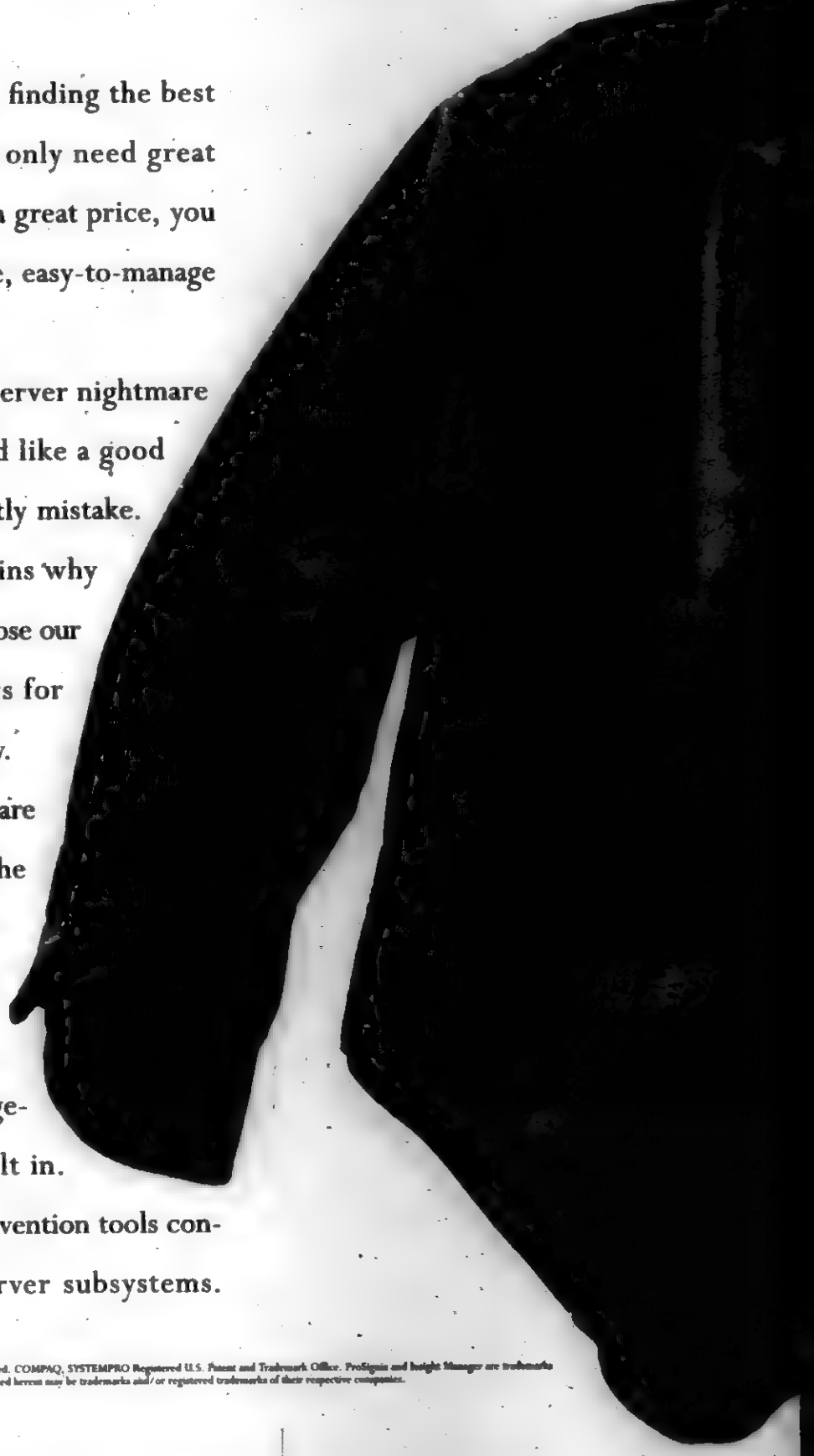

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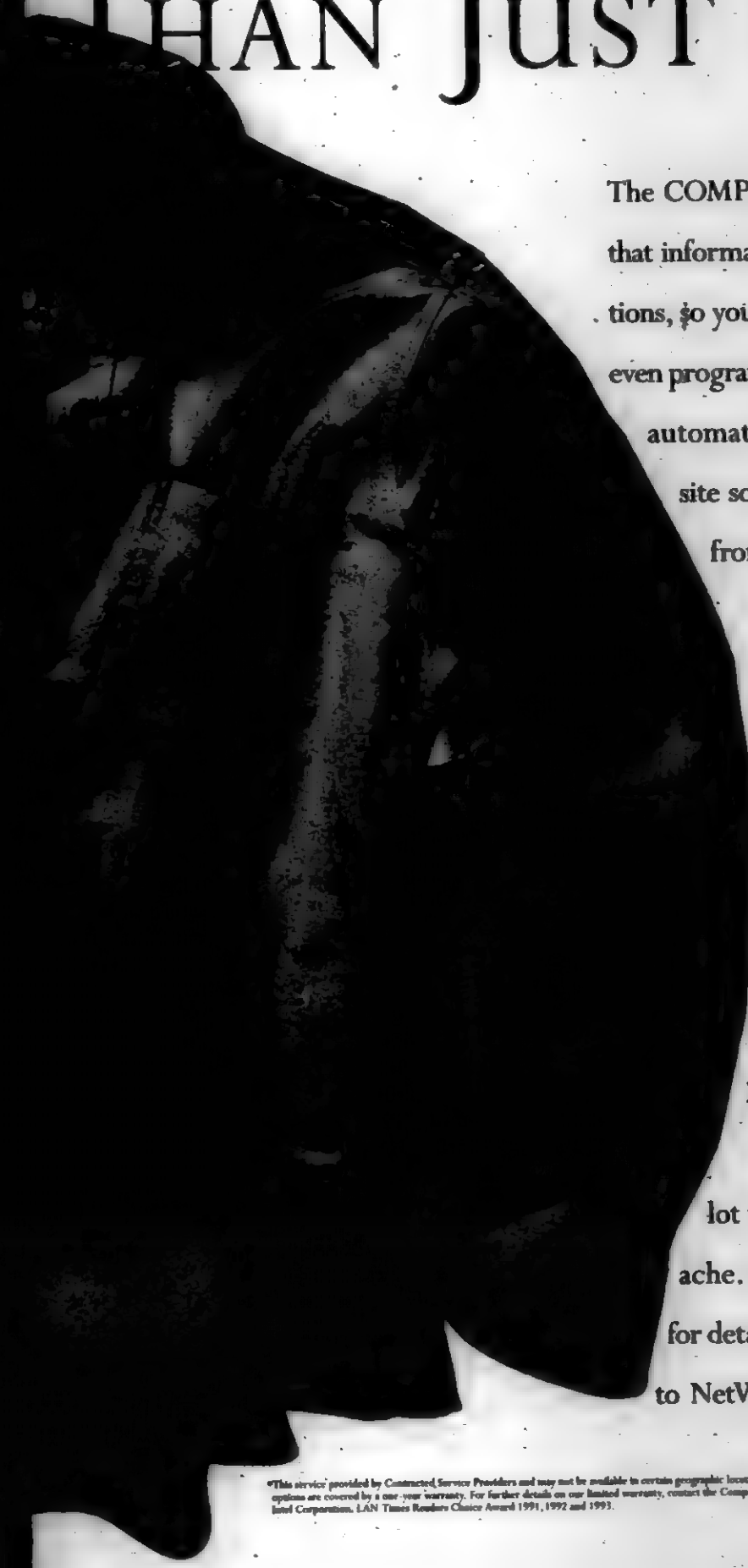

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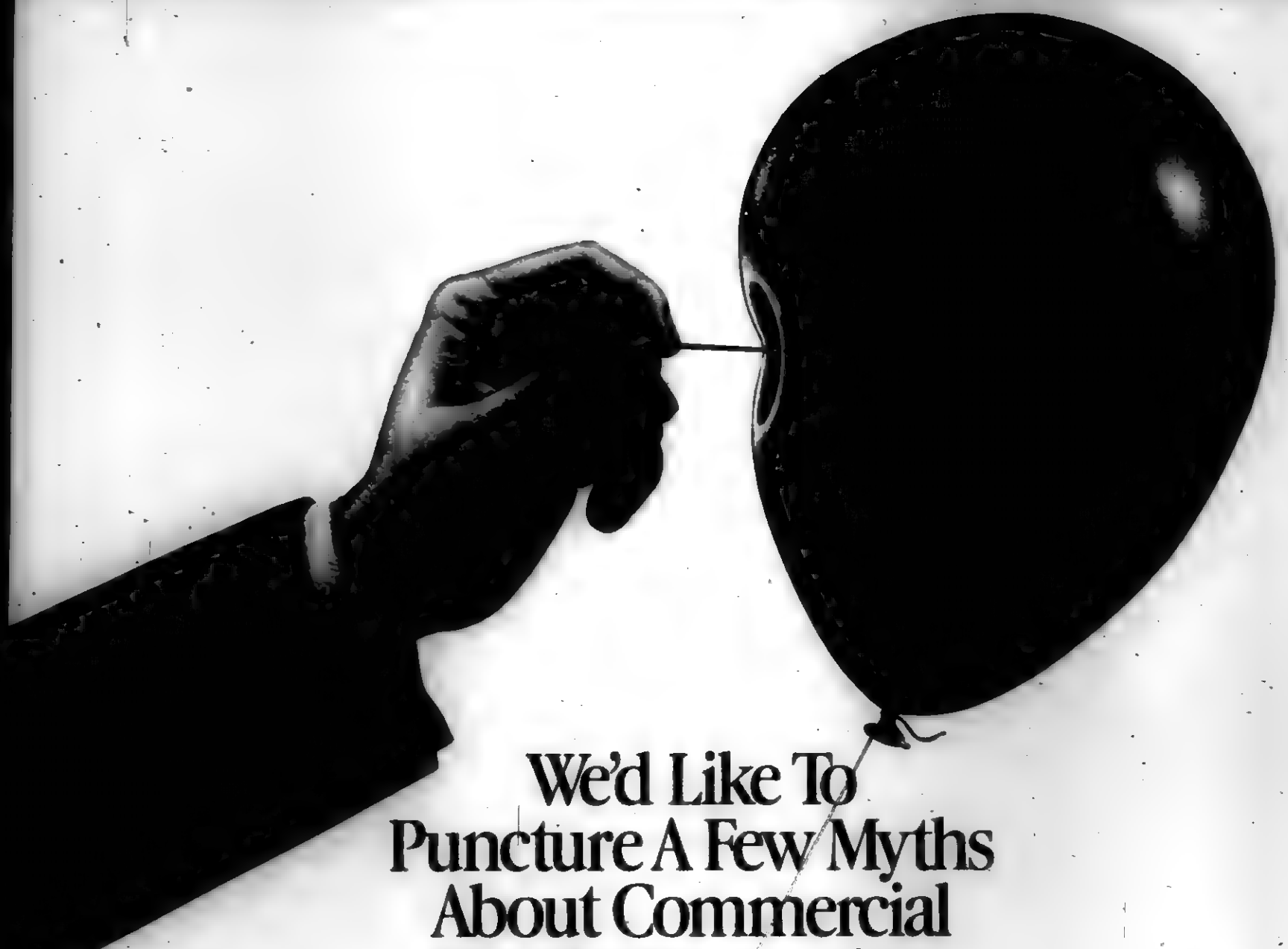

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Charles Babcock

NT: An open possibility

Will Microsoft's Windows NT fit anyone's definition of an open system? If it is anywhere near as successful as DOS and Windows, either in terms of copies installed or the size of its development community, it will end up a contender as a de facto open system.

Any attempt to label NT an open system will be furiously resisted by Unix fans, but it looks to me as if the rules are changing for those who must make decisions on moving to open systems. As far back as 1969, the Racal-Interlan book *Interoperability* signaled that a shift was in the offing, noting that standards, a key part of openness, were no longer coming out of committees. "A particularly successful product creates its own standard. Success feeds on itself," it said, in reference to Unix at the time.

One wonders how good a criterion "success" is for open systems. If Windows NT is a "success," will that make it as open as Unix? Not necessarily, but there are precedents.

A strong example of a de facto open system is Novell's NetWare, which not only dominates the LAN market with more than 70% of the market share, but has been geared to function with other vendors' technologies. It is an open system because of its owner's respect for the community of interest that has grown up around it.

Can IS managers depend on vendors to treat a product line as open? There is no safe answer to this question. As long as a vendor retains development control of a product, there is always some risk that it will be closed off and the IS manager left at the mercy of a vendor that wants to raise prices and sell add-ons.

Even if Microsoft sells millions of copies of NT, can we be sure the company will keep a broad range of competing network connections and interfaces open to it? What if third parties develop add-ons that Microsoft would rather sell?

An IS manager has to gauge the vendor's attitude toward the community of interests that come to focus on a product line. If a vendor heeds user needs, follows standards and keeps the system open to third-party developers, then I'd say a proprietary system can be described as having some degree of openness.

Recently, the Unix community moved toward putting the Windows GUI on RISC workstations. Microsoft's willingness to license Windows under Unix was directly tied to Sun's ability to put a Windows application binary interface on the market. Perhaps one guarantee of openness is competitors' ability to force the issue.

Where there is no prospect of competition, the IS manager can conclude there are fewer guarantees on openness.

Unix at this point has an "open" advantage with multiple parties collaborating on its development and competing to deliver the best version. But what if use of Unix slows? What good is an open system that no one is migrating to anymore? To be "open" and worthwhile, a system has to have a vigorous life as well as standard interfaces.

IS managers must focus on this interplay between proprietary and disinterested forces, between marketplace success and standards. Because IS managers no longer have the luxury of buying from one vendor, they are faced with the task of integrating dissimilar systems and must decide what is most likely to be sustained as an open product line.

The tension between "open" and "proprietary" will increase as Windows NT hits the market. IS managers will have to gauge its technical merits against Microsoft's commitment to openness, with no sure measure of the latter. Microsoft does have a record of supporting strong third-party development, however, and that community may serve as an effective watchdog of system openness.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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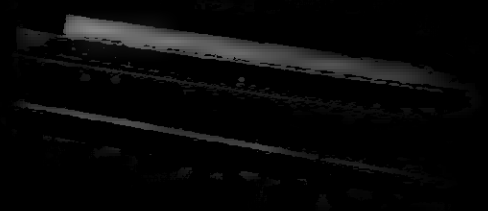

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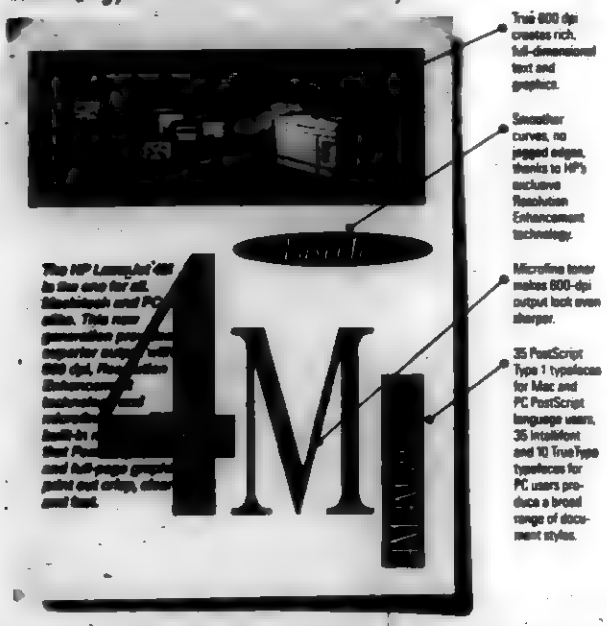

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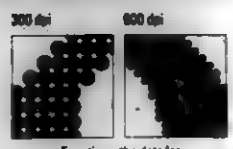

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Windows spreadsheets

Lotus woos DOS user base

By Michael Vizard
CAMBRIDGE, MASS.

With the arrival of 1-2-3 for Windows, Release 4 slated for next month, Lotus Development Corp. is expected to make an all-out effort to convince the remaining users of DOS spreadsheets that the time has come to upgrade to Windows.

According to Computer Intelligence/Infocorp, a market research firm in San Jose, Calif., approximately 60% of the DOS spreadsheet market has not yet adopted a Windows spreadsheet. Unfortunately for Lotus, about 40% of those surveyed by the research firm said they do not intend to move to Windows at all.

This effectively means that Lotus' effort will consist of a dual strategy of convincing the 20% of DOS users who plan to move to Windows that they should upgrade to 1-2-3 for Windows and of convincing those users who switched from 1-2-3 to Microsoft Corp.'s Excel spreadsheet or Borland International, Inc.'s Quattro Pro spreadsheet to take another look at 1-2-3.

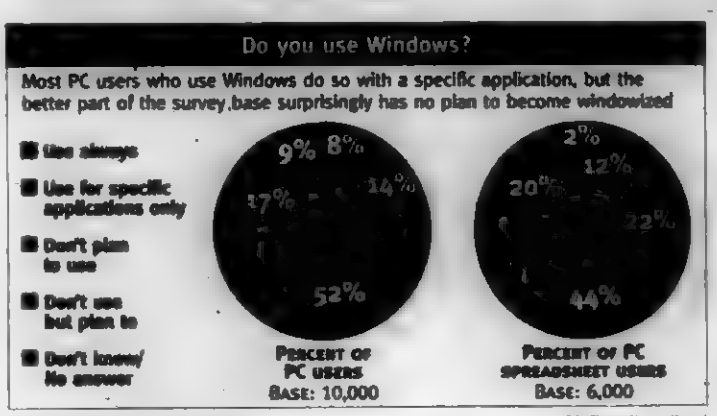
1-2-3, switch
Users of Excel or Quattro Pro, as well as users of previous releases of 1-2-3, can switch to 1-2-3 for Windows, Release 4 for $129. Users of 1-2-3 for Windows can receive a free upgrade to Release 4 until June 11.

"I bought all the Windows applications when they first came out last year, and that's where they stayed — in the box. But I'm impressed by the new release of 1-2-3 so I think we'll start learning to use Windows," said Peter Kelly, president of Financial Directions, Inc. in San Francisco.

"We have 1,000 PCs, with about less than 200 of them running Windows. Conceptually, we've made the decision to move to Windows, and our inclination is to continue the relationship with Lotus because of the huge investment we have in backward compatibility and training," said Ron Kasper, senior vice president of finance and administration at Loral Aeronutronic, a Newport Beach, Calif., unit of Loral Corp. that has about 750 copies of 1-2-3 and 150 copies of Excel.

"Right now we're split about half and half between 1-2-3 and Quattro Pro users. But I expect the new version of 1-2-3 will get about half the people that move to Quattro Pro to come back to 1-2-3," said Thomas Renner, a team leader for the

Lotus, *page 44*



Source: Computer Intelligence/Infocorp — CW Chart: Nancy Kawal

Avis saves time, money with Mac client/server system

By Thomas Hoffman
GARDEN CITY, N.Y.

Avis Rent A Car Systems, Inc. has long claimed an information technology leadership role in the travel industry, dating back to the installation of its first terminal-based Wizard reservations system in 1972. More recently, the $1.27 billion car rental agency made a splash in client/server computing to improve response time in processing reservations for customers.

Using Apple Computer, Inc. Macintoshes on the desktop, Avis agents are getting a fresh look at reservation information that they once accessed only through IBM 3270-type terminals and foot-thick paper volumes. Avis recently installed a $3.5 million client/server-based reservation processing system at its Worldwide Reservation Center in Tulsa, Okla.

GUI-based system

The Tulsa Advanced Function Terminal (TAFT) is a graphical user interface (GUI)-based system that is replacing 700 3270 terminals with Macintosh LC III PCs. A Sun Microsystems, Inc. SPARCserver 10 is being used to route reservation information from a Sybase, Inc. SQL Server relational database management system. The Sun server is linked to Avis' Wizard IBM mainframe complex here using the Transmission Control Protocol/Interconnect Protocol over an LU6.2 gateway. An IBM 3090 houses customer and rate information.

TAFT is being used to tackle the 23 million customer calls handled annually by Avis' reservations agents and has been in development for the past 18 months, according to Peter R. Tittler, Avis' vice president of networks and technology.

Avis' Peter R. Tittler and Dorothy A. Teubner *lead the development of the client/server reservations system and the savings it allows agents to pass on to customers*

Reduction realized

Six months of TAFT testing by 12 reservations agents has shown up to a 20% reduction in the amount of time agents spend processing a customer reservation over the phone. Prior to TAFT, reservations processing with clients took up to 2½ minutes by phone. TAFT has reduced that time to less than two minutes.

TAFT helped reduce the time by incorporating several improvements. Not only do agents report that the Macintosh is easier to use than the 3270 terminals were, but the Macintosh keyboards were designed with "quick keys," or a keyboard configuration that enables reservation agents to press a single key to pull up a screen to enter a customer's credit card or driver's license number. In the past, agents spent considerably more time typing in characters to enter such information, according to Dorothy A. Teubner, vice president of systems development at Avis. So far, TAFT has reduced keystroke entries by 40%.

TAFT also automatically calls up information that in the past the agent had to hunt for in books, such as insurance regulations for the region where the customer will be traveling. A key to the client/server architecture is that while one portion of the reservation is being processed on the server or information is being drawn down from the host, the Macintosh client is acting to anticipate which information —

Avis, *page 46*

On Site

Avis Rent A Car Systems
Garden City, N.Y.

Challenge: To install a system that would reduce the time spent processing reservations and training agents.

Technology: Sun SPARCserver 10, Sybase SQL Server RDBMS, Apple Macintosh LC IIIs, IBM 3090 mainframe.

Results: Reduced reservations processing time by 20%; reduced agent keystrokes by 40%; reduced training from six weeks to three weeks; projected telecommunications savings of $1 million per year.

Response team formed to handle security woes

By James Daly

Information systems managers trying to keep their arms around the rapidly evolving fields of data and network security are coming to a sobering conclusion: Their arms are just not big enough.

As a result, the computer emergency response teams of more than 20 government and private organizations in North America and Europe have joined forces in an attempt to swap tips and tricks.

The coalition, known as the Forum of Incident Response and Security Teams (First) is essentially an electronic roundtable where members exchange information on everything from opinions about antivirus software for the Apple Computer, Inc. Macintosh to the best way to secure an international network.

Data loss

PC losses in 1992 exceeded $1.2 billion, according to Safeware, The Insurance Agency, Inc. in Columbus, Ohio. Causes ranged from fire and lightning to theft.

"Information sharing is the name of the game these days," said John Kinyon, manager of network security at member company Motorola, Inc. in Schaumburg, Ill. "It's difficult to stay up to date unless you do a little hobnobbing with our fellow security wizards." Participation in First is voluntary, and member teams must fund their own involvement.

Member organizations include the U.S. Air Force, the Department of Defense, NASA, Digital Equipment Corp., Sun Microsystems, Inc., Unisys Corp., TRW, Inc., Sprint Corp., Electronic Data Systems Corp. and Westinghouse Electric Corp.

The main means of communication among members is the electronic network. "For a response team to be effective, it must have rapid communications both within its own constituency and with other incident response teams," said Dennis Steinauer, who oversees the First participation of the National Institute of Standards and Technology in Gaithersburg, Md.

First members use a variety of automatic alerting mechanisms, ranging from electronic mail to the exchange of beeper numbers, to achieve this rapid communication. First also advises clients on potential threats and emerging incident situations, such as glaring system security bugs.

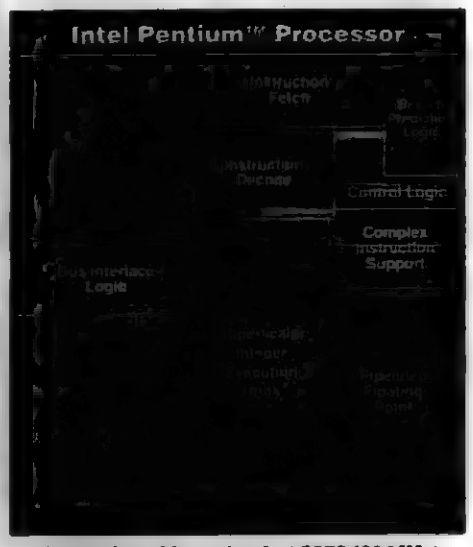
"Computer security vulnerabilities associated with information technology, such as malicious abuse or viruses, require a rapid, skilled and coordinated response to minimize damage," Steinauer added.

Although initial membership consisted primarily of U.S. government organizations, membership of private-sector organizations, universities and non-U.S. groups is growing.

Kinyon said the First electronic network is a good place to start when a security problem becomes too perplexing. "You go right to the bottom line with these guys," he said. "It's saved us a lot of grief a lot of times."

Chips

The look of Pentium boxes



Intel's Pentium chip, *priced at $878 (60 MHz) and $965 (66 MHz), is up to twice as fast as the most powerful 486 processor*

Intel Corp.'s release of the Pentium chip brought plenty of fanfare from hardware vendors, but most of the systems they announced will initially ship with the 1486 inside them [CW, May 17]. Future versions will have Pentium chips as Intel ramps up production. Most of the products listed in the chart at right were designed to ship exclusively with Pentium chips.

PENTIUM SYSTEMS*

NCR	Processor	RAM	Storage	Base Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ZENITH DATA				
[illegible]	Pentium 66 MHz	[illegible]	[illegible]	$8,699
[illegible]	Pentium 60 MHz	[illegible]	[illegible]	$7,699
AST				
Premium SE	Pentium 60 MHz	16M bytes	Up to 8G bytes	$7,500-$9,500
Premia (desktop)	Pentium 60 MHz	16M bytes	NA	$5,000-$8,000
Manhattan SMP	Up to four processors	16M bytes	Up to 16G bytes	$32,000-$36,000
HEWLETT-PACKARD				
NetServer LM	Pentium 60 MHz	16M-256M bytes	605M-9G bytes	$7,649-$17,000

PENTIUM-READY SYSTEMS*

Unisys	Processor	RAM	Storage	Base Price
PW2 Advantage Plus 5166, 5266	1486 66 MHz	Up to 192M bytes	Up to 2.1G bytes	NA
U6000 100, 300	1486 66 MHz	Up to 192M bytes	Up to 2.1G bytes	NA
ZENITH DATA				
[illegible]	1486 33MHz	[illegible]	535M bytes	$4,699
[illegible]	1486 [illegible]	16M bytes	535M bytes	$4,699

*Sampling of current systems NA: Not available

Compaq, TI shore up notebook lines

By Michael Fitzgerald

■ Fields full of notebooks are hitting the market as vendors round out product lines, including the following products that were announced last week.

No PCMCIA for them

While most of the big players in the notebook market have already added Personal Computer Memory Card International Association support to their notebooks, both Compaq and TI continue to shun the standard.

For now, this does not hurt them, said Ted Julian, an analyst at International Data Corp. "In the real world, the marketplace doesn't seem to mind so far."

•Compaq Computer Corp. added three models to its LTE Lite series. The 4/33C uses Intel Corp.'s newly shipping 33-MHz 1486SL processor and features an active-matrix color screen. The 4/25E and 4/25 both use the 25-MHz SL, but the 4/25E adds an active-matrix monochrome display. All three come with either a 120M-byte hard drive or a 210M-byte hard drive and 4M bytes of random-access memory. They weigh between 6.3 and 6.5 pounds and are touted as offering from two to five hours of battery life. Prices for the LTE Lite series start at less than $2,699.

•Texas Instruments, Inc. released three new models of its TravelMate 4000 product line. Topping out the line is a 25-MHz/50-MHz DX2 chip with an active-matrix color display. TI officials said the company had picked a small 8½-in. display because it was easier to produce than larger 9½-in. screens, and it can be shipped in higher volumes.

Texas Instruments' TravelMate *4000E WinDX2/50 ships with a 200M-byte hard drive and Windows for $4,999*

TI's TravelMate 4000E WinDX2/50 weighs 6.2 pounds and will cost $4,999 when it starts shipping next month with a 200M-byte hard drive and Microsoft Corp.'s Windows.

The product meets the Environmental Protection Agency's Energy Star program and can get up to three hours of battery life.

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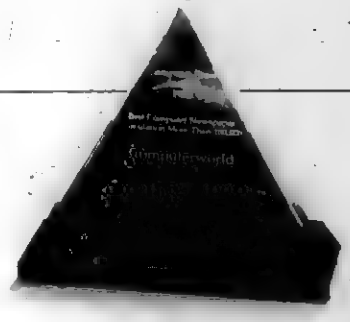

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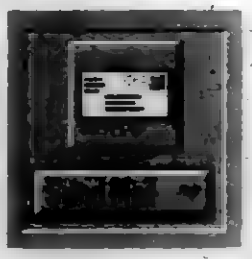

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But now there's a new system — a single, cross-platform workgroup application that can handle all your internal business operations and communications electronically. It's WordPerfect® Office™ 4.0, the first "operating system" for companies.

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e-mail engine. There's nothing else like it available today, and perhaps surprisingly, it's available for the cost of e-mail alone.

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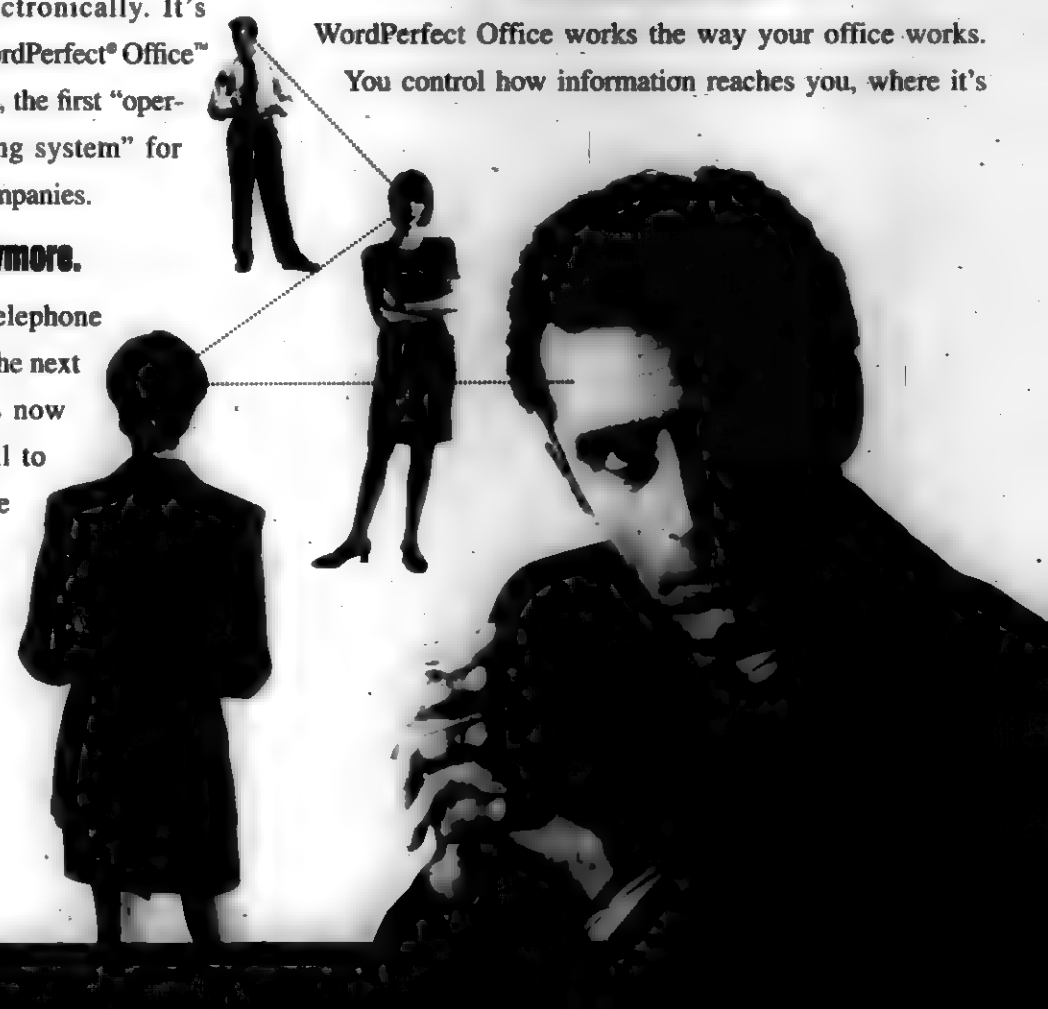
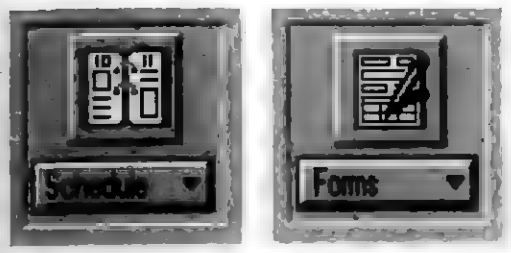


filed, where it's routed after it leaves your desk. You can accept or reject meeting requests, of course, but you can also delegate them. You or your proxy can check for conflicts on any number of personal calendars across any number of networks — even across dissimilar computer operating systems — with a single keystroke.

Your incoming mail can be automatically sorted and forwarded to the appropriate people when you're out of town, or you can handle it yourself from your laptop. And WordPerfect Office features the only electronic Out



TNG SYSTEM.

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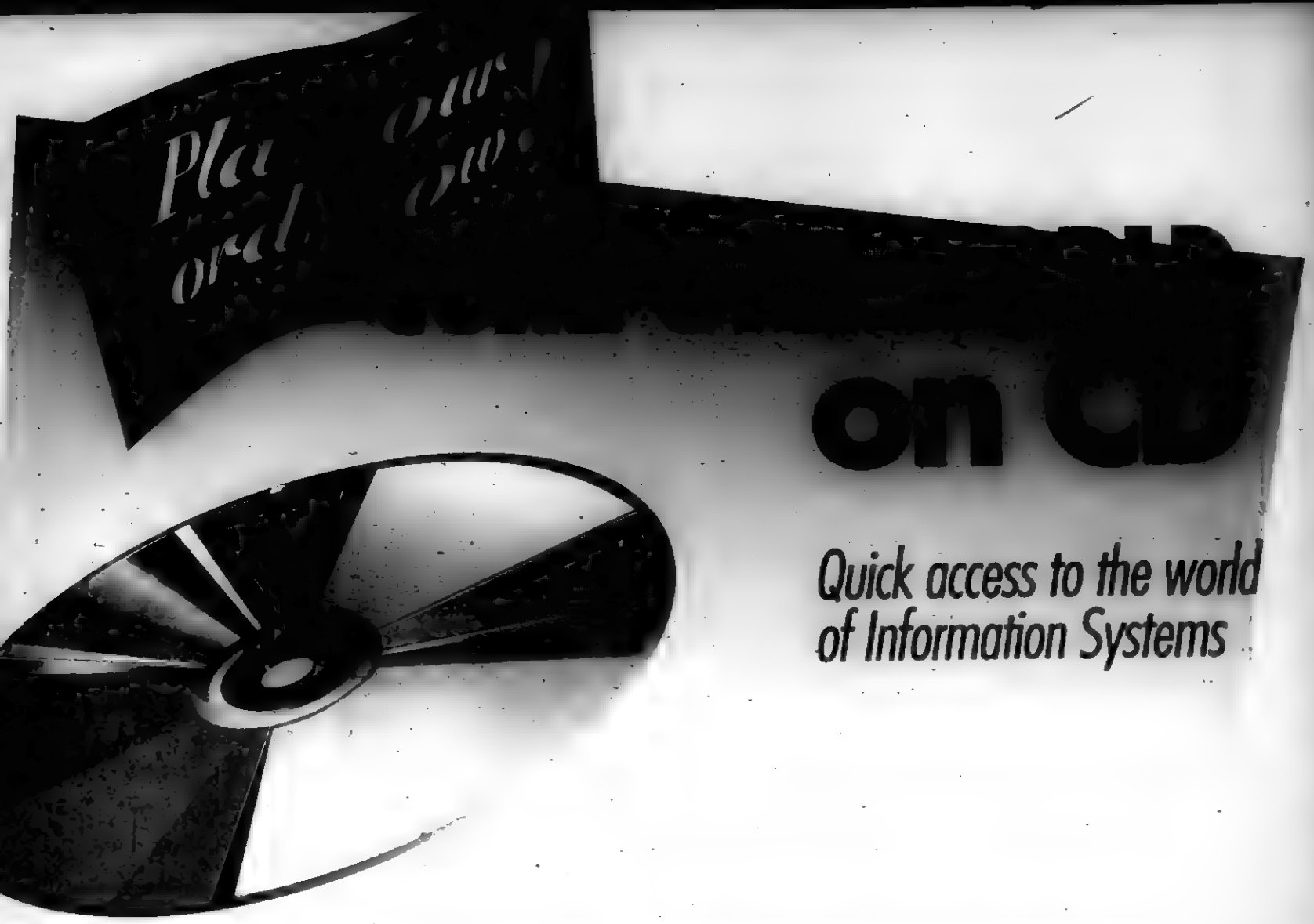

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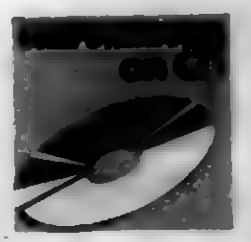

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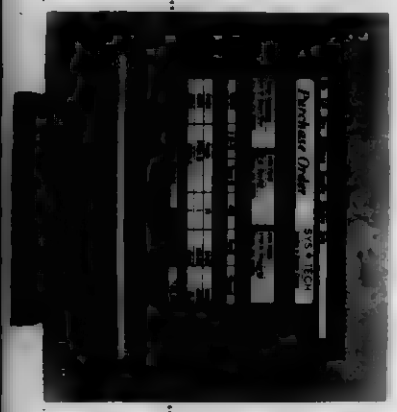

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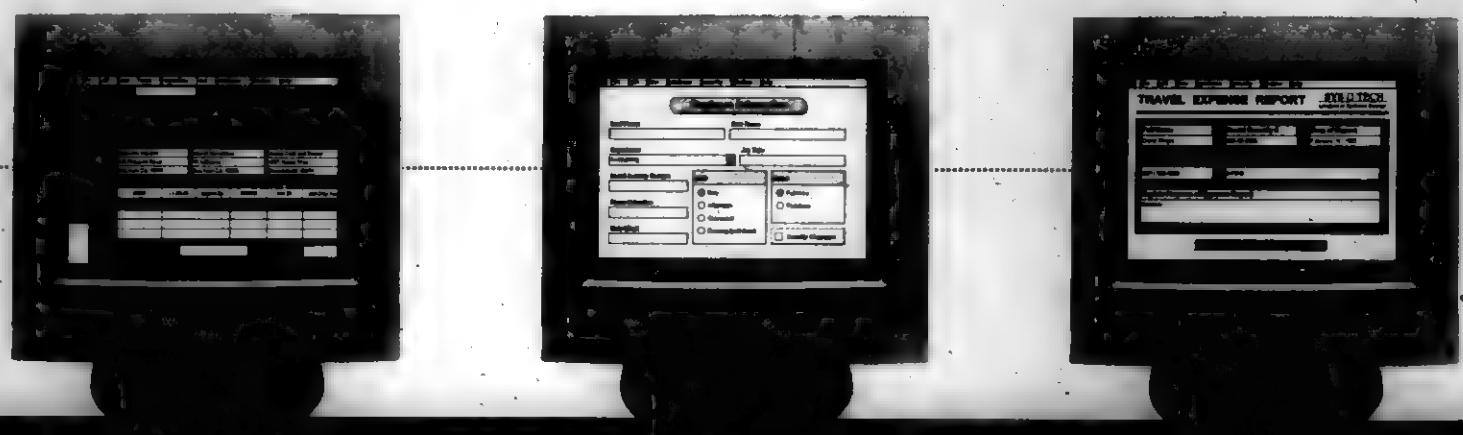

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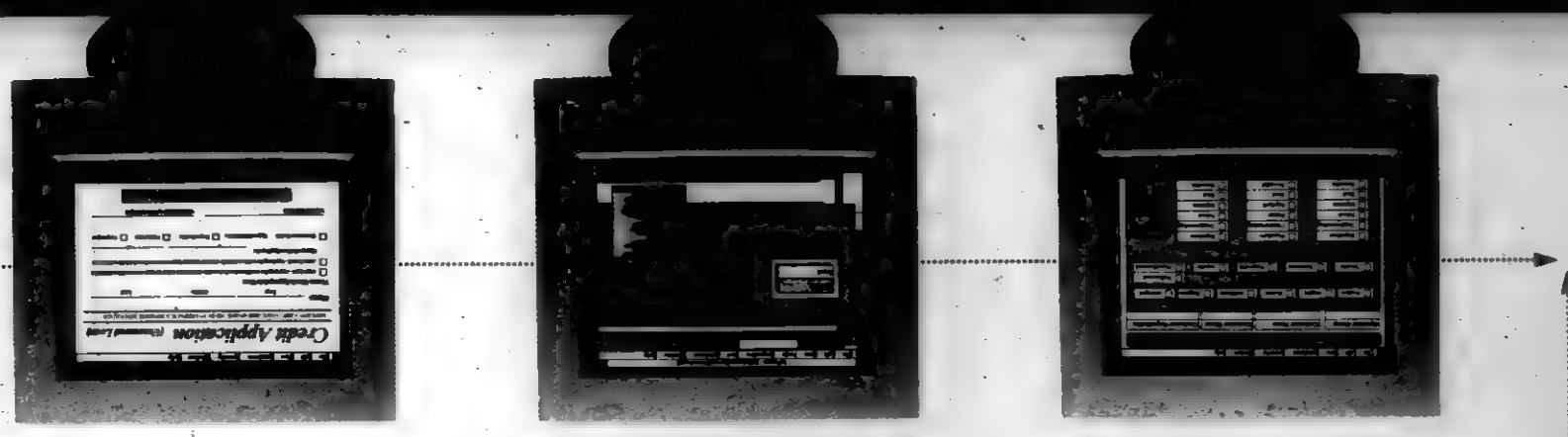

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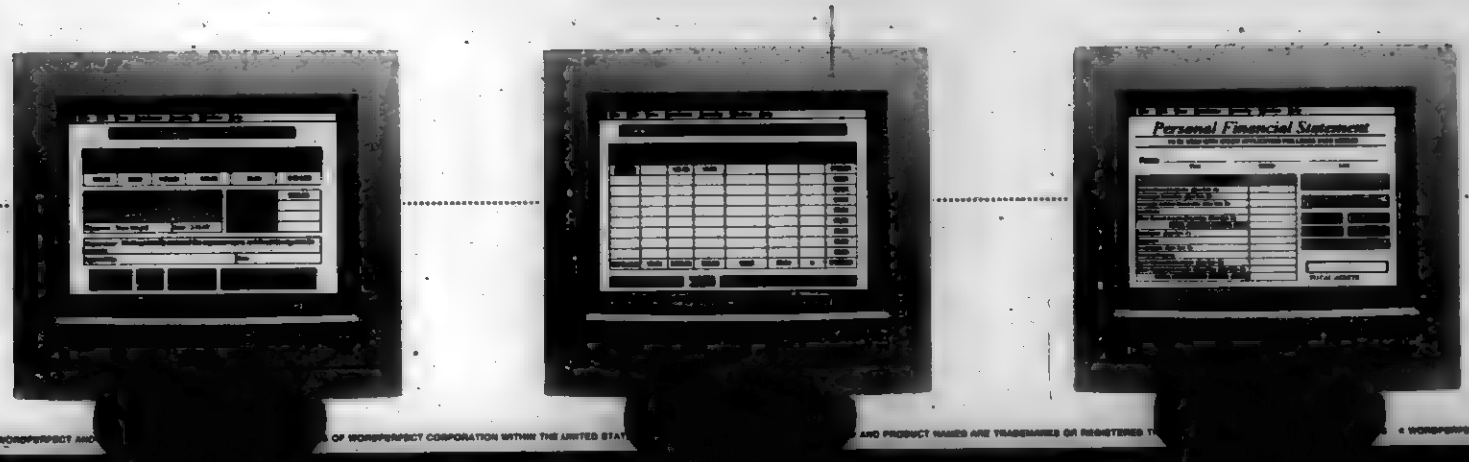

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WordPerfect

Lotus woos DOS user base

CONTINUED FROM PAGE 39

automotive paints unit of Sherwin Williams Co. in Chicago.

But while Lotus has made headway with the introduction of a viable Windows offering, both Microsoft and Borland are readying return volleys for this fall.

"Lotus has made some improvements, but their time in the sun will be relatively brief," promised Lewis Levin, general manager at Microsoft's Excel business unit.

Lotus roadblocks

Specifically, Microsoft is working on Version 5.0 of Excel for delivery this fall. Among Excel 5.0's most notable new features will be support for Version 2.0 of Microsoft's Object Linking and Embedding (OLE) facility. This facility, which will be added to all Microsoft applications in the next 18 months, will allow applications to share data in a highly transparent fashion.

In addition, Microsoft plans to deliver a common macro language and similar user interfaces across all its applications.

"The future is going to be about consistency and integration. The feature wars are over," said Robbie Bach, Microsoft group product marketing manager for Excel.

In the meantime, Borland has announced that it will deliver Version 2.0 of Quattro Pro for Windows this fall. It will include a number of wizards designed to automate tasks such as version management, expanded Help facilities and a new graphing utility.

"I can't say any of the spreadsheets for Windows packages really shine above the others, but 1-2-3 users won't be disappointed by the new offering," said Daniel Gasteiger, editor of "The Spreadsheet Consultant" newsletter in Cambridge, Mass.

'What-if' advantage

However, the depth of the version management control in 1-2-3 may give Lotus one long-term feature advantage over its rivals in workgroup environments. In addition to tracking spreadsheet files, the lastest version of Lotus' 1-2-3 allows users to create what-if scenarios across ranges and cells in the same spreadsheet.

"With Version Manager, Lotus really raised the bar compared with the Scenario Manager facility in Excel," Gasteiger said.

Bach countered that the version managing feature is too restrictive for most sites.

As a result, while Lotus has made significant strides in the Windows market, the damage caused by not having an offering until Release 4 that truly takes advantage of the Windows environment may prove difficult to reverse.

"We have 16 PCs in our group and nine of them now use Excel. We switched because the main problem we had was making graphs, which are a lot easier to do using wizards in Excel," said Dwayne Byrom, technologist at Halliburton Services, an oil field maintenance service provider in Duncan, Okla.

Now, Byrom said, his company has a package deal for suites in place that would make it difficult to switch back to 1-2-3.

"The one thing Lotus doesn't have is the strong counter to suites. Microsoft can leverage Microsoft Word sales, while Lotus' Ami Pro doesn't have a lot of market share," noted Chris LeTocq, an industry analyst at Computer Intelligence/Infocorp.

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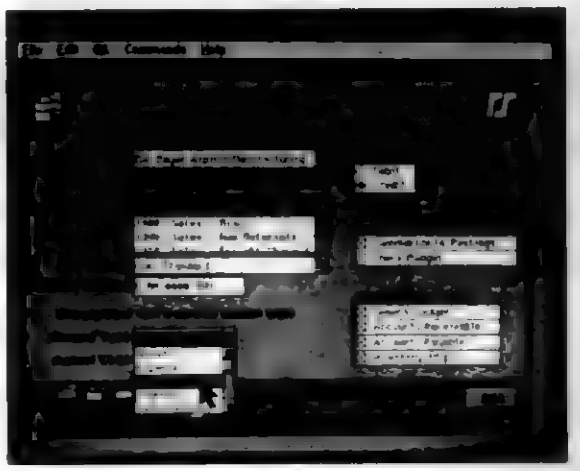

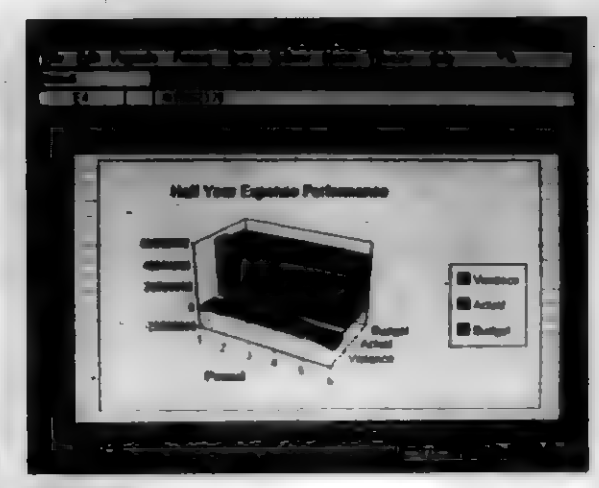

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The buying decision

When Avis went looking for the client portion of its client/server system, the company weighed the Apple Macintosh against platforms such as Unix, Microsoft Corp.'s Windows and IBM's OS/2.

Peter R. Tittler, Avis' vice president of networks and technology, said the Macintosh proved itself most cost-effective in terms of hardware and software. Also, with Avis' three years of Macintosh experience, Tittler said he felt it was a more "stable environment" than some of the others.

Performance gave the Sybase SQL Server the win over databases from Oracle Corp. and The ASK Group, Inc.'s Ingres Products Division, he said.

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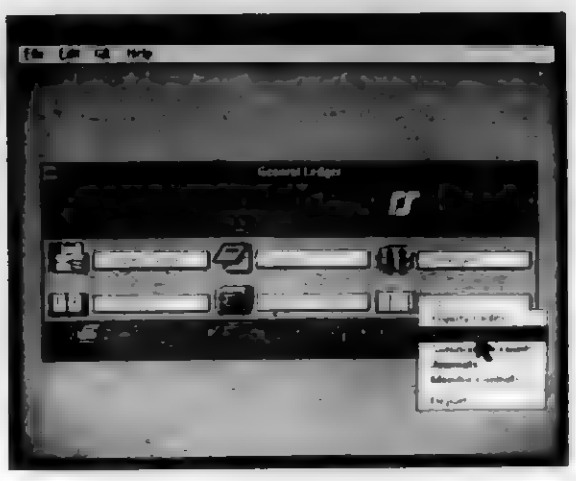

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ROSS SYSTEMS

Avis saves time

CONTINUED FROM PAGE 39

such as the insurance data — may be needed next.

Reduction in reservations processing time is key in the competitive car rental industry. According to Tittler, customers will not bother waiting for a reservation if they think they can receive faster service from a competitor such as Hertz Corp., National Car Rental Systems, Inc. or Alamo Rent-A-Car, Inc. "The key is consistent service wherever customers may be," Tittler said.

By reducing the amount of time spent preparing reservations with customers over the phone, Avis anticipates improved customer satisfaction and a hefty $1 million annual savings in phone bills, Tittler said.

Mainframe migration

Avis expects TAFT to eventually reduce its reliance on its IBM mainframes. Tittler said Avis hopes to migrate its IBM DB2 rate database from the 3090 mainframe to the client/server environment by sometime in 1994.

Because Avis is employee-owned, there was a great deal of input from reservations agents on the GUIs that were developed for TAFT Macintoshes, Teubner said.

By the end of this month, 700 Macintosh PCs and workstations will be TAFT-enabled.

The GUI-based systems have provided other benefits. For example, when Avis needed to train a new reservations agent to process reservations using the 3270 terminals in the past, the training period averaged six weeks. In contrast, the training period for new agents on the GUI-equipped Macintosh PCs has been pared to three weeks. "The GUI front ends for agents have added value," Teubner said.

Application packages

Lucas Management Systems has introduced Artemis Schedule Publisher 4.1L project management software.

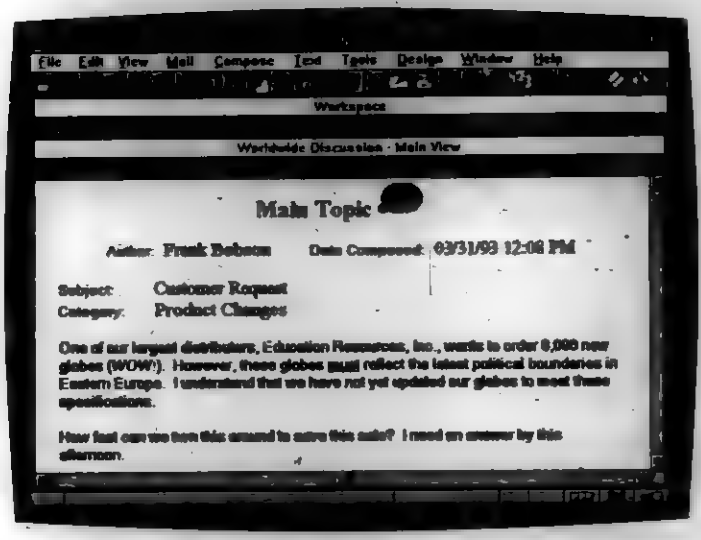
The product supports fully automated resource scheduling and multiproject analysis. It offers real-time calculation of schedules, resources and costs. Graphics reporting capabilities are included, and an embedded drawing module offers more than 100 report formats. A graphical tool bar has been added.

Artemis Schedule Publisher operates in a Microsoft Corp. Windows environment. However, it will also be available in an Apple Computer, Inc. Macintosh version in the future.

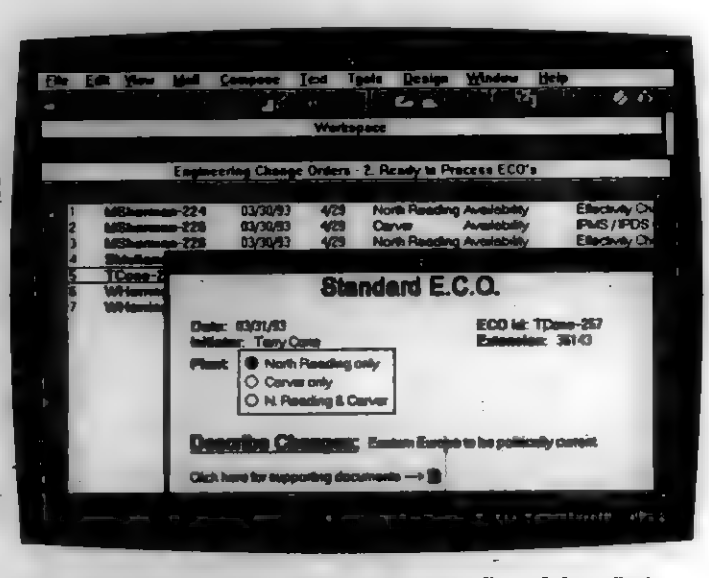
The product costs $1,995 per copy.

▶ *Lucas Management*
Suite 350
12701 Fair Lakes Circle
Fairfax, Va. 22033
(703) 222-1111

1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems world-wide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale, the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.



5. Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.

6. After lunch he opens a document from Ellen, in product development, who has responded with the necessary changes, and scheduling information. The new art was scanned directly through Lotus Notes: Document Imaging from the art department. James approves the art for manufacturing.

How Lotus Notes Relea

Thousands of companies already know how Lotus Notes helps them respond more quickly and effectively to the demands of everyday business. Now Release 3 extends that power to new dimensions.

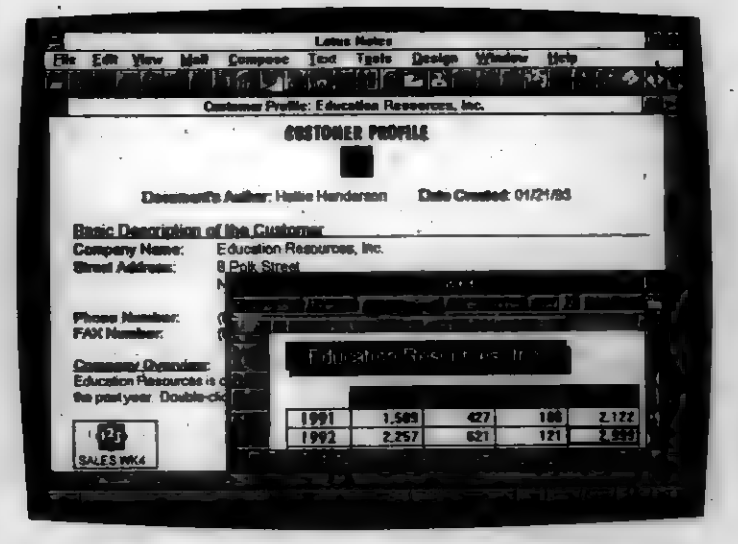
Just watch how James Carlton, a new district manager at Global Publishing, uses Notes Release 3 to solve a major global problem in short order. See how he uses information from on-site and remote locations. From both inside the company and external sources. Across a

variety of platforms. How he uses applications such as Account Tracking, Newswire, and Engineering Change Orders to get a new product developed fast. And how he creates an informal team spanning a range of departments to do it.

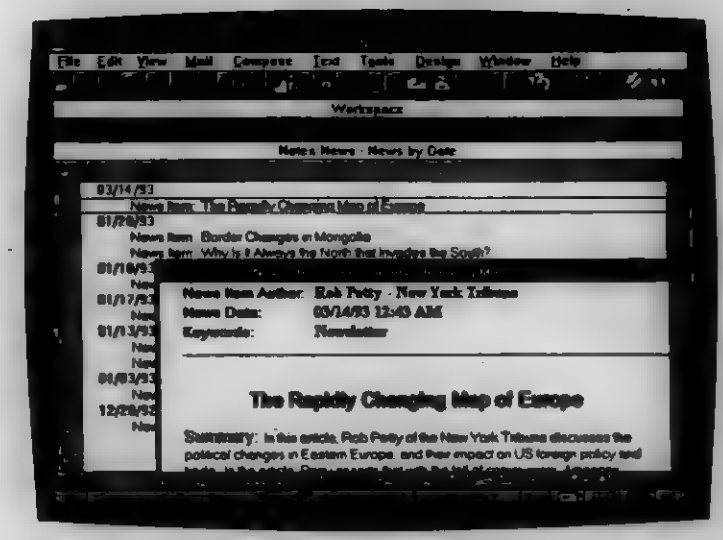
With the new Release 3, Lotus® Notes now supports all the leading GUI platforms: Windows,™ OS/2,® UNIX,™* even Macintosh.®

Which means the award-winning workgroup power of Lotus Notes® is now readily available to help virtually all networked businesses improve

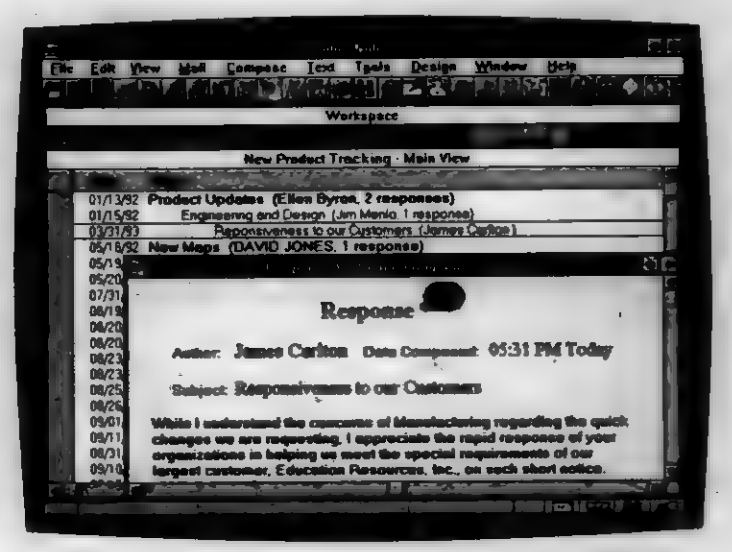
*UNIX Server and Client available by year end 1993. In Canada, call 1-800-GO-LOTUS. © 1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes and 1-2-3 are registered



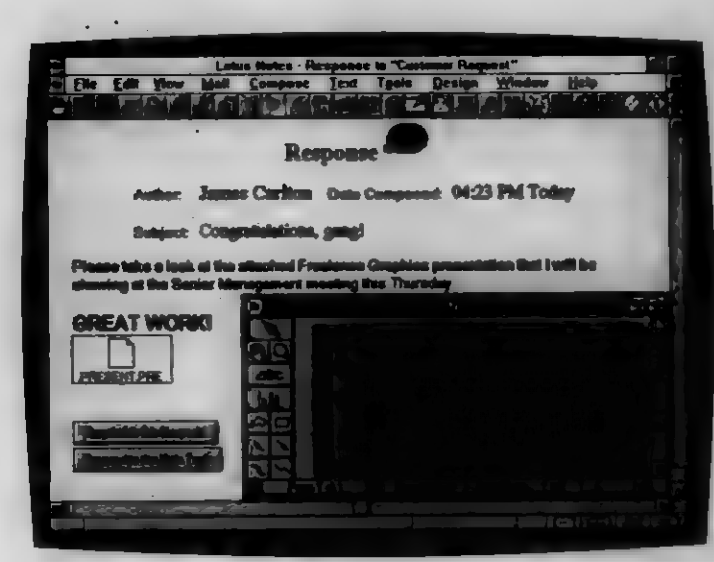
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database so everyone can see how the team rearranged the world to save a big account.

se 3 changed the world.

their performance. By accelerating business processes and helping people work together more effectively than ever before.

You'll find your favorite user-friendly features from other Lotus applications like SmartIcons™ and a status bar make Notes even easier to use.

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But you don't have to change your world to get going on Notes. Now you can get everything you need in the Lotus Notes Starter Pack for just $995 (SRP). It includes one Notes Server for Windows and two Notes Clients for Windows. Plus more than 25 ready-to-use applications for business processes like account management, customer service and product development. For information call **1-800-828-7086, ext. 8847** or visit your Lotus Authorized Reseller or Lotus Business Partner.

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Lotus Notes

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New systems, new business practices

Some users find one requires the other when they go client/server

By Kim S. Nash

"A few hair-raisers [and] a lotta sweat" is how Greg Reynolds describes his department's move to client/server computing.

Reynolds, manager of human resource development at Eli Lilly and Co., led a group of roughly 30 information systems workers through 2½ years of "all sorts of surprises" that resulted, in September 1992, in a 15,000-employee payroll system that runs faster and eats up fewer IS resources than the homegrown host-terminal setup it replaced, he said.

He advised would-be followers of the client/server path to beware the duality of distributed systems: Not only must you install and manage networked PCs and other sometimes foreign technologies, but your firm must also frequently overhaul business practices to wring benefits from client/server systems.

If he had his druthers, Reynolds said, he would not have tried to make both big leaps at once. "Too many changes to deal with. It was *tough*," he said. Eli Lilly moved payroll for 15,000 U.S. employees and 8,000 retirees to PeopleSoft, Inc.'s client/server HRMS system on a wide-area network of 300 Intel Corp. 1486-based IBM Personal System/2s accessing a DB2 database. "Some of my own colleagues told me I was crazy," Reynolds said, "but the risk we took has been rewarded."

Use shrink-wrapped software

Reynolds and others who have taken the client/server leap of faith advise the uninitiated to try the move in a small or medium-size project using off-the-shelf programs. Today, that means either human resources or certain accounting systems because these are virtually the only major packages now on the market.

To be sure, some users have succeeded in building client/server systems using tools such as Powersoft Corp.'s PowerBuilder or Gupta Corp.'s SQL Series. However, starting with a packaged application "is one less worry" for beginners, according to Larry Miller, IS manager at Owens-Corning Fiberglas Corp.

The Toledo, Ohio-based firm sought client/server packages for areas where in-house staff lacked expertise, Miller said. Owens-Corning went live with a distributed payroll/human resources system for 4,000 corporate employees last year. The company is expanding the application to North American regional offices to serve 22,000 workers.

"We couldn't build applications of this magnitude," Miller said. He added that he could not justify the effort of building such systems when they are available as near-commodity items.

Stranded at sea

But users said they still need help, even implementing off-the-shelf applications. Lack of guidance is one trouble spot. Questions loom about nitty-gritty issues such as version control and managing companywide application updates. "No one tells you how to build that stuff in," said David Callingham, partner at CGI Group, Inc., a consulting firm in Toronto.

Eli Lilly, for example, wanted to jump-start its project with outside consultants, but none had PeopleSoft know-how, Reynolds said.

Help is available from vendors for a fee, noted David Cameron, vice president of IS at The Wackenhut Corp. The Coral Gables, Fla.-based conglomerate called on Dun & Bradstreet Software consultants last year to smooth rough spots in installing SmartStream, client/server decision support products from D&B Software.

SmartStream was designed to yank data from mainframes for workstation or PC users. The product will connect to D&B Software's forthcoming financial modules, due out next month, the company said.

Wackenhut is a big D&B Software user, dating back to premerger Management Science America, Inc. days. Always a solid mainframe shop, the company now wants to "move almost everything" to five Hewlett-Packard Co. HP 9000 Unix servers in 18 months to two years, Cameron said. "We're using SmartStream to train IS on what client/server is all about," he explained.

Interim step

Other users are less aggressive. Jay Graydon, vice president of finance at Shedoke McMaster Hospital in Hamilton, Ontario, has been experimenting with SmartStream for several months on a Digital Equipment Corp. VAX connected to six users on generic 486-based PCs. The SmartStream project is separate from the hospital's primary equipment.

"This is an interim step for us. We have to see what kind of added functionality we get before expanding," Graydon said.

Although most users declined to talk about the cost of client/server applications, they agreed that it is not cheap. Many decisions are involved, including operating system and database server platforms. Plus, concerns abound that systems management tools common for minicomputers and mainframes are not yet available for client/server environments.

Large system companies have had years to work through the various permutations of systems, while client/server is just getting started, said Bob Johnson, an analyst at Dataquest, Inc. "When you're dealing with your distributed computing environment, that highway can't have a lot of potholes in it. If it does, you are going to be out of business," Johnson said.

David Coursey

Checking out PowerPC

To PowerPC or not to PowerPC, that — with apologies to the "other" Bill — is the question. Is it nobler to follow the Pied Piper of Intel to chart a RISC-y course to a new destination?

OK, so I made a mess of literature, but I've been up late the last couple of nights worrying about the PowerPC so you don't have to. Not that many of you have been burning the midnight oil over this one. Most people know just enough about the PowerPC to know they probably don't want one. That is a shame because the Motorola/IBM microprocessor family could become important. First, the upside.

• The first PowerPC, the 601, is sampling now and will appear in machines before the end of the year. In terms of processing power, think of the 601 as a Pentium with a math coprocessor attached. Integer performance, in native mode applications, is about the same as Pentium, but the 601 moves ahead in floating-point calculations, just like an 80X86 with a coprocessor.

The PowerPC is also promised to be available in large quantities, cost much less than Pentium and not require a new air-conditioning system to drain Pentium-generated heat out of your building. By comparison, the Pentium should cost more than twice as much and is promised in only limited quantities, perhaps 200,000 in the first year. Apple, meanwhile, plans to sell 1 million PowerPC machines in the first year.

• Speaking of Apple, the PowerPC is the processor for the next generation of midrange and high-end Macintoshes. The Motorola 68000 series will remain in the product line, at least for now, but Apple plans to move aggressively into

Coursey, *page 54*

Client/server promises abound, including the following:

- More flexibility by enabling end users to do for themselves tasks that IS typically performs, such as report writing.
- Potential savings in operations and other costs by using smaller hardware and fewer IS staffers.
- A business edge over rivals that comes from freeing IS staff to work creatively.

Would-be client/server users face tough decisions: Windows NT, Unix, NetWare or OS/2? Buy or build applications? Which administration tools? "There's so much noise out there now, with no one controlling the volume," said CGI Group's David Callingham.

Financial products

The following is a sampling of what is coming down the pike in client/server financial applications:

- D&B Software and PeopleSoft plan to fill out their client/server product lines with accounting modules next month, including general ledger and accounts receivable and payable pieces.
- IMRS, Inc. plans to break into this arena with products inherited via its February acquisition of MAI Systems [CW, April 19]. However, the products will lack Windows support — key to many users' client/server plans — until early 1994, the company said.
- Ross Systems, Inc.'s Renaissance/CS line of financial applications is due for a kick next month, with a Microsoft Windows-based client portion of a Unix-based distributed system introduced in January, according to Larry Smart, president.
- Walker Interactive Systems plans to release seven finance packages for HP's HP/UX, IBM's OS/2, Windows and the Open Software Foundation's Motif by the fourth quarter. A spokesman said the products will be priced comparable to Walker's mainframe products, which range from $150,000 to $400,000 per package, depending on platform and number of users.

Novell beefs up customer support options

Vendor identifies NetWare experts with new certification process

By Michele Doetert
PROVO, UTAH

In an effort to respond to complaints about end-user support at the reseller level, Novell, Inc. has announced a program to identify resellers, dealers and systems integrators with demonstrated NetWare support expertise.

Novell said the program is a response to customer demands for better NetWare support from the reseller channel.

"Our customers are telling us that they can't get competent support from their reseller," said Richard King, Novell's vice president of service and support. "We get thousands of calls every month from users looking for a referral to a new support provider."

User complaints about reseller support include poor response times, limited access to hands-on experts, lack of on-site support and receiving outdated information about new patches and revisions.

Common complaint

The complaint cited most often was reseller inexperience with multivendor, local-area network-to-host environments.

"We bought our NetWare from our local Computerland, and the one guy there who really knows his stuff is always swamped," said Paulette Hamilton, a LAN administrator at National Health Laboratories in La Jolla, Calif. "So we either struggle with it ourselves or wait for Novell support to get back to us from their 800 line."

Hamilton added that she would be especially interested in a referral to a support center with expertise in NetWare/Systems Application Architecture integration.

Toll-free referrals

Support providers that meet Novell's requirements will be certified as Novell Authorized Service Centers (NASC) and receive customer referrals from Novell. Novell said that certification is currently under way, with the toll-free NASC referral program scheduled to be up and running by June 15.

In addition to resellers, Novell expects to certify independent support providers such as TRW/Computerland Corp. and JWP, Inc., as well as support organizations owned by vendors such as Hewlett-Packard Co. and Digital Equipment Corp.

To become authorized, organizations must have at least two certified NetWare engineers (three will be required by the fall), at least one enterprise certified NetWare engineer (CNE), a defined response time, a support lab, on-site support within a 50-mile radius and hot-line support, among other requirements.

Novell said it expects 80% to 90% of its 586 Platinum resellers, which are already required to have at least two CNEs on staff, to join the NASC program.

The NASC program is the latest of several Novell support initiatives, including a technical support alliance between Novell and third-party hardware and software vendors such as Compaq Computer Corp. and Microsoft Corp., the formation of Novell Consulting Services and the introduction of its Master License program for very large customers, which includes direct Novell support.

Weeding out

To ensure the best possible service and support available, members of Novell's Authorized Service Center program must meet a number of requirements:

- Staff with technical proficiency.
- Ability to respond to customer's need for a specific service.
- Defined response time.
- A support lab.
- Ability to deliver on-site support.

Source: Novell, Inc.

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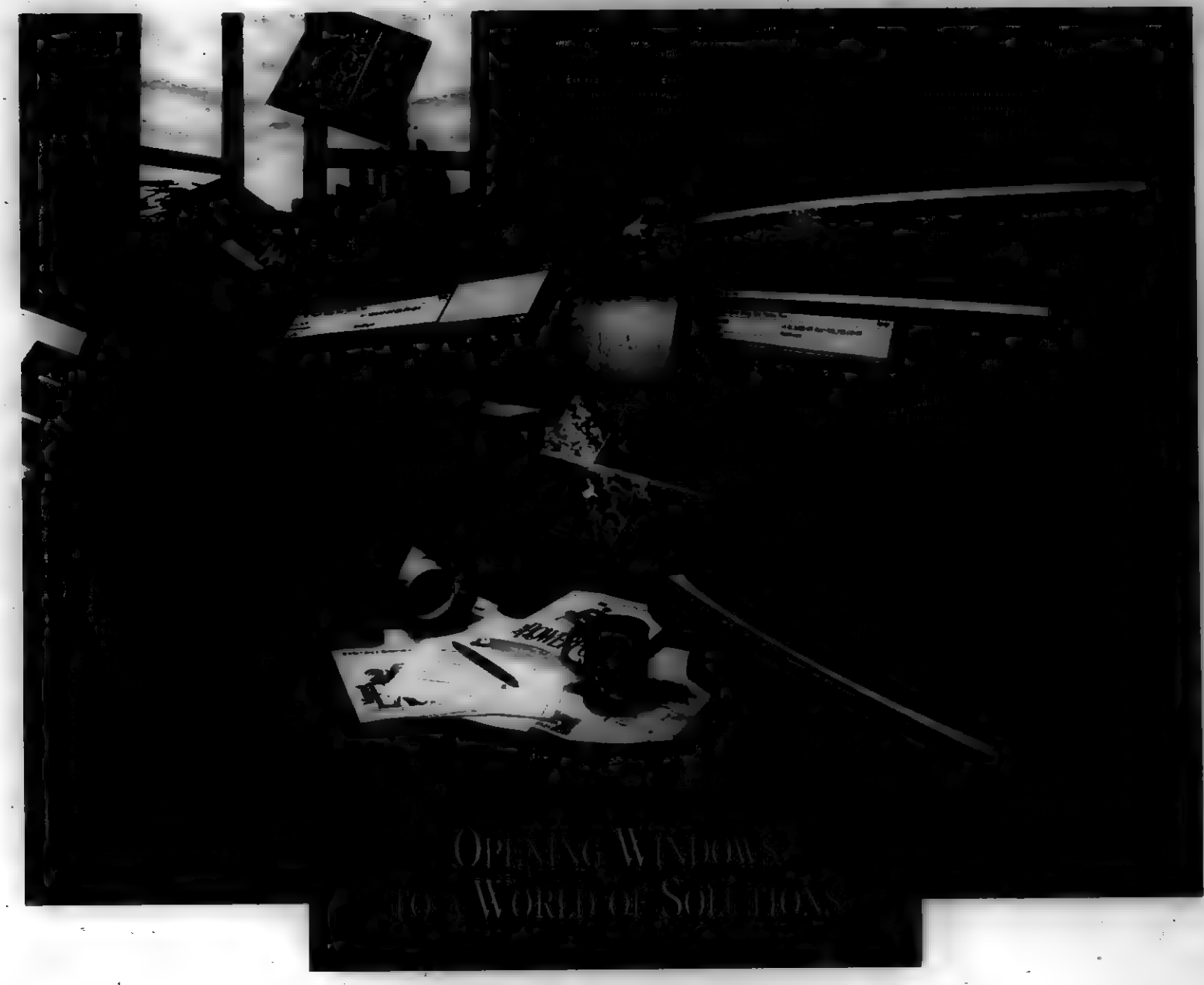


In the world of Windows NT, Intergraph's applications bring a new level of power and sophistication to the technical desktop.

Olé OLE

Integrate CAD processing with other Windows applications such as Word and Excel by taking advantage of complete support for Microsoft's Object Linking and Embedding (OLE) technology.

The computer graphics industry has made another leap forward. Under Microsoft's New Technology operating system, popular business programs and Intergraph's technical applications can run alongside each other on the same computer. The same friendly Windows environment appears throughout the applications — word processing, spreadsheets, architecture, civil engineering, mapping, and all the rest. CAD users can now spend time designing and drafting, not navigating through the operating system.

New technology, new opportunities.

The arrival of a powerful new Windows operating environment means that for the first time, hundreds of thousands of microCAD users will have access to the functionality and technical sophistication of Intergraph applications.

Technical leadership.

The list of disciplines addressed with Intergraph software is one of the longest in the industry – and continues to grow.

Aeronautical charting • Architecture • Cartography • Civil engineering • Dispatch management • Document management • Electronics design • Energy exploration • Environmental resource management • Facilities management • Geographic information systems • Image processing • Industrial design • Manufacturing • Mechanical engineering • Photogrammetry • Plant design • Publishing • Ship design • Surveying • Telecommunications • Urban planning • Utilities – gas, electric, water •

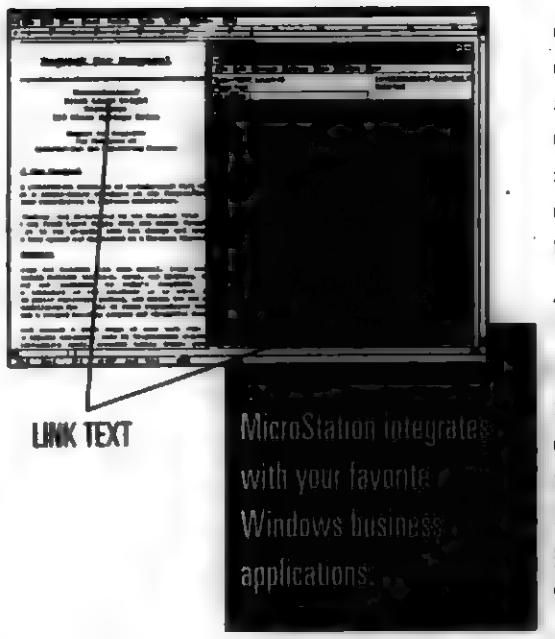
"The Microsoft-Intergraph alliance provides a full range of technical applications, as well as a wealth of personal productivity tools – complete solutions for the technical desktop."

Paul Maritz, Microsoft
Senior Vice President of Systems

Intergraph is the world's largest independent development site for Windows NT applications.

NT

MicroStation is general-purpose CAD software that runs on PCs, Macs, and UNIX workstations. It is a primary tool in Intergraph's solutions for the technical desktop. If you appreciate the economy of PCs but need sophisticated design power, take a look at MicroStation. It means a more productive, more profitable future for you and your company.



CAD should give you the productivity edge you need to be competitive in today's business environment. You need a tool that streamlines the process of drafting, as well as a modeler that helps you create virtually any object – fast. You should be able to store design data in relational databases without programming. Your future depends on the ability to share data with your design team and other operations. MicroStation software gives its users this level of proficiency. And keeps them in tune with the best in applications solutions.

"MicroStation includes a robust set of 3D capabilities and gives you a variety of ways to render models."
InfoWorld

Intergraph introduces MicroStation Version 5. It brings renowned integration advantages to designers and engineers who need to run in the Microsoft Windows business environment – Windows, Windows for Workgroups, and Windows NT.

Software that puts you in charge.

Today, *user friendly* means more than easy – it means software that empowers you. You control MicroStation through a graphical command center featuring icon command buttons ... pull-down menus ... tear-away palettes ... multiple, resizable overlapping views. The display is sleek. With no perceptible repaint, Version 5's graphical user interface seems to float over your drafting and design area.

MicroStation runs as an extension of the way you work. Choose from unique *Workspaces* designed for your profession. They configure the graphical CAD desktop for you and manage the computing environment to your needs. Even discipline-specific drafting *styles* are provided. And it's all tailorable: Graphically build your own pull-down menus and palettes. Rearrange fields in dialog boxes. Disengage commands. You've got the power to create the interface that best meets the needs of the task at hand.

CAD software should accommodate the way you think, work, learn – even change your mind. You should be able to select a different dimensioning system right in the middle of a command. Or modify a shape and have all of the dimensions automatically change. Simple actions – like grabbing a line or object – should be so fast that they require no conscious effort. MicroStation performs functions like these as a matter of course. Other CAD software simply can't.

A powerhouse of features gives you the productivity edge!

MicroStation offers more functionality in one package than any other CAD software. New *dimension-driven design* options help you design intelligently using geometric and dimensional constraints. Apply variables to the constraints and save your design for reuse with different parameters when creating similar objects or parts. These and more new capabilities – like user-defined linestyles and associative patterning and hatching -- provide the most complete drafting environment available.

Powerful tools help you create freeform, mathematically precise surface models. Model virtually any object, no matter how complex. Perform trim, blend, fillet, and Boolean operations between surfaces. You've got the simplicity of solid modeling without the overhead.

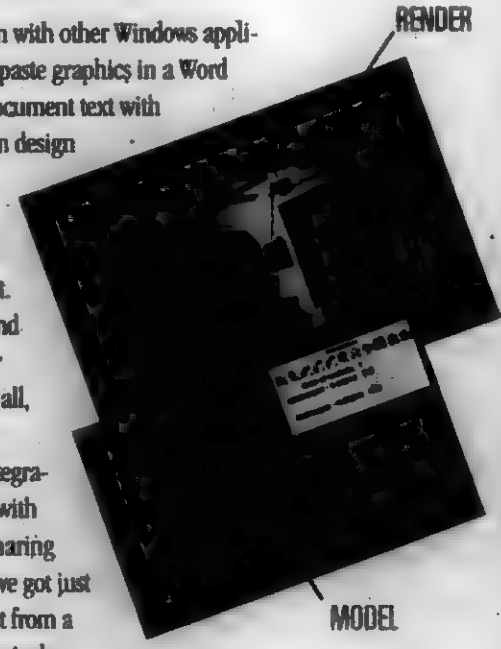
Visualizing your designs is easy and cost-effective with MicroStation's new photorealistic rendering capabilities. Light sources, shadows, transparencies, depth cueing, anti-aliasing, and bump and pattern mapping help you market your designs. You can even create flythrough animations and play them onscreen for your clients. MicroStation is a powerhouse of features in one package.

The best tool for the '90s production environment.

Users value the way MicroStation performs in the production environment. On large projects, it's a clean-running, fast performer. One user said, "MicroStation is an all-encompassing system ... capable of covering all facets of project management, not just design and drafting."

MicroStation users enhance productivity through real-time data sharing. True file referencing allows each member of a workgroup to easily and safely share files concurrently with others. It's peer-to-peer sharing of design information while everyone continues working – across multiple hardware platforms and networks.

Run MicroStation with other Windows applications. Cut and paste graphics in a Word proposal. Link document text with your MicroStation design file. Drive MicroStation graphics with an Excel spreadsheet. Embed sounds and messages in your design file. All in all, if you combine MicroStation's integration capabilities with Windows' data sharing capabilities, you've got just what you'd expect from a '90s CAD product. And you have a clear growth path to Intergraph's sophisticated application solutions for UNIX and Windows NT.



PC MAGAZINE EDITORS' CHOICE
February 23, 1993
MicroStation PC, 4.0.3

"MicroStation PC is an exceptionally usable, powerful package with such rare and exotic features as non-uniform rational B-splines."
PC Magazine

MicroStation

"Compared to DataCAD, AutoCAD, and VersaCAD, MicroStation is much faster ..."
Computer-Aided Engineering

In some industries, 25 years is not much. In computer graphics, 25 years is the lifetime of the industry. For a quarter of a century, Intergraph has developed computer graphics systems – hardware, software, and support – for industries that rely heavily on maps, engineering drawings, and models to convey information.

Intergraph users range from small offices or departments to large multinational firms, and their projects run the gamut from single drawings to complex aircraft carriers.

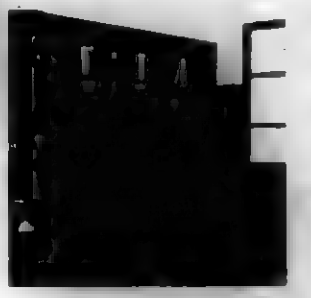
Climb the Statue of Liberty, ride Swiss Rail through the Alps, use the 1993 Rand McNally Road Atlas, or take a break with the world's most popular soft drink. In these unexpected places – and hundreds of others – you'll find the results of combining Intergraph's computer graphics experience with users' ingenuity.

With Intergraph's MGE geographic information system, California's Division of Mines and Geology will provide digital maps to enable Californians to determine if they live in risky earthquake or landslide zones.

Low-cost suite of AEC applications

Feature-packed and available at a low cost, Intergraph's MasterWorks applications for architects and civil engineers bring a new level of power and value to the technical desktop. Intergraph brings to the Windows world functions formerly available only in high-end CAD systems. The MasterWorks series includes these applications:

RoadWorks for transportation engineering
DesignWorks for architectural design
CogoWorks for coordinate geometry
FrameWorks for structural modeling
SiteWorks for site design



Gobbell Hays Partners Inc., a 32-person firm, uses MicroStation and ModelView from Intergraph to design laboratories for corporations and universities.

Affordable, expandable geographic information systems (GIS)

With the Modular GIS Environment (MGE) solutions for the PC, Intergraph gives you the best of both worlds – the power of the world's leading GIS on the world's most popular computing platform. Using MGE PC solutions, you can build an integrated, powerful GIS without investing large amounts of time, money, or resources. Start with a single PC and add workstations and sophisticated software as your needs grow. Or expand your existing MGE network with cost-effective PC seats. MGE PC solutions include:

In 39 of the 50 departments of transportation in the United States, Intergraph applications for surveying, civil engineering, and GIS enable the DOTs to design and maintain the nation's transportation infrastructure.

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Intergraph has traditionally supplied complete software and hardware solutions. In keeping with this tradition, Intergraph offers its own systems designed for Windows NT. They're optimized for CAD immediately out of the box, with full networking capabilities built in. With an Intergraph workstation, display clarity, high resolution, and graphics performance make viewing your work a pleasure.

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Intergraph's integrated data management architecture provides access to technical information within applications and across disciplines. This means that Intergraph's applications can address an entire project workflow from end to end. Access to information across disciplines is made even easier by the fact that all applications feature the same easy-to-learn-and-use graphical user interface.

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Many of Intergraph's customers operate on networks that include a mixture of workstations and PCs, so interoperability is essential. Because Intergraph application file formats are common across hardware platforms, there are no problems of data incompatibility or translation, and sharing data is easy. Also, basic Windows NT includes all the tools needed for TCP/IP communication with our UNIX-based systems, so users can mix UNIX-based and Windows NT-based workstations in their networks and enjoy smooth interoperability.

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Intergraph data management tools have built-in interfaces to Oracle, Informix, and other database management products. Support of leading databases in multiple environments lets you create links to them without programming.

Growth path.

If you choose to upgrade your hardware or add other high-end technical applications, Intergraph gives you a growth path. You can upgrade your system and continue to share files.

Open systems and industry standards.

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INTERGRAPH
Solutions for the Technical Desktop

Coursey

CONTINUED FROM PAGE 49

PowerPC, even at the risk of confusing customers while the transition takes place.

This is a must move for Apple, which has already announced plans for several PowerPC machines and has more than a dozen developers lined up to write native-mode applications.

This is important because without specially written applications, PowerPC, like Pentium, really doesn't shine. One of the issues for Apple, however, is the confusion this creates in the marketplace.

Apple isn't saying when the new boxes will come out beyond "the first half of 1994," but at some point smart customers are going to stop buying 68000-based machines and wait Apple out.

•IBM is committed to PowerPC as well, though not to the same level as Apple. IBM hasn't been real specific, although it's easy to predict RS/6000 type machines built around the new architecture. There could even be a portable or two, especially in 1994, when next-generation PowerPC chips begin to appear.

This will be interesting because the second-generation PowerPCs, the 620 and 603 (there is no 602) may be in machines about the time Intel finally gets the Pentium into mass production. That would give the PowerPC camp big advantages in both performance and price.

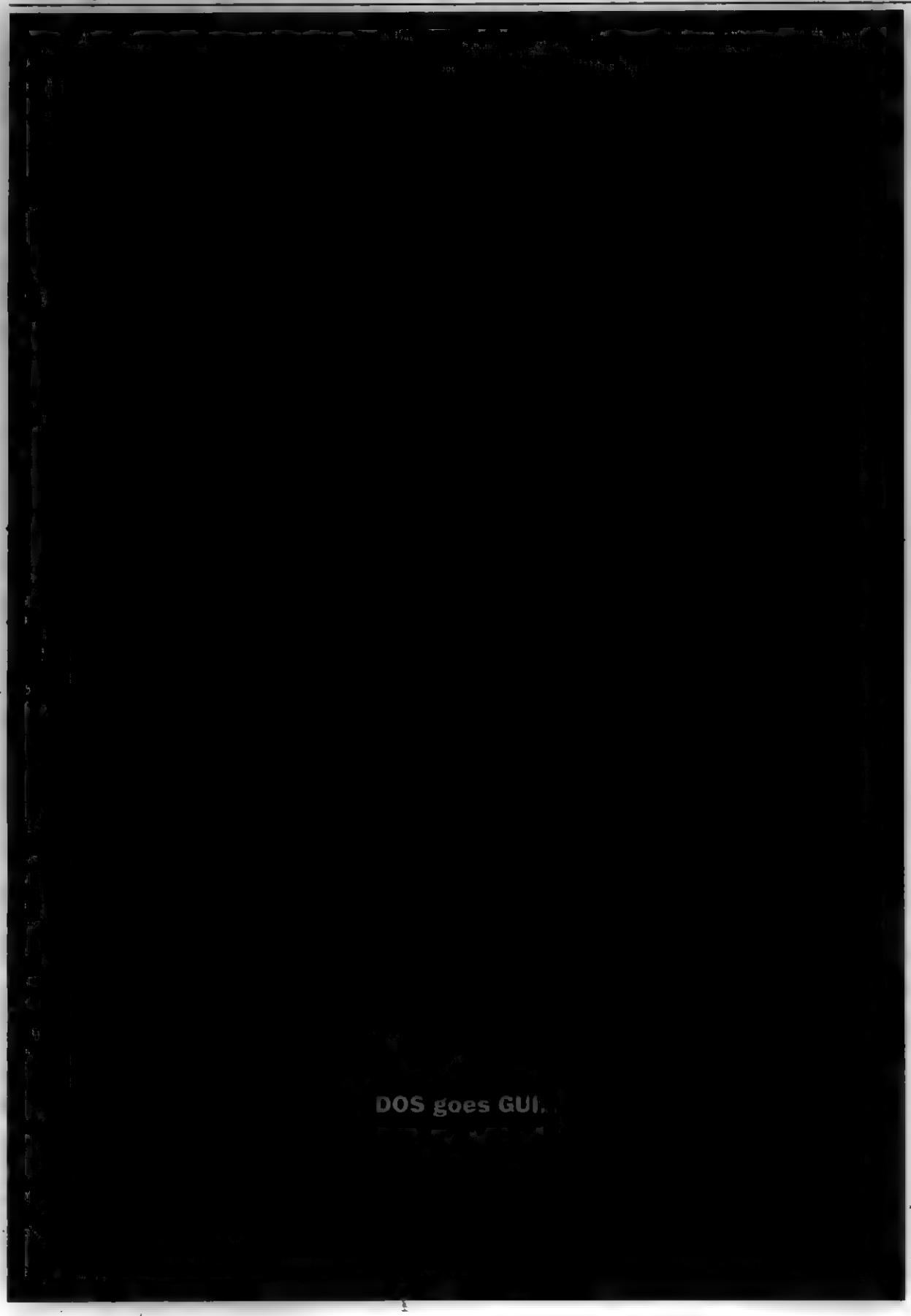
Besides IBM, Sun and several Unix vendors — though notably not The Santa Cruz Operation — have committed to developing for PowerPC, giving the chip instant authority in the Unix camp. The PowerPC could also be a threat to AT&T's Hobbit processor, used in the EO devices, and perhaps to other personal digitial assistant architectures.

•On the downside, Microsoft hasn't made any big public pronouncements but is quietly saying it won't support the PowerPC short of being dragged into doing a port of Windows NT. This reflects both the commitments Microsoft has already made to DEC's Alpha and the Mips R-4000 processors as well as its relationship with Intel and antipathy toward Apple, Motorola and IBM.

The lack of Microsoft support is probably the single most important mark against PowerPC and offsets most of the positives, at least where the bulk of the market is concerned.

But you'd be smart to keep an eye open, especially where workstation and server strategy is concerned, because that's where the PowerPC with Unix and Apple could make a real play for corporate dollars. For price, performance and making a statement that we still believe in open architectures, the PowerPC looks like the way to go, even if we have to drag Microsoft along.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.



Ethernet cards turn PCs into LAN hubs

By Lynda Radosevich
DEERFIELD BEACH, FLA.

Networking start-up Alta Research Corp. is shipping a new line of Ethernet cards that can convert a PC into a four- or six-port Ethernet hub. Up to four of these cards can be linked in the same PC using an internal cable (included) to create an inexpensive 24-port concentrator.

Called EtherRim, the cards are aimed at departmental local-area network users in networks of five to 10 workstations. One likely use is to wire PCs together in a "daisy chain" to avoid wiring each computer back to a wiring closet.

One card has four 10Base-T ports and one 10Base-2 backbone connector. Another has six 10Base-T ports. The cards can be installed in any PC with 8- or 16-bit XT/AT or Extended Industry Standard Architecture buses. They can turn an old XT into a 24-port concentrator for about $40 per port, said Fred Thiel, vice president of sales and marketing.

The cards do not include standard management facilities such as Simple Network Management Protocol, but they do include automatic partitioning and isolation. The cards are priced at $295 for a 10Base-T version and $315 for the 10Base-2 version.

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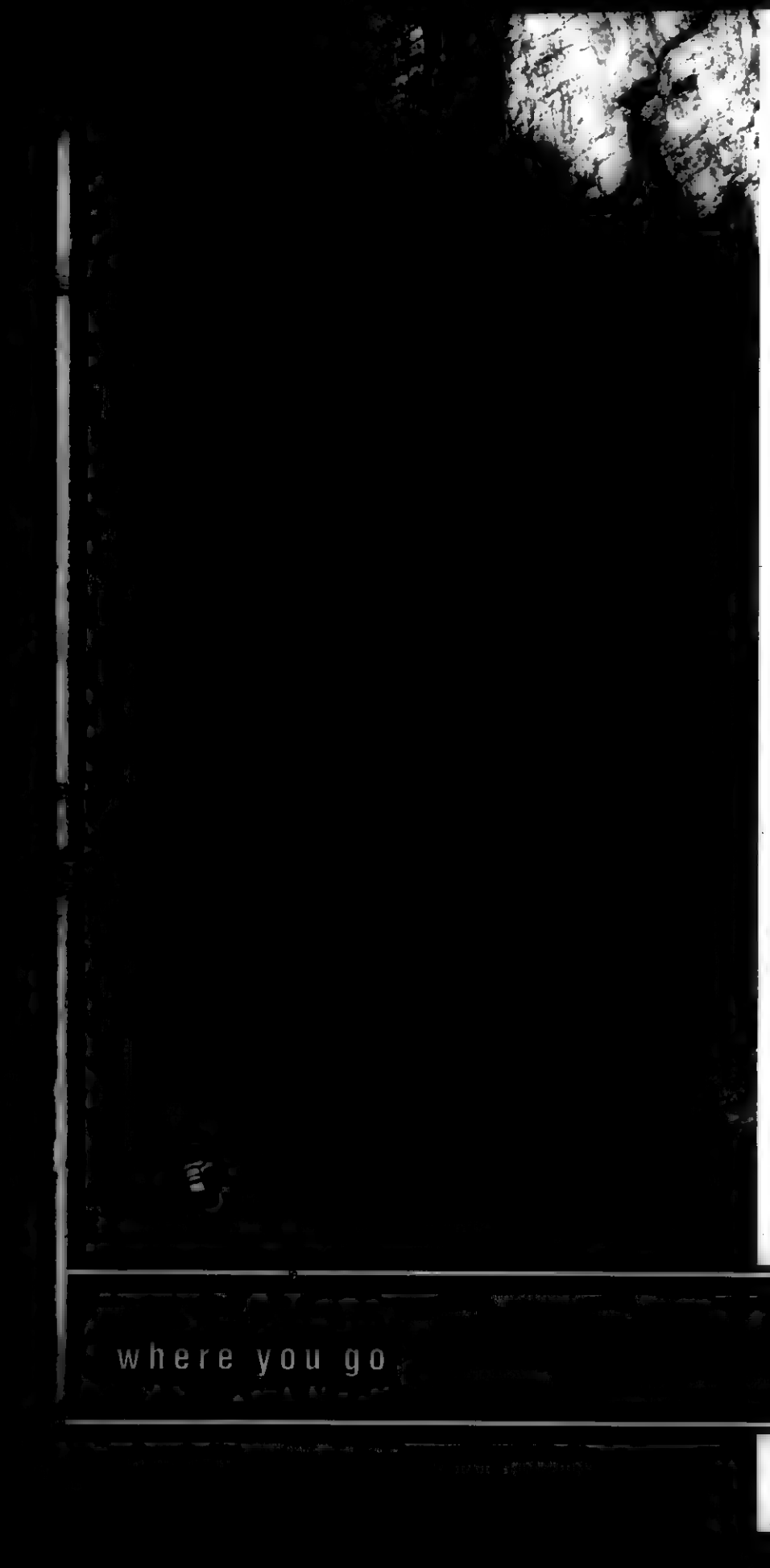

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DEC partnership ships group scheduling tool

By Lisa Davidson
MANTENO, ILL.

Digital Equipment Corp. and Powercore International, Inc. have started shipping Version 1.1 of Network Scheduler 3, a group scheduler designed to fully support DEC's TeamLinks Mail X.400 environments.

With Network Scheduler 3, users can create personal and group calendars with features such as 24-hour scheduling access, automatic search for conflict-free meeting times, dynamic conflict detection, printed graphical reports and user-defined viewing rights to personal calendars, according to the vendors.

Support is provided for various local-area networks and DEC's Pathworks network operating system. With DEC's TeamLinks, users have access to time management features for scheduling meetings between workgroups. Through DEC's Mailworks and TeamLinks Mail, the upgrade now supports wide-area message transport.

With this release, processing speeds for DOS users are said to have improved by 200% to 300%. When the product is running in DOS, it can perform tasks including copying, reconciling and sorting schedules faster than its predecessor.

The product is available in DOS and Microsoft Corp. Windows-based versions. For five users, the price is $395; for 25 users, $1,195; and for 100 users, $3,995.

Workgroup software applications

BBN Software Products has introduced BBN/Cornerstone, data analysis software for client/server computing.

The software integrates data access, statistical analysis, visualization and presentation of results. It is a graphical user interface-based product that consists of a base module with a data analysis framework, dynamic graphics, a work session capture mechanism and a broad data access capability.

A single-user fixed license costs $1,795, and a floater license costs $2,395.

▶*BBN Software Products*
150 Cambridge Park Drive
Cambridge, Mass. 02140
(617) 873-5000

Prism Solutions, Inc. has released Prism Warehouse Manager 2.0, software that converts operational applications and legacy data into integrated information that can be addressed in Unix or IBM's OS/2 client/server environments.

With the product, users can build an informational database or data warehouse to house a subject-oriented, historical base of information. The product extracts and integrates data, generates code and constructs a data warehouse.

It costs $75,000.

▶*Prism Solutions*
440 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 481-0240

Unix

Ampersand Corp. has announced the availability of MaTrix, a Unix-based complex instruction set computing (CICS)-compatible transaction processing environment, on Sun Microsystems, Inc.'s workstations and computers.

The product can be used for distributing production applications on Unix-based platforms and for off-platform development. MaTrix offers application development capabilities such as a screen-painting utility that generates CICS maps, a fully configurable source-code screen editor and a record editor to create, modify or delete records in the internal VSAM database.

The eight-user license costs $8,000.

▶*Ampersand*
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Network holds sway on life, death

By Lynda Radosevich
SAN ANTONIO

If you are going to get hit by a truck, San Antonio could be the best place for it to happen.

Using the city's new dispatch system, emergency-call workers can save precious minutes by dispatching the closest emergency vehicles, taking into account daily traffic patterns. Drivers are assisted by detailed street guides printed from an up-to-date database. Once emergency vehicles reach the scene, emergency workers can quickly obtain medical records and other vital information from dispatchers.

This is made possible by San Antonio's new computer-assisted dispatch system (CADS). The system is the result of a two-year project to reconfigure the city's mainframe-based system and incrementally port it to Unix-based servers and PCs.

The network supporting CADS comprises two NCR Corp. 3450 multiprocessing servers in the police department building. One feeds emergency information to 50 Intel Corp. 80386-based PCs, and a second functions as a standby. The PCs, which are connected to the server by a Transmission Control Protocol/Internet Protocol network, are used by emergency-call takers and dispatchers.

ON SITE

City of San Antonio
Texas

Challenge: To improve speed and functionality of the city's emergency dispatch system.

Technology: NCR Unix-based servers; Intel x86 PCs; and Software AG Adabas host and client/server database software written in Natural language.

Results: Emergency vehicles arrive on accident scene 22.5% faster.

An Amdahl Corp. 5990 mainframe in a nearby building hosts the master copy of the CADS databases and updates the Unix servers every 30 minutes via a fiber-based Open Systems Interconnect network. The 5990 also processes other city applications such as payroll and property taxes.

Calls are sent directly from dispatchers at their PCs over a two-way, customer-owned Motorola, Inc. wireless network to police, fire and emergency workers equipped with notebook computers or smaller devices.

Frank Stromboe: *New PCs have cut life-saving seconds off response time*

Additionally, to connect to 250 remote sites, such as a new job-training facility, the city is implementing frame-relay services from Southwestern Bell Telephone. "It's consistent, and we save about 20% over the point-to-point lines and get away from the hassle of modem connections," said Frank A. Stromboe, director of the City of San Antonio Department of Information Services.

CADS updates the city's fire, police and medical dispatch capabilities in many ways. For instance, when an emergency call came in through the old system, the caller's address was displayed on a dedicated device and was rekeyed into a dispatch report displayed on a separate dumb terminal. Now, the workers have PCs with displays split into windows and can paste address and additional information automatically into the call report.

Stromboe said this process alone takes 30 seconds off the response time. When someone has a life-threatening injury that causes heavy bleeding, for example, 30 seconds "can mean the difference between life and death." In fact, the city can cite four instances where the faster response has saved lives.

Overall, Stromboe said, total response time from when a call is first received to when an emergency vehicle arrives on the scene has been reduced by 22.5%, from 6.7 minutes to 5.2 minutes. Without the new system, the city would have had to spend $15 million to add vehicles and human resources in order to achieve the same result, according to Stromboe. The city invested just $1 million in the CADS.

Network, *page 62*

James M. Connolly

E-mail gone awry

One of the great things about E-mail is that the lowliest peon in a company can send a message to the chairman.

Another great thing about E-mail is that the chairman can avoid reading that same message. All he must do is filter incoming E-mail, giving priority to messages that come from key assistants or deal with selected "important" topics.

Another great thing about E-mail is that an employee can send everyone on the staff detailed messages — complete with attachments — offering opinions about a topic that the recipients know nothing about and may not even care about. (Expect these messages on deadline days.)

The absolute greatest thing about E-mail? The Delete key.

With E-mail, we've created a monster where we wanted a gentle giant. We wanted the Jolly

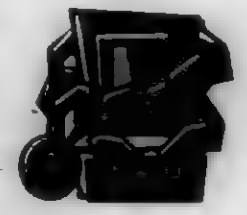
Connolly, *page 60*

Data security

BT, CompuServe offer protection from hackers

By Joanie M. Wexler

Enhanced network service providers BT North America, Inc. and CompuServe, Inc. last week took steps to allay users' concerns about their data's vulnerability to hackers. The carriers implemented data network safeguards in the form of vendor-managed services or customer-managed site equipment that analysts said will likely appeal to customers with differing levels of network security savvy.



BT, for example, said it would assume complete management of customer databases and equipment for its security products portfolio, which includes access control and encryption from third-party vendors.

CompuServe said it will make available for customer sites an encryptor from Cray Communications for its frame-relay services that CompuServe will "ensure stays operational," said Robert McKinney, product manager for internetworking services.

"However, we think it's important for customers to maintain [sensitive] things like public keys themselves," he said.

"Customers truly concerned about security will likely conclude that they must manage their own passwords and databases," concurred Kenneth Bosomworth, director of research at International Resource Development, Inc., a consultancy in New Canaan, Conn.

"However, less sophisticated users will turn to carrier management to at least provide them with some level of security" — which is nonexistent on public packet networks today, Bosomworth said.

On the lookout

Security issues on users' minds include fear that an outsider will watch proprietary data as it is transmitted, such as formulas sent by drug companies or new car designs transmitted by automobile manufacturers, according to Michael Erickson, product manager for security products at BT.

A potential Achilles' heel is that "value-added" carriers such as BT and CompuServe use some lines from public telephone companies, such as AT&T, and "criminals have learned how to get into those central office switches for monitoring traffic," said Steve Matthews, BT manager of global network and business information security.

Bosomworth noted, however, that "for most companies, the biggest threat comes from their own employees, for which none of these measures is of the slightest use."

BT's managed security service suite combines safeguards offered by third-party vendors: access control by Security Dynamics in Cambridge, Mass., and key encryption by Technical Communications Corp. in Concord, Mass.

Security Dynamics' SecureID Card randomly generates a new six-digit code every 60 seconds. To gain access to a protected information resource, users would enter their fixed personal identification number plus the code that happens to appear on the credit card-size SecureID card at the moment.

As part of its security package, BT will also provide security consulting services. This includes attempts by BT to hack into a user's network resources to identify and fix vulnerabilities. The carrier will also send users electronic network activity reports to help them track unauthorized network use.

Generic APIs for messaging are on deck

By Lynda Radosevich

While messaging vendors such as Lotus Development Corp., Microsoft Corp. and Novell, Inc. each offer application programming interfaces (API) to their messaging systems, another group, the X.400 Applications Program Interface Association (XAPIA), is getting ready to roll out a generic set of basic APIs meant to span all messaging systems and hardware platforms [CW, Oct. 26, 1992].

Called Common Mail Calls, the APIs will help move electronic mail and mail-enabled applications across disparate software and hardware platforms and can replace vendors' proprietary APIs to ease development efforts. Microsoft, Lotus and Novell voiced support for the XAPIA's effort.

The first set of Common Mail Calls is expected to be introduced at Electronic Messaging '93, scheduled for June 14-17 in Atlanta. Additionally, the XAPIA announced that it will begin developing a new round of mail calls and invited interested vendor and end-user organizations to join the development effort.

For more information, contact Ed Owens, chairman, at (415) 335-0646 or Janie Chang, communications chairwoman, at (604) 436-2922.

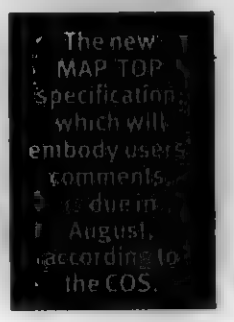
MAP/TOP update will incorporate worldwide protocols

By Elisabeth Horwitt

Proposed enhancements and changes to Manufacturing Automation Protocol/Technical and Office Protocol (MAP/TOP) 3.0 would incorporate several key national and international protocols into the standard.

Proposals for the 1993 release of Version 3.0 of the manufacturing and office networking standard include the following:

- Extensions to lower layer protocols to satisfy European user requirements.
- Inclusion of the International Standards Organization's X.500 directory services.
- Inclusion of the Intermediate System to Intermediate System routing algorithm for MAP/TOP networks.



The document also proposes that the Corporation for Open Systems (COS) standards body accept the contents of the Industry/Government Open Systems Specification.

Two functional areas are excepted from this proposed acceptance: network management and directory services.

The enhancements are now being considered as a ballot by members of the North American MAP/TOP User Group, with comments due back by Friday.

The new MAP/TOP specification, which will embody the comments, is tentatively due out in August, according to a COS spokeswoman.

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MacUser Editors' Choice Award, 1992

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MacWEEK 1992 Editors' Choice
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Connolly

CONTINUED FROM PAGE 57

Green Giant, carefully digging into the soil with his pinky to plant tons of vegetables and thus help feed the world. Too often E-mail is Godzilla. People send messages just because they can, and people ignore messages just because they can. My favorite excuse is: "The system must have eaten your message."

As much as I enjoy using E-mail to communicate with people within my company and on the outside, I know one thing: Nobody really knows how to use it, and that is why we have so many messages that are misread or not read at all.

I asked a bunch of IS managers and other users whether their companies teach users how to make proper use of E-mail. The typical response was something like, "Oh, yes. But it's easy — just point and click and type." The trouble is, those lessons deal only with the plumbing, not with the message.

Ask some people whether their company offers classes in how to write an E-mail message and the response is "Huh?" Actually, some don't even verbalize that one; they just get that familiar glassy-eyed look. But I guarantee every one of those people has been through an E-mail hell where they echoed Strother Martin's old line, "What we have he'ah is a failya to com-mun-i-cate."

Few in the corporate world realize written communication takes training. (Hey, I even went to college to learn this stuff.) Too many just type on a keyboard the words they would have said in person. You can be a great orator, but if you can't get to the point in a written message, nobody is going to read it.

And almost no one stops to think how differently the brain records the written word vs. the spoken word. The wrong word spoken over the phone or in person may be easily missed as you and your associate babble back and forth. The wrong word typed into an E-mail burns itself into the reader's memory. "Joe, you failed to send me those numbers. Please do so right away" can serve as a gentle reminder when spoken and is soon lost in the general din of the office. But, put that in a written message sitting under Joe's nose for five seconds or 20 minutes and it becomes "Joe, YOU FAILED."

If corporate America wants to get serious about written electronic communication, it must make sure that people know how to communicate rather than just send messages. Here are some suggestions:

Message musts

- Recognize chains of command and what spy-type folks call "need to know." Encourage everyone to send an E-mail to the chairman but only when the chairman is the appropriate recipient. "How about that ball game?" is not a message for the chairman. "There are serious morale problems in my business unit" may be just fine.

At the same time, there are people further down the food chain who shouldn't hear about problems they cannot solve and that don't relate to them.

- Don't use E-mail to avoid uncomfortable face-to-face communication, and don't use filtering or supposed system problems to dodge communication.
- Keep E-mail messages brief and targeted. You could even learn from the old-line newspaper approach of using a headline and a "who, what, where, when, why and how" type of opener to your message. If your subject line says, "Possible losses in second quarter," and your message starts with "Given the poor sales of our Whoseamathingies in Europe, we may lose $3 million," you can be darn sure people will read your message.
- Be careful how you say what you say. Remember that a poorly chosen printed word doesn't whip past the recipient at the speed of sound. It just simmers there on the screen.

One final note just to protect myself from the evils of the misinterpreted written word. That part about the chairman not reading E-mail from the peons was a generic reference to the corporate world at large, having nothing to do with personal experience. Honest, I'm sure the chairman of my company reads his E-mail.

Well, maybe I'll drop Pat a note about the ball game, just to find out.

Connolly is *Computerworld*'s technical sections editor. His MCI Mail address is 507-1804.

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[redacted]

Links

Xylogics, Inc. has introduced the Annex Printer Server family.

According to the company, the products enable users to access, distribute and manage printers. A combination of two high-speed parallel ports and eight serial ports are provided, allowing users to attach PCs, terminals, modems and other devices along with high-speed printers.

Both Unix Transmission Control Protocol/Internet Protocol and Digital Local-Area Transport protocols are simultaneously supported, providing transparent access to any printer connected to an Annex Printer Server.

The Annex Printer Server family is available in two models, with prices starting at $1,995.

▶ *Xylogics*
53 Third Ave.
Burlington, Mass. 01803
(617) 272-8140

Xyplex, Inc. has announced the eight-port entry-level MX-800, the high-performance 20-port MX-1620 and the 40-port MX-1640 stand-alone communications servers.

The products are multifunction servers that provide network access locally and on a remote dial-up basis for an assortment of devices from PCs and terminals to data acquisition devices and bar code readers, the company said. Simple Network Management Protocol support is provided for configuration and network management.

The servers can be used on IBM, Unix and Digital Equipment Corp. systems.

The eight-port 800 costs $1,595. The 20-port 1620 costs $3,995, and the 40-port 1640 is priced at $5,995.

▶ *Xyplex*
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Fax

Alcom, Inc. has announced the LanFax Redirector 2.1-GL (LFR 2.1-GL), a local-area network fax server.

The product was designed for GammaLink's GammaFax boards and offers 32-line support, enhanced inbound routing capabilities and a number of new features such as Tag Image File Format support, the company reported.

Heavy inbound and outbound fax traffic can be handled because the LFR 2.1-GL supports up to 32 fax lines in a single server.

New intelligent inbound routing capabilities support five routing methods: Non-Standard Format-based routing, Dual Tone Multifrequency, Direct Inward Dialing, Source-ID routing and Channel routing.

To enhance the performance and functionality of LFR 2.1-GL, speed enhancements and printed confirmation slips have been provided. The server requires a dedicated 386 or above PC with MS-DOS 5.0, 4M bytes of random-access memory, an 80M-byte hard drive and GammaFax fax cards.

A 50-user version of LFR 2.1-GL costs $2,995, and the 100-user version costs $4,995.

▶ *Alcom*
1616 N. Shoreline Blvd.
Mountain View, Calif. 94043
(415) 694-7000

Net technology pace winds developers

By Elisabeth Horwitt

With the market heating up and the pace of introductions quickening, major internetworking and network management players are finding they can no longer afford the time to develop key products in-house — or at least the players' technologies.

As a result, they are acquiring key niche players.

A good example is Peregrine Systems, Inc.'s recent purchase of Network Edge, Inc., a Colorado Springs company whose software enables Hewlett-Packard Co.'s OpenView to manage Novell, Inc. NetWare local-area networks. The acquisition offered Peregrine a chance to branch out into NetWare management from an established position in IBM and Unix systems management, said Jill Huntington-Lee, principal at Brandywine Network Associates, a Cinnaminson, N.J., consulting firm.

"Technology is moving so quickly today that companies often cannot afford to do development in-house."

"A few years ago they might have developed the technology themselves; but things move so fast today, they can't afford to," she added.

Acquisitions abound

Other recent examples of companies buttressing their product lines through acquisitions include the following:

•Network Systems Corp. bought Bus-Tech, Inc. in Burlington, Mass. Bus-Tech develops hardware that connects different types of LANs to IBM mainframes. One of its more strategic offerings is an IBM 3172-compatible cluster controller that connects to an IBM channel and runs Novell's NetWare for SAA host interconnect software. Network Systems specializes in host channel-based networking.

•Penril DataComm Networks in Gaithersburg, Md., acquired Datability, Inc., a LAN bridge, router and communications servervendor in Carlstadt, N.J. Datability will become a new division of Penril, alongside the existing DataCom Division that sells modems and T1 multiplexers.

•Xylogics, Inc. in Burlington, Mass., acquired Novell IPX protocol technology and the LANModem product line from Microtest, Inc. in Phoenix. The company plans to integrate the technology into its Annex line during the next year, enabling the communications server to support remote access and dial-up routing for three key protocols: IPX, Apple Computer, Inc.'s AppleTalk and Transmission Control Protocol/Internet Protocol.

Network

CONTINUED FROM PAGE 57

"That underscores the fact that technology really pays for itself," he said.

The CADS database houses geographic and other information tied to people's telephone numbers.

For instance, when an emergency call comes in, the call taker automatically receives the caller's address and location, such as a bedroom where a disabled person sleeps.

The database also includes historical information that lets dispatchers predict where emergency calls may come from. Based on trends such as traffic patterns and current data such as road construction, the dispatcher can route the vehicles the shortest way.

At your service

San Antonio's computer-aided police, fire and emergency medical service dispatch system has the following:

- 2,820 daily requests for service.
- 96 dispatchers.
- 25 call takers.
- 406 regularly scheduled vehicles per shift.
- 516 mobile data terminals.

Software picks

The software supporting the emergency dispatch systems was written in Natural programming language by Software AG of North America in Reston, Va. The database structure is Software AG's Adabas database management system. The city chose Adabas because it operates on the mainframe and Unix platforms using the same code.

"For the most part, the MVS version is the same as the Unix version, so we can move to Unix-based machines and distributed processing with the same staff that has been building expertise in our department for 30 years," Stromboe said.

One of the challenges in building a scalable system was figuring out how to keep multiple databases synchronized. For example, the mainframe version of the geographic information file is updated from other offices, such as the tax office, and must be replicated on the Unix boxes. So Software AG had to provide software that replicates the geographic database in several places every 30 minutes, Stromboe said.

Other factors driving the move to Unix-based client/server include cost/performance ratios. For example, Stromboe said the two NCR 3450s cost approximately $30,000, and he pays in excess of $400,000 every year just for maintenance of the MVS software.

Stromboe said he plans to move other applications such as payroll processing and accounts payable and receivable off the mainframe. However, "we have enough life in the one we have to last another five years, based on our growth rate," he said.

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IBM Business Partner

Mainframers: We're no dinosaurs

Even as client/server systems push out big iron, mainframers say their skills will still be in demand

By Johanna Ambrosio

It may be wishful thinking by the politically incorrect, but some mainframers expect their ship to return one day soon. As client/server applications take hold in corporate America, the theory goes, the mainframe skill set will be a requirement for these systems to truly succeed.

"All the mistakes that client/server applications are making were made 20 years ago" by people who tend the mainframe, said Carl Henderson, systems manager at Canadian National Railways in Montreal. "I don't worry about my job because there will always be one."

Henderson and others at a recent meeting of mainframe maintenance programmers in San Francisco pointed out how client/server applications increase the need for the things that mainframers already know how to do: enterprisewide security, backup, software distribution, change management and just getting things to work together without blowing up.

Still, it is a tough time to be associated with mainframes because the information systems training and travel money generally goes to people working on the "hot" projects that typically do not involve a host computer. Also, companies may be reluctant to provide new opportunities for someone who may be their only real expert on a given critical production system.

All this makes it difficult for mainframers to get the training they need on client/server technologies. Especially key skills for the host-centric involve desktop operating systems, the C programming language and local-area networks.

One mainframe programmer who spoke anonymously summed up the dilemma: "My company has a policy of us not working after hours on anything except emergencies, so it's difficult to stay here and learn what I need. So I've set up a local-area network with three PCs in my living room at home. I just can't tell anyone that I'm doing that."

Numbers dropping

Nathan Lowell, an IS director in Buffalo, N.Y., and president of the Software Management Association, the group that hosted the meeting, said, "Companies are unwilling to invest in training. Our membership has dropped from almost 900 in 1989 to under 400." Only about 100 people made it to the San Francisco gathering, and this number included consultants and representatives from software vendors.

Lowell agreed, however, that mainframers' skills will come back in vogue. "Saying that client/server replaces mainframes is like saying you're going to scrap the interstate highway system to buy a new kind of car. The existing systems have buried in them all the rules that control the business; only people don't know what those rules are. The promise of client/server doesn't replace that."

According to the Software Management Association, there are some 2.5 million programmers in North America, 1.5 million of whom work on maintaining mainframe applications.

Another programmer spoke with some pride about how his group was called in to rescue a client/server project gone awry because of a lack of policies and procedures. "It makes you wonder who's really got the walnut-size brain," he said, referring to the oft-cited reference to mainframers as dinosaurs.

"I see our role becoming the keeper of the corporate data, having to control the PC world and make sure that the software is all legal and that people's files don't get lost," said Dennis Power, director of technical services and operations at Atlas Van Lines in Evansville, Ind. "The mainframe technical people here are very close-knit with our PC network people. If they have problems or questions, they talk to us."

Although programmers might feel otherwise, these issues are not entirely lost on some top IS management. "There's an element of truth in what they're saying," said Jens Pedersen, vice president of IS at GreatWest Life Assurance Co. in Denver. "Backup, recovery and other kinds of data processing hygiene are going to become important factors in the client/server world.

"I think there's a tremendous role for people willing to make the effort to bridge the gap between the mainframe and client/server environments," Pedersen added.

However, Pedersen said, programmers must be proactive in getting the skills they need and not just sit back waiting for the phone to ring. "I don't think there's anyone better motivated to look after your education than you are yourself."

SAS optimizes applications by distributing across networks

By Gary H. Anthes
NEW YORK

■ At its annual user conference here recently, SAS Institute, Inc. outlined a client/server approach based on the assertion that many existing tools for distributed computing are not well-suited for analysis and retrieval of information from very large remote databases, especially when they are nonrelational in structure.

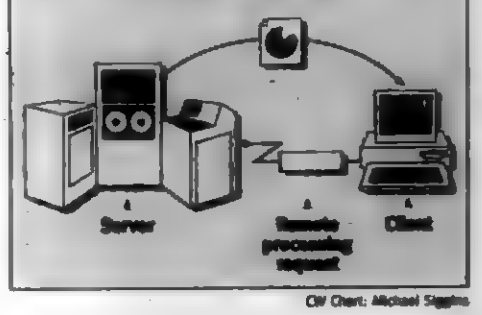
SAS President James Goodnight said most desktop SQL-based query products are "partial solutions at best," appropriate only for low-volume applications accessing relational databases. He said many applications, especially executive information systems drawing on large databases, are optimized by client/server implementations that split processing logic across the network, allowing client and server each to do what they do best.

To back that up, SAS demonstrated its SAS/Connect product, which enables remote servers to act as compute servers as well as data servers. Its "remote submit" feature allows local SAS statements to be sent to a SAS session on a server for execution. That allows preprocessing and summarization of the database, minimizing traffic back to the client.

Blue Cross/Blue Shield of Connecticut has SAS products on its IBM 3090/600 mainframe and on its local-area networks, and it uses SAS/Connect to initiate SAS processing of huge files — some with 50 million rows — on the mainframe before sending summary results to Microsoft Corp. Windows-based PCs for final processing and presentation.

Server savvy

SAS/CONNECT SOFTWARE ENABLES REMOTE SERVER PLATFORMS TO ACT NOT ONLY AS CLIENT/SERVERS BUT AS COMPUTE SERVERS



CW Chart: Michael Siggins

"Only small portions of data are returned, so response on the PC is real good," said Michael L. Davis, research staff assistant at Blue Cross/Blue Shield. Moreover, Davis said, the big data-crunching jobs can be scheduled for overnight processing when the mainframe is lightly loaded.

Davis pointed out another advantage to the approach: It allows moving specialized SAS modules — for modeling, graphic presentation and the like — to the desktop, where SAS license fees may be an order of magnitude less than equivalent SAS products in the glass house.

"That is definitely a good approach for the kinds of applications where there is a substantial amount of data slicing and dicing that can be done on the server," said Scott Winkler, program director of software management strategies at Gartner Group, Inc. in Stamford, Conn. "It can keep the network from being overloaded with useless data transfers."

Bert Cave, senior product manager for SAS at Intel Corp., said Intel hopes not to buy any more mainframes and is reviewing all its applications to determine which should be moved to client/server. He said some such applications will be implemented using local databases while others will use SAS/Connect to get data from existing mainframe databases.

SAS, *page 67*

An experiment in connections

An experimental feature of SAS/Connect, called "remote library services," allows client SAS sessions to reference software libraries that send remote data to the client. The feature can also be used to update a remote file with data sent from the client. Syntax is the same as for purely local operations. The feature, to be shipped with SAS 6.08 in August, is ideal for low-volume transaction processing, according to SAS.

Mainframe computing

Sallie Mae fights back against its critics

By Mitch Betts
WASHINGTON, D.C.

President Bill Clinton wants to eliminate Sallie Mae, but the clever lady is fighting back with a mixture of old-fashioned lobbying and leading-edge technology.

Clinton and other critics said the government's student loan program would be more efficient if the Student Loan Marketing Association, better known as Sallie Mae, and other financial middlemen were cut out of the picture. Sallie Mae, however, is out to prove them wrong.

AT A GLANCE

Sallie Mae
Student Loan Marketing Association
Washington, D.C.

- Business: A federally chartered, stockholder-owned corporation in the secondary market for education loans. Founded in 1972.
- Assets: $46 billion.
- Profit (1992): $394 million, up 14%.
- Employees: 4,300.

To bolster its image for efficiency and innovation, Sallie Mae has been running full-page advertisements in national publications touting its mainframe system for servicing student loans. In addition, the government-chartered corporation is about to undertake a huge document imaging project that is expected to cost $50 million over four years.

Sallie Mae also has a grand plan to migrate its loan-servicing operation to a client/server architecture in which its mainframe would act as a central data server running IBM's DB2 relational database management system.

In the complicated world of guaranteed student loans, Sallie Mae raises money in the financial markets so it can buy student loans from banks and other lenders.

Then Sallie Mae services the loans, which means handling the administrative work of getting college graduates to pay up.

The cornerstone of Sallie Mae's loan-servicing operation is a custom-developed system called Class, which runs on an Amdahl Corp. 5990-3550 mainframe at the Herndon, Va., data center.

The 5-year-old Class automates virtually every aspect of servicing the loans in an effort to keep administrative costs and loan delinquencies down.

For example, every night it scans Sallie Mae's portfolio of 3.5 million student loans looking for past-due balances and other loan situations that need special attention.

If a borrower has missed a payment, for instance, Class and its integrated telephony system will dial the borrower's phone number and route the call and the loan records to a service representative.

In the second quarter of 1994, Sallie Mae plans to convert Class from the current IMS database, crammed with 500G bytes of loan records, to DB2 "so we'll have one logical view of the database," said Donald G. Gallagher, vice president for servicing and corporate systems.

The move to a client/server architecture is intended to give business managers the capability to use PC-based software for analyzing the huge loan database, he added.

"The wave of the future is not CICS, IMS and mainframes," Gallagher said. "We want to be in the position to take advantage of whatever off-the-shelf products come out to help users unlock information that is now hidden away in the mainframe."

President Clinton wants to ax Sallie Mae, but the student loan institution is using technology to streamline processes and prove its worth. Sallie Mae also has plans for a 2,500-seat imaging system and migration to client/server systems.

An even more pressing project is selecting a vendor for the document imaging system, which is crucial for dealing with one of Sallie Mae's biggest administrative headaches: 3 million pieces of incoming correspondence a year.

"We have trucks backing up and depositing all this paper. Tracking and moving it around is just a nightmare," said Robert D. Friedhoff, senior vice president for servicing. "We want to stop that paper right in the mailroom, [scan it] and then move it around electronically," Friedhoff said.

The biggest challenge is how to build an affordable, high-bandwidth wide-

Sallie Mae, *page 67*

for NetWare
for OS/2
for UNIX
for Macintosh
for VMS
for MVS

Sallie Mae

CONTINUED FROM PAGE 66

area network capable of allowing 2,500 employees to access the document images, which will be stored on local jukeboxes at seven regional centers across the country, Gallagher said.

For vendors in the imaging business, the Sallie Mae contract is considered the "deal of the year." Gallagher said a handful of major vendors are in the midst of test demonstrations. He said he expects a decision in June or July.

An industry source said the bidders for the prime contract include IBM, Price Waterhouse and Grumman Data Systems, the Herndon, Va.-based systems integration unit of Grumman Corp.

Sallie Mae's crusade for efficiency and innovation is a response to the political and competitive threats to its core business.

Plans to cut

President Clinton said the government could save $1 billion a year by scrapping the current student loan program and allowing students to borrow money directly from the federal government, without intermediary banks and Sallie Mae.

But Sallie Mae and other supporters of the current system scoff at the notion that federal bureaucrats could do a more efficient job.

Computerization and competition among Sallie Mae and rivals such as Citibank NA and Chase Manhattan Bank NA have steadily driven down the administrative costs of servicing the loans, according to a Congressional Research Service report.

However, the legislative battle over student loans and the future of Sallie Mae are likely to be spirited. U.S. Sen. Paul Simon (D-Ill.), for example, recently blasted Sallie Mae for being "so consumed with self-interest" that it has employed high-powered lobbyists to block reform and preserve its subsidies under the status quo.

In any case, Sallie Mae is preparing for an uncertain future in which it may need to develop new lines of business. "We want to get [our information system] to the point where it is flexible enough to handle whatever the future brings," Gallagher said.

SAS

CONTINUED FROM PAGE 65

"A lot of our demand for SAS running on Intel platforms is coming from our mainframe and VAX users," Cave said. "As a first pass, we will do as much as possible on [the desktop] but connect to [the large machines] for data from legacy systems."

Winkler said preprocessing of server data can be done with SQL queries, but there is a danger that improperly constructed queries may send too much data across the network. Also, programs are often written in languages more difficult than SAS commands.

"So here I am, the end user on my PC," Winkler said. "I create this analysis in SAS, which I am trained in as an end user, and then I ship that function up to the server to get the work done.

"It makes sense for people who are looking at different decision support environments to deploy this kind of system, especially if they've got end users who really want to get involved in determining their own analysis," he added.

Up and coming from SAS

SAS attracted much interest from its demonstrations of the Frame feature of SAS/AF, which allows users to quickly build or enhance applications based on object-oriented technology.

"It is quite a revolutionary approach," said Khasha Dehnad, a manager at The Depository Trust Co. in New York, which recently built an executive information system using SAS' object-oriented products.

The Cary, N.C.-based company also did the following:

- Announced that it has begun shipping the beta-test release of the SAS System for major Unix platforms and for a new environment, Convex Computer Corp.'s ConvexOS. It will contain experimental versions of new products for developing geographic information systems and for manipulation of image data. SAS said it has also begun shipping beta-test copies of SAS for Microsoft's Windows NT.
- Unveiled Emulus, a 3270-emulation product that allows users of major Unix platforms to access 3270 applications on IBM mainframes using Transmission Control Protocol/Internet Protocol.
- Announced a C++ development environment for IBM 370/390 environments running MVS or VM/CMS.
- Announced "interoperability engines" to aid in the migration of applications and files from Digital Equipment Corp. VAXs to Alpha systems.

— Gary H. Anthes

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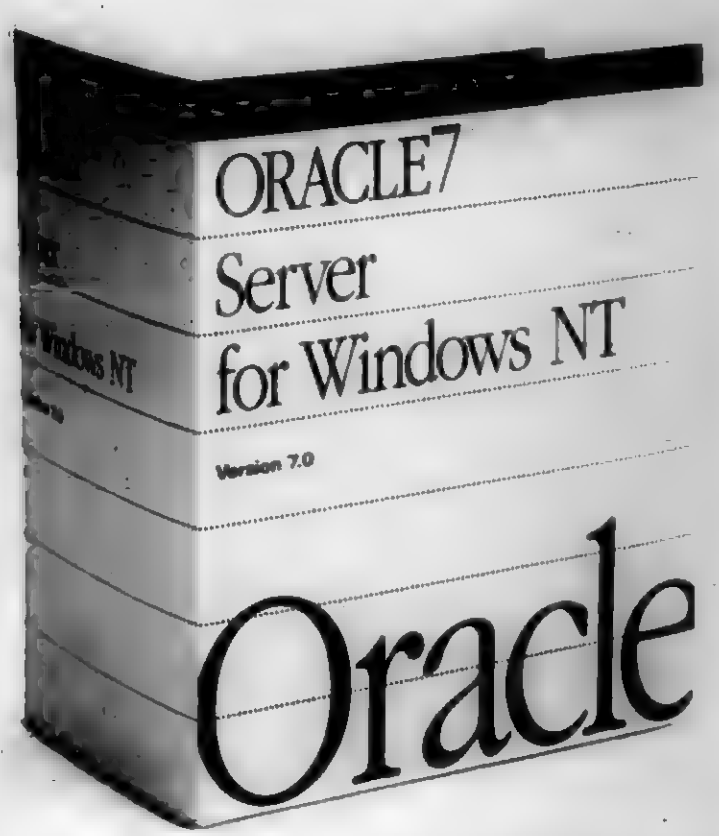

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Ingres users speak out

By Jean S. Bozman
SANTA CLARA, CALIF.

Users of The ASK Group, Inc.'s Ingres Products Division database faced another beginning earlier this month, as a new group of top Ingres executives outlined their plans to improve marketing to the North American Ingres Users Association (NAIUA). Many users said this fresh start — which dates to a March reorganization of $432.4 million ASK — should be built on closer ties to users.

Ingres, long known for its advanced database technology and low-profile marketing, has already requested direct feedback, users said. "Ingres held a customer advisory council at the end of March," NAIUA President Dwight Coles said. "That was a first for us."

Ingres product managers are also drawing users into the product design process, said Matt DiMaria, director of Ingres tools marketing. DiMaria said he expects the inclusion of users to set priorities in development projects.

Peter Micchiche, vice president of Ingres' North American operations for the past four months, acknowledged user frustration at seeing two executive teams since the ASK applications software firm acquired Ingres for its database in September 1990. "Because you have seen other management regimes speaking in front of you, we have a near-term credibility gap," he said.

Micchiche said the latest organization [CW, March 15] would allow the firm to focus on the U.S. and Canada because more than half of Ingres' $254.9 million in 1992 sales came from overseas, particularly Europe. ASK Chief Executive Officer Pier Carlo Falotti said the users "have been right all along. They understood the ability of the product despite a lack of market visibility."

Team approach

The NAIUA plans to keep close to Ingres by reincorporating the 8,000-member user group in California. It also plans to work with other Ingres user associations worldwide to present its product requests with greater impact. Incoming NAIUA President Kitty Weaver, a systems administrator at the National Center for Atmospheric Research in Boulder, Colo., said the NAIUA has infrequent contact with European Ingres user groups, except for an annual meeting with Ingres users in the UK.

Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said Ingres management understands the need to focus on North America, where sales have lagged in recent years. "They lost a lot of time and momentum with the ASK acquisition," he said. "There were a lot of issues about how to fit Ingres into ASK's MANMAN strategy, and it didn't fit." ASK ended up acquiring technology for its MANMAN/X open systems applications suite from a Dutch company, Baan NV.

Some Ingres users noted recent improvements in North American product support. Canadian user Sean O'Hara, a programmer analyst at Promotional Services Ltd. in St. John, New Brunswick, said his firm used to get technical support for the Unisys Corp. U 6000 machine from the UK. In recent months, support was moved to Ingres headquarters in Alameda, Calif., improving response time, he said.

Ingres' jewels

Highlighting the NAIUA conference was a preview of enhanced features for the 3-year-old Ingres/Windows4GL graphical application development toolset.

Ingres said it intended to deliver the following products within 24 months: "Ruby," a graphical report writer; "Amethyst," a graphical user interface-based code generator; and "Jade," an enhanced version of the basic Ingres/Windows4GL tool set, which is expected to be called Ingres/Windows-4GL 2.0.

Product details are scheduled to be announced this fall, Ingres said.

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DEC boosts its storage line

By Melinda-Carol Ballou

Digital Equipment Corp. updated its storage line with a series of products announced earlier this month.

Dubbed StorageWorks, the products are based on the Small Computer Systems Interface-2 standard and offer a modular design that places storage devices, controllers, power supplies and other components into snap-on carriers.

These carriers can then slide into modular shelving and packaging that can be configured for a range of options from the desktop to the high end, DEC officials said.

The following products were included in the announcement:

- The StorageWorks RAID Array 110 is a turnkey, controller-based random arrays of inexpensive disks (RAID) subsystem for VAX-based systems.
- A Desktop Expansion unit allows for entry-level desktop storage. It targets the workstation market (initially supported on the DEC 3000 AXP, Model 300L).
- The Datacenter Cabinet expands high-end DEC 7000 AXP and DEC 10000 AXP systems.
- The StorageWorks Desktop Pedestal expands on systems ranging from the DEC 3000 AXP to the DEC 10000 AXP.
- Four RW500 optical storage libraries or jukeboxes offer automated, low-cost access to data, according to DEC officials.

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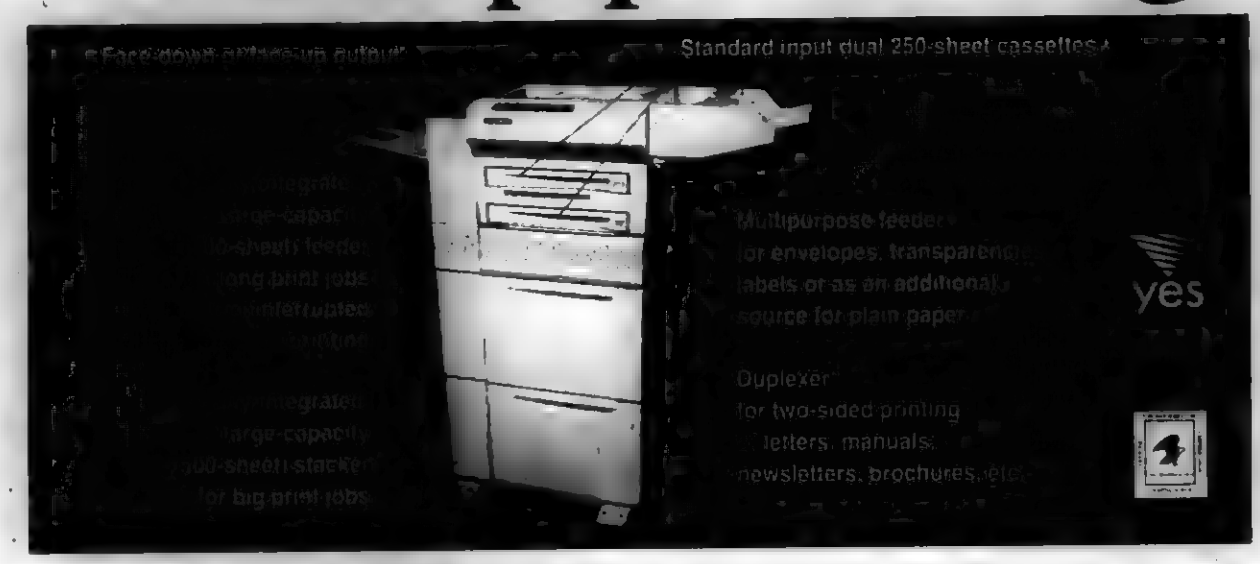

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In Brief

IBM to sell parts

IBM has announced that it will supply parts, services and software to two mainframe computer manufacturers in the former Soviet Union. The two plants, in Moscow and Minsk, will manufacture rack-mounted, air-cooled machines similar to the low end of the Enterprise System/9000 family. This is reportedly the first time that IBM is selling major components to another mainframe maker.

Trucker migrates

Truck manufacturer **Paccar, Inc.** in Renton, Wash., and integrator **Innovative Information Systems, Inc.** in Norwood, Mass., have put the finishing touches on a project in which Innovative Information Systems migrated Paccar's warehouse control system from an IBM 8100 to a Hewlett-Packard Co. HP 9000 running Unix.

Revenue growth expected

Unisys Corp. said this month that it expects its U.S. multivendor network systems integration services revenue to double in 1993.

Parts a phone call away

NCR Corp. has established NCRParts, a toll-free order desk where NCR customers can order replacement parts for NCR System 3000 products, AT&T PCs, workstations and peripherals.

Ready to deliver

Officials from supercomputer maker **Cray Computer Corp.** reported that the **National Center for Atmospheric Research**, the first Cray-3 customer, is expected to take delivery of its demonstration and evaluation machine later this month.

HP exec promoted

Glenn Osaka, whom HP late last year promoted to run its HP 3000 proprietary minicomputer operations, has picked up additional duties. HP last week named Osaka general manager of its Cooperative Computing Systems Division, which markets client/server solutions. The post was vacated last month when general manager Carol Mills moved over to run HP's Unix minicomputer business [CW, March 22], according to the company.

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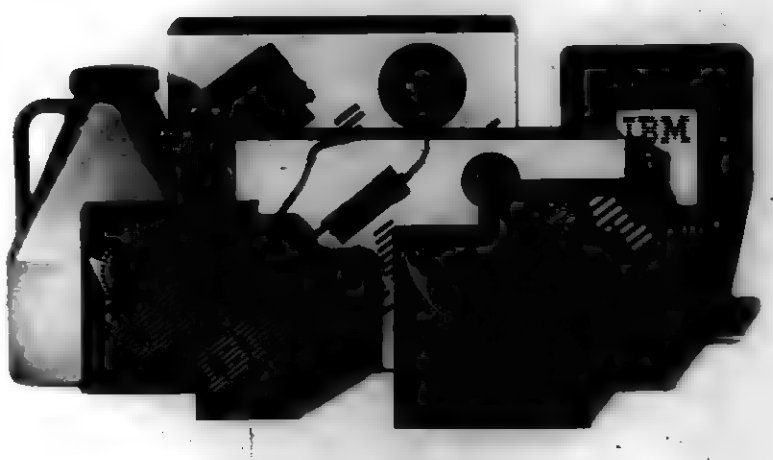

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Unix

Pyramid Technology Corp. has introduced ServiceExpert, a continuous monitoring analysis reporting system designed for mixed-vendor Unix environments.

According to the company, the product allows users to identify and respond to early signs of potential hardware errors and system software problems. Large amounts of system performance data are generated, forming reports that enable users to make proactive decisions by examining maintenance requirements. ServiceExpert also produces network statistics, long-term trend reports and application support.

The product has the ability to track a variety of Unix and Pyramid-specific parameters, such as file permissions management, file and directory size changes, log file archival management, file system integrity, systems error log monitoring, password/group file integrity and remote access memory, among others.

ServiceExpert starts at $750 per month per system.

▶ *Pyramid Technology*
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Software application packages

System Software Associates, Inc. has introduced Version 4.0 of its Business Planning and Control System (BPCS).

The product was designed for organizations running IBM's Application System/400. It has the ability to integrate more than 40 business applications, giving users a customer-driven enterprise management system.

Two client/server applications have been added to this version: Formulation Assistant and User/IFX.

Formulation Assistant defines product process formulations and works in conjunction with the AS/400 database; it has pop-up windows, pull-down menus and an icon tool palette.

User/IFX is a fax and image server application that enables users to send and receive faxes and images from their AS/400-connected workstations, the company reported.

BPCS applications are priced from $1,500 to $240,000 per product per license, depending on the AS/400 model used.

▶ *System Software Associates*
500 W. Madison
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Interactive Software Services, Inc. has announced Version 4.2 of AMIS 400 and three other software products.

According to the company, AMIS is the only decision-support software that runs specifically on IBM's Application System/400. It now features an Intuitive Rebalance that directs how the database is recalculated.

The other products are:

- AMIS EIS, an executive information system that assists users in making complex business decisions. With desktop PCs, users can view selected key performance indicators in a graphical environment.
- AMIS Connect, which allows any AS/400 application to be linked to an AMIS database.
- The AMIS Workstation, a Microsoft Corp. Windows-based PC version of AMIS that enables users to analyze and model data in the AMIS 400.

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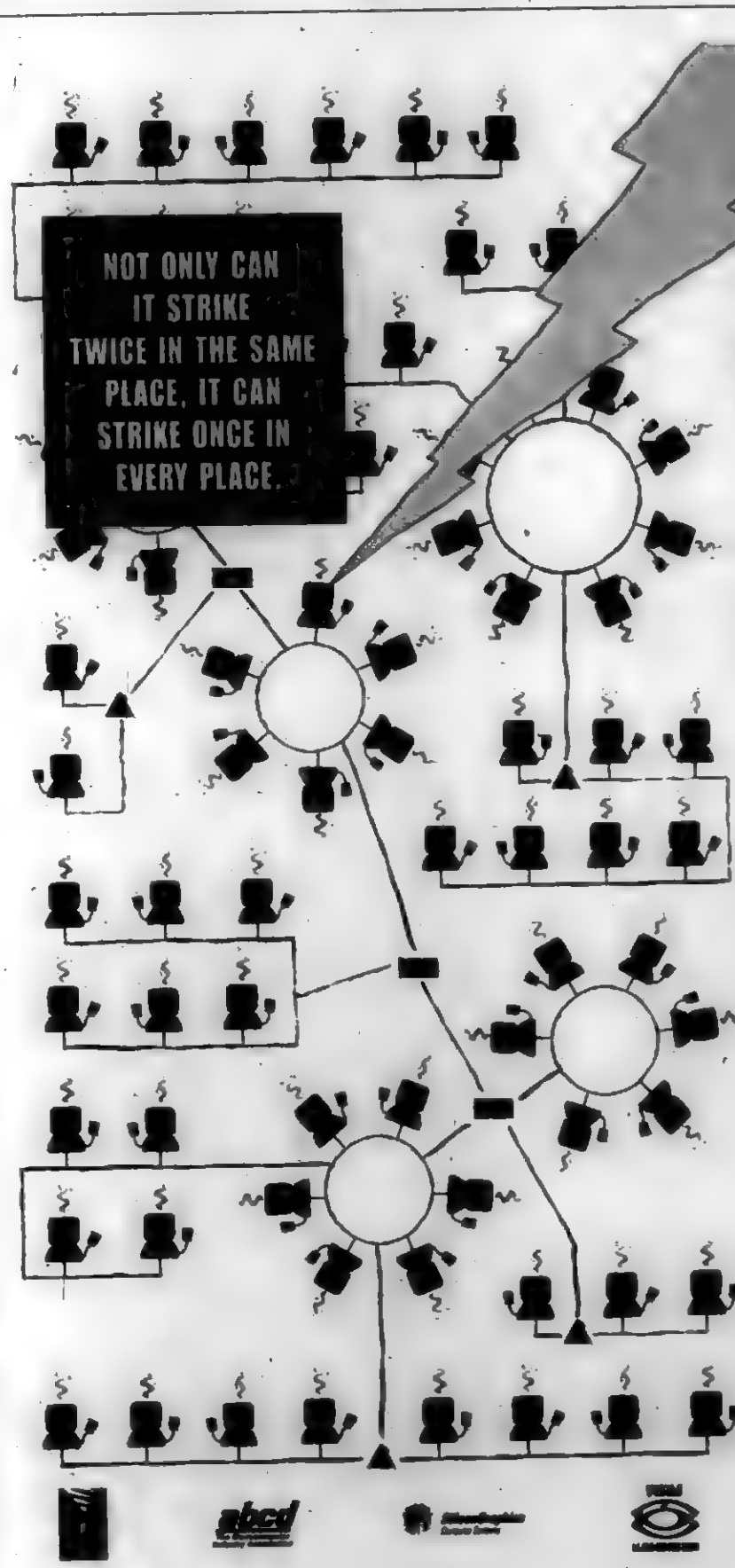

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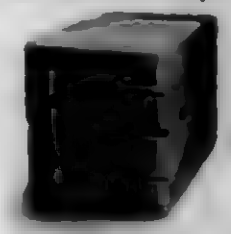

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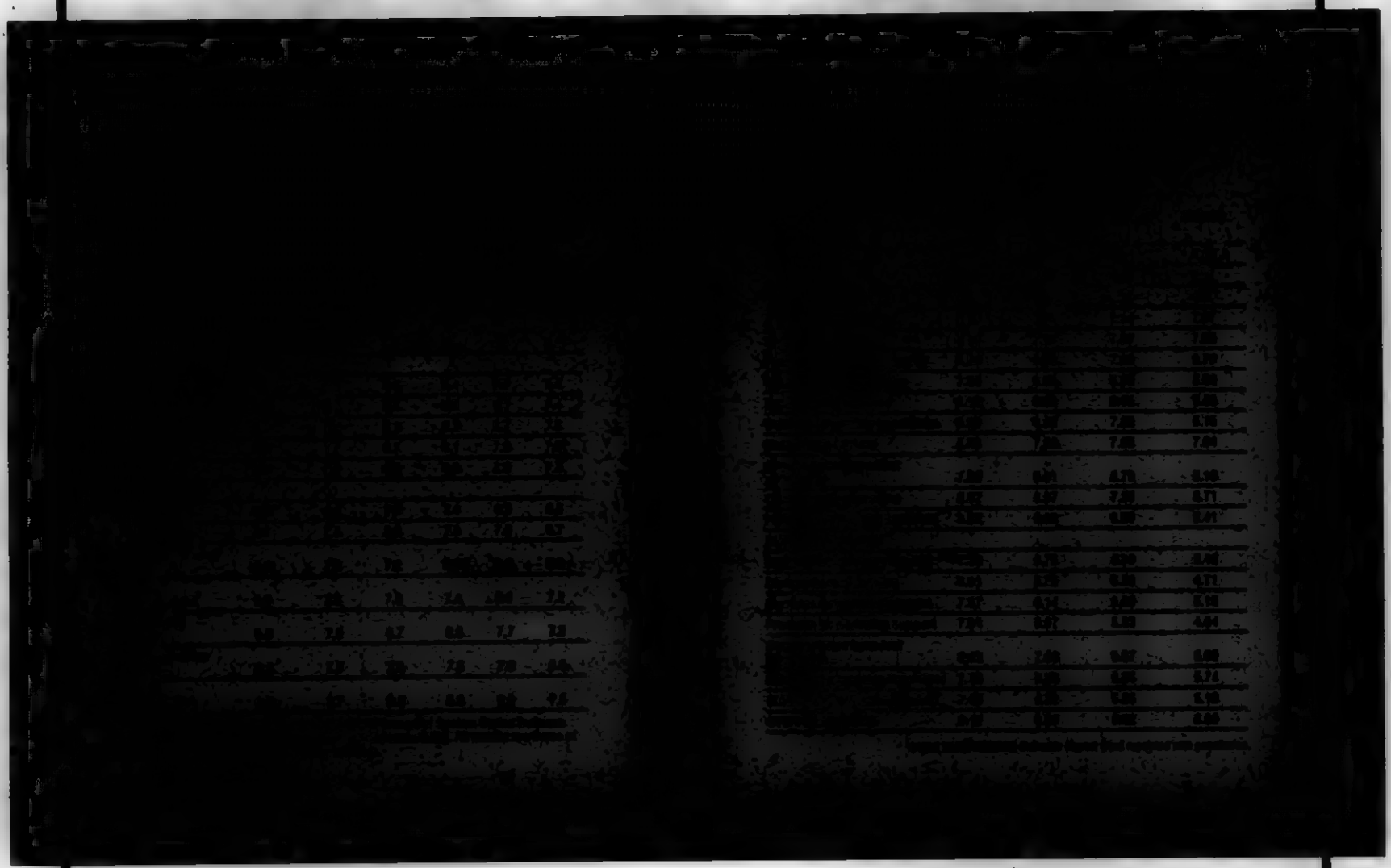

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CPWADV0624

Pen Pal a friend to developers

By Michael Fitzgerald

Pen computing continues to attract interest among niche market users, such as utilities.

In an effort to capitalize on this, PenPal Associates has released a new version of its Power Pen Pal application development tool and cut the price from $995 to $695.

At Monongahela Power Co., the software product is expected to save $3,500 per year per user just in terms of time efficiencies, according to data from a pilot project at the Fairmont, W. Va., company.

Independent Stave *improved its barrel inspection process with Pen Pal 3.0*

Monongahela found that a pilot application designed to automate its field engineers saved them significant amounts of time simply by eliminating the need to type data from forms into desktop PCs. The seven-person pilot, using software developed in Power Pen Pal Versions 3.0 and 4.0, is expected to lead to a 48-unit rollout by the fall.

Debra Ann Champ, a distribution engineer at Monongahela Power, said Power Pen Pal is a time-saver in program development, too. Monongahela Power purchased Power Pen Pal partway through a pen-based pilot program that had started with PadBase, a Grid Systems Corp. tool. Champ has converted 400 forms from paper to digital media, including debugging. The process took six months.

Monongahela Power switched to Power Pen Pal 3.0 because PadBase was "cumbersome and C-oriented and not user-friendly," Champ said. Pen Pal offered specialized commands that made it easy to design pen-based staples such as buttons to click on, and it offered reasonable handwriting recognition. Champ said she also liked that changes could be made to programs in a matter of minutes.

Champ said Power Pen Pal 4.0 has an improved ability to manage forms; the previous version was unable to handle all the forms Monongahela Power had. The new version also has better linking commands and clearer error messages.

Analysts credited Los Altos, Calif.-based Pen Pal Associates for strengthening its tool while keeping it easy to use.

"It was a nice little product, but they needed to beef it up, and they have," commented Portia Isaacson, president of Dream IT, Inc., a consultancy and market research firm in Colorado Springs.

One new feature is the ability to support dBase DBF files, which Pete McCoy, a technical specialist at Alabama's State Auditor's Office, cited as key. The office uses pen computers to track state property, from scuba tanks to office equipment.

Still, some users will stick with Pen Pal 3.0, at least for now. Jack West, an assistant plant manager at Independent Stave Co. in Lebanon, Mo., had no programming experience but was able to build an application that improved the barrel maker's inspection process in two months. "We had to transfer the data four times before we got computers," which created significant opportunities for mistakes, West said.

Growing pains

Object-oriented databases lack development tools

By Garry Ray

With activity heating up around object-oriented databases, you may think it is time to jettison the relational model.

Not so. And not for some time, according to analysts and users of the technology. While object-oriented database management systems have been gaining notice in technical shops and academia, they have yet to provide the range of programming and modeling tools that are widely used in corporate settings.

"For the most part, the tools are for technical programmers," said Steve McClure, manager of object technologies at consultancy International Data Corp. in Framingham, Mass. In almost all cases, object-oriented DBMS projects still require the expertise of C++ programmers, he said.

Going mainstream — slowly

- Object Design this month signed an equity and development deal with IBM that calls for object-oriented database management system use in more than 40 IBM engineering sites.
- Object Design last year inked a deal with fourth-generation language vendor Progress Software.
- Objectivity and Persistence Software agreed to integrate their products, which allow object-oriented DBMSs and relational databases to work together.

Recent announcements may indicate that object-oriented databases are beginning to jump into the mainstream of development technology.

Last month, IBM and Object Design, Inc. in Burlington, Mass., cut a joint development and licensing deal that will result in an estimated $25 million in sales for Object Design. IBM will use Object Design's ObjectStore database at more than 40 research and development sites nationwide, according to an IBM spokeswoman.

However, IBM does not anticipate releasing any commercial applications or development tools for the database in the immediate future, the spokeswoman said.

In addition, Progress Software, Inc. in Bedford, Mass., said late last year that it would provide a bridge between its Progress 4GL development tools and ObjectStore. The bridge will allow Progress developers to read and write data to ObjectStore databases.

Growing pains, *page 80*

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Cincom offers more intuitive interfaces

By Melinda-Carol Ballou

Cincom Systems, Inc. has announced Microsoft Corp. Windows support for the company's AD/Advantage application development environment and a point-and-click graphical user interface for its Control:Manufacturing software.

Cincom also began shipping its CPCS Request Tracking System for use with its CPCS Management and Guidance System.

AD/Advantage for Windows is a PC-based application development and testing workbench for generating applications in a graphical environment. The Windows support will allow developers to more efficiently create applications that are portable — running across IBM's MVS and VSE, Digital Equipment Corp.'s VMS, Groupe Bull's DPX/7 and other versions of the Unix, OS/1 and MS-DOS operating systems, Cincom officials said.

The software will automatically determine which type of interface is required and generate it, said Dennis Butler, director of product management. Mantis design objects can be imported from existing systems into the new editors offered by AD/Advantage.

The new Control:Manufacturing software's Turbo interface will let users navigate standard manufacturing functions. It is also available for users with Windows and Apple Computer, Inc. Macintosh desktop platforms.

The pull-down menus, point-and-click access, desktop integration and graphical buttons will make life easier, according to users at Ethicon Endo Surgery, a medical manufacturing plant near Cincinnati that is a division of Johnson & Johnson Co.

The Turbo interface to Control:Manufacturing "is terrific — it gives us much easier user access with point-and-click capabilities," said David Pomment, materials manager at Ethicon.

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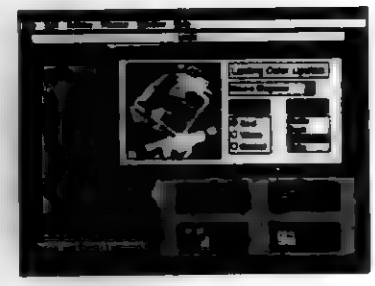

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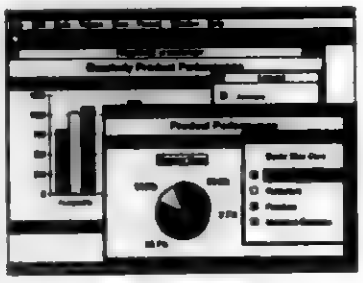

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Growing pains

CONTINUED FROM PAGE 79

Gene Bonte, vice president of workstation and server products at Object Design, said the relative vacuum of object-oriented DBMS tools is consistent with the evolution of any new technology.

"First people evaluate whether the technology is real. Then they do prototyping work to evaluate the benefits. Finally, they build products and move to deployment," Bonte said.

C++ hindrance

However, the trip from prototyping to widespread deployment may not be a speedy one if C++ programming is the only way to get there. According to Stephen Hunter, a database programmer and senior consultant at Sterling, Inc.'s intelligence and military division in Vienna, Va., the current object-oriented database management tool offerings are inadequate at best.

"This stuff has got to improve," Hunter said. "There's no way a user can get to an object database, and it's even hard for programmers."

Hunter said he has been using Objectivity, Inc.'s Objectivity/DB database and Persistence Software, Inc.'s Persistence development tool for an application accessing "terabytes" of relational data used by a federal intelligence agency. Those vendors, in Menlo Park, Calif., and San Mateo, Calif., respectively, announced the integration of their products earlier this month.

In the end, widespread use of object-oriented database products may happen only if an alternative is found to the C++ programming they now require. Persistence Software President Chris Keene, who acknowledged that the complexity of C++ is "a real issue" in the adoption of object-oriented DBMSs, said the answer may come with a less fashionable, but more usable, object-oriented Cobol.

"A lot of people may shudder" at that prospect, Keene said, but "the question is not elegance, but what people can use."

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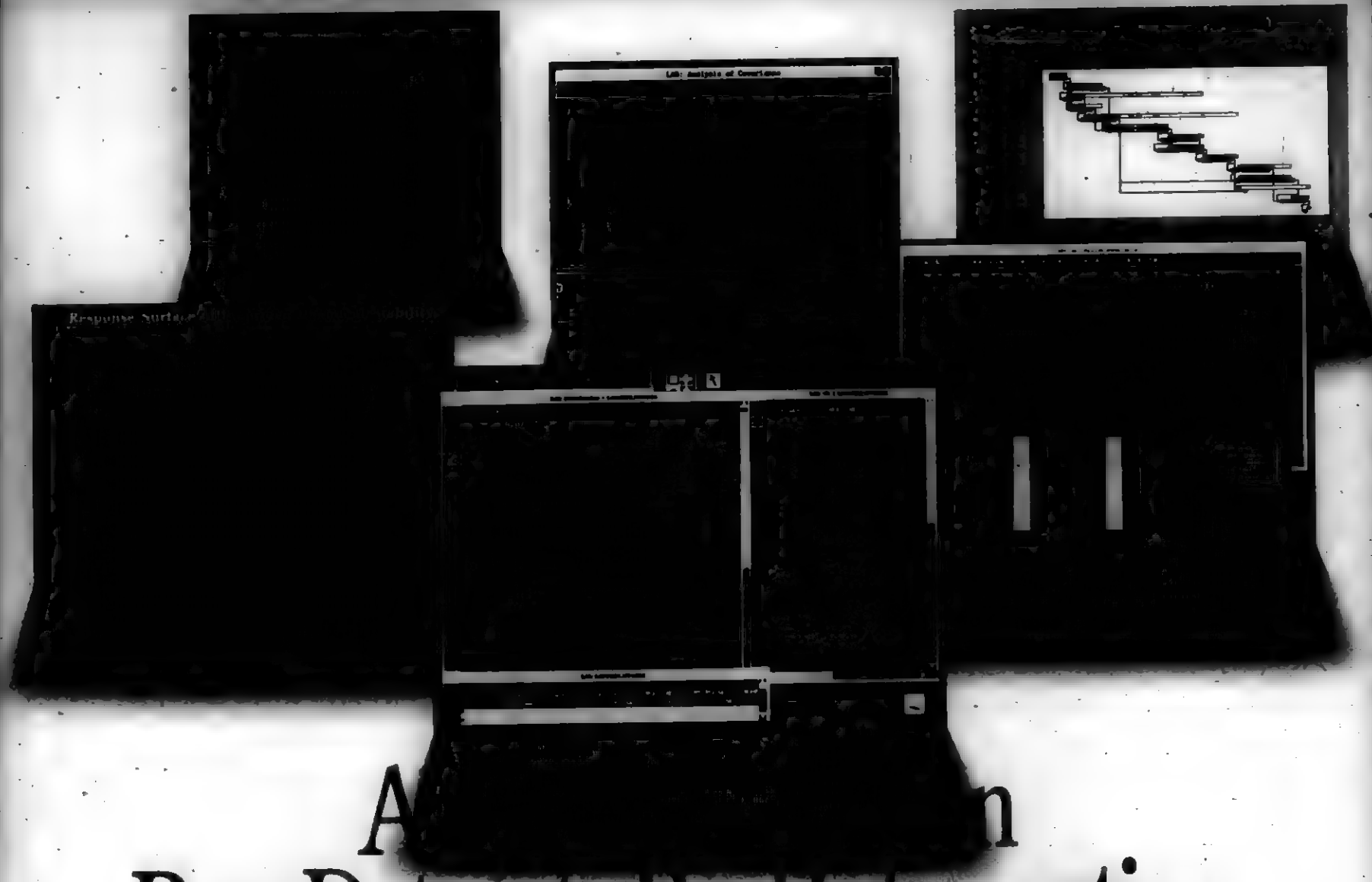

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Apple adds multimedia authoring tools

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. continued its aggressive effort to drive development of the multimedia market with the introduction of a fresh pair of authoring tools designed to offer newcomers a jump start into multimedia development.

The move is an important one for Apple, which is looking to expand its role in a market that is potentially lucrative but has yet to hit its stride. One stalling factor, developers said, is that authoring tools are often difficult to use.

"The availability of intuitive and easy-to-use authoring tools is essential to the growth of the multimedia industry," said Gaston Bastiaens, general manager of Apple's Personal Interactive Division.

The first tool, The Author's Solution for Interactive Electronic Books, has been targeted at electronic book publishing, one of the fastest growing areas of multimedia development.

The new tool kit has been designed to help fledgling multimedia programmers overcome some of the complexity of multimedia programming through easy-to-use tools as well as support and training resources, according to Satjiv Chahil, vice president of Apple's New Media/New Markets organization.

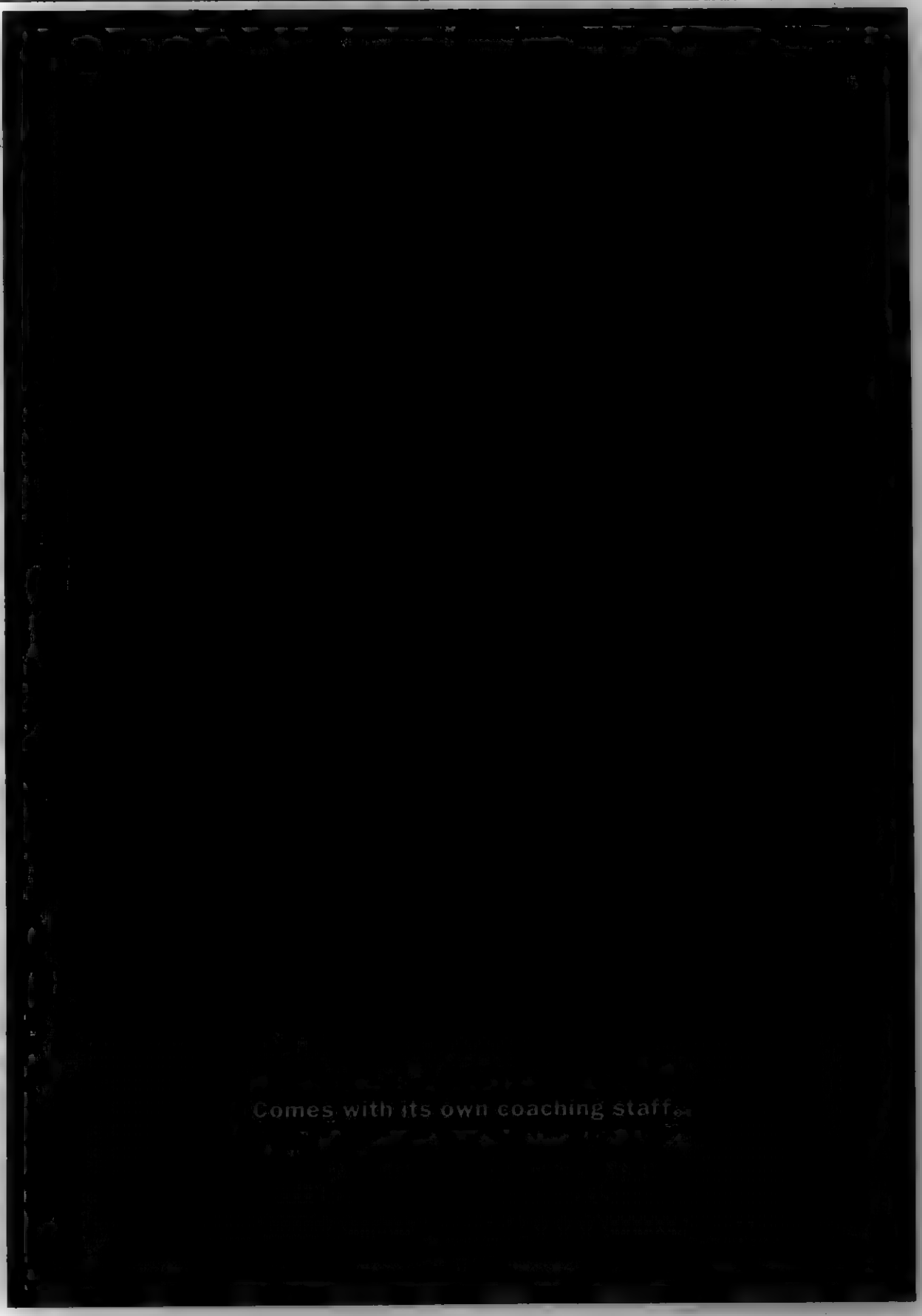
The Author's Solution will come in two configurations. The Level I Kit is a starter product for designing multimedia documents, especially those for internal distribution in a school or company.

The Level II Kit is a more comprehensive version that can be used to produce professional-quality electronic books within hours, Apple said.

The Author's Solution for Interactive Electronic Books is available through APDA, Apple's source for developer tools. The Level I product is $125, while the Level II version is $350.

Apple also announced The Apple Media Kit, which is targeted at authors engaged in the tricky business of pulling in graphics, video and sound from other multimedia applications. The product will make extensive use of Apple's QuickTime multimedia architecture and will support multiple platforms, including Windows.

The Apple Media Kit is also expected to support ScriptX, a cross-platform scripting language under development from Kaleida Labs, Inc. The media kit will ship later this year, according to Apple officials.



In Brief

Object computing alliance

Expersoft has announced the formation of the Distributed Object Access Alliance, a company-sponsored consortium of software vendors and systems integrators interested in distributed object computing. The San Diego-based vendor of the XShell distributed environment has enlisted five software companies and two systems integrators in the alliance so far.

MVS PL/1 emulator

IBM and Micro Focus, Inc. said they have jointly developed an MVS PL/1 emulator for IBM's OS/2 called Micro Focus PL/1 for ADMVS. The compiler, which includes compiler and debugging technology that Micro Focus licenses from IBM, emulates TSO/ISPF and job streams using MVS JCL, in addition to other PL/1 facilities.

SPARCworks adds CASE

Interactive Development Environments, Inc. (IDE) in San Francisco and SunPro, Inc., the application development tools division of Sun Microsystems, Inc., have agreed to integrate IDE's Software Through Pictures computer-aided software engineering (CASE) tools with SunPro's SPARCworks C and C++ development tools.

[redacted]

Application development tools

MicroStrategy, Inc. has released the Unix version of EISToolKit, an application development environment.

The product was designed for constructing applications for cross-platform, client/server executive information systems and decision-support systems in the Sun Microsystems, Inc. OpenLook and the Open Software Foundation Motif environments.

Platform features include presentation graphics, spreadsheet modeling tools, database connectivity and a graphical user interface. A fourth-generation programming language called Hyperscript, a Function library and MicroStrategy's UltraSQL are also provided.

Prices start at $1,995.

▶ *MicroStrategy*
1 Christina Center
Wilmington, Del. 19801
(302) 427-8800

Data Techniques, Inc. has announced Version 2.0 of ImageMan/VB, custom controls for use with Microsoft Corp.'s Visual Basic programming system.

The product enables users to add sophisticated image processing and scanning capabilities to their Visual Basic applications. Support is provided for processing, displaying and printing common PC-image file formats such as PCX, DCX, Targa, GIF and Tag Image File Format with Group 3/Group 4 fax compression, among others. Version 2.0 now supports scanners and digital cameras.

ImageMan/VB costs $249.

▶ *Data Techniques*
Suite 120
1000 Business Center Drive
Savannah, Ga. 31405
(912) 651-8003

Blue Sky Software Corp. has announced Visual SQL, a prototyper and ANSI source-code generator for creating Microsoft Corp. Windows-based client/server applications.

Working with industry-standard C or C++ compilers, Visual SQL generates ANSI C source code that makes direct calls to the database application programming interface (API) and the Windows API, the company reported.

The product costs $4,900.

▶ *Blue Sky Software*
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365

Template Software, Inc. has introduced SNAP Release 5.0, an advanced template-based development environment for constructing business-critical, distributed applications.

Enhancements to the product include new graphical user interface (GUI) building tools and expanded capabilities of the Shared Information Base.

SNAP Release 5.0 offers "drag-and-drop" icons and predefined and extendable object classes that support GUI displays such as forms, tables, text, graphs and topologies. Predefined GUI widgets such as cascading menus, check boxes, file selectors, list boxes and radio buttons are also provided.

Pricing begins at $50,000.

▶ *Template Software*
Suite 340
13100 Worldgate Drive
Herndon, Va. 22070
(703) 318-1000

Code libraries

EMS Professional Shareware has started shipping the C/C++ Utility Library.

According to the company, a total of 914 public domain and shareware products are compressed onto 43 1.44M-byte disks or one CD-ROM. An indexed database includes descriptions of all the products.

Users can find selected C/C++ products by name, vendor, type, release date or free-text search across descriptions. An assortment of types of files are housed in the library, such as Benchmark, Debugger, Link List, Code Analysis, Graphics and Memory, among others.

The library costs $50.50 on CD-ROM and $149 for the disk versions.

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The BUSINESS of Windows

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The art of the sell

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How to buy smart

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Users rate top packages

PAGE 128

Sonny Lewis

Full listing of the Windows World Open finalists. Page 113

Face to face with Microsoft Chairman Bill Gates. Page 123

Spreadsheet showdown: Excel, Quattro Pro and 1-2-3 for Windows. Page 128

Ami Pro garners high ratings in word processing category. Page 129

Microsoft's Access, Borland's Paradox for Windows compared. Page 132

The big SELL

Developing Windows applications is easy. Getting buy-in from business heads, end users — and even IS — is another story.

▶ **Con Ed's Rich Davisson:** *'My management was leery. When you say Visual Basic, it sounds so bubble gum in a mainframe shop.'*

By Julia King

Charlie Cappello and his team had the developers blues.

The Microsoft Corp. Windows-based tracking and archiving program they'd developed for Mingione, Borrusco & Co. was great, but the intended users were balky. So what to do? Cappello tempted them with golf.

Accustomed to working in a character-based computing environment, most managers at the East Haven, Conn., accounting firm were wary of moving to a completely new and different graphically oriented operating environment. So Cappello, the firm's technical adviser, gave them games — first solitaire, then golf.

It worked. In less than a week, the senior partner was consistently scoring under par on-screen, and after four weeks and less than $3,000 in development and testing fees, Doc-man, the company's custom Windows-based document management system, was subsequently put into production.

At Consolidated Edison Co. of New York, Inc., systems manager Rich Davisson had to do some politicking of a different kind to bring up a proposed Windows-based application for tracking and merging chemical information from nine power plants.

The company's mainframe-oriented information systems managers wanted no part of PC-based applications development, much less Windows, which Davisson was banking would be easier for plant operators to learn and use.

To make matters worse, Visual Basic, Microsoft's primary tool for developing Windows applications, was in its first release. "My management was leery," Davisson says. "When you say 'Visual Basic,' it sounds so bubble gum in a mainframe shop."

So Davisson outflanked them. He went to his customer base, showing prototype screens to power plant operators and other workers who would actually use the program. Buy-in was almost immediate, and Davisson got the backing he needed to go ahead with the project.

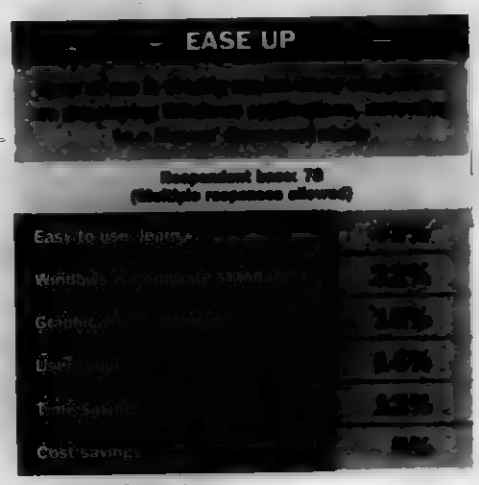
Both of these cases illustrate a simple point: Conception and development are just two — and perhaps the simplest — challenges in launching a successful custom Windows application. The harder issues include the following:

- Selling the program not only to upper management and users but also sometimes to the IS staff itself.
- Establishing compatibility with previously standardized applications and development tools.
- Securing the capital necessary to upgrade PC hardware and network servers to run Windows programs.
- Mediating internal political battles and cultural clashes.

IS support

If nothing else, support from IS must be won.

To that end, many companies are making sure IS gets involved early, even though many



Source: Buyers' Scorecard

King is a free-lance writer based in Ridley Park, Pa.

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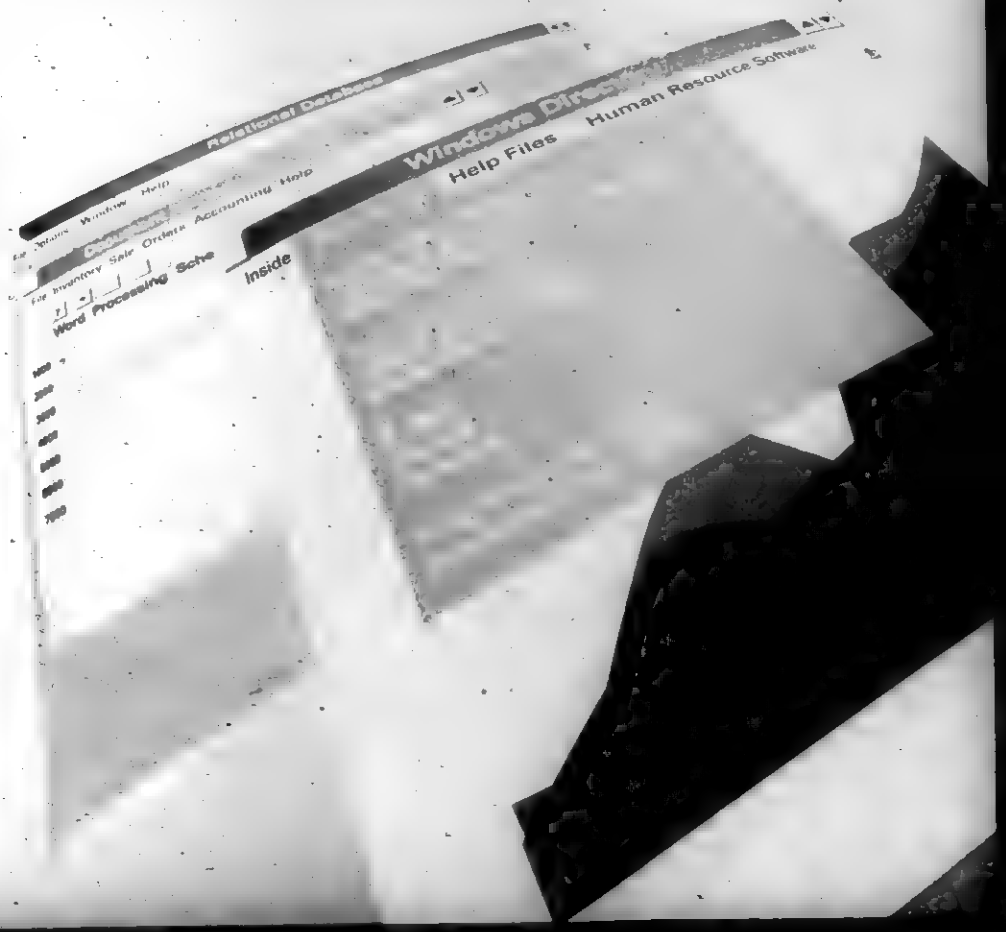

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Welcome

to Computerworld's first-ever Windows Directory for the Information Systems Environment. Computerworld is pleased to bring you, the Computerworld reader, this special directory of Windows products and services.

You'll find plenty of valuable products and services.

The companies whose products & services appear in this new directory have contacted Computerworld directly and have paid for their appearance so that they may hear from readers like you: professionals who they consider to be key users of their products and services.

Please save this directory for future reference.

Or pass it along to someone who might also find it useful. We've designed this special directory for you to use now and into the future. To gain the maximum value, please page through it to see the various specialty classifications that appear alphabetically.

There's even an index.

The index of all products and services described in the directory appears on pages 18 and 19.

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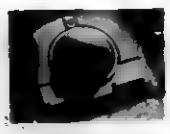

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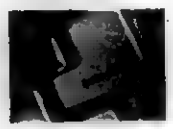

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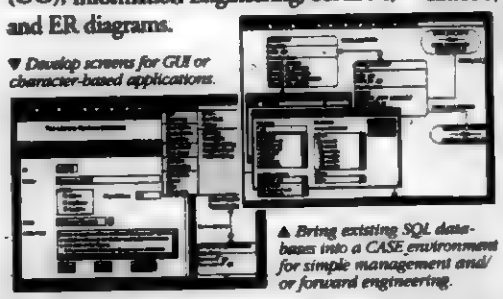

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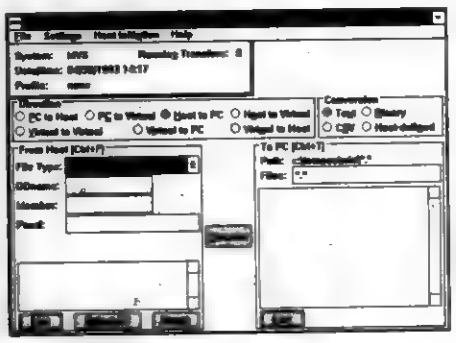

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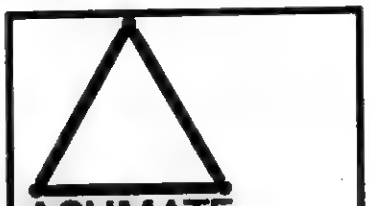

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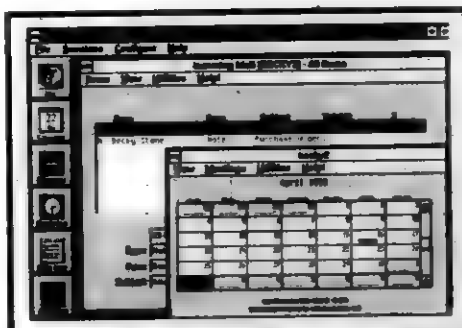

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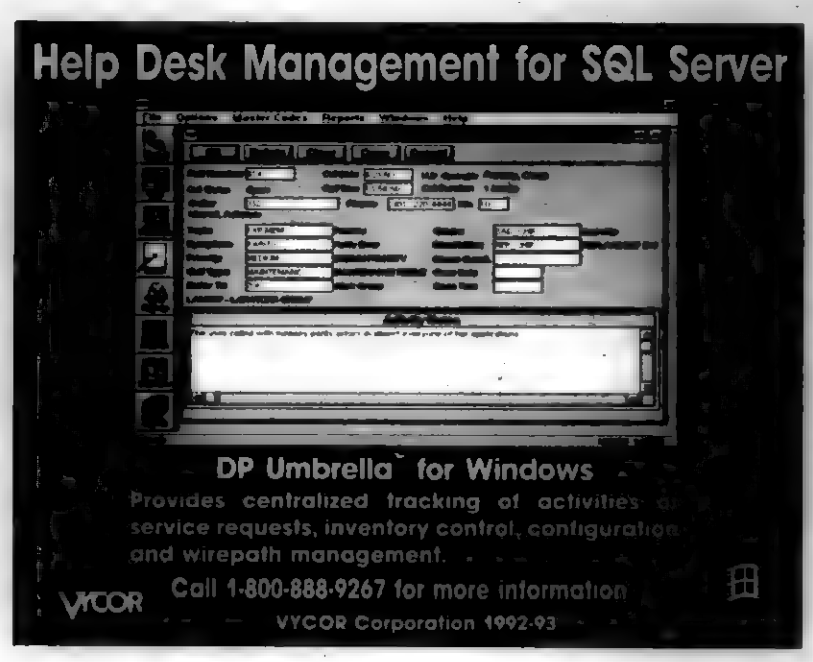

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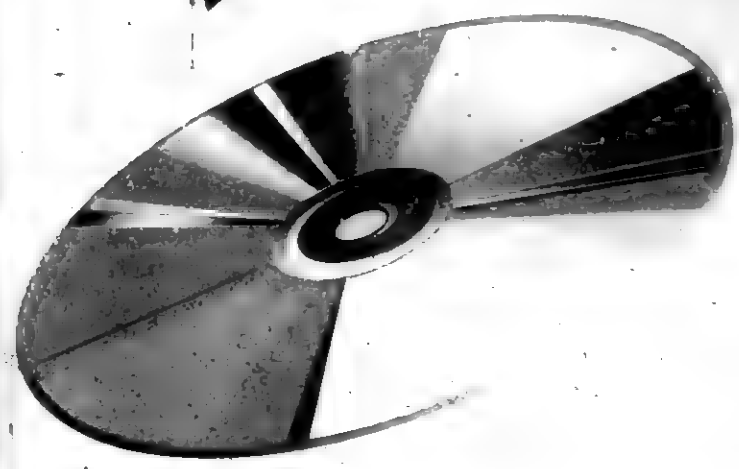

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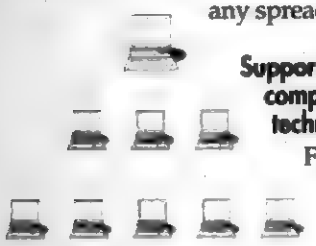

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of these applications are conceived by departmental application developers, says Bill Cornfield, president of The Windows Support Group, a New York-based consultancy.

The result? Reduced tension between IS and departmental application developers and increased technical quality and overall scalability of custom applications.

"More and more, we're seeing professional [IS] folks getting involved" in Windows applications development, Cornfield says. "They used to look at Windows as a toy, but now they're seeing how much can be done with it."

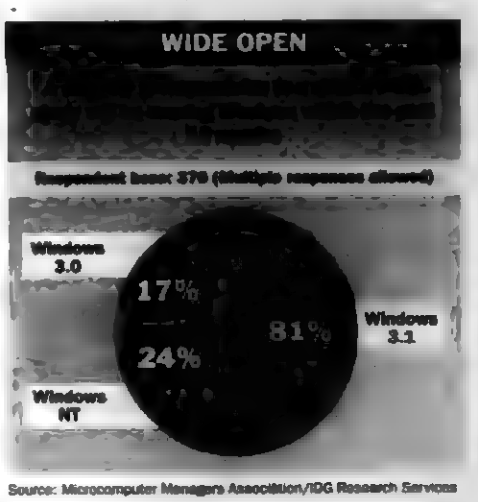
The importance of IS buy-in is best illustrated by looking at what happens when it has not been achieved.

Take the case of Harley-Davidson, Inc. The Milwaukee motorcycle manufacturer's trademark and licensing department brought in outside consultants to develop a custom Windows-based application for tracking trademark infringers.

In the meantime, Harley's IS department was already standardized on non-Windows technology and wasn't eager to involve itself in the trademark department's project.

On arrival, the consultants interviewed the department's users, who showed them finished documents generated by the largely paper-based system in place at the company.

Weeks later, when the consultants returned with prototypes of screens for the new application, they quickly discovered that earlier documents used in the tracking process had been omitted.



Source: Microcomputer Managers Association/IDG Research Services

"Now the screens have to be rebuilt, and the consultants want us to pay for it," says Bill Wood, manager of trademark enforcement at the company.

However, Wood does not blame the consultants. He says that if his department had had the full support of corporate IS on the project, these problems may not have occurred.

"We can request help from the IS department, but they are busy, and it may take them a couple of weeks to get back to me. Meanwhile, we don't want to hold up the consultants," Wood says. "Since we don't have full cooperation from in-house MIS, it is harder to communicate with the consultants."

Despite the problems, Wood says he remains committed to seeing the application through to completion and bringing it up by July 1. He says he expects the new Windows-based Trademark Wizard program, once running, will eliminate the need to hire at least three new employees at an annual salary of $40,000 each.

"We don't see our investment paying off now, and that's very frustrating," he says. "Still, we know there will be big savings down the road, and that's what makes this all worthwhile."

Support from the ground up

Most companies that embark on Windows projects do expect big payoffs, and most receive them — in the form of user satisfaction and lower development costs.

But the secret, they say, is to start at the departmental level, where PC-based developers and departmental managers opt to start in on smaller applications as a way of establishing a track record with the operating system.

"With a test project, where dollars are insignificant, it's easier to pass it through and show the benefits," says Frank Ramos, chief information officer at United American Healthcare Corp. in Detroit.

The big sell, *page 111*

The secret to Windows development: Start at the departmental level to establish a track record.

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Trouble was, the bank's customers were using eight different stand-alone DOS applications that had been developed over the years for various tasks.

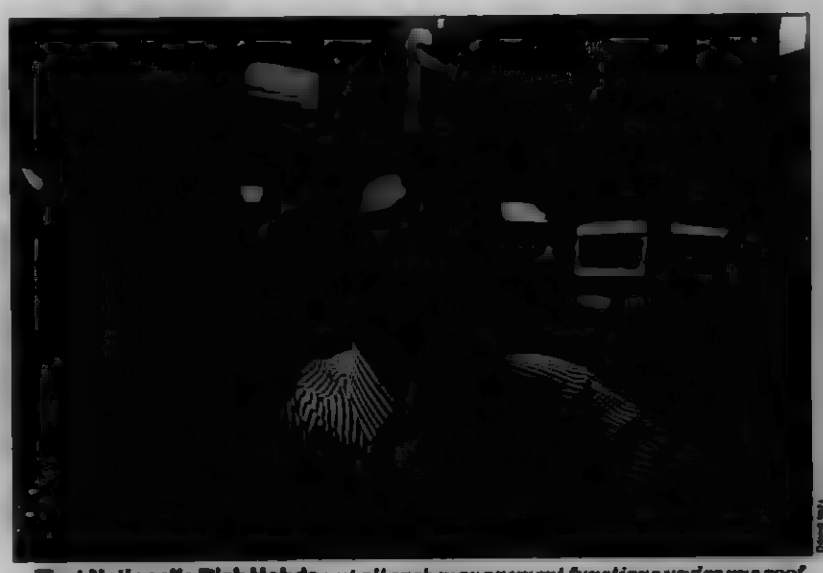
"Using three or four products got to be difficult for our customers because the products differed in their interface, security methods and communications functions," says Rich Hebda, vice president at the bank.

The bank felt it, too. When new capabilities such as local-area network support were required, First National had to build the new feature into each individual product, as well as support and maintain a welter of applications. More up-to-date products produced by competitors were also threatening to snatch away market share.

That's where Windows came in. Hebda's group dreamed up a client/server application that would integrate all of a corporate customer's worldwide cash-management functions under a single roof.

But the team couldn't "dream" the application into reality. Worse, Hebda's staff had never developed in Windows before. "There was this old MIS mentality about doing traditional design, but it just doesn't work well for creating a Windows product," Hebda says.

Hebda says Symantec Corp.'s Actor, an object-oriented development tool, helped make it easy to create prototypes. The team also used C.


▶ **First National's Rich Hebda** *put all cash management functions under one roof*

The resulting application, FirstWindow 2000, provides funds-transfer and reporting functions for global payments in a single application. About 20 corporate customers currently use the product on 500 workstations.

The application uses Dynamic Data Exchange to make communications transparent to end users. Once the user creates and sends in the transactions, First National's Tandem VLX system routes them to the appropriate back-office mainframes for processing.

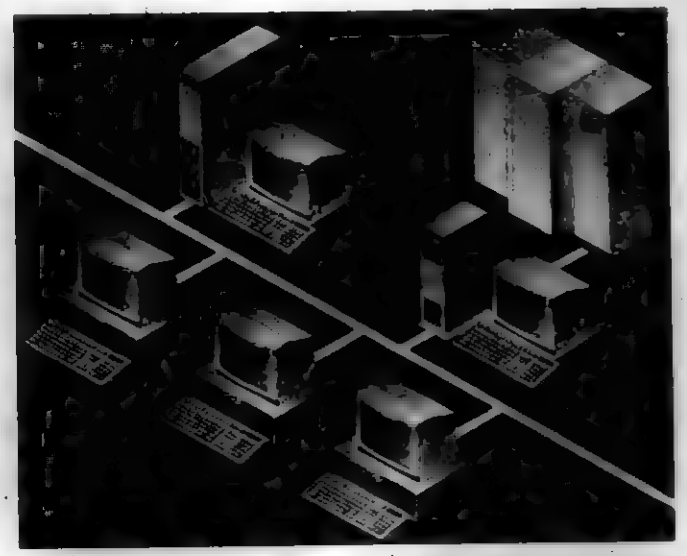
When the product was released in October 1992, it produced immediate benefits for the bank.

"We probably sold more new business in two months than we had in the past year," Hebda says.

Future plans include improvements to the product's interface to integrate it more tightly, Hebda says.

Hebda's ultimate goal is to be the leader in the world of cash management applications. "Because there's more emphasis than ever on information, people in the banking business need to become as knowledgeable about creating applications as software developers," he says. — *Written by Anita Amirrezvani, a contributing editor to* PC World Magazine.

There's a lot of serious rethinking going on in the area of information management. Because companies need to take advantage of new technology while keeping the best of their existing systems. They need to go to client-server computing. Without moving out of the mainstream.



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Right: This versatile operating system platform includes versions for both clients and servers.

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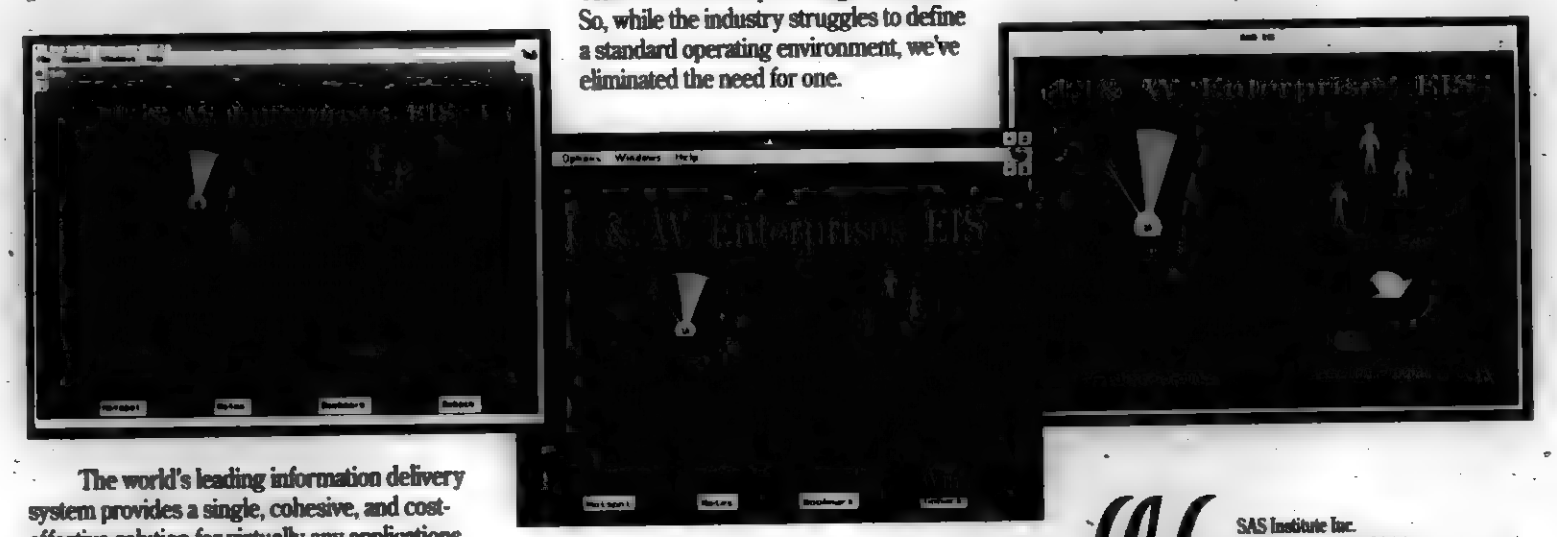

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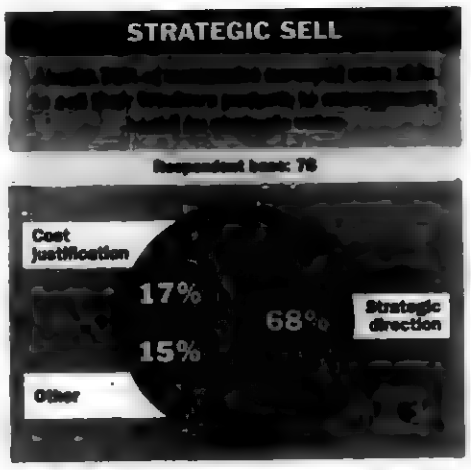


Source: Buyers' Scorecard

Continued from page 107

Ramos says he expects to cut operating and maintenance costs by about $350,000 annually with Relay 1.0, a custom Windows-based application that furnishes clinics in Cleveland and throughout Michigan, New York and Washington, D.C., with eligibility information on 175,000 United American Healthcare subscribers.

Developed in less than four weeks at a cost of $90,000, Relay 1.0 replaces a mainframe application, which employed a dedicated Prime Computer, Inc. 5370 computer to provide subecriber data.

Still, even Ramos' small project faced skepticism from line management.

"Initially, it was difficult to convey to management the advantages of something so dramatically different from a character- and terminal-based system," he says.

His group got buy-in by exposing managers to Windows-based tools such as Microsoft's Excel.

"They could see for themselves the ease of use and productivity gains," he says. "Having them feel the technology was critical to selling them on Windows."

Windows face-lift

At New York-based Citibank NA, senior executives were already well-acquainted with off-the-shelf Windows applications when staff members at the corporation's technology arm, Citibank Transaction Technology, Inc. (TTI), began work on a new Windows application. But in this case, familiarity didn't go very far.

Developers planned to build a Windows-based front end to Citimail, the bank's entrenched but user-ugly, mainframe-based electronic-mail system.

Initially deployed in the 1960s, some 25,000 Citibank employees worldwide use Citimail to communicate across many geographic regions and time zones. But its decades-old interface hadn't kept up with the times, says Carol Medine, director of application development at TTI.

Letting users try out an application in its early stages works well with Windows.

"It was very counterintuitive. People hated to use it but were forced to," she explains.

What was clearly needed was a new user-friendly interface to the system, Medine says. But internal politics were a big problem.

For starters, Citimail was supported by Citibank's corporate IS department, which was experienced on IBM mainframes and had little interest in Windows.

Moreover, these staff members didn't take kindly to the idea of "outsiders" from TTI coming in and telling them how to improve a system they had been operating for more than 25 years.

Medine and her group ultimately overcame this resistance by tapping corporate officers to beta-test MailView, the Windows-based

The big sell, *page 112*

Rocket manager

Lockheed's Windows-based facilities management software keeps things humming at its Space Shuttle plant

Want to sell your application to upper management? Show them a prototype that can retrieve and display several thousand data points on-screen while running a Windows word processor, a fax program and a graphics package.

That's what Ken Forster, a systems engineer at Lockheed Missiles and Space Co., did to prove that his Process Control System was powerful enough to run on the factory floor.

"I was able to run all of those packages and show that the application didn't fail in its task of trending data," he says.

FINALIST: WINDOWS WORLD OPEN

It was no small accomplishment. Forster's application was developed to replace an antiquated and unreliable minicomputer-based system that monitored industrial controllers for Lockheed's metal parts finishing facility, which makes Space Shuttle components. The plant houses clean rooms, paint booths and a chemical processing area.

"Having that system go down was like losing all the gauges in an aircraft — we would have been flying blind," Forster says.

The resulting Windows application was developed using InTouch, an object-oriented industrial application tool. The system runs on a six-node, peer-to-peer network that uses Microsoft's Windows for Workgroups. The application is displayed on 20-in. monitors with touch screens, so users can interact with the program by touching the screens directly or by using a mouse.

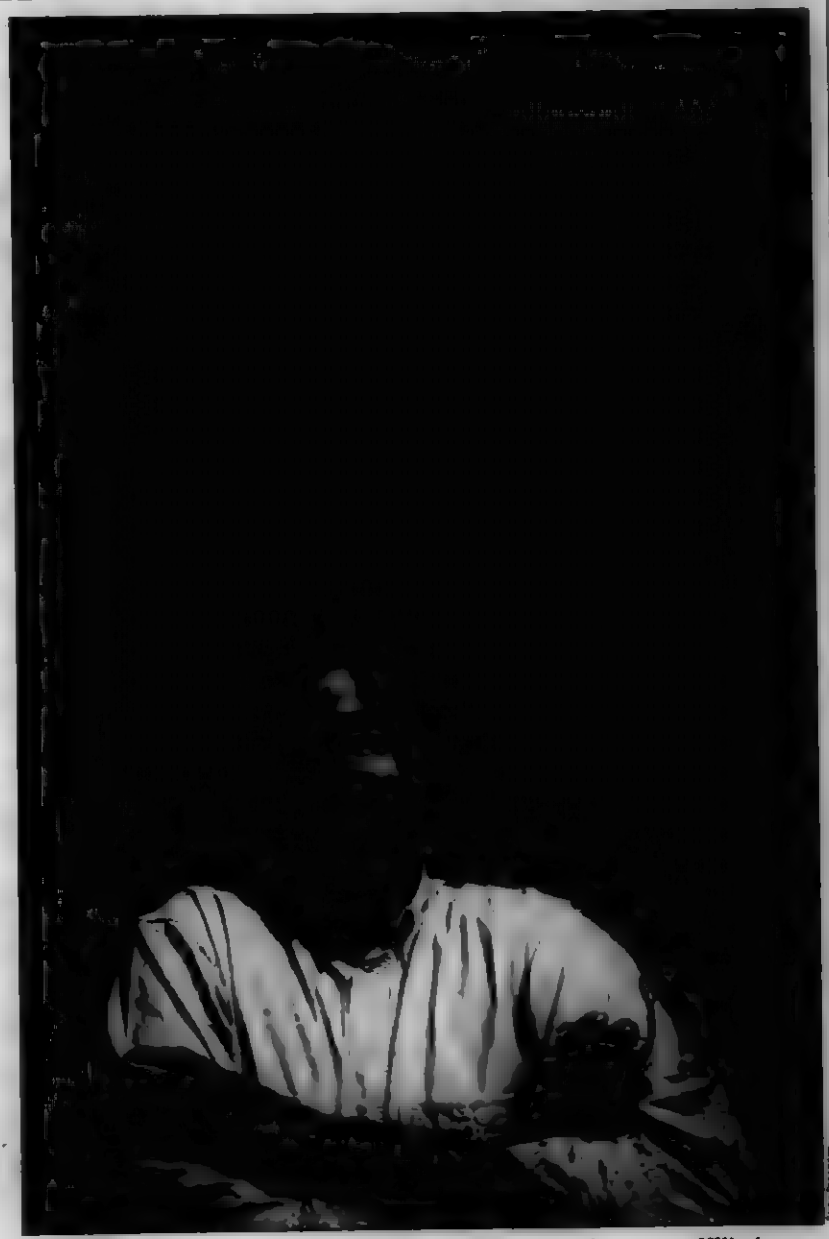
This lets plant operators control and modify the plant environment from the PC. For example, they can increase the temperature of a chemical tank just by touching the screen. The screens played a big role in getting Forster user collaboration, a technique that paid off big time in the final evaluation.

"I developed a few critical screens and then had people try it out and give their input," he says. At least half of the interface ideas are the result of staffers' requests for specific features.

Another big challenge was developing the touch application. "You need to make the control elements large enough so you can discriminate between them accurately," Forster says.

But the major benefit of involving the staff in development became clear when the old system was unplugged: "By the time the system was completely phased in, I didn't need to do any formal training because everyone had already tried it out," Forster says.

—Anita Amirrezvani



▶ **Lockheed's Ken Forster** *showed upper management the power of Windows*

Continued from page 111

front end they had developed for the E-mail system. "They gobbled this stuff right up," she says, "so the IS people supporting Citimail had to offer it. There was a grass roots demand for it."

Today, more than 5,000 disk versions of MailView have been distributed to Citibank staff members at a cost of about $5 each.

Medine attributes users' overwhelming acceptance of MailView to the iterative approach developers took throughout the design process, which lasted nine months. Using Actor, an object-oriented programming tool from Santa Monica, Calif.-based Symantec Corp., developers were able to quickly develop prototype screens, which they in turn took to users for comments.

This practice of letting users try out an application in its early stages is especially successful in the Windows environment, where a broad array of development tools makes it a relatively fast and easy process.

Outside help

Third-party tools, including the Victor Image Library for Windows from St. Louis-based Catenary Systems, Inc., were also instrumental in Real Data Management, Inc.'s development of an image-based real estate system. City Vision is a database containing text-, graphics- and video-based information about office space for rent in New York and Los Angeles.

The Victor library contains a wide variety of image display capabilities, which Real Data would otherwise have had to develop in-house. Without the library, developing a prototype quickly to show customers would have been impossible, says Kristan Stevens, Real Data's vice president of program development.

After all the wars have been fought and the applications deployed, most users report high satisfaction and big success — even in the sometimes harrowing area of training.

At Mingione, Borrusco, staff members received four hours of training in Windows and Docman and have been using both — problem-free — for the past four months, according to Cappello.

At United American Healthcare, training users on both the Windows operating system and the Relay application was accomplished in a matter of days, Ramos says.

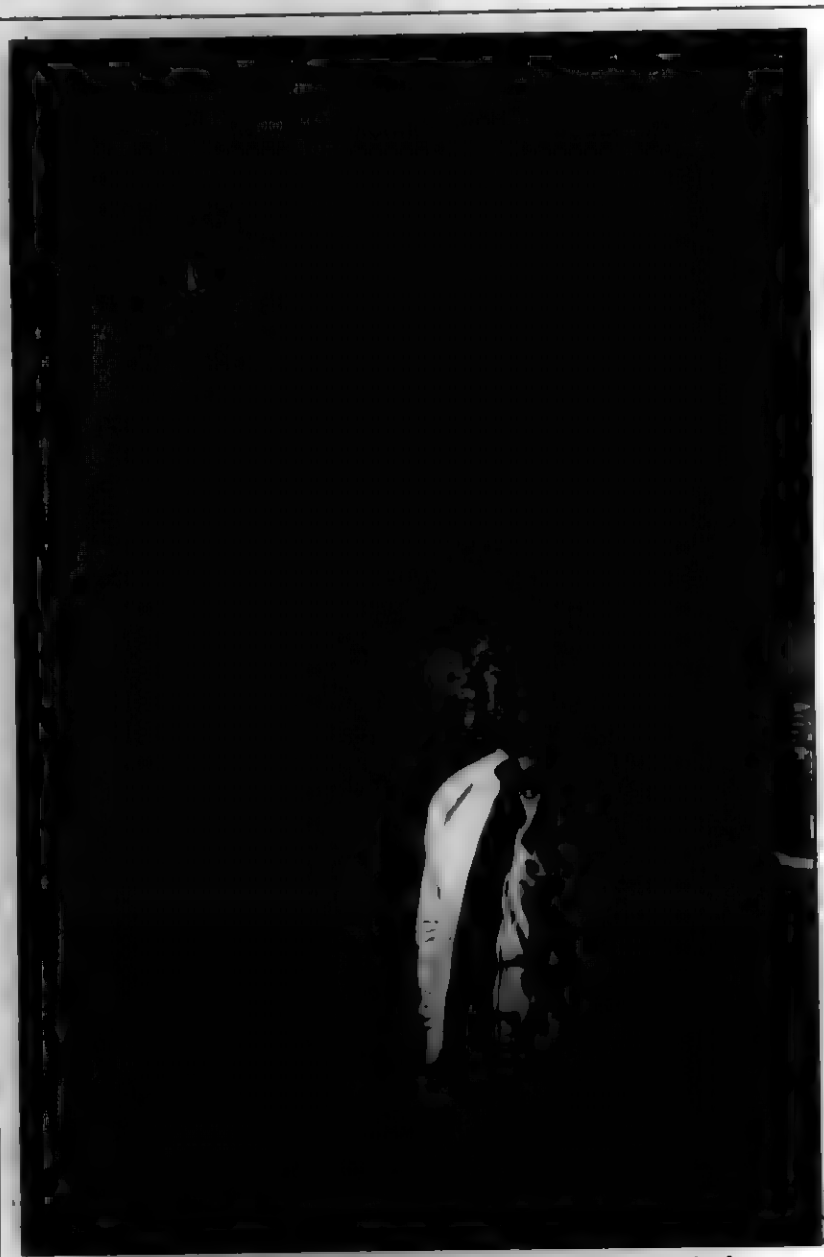
"I was eating my knuckles during training, afraid that users would say the whole thing was too complicated," he concedes. "But their response was totally the opposite. Now we're having a problem holding users back. They want word processing and spreadsheet software. The application has opened up their eyes concerning technology." •

Windows Open finalists prove that application development can be done (see facing page).

1993 WINDOWS WORLD OPEN JUDGES

CHARLES BABCOCK Technical editor *Computerworld*	CHRIS LINDQUIST West Coast correspondent *Computerworld*
VINCE CHIMIGNAN Director of information systems Sandy Corp.	JIM LIBAK* PC specialist Chevron Information Technology Co.
GUS RAMOS* President G. Warfield Brown Associates	BRENT WILLIAMS Director of PC software International Data Corp.
RAY HARRIMAN Chief technologist Electronic Data Systems Corp.	PAUL YAO President International Systems Design

*Winners from the 1992 Windows World Open



▶ Real Data's Kristan Stevens *says DOS versions were impractical*

Point-and-click real estate

Real Data offers complete on-line commercial listings in New York and L.A. — in minutes

Real Data Management's DOS-based bread-and-butter program was giving its developers indigestion. But moving to a Windows version meant convincing the firm's clients that the benefits outweighed the hardware upgrade costs.

City Vision lets real estate brokers tap into a subscription database containing details about thousands of commercial spaces available for rent in New York. But its DOS incarnation was causing some support problems.

"Under DOS, we had to write a lot of low-level routines to support all our customers' graphics hardware and printers," says Kristan Stevens, Real Data's vice president of program development. "It was becoming very impractical to keep coming out with new versions."

Windows' broad-based driver support would solve that problem and let Real Data embark on an ambitious expansion plan as well, he says.

The company wanted to create a massive new database containing property floor plans and maps and to put it, along with the Windows program, on CD-ROM.

FINALIST: WINDOWS WORLD OPEN

This is where Real Data's program had to sell itself. Many of its customers did not want to shell out the money for a PC that would support Windows.

The key to winning over the brokers, Stevens says, was showing, not telling, the difference between the DOS package and the Windows prototype — and illustrating how the brokers could produce better marketing materials with Windows.

"When they saw that they could take pictures from the program and put them in PageMaker or Microsoft's Word to create pamphlets and brochures, we got a strong response from brokers," he says.

The program is also much faster. Stevens says generating a list of all the spaces available in Manhattan takes five minutes, compared with two hours on the DOS program.

The company's efforts have paid off, doubling the user base from 25 brokerage houses to about 50.

A new version is forthcoming for the city of Los Angeles, and three other cities have been signed up for the program, Stevens says.

—Anita Amirrezvani

Meet the FINALISTS

The following 24 companies are finalists at the Windows World Open competition

CATEGORY TRANSPORTATION COMMUNICATIONS UTILITIES

COMPANY: GALILEO INTERNATIONAL
LOCATION: ENGLEWOOD, COLO.
APPLICATION: PERSONAL APOLLO

■ An offshoot of the Apollo travel reservation system, Personal Apollo lets anyone with a PC, modem and Windows make his own travel arrangements 24 hours a day. Users can connect to Apollo through a public data network.

CATEGORY TRANSPORTATION COMMUNICATIONS UTILITIES

COMPANY: LEA & ELLIOT, INC.
LOCATION: CHANTILLY, VA.
APPLICATION: LEGENDS

■ Legends is a collection of integrated models used in transportation system planning, design and evaluation. Using this package, a planner can simulate the action of a train along a given route, recording all train movements and delays.

CATEGORY TRANSPORTATION COMMUNICATIONS UTILITIES

COMPANY: CONSOLIDATED EDISON CO. OF NEW YORK, INC.
LOCATION: NEW YORK
APPLICATION: CON EDISON CHEMICAL INFORMATION SYSTEM (CIS)

■ CIS is a real-time data acquisition system that monitors the chemistry of the water in fossil-power plant boilers. It provides chemical addition control, maintains a centralized database of process data and displays the chemical information in a Visual Basic Windows application anywhere on the Con Edison WAN.

CATEGORY INSURANCE REAL ESTATE

COMPANY: UNITED AMERICAN HEALTHCARE CORP.
LOCATION: DETROIT
APPLICATION: RELAY 1.0

■ Relay 1.0 provides communications between 1,500 health care providers, 48 hospitals and more than 500 pharmacies for Detroit-based Omni Care Health Plan. With comprehensive data on subscribers, family members and their health and claims history, Relay leads staff through on-line forms completion.

CATEGORY INSURANCE REAL ESTATE

COMPANY: MUTUAL LIFE ASSURANCE CO. OF CANADA
LOCATION: WATERLOO, ONTARIO
APPLICATION: PC DAX

■ PC Dax enhances the mainframe-based E-mail system. The interface 'remembers' how each user prefers his desktop set up and embeds spreadsheets, images, voice and programs into the messages.

CATEGORY INSURANCE REAL ESTATE

COMPANY: REAL DATA MANAGEMENT, INC.
LOCATION: NEW YORK
APPLICATION: CITY VISION

■ City Vision provides access to a subscription database used by commercial real estate brokers. The application creates and runs surveys of available building space in Los Angeles and New York, according to criteria such as size, rent rates, geographic boundaries, building owner, listing agent and space type.

CATEGORY GOVERNMENT PUBLIC ADMINISTRATION

COMPANY: GUILFORD COUNTY SHERIFF'S DEPARTMENT
LOCATION: GREENSBORO, N.C.
APPLICATION: SGT. CAD

■ Sgt. CAD is a computer-aided dispatching system for public safety. When a 911 call comes in, Sgt. CAD aids the dispatcher in dispatching help and alerts personnel on road hazards, also providing maps to the location. The package provides status on the call and links with other Windows applications through DDE.

CATEGORY GOVERNMENT PUBLIC ADMINISTRATION

COMPANY: U.S. GEOLOGICAL SURVEY
LOCATION: RESTON, VA.
APPLICATION: WAIS FOR WINDOWS

■ WAIS for Windows retrieves topically diverse information and data from a diverse group of sources on geologic, topographic and hydrologic information. Users can search for data on a specific location by clicking on a world map and zooming in to the desired location.

CATEGORY GOVERNMENT PUBLIC ADMINISTRATION

COMPANY: SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
LOCATION: DIAMOND BAR, CALIF.
APPLICATION: VOC RECORD KEEPING

■ VOC Record Keeping was developed to streamline current emission record-keeping and reporting requirements. It provides a South Coast Air Basin view of all sectors arranged by enforcement areas that change color dependent on the air quality status. This allows inspectors to check air quality at a glance.

CATEGORY SERVICES PROFESSIONS

COMPANY: CREADSA
LOCATION: SAN JOSE, COSTA RICA
APPLICATION: VIRTUAL MEETINGS

■ Organized into three modules, Virtual Meetings was developed as a package to handle concurrent group decision-making. The package organizes decision-makers into logical groups and allows concurrent real-time interaction among group members.

CATEGORY SERVICES PROFESSIONS

COMPANY: AMERVISION CORP.
LOCATION: SACRAMENTO, CALIF.
APPLICATION: HEAT IS ON

■ Heat Is On is a comprehensive, on-line computer simulation program that was developed specifically to assist the defense in a murder trial. The application incorporates testimony from a wide range of sources, including an expert in thermal physiology, a heating engineer and a trace-gas engineer.

CATEGORY SERVICES PROFESSIONS

COMPANY: J. WALTER THOMPSON
LOCATION: CHICAGO
APPLICATION: TV REACH

■ TV Reach helps produce effective and cost-efficient television media plans in minutes, letting the planner experiment with a variety of options while automatically monitoring projected costs of an advertising campaign.

CATEGORY FINANCE

COMPANY: FIRST NATIONAL BANK OF CHICAGO
LOCATION: CHICAGO
APPLICATION: FIRST WINDOW 2000

■ First Window 2000 offers integrated funds transfer and information reporting functions designed to streamline customers' global payment initiation process. Using First Window 2000, customers can initiate payments from any First Chicago account worldwide in any transaction type, any currency, to anyone, anywhere.

CATEGORY FINANCE

COMPANY: MENGIONE, BORRUSCO & CO.
LOCATION: EAST HAVEN, CONN.
APPLICATION: DOOMAN

■ For users at this financial services company, Dooman provides a foolproof backup system for all documents produced and lets employees run word processing, spreadsheet and graphics applications without a large investment in Windows training.

CATEGORY FINANCE

COMPANY: CITICORP TRANSACTION TECHNOLOGY, INC.
LOCATION: SANTA MONICA, CALIF.
APPLICATION: MAILVIEW

■ MailView serves as a front end for Citicorp's old E-mail system, Citimail. It allows users to compose messages, read received messages, print and file messages and update their Address Book in a user-friendly Windows environment.

CATEGORY WHOLESALE RETAIL DISTRIBUTION

COMPANY: HARLEY-DAVIDSON, INC.
LOCATION: MILWAUKEE
APPLICATION: TRADEMARK WIZARD

■ Trademark Wizard allows Harley-Davidson to monitor royalty payments on more than 80 licensing agreements for products bearing more than 1,000 Harley-Davidson trademarks. The application lets users define new licenses and update data such as license agreements, royalties collected and infringements.

CATEGORY WHOLESALE RETAIL DISTRIBUTION

COMPANY: TACO BELL CORP.
LOCATION: IRVINE, CALIF.
APPLICATION: REAL ESTATE CONSTRUCTION MANAGER WORKBENCH

■ The Taco Bell restaurant development department uses this application to collect, analyze, evaluate, monitor and manage restaurant site data. The information used follows the site through its entire life cycle, from site selection to acquisition and construction.

CATEGORY WHOLESALE RETAIL DISTRIBUTION

COMPANY: WESTON INFORMATION NETWORK
LOCATION: TORONTO, ONTARIO
APPLICATION: WORKERS COMPENSATION EARLY INTERVENTION (EIU)

■ This employee compensation claims management system operates over the company's WAN. Employees' workers compensation details are entered electronically. Once the claim is established, it is transmitted to the WCB. Clearing the claim initiates a series of follow-up letters to the WCB and the family physician.

CATEGORY MANUFACTURING

COMPANY: LOCKHEED MISSILES & SPACE CO.
LOCATION: SUNNYVALE, CALIF.
APPLICATION: B/071 OPERATOR INTERFACE

■ The B/071 Operator Interface supervises the operation of Lockheed's automated advanced metal finishing facility. Providing access to each building subsystem, users can get data on anything from the building blueprints to operation manuals by clicking on the mouse.

CATEGORY MANUFACTURING

COMPANY: CONTECH
LOCATION: CARACAS, VENEZUELA
APPLICATION: PROCESS 2.0 FOR WINDOWS

■ Process 2.0 for Windows is a statistical process control application that helps improve the quality of manufactured products and services such as public transportation and health care. It monitors production processes, analyzing the variables and identifying differences in materials and performance of personnel and equipment.

CATEGORY MANUFACTURING

COMPANY: DIGITAL AUDIO DISC CORP. (DADC)
LOCATION: TERRE HAUTE, IND.
APPLICATION: COMPUTERIZED CD-ROM ORDERING SYSTEM (CCOS)

■ This application is a series of three Windows-based programs that simplify the ordering process for DADC and its customers. The primary program, CCOS, is used by DADC's customers to enter and store orders in a database, copy them for monitoring, print them for faxing or transmit them directly via modem.

CATEGORY OTHER

COMPANY: SOUND APPLICATIONS, INC.
LOCATION: CAHABA HEIGHTS, ALA.
APPLICATION: SONOMASTER 2000

■ SonoMaster 2000 improves physician and technologist training in performing and interpreting diagnostic ultrasound examinations. Using a series of diagnostic boxes, the package prompts the student on how best to direct the ultrasound beam.

CATEGORY OTHER

COMPANY: PSICOR, INC.
LOCATION: SAN DIEGO
APPLICATION: OPERATOR STATION APPLICATION (OSA)

■ OSA is used in Psicor's dispatch center to schedule and dispatch technicians and equipment to about 400 hospitals in the U.S. and Canada. The application maintains a database of hospitals so that when a call comes in from a number in the database, the client and caller information is automatically retrieved.

CATEGORY OTHER

COMPANY: SHELL WESTERN E&P, INC.
LOCATION: HOUSTON
APPLICATION: MANAGEMENT INFORMATION GRAPHICS (MIG)

■ MIG is a decision-support database that provides a GUI for accessing visual trends and tabular views of business performance data. A user can select a business unit and performance category; MIG then displays monthly and cumulative data from the current year and previous two years, as well as current year forecast data.

Buying SMART

Five behind-the-screen issues and what to do about them

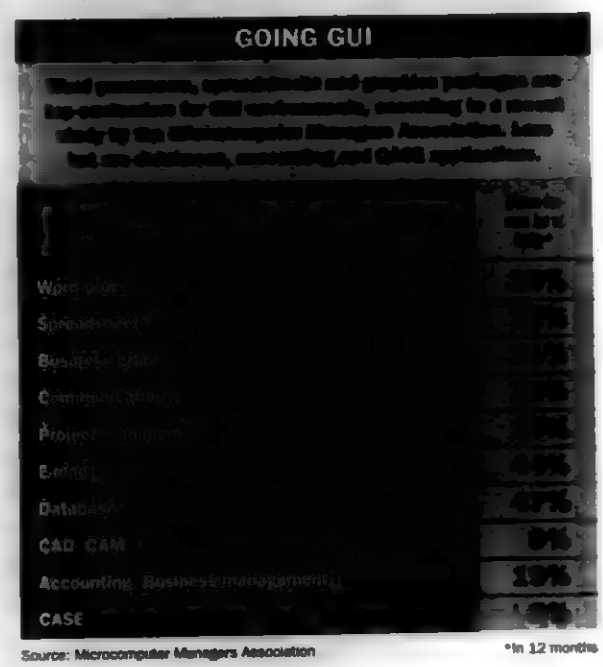
By Michael Drips

Ease of use is Windows' main claim to fame. But "ease" is not the first word that comes to mind when you're embarking on an enterprisewide installation of this environment.

Whether you're transitioning from DOS or just expanding your Microsoft Corp. Windows use, there are any number of areas in which you could make a wrong turn. Here are five of them.

The DOS-to-Windows translation factor. The first danger zone is the issue of transporting data from DOS to Windows. If the translation isn't done well, you could lose data or spend a lot of time editing corrupted files.

If your corporation is using DOS versions of WordPerfect Corp.'s namesake word processor and Lotus Development Corp.'s 1-2-3 spreadsheet, what happens if a decision is made to go with Microsoft's Office? Does Microsoft's Word translate WordPerfect DOS files as well as WordPerfect for Windows? No. Does Microsoft's Excel translate Lotus' 1-2-3 files as well as 1-2-3 for Windows? No. Does either Microsoft's Word or Excel translate the macro files from WordPerfect for DOS or 1-2-3 for DOS as well as their Windows counterparts? No.



Source: Microcomputer Managers Association

*In 12 months

The fact is, while all the mainstream Windows packages offer translators, each one performs differently. Programs such as 1-2-3, WordStar International, Inc.'s WordStar, Word and WordPerfect all do an excellent job of importing data from their own DOS versions; however, they don't do as well with competitive programs.

If your firm switches to a different word processor or spreadsheet on Windows, be sure to run extensive importation tests against DOS data before making the commitment.

Of course, there are workarounds to the data importation problem. For example, if a WordPerfect for Windows user downloads an electronic-mail message from CompuServe, the program won't be able to import it as an ASCII file; it will just put garbage on the screen.

But the user can open the file using Microsoft's Notepad (which ships with Windows), edit out the extra characters and save it as an ASCII file. Then WordPerfect for Windows will be able to open the file.

The choice between multivendor and single-vendor solutions. A second area lies in the choice of whether to hand-choose Windows versions of your favorite DOS programs — and end up with a group of programs from several vendors — or choose a group of applications from a single vendor.

The nice thing about upgrading your DOS applications is that it's economical (see "Shopping price," page 115). With WordStar, WordPerfect and 1-2-3, you also get perfect translation of your DOS files.

However, there are drawbacks. Each of these particular programs gives users the choice of implementing either a Windows-compliant or a DOS-compliant keyboard template. If they use the DOS template, users will face a hurdle in learning Windows, as they will have to remember two sets of keyboard commands.

The WordPerfect keyboard template is totally incompatible with the normal Windows Common User Access. For example, ALT-F4 normally closes a Windows application, while in

WordPerfect, the same keystroke turns on the Select function.

If you choose instead to start fresh with a single-vendor suite of applications — such as Microsoft's Office, Lotus' SmartSuite or Borland International, Inc.'s Office for Windows — you're bound to get applications without a DOS counterpart, such as Excel (which ships with Office) or Ami Pro (which ships with SmartSuite).

You *can* throw out the unfamiliar application and purchase the Windows version of your DOS spreadsheet; however, some of your users will likely start using the ones contained in the software suite. This will further complicate matters, as you will have to support two programs in Windows, not to mention ongoing DOS support during the transition period.

3. **Shopping price.** It would seem that the best deal is to purchase a suite of applications from a single vendor. Obviously, you get more applications for your money (see story page 118).

But to make that cost justification work, a majority of your employees really have to use all of the applications contained in the software suite. If you're paying for a graphics package, E-mail and database systems that aren't going to be used, then the purchase isn't justified.

Also, be certain to shop around for discounts. Large account resellers, such as CompUSA, have arrangements with large vendors to sell software at the same price as the manufacturer when a large quantity is being purchased. Discounts can be as steep as 60%, with quantities in the neighborhood of 2,000 to 5,000 units sold over a 12-month period.

Don't forget to investigate the pricing for upgrading from your DOS applications. Most vendors offer competitive upgrades for about 50% off the regular price.

4. **The challenge of accessing legacy data.** Most people will need to consider accessing legacy data through a Windows database, especially mainframe databases. Neither Borland's Paradox nor Microsoft's Access can access enterprisewide databases such as IBM's DB2, although both can access databases residing on local-area network servers.

Even Windows databases that can access legacy data — such as DataEase International, Inc.'s DataEase and Approach Software Corp.'s Approach — require a third-party package to make the connection. The prices on such packages are high, starting at about $35,000.

E-mail is certainly an additional source of enterprise data. Microsoft's Mail and Lotus' CC:Mail work across multiple platforms such as Unix, IBM's OS/2 and Apple Computer, Inc.'s Macintosh, but what about connectivity to IBM's Professional Office System or Digital Equipment Corp.'s All-in-1? Once again, this is an additional cost to factor in when moving into the Windows environment on an enterprisewide basis.

5. **Ensuring good support.** Support is a huge area of concern for Windows users. Because vendor support can vary widely, take the time to call the support lines of all vendors whose Windows packages are under consideration. See how long it takes to get through to the support line and how fast they get you an answer.

Other than WordPerfect, which has an 800 number for support, you will usually bear the cost of the support call. Also, if you've gone for the "best of breed" instead of a software suite, you may have to deal with several companies, each with differing policies, for support.

If that's the case, it's best to set up a help desk to be the sole source for internal support and the only authorized vendor contact for external support. Otherwise, you could have 500 or even 5,000 people calling vendors with similar problems. This would run up phone expenses and waste company time.

These are just five issues. During your transition to Windows, you will encounter many

Buying smart, *page 118*

Windows is cheaper if you upgrade DOS software. Vendors usually offer upgrades for 50% off the regular cost.

What is OLE *anyway?*

■ **Object Linking and Embedding (OLE)** lets users create an object — a chart, a sound byte, an illustration — in one application and then export the object and edit it within other applications. Currently OLE 2.0 is an application programming interface that older applications can't take advantage of. Eventually, OLE functionality will be built into Microsoft's future-generation operating systems so that all applications that run under the Cairo operating system (the follow-up to Windows NT) will have access to OLE services.

What's the difference between 'linking' and 'embedding'?

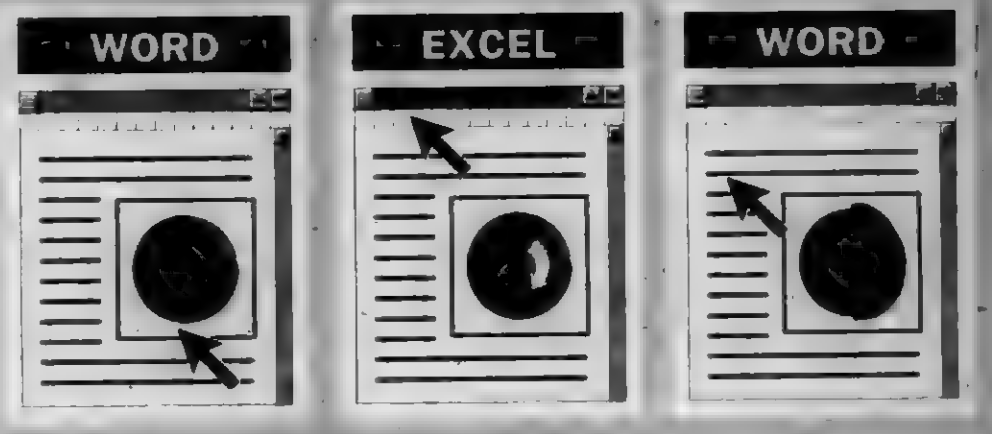
■ 'Linking' is a more limited implementation of the 'embedding' function diagrammed at right. A linked object maintains live links to the applications that created it but cannot be edited within the document. To change the data, the user must switch windows and open the application in which the object was created.

What else does OLE 2.0 do?

■ Automation allows one application to control another. For example, a user can input data to a word processor and, through OLE links, send the data to a charting program engine, which would create a flowchart and return it to a document.

■ 'Drag and drop' lets users move embedded objects from one document or application to another.

HOW MICROSOFT'S OLE 2.0 WORKS



1. Salesman Bob is working on his first-quarter market share report, using Microsoft's Word or any Windows word processor. At some point, he needs to update a chart showing market share. He double clicks on the chart.

OLE recognizes the chart as an embedded 'object' that was created in Bob's Excel (or any Windows-based) spreadsheet. OLE calls up the functions needed to edit the chart.

2. The Word menus are replaced by Excel spreadsheet menus. The Word document remains on-screen, but Bob makes the appropriate changes in his chart data using the Excel menus. This is not quite the same as opening the full Excel application because not all of the spreadsheet's functionality is available through OLE. However, Bob can change the numbers to update his pie chart and perform other basic edits.

3. When he's finished, he clicks on the document anywhere outside of the chart. OLE saves the changes and closes the Excel menus. The word processor returns to the foreground.

Bob has changed his market share chart without ever closing or leaving the sales report window. Now he can continue to edit the rest of his document using the Word menus as before.

THE KITCHEN SINK IS

If you're getting the feeling the T4500 series represents a new standard in business notebook computing, you're right.

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The T4500C's dimensions: 11.7"Wx8.3"Dx2.0"H.
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intel inside

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Taking a LOOK *at suites*

THE FIRST SUITE

■ Microsoft's Office for the Apple Macintosh in 1988.

WHO SHOULD CONSIDER SUITES

■ Corporations and small to medium-size businesses.

HOW SUITES ARE SELLING

■ Suites account for 40% of the sales of Microsoft's Word and Excel. They account for 20% of the sales of Lotus' 1-2-3 for Windows, Ami Pro and Freelance.

PRIMARY ADVANTAGES

COST

■ Three to five applications are bundled and sold for the normal purchase price of two.

SUPPORT

■ Obtaining enterprisewide support from a single vendor is more sensible than trying to integrate a variety of packages from multiple vendors. In fact, corporations can leverage their relationship with a software vendor by pushing for lower cost site licenses and network licenses while simultaneously requesting additional software features based on the scale of the corporation's present and future licenses.

PRIMARY DISADVANTAGES

■ If you don't need all the applications that are bundled, you could be wasting money. Consider that the current street price for either Microsoft's Office or Lotus' SmartSuite is approximately $350. The competitive upgrade price for these companies' word processors and spreadsheets is about $120 apiece. So if your corporation requires only word processing and spreadsheet applications, that totals $240, a savings of $110 per employee below the cost of a suite.

Roger Lewis

There's more to it than four products in one.

THE INS AND OUTS OF THE CHOICES

PERSONAL INFORMATION MANAGERS

■ Lotus is the only suite with a personal information manager.

DATABASES

■ Borland offers a Windows databases in its suite. Microsoft makes one available for $199. Lotus has no database component.

E-MAIL

■ Microsoft and Lotus bundle E-mail and graphics packages in their suites. Borland's Office doesn't. Lotus' E-mail package is the only one to support Unix and OS/2 platforms.

COMMONALITY AMONG APPLICATIONS

■ There is no commonality in the Borland suite between WordPerfect and the Borland applications, other than the fact that they are all Windows applications.

On the other hand, the use of Smarticons in Lotus' SmartSuite and customizable tool bars in Microsoft's Office creates a very cohesive look and feel to the applications contained in the suites.

INTEGRATION AMONG APPLICATIONS

■ Microsoft and Lotus have gone to considerable lengths to incorporate prewritten macros within their suites to provide a common ease of use in exchanging data across their packages. As users become more comfortable writing their own macros, they can mold the applications to fit their work methods rather than adapting their work methods to fit the Windows applications.

WordPerfect and Borland, on the other hand, contain entirely different macro languages within their applications that prohibit the type of application synergy that Lotus and Microsoft have attained.

GRAPHICS PACKAGES

■ The inclusion of graphics packages in the Lotus and Microsoft suites is often a decision point as to whether to buy a suite or separate applications. If your organization doesn't need the graphics applications, there may not be a cost-justification for purchasing one.

Conversely, this might be a negotiating point for getting a vendor to lower its pricing on a quantity purchase.

THE THREE MAJOR SUITES	WORD PROCESSOR	SPREADSHEET	DATABASE	E-MAIL	GRAPHICS	PERSONAL INFORMATION MANAGER
Microsoft's Office ($750)*	Word	Excel	Access**	Mail	Powerpoint	NA
Lotus' SmartSuite ($795)*	Ami Pro	1-2-3 for Windows	NA	CC:Mail	Freelance	Organizer
Borland's Office for Windows ($595)*	WordPerfect for Windows	Quattro Pro	Paradox	NA	NA	NA

* Retail ** For an additional charge of $199

Continued from page 115

more. For example, your staff is going to demand faster PCs when they find out how slow Windows programs are compared with DOS word processors.

There are also future issues to deal with. Windows NT will bring in true 32-bit applications, which run much faster and increase productivity. Sybase, Inc.'s SQL Server for Windows NT will bring object-oriented database manipulation to both Windows 3.1 and Windows NT users. Windows NT Advanced Server introduces to networking a new level of security, network services and other features that are beyond anything currently on the market. ■

Drips is a Prairie Village, Kan.-based consultant specializing in Windows computing, client/server and CASE.

If you choose software from several vendors, set up a help desk as your single support source.

TAKE THIS QUIZ

■ Have you factored in the [illegible] data to the formats of your selected Microsoft Windows applications?

■ Has a hardware inventory been completed to establish the costs of additional hardware upgrades in order to run Windows?

■ Is a training program planned or in place to [illegible] into effectively using the Windows environment?

■ Has an individual or group been designated to maintain a help desk to maximize internal support while limiting vendor contact?

■ Is a plan in place for distributing software within the organization without inviting employee software piracy?

■ Has your company considered using the software over networks, instead of installing it on individual desktop PCs?

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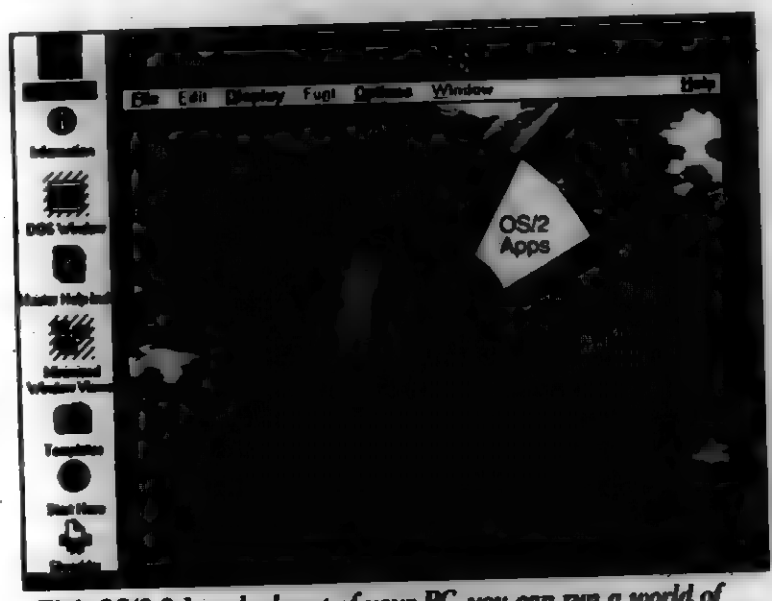

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Common Windows questions

From networking to development tools to Windows NT, there's a lot of ground to cover in learning about the Microsoft Corp. Windows environment. We asked Noah Ross, director of technology at Cap Gemini America, Inc., a New York-based information consulting and services company, and Michael A. Browning, a senior manager of information engineering and advance technologies at the firm, to elaborate on some of the questions users ask most.

Q. How can we optimize our Windows environment?

A. There are lots of things you can do without spending a cent. Here's a few tips:

- Throw out Smartdrive. It may be slowing down your system.
- Speed up your bus. Most BIOS are preset to some multiple of the clock speed.
- Use your advanced BIOS setup to increase the speed. Find the highest speed that still supports all your peripherals.
- Use a permanent Swap File instead of the preset Windows temporary one. You can change this in the Virtual Memory section of the Windows Control Panel.
- Use 32-bit disk access. If you have an IDE controller, you can set this in the Windows Control Panel. This can really help your disk I/O.
- Don't use Wallpaper. It looks pretty, but it takes up a lot of valuable memory.
- Remove unused fonts. They take up a lot of space.

Q. What software do I need to make Windows a networked environment?

A. It depends on the protocols you intend to use. Environments with several protocols may need several products. Microsoft's Windows for Workgroups is a good product for working with Novell, Inc. and NetBIOS networks.

If you use Transmission Control Protocol/Internet Protocol or Network File System, Netmanage, Inc.'s Chameleon is a good choice. Other users may prefer FTP Software, Inc.'s PC/TCP or Wollongong Group, Inc.'s Pathway, among others.

One nice feature of Windows for Workgroups is that it allows each workstation to function as a server, which gives you a lot of flexibility in sharing data and printers.

You'll need software for network administrative tasks, too.

Q. How do I plan for Windows NT?

A. NT is going to be a major part of any future Windows enterprise configuration, especially as a server. Sybase, Inc.'s SQL Server for Windows NT is already positioned to take advantage of NT's advanced features. Oracle Corp.'s Oracle 7, Cincom Systems, Inc.'s Supra 3 and others promise similar functionality.

Windows NT promises to provide a new network standard for Windows computing. Whether this will displace Novell's NetWare remains to be seen, but Novell is understandably concerned.

It makes a lot of sense to keep your options open when looking at software and hardware. Look for applications that plan to support NT's functionality in the future.

When NT is released, as with any new operating system, it probably will not be used immediately to support critical business applications. Most shops will probably "play" with it for a while with noncritical applications until they develop confidence. Don't expect to see critical systems on Windows NT until next year or later.

Q. What about Windows 4.0?

A. Windows NT is not going to fit on most desktops; it is just too heavy for nonpower users (you'll need 16M bytes and 200M bytes or more disk.) However, preemptive multitasking and 32-bit applications will be a "must" for network clients. This will be the place for Windows 4.0 or an "NT Lite." •

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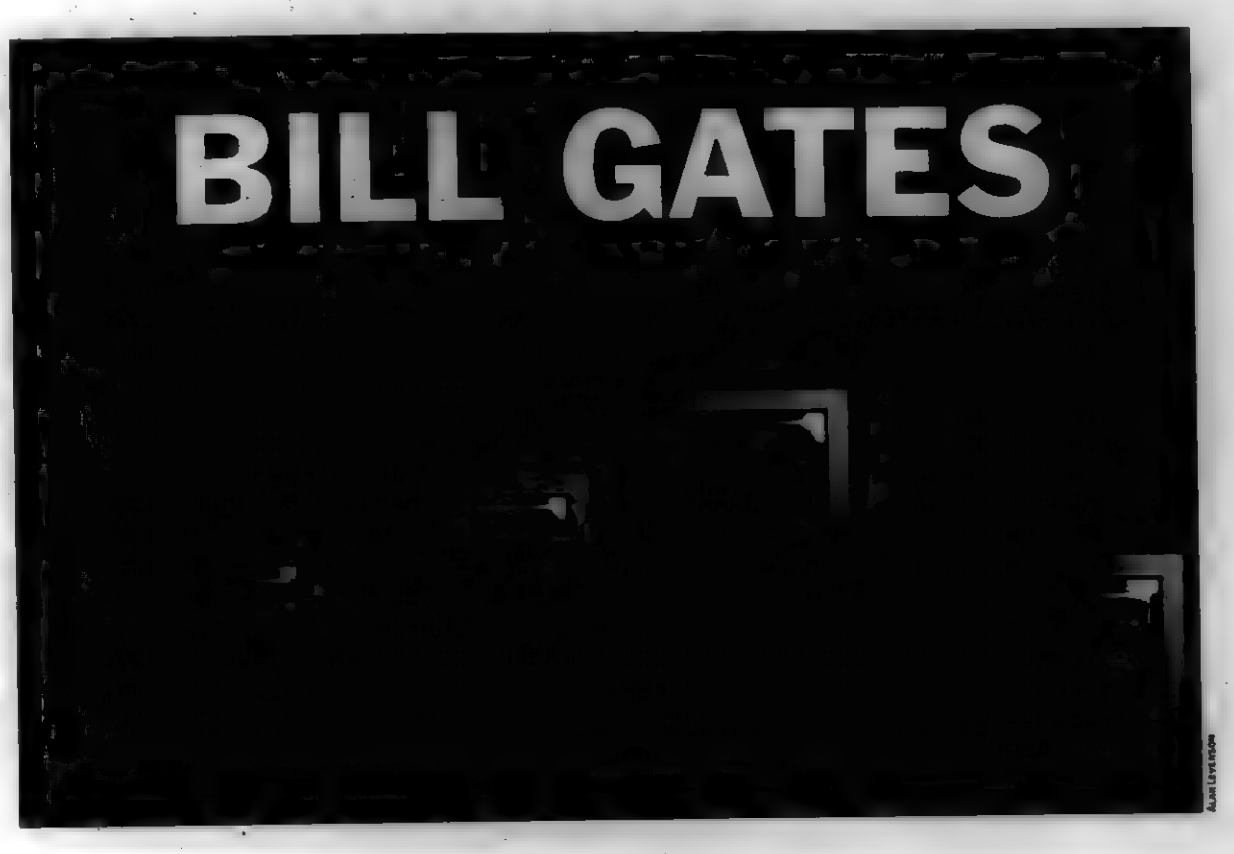

Face to Face

Microsoft's chairman sees Windows NT rolling over Unix on the desktop and giving NetWare a run for its money

Q. You've said that Windows NT would outsell Unix by a factor of 5-to-10 in its first year. Are you still standing by that?

A. Understand that Unix is many different things. You have to write for a particular form of Unix. I said we'd sell a million [copies of Windows NT] in the first 12 months, which is about five times the most popular form of Unix.

To application developers who have written software for high-end systems, NT is big news because it allows volume developers to be profitable. Windows NT gives them the best of the PC, the workstation and the network operating system. In everything that's going on in computing — the GUIs, the great tools and Sun acknowledging that the Windows API is the mainstream — there's a clear message that people can build their apps on Windows and not run out of room.

Q. Looking out a couple of years, what will be the market share of Unix vs. OS/2 vs. Windows NT?

A. What's volume today? Nothing you mentioned. What sells in volume are DOS, Windows, Mac and NetWare. So you're talking very small numbers.

Hey, I can snap my fingers and generate a million units of NT through pricing to OEMs. If people want numbers, we can give them numbers.

But we want to be sure people understand [what they're buying]. We're telling OEMs they should bundle Windows NT only in the very high-end systems and servers.

The question is, which APIs will be mainstream? As these operating systems try to be clones of Windows, you could have everything written to Windows and still have volume. It depends on who's doing the best implementation of Windows, and we're confident we'll do that.

Q. Why should Windows NT become a contender in the network operating system market?

A. Out of the box, it has everything that you get in NetWare v3.11. So Windows NT is enough for 60% of the volume that Novell does. When you get into multiserver networks, we're competitive there with Windows NT Advanced Server. We're going to make that available for a lot less than people have expected in the past and include a lot of extra features, like Mac support and dial-in capabilities.

The big numbers will be in application servers. NetWare is not a good application server platform. That's why we've built SPX/IPX and other communications protocols into all our Windows products. People can just use Windows, and for their large networks where they've already got NetWare, they just bring in NT servers as application servers.

Q. How will Windows NT break down by desktop vs. server sales?

A. It's a little less black and white than before, when there was a lot of difference between the desktop and the server. But I'd say, because desktops are so numerous, that NT will be sold one quarter on the server and three quarters on the high-end desktop.

Q. Will Taligent [the joint operating system project between IBM and Apple Computer, Inc.] be much of an issue?

A. I don't know. Have you seen any good Taligent applications? Have you seen a lot of start-up companies focused on Taligent? Do you know what a Taligent application does that a normal application doesn't?

Let's say a Taligent application does something. Some smart guy is going to come along and decide he can make that happen on Windows and have an installed base of 100 million to sell to instead of zero. There must be something magical going on in your head to say, "Let's start over on operating systems."

Yes, object orientation is valuable. It lets you structure information better and write interfaces better, but all that stuff is

Bill Gates, *page 127*

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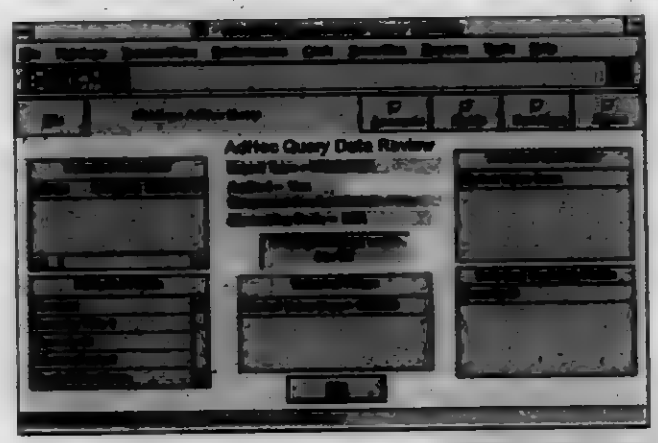

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Bill Gates

CONTINUED FROM PAGE 123

evolving in Windows at least at the pace at which people can absorb the concepts.

Q. How would you describe your relationship with corporate information systems?
A. That has to be put in the framework that the industry is restructuring from top-to-bottom suppliers to [a structure] in which companies specialize in processors or software. When people pick Microsoft, they like our financial stability, our long-term approach, our willingness to share our vision and the way we've got the software industry to build on a common platform.

"Some [people] are looking for someone to do for them what IBM did. We never will have that kind of role. Can one company be on top of [everything]? No way!"

They've had a dilemma in the past where their high-volume applications didn't fit in with their high-end platforms, and now we're saying because of Windows NT, there's no dilemma. Just go for it.

We do have a large group of people to talk to these companies. But some of them are looking for someone to do for them what IBM did. We never will have that kind of role.

Q. Has that role become unimportant?
A. It can't exist because the technology is moving too fast. Tools, disks, operating systems, instruction sets, databases, chips — can one company be on top of all of those things? No way! So once the industry has gone into this form, it won't go back. You still have systems integrators who'll assemble those pieces. But if you're in a business where information processing is crucial, you'll want your own employees to get involved in these things.

Q. You were quoted recently as saying power is coming back to the data center. Why do you think that's happening?
A. I don't know that it ever went away. It's an important thing in a corporation, of "How do you store your information?" and "Where is it physically located?" Because we're trying to leverage the structure of existing networks to make it easy to browse those database management systems, the productivity application world and the data center world are not separate anymore.

There are still large economies of scale in storage costs and administration of looking over that data, and particularly as fiber brings communications costs down, you'll be able to pool a lot of data in one place.

But you'll still have these big data centers. Inside them will be microprocessor-based systems running Windows NT, but they will be data centers.

Q. Do you have a sense that object-oriented will catch on as a new way of doing things?
A. The only trick in software is to use code that's already been written. Object orientation is just a development technique. Yes, all the new tools are object-oriented, and good companies should factor in objects as they write code. There's more C++ code written at Microsoft than anywhere else on the planet. But the idea that there's something magical about it really bothers me. Anybody who's been in the computer industry more than five years has seen these things come and go 10 times.

For example, we're closing all our warehouses in Europe to move to a single warehouse. It's very complicated because of currency requirements and such.

So we're writing this new application, and no one is saying, "Oh, this is so easy — it's object-oriented. No problem." What a bunch of BS. Hey, 90% of the application has to do with the complexity of the issues you're dealing with and not some goo.

So, yes, object orientation is super important, [but] 80% of the [work] is still going to be brainstorming what the application should look like. So most of the people who write Cobol today won't be writing a lot of code. They'll be doing visual [prototype] applications and providing pieces for the coders.

Q. What would you do to fix IBM now?
A. I feel sorry for Lou [Gerstner]. We'll all armchair the guy to death. The closed, account-oriented strategy that IBM pursued so successfully is not a model to use moving forward. What business to split off is a very tough question.

My personal view is, take the consulting business and spin that off. I think the AS/400 business, with a separate operating system and separate, independent developer — there's no reason they should be burdened with that combined sales force. They should probably bring in some smart managers and let that business go off on its own.

But they've still got chips, PCs, workstations, mainframes and research, and there are reasonably deep synergies there. The simple thing is to say you should break them all out, but I wouldn't jump to that conclusion because maybe the next-generation microprocessor is the basis for a next-generation mainframe. Maybe they will also get their act together on networking, but it's awfully late for them to do that.

Q. If IBM had come to you 12 years ago and insisted on an exclusive license to MS-DOS, would you have signed it?
A. Are you kidding? No, absolutely not. We could have taken any hardware model and convinced other hardware manufacturers to use it as a standard. There were 42 different types of PC designs when MS-DOS was first shipped. It dropped to two. Why? Because we got the phenomenon of the more volume you get, the more software you get. We convinced IBM to use one of the first 16-bit chips, and there was this model from the mainframe world cloning IBM, so that's what we talked to Compaq and Columbia and others about doing.

We would have been glad at sometime to sell IBM part of the company. We even proposed to IBM that they buy part of Microsoft — I think it was 30% — and they turned us down. At every stage of our relationship, they had project groups doing work to wipe us out. We stayed ahead, but it wasn't simple. •

Interview conducted by executive editor Paul Gillin and technical editor Charles Babcock.

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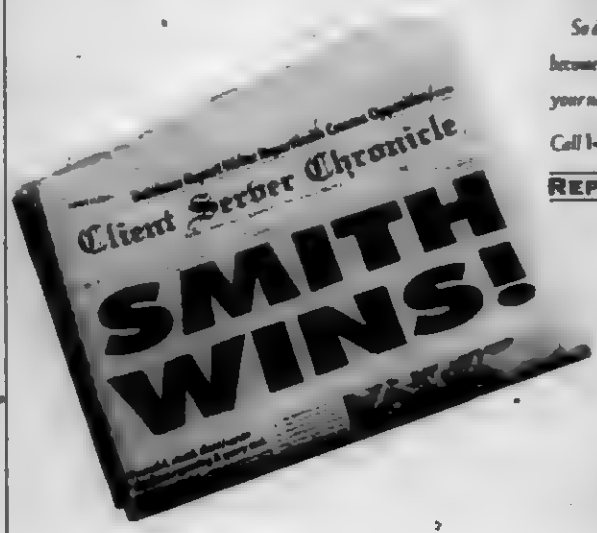

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Testing the BEST

Excel's tools, Quattro Pro's value garner most user satisfaction

By Derek Slater

Microsoft Corp. has had more time than any other player to work out the kinks in its spreadsheet, having been the first to offer a product such as Excel to the Windows market. That edge helped the product eke out a narrow first-place margin in the Buyers' Scorecard, in which users of the three leading Windows spreadsheets rated their products.

Microsoft's Excel topped Borland International, Inc.'s Quattro Pro by a point, 79 to 78, for the highest overall satisfaction score. Traditional spreadsheet kingpin Lotus Development Corp.'s 1-2-3 for Windows scored 74, four points behind Quattro Pro. Because Release 4.0 was just announced, this survey rated the prior version of Lotus 1-2-3 for Windows.

COMPUTERWORLD BUYERS' SCORECARD

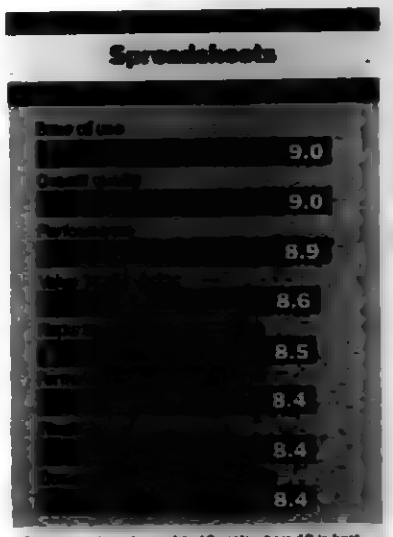
The response base, 50 users for each product, included a mix of both end users and information systems professionals supporting multiple copies. Approximately 30% of the respondents held IS manager or director titles. The balance were programmer/analysts or end users of the spreadsheets.

Excel is the longtime market share leader. It still holds more than 60% of the Windows market, according to BIS Strategic Decisions in Norwell, Mass.

But Quattro Pro and 1-2-3 for Windows are expected to gain share as the products mature.

The survey indicates that Excel will not easily give up its devotees. It received higher satisfaction grades than the other products in overall quality, ease of use and performance.

The product's highest individual rating area was formulas and calculation tools. Key unique features of the product include drag-and-drop cell movement and several automatic formatting and filing commands. Excel also has six customizable tool bars (separate bars for formatting, drawing, charting and so forth).



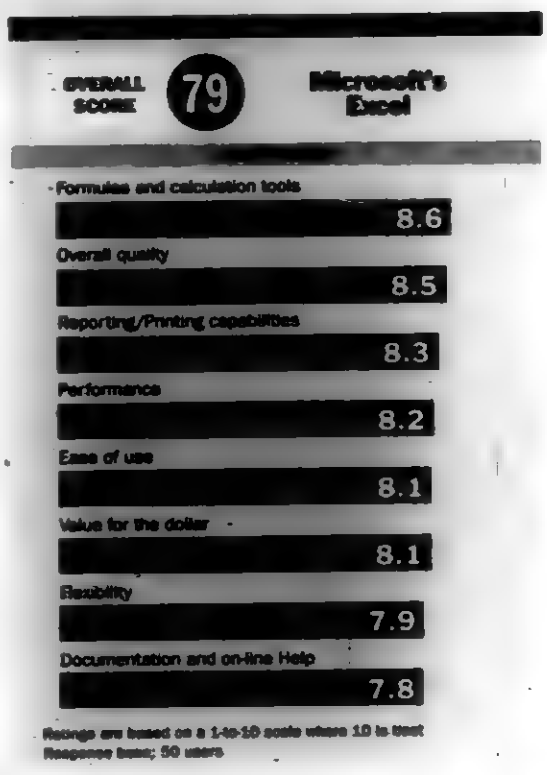
Excel received its lowest scores in macro language capabilities — a strong category for Borland's Quattro Pro — and browsers.

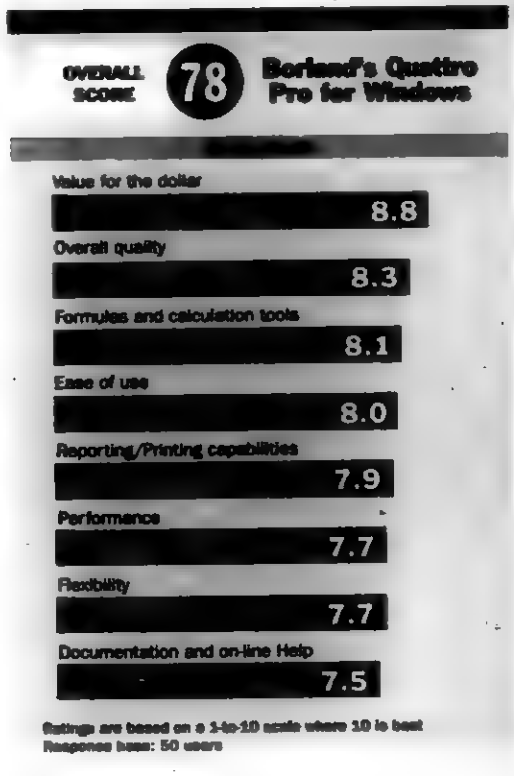
Quattro Pro also achieved higher ratings in its ability to handle graphics elements.

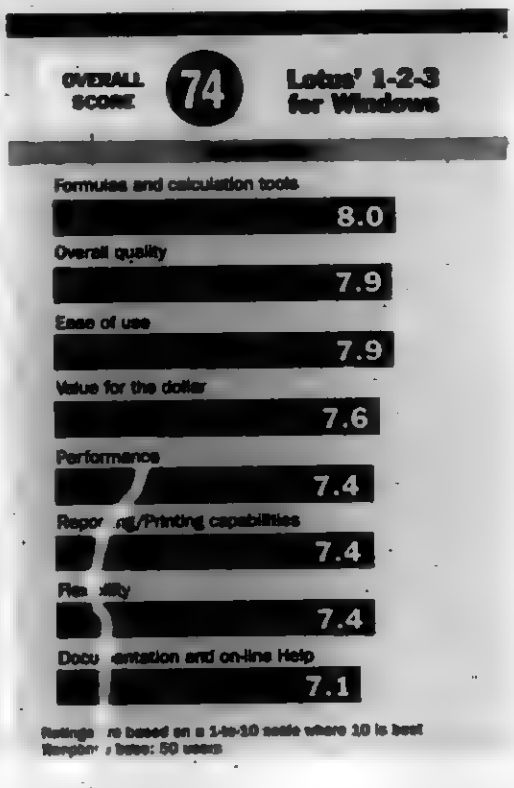
The product has strong support for three-dimensional worksheets and graphs and actually integrates much of the functionality of presentation graphics programs, including a slide-show feature.

Quattro Pro users indicated they were less happy with their vendor's service and support; the product's lowest satisfaction rating came in that area.

Overall, Lotus' 1-2-3 for Windows received lower ratings than its rivals in most categories. But it earned its highest scores in categories users say count: overall quality and ease of use. The product's weakest areas were its macro language, along with Microsoft, and use of the Windows interface. Die-hard DOS spreadsheet users can open a "classic" menu mode that lets them use the same slash-key menus and commands under Windows. •







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Ami Pro's quality, Word's editing, WordPerfect's service earn praise

By Derek Slater

Competition in the word processing market can be particularly cutthroat. In the Buyers' Scorecard user poll of the leading Windows-based word processors, Lotus Development Corp.'s Ami Pro and Microsoft Corp.'s Word for Windows finished neck and neck, with Ami Pro squeaking out a narrow victory in overall satisfaction.

WordPerfect Corp.'s WordPerfect for Windows placed with a 76 overall score, compared with 80 for Ami Pro and 79 for Word for Windows. Fifty users of each product responded, including information systems management and end users.

Ami Pro earned the highest satisfaction score in the three categories users say they consider most crucial: overall quality, ease of use and performance. Some of its other strengths include the ability to preview a document or style sheet before opening it and the ability to access integrated graphing and drawing tools.

Users can edit charts in the same window as text. Ami Pro makes extensive use of icon bar menus, and the right mouse button brings up a menu of commonly used functions.

On the other hand, Ami Pro received lower ratings than either of its competitors in documentation and on-line Help and in service and support.

Ami Pro runs only under Windows. Version 3.0, released last year, is priced at $495. The product has gained a greater share in the Windows market during the past three years with the help of Lotus' marketing. Lotus acquired Ami Pro's developer, Samna Corp., in 1990.

Microsoft's Word for Windows, which once had the Windows market largely to itself, scored higher than its competitors in editing capabilities and documentation. Users also rated the Microsoft product highly in its use of the Windows interface and Windows functions such as Dynamic Data Exchange. It fared less well in long document handling and trailed slightly behind the other two products in value for the dollar.

Like the other word processors in the survey, Microsoft's Word for Windows costs $495. Microsoft Word held roughly a 46% share of the total $1.7 billion 1992 word processing market (including both DOS and Windows sales), according to Dataquest, Inc. Word's overall market share has increased dramatically with the rise of Windows.

Microsoft recently announced that the next version of Word for Windows will support ObjectBasic, a common macro language that the company is developing for all its applications.

The Windows version of WordPerfect reached the marketplace well after the other two products. In the user survey, the WordPerfect entry distinguished itself in vendor service and support, earning the highest satisfaction score in that area by a wide margin. It also outscored its rivals in its ability to handle long documents.

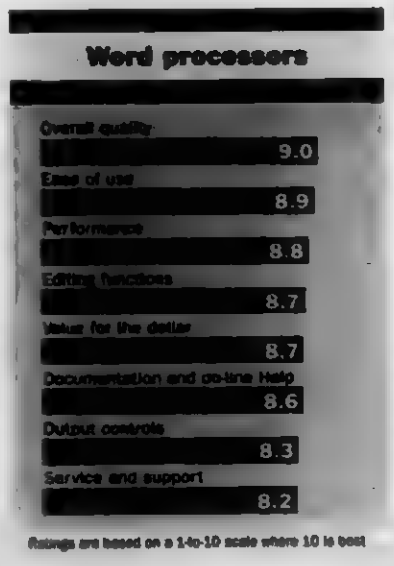
In most other areas, though, user satisfaction with WordPerfect for Windows was lower than for the other two products. Particular weaknesses were the vendor's use of the Windows interface and its control over printing functions. Version 5.2, released early this year, rectifies the first version's lack of full support for Windows functions such as Object Linking and Embedding and also offers a QuickFinder text-retrieval feature the other products lack.

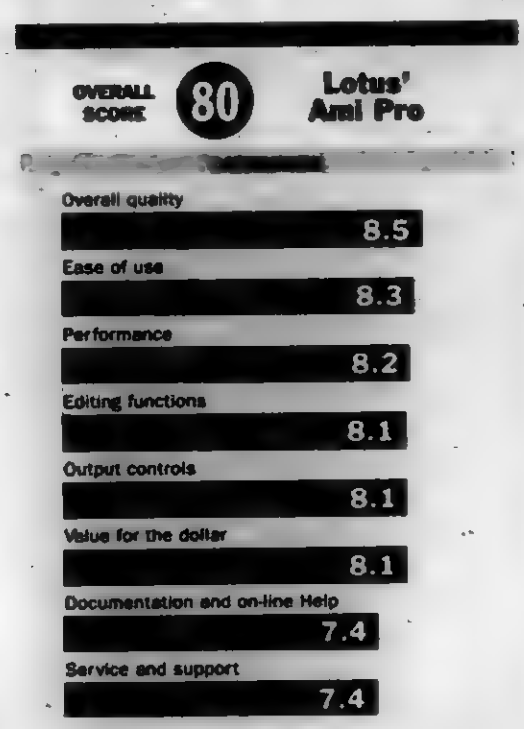
The WordPerfect for Windows package also includes Reference Software International, Inc.'s Grammatik 5 grammar checking program, although it is not integrated into the word processor, as are grammar functions in Ami Pro and Word.

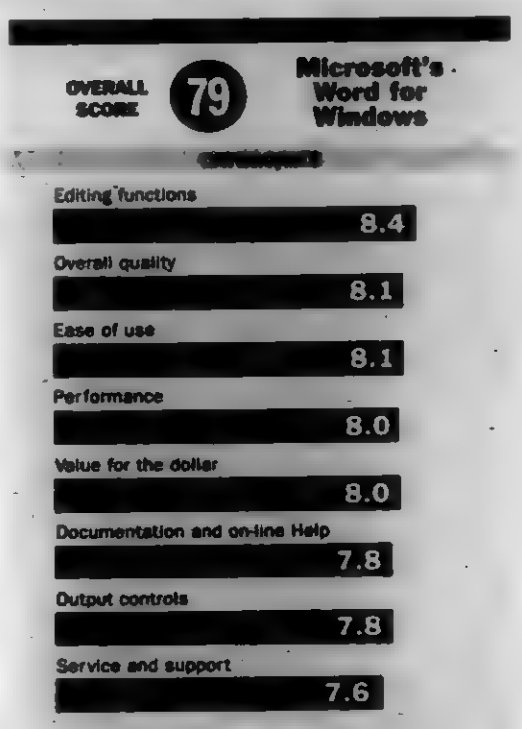
WordPerfect for Windows is not likely to match the runaway market share lead of its DOS counterpart. In an effort to compete with Microsoft's Office and Lotus' SmartSuite application bundles, WordPerfect recently announced a deal to package WordPerfect for Windows with database and spreadsheet products from Borland International, Inc. at a steeply discounted, 90-day introductory price of $399.99. The version of WordPerfect in Borland's Office for Windows suite is slightly modified to provide greater integration with the Quattro Pro spreadsheet.

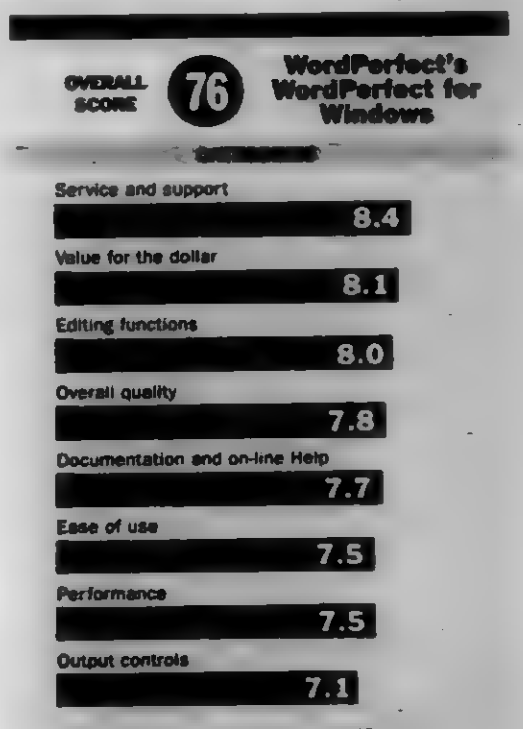
After the 90-day period, the suite will cost $595.

Microsoft's Office costs $795, and Lotus' SmartSuite costs $750; both prices include business graphics and electronic-mail software packages but lack databases (although Microsoft's Office users can incorporate the company's Access database at an additional cost). •









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Vendors hit the mark

Spreadsheet vendors are focusing their efforts in the right place, according to the Buyers' Scorecard results: Users said they are pleased with their products in key areas, finding room for improvement only in the categories they're less concerned about.

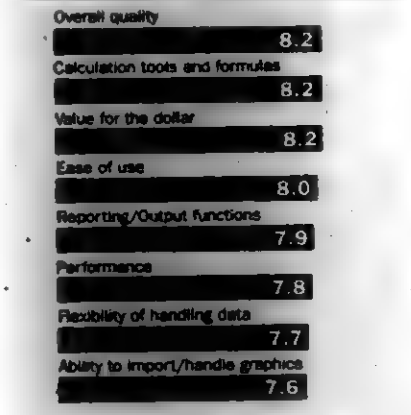
The leading spreadsheets earned an average score of 8.0 or above in four areas: overall quality, ease of use, value for the dollar and calculation tools.

Windows spreadsheet sales equaled almost exactly half of the $1.5 billion 1992 worldwide spreadsheet market, according to Dataquest, Inc.

Because Lotus' 1-2-3 and Borland's Quattro Pro have been available for a relatively short time, that percentage should rise as the products mature.

Matching the spreadsheet results against the satisfaction ratings for word processors yields interesting comparisons. Spreadsheets scored much higher than word processors in their handling of the Windows interface but roughly the same in ease of use. Spreadsheet developers have gone out of their way to make it easy for DOS users to transition to Windows (particularly from Lotus' 1-2-3) by incorporating similar menus. •

Spreadsheet strengths and weaknesses



Ratings are based on a 1-to-10 scale where 10 is best

Speed not a problem

If word processor users had their way, these products would deal better with long documents. Their performance, however, is fine, at least according to Buyers' Scorecard respondents.

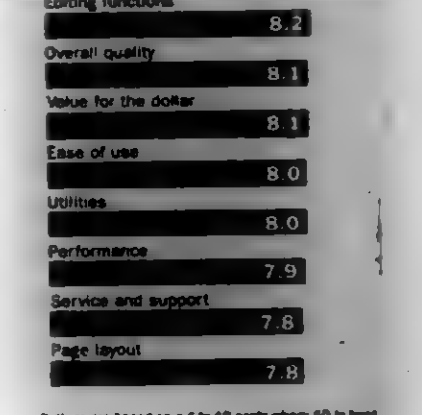
Categories that garnered an average rating of 8.0 or above included editing functions, overall quality, value for the dollar and utilities. The utilities category included features such as mail merge, fax support, spell checker and dictionary functions. The word processing products scored highest in areas that were most important to users.

Some experts have questioned the wisdom of running word processors on the Windows platform, given the environment's tendency to slow down functions; however, users indicated that speed was not a big problem.

Where they did find room for improvement was in the word processors' ability to take advantage of Windows functions such as Dynamic Data Exchange and Multiple Document Interface.

According to Dataquest, Inc. in San Jose, Calif., Windows-based word processor sales raked in $1.1 billion in revenue in 1992, out of a total of $1.7 billion spent on all platforms. •

Word processor strengths and weaknesses



Ratings are based on a 1-to-10 scale where 10 is best

METHODOLOGY

Products included in the Buyers' Scorecard are the market share leaders among Windows-based word processors and spreadsheets. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results.

Computerworld thanks the following firms for their help in preparing this survey: *Computerworld* Database Division and Dataquest, Inc.

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Paradox suffers from compatibility conflicts in face-off with Access

DATABASE FACE-OFF

PARADOX FOR WINDOWS users balk at the major rewrite Borland has applied to this first non-DOS version of the product. Particularly difficult issues are adapting old Paradox applications to the new environment and getting familiar with the new object-oriented programming language.

ACCESS benefits from having no previous versions, and the product is viewed by users as very easy to get up and running but lacking in sophisticated programming capabilities. Users were also less satisfied with technical support and performance for both Windows DBMSs.

In the battle for Windows database management systems supremacy, the two primary contenders have come out with new releases that compete head-to-head on numerous features.

But user evaluations of the products reveal significant differences. While Borland International, Inc.'s Paradox for Windows stretches Windows' functionality and challenges programmers with object-oriented tools, Microsoft Corp.'s Access relies on Basic and offers more for end users than developers.

Four users of each product gave their evaluations in *Computerworld*'s Firing Line teleconference. The format was developed with assistance from Howard Rubin Associates, Inc. and Technology Investment Strategies Corp.

Reliability

Because both products are the first Windows databases from the vendors, users said they expected to find problems in their execution. But only one Access user reported problems, and Paradox users said the product was even more stable than DOS versions.

Consultant: "I have been a little bit disturbed by Access freezing. It's not as stable as I would like to have it."

Performance

The combination of databases with extensive memory requirements and Windows' own graphical features causes these databases to be much slower than their DOS competitors. But none of the users expected anything different.

Insurance company: "Compared to Paradox 4.0, it takes Paradox for Windows three to four times as long to do something."

Bank: "I don't think anyone in his right mind would choose a Windows-based database if speed were the main criterion. In Paradox, nothing is optimized. They really devoted all their time to make it not blow up."

Entertainment firm: "I would like to see Paradox tweaked a little bit. Drawing a screen, especially with bit maps, is very sluggish."

Consultant: "Access isn't as fast as it looks at first. It presents a quick representation of the table, but when you realize what it's doing behind the scenes, it's slower than third-party products."

Ease of use

Both vendors have taken pains to make common functions extremely easy to accomplish. But complicated programs for customized applications are difficult. Access has an edge in offering more features in the tool bar menu.

Bank: "Paradox for Windows was extremely easy to use at first. But there were some things I couldn't figure out how to do at all. I tried to create a fairly complex form using four table relationships, and I only wanted to present the user with two of the rows and columns. After playing around with it for a couple of days, I gave up and wrote it in Paradox 4.0."

Consultant: "Access is real easy for end users. Once you start programming, there are some things that are not so easy to use such as the database structure."

Technical support

Neither vendor received raves about service and support. Users were unhappy about long waits when calling the support line, and alternative online means were no more satisfactory. But the users all expected to have these problems.

Bank: "For Access, the technical support line was completely jammed. I finally did get through. I was doing some fancy stuff with a report and the wait was a hassle."

Entertainment firm: "For application development, the Borland support was almost impossible to get through to, so I used CompuServe. Even that seems overburdened at times. A lot of times I know more about the product than the person I'm dealing with."

Ease of installation

Everything went as expected for both products. The only complaint was the memory requirement. Paradox for Windows consumed 17M bytes. Access digested 12M bytes.

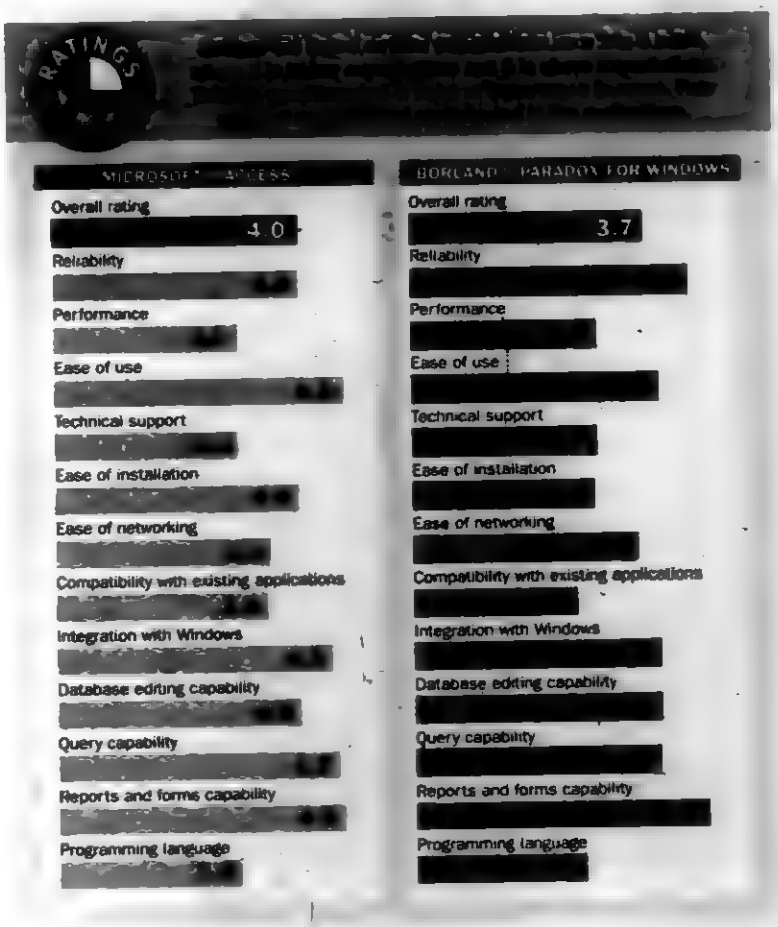
Ease of networking

Paradox for Windows users said record- and form-locking have improved, making network configurations easier. Access users had no problems with the networking features.

Entertainment firm: "Setting up a network in Paradox is messier than it needs to be. The Windows executables and [Dynamic Link Libraries] are read-only, so a network installer needs certain access to do that."

Compatibility with existing applications

This was a major issue for Paradox users, as the Windows version allows only tables from the previous version to be converted. All forms and reports must be rewritten, and the programming language is totally different. Access users didn't have previous applications to port and with the exception of transferring some dBase files, they



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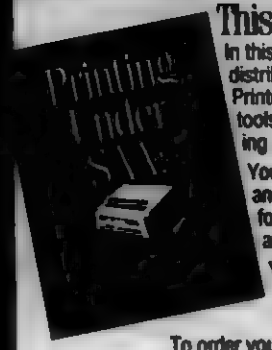

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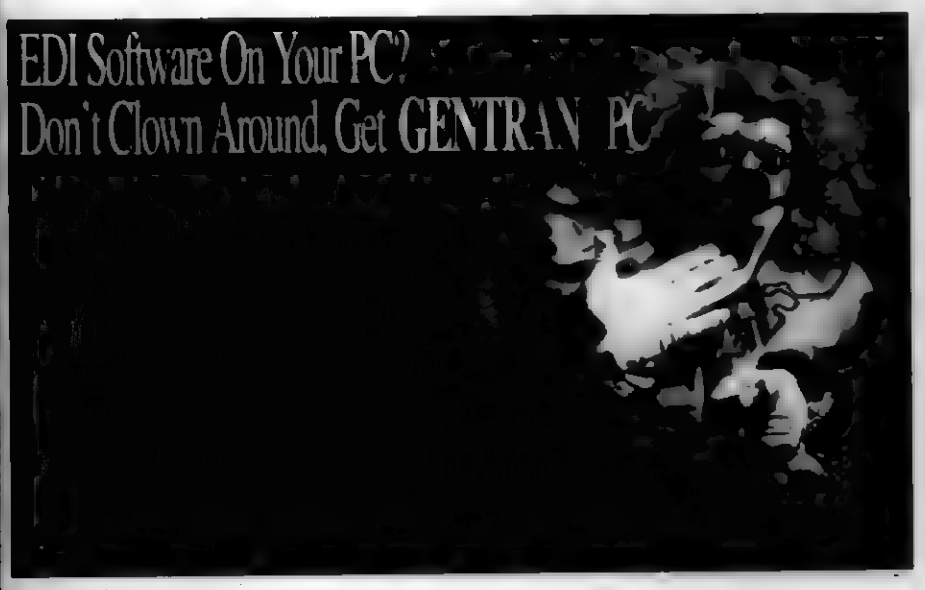

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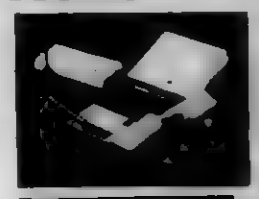

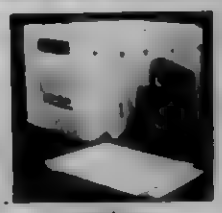

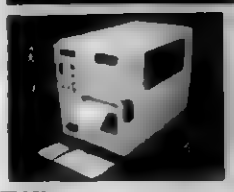

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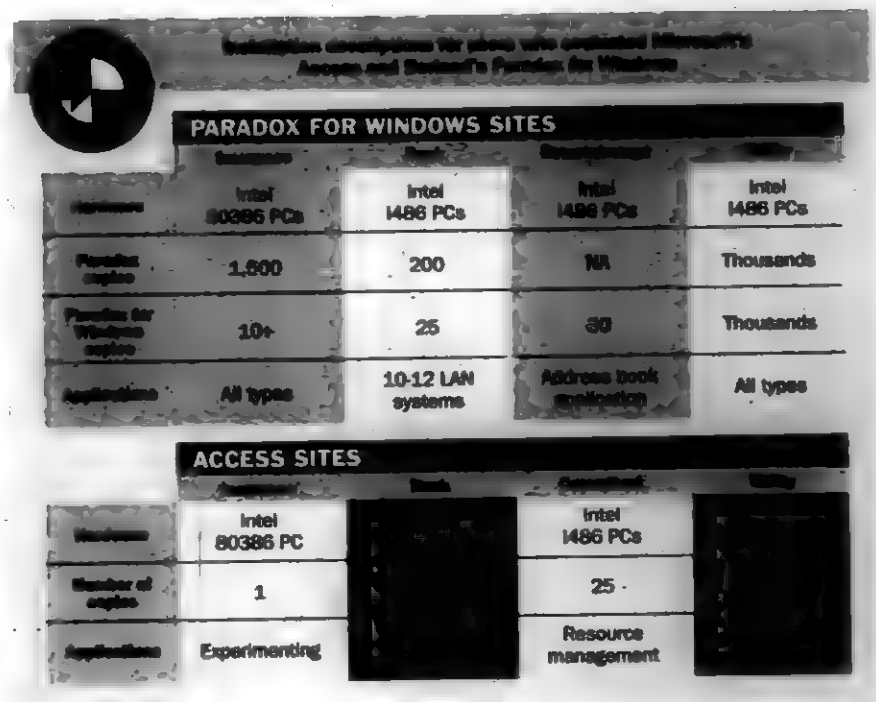

did limited work in this area.

Consultant: "I was impressed with the ability to convert dBase files to Access. It is limited, though. You also can't use the existing Visual Basic module. I'd like to see Access and Visual Basic become one."

Insurance company: "The conversion of a Paradox DOS application to a Paradox for Windows application has proved very difficult. It's basically a rewrite."

Bank: "It's a total rethink of what you're doing. I wouldn't recommend converting anything. There's no benefit to the file structure unless you're using the very novice level of Paradox. Once you get into ObjectPAL, it requires that you trigger events, not just change table values."

Integration with Windows

Users rated Windows integration highly for both products.

Bank: "Borland is trying to leapfrog Microsoft as the source for Windows knowledge by putting in new things in Paradox for Windows like the right click mouse. (If you click on an object with the right mouse button, a property inspector or object menu comes up with a list of options for the object.) It's a more powerful and complicated implementation of the Windows functionality, which means it's slightly harder to use than Microsoft's product."

Database editing capability

These features were rich and varied in both products, though Access was more tuned for end users than programmers, according to the users.

Entertainment firm: "Paradox has a pretty nice extension to Table View. There's everything there that I could possibly want."

Consultant: "Editing for end users in Access is great, and it eliminates some programming. From a developer's standpoint, the editing tools are not totally there."

Query capability

Even though query-by-example originated with Paradox, users said both products implemented this feature very well.

Entertainment firm: "Paradox's query engine is about the best. The Windows version cuts out a lot of the temporary files you used to have to do."

Consultant: "Access is not as intuitive as I'd like, but it's very good."

Reports and forms

The highest accolades were given to the packages' presentation abilities.

Insurance company: "The Windows version of Paradox is 100 times better than the DOS version."

Entertainment firm: "This is the selling point of Paradox for Windows."

Bank: "Converting the form into the report is an outstanding feature of Paradox. Reports were the DOS version's weakness."

Consultant: "Access is a great presentation package. You can do a lot of versions, and you can't go wrong."

Programming language

Both packages took hits in this area: Access because it is not sophisticated enough and Paradox because it represents a paradigm shift from procedural to event-driven programming.

Entertainment firm: "With Paradox, there's a steep learning curve, but once you get over that you can do a lot of interesting things with strategically placed code."

Bank: "Although it looks easy in the book, I found it difficult. For us to be effective, we'll definitely need consulting and training help on our first few applications because it is a different product. It's a cold bath of rethinking programming. I don't think everyone's going to make the cut. I have to struggle to get back to the intermediate level even though I felt I was pretty expert with PAL beforehand. Borland has its hands full getting training out there."•

Written and compiled by Michael L. Sullivan-Trainor.

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Microsoft responds

Here are Microsoft's responses to the issues raised in this evaluation. Borland was not able to offer a response in time for publication. The responses are from David Risher, product manager for Access.

•**Performance:** It's no secret that Windows databases are substantial pieces of software. Access requires 386s and at least 4M bytes of random-access memory. We were very careful to give users the option of how much disk to use — Access' minimum installation takes fewer than 5M bytes of disk space. Access is also optimized so that it can start in low memory situations.

A key goal for the next release is to increase performance particularly on low-end 386s. Technology like Rushmore, which we acquired when we merged with Fox Software, Inc., makes a lot of sense in Access architecture. You can expect to see it show up as we move forward.

•**Technical support:** Since introducing Access, we have tripled the number of support engineers dedicated to the product. We are now at the point where we no longer "busy out" with customers, and wait times are coming in line with those of other Microsoft applications. We will continue to add engineers as well as continue our very active CompuServe forum.

•**Programming language:** Access Basic is an extremely sophisticated language, with support for such constructs as transactions, huge arrays, error handling, the ability to call Dynamic Link Libraries and very fast compilation. At the same time, it is a language that is making its way into many Microsoft applications. Microsoft's commitment to Basic means that our different flavors of the language will consolidate into a unified engine in which coding in one application will be reusable in another and one application will be able to drive another.

•**Integration with Windows:** Access already has taken a lead with its use of Windows — from its drag-and-drop query and form interface to tools such as Wizard and Cue Cards. Access also uses Windows Open Services and Open Database Connectivity to allow it to work with other data. Future versions will take this even further. You can expect to see the latest versions of Object Linking and Embedding in future versions of Access, as well as state-of-the-art aspects of the Windows interface seen in Excel and Word.

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PAUL SCHULENBURG

Look, ma, NO WIRES!

By J. Gerry Purdy

Imagine you're sitting in a chair watching your child's soccer team warm up. There's a few minutes before the game, so you open your small handheld portable computer. You notice that you've received a fax from a customer in Japan. You take a pen and mark up the fax, indicating changes and comments, and then command your personal communications assistant to send the fax back to the customer in Japan, where it is displayed on his fax machine.

All at the same price of making a phone call.

Wouldn't that be great? Unfortunately, receiving and responding to wireless fax messages is currently a pipe dream, as are many other applications using wireless networking. But I believe that by 1994, wireless data communications should start to take off as the wireless infrastructure strengthens, costs start to decline and technical advances bear fruit.

1993 is a watershed year for wireless networks. User costs will start to decline, the infrastructure will solidify and technology advances will make their mark.

Infrastructure care

Remote users today can send messages, faxes and full-motion video over the phone system through software that assists in remote connection via land lines.

The infrastructure that would make wireless communications as easy is not fully in place yet. However, the key wireless network companies say they will solidify the infrastructure, changing analog networks to digital, building new or updating old transmitters and releasing communications software by 1994 and beyond.

Many of the radio stations in place today handle cellular broadcasts, which is fine for information that transmits in a continuous format, such as voice. But because data communications travels in short bursts, there is typically a wait between each transmission. With cellular, companies end up paying for a lot of dead air.

The idea is to convert cellular networks from analog to digital and to refine compression techniques, pumping up the ability to carry. Cellular Digital Packet Data (CDPD), a joint venture between McCaw Cellular Communications, Inc. and the seven regional Bell holding companies, is expected to enable "channel hopping," the ability for data transmissions to occur on existing analog voice networks during idle times between voice calls.

CDPD is also expected to be designed for security. The network will encrypt all packets sent over it with a user identification that makes it hard to scan and decode the message. The network, however, will reportedly not begin operation until the end of this year, with broad rollout in 1994.

Two wide-area wireless networks available today opt for packet-switching technology to carry data transmission. One is the 19.2K bit/sec., 800-MHz Ardis system, a joint venture between Motorola, Inc. and IBM designed originally to support field service and support personnel. The other is Mobitex, a 19.2K bit/sec., 900-MHz system, which is a joint venture between RAM Mobile Data and BellSouth Corp.

Designed for data from the outset, the packet networks send standard amounts of data packaged with an address. Each node checks out the packet's address and, if appropriate, broadcasts to the next node. At the end of the packet's travels, the receiver assembles the packet. In this way, messages from all over can share the same frequencies.

But while Ardis and Mobitex are set up to handle data, they

Wireless nets, *page 141*

Purdy is vice president and chief analyst for the mobile computing service at Dataquest, Inc. in San Jose, Calif.

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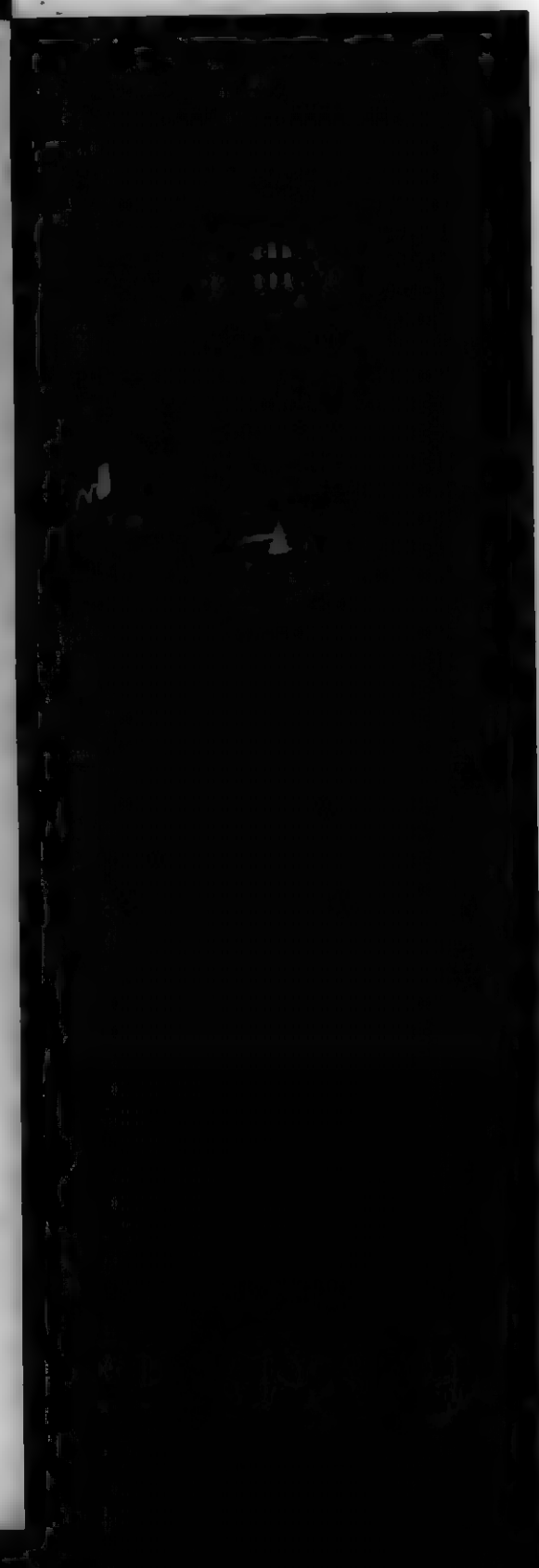

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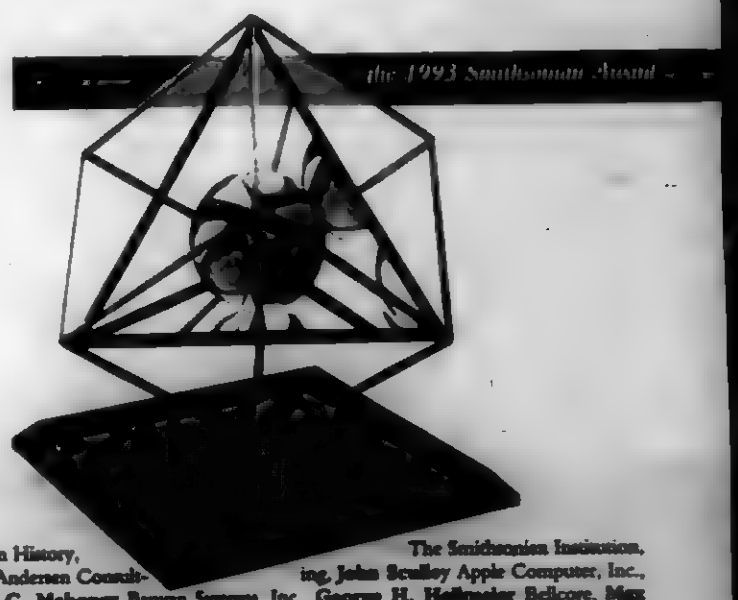

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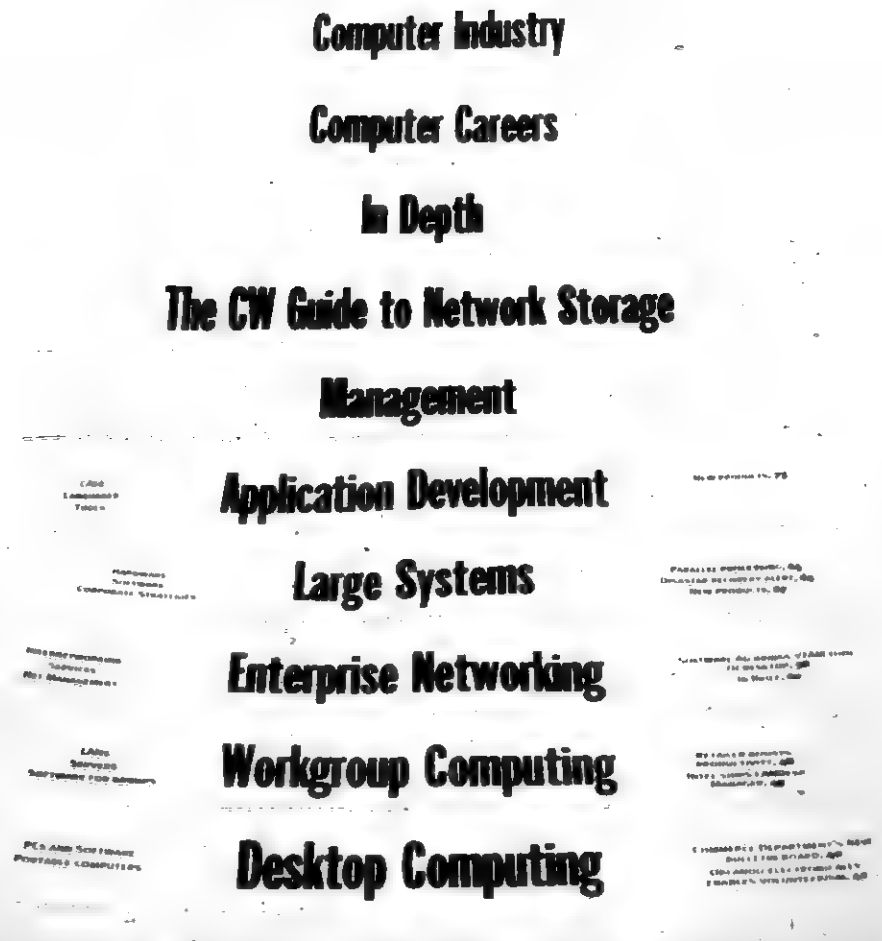

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Wireless nets

CONTINUED FROM PAGE 137

don't have the "coverage" cellular offerings do. Their sponsor organizations, however, say they are working at beefing up their radio bases substantially by the end of the year.

RAM Mobile says it is rolling out five to 10 base stations a week, for a total of 800 expected by July. It is updating software to handle wireless data transmission. Ardis has 1,300 base stations, with 700 more planned for the next several years.

Pardon me, modem

Also helping wireless hit its stride will be small, low-power and affordable radio modems, making their appearance by 1994. Today, modems are comparable in size to a pager or cellular phone; by next year they will fit in card slots for Ardis, Mobitex and CDPD communications.

As these units become smaller, they will become more attractive to users. More users will buy them, and the volume jump will likely push prices down. I predict costs will plunge from the current price of $795 to about $300 by 1994.

It's no good if radio modems are widely available, software is available and wireless networks are available but the cost of using wireless data services is higher than the cost of using land line data communications. Sometimes wireless costs can be two to three times higher than those for phone transmission.

What's the cents?

A subscription to MCI Mail, for example, costs $35 a year, with messages of up to 500 characters priced at 45 cents. In contrast, RAM Mobile charges $69 a month per individual, plus a monthly packet charge of approximately $25 to $100, depending on use.

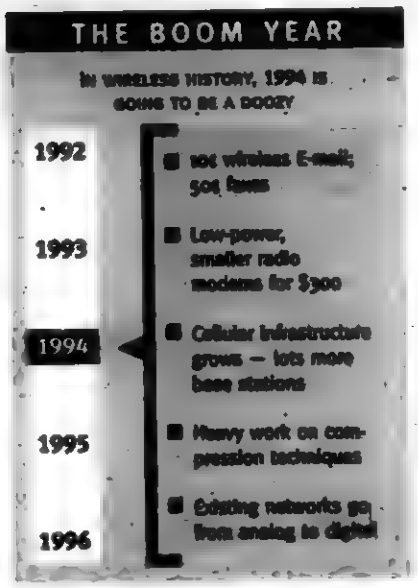
Users pay a minimum of $32 a month for Ardis, with one character packet of 240 characters (about 30 words) priced at 16½ cents.

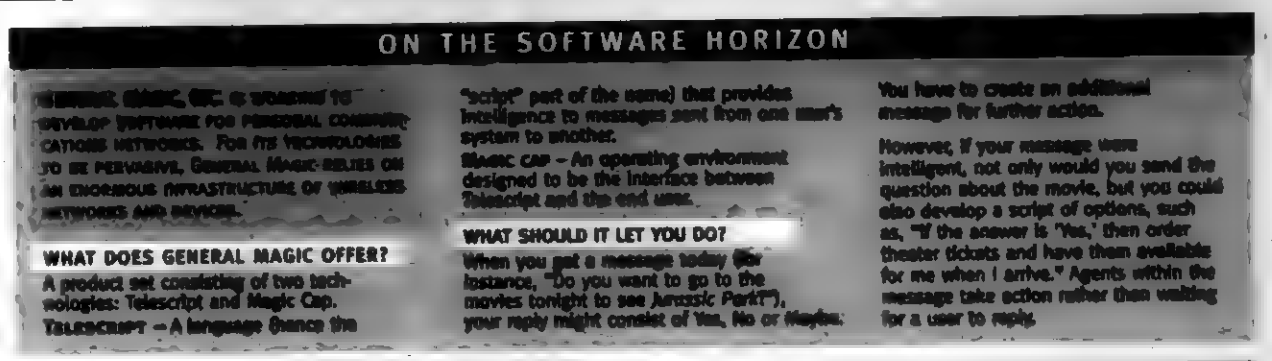
But wireless prices should fall and be competitive with land line by next year.

For instance, McCaw says that when its CDPD network comes on-line later this year, prices will be about 10 cents for a short electronic-mail message and 50 cents for a one-page fax.

What's going to bring prices down? First and foremost is simple economics. Wireless data network vendors will start to recover capital costs and will pass on lower prices to users.

Second, advances in technology, such as miniaturization, will start to have an impact. Finally, as wireless becomes more mature, competitive forces will work to reduce costs. •





Hey! My modem's dead!

You're in a rush and jump on a plane to Europe with your handheld computer and its trusty radio modem card. The first thing you discover when you land is, voila — your trusty old radio modem doesn't work. Just like you can't plug in your hairdryer, using wireless communications is verboten because radio transmitter/receiver frequency is different in Europe than it is in the U.S.

This represents an interesting challenge. Users need an easy and convenient method to run their wireless equipment overseas. Here are some of my ideas:

• **The swap option.** Airlines might let a user traveling to Europe trade in his current radio modem for one that works locally. He would trade the unit back when he gets on a return plane to the U.S.

• **The toggle option.** Radio modem makers could develop what would likely be a higher priced products version letting users switch between one frequencies.

• **The global village option.** After the turn of the century, I think we'll see systems developed that use the same frequency all over the world. Such personal communications networks will require a higher broadcast band (in the gigahertz vs. megahertz range).

Because they'll use a higher broadcast band, these systems will require a much larger network of antennae to transmit signals, which only go short distances at low power.

The positive side of transmitting at high frequency is that users will be able to send and receive more information anywhere, including Europe. •

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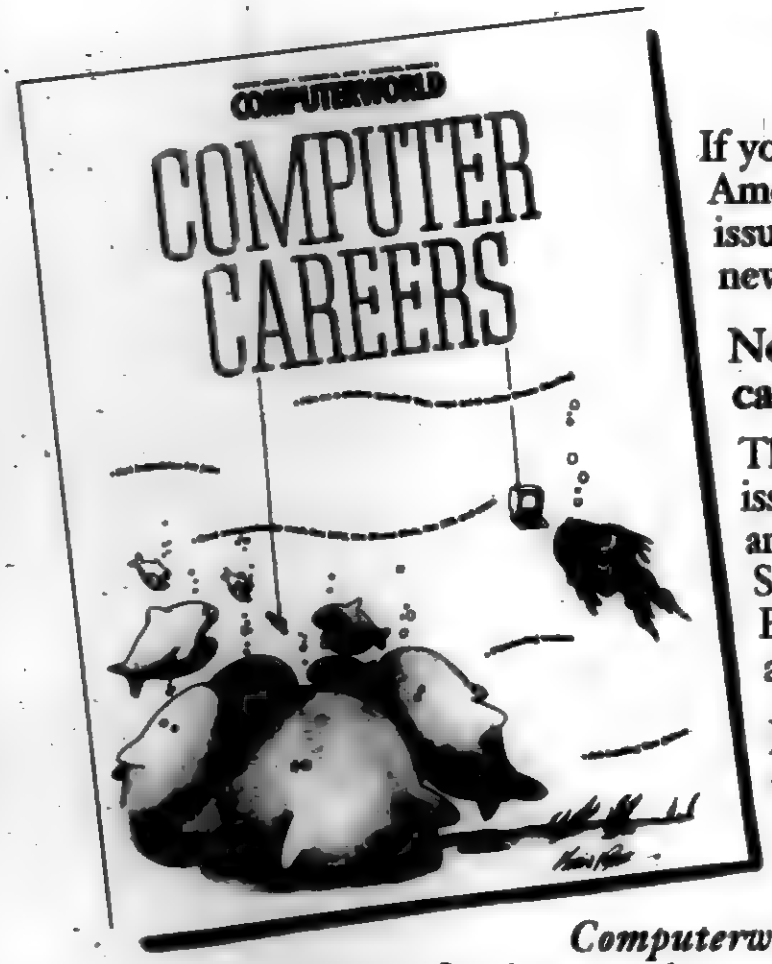

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PROGRAMMERS move to client/server

By David A. Kelly

FOR SOMEONE USED to programming large systems in languages such as Cobol, Fortran, PL/1 and assembler, moving to client/server development can be daunting. But training professionals and programmers who have made the change say it can be done.

"If you're a mainframer, don't give up," says Kevin Fleischood, systems engineer at Sabre Technology Group, a unit of AMR Corp. "I was able to convert 15 years of mainframe experience into client/server skills."

"You need to have an open mind and be prepared to discard your old notions," says Linda Whitson, vice president at Training Systems & Solutions, a division of AMR Information Services, Inc. For example, "mainframe programmers need to reconceptualize the building of applications. Programming in object-oriented languages requires a significant shift from programming in Cobol."

Despite the leap, the transition can be made. But learning the significant differences between mainframe and client/server programming is important.

■ Conceptual shifts

One of the biggest changes for people moving from programming in languages such as Cobol or assembler to C++ and other object-oriented languages is adapting to the idea of reusability. Instead of writing code that is specific to an application, developers must create code objects that can be easily reused.

Another change for developers is the contrast between character-oriented mainframe applications and event-oriented Microsoft Corp. Windows applications. For example, under CICS Cobol, screen events are handled at one place, while in Windows, each field and button on the screen can trigger an event. "We found that this is a tough concept for people coming over from the mainframe side," says Michael Ryan, systems manager at Merrill Lynch & Co. in New York.

Another problem is the speed of change in the client/server world. "Cobol programming on mainframes hasn't changed very much," Ryan says, "but if you're developing for client/server, you need to learn new metaphors and programming approaches as they come along."

■ Less programming

The move toward standardization and the enormous variety of client/server software available gives programmers the option of integrating existing programs or packages into their applications rather than reinventing the wheel. This is a big change for developers emerging from the mainframe environment where "you rarely used more than one package," says Don Weimann, visual programming specialist at Chevron Information Technology Co. in San Ramon, Calif. "Now you are able to integrate spreadsheets into applications using DDE or OLE, so you don't have to write everything that you need."

■ Increased responsibility

The client/server environment isn't as controlled or comfortable as a mainframe environment. "The infrastructure is less concrete," Weimann says. "For example, on mainframes there is source-code management and procedures for moving code into active use. When you are doing that in client/server, the server is amidst the group, and you pick up all these additional tasks, such as backup, recovery, memory management and maintaining network connections." Fleischood says, "Mainframers may take [their source-code management] for granted, but we found that getting the right one was crucial to the success of our project."

■ Teams

Developers find that client/server project teams tend to be different, too. Instead of just interacting with other computer people, client/server specialists do everything from working directly with end users to meeting with high-level company management.

"Project teams need to have a great deal of end-user operational knowledge to improve the efficiency of the client's operations," says John Keating, senior analyst at G2 Research, Inc.

■ Increased development speed

Application development under client/server is faster and more interactive than mainframe development. Developers can use tools such as Powersoft Corp.'s PowerBuilder and Blyth Software, Inc.'s Omnis to get user feedback, create screens and continue building the application without losing time.

In traditional development, the client often would not see a system until it was almost complete, resulting in less productive code and more extensive changes to completed code.

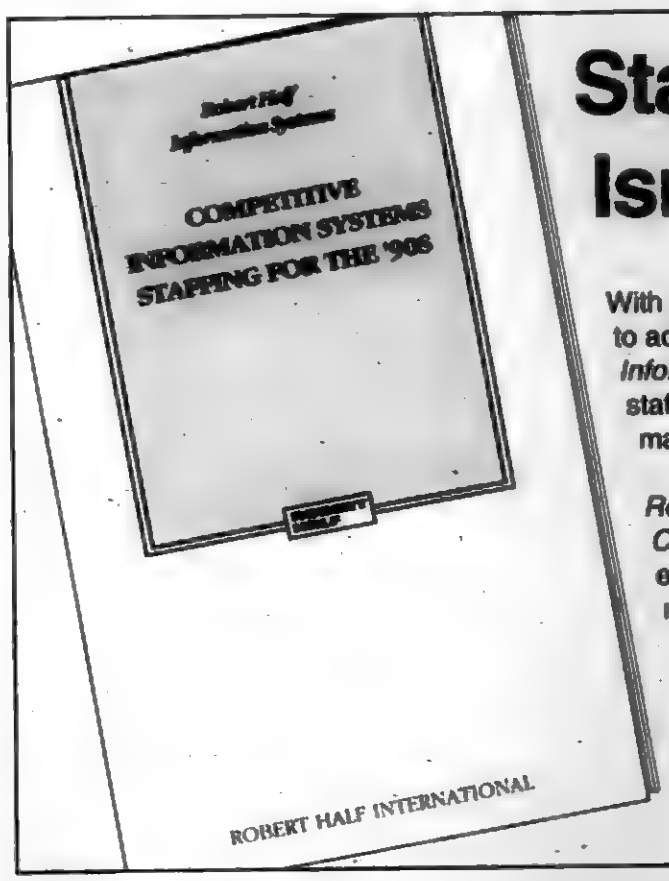
"It becomes one of the more difficult transitions to make," Ryan says. "You do more prototyping approaches in client/server instead of just building applications to specification."

■ Best advice? Go GUI

So what's the best way to start making the move to client/server? Learn and understand a graphical user interface environment, Ryan suggests.

You can make the transition if you try. "You need to be flexible — stretch yourself to look beyond the envelope that you're used to in a mainframe environment," Whitson says.

Kelly is a client/server and systems integration consultant in West Newton, Mass.



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Career advice for the '90s

Don't wait to motivate staff

Raymond S. Perry, vice president and chief information officer at Avon Products, Inc. in Rye, N.Y., joins us this week as Fast Track's guest adviser. Fast Track is a twice-monthly column dedicated to answering your career questions.

Q. I am the information systems director at a relatively small shop. Due to the stagnant economy, turnover has been nonexistent for almost two years. With no positions opening up, it is difficult to keep my staff challenged, and I'm not in a position to offer promotions or raises. How can I keep them motivated?

A. Whether an information systems shop is large or small, the advice is the same, and there's plenty that you can do:

•Try to provide an educational development program by working with a local university. Encourage your staff to take specialized courses and to work on advanced degrees to expand their skills in both general business and technology areas.

•Assign research projects on new technologies. For instance, have someone find out about client/server applications or investigate telecommunications benefits by talking with key vendors. Afterward, have him present his findings to the staff. This not only challenges the individual but the department as well.

•Cross-train IS staff by moving them to different assignments or having them work with different people. The person responsible for the data center, for instance, could investigate the job of the person in charge of the development staff.

•Bring in executives from other parts of the business to describe what their IS needs are. Any executive can translate his business problem into an information need in less than 10 minutes.

These are just a few things that we do in our organization to keep people interested, excited and stretching. IS people are technical people and love a challenge.

Raymond S. Perry, *vice president and CIO, Avon Products*

Q. I was "rightsized" out of a senior programming job at a bank. Six months later, I was hired by an insurance carrier as a project manager. There is a shortage of resources here, and we're under a lot of pressure to deliver more with less. Morale is low. Short of leaving, how can I make the best of a bad situation?

A. Find a way to demonstrate your need for more resources. Or demonstrate that the requests being made of you are unreasonable. You can prove your point by getting benchmarks from outside vendors and public accounting firms. These groups can assess how they would solve the same problems you're working on.

In many cases, your company will find that most of these outside services cost more, take longer and are more difficult to work with. Your group will begin to look awfully good. And if it doesn't, you should figure out a way to change this because it probably means that you aren't competitive.

You might also look at ways to deliver more with less. Client/server technology, stronger user involvement, PC solutions and a lot of other less formal approaches than what the mainframe requires are faster and simpler.

Finally, I wouldn't rule out working on your resume at the same time. There are a lot of situations where you just can't win.

Q. I am a local-area network manager at a large manufacturing company. I have ideas on how to improve the way things are done; however, politics are holding me back. What's the best way to point out ineffective procedures without jeopardizing my position?

A. The phrase "politics are holding me back" implies that people are not listening to you or are feeling threatened by your suggestions for improvement. One piece of advice is to present your suggestions in a more positive way by describing how they could benefit the people you are trying to win over.

Another tactic is instead of telling people what needs to be done differently, ask for an opportunity to show them. Once they see the difference, they will adopt the change.

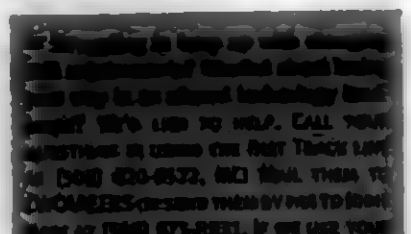
It's also worth asking other people how they view you. Do they see you as a person trying to help them or someone that threatens and embarrasses them? Depending on the answer, you might want to change your approach. A nonthreatening manner, a sense of humor and good interpersonal skills are worth a million in these situations.

Q. I am a software developer at a financial organization. It's frustrating to work with users who constantly change their minds about what they want. How can I deal with them, without insulting their intelligence?

A. Change is crucial; therefore, you must recognize it as part of the process and learn to manage it. Remember that speedy product delivery is key. The quicker you deliver products to users, the less time they have to make changes.

Also, ask users to agree to a date after which they can't make any changes to a particular release. If they come to you after that date, they'll know the changes will go into the next release. This keeps them from being too frustrated and allows you to focus on what you're trying to deliver.

Change is a natural and important part of the process. If I found a system where the user didn't want to make changes, I'd worry because it says to me that the project isn't really critical to his business.



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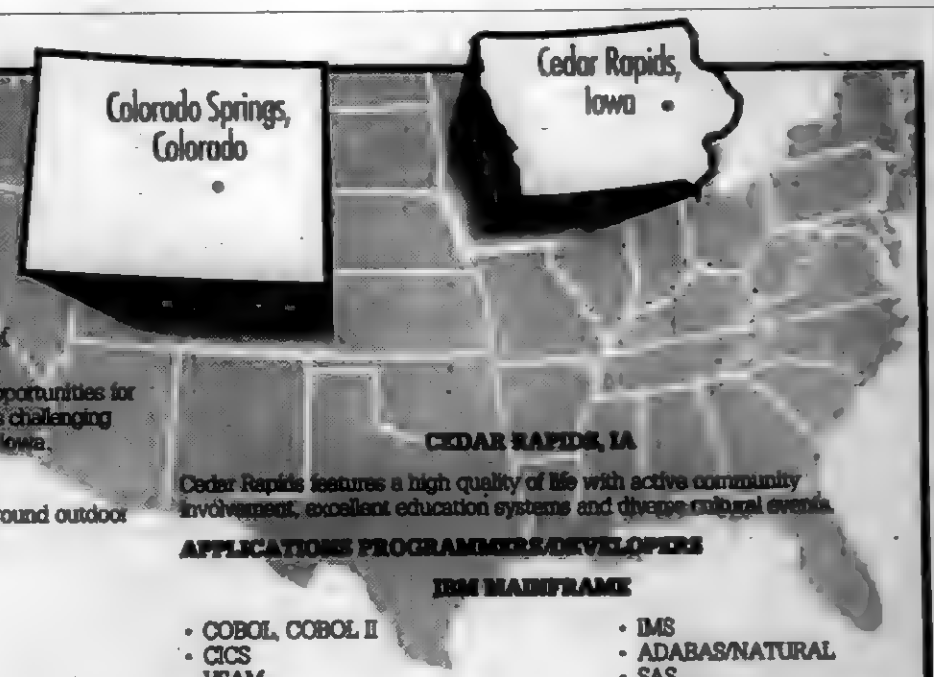

Innovation begins with ideas, making the right choices and having an independent mind set that is able to work within a team framework. MCI has achieved success and become a $10 billion company by gaining the competitive edge that comes from professional interaction and use of advanced technology.

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(Response Code Dept. 1206/SPCW)

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- Performance Tuning & Capacity Planning
- DASD Management
- Database Administration

Experience is required in:

MVS/ESA, DFP/ESA, DFHSM, DFSMS, DFDSS, CICS, DB2, IMS, ADABAS, RACF, Teleview, VTAM, Netview, JES, Omegamon, SMP/E, MICS, SAS

IBM/VAX APPLICATIONS DEVELOPERS/PROGRAMMERS
(Response Code Dept. 1206/EDME)

IBM MAINFRAME

- COBOL
- CICS
- DB2
- VASM
- C, C++
- ADABAS/NATURAL
- WINDOWS / OS/2
- PRESENTATION MANAGER
- VTAM
- TOKEN RING
- X.25/X.400
- FOXPRO
- SYBASE
- LU6.2
- TESTERS

VAX

- VAX/VMS
- C, C++
- POWERHOUSE
- UNIX, ULTRIX
- DECNET
- ETHERNET
- DECTOOLS
- WINDOWS
- SNA
- VTAM
- LAN/WAN
- X.25/X.400
- TESTERS
- OSI
- STRATUS

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- ADABAS/NATURAL
- SAS
- TSO/ISPF
- MVS/ESA

PCs/MICROS

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- PRESENTATION MANAGER
- DATABASE MANAGER
- WINDOWS DEVELOPMENT
- SYBASE
- LU6.2
- FOXPRO
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- ETHERNET
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- INFORMIX 4 GL, INFORMIX 4WEB, 4MAP
- DCS, FOUNDATION TOOLS, COBOL, DB2

SOFTWARE

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- C, TELEVIEW, UNIX, X-WINDOWS
- C, LU 6.2, DB2, VAX/VMS
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- OS/2, PM
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- CASE TOOLS/FOUNDATION
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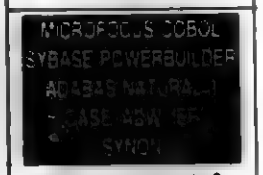

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small-scale computers	39,210
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Software Vendor	218,027
for large-scale systems	90,605
for medium-scale systems	68,763
for small-scale systems	58,422
for personal computers	97,695
for technical workstations	33,217
Non-CPU Computer Products Manufacturer	42,051
VAR/Dealer/Retailer	27,772
DP Service Bureau/ Contract DP Services	71,293
Consulting/Planning	76,848
Manufacturer (not computers)	202,131
Insurance	91,117
Healthcare	48,866
Banking/Financial Services	116,696
Government Federal/State/Local	114,677
Business Service (except DP)	63,793
Communications Systems	55,744
Public Utilities	24,931
Transportation	51,533
Wholesale/Retail Trade	107,725
Education	92,761

SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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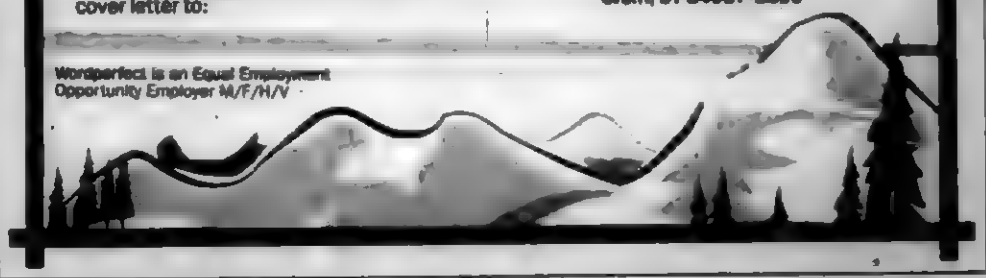

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- ERWIN, ADW/O, IMS
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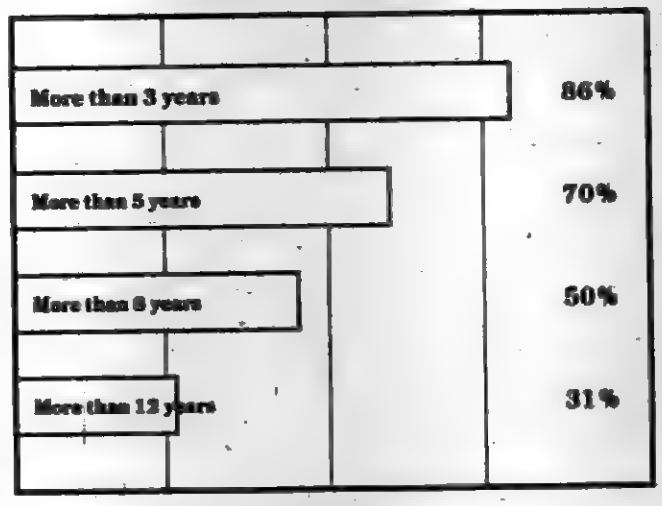

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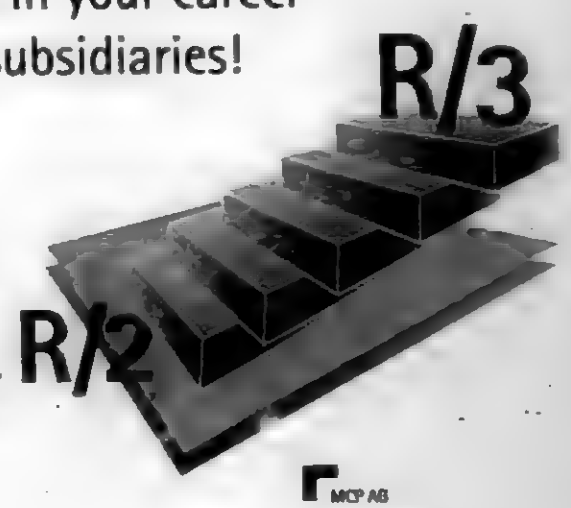

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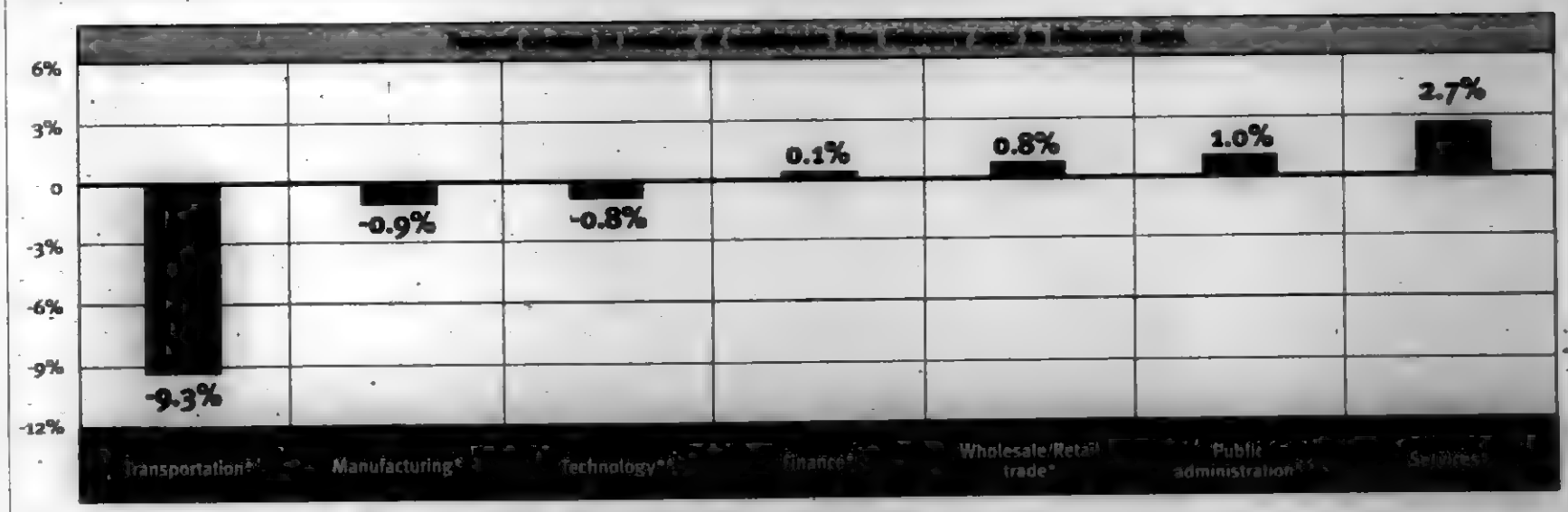
The service industry hired more workers than any other segment, while the transportation industry made huge cutbacks



*Source: U.S. Department of Labor, Bureau of Labor Statistics

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Prices hard to come by; but persistence pays off

shopper alert

By Stefanie McCann

IF YOU WANT a price quote for a specific PC or notebook from a reseller, superstore or vendor and only have time for a couple of quick phone calls, you can probably forget it. It's not as easy as it seems.

My mission was to get a random sampling of prices for a few systems, but 51 phone calls later, I still had a pretty sketchy list.

I was looking for machines introduced in the last year, including Apple Computer, Inc.'s PowerBook 180, Toshiba America Information Systems, Inc.'s T4500 and IBM's ThinkPad (see chart).

Out of the four superstores I called, only a few carried these particular systems. Instead, many stocked lesser known machines from manufacturers such as Leading Edge Products, Inc. The superstores were the most willing to give out prices, however, and were always available to take my calls.

Of the stores I contacted, I fared best with Computer City in Fort Worth, Texas. With one call and minimal time on hold, I received prices for three systems.

The same was true for Micro Center in Columbus, Ohio, and Ballard Computer, which is in Seattle.

At the reseller level, obtaining a price was generally more time consuming, but resellers carried more of the systems in my search. I called Inacom five times before I got a call back — a week later.

I called two MicroAge stores (about seven times), but the reseller never followed through. On the other hand, Computerware in Bristol, Pa., responded after only one call.

On the vendor front, getting prices meant leaving a few messages and playing phone tag, but otherwise, they were quite amenable.

Price trends

It's actually easier to get a sense of pricing trends than it is to get individual prices. I486-based PC prices have dropped 22%, and I486-based notebook prices have dropped an average of 20% in the last six months, says John Murphy, president of reseller Metro Computing in Gibbsboro, N.J.

What's good for buyers right now is that competition is spurring vendors and resellers to add more disk space, more memory or faster chips for relatively little cost.

According to Metro Computing, of the systems listed, the price for Toshiba America's T4500 has dropped the most in six months — about 10%. Apple's PowerBook 180 costs approximately 4% less now, and IBM's ThinkPad is about 3% cheaper.

McCann is an assistant researcher, features.

Asking price

PC and notebook prices vary a lot depending on where you shop. In this sample, the biggest price difference between vendors and resellers is $895; the smallest is $170.

Apple PowerBook 180	$4,469			$4,099	$4,299		$3,998
IBM ThinkPad 200	$2,950			$2,950	—	—		$2,616
Toshiba T4500	$2,999			$2,599		$2,849		$2,104
IBM ThinkPad 500	$1,999			$1,677		—	—	$1,507
Leading Edge Product WinPro 486	$2,699 (without monitor)			$1,349	—	—	—	—

Companies are national, unless otherwise specified. (—) indicates reseller does not sell system.

*Other locations: King of Prussia, Pa.; Wilmington, Del.; Cherry Hill, N.J.
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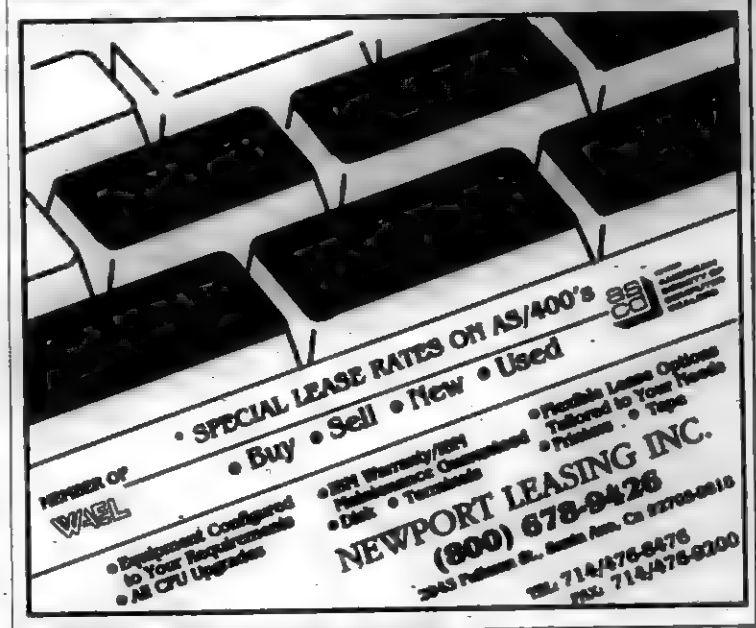

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PS/2 Model 70-A21	$875	$850
PS/2 Model 55SX	$750	$675
ThinkPad 300	$1,400	$1,350
PS/2 Model 90-D1g	$1,700	$1,700
PS/2 Model 95-QIF	$3,000	$2,825
Compaq ProLinea 4/50	$1,100	$1,500
ProLinea 4/33	$1,050	$1,250
Portable 386	$650	$675
SLT-386	$925	$825
LTE-386	$650	$650
DeskPro 486/33i	$1,850	$1,725
Apple Macintosh SE	$625	$600
IICX	$1,550	$1,350
IICI	$2,250	$2,050
IIFX	$2,800	$2,500
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REQUEST FOR PROPOSALS
CMM-858

SYNOPSIS: The New York City Transit Authority is seeking a Consultant to Evaluate and Assess MRA and Other Commercially Available Software Packages Against the Authority's Employee Related Information Needs.
CLOSING DATE: June 21, 1993 - 1:30 P.M.
CONTRACT NO. CMM-858

The RFP may be obtained free of charge by calling the Procurement Specialist David Petersen at (718) 694-4080 or copies of the solicitation can be obtained without charge by mail or in person at 130 Livingston Street, Brooklyn, New York 11201, 1st floor Bid Reception desk between the hours of 9 AM - 3:30 PM.

The factors that the Authority will consider in evaluating proposals are listed below in their relative order of importance: Knowledge of overall requirements; Experience in relevant areas; Experience and qualifications of assigned personnel; Cost analysis of Price (labor, overhead, profit and out-of-pocket expenses); Responsiveness and completeness of the proposal with regard to the work and all matters called for in the RFP; Project planning including subcontractors; In-depth knowledge of commercially available Human Resources/employee-related data software packages; Broad knowledge and experience in the conducting of feasibility studies, evaluation/assessment of software packages, use of proprietary assessment tools, processing of data analysis and modeling, determining information and business system architecture, engineering of systems applications, preparation and delivery of executive level presentations and the development of final reports.
A pre-proposal conference will be held on Thursday, June 3, 1993 at 9:30 AM in Conference Room 816, 6th floor, 130 Livingston Street, Brooklyn, NY.
Proposers who wish to attend should notify the Procurement Specialist David Petersen at 718-694-4080 not later than 4 PM on June 1, 1993. All inquiries, in writing, must be received by the Authority by June 4, 1993. The Authority intends to select a proposer or proposers with which to enter into negotiations by July 6, 1993. The anticipated contract award date is October 1993.
Proposers will be fully responsible for the delivery of their bids in a timely manner. Reliance upon the U.S. Mail or other carriers is at the proposer's risk. Late submissions will not be considered.
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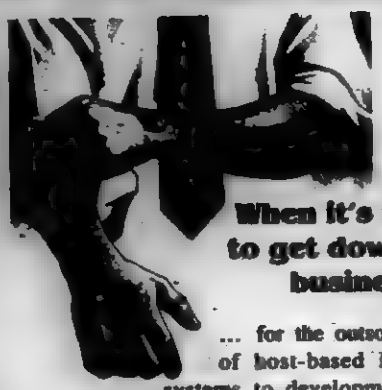

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Gainers

Percent

Applied Communication Corp.	46.9
Knowledgeware Inc.	30.7
MRO	30.6
Group I Software (L)	30.0
Viewlogic Systems	21.7
Software Toolworks Inc. (H)	19.4
Creative Technologies Inc.	18.1
Scientific Atlanta Inc.	17.9

Dollar

Sybase Inc. (H)	7.88
Electrosoft Corp.	7.38
Hewlett Packard Co. (H)	4.25
Intel Corp.	4.00
Compaq Computer Corp.	3.88
Creative Technologies Inc.	3.25
AT&T	3.00
DSC Communications	3.00

Losers

Percent

Bachman Info. Systems	-18.5
Cognizant Inc.	-15.9
Digital Systems Int'l Inc.	-14.3
Datagram Corp.	-13.9
MathSoft	-11.6
CE Software	-9.7
Sequoia Systems Inc.	-9.3
Tigent Corp. (L)	-8.3

Dollar

Matsushita Electronics	-2.63
BMC Software Inc.	-2.00
Tektronix Inc.	-2.00
Zebra Corp.	-1.88
Software Spectrum Inc.	-1.50
Datagram Corp.	-1.50
Symantec Corp.	-1.50
Policy Management Sys.	-1.50

Firm writes in wide margins

In the era of contracting margins, data processing service provider BISYS Group, Inc. (BSYS) is going against the grain.

BISYS' operating margin grew 1.5% compared with last year, according to Salomon Brothers, Inc. analyst James Kissane.

Kissane said the Little Falls, N.J.-based company managed that trick because it offers only a single software product, Totalplus, on which BISYS can spend all of its development resources. BISYS handles data processing chores exclusively for banks, thrifts and other financial institutions. Economies of scale derived from a single-product focus should allow BISYS to continue expanding its operating margins during the next several fiscal years, Kissane said.

He issued a Buy rating for BISYS stock in his May 12 report. BISYS closed Wednesday at 17¾. It has reported losses for the past two fiscal years, due to onetime charges and goodwill write-offs related to the company's spin-off from Automatic Data Processing, Inc. (AUD). Apart from those charges, the company has tallied operational profits.

However, BISYS' concentration on a single methodology is a hindrance as well as a blessing, according to F. Mark D'Annolfo, senior vice president at investment research firm Adams, Harkness & Hill, Inc.

BISYS and larger competitor Fiserv, Inc. (FISV) derive about half of their revenue growth through acquisitions of smaller players in their highly fragmented industry. "The disadvantage of the one product is that it makes the acquisition criteria a little tighter for BISYS," D'Annolfo said. "Fiserv is less efficient, but they will operate multiple packages, so acquisitions are easier."

D'Annolfo said he expects Fiserv to record approximately $450 million in revenue this fiscal year, compared with $90 million in revenue for BISYS. "Fiserv has a little more of a national presence. BISYS right now is about where Fiserv was a half-dozen years ago," D'Annolfo said. Fiserv's profit margins are in the low teens, while BYSIS margins could climb as high as 19% by 1994.

D'Annolfo, like Kissane, rated BISYS issues a Buy. Fiserv issues, which closed Wednesday at 18½, are "attractive on weakness," meaning they are a good buy any time the share price drops, D'Annolfo said.

In addition to competing for the same customers, Fiserv and BISYS seem to be inextricably tied together. Curiously, Fiserv owns a 7% stake in its rival. Both companies have also received financing from investment firm Welsh, Carson, Anderson and Stowe.

— Derek Slater

Each	52-Week Range			May 21 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	37.63	9.63	1 COM Corp.	37.50	1.88	5.3
NYS	80.25	61.38	American Info Techs Corp.	72.75	0.75	0.3
NYS	60.38	40.63	AT&T	59.75	5.00	9.1
OTC	3.56	0.75	Abtel Communication Corp.	2.94	0.94	46.9
OTC	24.50	10.25	Banyan Systems Inc.	15.25	0.75	5.2
NYS	56.75	42.38	Bell Atlantic Corp.	54.13	1.63	3.1
NYS	57.50	46.75	Bellsouth Corp.	52.13	0.63	1.2
NYS	6.25	3.63	Bolt, Beranek & Newman	4.63	0.00	0.0
OTC	18.50	9.50	Brooktrout Technology	11.38	1.13	11.0
NYS	101.63	42.13	Cabletron Systems (H)	99.63	2.63	2.7
OTC	19.50	3.75	Centigram Communications	17.00	-0.75	-4.2
OTC	40.00	17.75	Chipcom Corp. (H)	39.50	2.25	6.0
OTC	54.00	20.00	Cisco Systems Inc. (H)	54.00	4.13	8.3
OTC	18.75	5.50	Compression Labs Inc.	9.88	-0.50	-4.8
OTC	34.00	11.00	CrossComm	33.25	3.25	10.8
OTC	4.63	0.88	Data Switch Corp.	3.25	-0.25	-7.1
NYS	22.13	12.38	Digital Comm. Assoc.	13.00	-0.38	-2.8
OTC	12.75	4.50	Digital Systems Int'l Inc.	4.50	-0.75	-14.3
OTC	41.25	4.00	DSC Communications	41.25	5.00	13.8
OTC	9.50	4.75	Fibronix Int'l Inc.	6.63	-0.13	-1.9
OTC	26.00	8.75	Fibronix Int'l Inc.	11.50	1.13	10.8
OTC	4.38	1.50	Gandalf Technologies Inc.	3.13	-0.13	-3.8
OTC	7.06	0.69	Gateway Communications	1.13	-0.03	-2.7
NYS	14.50	2.88	General Datacomm Inds. (H)	14.50	1.75	13.7
ASE	4.00	2.00	Go Video	2.31	-0.19	-7.5
NYS	37.75	30.63	GTE Corp.	35.38	0.13	0.4
NYS	84.25	62.50	ITT Corp.	81.38	0.25	0.3
OTC	51.13	29.88	MCI Communications Corp. (H)	51.13	2.75	5.7
OTC	11.50	2.25	Microcom Inc.	5.00	0.25	5.3
OTC	24.25	4.75	Netwk Corp.	5.25	-0.25	-4.5
OTC	19.00	8.75	Network Computing Devices	11.25	0.00	0.0
NYS	15.00	5.38	Network Equipment Tech.	7.13	-0.63	-8.1
OTC	23.25	8.00	Network General	9.38	-0.38	-3.8
OTC	15.75	8.50	Network Systems Corp.	9.63	0.75	8.5
OTC	70.25	14.38	Newbridge Networks Corp. (H)	68.38	3.75	5.8
NYS	46.00	30.50	Northern Telecom Ltd.	36.38	2.13	6.2
OTC	35.25	22.50	Novell Inc.	31.25	1.50	5.0
NYS	92.50	75.00	Nynex Corp.	81.50	-1.38	-1.7
OTC	30.00	14.50	Octel Communications Corp.	21.50	0.75	3.6
OTC	6.13	3.38	Penril Data Comm Networks	4.38	0.25	6.1
OTC	38.75	10.25	Picturetel Corp.	21.88	-0.38	-1.7
OTC	15.25	4.63	Proteon Inc. (L)	5.63	0.75	15.4
NYS	32.25	11.50	Scientific Atlanta Inc.	32.25	4.75	17.3
NYS	81.50	59.38	Southwestern Bell Corp.	75.25	-0.38	-0.5
NYS	33.25	21.00	Sprint Corp.	31.38	1.38	4.6
OTC	27.00	10.50	Standard Microsystems Corp	16.75	1.13	7.2
OTC	18.50	6.88	Stratacom Inc.	12.75	1.38	12.1
OTC	120.50	25.75	Synoptics Communications	120.13	4.50	3.9
OTC	7.00	3.88	Tellent Corp. (L)	4.13	-0.38	-8.3
OTC	9.38	2.13	Telematics Int'l Inc.	6.13	0.00	0.0
OTC	26.50	13.38	US Robotics	24.75	2.50	11.2
NYS	46.00	34.38	US West Inc.	43.13	1.88	4.5
OTC	53.00	12.00	Wellfleet Communications (H)	52.25	3.25	6.6
OTC	14.50	7.00	Xircom	12.25	1.75	16.7
COMPUTER SYSTEMS						
OTC	6.75	2.50	Advanced Logic Research	3.50	0.25	7.7
OTC	65.25	41.50	Apple Computer Inc.	57.50	2.13	3.8
OTC	24.25	11.25	AST Research Inc.	15.50	1.00	6.9
NYS	12.50	3.50	Commodore Int'l	4.13	-0.25	-5.7
NYS	58.50	23.13	Compaq Computer Corp.	57.25	5.88	11.4
OTC	49.88	15.00	Dell Computer Corp.	32.75	1.50	4.8
NYS	85.50	50.25	Hewlett Packard Co. (H)	84.50	6.25	8.0
NYS	35.75	16.13	Silicon Graphics	35.75	1.63	4.8
OTC	41.00	22.50	Sun Microsystems Inc.	29.88	4.00	15.5
NYS	32.13	22.25	Tandy Corp.	29.50	-0.13	-0.4
OTC	11.00	2.75	Zeos International Ltd.	4.00	0.00	0.0
DISK SYSTEMS						
ASE	18.38	4.63	Ambami Corp.	5.25	0.00	0.0
NYS	9.75	4.25	Conner Computer	6.38	0.50	8.5
OTC	6.13	1.88	Cray Computer	2.88	0.00	0.0
NYS	32.88	19.00	Cray Research Inc.	29.00	-0.38	-1.3
NYS	13.88	7.13	Data General Corp.	10.50	0.75	7.7
NYS	49.25	30.38	Digital Equipment Corp.	46.38	-0.25	-0.5
NYS	38.63	26.63	Harris Corp.	35.50	0.00	0.0
NYS	100.38	45.88	IBM	48.75	0.88	1.8
OTC	22.00	5.50	Kendall Square Research	14.75	-0.25	-1.7
NYS	127.50	83.00	Matsushita Electronics	117.50	-2.63	-2.2
OTC	23.75	8.25	NetFrame	17.25	0.25	1.5
OTC	15.50	9.25	Parallan Computer (H)	14.50	-1.00	-6.5
OTC	18.00	6.00	Pyramid Technology (H)	17.88	1.13	6.7
OTC	24.00	11.25	Sequent Computer Sys.	22.38	2.38	11.9
OTC	14.50	1.38	Sequoia Systems Inc.	2.13	-0.22	-9.3
NYS	48.38	29.50	Stratus Computer Inc.	36.00	1.75	5.1
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.38	3.0
OTC	19.00	10.63	TriCord Systems	14.75	0.00	0.0
NYS	13.88	7.75	Unisys Corp.	11.50	-0.50	-4.2
SOFTWARE						
OTC	65.75	25.25	Adobe Systems Inc. (H)	65.75	4.63	7.6
OTC	21.00	10.25	Aldus Corp.	15.63	1.13	7.8
OTC	14.25	5.50	American Software Inc.	7.00	0.25	3.7
OTC	28.13	9.75	Ask Computer Systems	12.00	-0.75	-5.9
OTC	56.50	32.75	Autodesk Inc.	51.75	3.00	6.2
OTC	13.00	2.50	Bachman Info Systems	2.75	-0.63	-18.5
OTC	43.00	33.75	BGS Systems Inc.	33.75	-1.25	-3.6
OTC	84.13	37.25	BMC Software Inc.	53.50	-2.00	-3.6
OTC	28.25	17.00	Boole & Babbage	21.25	0.00	0.0
OTC	54.50	17.50	Borland Int'l Inc.	25.88	0.13	0.5
OTC	6.38	3.00	CE Software	3.50	-0.38	-9.7
ASE	29.13	6.25	Cheyenne Software Inc. (H)	28.88	1.88	6.9
OTC	19.50	8.25	ChipSoft	11.25	1.50	15.4
OTC	9.75	5.63	Cognos Inc.	6.50	0.25	4.0
NYS	29.38	10.88	Computer Associates (H)	29.38	3.00	11.4
NYS	12.38	2.75	Computervision Corp.	6.75	0.25	3.6
OTC	34.25	19.25	Compuware Corp.	27.00	0.00	0.0
OTC	14.75	5.75	Conshare Inc.	6.13	-1.13	-15.5
OTC	17.25	10.75	Corel Corp.	15.00	0.25	1.7
OTC	28.00	5.75	Easel Corp.	5.75	-0.38	-6.1
OTC	25.25	12.00	4th Dimension	19.75	-0.50	-2.5
OTC	19.50	6.00	Frame Technology	7.38	-0.38	-4.8
OTC	20.75	10.00	Group I Software (L)	13.00	3.00	30.0
OTC	35.25	18.00	Gupta	18.00	-0.50	-2.7
OTC	8.75	3.50	Hogan Systems Inc.	7.75	0.13	1.6
OTC	25.75	11.25	HMS	18.00	4.75	35.8
OTC	34.75	18.50	Information Resources	34.00	1.50	4.6
OTC	46.25	12.13	Informix Corp. (H)	45.50	3.25	7.7
OTC	17.00	9.50	Intergraph Corp.	9.88	-0.13	-1.3
OTC	13.63	6.88	Interleaf Inc.	8.88	0.25	2.9
OTC	18.00	6.75	Intersolv Inc.	7.75	-0.38	-4.6
OTC	16.00	7.75	Knowledgeware Inc.	11.88	3.38	39.7
OTC	54.75	26.00	Legent Corp.	28.25	0.00	0.0
OTC	34.25	14.75	Lotus Development	34.25	3.75	12.3
OTC	23.00	7.75	MathSoft	9.50	-1.25	-11.6
OTC	23.25	5.25	McAfee Associates	7.00	0.25	3.7
OTC	11.63	1.88	Meca Software	11.00	-0.13	-1.1
OTC	15.00	5.25	Mentor Graphics	10.38	0.75	7.8
OTC	46.00	27.25	Micro Focus	35.38	1.63	4.8
OTC	19.00	4.38	Micrografx Inc.	5.75	0.00	0.0
OTC	95.00	65.50	Microsoft Corp.	92.50	7.38	8.7
OTC	61.88	16.00	Oracle Corp. (H)	41.88	3.38	8.8
OTC	32.75	15.38	Parametric Technology	32.75	3.63	12.4
OTC	40.50	22.50	PeopleSoft	31.25	0.75	2.5
OTC	9.00	3.50	Phoenix Technologies	4.63	-0.38	-7.5
OTC	40.00	25.38	Powersoft	28.50	0.25	0.9
OTC	61.50	17.00	Platinum Software	26.00	2.75	11.8
OTC	25.00	11.25	Platinum Technology	14.75	-1.00	-6.3
OTC	61.50	29.00	Progress Software Corp.	38.25	-0.75	-1.9
OTC	15.50	2.94	Quarterdeck Office Sys.	3.06	-0.13	-3.9
OTC	24.50	11.75	Rainbow Technologies Inc.	24.00	1.75	7.8
OTC	15.75	6.00	Rasterops	7.13	0.06	0.8
OTC	15.25	3.63	Ross Systems	11.50	-0.75	-6.1
OTC	27.25	8.50	Saphire Intl. Corp. N.V.	23.00	1.25	5.7
OTC	15.00	6.75	Software Publishing Corp.	7.63	-0.25	-3.2
OTC	10.75	2.00	Software Toolworks Inc. (H)	10.75	1.75	19.4
OTC	4.50	0.75	Spinnaker Software	1.44	-0.13	-8.0
OTC	12.75	3.25	State of the Art	10.00	0.75	8.1
NYS	24.63	13.75	Sterling Software Inc.	19.13	-0.13	-0.6
OTC	19.00	8.00	Struct. Dynamics Research	19.00	1.50	8.6
OTC	71.13	21.00	Sybase Inc. (H)	71.13	7.88	12.5
OTC	44.25	5.88	Symantec Corp.	16.50	-1.50	-8.3
NYS	17.50	5.25	Systems Center Inc.	10.00	0.00	0.0
OTC	25.50	10.88	System Software Assoc.	16.25	1.75	12.1
OTC	7.00	2.50	Tomic Corp.	3.38	-0.13	-3.6
OTC	22.75	9.13	ViewLogic Systems	18.25	3.25	21.7
OTC	23.90	6.75	Walker Interactive Systems	7.50	0.00	0.0
OTC	3.19	1.38	Wordstar	1.94	-0.06	-3.1
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices	28.63	0.13	0.4
NYS	21.38	9.00	Analog Devices Inc.	19.00	1.13	6.3
OTC	23.63	7.63	Atmel Corp.	23.63	1.00	4.4
OTC	9.38	2.75	Chips and Technologies	3.50	0.13	3.7
OTC	39.75	13.00	Cirrus Logic	17.00	0.50	3.0
NYS	13.38	7.38	Cypress Semiconductor Corp. (H)	12.75	0.13	1.0
NYS	16.13	8.00	Dallas Semiconductor	14.50	-0.13	-0.9
OTC	121.25	46.50	Intel Corp.	104.00	6.00	6.1
NYS	14.13	6.88	LSI Logic Corp.	12.50	0.75	6.4
OTC	33.25	13.75	Lattice Semiconductor	30.00	3.75	14.3
NYS	28.50	13.13	Micron Technology	28.25	4.00	16.5
NYS	78.75	37.13	Motorola Inc. (H)	78.25	3.63	4.9
NYS	15.00	8.50	National Semiconductor	14.38	0.38	2.7
OTC	18.00	6.50	Sierra Semiconductor	8.25	0.25	3.1
OTC	40.00	22.25	SynOptics	40.00	4.25	11.9
NYS	65.00	32.25	Texas Instruments	64.88	3.00	4.8
OTC	8.88	6.00	VLSI Technology	7.50	-0.25	-3.2
OTC	8.00	2.13	Weitek (H)	7.63	0.25	3.4
ASE	9.63	4.13	Western Digital Corp.	5.00	-0.13	-2.4
OTC	37.50	14.50	Xilinx	36.75	2.50	7.3
OTC	27.84	12.50	Zilog Inc.	27.00	0.75	2.9
PERIPHERAL SUBSYSTEMS						
OTC	37.25	11.75	American Power Conversion (H)	37.25	4.00	12.0
OTC	20.16	13.66	Barctec Inc.	18.00	-0.25	-1.4
OTC	18.00	6.25	Cambex Corp.	8.25	-0.25	-3.8
ASE	18.38	6.50	Cognitronics Corp.	7.13	0.00	0.0
NYS	25.50	12.00	Conner Peripherals	13.50	1.00	8.0
OTC	38.50	10.75	Creative Technologies Inc.	34.25	5.25	18.1
OTC	30.75	14.25	Data Race Inc.	24.63	2.63	11.9
ASE	17.00	4.75	Datagram Corp.	9.63	-1.50	-13.5
NYS	34.25	9.50	EMC Corp.	34.25	1.00	3.0
OTC	10.50	5.38	Emulex Corp.	7.25	0.00	0.0
OTC	19.00	13.25	Evans & Sutherland	17.25	0.38	2.2
OTC	33.63	12.00	Exabyte	12.75	-1.00	-7.3
OTC	28.00	7.09	Intelligent Info. Systems	20.75	-1.00	-4.6
OTC	8.88	5.88	Iomega Corp.	5.00	0.00	0.0
OTC	21.50	5.75	IPL Systems Inc.	8.25	0.25	3.1
OTC	24.00	10.75	Komag Inc.	21.25	0.75	3.7
OTC	19.63	5.88	Maxtor Corp.	7.75	0.75	10.7
OTC	11.25	5.75	Micropolis Corp.	7.50	-0.25	-3.2
NYS	116.00	93.00	3M Corp.	114.88	1.00	0.9
OTC	7.75	4.00	Printronix Inc.	6.75	0.25	3.8
NYS	17.25	6.88	QMS Inc.	15.75	1.00	6.8
OTC	17.88	13.63	Quantum Corp.	13.50	-0.38	-2.7
OTC	12.75	3.38	Radius Inc.	3.75	-0.13	-3.2
NYS	16.25	7.50	Recognition Equipment	15.00	1.50	11.1
OTC	13.88	4.50	Ricoh Inc.	4.50	-0.25	-5.3
OTC	22.38	12.00	Seagate Technology	17.00	1.13	7.1
NYS	40.25	18.00	Storage Technology (H)	40.25	1.13	2.9
NYS	27.88	16.88	Tektronix Inc.	24.25	-2.00	-7.6
NYS	80.88	66.75	Xerox Corp.	73.75	-1.88	-2.5
SERVICES						
OTC	23.75	14.75	American Mgmt. Systems	18.88	-0.63	-3.2
NYS	4.75	2.88	Arkcom Inc.	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	27.25	1.50	5.8
NYS	56.13	38.75	Auto Data Processing	49.63	0.63	1.3
NYS	17.25	9.94	Ceridian Corp.	14.88	0.13	0.8
NYS	17.38	13.13	Comdisco Inc.	14.25	-0.13	-0.9
OTC	8.25	4.50	Computer Horizons	7.25	0.00	0.0
NYS	80.50	57.00	Computer Sciences	74.00	2.13	3.0
NYS	9.25	6.50	Computer Task Group (L)	6.88	0.25	3.8
NYS	40.50	22.00	CompUSA Inc.	32.50	1.63	5.3
OTC	14.75	6.00	Corporate Software	12.25	0.25	2.1
OTC	23.75	7.38	Egghead Discount Software	9.00	-0.25	-2.7
NYS	35.88	25.25	General Motors E (EDS)	30.50	0.50	1.7
OTC	25.50	9.25	Macom Corp.	17.88	-0.63	-3.4
OTC	15.38	6.25	Intelligent Electronics	14.00	0.75	5.7
OTC	13.00	6.63	Medisel	12.38	0.38	3.1
OTC	14.75	5.75	Microdyne Inc.	14.00	1.25	9.8
OTC	43.00	21.75	Paychex	39.25	3.00	8.3
NYS	87.25	37.00	Policy Management Sys.	37.75	-1.50	-3.8
NYS	38.00	16.81	Reynolds and Reynolds	36.50	0.88	2.5
OTC	32.75	22.00	SEI Corp.	31.75	0.25	0.8
OTC	24.38	16.88	Shared Medical Systems	21.13	0.38	1.8
OTC	13.88	5.75	SHL Systemhouse	11.38	0.13	1.1
OTC	29.25	18.25	Software Spectrum Inc.	25.25	-1.50	-5.6
OTC	39.75	22.50	Sunguard Data Systems	29.38	0.13	0.4
NYS	4.38	3.13	Ultimate Corp. (H)	4.13	0.38	10.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

HP looks strong

Exceeding analysts' expectations, Hewlett-Packard Co. reported fiscal second-quarter net earnings of $347 million, a 7% increase over the same period last year. Revenue in the period ended April 30 rose 22% to $5 billion. HP cited strong growth in all geographic areas and product lines, particularly in its LaserJet printers, multiuser Unix systems, X Window System terminals and software development tools.

Compuware gains

Compuware Corp. posted fiscal fourth-quarter net earnings of $9.5 million, compared with a loss of $23.2 million in the same period last year. Revenue grew 22% to $69.1 million. For the year, the Farmington Hills, Mich., firm earned $50 million on revenue of $235 million, compared with last year's loss of $28.8 million on revenue of $175 million.

JWP to sell PC unit

JWP, Inc. last week agreed to sell its Businessland, Inc. subsidiary to a group of investors. JWP acquired the struggling reseller and network integrator a couple of years ago to boost its Information Services unit. The investor group has agreed to assume all of Information Services' debts, which total $125 million, and other liabilities. JWP will also receive warrants to purchase up to 10% of the investment group's common stock.

SHORT TAKES Saploms International Corp. N.V. in Cary, N.C., reported fiscal first-quarter earnings of $402,000 on revenue of $8.7 million.... Graphnet, Inc. in Teaneck, N.J., has filed suit against MCI International, Inc. alleging that the MCI Communications Corp. subsidiary is trying to force it out of the valued-added telex and fax transmission business.

Dell revamps portable strategy

Apple's PowerBook chieftain tapped to fix product development woes

By Patricia Keefe
AUSTIN, TEXAS

Dell Computer Corp. likes to compare its average three-day shipping schedule with delays of a month or more across state at rival Compaq Computer Corp. But when it comes to Intel Corp. 1486-based laptops, Dell cannot ship a one. Surprisingly, it does not yet make them and will not ship any until year's end.

And then there are the laptops that Dell no doubt wishes it had not shipped: the 320N notebook, which stumbled following what Dell officials said were "perceived" quality problems; and more recently, the 325SLi subnotebook, which Dell recalled to correct miswired motherboard connections.

John Medica *will have his hands full with Dell's laptop unit*

The result has been an admitted drop in Dell's laptop revenue from 12% to 10% of the company's overall revenue. No one is more aware of these problems than John Medica, Dell's new vice president of portable products. A little more than a month ago, Medica left Apple Computer, Inc., where he was lead developer on the successful PowerBook line, to take up the gauntlet at Dell.

Notebook problems

In a recent interview, Medica addressed the fact that Dell is lagging badly in the notebook market. He delicately noted that "Dell has tremendous upside potential" in this area. More specifically, he said Dell has no 486 notebooks or active-matrix screens. "That's a problem," he acknowledged.

"We will learn what we can from a suboptimal scenario and apply it to next time," he said.

Medica is probably the right person for the job. The situation at Apple prior to the launch of the PowerBook is somewhat analogous to where Dell is today, according to Matthew Cain, an analyst at Meta Group, Inc. in Westport, Conn.

Apple, too, was once a real laggard in the portable market, with some "dreadful" machines that were not really selling, Cain said. Since the "blockbuster" PowerBook took off, Apple has not looked back, he added.

"Anyone who shepherded that effort must have learned something — lessons that would be applicable on the Intel side of the market as well," Cain added.

Analysts said Dell fell behind in the laptop market because its desktop business was doing so well. They agreed the laptop market is critical to Dell's future success.

Medica's primary goal for the next two to three years is to achieve a comparable share in notebooks to whatever Dell holds on the desktop (see chart).

He has divided his challenges into near- and long-term business plans (see story below right).

The first step is to correct the technical "oversights of the past." These include nonbacklit screens with the 325SLi and non-active-matrix screens across the line. He said he also intends to boost overall processing performance while shrinking overall bulk.

Also on the drawing board is delivery of 486-based machines by year's end, Medica said.

Waiting can be deadly

As for whether Dell can afford to wait that long, Medica noted there are several critical matrices on which portables are judged — size, weight, processor, storage capacity and display quality. "If you are one or two generations behind the market leaders, you're in trouble because then you either have to compete on price or not sell [at all]," he explained. "That's the reason [Dell notebooks] aren't in high demand today."

According to Computer Intelligence/Infocorp analyst Kimball Brown, it is too late for Dell to come out with a 486SL-based laptop. "They don't want to start out with an aborted 486 at this stage; it'll be a dead product by fall," he said. Brown explained that Intel is doing away with the SL series and is pushing the 3.3V S series, which will not be available in volume until year's end.

World class partners

To hit those critical benchmarks, Medica also acknowledged the "need to deliver a competently manufactured ... line of products." To rectify this, Dell said it intends to align itself with "world-class" suppliers of key portable system components.

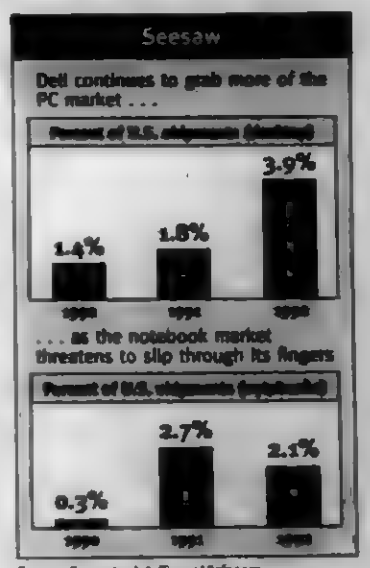
Doing so will provide the company with a window to where the technology is going for the next 24 months, which in turn will help Medica make appropriate product mapping decisions.

In the short term, he said Dell must satisfy 320N customers "as best we can."

Meanwhile, Medica is in the midst of reviewing Dell's laptop deployment strategy. A lot of the 320N is built from OEM parts, which has limited Dell's control over the process. However, Dell has no intention of changing its strategy of purchasing parts from OEMs with "limited value-add from us," he said.

Taking over

John Medica, vice president of portable products at Dell, estimated that one out of every five or six systems sold today is a notebook. Four years from now, he said he expects that will have changed to one system out of every three. Meta Group analyst Matthew Cain agreed, estimating that by 1997 40% of all PCs shipped will be laptops.



Source: Computer Intelligence/Infocorp

Setting sales for success

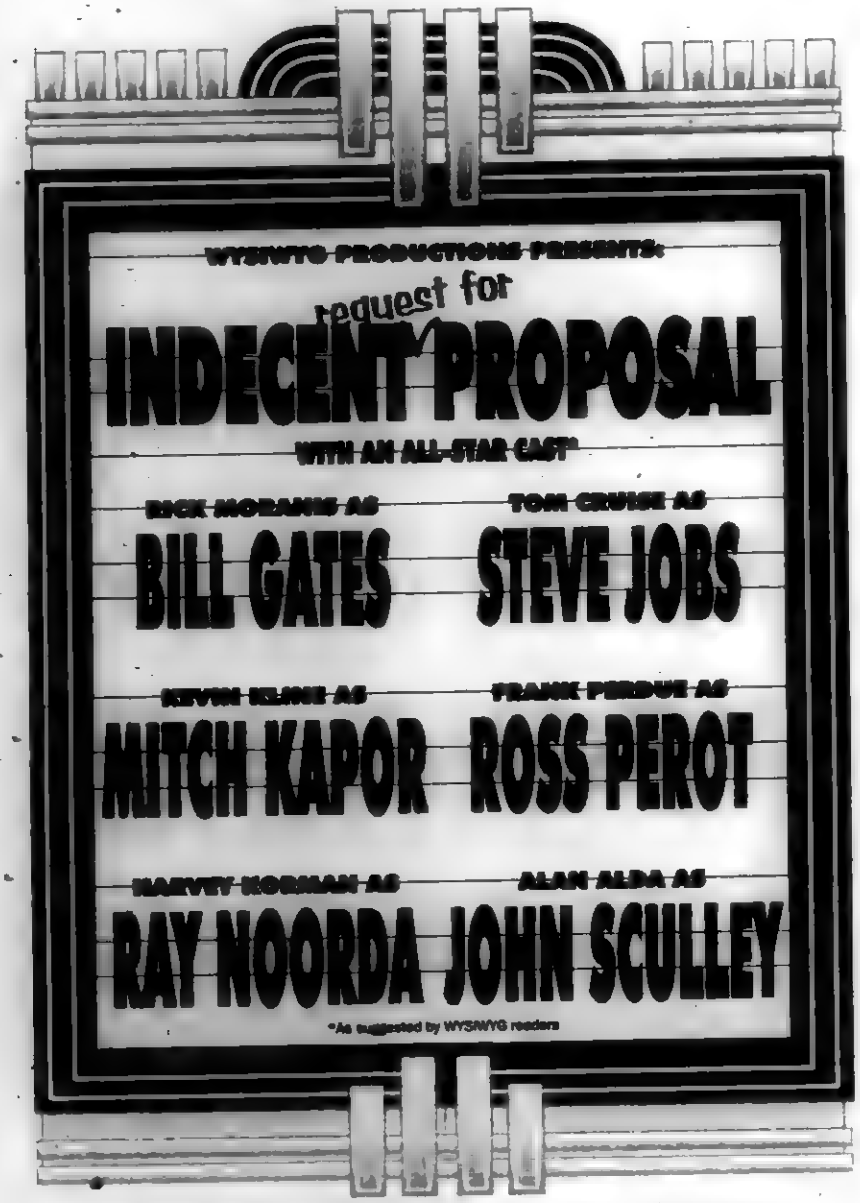
After heading the launch of Apple's highly successful PowerBook, John Medica, now vice president of portable products at Dell Computer, will have his hands full righting Dell's listing portables ship.

The following are Medica's top priorities for 1993:

- Broaden product lines.
- Outline critical technologies with world-class suppliers.
- Get within three to four months (at least) of market leaders in supplying the latest advancements in key laptop features.
- Improve product design so systems can be turned out and around more quickly.
- Compete to Dell's strengths: customization, service and support and direct relationships with customers.
- Get into the handheld and pen-based system markets (further down the road).

Medica said that because laptop buyers typically are computer-savvy, he expects to be able to divert marketing dollars to research.

—*Patricia Keefe*



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WYSIWYG design by Michael Siggins

The Fifth Wave *by* Rich Tennant

"These kidnappers are clever, Lieutenant. Look at this ransom note, the way they got the text to wrap around the victim's photograph. And the fonts! They must be creating their own—must be over 35 typefaces here...."

Inside Lines

Smudgeless input

Pen computing has failed to attract much interest for a variety of reasons, one of which is the fact that users can't send pen input among devices. That will start to change today at Comdex/Spring '93. Slate Corp. and five other vendors — Apple, Microsoft, Lotus, Go and General Magic — will introduce Jot 1.0. The product is an effort to define electronic "ink" as a new type of data, easily recognizable across applications and systems.

Strange bedfellows

Lotus is holding discussions with Microsoft concerning the Benio object file format that is at the heart of Apple's initiative to build a facility that would provide Microsoft OLE-like capabilities for the Macintosh. "Most of our work with Microsoft on OLE is to make sure it's an open environment. We're trying to get them to support the Bento file format under OLE" for cross-platform development, said Alan Morrow, general manager at Lotus.

Close-knit partners

DEC and Microsoft are researching the development of Windows NT-based clusters and mixed clusters, according to DEC sources. "DEC owns most of the interesting patents on how to make a single environment out of clusters," said Dennis Schneider, DEC's manager of NT marketing, who said the companies are looking at what might be the most appropriate markets for NT clustering. "NT and Windows systems would be a natural" choice, he said, adding that work is preliminary right now. Issues to be resolved would include virtual memory, security and locking mechanisms to manage applications across the clusters.

Follow the leader

Enrico Pesatori, vice president of DEC's PC business unit, is doing some spring cleaning of the marketing group, bringing in his cronies from Zenith Data Systems and other outside executives, DEC sources said. They said the PC marketing organization will be reorganized, and Matt Mirapaul, vice president of marketing communications at Zenith, is coming into spearhead the changes.

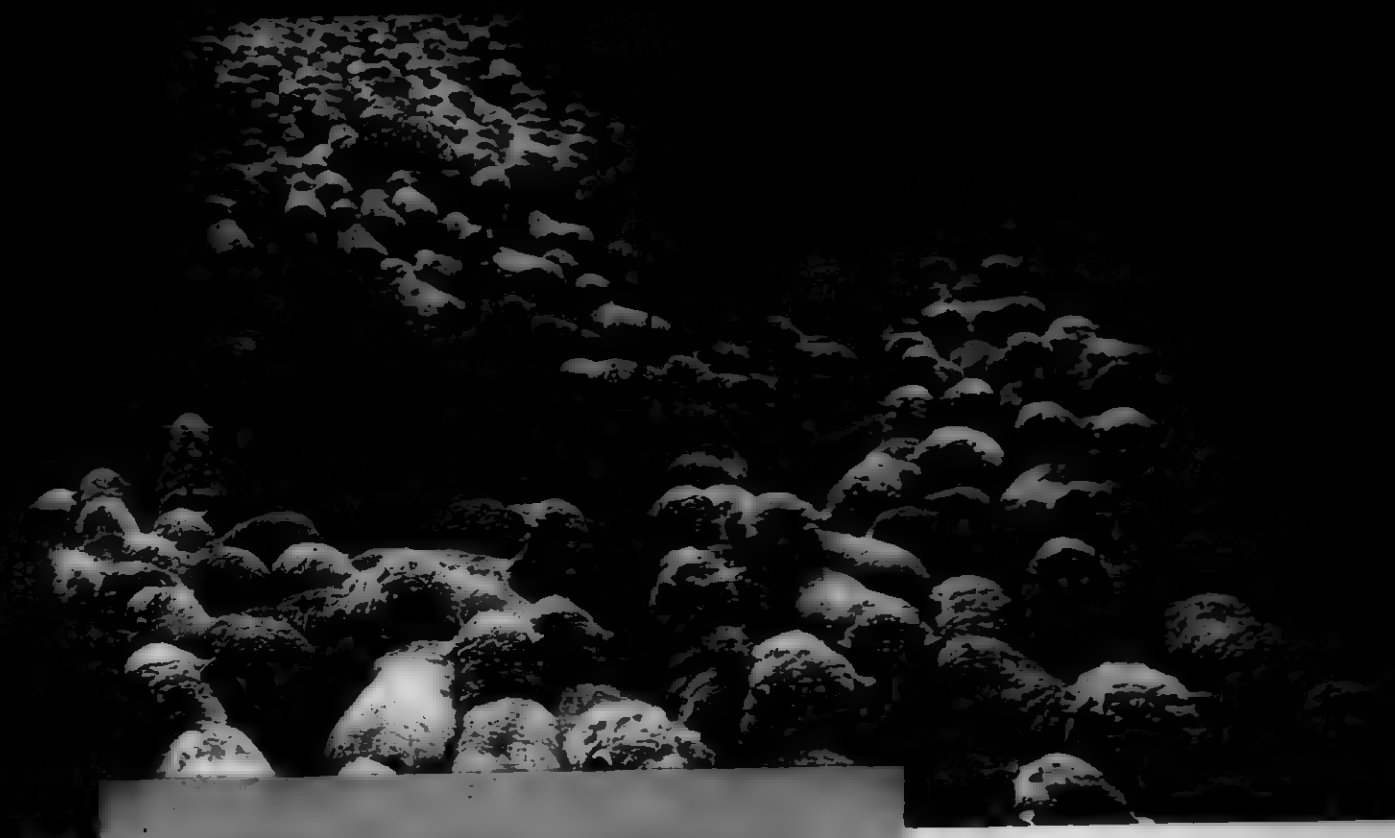
Cooperating with customers

NCR has been quietly unbundling its Cooperation office software suite since the beginning of this year to meet customer demands, according to Krystyna Filistowicz, an analyst at Dataquest, Inc. Users have pressed NCR to break out Cooperation's functional modules to more easily integrate them into their workgroup environments, rather than being forced to purchase the entire suite, she said. Daniel L. Beatty, an assistant vice president of coordination technologies at NCR, confirmed that NCR has started taking steps to unbundle the comprehensive suite.

Switching switches?

MCI is considering swapping out its Siemens Stromberg-Carlson switch-based fast-packet backbone and is already in lab trials with three other vendors' switches, according to a consultant who hung around at an MCI press conference at the ICA/ComNet show last week while Paul J. Weichselbaum, MCI's vice president of data marketing, fielded questions. The consultant surmised that MCI is considering a new backbone because Siemens has not made any announcements about ATM support, and MCI is feeling competitive pressure to offer ATM-based services.

Turns out that Microsoft may have been suffering from a small case of the "cobbler's children have no shoes" syndrome. Microsoft has contracted Ideas Commercial Systems, a Columbia, Md., unit of Ideas, Inc., to build an imaging and document management system for its accounting departments. The Ideas Impresario software, which will be piloted next month, will be deployed on NT servers. The software replaces the paper-based system that Microsoft currently uses in its accounting department. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



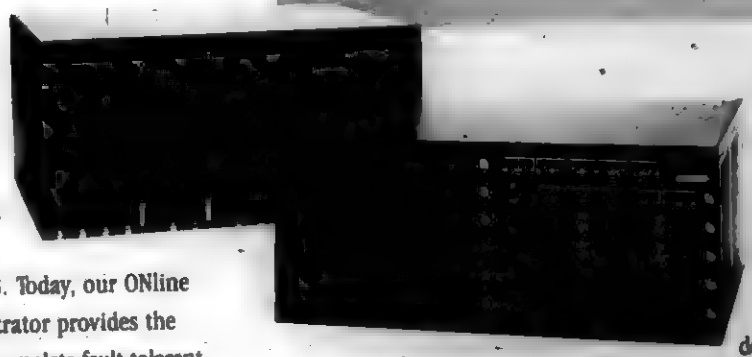
While the others play follow-the-leader, we thought you'd like to know who they're following.

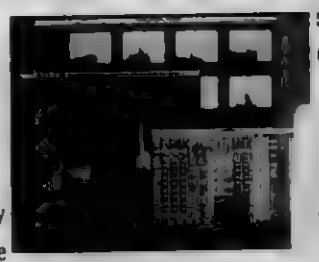
Funny thing. Seems like every time we talk to a potential customer about our ONline intelligent switching hub, the competition immediately starts discounting the price of their units.

The reason is obvious: Since Chipcom has consistently led the way in hub technology right from the beginning, what choice do the others have?

First with Fault-Tolerance. Chipcom has built fault-tolerance into all its networking hubs since 1988. Today, our ONline System Concentrator provides the industry's most complete fault-tolerant solution for large facility-wide networks, with features like backup power supplies, and Controller Modules, redundant links, backup concentrator configurations, self-healing network management and fault-tolerant transceivers.

First with Multiple Networks. When we introduced the TriChannel™ backplane, our biggest challenge was getting people to understand that now one hub could do the work of three or more, supporting up to 3 Ethernet, 7 Token Ring and 4 FDDI networks with integrated bridging and routing. Or to understand how much money it would save them on equipment purchase and operating costs.





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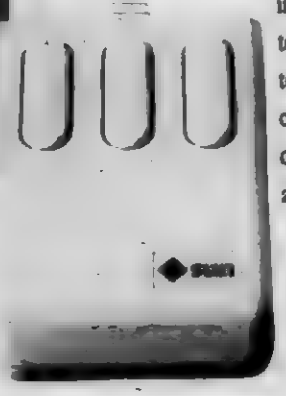

What does all this mean to you? It means that when you specify Chipcom, you're buying from a company that has always looked at networking differently. While the others were struggling with workgroup and departmental LANs, Chipcom hubs were running the huge manufacturing and financial networks of some of the largest companies, banks and universities in the world. Under conditions considerably tougher than any you're likely to encounter.

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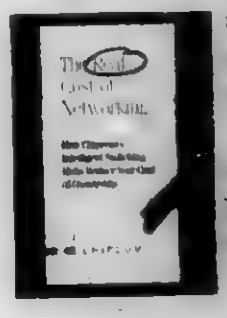

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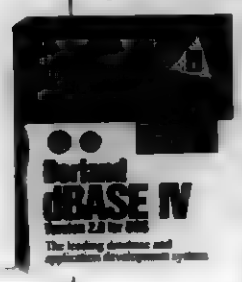
—PC Magazine, May 11, 1993



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COMPUTERWORLD

Inside

COMDEX

Comdex/Spring '93 and its sibling, **Windows World**, teemed with activity last week, much of it focused on the operating system wars. Coverage starts on *page 6*.

GLOBAL NETWORKING

AT&T makes history by opening the way to consistent business network services across sometimes rocky foreign terrain. **MCI**, meanwhile, signs up local carriers to give users more choices in the dedicated-access portion of their long-distance contracts. *Page 2*

RAID SYSTEMS

Storage Tek's window of opportunity for its still-unshipped Iceberg RAID storage system closed further last week as rival **HDS** unveiled a 90G-byte alternative. *Page 4*

UP NEXT

In an admitted last-ditch effort to pump some life into the NextStep market, **Next** Chairman Steve Jobs introduced 486 software designed to extend his firm's reach. *Page 20*

OS duel shifts to emphasis on critical apps

Users starting to cement plans for platform features

By Christopher Lindquist
ATLANTA

■ With many leading-edge users seemingly settled on their future desktops, Microsoft Corp. and IBM are waiting to see which operating system can rack up the most mission-critical applications faster: Windows NT or OS/2.

At last week's announcement of Windows NT at Windows World, Microsoft Chairman Bill Gates used several bleeding-edge customers, including JC Penney Co. and National Westminster Bank, to showcase sophisticated applications already ported to the Windows NT platform.

In his keynote, James A. Cannavino, senior vice president of Personal Systems at IBM, pounded on Microsoft's alleged weakness in information systems shops, pointing out that no two customer shops are the same.

"For client/server to function as a system, it has to be man-

OS duel, *page 12*

IBM sets PS/2 update

Lower cost, high-end models to follow 'Green PC,' notebooks

By Michael Fitzgerald
SOMERS, N.Y.

As IBM puts the final touches on two new notebooks and its first "Green PC," it is also preparing for a major refresh of its premium Personal System/2 line and the U.S. debut of its Ambra clone line later this summer, sources close to the company said.

On June 15, IBM is expected to showcase the ThinkPad 500 subnotebook and the ThinkPad 350, its first true notebook. Its Green PC, initially to be called the Personal System/Energy Workstation, will be almost identical to a product IBM displayed at Comdex/Fall '92 [CW, Nov. 24, 1992].

IBM is expected to follow these announcements with a much-needed new line of lower cost PS/2s, sources said. While these machines are expected to be Pentium-capable, IBM initially will base the high-end PS/2 Model 105 on its Blue Lightning chip, which runs at 33 MHz externally and 99 MHz internally. IBM will use its 25/50-MHz 486SLC2 as the base desktop processor in the new line.

"They desperately need to update the PS/2 line, which has become antiquated," said John Dunkle, president of WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

The new PS/2s are expected to include a variety of fresh twists for IBM, including a choice of on-motherboard Token Ring or Ethernet; MWave, a multimedia digital signal processor developed with Texas Instruments, Inc.; higher speed versions of the Micro Channel Architecture and Extended Graphics Array; and the new modular SurePath BIOS co-developed by IBM and Phoenix Technologies Ltd.

Personal Computer Memory Card International Association drives will be an option, and CD-ROM drives will come standard on high-end models.

IBM is said to be mulling over how to price the new PS/2s to keep its major corporate accounts from jumping to the ValuePoint line

IBM, *page 8*

Low score

IBM's PS/2 received low ratings in value for the dollar in a recent survey. But new plans will address price and performance issues.

RESPONSE BASE: 30 USERS

8.4	Software compatibility	LIKES: "Reliability and IBM service."
8.2	Hardware compatibility	
8.1	Performance	
8.0	Reliability	DISLIKES: "Poor price/performance ratio."
8.0	Vendor responsiveness	
6.3	Value for the dollar	

BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Source: Computerworld's Buyers' Scorecard — CW Chart: Nancy Kowal

Pen initiatives seek to ignite sluggish market

By Michael Fitzgerald and Lynda Radosevich
ATLANTA

Seeing the handwriting on the wall, pen computing vendors are actively exploring ways to jump-start adoption of the technology, which thus far has underwhelmed most observers.

A multicompany consortium last week revealed a specification, called Jot, that enables applications to share handwritten notes, sketches and other pen-generated data among a variety of platforms, including non-pen systems [CW, May 24]. Such communications were not previously possible.

The group is led by Slate Corp., Lotus Development Corp. and Microsoft Corp.

Pen initiatives, *page 14*

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On second look

The majority of IS managers said vendors have done only a fair job communicating the business benefits of pen-based computing . . .

PERCENT OF RESPONDENTS
BASE: 287

. . . which is one reason some analysts have revised their once-optimistic revenue estimates.

1992
WORLDWIDE REVENUE

[illegible] estimate $270M

Source: IDG Research Services, Framingham, Mass., and Dataquest, Inc., San Jose, Calif.

Bank grabs exec to push client/server

By Nell Margolis
NEW YORK

Bankers Trust Co. has lured Aetna Life & Casualty Co. Chief Technology Officer Lyle Anderson to help shape and sharpen the bank's already strong client/server thrust.

Three days into his new job as a vice president at Bankers Trust's Technology Strategic Planning Division, Anderson last week described his initial agenda as "coordinating the use of the bank's many PCs and LANs to better serve our strong commitment to client/server." Anderson will have worldwide, cross-business responsibility, said managing director Michael Packer, to whom Anderson reports. The details of this responsibility are currently being hammered out, Packer added.

Industry observers widely credit Aetna with being in the vanguard when it comes to using information technology as a business enabler. As technology chief at Aetna, Anderson earned his stripes helping to roll out complex projects in a large, decentralized financial institution setting. "Lyle's ex-

Bank, *page 16*

[illegible]

IS staff
1,300

Total IS budget
$435M

IS staff spending
$115M (includes salary, benefits, travel)

Number of PCs
8,000 PCs on several hundred LANs

Source: 1993 Computerworld Premier 100

Robin McClain

WINDOWS WORLD

As NetWare users grumble about an April beta test for Windows NT, **Lithonia Lighting** steps back from OS/2 2.0 to Version 1.3, pointing to system glitches between 2.0 and LAN Server 3.0. *Page 12.* And as **Microsoft** developers toil on NT's next generation *(page 10)*, beta-test users of NT and OS/2 2.1 talk about their deployment plans. *Page 1.* Also, NT's impact on DEC's Alpha PC plans stirs debate. *Page 8*

COMDEX/SPRING '93

Comdex focuses on standards: PC Cards — credit-card-size solid-state devices — could become as interchangeable as floppy disks soon, thanks to recent standards. *Page 6.* A consortium of vendors agrees on a standard for sharing handwritten electronic notes among various pen and non-pen systems. *Page 1.* Seeking standards, users express concern about implementing Windows-based mail and mail-enabled applications. *Page 14.* **IBM** will launch a new notebook, the Green PC, with PS/2s and Ambra PCs due later in the year. *Page 1*

CLIENT/SERVER

Bankers Trust snags a former **Aetna** IS exec in an effort to bolster its client/server thrust. *Page 1.* **Mellon Bank** teams with **HP** and **Oracle** on a client/server bank information system. *Page 4.* Two of the nation's largest futures exchanges embark on a three-year effort to develop distributed applications for their trading-floor and back-office system. *Page 61*

DATABASES

IS managers learn that they must balance the value of hosting a jumbo database against the personnel and resource costs associated with managing it. *Page 57*

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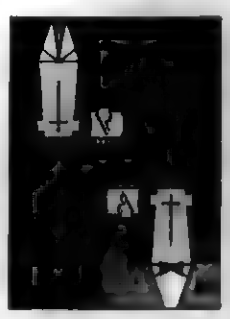
AT&T eyes global telecom focus

Taps partners to provide common features and services

By Joanie M. Wexler
WASHINGTON, D.C

AT&T last week broke fertile ground in a bid to give multinational companies consistent worldwide network service currently unavailable from a global smattering of disjointed telecommunications providers.

The networking giant said it has begun forming partnerships with the world's public telecommunications carriers to jointly develop network services that span the globe with common features and performance standards. The initial services include virtual private networks, private lines and frame relay.



Users and analysts said the move is a coup for large companies and a turning point for the telecommunications industry. The AT&T offering that will result from the partnerships — dubbed "WorldSource" — will allow global firms to go to one source for a cohesive set of dialing plans and services. Firms will also gain cross-country billing in the country, language and currency of their choice.

"We don't want to see different standards and interfaces across the globe," said Andy Sokolov, senior vice president of telecommunications and computer operations at PaineWebber, Inc., a WorldSource test site.

Bob Benmoeche, a PaineWebber executive vice president, added: "It is clear now that, with a managed focus, we'll begin to expand our global exposure and operate in a lot more countries."

Previously, long-distance carriers such as AT&T have taken on the Postal Telephone and Telegraph (PTT) administration negotiation headaches for customers in attempts to provide quasi-one-stop shopping. However, the U.S.-based carriers had little control over service availability or quality and no way to consolidate billing.

"The big difference here is that AT&T is partnering with the PTTs for the services I need, instead of just championing my cause," said Michael Radcliff, vice president of corporate information systems at Honeywell, Inc. in Minneapolis. Honeywell also intends to participate in the WorldSource pilot.

Currently, Radcliff said, network services abroad either "aren't available where we need them, they are not affordable or the quality is not up to par."

One user said he anticipates an eventual reduction in global telecommunications costs. John Faccibene, vice president of telecommunications at brokerage firm Garban Ltd., said, "Now it costs twice as much to call from a foreign country into the U.S. [than the other way around]. I'm bound to pay less with one virtual global connection."

Daniel Briere, president of consultancy TeleChoice, Inc. in Verona, N.J., said WorldSource is "probably the most significant [telecommunications] event that will happen for big companies this year. People are running applications here that they can't use in other countries" without the proper network support.

Fruits of the first two AT&T alliances — with Japan's Kokusai Denshin Denwa Co. and Singapore Telecom — will be available in North America and the Asia/Pacific region later this year. PTT partnerships are slated to expand to Europe early next year.

MCI guards 'last mile'

Keeping with the current "partnership" theme in the telecommunications industry, MCI Communications Corp. last week linked arms with 22 local network service providers — including two cable TV firms — to offer customers a choice of carriers for providing redundancy in the "last mile" of their networks.

MCI introduced Custom Access, a service that makes MCI responsible for uptime in the local-access portion of its customers' corporate networks. The service will let users buy dedicated local-access services from any mix of carriers providing access into their building, rather than having to negotiate with multiple vendors, MCI said.

This could be initially useful to those companies in metropolitan areas already enjoying competition in the local loop, said Mike Kilbane, senior adviser to the International Communications Association user group. "For a carrier to go out and do the legwork to uncover the alternative access options into your building is commendable," he said.

The MCI service comes with a guarantee that covers about 1,200 buildings in the U.S. If a dedicated access line fails for more than one minute, MCI said it will refund one month's circuit charges to the customer.

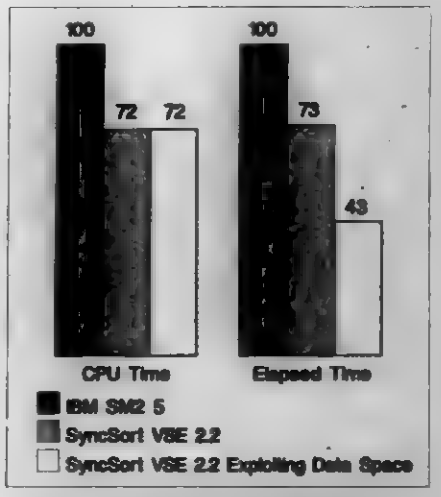
Traditionally, customers have left it up to their long-distance carrier to choose a local provider, and usually the carrier has gone to the regulated phone company, said Ken McGee, a vice president at research firm Gartner Group, Inc. in Stamford, Conn. But "when customers don't properly negotiate the access portion of their contracts, they're leaving money on the table," he said.

—Joanie M. Wexler

Corrections

- A chart in the May 24 issue incorrectly noted the recommended and minimum memory requirements for OS/2 2.1. The actual numbers should be 4M bytes minimum and 6M bytes recommended.
- An item in the May 17 issue misidentified the division of IBM working with Emass Storage System Solutions to hook up the RISC System/6000 with Emass' data-storage systems. The correct IBM division is Technology Consulting and Services in Dallas.

HERE'S WHERE WE LEAVE THE COMPETITION.



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Legent unfurls usage pricing

License server will capture billing

By Gary H. Anthes

Responding to customer demands for increased simplicity, fairness and flexibility, Legent Corp. is developing usage-based pricing options for its systems management software products.

Within a year, the company will be able to bill customers based on their actual product use, as determined by statistics captured by a "license server," according to Legent executives.

The announcement comes in the wake of IBM's recent move to experiment with usage-based, or metered, pricing [CW, May 24]. Legent said it has been working on the concept for some time and is not among the firms working with IBM to flesh out the idea.

Legent stopped short of saying which products might offer the option, how "usage" would be defined or how the approach might be administered. However, the company said it will likely build its license server — which could take feeds from any Legent product — using license management software from either Highland Software in Palo Alto, Calif., or Gradient Technologies, Inc. in Marlboro, Mass.

"We will roll out [the license server] with new products phased in over the next 18 months," said Robert Yellin, chief technology officer at the Vienna, Va.-based systems management software firm.

Priced to use

Software vendors are weighing pricing and billing on a variety of usage measures

BY USE METRICS

- Per log-on
- Per transaction
- Per job submission
- Per use/time period

BY USER METRICS

- Number of users connected
- Number of potential users
- Number of concurrent users
- Number of named users
- Number of active users

Source: Open User Recommended Solutions consortium, Philadelphia

Yellin estimated that about half of Legent's customers favor some kind of metered billing, while the others favor more traditional approaches based on measures fixed at contract negotiation time.

Devilish details

While Legent said it is easy to define the goal of metered billing — fairness to both parties — the devil is in the details.

Kim Strohm, Legent's senior director of planning and operations, said usage-based billing "may be the ultimate in fairness" because customers pay for just what is used and presumably for the value received. However, Strohm said, it does not necessarily satisfy a key customer demand for budget predictability. "I don't think companies want their software budgets to act like telephone bills," she said.

"It does not sound appealing to me personally," said David Quigley, director of computer services at Minneapolis-based Target Stores, a national chain of 550 discount outlets. He said he fears that unpredictable spikes in retail sales or other corporate activity would give rise to unpleasant peaks in his software invoices.

Legent user H. William R. Townsend, manager of computing services operations at Air Products and Chemicals, Inc. in Allentown, Pa., said the concept of usage-based billing appeals to him. "The advantage is you pay for what you get," he said. "The disadvantage is you may not be able to predict your long-term costs because now you have to predict two variables — price changes and use changes." Townsend said Legent and other vendors must find a way to even out peaks and valleys in billed usage to ensure customers have budget predictability.

Mid-Atlantic correspondent Thomas Hoffman contributed to this report.

Long live simplicity

While Legent explores usage-based billing, it is more than a year into a program offering enterprise licenses.

Under this type of arrangement, large customers sign multiyear contracts for essentially unlimited use of a basket of Legent products. The user sends in a single check each year for an amount known in advance.

Target Stores just signed a four-year enterprisewide agreement for use of 10 Legent products. "Now we can add Unix boxes out [in the stores], upgrade our mainframe or add more stores, and it doesn't matter," said Carol Flaig, general manager of network systems.

Flaig hailed such umbrella agreements as the wave of the future for Target Stores and its software vendors and said she hoped they would end vendor disputes, unpredictable bills and skyrocketing prices. *— Gary H. Anthes*

HDS unveils smaller DASDs

By Jean S. Bozman

PALO ALTO, CALIF.

Hitachi Data Systems Corp. (HDS) shrank its IBM-compatible disk drives last week, squeezing the equivalent of three IBM-compatible 3390 Model 3 drives into a single 90G-byte cabinet. It will replace the year-old HDS 7390 line, to be discontinued by year's end, HDS said.

The new device, the HDS 7693 Disk Array, has a 1G-byte cache memory and will ship by July for about $11 per megabyte of memory, analysts said. If it includes the 7690 controller, the HDS 7693 costs $14 per megabyte. A 270G-byte companion storage product, the HDS 7699 Disk Array, is due to ship in third-quarter 1994. The high-end product will compete with IBM's triple-density 3390 Model 9, which IBM announced in May for a June delivery [CW, April 12].

Both the IBM and HDS triple-density disk drives will sell for roughly $4 to $5 per megabyte, industry analysts said. However, the high-capacity HDS and IBM units will provide slower performance than the base models, they said. Both the HDS 7693 and the HDS 7699 will use a compact 6½-in. disk.

The triple-density IBM 3390-compatible disks could blunt the appeal of Storage Technology Corp.'s Iceberg RAID 5-plus array in large IBM mainframe shops for those seeking inexpensive, high-capacity storage. Those seeking error recovery and parity may decide to wait for StorageTek's twice-delayed Iceberg, which is set to ship later this year [CW, May 24].

Users are expected to benefit from the HDS subsystem's smaller footprint because a cabinet housing 90G bytes of memory and a 7690 controller takes up 14.4 sq ft. Bob Prosen, director of capacity and contingency planning at Sprint Corp., said the more compact units would require less than half the floor space of IBM 3390 models holding the same amount of data. Sprint is testing the 7693.

RAID stepping-stones

HDS said it plans a stand-alone redundant arrays of inexpensive disks (RAID) product for the IBM-compatible mainframe market for the mid-1990s but gave no details. Its Single Large Expensive Disk (SLED) or current direct-access storage device technology, will migrate into what HDS termed its Small Technologically Advanced Reliable (STAR) disk technology, which is a half-step to full RAID.

HDS' current line supports RAID-1 mirroring and RAID-3 high-speed data transfer in the backup system for its HDS 7900-6 semiconductor disk product. Hitachi Ltd. is already shipping a unit in Japan that supports RAID 3, RAID 4 and RAID 5 software with a 20M byte/sec. data transfer rate, HDS said.

But HDS' RAID offerings are far from complete. "The reason why they're stressing this acronym STAR is that they would like people to get the message that it's between SLED and RAID," said Omri Serlin, president of ITOM International Co. in Los Altos, Calif. "But they don't have a RAID offering yet. That will take a considerable amount of re-engineering."

IBM is expected to ship a RAID product in early 1994, said Paul Wolfstaetter, a program director at Gartner Group, Inc.'s Large Computer Strategies Group. HDS is expected to ship its answer to that about 12 to 18 months later.

Client/server

Bank eases data access

By Nell Margolis

NEW ORLEANS

Mellon Bank Corp.'s Financial Institutions Outsourcing (FIO) Group is poised to unveil a client/server system aimed at dispersing highly targeted information across a bank's entire organization. The rollout is proceeding despite the imminent sale of the group's corporate parent, Mellon Information Systems, to an unknown bidder.

Currently in beta testing at three unidentified Mellon FIO client banks, the product will allow users to access whatever data serves their individual needs from any banking application, regardless of platform or geographical location, a Mellon spokesman said.

Mellon staged a mini demonstration at the American Bankers Association's annual National Operations and Automation Convention here.

Mellon IS in Pittsburgh was put on the block earlier this year in the wake of its $31 billion parent's rededication to core banking activities [CW, March 22].

Ownership uncertainties notwithstanding, Mellon FIO has lined up an august list of strategic partners to deliver the bank information management system — code-named InformEnt, according to a source close to the bank — in early 1994.

Hewlett-Packard Co. will bring its HP 9000 Unix workstations; Oracle Corp. will supply the database engine; Powersoft Corp. will give the development tools; and Indigo Software Corp. will supply the report writing tool.

Well worth the risk

HP account representative Don Lind said any qualms his firm might have felt about taking on an unknown strategic ally faded in the face of Mellon IS' potential clout in a quickly massing market.

"A system like this is what customers are asking for, and no one's really supplying it yet — not in one package," he said. "Someone *has* to deliver it. Whoever buys Mellon IS is going to want to put a lot of resources behind this project or they'll risk losing market share."

Mellon IS, Lind noted, has "both the software expertise to create the offering and established relationships with about 200 customer banks to sell into. Lots of companies have one; how many have both?"

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News Shorts

Novell to acquire object maker

Novell, Inc. has announced plans to acquire Salt Lake City-based Serius Corp. for $17.3 million. Novell bought a small equity stake in the object-oriented tools company early last year. Serius has a library of objects that nonprogrammers can use to create applications by pointing and clicking. Applications built with Serius objects can be ported to Apple Computer, Inc. Macintosh, Microsoft Corp. Windows and Unix environments; support for OS/2 and Windows NT is also planned. Novell said it is buying the company because Serius' building-block approach allows users to access and build vertical software solutions faster.

Public access to documents debated

Rep. Edward Markey (D-Mass.), chairman of the House Subcommittee on Telecommunications and Finance, last week asked the U.S. Securities and Exchange Commission (SEC) to explore making corporate financial statements in the SEC's electronic data gathering, analysis and retrieval system available free to the public via the Internet. Critics have complained that the SEC's current plan to make filings available electronically via commercial information services providers interferes with the public's right to free and easy access. The SEC has countered that it is not its business, nor does it have the budget, to offer electronic access to the 65G-byte database.

Utility adopts client/server

Pacific Gas & Electric Co. (PG&E) in San Francisco is embarking on the client/server road, starting with a rework of its massive Customer Information System. PG&E, with 20,000 PCs and 400 Banyan Systems, Inc. local-area networks, is reconstructing its customer information architecture, going to Microsoft Corp. Windows NT on the desktop and IBM DB2 on its hosts. This architecture will replace DOS, Windows and a homegrown flat-file database on the host. PG&E's in-house team is working with Andersen Consulting, Microsoft and Mozart Systems Corp. on the multiyear development effort.

Fedex IS VP joins BellSouth

Federal Express Corp. Corporate Systems Development Vice President Jon Ricker, whose efforts helped Fedex to a prestigious Malcolm Baldrige National Quality Award in 1990, is on the move from transportation to communications. Effective June 15, Ricker will be assistant chief information officer at BellSouth Telecommunications, Inc. in Atlanta.

Packing more routing punch

McData Corp. has announced products that will reportedly allow a Systems Network Architecture (SNA) cluster controller, such as McData's LinkMaster family, to encapsulate IBM SNA transmissions into Transmission Control Protocol/Internet Protocol (TCP/IP) packets. This would leave more router resources for handling TCP/IP traffic, McData said.

SHORT TAKES Kalpana, Inc. said last week it will develop products that integrate its Ethernet switching technology into Hewlett-Packard Co.'s 10Base-T smart hub.... Electronic Data Systems Corp. announced last week that it will offer a $300 suite based on software derived from Lotus Development Corp., Software Publishing Corp. and WordPerfect Corp., but it will be available only to Armed Forces sites.... IBM announced Network Design and Analysis/2, an OS/2 version of a host program that generates routing tables for SNA and Advanced Peer-to-Peer Networking or a mixture of both.

News shorts, page 16

When overnight isn't good enough

By Lynda Radosevich
ATLANTA

Not to be one-upped by new communications technologies, power users Federal Express Corp. and United Parcel Service, Inc. displayed products of their own at Comdex/Spring '93 last week. Both firms showed attendees new features on systems that help customers ship and track their packages.

One feature that distinguished their goods from the rest of those displayed on the show floor was price: The shipping companies will install the hardware and software at customer sites for free.

Fedex unveiled a new hardware and software system designed for small businesses and remote offices that ship as little as one package a day. Called Powership 3, the system comprises an Intel Corp. 80386-based PC from NEC Technologies, Inc., customized DOS-based communications and graphical database software, a printer for reports and a small printer for bar-code labels.

Customers can enter up to 32,000 addresses into the database, print their own labels rather than handwriting them and keep track of their shipping expenses and volumes. Also, customers can dial into Fedex shipment information databases and track packages via modem.

For customers interested in just the tracking capabilities, Fedex handed out free DOS and Microsoft Corp. Windows communications software for dialing into the tracking databases.

"It's fantastic," said Phillip Tetreault, a consultant at start-up Perisol Technologies in Raleigh, N.C., which develops peripherals for the banking industry. "Using this, when you ship something and the recipient says he never got it, you can tell him right away when it got there, who signed for it — everything."

Slimmed-down version

The Powership 3 is an updated version of a bulkier system that Fedex has been shipping to high-volume customers since 1991. Currently, more than 25,000 customers have the automatic shipping and tracking system, and packages sent using the system represent half of the 1.8 million packages Fedex sends each night, said Laurie Tucker, vice president of customer automation and invoicing.

Fedex is rolling out Powership 3 in regional markets, starting with the Dallas, Chicago, Kansas City, Minneapolis and Phoenix areas, and is targeting nationwide use for next year.

Meanwhile, UPS' booth displayed updates to the company's shipping and tracking systems.

Called Maxitrac and Maxiship, the system includes a 386-based PC, separate bar-code printers for scannable labels and reports, software, a 14.4 bit/sec. modem and an electronic scale. Currently, UPS has 26,000 customers using its DOS-based tracking software, and the company plans to offer a Windows version "soon," according to Phil Nardomarino, applications manager for customer systems.

The system, which costs UPS $4,000 to $5,000 per site, is worth the expense because it reduces the calls that UPS telephone operators must process and cuts the amount of information that must be keyed into the company's database, Nardomarino said.

UPS customer Dennis Nugent, warehouse manager at W. W. Granger, an industrial supply company in Chicago, said the Maxiship system replaced a manual system that handled 3,000 packages per day.

Vendor flurry entrenches PC Card acceptance

By Michael Fitzgerald

A spurt of activity in the PC Card market signals that vendors believe the new standard has been accepted by the market and is now stable.

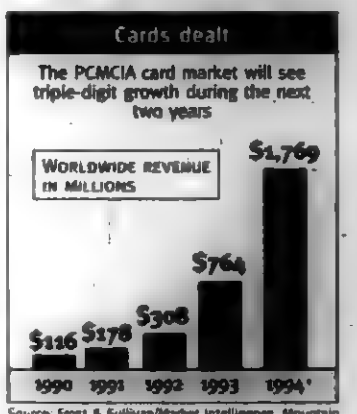
PC Cards, the short name for solid-state storage devices that adhere to the Personal Computer Memory Card International Association (PCMCIA) standard, now are used mostly as random-access memory upgrade cards. They can also accommodate peripherals, such as modems and local-area network adapters, as well as software applications or even hardware and software combinations.

Because of PC Cards' speed, small size and low-power draw, vendors are building drives that support the cards into most portable computers today.

"PCMCIA is the bus of mobile computing and will have the same beneficial impact that the AT bus has had for desktops," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

But the market for PC Cards has taken a while to gain momentum, in part because the cards were not as easy to swap as floppy disks. Recently, the PCMCIA released Version 2.01 of its socket services standard, which controls how data on the cards is read, and appears to have stabilized the standard.

"It's time — the standard is really there now," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing," a newsletter in Brookdale, Calif.



Source: Frost & Sullivan/Market Intelligence, Mountain View, Calif.

Recent developments include the addition of PCMCIA drives by an array of notebook makers as well as some desktop vendors.

For example, Digital Equipment Corp. announced that it will offer PCMCIA drives as an option in its servers. Hewlett-Packard Co. is expected to follow suit tomorrow for its new Vectra desktops. IBM PC Co. is expected to make PCMCIA drives standard on its new "Green PC" and will also offer them as an option in its new Personal System/2s (see story page 1).

Beneficial actions

Also in PCMCIA's favor is a recent decision by Intel Corp. to give the standards body its Exchangeable Card Architecture, which eliminates the potential for two incompatible standards to develop.

Sources also said IBM, Toshiba Corp., Seagate Technology, Inc., Maxtor Corp. and SunDisk plan to announce in mid-June that their PCMCIA storage devices will be fully compatible with one another, which should make the PCMCIA-ATA, or AT architecture, a de facto storage standard. The companies refused to comment.

Numerous vendors are making cards, and some new players will soon bet on the market, including Simple Technologies, Inc., a fast-growing maker of RAM upgrade cards. By year's end, "We will build modems and adapter cards for the PCMCIA market," promised Mike Moshayedi, president of Simple Technologies.

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Alpha PC revs up for Windows NT

By Michael Vizard
ATLANTA

Digital Equipment Corp. last week sought to invigorate its desktop systems drive with the unveiling of the $6,795 DECpc AXP 150 system. The Comdex/Spring '93 arrival of DEC's long-awaited Windows NT platform is likely to serve as a harbinger of change that will reverberate throughout its entire product line (CW, May 17).

DEC faces numerous product-positioning obstacles in its quest to market Windows NT alongside OpenVMS and the Open Software Foundation's OSF/1 systems. And DEC will also have to overcome a late jump out of the Windows NT starting gate, analysts said.

At Comdex, Microsoft said it will initially ship CD-ROMs that will have binaries for Intel Corp. and Mips Technologies, Inc. systems. Binaries for DEC's Alpha AXP processor will be added to those CD-ROMs when they become available.

This lack of initial support for Alpha binaries means developers will be concentrating most of their efforts on Intel and Mips platforms ahead of Alpha platforms, said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

In the works

Microsoft said 2,000 commercial applications are currently under development; more than 500 will ship by year's end. DEC, meanwhile, said 300 commercial Windows NT applications will be recompiled for Alpha AXP systems this year. And by June of next year, there should be 1,500 Windows NT applications available for Alpha, said John J. Rando, DEC vice president of multivendor customer services.

But unless DEC can actually deliver that installed base, many software vendors are likely to follow the same path as Frame Technology Corp. in San Jose, Calif. Frame has decided to forgo both the Alpha AXP and the Mips platforms because the cost of supporting these platforms is not likely to be justified by the volume, according to V. Siva Kuma, general manager at Frame's Desktop Products Division.

As a result of these market realities, DEC said it expects about 80% of the Windows NT systems it sells will actually be Intel systems. "We have to be realistic," said Enrico Pesatori, DEC vice president and general manager for the PC business unit.

Intel "has [many] companies behind it, and [DEC] can't outrank that" with software vendors, Pesatori said.

DEC said it will offer OpenVMS and OSF/1 on its new PC systems by the end of this year. But those Extended Industry Standard Architecture bus systems will be offered only as servers that will be comparable to a $1,495 system running Windows NT Advanced Server Edition.

In the first half of 1994, DEC will offer a $3,000 desktop PC that will run NT, OpenVMS and OSF/1. That system will be based on a Peripheral Component Interconnect bus, said Jon Roskill, marketing manager for Alpha desktop systems.

Senior writer Michael Fitzgerald contributed to this report.

Integration takes center stage

New features not a priority for developers

By Michael Vizard
ATLANTA

After years of trying to overwhelm customers with features one-upmanship, many PC developers are now rearchitecting their products to offer tighter application integration.

The change has come about because developers have finally realized that users are ignoring most of the features in any given software package.

"We're about a year into adopting Windows, and at this stage of the game there are a lot of features that are not being used," said Scott Brady, data resource manager at Holland America Line, Inc. in Seattle.

Different angles

Vendor understanding of this was evident at Comdex/Spring '93 last week.

"In the next release of our products, we're going to revisit how the applications integrate with one another," said Mike Fritz, Microsoft's group marketing manager for developer relations.

To that end, Microsoft will make use of an automation feature included in Version 2.0 of its OLE facility.

This feature provides developers with a common macro language, which enables them to work against a range of applications. This means that rather than having a single type of macro for each application, information systems developers will be able to create macros and intelligent agents that could be applied to a series of users and applications.

"There will be no walls between applications," said Leslie Kock, a product marketing manager for Microsoft's Excel spreadsheet.

But providing OLE 2.0 is only the "plumbing" that will allow developers to create tightly integrated applications, noted Frank Ingari, vice president of marketing at Lotus. At Comdex, Lotus showcased Version 2.0 of its SmartSuite offering. Due in July, SmartSuite 2.0 adds more intelligence to the translation process across applications.

Inside an 'intelligent' application

PC software vendors agree that future applications will contain the following hierarchy of ease-of-use service:

Source: Vendor and user interviews

This means, for example, that Freelance will recognize that a user is attempting to transfer a chart from 1-2-3 and will automatically convert that data into a Freelance format. Lotus has also added support for an Application Field Exchange Facility that ties SmartSuite applications into Notes.

In a similar approach, Borland International, Inc. is adding a Publish facility to its Quattro Pro 2.0 spreadsheet to make it easier for users to share data across multiple spreadsheets, said Dave Watkins, vice president of product management at Borland.

Next in line

After implementing the plumbing required to integrate applications and developing agents that will work across applications, vendors said their next goal is to develop versions of their software that adjust to the habits of individual users.

"Ultimately, I'd like to see software that can figure out that I'm not using 50% of the features and not load these features so it will run twice as fast," said Will Reynolds, Lotus' director of development for SmartSuite.

"The software is going to be able to figure out what you are going to do next and make that process the automatic default," said Jerry Michalski, a contributing editor to the "Release 1.0" newsletter in New York.

But users should not expect tremendous advancements in the near future. Most developers are just beginning to learn how to implement the basic plumbing that will be provided by OLE 2.0.

In Version 6.0 of WordPerfect, there are 50 Coach facilities that walk users through their task or automatically perform those functions if instructed. WordPerfect has made another 50 Coaches available on its bulletin board service, and it will provide users with the tools to make their own Coaches, according to product manager Todd Ashman.

IBM sets PS/2 update

CONTINUED FROM PAGE 1

or other AT bus machines. Sources said the company may price the new boxes as much as 30% less than similarly configured models of the current PS/2 line.

Varied reaction

User reaction was mixed. Strong MCA shops were pleased with the news. Bruce I. Linker, assistant vice president of information systems at Dean Witter Reynolds, said, "This is what I was waiting for [from IBM]. The announcement looks very interesting, especially if it's a price drop and I can get built-in Token Ring."

But Jockey International, Inc. in Kenosha, Wis., has left MCA behind in favor of the ValuePoint line, according to PC coordinator Jacqueline Bynsdorp. She said she is tired of having to pay $1,000 to replace a single 60M-byte hard drive on an MCA machine.

Sources said IBM has pushed back plans to introduce its Ambra line of PCs in the U.S. to the week of June 28. Ambra is now sold in Europe and Canada.

This product line, which is not an IBM-brand product but is built by Individual Computer Products International Ltd., an IBM subsidiary in Singapore, will, like the PS/2 line, top out with the Blue Lightning chip, according to sources. This creates the possibility of increased brand confusion.

"They're absolutely shotgunning the market in hopes of catching new users," Dunkle said. "We expect that the new PS/2s will bring a sigh of relief to the market, but Ambra will really muddy the waters."

IBM refused to comment on specific products.

Meanwhile, the sub-4-pound ThinkPad 500 is slightly smaller than a notebook with a 7.5-in. screen. It has an external floppy drive, uses the 486SLC2 (a 25/50-MHz IBM derivative of Intel Corp.'s I486SL microprocessor) and is expected to have up to 3 hours of battery life.

The 5.8-pound ThinkPad 350 will run on an Intel 35-MHz 486SL. The monochrome notebook will have a battery with a built-in charger that can be plugged into electrical sockets. The battery will give between three and four hours of life.

Flip-flop feature

The Model 350 was designed to let users swap the floppy back and forth with an unannounced wireless Cellular Digital Packet Data communications module, sources said.

Both new ThinkPads will use PCMCIA slots, and the Model 500 will have an external floppy drive. IBM is expected to price the subnotebook 500 at $2,500 and the 350 below $2,000.

The PS/Energy Workstation will be the first in a family of "green" PCs, with more to come in the fall.

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Microsoft charts client/server course

By Michael Vizard
REDMOND, WASH.

While Microsoft Corp. hosted a coming-out bash for Windows NT at Windows World in Atlanta last week, company engineers here were working on the next generation of Microsoft's client/server technology.

Though Windows NT will initially give Microsoft a high-end server for local-area networks [CW, May 24], Microsoft executives said the next client/server move calls for a revamping of the Windows operating system — to make it easier to find files and resources — and the building of a distributed file system (DFS) that Microsoft is developing to link all Windows NT systems on the network.

The DFS will allow users to seamlessly access any resource that resides on Windows NT systems across the network without knowing what drive a file is located on, said Doug Henrich, Microsoft group manager for developer relations. This universal system view capability is being created as part of Microsoft's object-oriented operating system project, called Cairo, which is due in 1995.

"Having a distributed file system is a must for creating a virtual mainframe in a client/server environment," said John Donovan, a director at WorkGroup Technologies, Inc. in Hampton, N.H.

But it is unclear whether users will wait for Windows NT to mature before fully embracing client/server, Donovan noted. "The Unix vendors are way ahead of NT in terms of providing this capability. Everything about NT screams a need for a distributed file system."

NT provides a domain service capability that gives users access to a specific set of servers. However, it lacks a global directory service similar to the services provided by Novell, Inc.'s NetWare 4.0 or Banyan System, Inc.'s Vines software.

To make up for this, Microsoft said it plans to build a DFS that will include the functionality of a global directory service and will provide the distributed system capabilities typically associated with Unix and Digital Equipment Corp.'s OpenVMS systems.

Because the current version of Windows NT lacks robust distributed system capabilities, most users said they see it as a LAN solution.

"Right now, NT is laid out as a direct competitor to NetWare. The management tools for building a distributed system like Unix are coming in a future release," said Richard Lansing, a vice president at Chemical Banking Corp. in New York.

As a result, most users will probably restrict Windows NT to pilot projects that call for a server on a local workgroup. "We won't put NT out as a production system until we're sure it's secure. We're risk-averse when it comes to new operating systems," Lansing said.

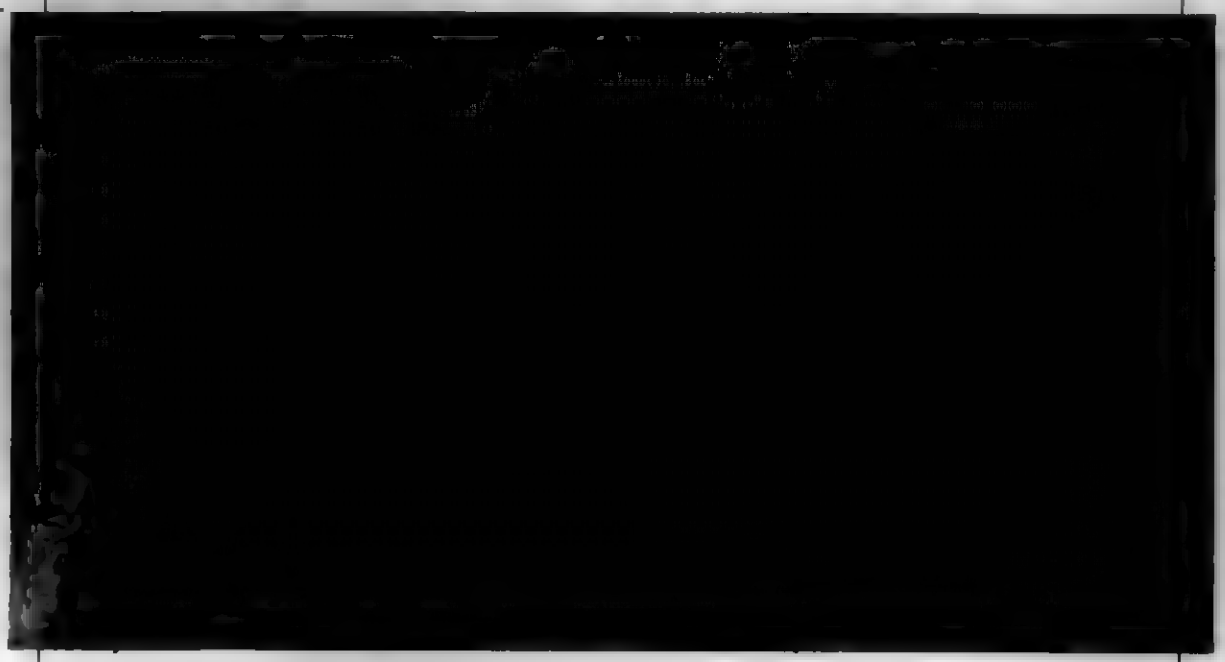
Icing on the cake

The DFS capability will eventually be added as another service to be layered on top of modularly architected Windows NT. The DFS will be part of Microsoft's Windows Open Service Architecture, which Henrich said will allow Microsoft to add new system services to Windows NT over time.

Microsoft is also working on a revamp of its Windows operating platform under the code name Chicago. The revamp is expected to go into beta testing this summer and will require Microsoft to reuse the Windows interface for NT some time in 1994 as well, said Jesse Berst, editor of the "Windows Watcher" newsletter.

Windows 4.0, which is expected next year, will include built-in support for network protocols, according to Rogers Weed, Windows product manager. It will also include an integrated file and program manager, support for preemptive multitasking, a mail client capable of supporting voice and fax, a common inbox, a common directory tree and folders that will resemble the folders currently used in the Apple Computer, Inc. Macintosh operating system, Berst said.

With the arrival of built-in network support in Windows 4.0, Microsoft essentially will have merged its Windows and Windows for Workgroups offerings.



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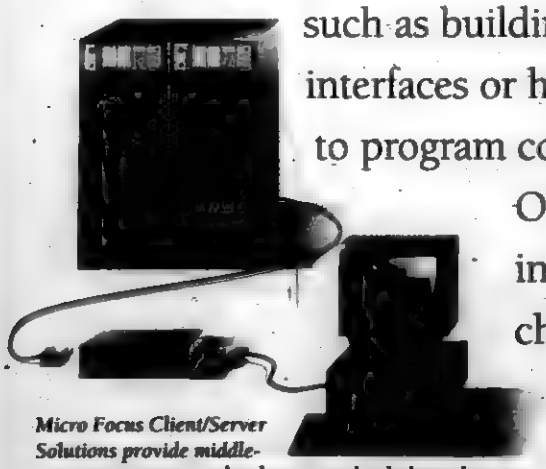

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OS duel shifts

CONTINUED FROM PAGE 1

aged as a system, and we have decades of experience making heterogeneous systems talk to each other," Cannavino said.

Despite formal introductions last week, neither Microsoft's NT nor IBM's OS/2 2.1 has shipped yet. Even so, users are already making plans for the updated operating systems. It appears those plans may reverse the traditional roles of the competing operating systems: Windows on the client and OS/2 on the server.

Microsoft's Bill Gates *shared NT beta-test success stories*

Many Windows 3.1 users are plotting a server course for Windows NT, based both on its scalability to multiprocessor systems and its multitasking and multithreading abilities. Meanwhile, a speed-enhanced and more reliable OS/2 2.1 is primed for a move to the client.

Indeed, IBM has stated its intention to put the necessary resources — marketing, support and otherwise — behind OS/2 2.1 to make it a success, said Brent Williams, program director for PC software at International Data Corp. in Mountain View, Calif.

Other factors could also help OS/2 2.1, Williams said. These include a recent move by hardware vendors to custom-configure systems rather than prebundle software and the slips in Windows NT's schedule. It was originally slated to ship before the end of 1992. Then the date shifted to first-quarter/spring 1993 and then summer. Microsoft's revised schedule could place the release in late August. "Now that NT's late, people with critical needs are going to go with OS/2," he said.

Robert Holmes, computer technology research analyst at Southern California Gas Co. in Los Angeles, is one user who has already committed to OS/2. He said that while OS/2 2.0 is now used primarily by users needing to run OS/2-specific applications, Version 2.1 appears to be solid enough for him to offer it as a general desktop option for OS/2, Windows 3.1 and DOS users.

There were "all kinds of things that were potential support hits [in OS/2 2.0]," Holmes said, noting that most of these problems are gone now. He said driver support has improved, particularly for video, and that glitches that could have become problems, such as the ever-expanding initialization files in the WorkPlace Shell, have been fixed.

OS/2 2.1's Windows 3.1 support will win it some other converts. "It certainly does enable us to do quite a bit that we couldn't do with 2.0," said Karl Hamme, lead programmer analyst at Geico Insurance in Washington, D.C. In particular, Hamme said, developers at Geico no longer have to reboot to DOS and Windows 3.1 to use several important Windows-based development tools.

IBM's James Cannavino: *IBM has the experience to tie client/server systems together*

While OS/2 2.1 may help IBM capture some desktops, Windows NT seems targeted in some accounts primarily for servers. James Richards, PC systems administrator at Psicor, Inc. in San Diego, said his company wants to move some applications to Windows NT to take advantage of the performance of multiprocessor systems.

And William Cornfield, president of the Windows Support Group consultancy in New York, said he believes one group of users will certainly move to Windows NT soon — those using SQL Server on OS/2. "I would be shocked if by the end of the year you found 10% of SQL Server users still on OS/2," he said.

SQL Server for Windows NT is more stable than the OS/2 product, even as beta-test software, Cornfield said.

SQL Server is not the only draw for NT, however. A user at a large West Coast aerospace firm said he is looking forward to Windows NT's preemptive multitasking to make his process control application more powerful and responsive. One part of the system controls alarms that warn of dangerous situations in a chemical plant, so any improvement in performance is important. His current application runs on Windows 3.1.

"NT is definitely where we are going to head to," the user said. "That's where the future is."

Performance is also crucial to Psicor, which supplies doctors and equipment for 80,000 medical cases per year to some 600 hospitals around North America — with guaranteed response times of five minutes.

"We're just crying for resources," Richards said. "We'd convert to 32-bit systems for speed alone."

OS/2 bugs force firm to backtrack

By Rosemary Cafasso
CONYERS, GA.

Fed up with mysterious system glitches on its IBM OS/2 2.0 servers, Lithonia Lighting Corp. plans to go back to Release 1.3 of the operating system, according to Jeff Kernan, vice president of information systems.

"From a business perspective, I have burned so much time, it is time to drop back and punt," he said.

Since January, Lithonia has experienced system "hang-ups" that even IBM has had trouble diagnosing, Kernan said. The problems occur on servers running OS/2 2.0, IBM's LAN Server 3.0 and multiple applications, including software designed in-house.

IBM executives said IBM will train an additional 500 staff members on LAN system and client/server support issues

Dave Sawyer, an IBM marketing representative who handles the Lithonia account, said IBM is continuing to work with the lighting company, which he said has a complex and somewhat unique set of software.

"We have had some problems that we have not been able to figure out exactly what they are," Sawyer said.

Two other OS/2 users contacted last week said they had not experienced serious problems with LAN Server 3.0 in tests. However, one said he frequently finds it difficult to get technical answers and bug fixes from IBM when it comes to LAN Server 3.0.

The IS department at Lithonia provides service to nearly 100 independent agents as well as to its own internal users.

Kernan said he opted to move back to Version 1.3 when the system problems reached a point where agents were spending too much time with computer issues and not enough with the business of selling lighting equipment.

Kernan and Tom Martin, director of computer services at Lithonia, said IBM has been responsive and gave them access to its OS/2 developers as they migrated to OS/2 last year. But as problems continued and as IBM could not solve the server hang-up issue, Lithonia grew frustrated with IBM's inability to provide it with solutions.

Recently, Kernan said IBM suggested an upgrade to OS/2 2.1, which was officially unveiled in New York two weeks ago. Kernan said his staff has tested Version 2.1 and found no problems with it, but he is not confident that it would stabilize his environment.

Version "2.1 may be the answer and we will try it," Kernan said. "But I am not going into a customer site and subject them to more trouble potentially. The track record is not good."

Lithonia plans to swap out Version 2.0 at 32 sites and reinstall 1.3. Several sites that were migrating to OS/2 for the first time will now get 1.3 instead of 2.0 as planned.

Internally, Lithonia runs about 100 OS/2 servers, and only 10 are Version 2.0. Martin said these servers, which also run LAN Server 3.0, do not seem to have the problems that have plagued the field systems.

A matter of timing

A new release of the Windows NT "March beta" sent in April to a small number of beta-test users is again raising issues about Microsoft's relationship with Novell, Inc.

The late-April release, which was sent to Windows NT Advanced Server beta-test users, contained changes to the Windows NT Transport Device Interface (TDI) that network requesters use to talk to the operating system.

Microsoft said it made the changes to improve Windows NT performance, but they had a side effect of not working with Novell's beta-test version of its NetWare requester for Windows NT.

Louis Kahn, network administrator at the Centers for Disease Control and Prevention in Atlanta, was one user who received the March beta-test version that was sent in April.

"But I can't install [it]. I don't have an NT redirector from Novell, and I blame that on the fact that Novell didn't get the code before I got it," Kahn said.

Other beta-test users reported the same problem, and Microsoft acknowledged that the TDI had been changed and that Novell would have to provide a second redirector for the new beta-test version.

Microsoft Windows NT product manager David Thacher said the problem was due to an "oversight" on Microsoft's part. He said the TDI would not be changed again.

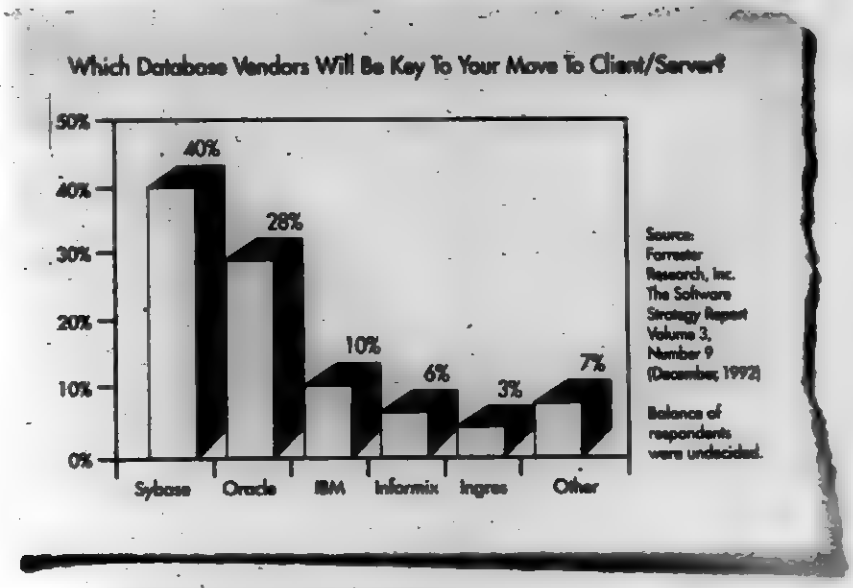
"There's no question that our top priority is making sure that the NetWare requester works great," he said.

Thacher added that the primary reason for releasing the beta-test version was to let customers test the Apple Computer, Inc. Macintosh connectivity for Advanced Server that had just been added.

Novell sources said they are not particularly pleased with the situation because they will now be forced to support two versions of their requester while the beta test is going on. The requesters will converge whenever Windows NT ships. A new version of the requester should be available within a few days, the sources said.

— *Christopher Lindquist*

The analysts have graphed the future of Client/Server computing.



And they have also spoken.

In recent issues of their ongoing reports, four of the most respected computer industry analysts have taken an unbiased look at Sybase, and its vision of enterprise-wide client/server computing.

They were impressed.

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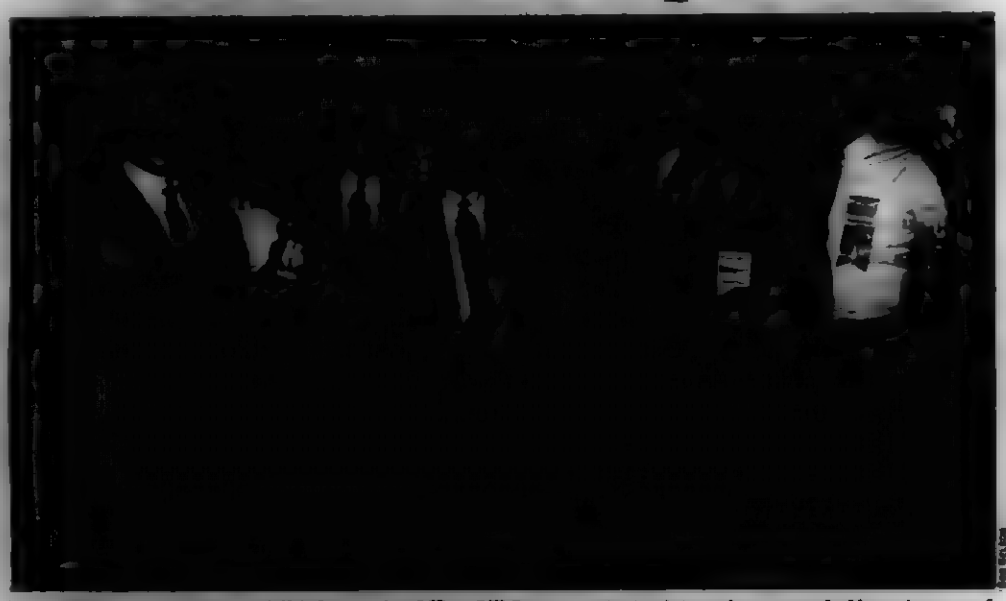
Windows World Open 1993



Microsoft Corp. Chairman and Chief Executive Officer Bill Gates (center), pictured surrounded by winners of the Windows World Open 1993 Awards (from left to right): William Hamilton, Weston Information Network; Ken Green, J. Walter Thompson; Michael Abele, representing United American Healthcare Corp.; Ken Forster, Lockheed Missiles and Space Co.; Tim Buyers, Shell Western E & P, Inc.; Tim Gaudin, US Geological Survey; Art Hill, First National Bank of Chicago; and Thomas Conoplay, Galileo International

Pen initiatives to ignite market

CONTINUED FROM PAGE 1

Separately, sources said AT&T is considering a plan to start a high-profile evangelical push that will seed EO, Inc.'s pen-based Personal Communicators into key business accounts.

The Jot spec, meanwhile, has the backing of 22 companies, including Apple Computer, Inc., Go Corp. and General Magic, Inc.

Donald A. Zagar, president of Dazzling Pen, a pen computing value-added reseller in Prospect, Conn., said Jot "will fill in some holes in pen-based communications by letting users jot notes down and send them without using frustrating translation software." He said the difficulty in sending electronic ink, as pen input is known, had prevented several potential clients in the grocery industry from implementing systems that use pen input.

Wayne Warwick, director of systems development for the loss control department at ITT Hartford Insurance Group in Hartford, Conn., said the standard will give him flexibility in choosing pen platforms. The insurance company is piloting pen-computing applications using Grid Systems Corp.'s Convertible pen-and-keyboard notebooks and Microsoft's Windows for Pen Computing.

The first major application to use the Jot ink standard may be electronic mail. Pradeep Singh, group manager of mobile services at Microsoft, said Microsoft's Mail will support the ink standard "roughly within a year." Microsoft also plans to support ink in the next major release of Windows.

Lotus was not as forthcoming. Pito Salas, manager of future products, said Lotus supports the Jot standard but has no immediate plans to add support for the ink data type to its CC:Mail software.

Down but not out

Meanwhile, AT&T, which hoped its Hobbit microprocessor and its relationships with EO and Go would enable it to dominate the pen market, has been disappointed by the market's lack of enthusiasm for the product. Still, AT&T has not given up.

Sources close to Go and AT&T said Go approached AT&T two weeks ago with an idea to give EO communicators to as many as 25 high-profile individuals.

While the plan would focus on proving the genuine business functionality of these devices, it would also include celebrities to address the potential consumer market. One such user might be the San Francisco 49ers, where the EO could replace the headsets that currently handle communications between coach George Seifert and his staff in the booth away from the field, a source said.

Behind this idea is the failure of the market to understand what the EO personal communicator does, the sources said.

"When people see these machines, they get very excited, but nothing's out there right now, and no one's using them," said one source at Go.

Both AT&T and Go refused to comment, but sources said AT&T has jumped on the idea.

Analysts said the seeding idea seemed to make sense. "They have to do it because just putting these things into AT&T phone stores and expecting people to buy them isn't going to do it," said William Lempesis, editor of "PenVision News," a newsletter based in Pleasanton, Calif. "To push it as a horizontal [device] will take time and something like this seeding program."

[redacted]
- On June 15, Grid Systems Corp. is expected to make several announcements, including immediate delivery of a 486SL-based version of its Convertible and a 486SL-based version of its PalmPad, to ship in the fall.
- Apple's Newton is expected to come to market June 29.

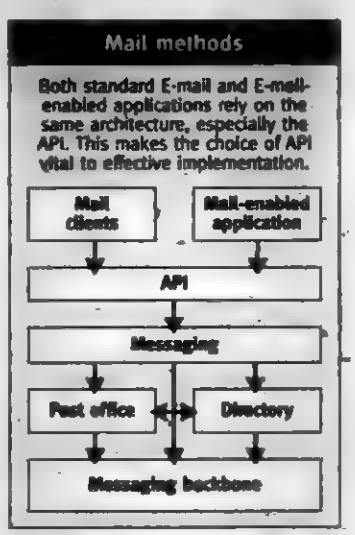
Users wary about launching apps for Windows E-mail

By Lynda Radosevich
ATLANTA

The proliferation of Microsoft Corp. Windows-based electronic mail has vendors positioning the technology as the stepping-stone to advanced applications such as work flow.

Target users at last week's Comdex/Spring '93 have a different idea: While Windows is their platform of choice, they are worried that implementing Windows-based E-mail and mail-enabled applications enterprisewide remains a risky technical — and cultural — proposition.

"I'm concerned about Windows' stability," said Wade Wood, information specialist at United Way in St. Paul, Minn. The organization is looking at the major Windows mail packages to replace host-based mail and is exploring work flow and forms routing. However, "now the AS/400 is stable, and we know messages will make it through the T1 gateways to our Minneapolis office," he said.



Source: Lotus Development Corp./Microsoft Corp.

Cultural issues overshadow technical ones for Robert Fluegel, director of research and development at Advo, Inc., a direct-mail marketing firm in Windsor, Conn. Despite Windows' vaunted easy-to-use graphical interface, some of his company's employees would rather leave the computing to others. "How do you teach an executive to route his own memo when he's used to just giving it to his secretary?" Fluegel asked.

Forewarned is forearmed

At a session on E-mail-enabled applications, speakers warned corporate developers of the many challenges they face in implementing critical mail and mail-enabled applications. For example, they will have to choose from amongst a half-dozen application programming interfaces if they want to develop customized applications.

Other issues include lack of security, text integrity and guaranteed delivery. For example, today's mail and mail-enabled applications have no feature that would keep pranksters from sneaking into co-workers' offices and tampering with message-based applications using their co-workers' log-ons. One fix would be a screen saver that requires a password to reactivate a computer after a period of inactivity.

Another problem, retracting misdirected messages and documents such as confidential product plans, is addressed by WordPerfect Corp.'s Office 4.0 E-mail package. WordPerfect said it offers the only E-mail software that lets users retract messages and routed documents that have not been opened by the recipients.

Despite the challenges, Comdex attendee Judy Fuetter, programmer/application developer at the St. Johns River Water Management District in Palatka, Fla., said she is looking forward to developing E-mail applications once the organization completes its transition from a host system to a Transmission Control Protocol/Internet Protocol and Novell, Inc. NetWare network with Windows-based PCs for 500 people.

Reporter's Notebook

IBM's Jim Cannavino spoofed just about everyone in his keynote address, which was prefaced with a *Saturday Night Live* takeoff called "Industry Update" that included the IBM logo done up to look like an Oreo cookie and hysterical shots of Philippe Kahn as Cap'n Crunch and Bill Gates in a baby outfit. A commentator in the video bemoaned IBM's move away from white shirts, noting that, "When they wore white shirts, they made money." Also included was a clip from a recent Joan Rivers show that highlighted PCs and featured stacks of OS/2. Rivers was in full ditz mode, saying, "I don't do computers because I found out Windows was involved, and I don't do windows."

It surely was an experienced user of 1.0 software who amused the 400 Comdex attendees crammed into an overflow room for a televised view of the Windows NT introduction. When the videotaped portion of **Microsoft** Chairman Bill Gates' infomercial opened without sound, a voice from the audience assured, "That will be fixed in the next release."

In the past, the types of products sold storefront-style on show floors tended to be computer games and luggage carriers, not operating systems. But IBM delivered OS/2 2.1 to anyone with the cash or plastic, claiming sales of 500 copies on the first day of the show. Meanwhile, printer vendors such as **Hewlett-Packard** found that you don't have to truck boxes of glossy product literature to a show. They output the literature right on the show floor using their own products.

IBM held a couple more "technology" demonstrations in its OS/2 booth this time around. These included the IBM Microkernel or "Workplace Operating System" running DOS, Unix, OS/2 and Windows personalities — but only in full-screen mode. Several of the personalities are due to go into beta testing later this year. IBM also showed a version of OS/2 2.1 running on an **AST Research** multiprocessor "Manhattan" machine. A group of IBM developers worked with **Intel** to produce the version, which should go into beta testing this summer.

More than 1,100 show attendees faxed opinions to their congressmen using **FutureSoft Engineering**'s fax software and congressional phone book supplement at the company's booth. FutureSoft said attendees' favorite topics were the budget plan (most didn't like it) and gays in the military.

IBM took the "best dig" award by outfitting its employees with shirts reading NT: Nice Try. The slogan on the back of the shirts read: "OS/2, not just up and coming, up and running."

A **Lotus** representative could not explain the differences between that company's 1-2-3 for Windows spreadsheet and its Improv for Windows spreadsheet, according to an attendee who asked to have the differences explained. "I use them both myself; they are just different," the frustrated rep reportedly said.

Those who have worn out shoes and nerves dealing with the logistics of getting around Comdex and other major trade shows over the years may have noticed the unusually high number of attendees who were physically handicapped or visually impaired. It was refreshing to see them gain access to the technology. However, the medals of honor go to the seeing-eye dogs that led their owners through the crush of people, some of whom thought nothing of brushing guide dog and owner out of the way.

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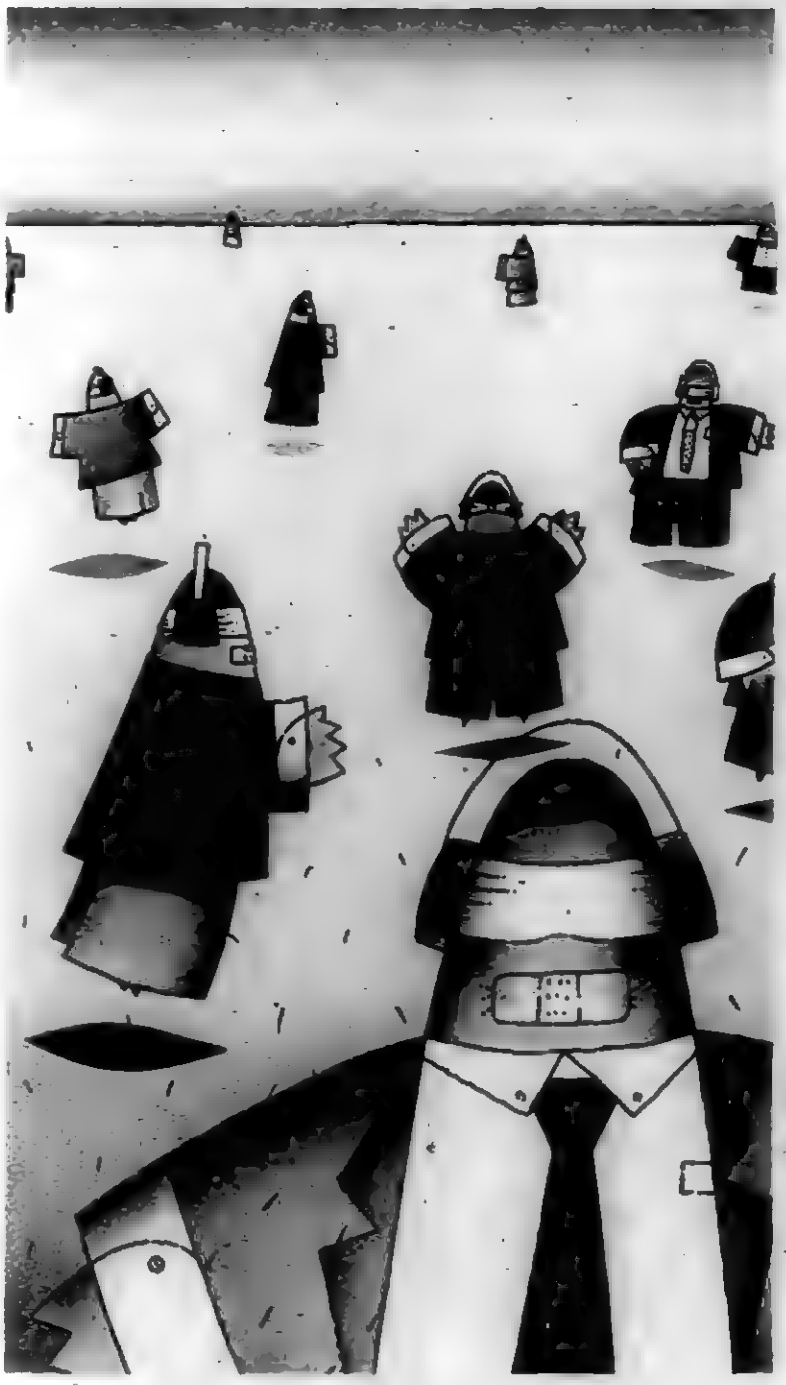

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News Shorts

IBM recalls notebook model

IBM PC Co. is recalling all 150,000 Personal System/2 Model L40SX notebooks it has sold since March 1991. A spokeswoman said IBM has discovered that 15 units sold in Europe have had problems with bad battery circuits that generate too much heat. Although this represents 1/100th of 1% of its units, IBM is recalling every one sold. The spokeswoman said customers would receive notices of what to do in the next 30 days and, in the meantime, they should remove the battery and use the product with an AC adapter.

Railway begins systems revamp

Canadian National Railways in Montreal launched a $100 million project last week that will peform a "heart transplant" on the company's major rail management systems, according to Ronan McGrath, vice president of information systems and accounting. Canadian National will replace its core traffic systems, currently IBM mainframe-based, with a recently developed integrated traffic management system from Santa Fe Pacific Corp. in Chicago. The new software is also mainframe-based and will require IBM's DB2. However, McGrath's staff will design a graphical front end to the system using Microsoft Corp.'s Windows.

Hanging up on phone crooks

High-tech thieves who fancy stealing cellular phone service may soon be disconnected. Software makers Computer Sciences Corp. and Coral Systems, Inc. announced last week that they will team up with the security consultants at The Guidry Group to fight techno crooks who steal and resell more than $1 million each day in cellular service.

Marcam names Ross in patent suit

In a suit filed last week in Boston, Marcam Corp. alleged that Ross Systems, Inc.'s Promix software infringes on Marcam's patented technique of determining a bill of materials. Marcam uses this in its Prism software for the IBM Application System/400. Ross Chairman Dennis Vohs said the suit is "without merit."

DEC net management to support NT

Digital Equipment Corp. announced it will support networked Microsoft Windows NT systems with its Polycenter network management platform. DEC said that during the next 24 months it will deliver Windows NT applications for monitoring system resource use and network traffic levels, as well as for managing software distribution and hardware and software configurations. Like Tivoli Systems, Inc., which recently announced a rival NT management product, Polycenter will be able to manage a mixture of NT, Windows and Unix systems, DEC said. Also last week, DEC announced Pathworks for NT.

Shared Medical Systems wins award

Joe Carola, manager of database administration at Shared Medical Systems (SMS), won the award for Information Excellence at the International DB2 Users Group last week. Carola, whose department supports hundreds of client hospitals tied into the SMS environment, "was instrumental" in organizing and developing a centralized database group.

SHORT TAKES Microprocessor maker Cyrix Corp. submitted a plan to the Securities and Exchange Commission to raise $25.4 million with an initial public offering of 2 million shares of common stock. ... Still reeling from the competition brought on by the March release of DOS 6.0, Stac Electronics, Inc. in Carlsbad, Calif., last week laid off 20% of its 200 employees.

Client/server on users' minds

Database, migration issues dominate DB/2 Users Group meeting

By Johanna Ambrosio
DALLAS

If client/server has a heart, it is usually a database. Not surprisingly, the 1,000-plus database implementors gathered here last week spent a fair amount of time talking about client/server issues alongside the more traditional mainframe challenges of performance and availability.

At this early stage in the client/server game, many attendees at the fifth annual meeting of the International DB/2 Users Group were asking how-do-I-get-there-from-here? kinds of questions. The issues: How to link the server and mainframe worlds, how to figure out where to put the data and what kinds of changes to the mainframe database all this might require.

A client/server panel, made up of user and vendor representatives, drew about 200 attendees. User panelist John Baraldi, vice president at Chase Manhattan Bank NA in New York, advised database gurus to learn more about the world of communications.

"Take your VTAM person and your LAN administrator to lunch and become real good friends," Baraldi said. "You don't need to know the full gamut of communications issues." But database administrators need to understand the impact of using different communications protocols — i.e., using IBM LU6.2 vs. 3270 connectivity.

Baraldi said Chase decides where to put applications based on which platform they will fit on. "Our largest OS/2 database is about 500M bytes, and our largest on Unix is about 5G bytes. Everything beyond that goes on a mainframe," he said.

Other attendees had different concerns, including training, support and cost. "Just the middleware piece of client/server is very expensive," said David Beulke, DB2 database administration manager at Spiegel, Inc. in Westmont, Ill. "There are a lot of hidden costs, like the LAN administrator and applications person in the business unit and backup and recovery."

Some users said their companies are going wholehog to non-host platforms as a cost-control issue. Others said their mainframe database systems are continuing to grow, and still others said they have both.

Similarly, not all are staying faithful to IBM off the host platform. "Some are using or installing IBM's [workstation and server] products; others are already using other vendors' products," said Howard Fosdick, an independent consultant in Villa Park, Ill.

Bank

CONTINUED FROM PAGE 1

perience will make him a valuable player on our team as we continue to deploy architectures such as client/server," Packer said.

However, he added, Anderson's newly minted position signals no new departure for the bank. "It's just part of our continuing commitment to client/server architectures that allows us to blend the end-user playpen with the industrial-strength data center."

During the past several years, the bank has steadily implemented client/server applications, Packer said. One, for instance, allows clients direct access to trust and pension information. Another gives users of the bank's "derivatives" services — e.g., swaps, options, warrants — access to risk management information. Information- access systems for corporate finance professionals now operate in client/server mode.

According to Robert Moll, a banking analyst at Arthur D. Little, Inc., it is hard to find a major bank that is not making a foray into the largely unproven area of client/ server computing — notwithstanding many pitfalls.

"Client/server is compelling for large banks because most of them are coming to realize that about 75% of their IS resources go toward maintaining legacy systems that support the commodity side of banking," Moll explained. "To redeploy these resources toward something more innovative, more apt to offer competitive advantage, they have to encapsulate the legacy system — and that's when they start thinking client/server."

Encapsulation is an increasingly popular approach that involves surrounding older mainframes with gateways, interfaces and utilities that provide users with easy access and ready control of data.

However compelling the architecture may be, baby-stepping into client/server rather than attempting a rapid ramp-up is the way savvy banks are going to go, said Andy Roehr, a banking analyst at BSG Consulting, Inc. in Houston.

"If you want to learn to walk, don't do it on a balance beam," he said. "Nobody's moving their [daily deposit accounting] applications. They're starting with lower level applications like account maintenance — things that are not mission-critical to the bank."

Don't trip

The path to client/server is strewn with obstacles, said Robert Moll, analyst at Arthur D. Little. Among them are the following:

- A deluge of aggressively marketed products in a largely untried area quickly translates into confusion for banks on tight budgets.
- Estimating the time and cost of a client/server initiative is close to impossible, "particularly when the methodologies advocated differ widely."
- Expectations run dangerously high, setting up cheerleaders and users alike for a fall. Moll's advice: "Don't try to build a super-duper-duper workstation that's going to cure every problem in the company. Keep it simple."
- Demand for client/server-savvy professionals far outstrips supply.

Ace in the hole

Bankers Trust, noted Joseph Ziskin, an analyst at the Boston-based Ernst & Young Center for Information Technology and Strategy, holds an additional ace when it comes to client/server implementation: years of experience as a trading center.

"Companies with large trading organizations are far more advanced in sophisticated transaction processing, in Unix, in open systems — they've been dealing with these questions for years," Ziskin said.

Meanwhile, at Aetna, Anderson's departure translated into promotions for two of his colleagues.

Ann Dunphy, former program manager of market-driven quality, is stepping into Anderson's shoes on an interim basis. Scott McAlinden, Aetna's information technology chief of staff, becomes vice president and chief administrative officer of a new organization, AIT Administration & Finance, created by the merger of the chief of staff's office and the finance and planning group.

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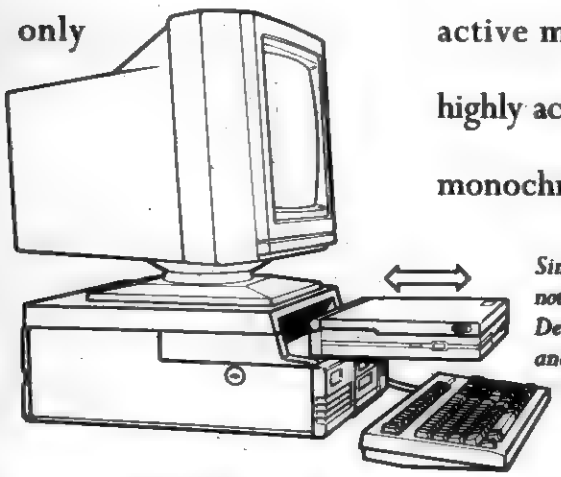

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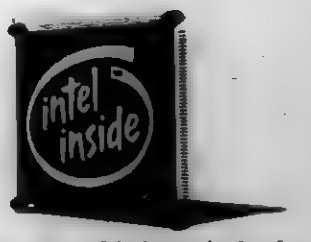

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Next plunges into software with partnerships

By James Daly
SAN FRANCISCO

Next, Inc. Chairman Steve Jobs hosted a revival meeting at last week's NextWorld Expo, crowning the firm's born-again status as a software company with key industry partnerships.

He indicated, however, that if the software strategy does not stick, his company is finished. Jobs did not provide a time frame for that decision, saying he would have to see how successful the new strategy becomes.

"Next still has at least $10 million from Steve and a $50 million line of credit from Canon, so this is not their swan song yet," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

Steve Jobs: *Liberated from the black box*

Jobs, who addressed an audience of at least 2,000 for nearly two hours, announced the availability of a new version of the NextStep object-oriented operating system that works on PCs and workstations running Intel Corp. 7486 microprocessors.

"We have liberated NextStep from the black box," Jobs said, referring to the company's slow-selling workstations, which were scrapped in February to allow Next to focus on NextStep [CW, Feb. 15].

Hewlett-Packard Co., Compaq Computer Corp., Digital Equipment Corp. and NCR Corp. have joined the list of PC manufacturers that will offer NextStep 486 as an option on their systems. Borland International, Inc. also announced plans to port its InterBase relational database to NextStep 486, although no general availability date was announced.

Although NextStep has been available for more than four years, its proprietary nature had made it a difficult sell. "Next was never an option before because we had no interest in going to a new platform," said Mike Adelson, project manager of branch automation/retail systems at Chrysler Corp. subsidiary Chrysler Financial in Southfield, Mich.

Chrysler Financial now plans to purchase 2,500 copies of NextStep 486, which will be used in a client/server environment to support more than 100 branches throughout North America.

Putting NextStep on the Intel platform also lessens the fear factor. "People don't want to think that they have to junk their systems to tap into Next; this lessens that perceived risk," said Dwight Koop, executive director of information technology at Swiss Bank Corp. in Lisle, Ill.

NextStep users have long praised its design as one that makes it easier to reuse large chunks of software code. They say it delivers today the kind of object-oriented programming environment that potential rivals — such as the Apple Computer, Inc./IBM joint venture Taligent, Inc. or Microsoft Corp.'s Cairo — project they will not deliver before 1995.

But analysts said the chances of Next's taking over this object-oriented development market are slim, as Microsoft and Taligent are likely to be the real operating system powerhouses in the future.

"NextStep is as good as anything that's out there, but the move [to develop custom applications] may not be as fast as Jobs likes," said David Card, director of systems research at International Data Corp. in Mountain View, Calif.

Riding HP's desktop coattails

Next's partnership with Hewlett-Packard is the firm's best chance to move the NextStep 486 onto the corporate desktop, via HP workstations and PCs.

Next Chairman Steve Jobs said the firms' Object Enterprise partnership will provide one-stop shopping for users who want to bring an object-oriented framework to a client/server environment.

Next will port NextStep to a spectrum of HP computers, including Vectra PCs, the HP Apollo 9000 Series 700 workstations and Series 700 and 800 servers. The Object Enterprise initiative will also integrate key computing standards such as the Object Management Group's Corba and the Open Software Foundation's Distributed Computing Environment and Distributed Management Environment.

Jobs said the partnership will initially concentrate on selling to financial services users, who were among the first to embrace workstations and object-oriented tools.

HP hopes the partnership will give it added punch in combating Sun Microsystems, Inc., its traditional rival in the battle for the hearts and wallets of the financial industry, noted Ruann Ernst, HP's director of financial services industry marketing.

—James Daly

Distributed systems

Delayed DME awaits Corba

By Elisabeth Horwitt
BOSTON

General availability of Distributed Management Environment (DME), the Open Software Foundation's (OSF) object-oriented platform for managing distributed systems, will be delayed until it incorporates the Common Object Request Broker Architecture (Corba), OSF director of DME programs Peter Shaw said last week.

Corba is an Object Management Group (OMG) standard that defines a common set of programming interfaces by which applications can handle the tasks, devices, functions and pieces of data involved in getting a job done. The OSF will incorporate management-specific features into Corba, as well as a "persistence" of objects that ensures that a device or function, once activated, does not disappear when the job is completed, Shaw said.

In addition, the OSF and the OMG need time to work with vendors to provide interoperability across different implementations of Corba, he said.

Shaw would not give a time frame for implementing Corba within DME. A spokesman at IBM, which is integrating Corba into DME, estimated that would occur in the second quarter of next year [CW, May 24].

On the other hand, DME Distributed Services, a set of basic management services for managing Distributed Computing Environment (DCE)-based systems, is on schedule to ship by year's end, Shaw said. The code is "functionally complete" for the services, which include software distribution, license management and services that enable a DME system to manage any PC running DCE.

Moving across nodes

The OSF has also "created a mechanism" that allows applications based on the services to manage systems via Transmission Control Protocol/Internet Protocol rather than DCE, Shaw said. What DCE provides, however, is an environment for distributing management applications and systems across multiple nodes.

Groupe Bull and Hewlett-Packard Co. are expected to finish co-developing the Network Management Option portion of the framework by the first quarter of 1994.

This piece incorporates the X/Open Co.'s Management Protocol, a common application programming interface (API) that enables network management applications to work with either Common Management Information Protocol- or Simple Network Management Protocol-compliant systems.

The OSF will enhance the interface with support for its object-oriented framework, Shaw said. But this means that until the framework is ready, users might as well purchase the existing API from other channels, he added.

DCE products ready, but users waiting

By Jean S. Bozman
BOSTON

A wave of products based on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) technology made an appearance at the OSF's interoperability showcase last week. However, users said they do not expect to run DCE applications in production until next year.

Users attending Challenge '93 seemed pleased with the demonstrated prototypes of distributed applications built on OSF technology. "The vendors cooperated, and an awful lot of this stuff actually worked," said Tony Carrato, a member of the OSF's end-user steering committee and a principal consultant at Mile-High Information Services, Inc. in Denver.

"It's taken just about two years from the time OSF first said DCE was shipping until we're finally going to get a critical mass of products," said Roy Schulte, a vice president at Gartner Group, Inc.'s Software Management Strategies service.

OSF President David Tory attributed the delay in part to "a long hiatus while the Motif technology was being productized by the vendors."

Users said they expect to have DCE applications in production by next year at the earliest. Several attendees said they are just getting started with OSF technology, monitoring the OSF/1 operating system, DCE technology and Distributed Management Environment networking technology before implementing it. These users said they would like to see more DCE tools for debugging and testing DCE applications before committing to use it in production.

"I'm waiting for all the pieces of DCE because I want to have a single, uniform naming space," said David Nesal, a systems programmer at the University of Florida's data center in Gainesville, Fla.

His site has been running the OSF's operating system, in the form of IBM's AIX for Enterprise Systems Architecture, for nearly a year. But distributed applications that link mainframe AIX files with distributed Unix workstation files will require DCE's naming services as well as its Distributed File System, Nesal said.

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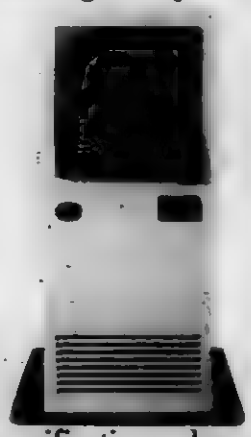

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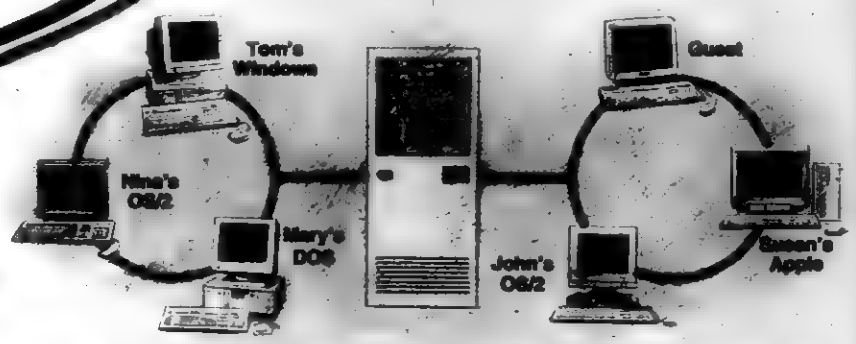

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Peer-to-peer networking

New VTAM brings users closer to APPN

By Elisabeth Horwitt
ARMONK, N.Y.

IBM last week started Systems Network Architecture (SNA) users on the long, rocky migration path to Advanced Peer-to-Peer Networking (APPN) — the vendor's next-generation enterprise network architecture — with the shipment of ACF/VTAM Version 4, Release 1. The software enables other APPN nodes to access IBM hosts over peer-to-peer links.

Users are still awaiting the ability to provide their widespread 3270-to-host networks with key APPN benefits such as the addition and deletion of devices without manual network table updates and automatic calculation of multihop routes, according to David Passmore, a vice president at Gartner Group, Inc., a consulting firm in Stamford, Conn.

VTAM 4.1 gives those benefits to links between hosts and OS/2, Application System/400, 6611 routers and other devices supporting APPN. However, the broad base of traditional terminal-to-host SNA networks will not be migratable to APPN until IBM ships VTAM 4.2, with its dependent LU server requester function, sometime next year. SNA terminals will be able to reach resources on an APPN network by accessing a VTAM 4.1 host over a traditional SNA link.

VTAM 4.1 works in combination with IBM's Network Control Program Version 3, Release 2, shipped in March, to convert an IBM host and front-end processor into an APPN Network Node, End Node or central directory server. The IBM host can then exchange information with other APPN nodes about its attached resources, keep track of resources across the network and cooperate with other nodes to route transmissions efficiently.

Canada Mortgage and Housing Corp. has been beta-testing VTAM 4.1 as a way to directly link its AS/400s to an IBM mainframe [CW, April 26]. The Ottawa firm lacks an extensive SNA subarea network, so it has "minimal interest" in the future VTAM 4.2's ability to replace 3270-to-host links with APPN, according to Ken Smith, systems software manager.

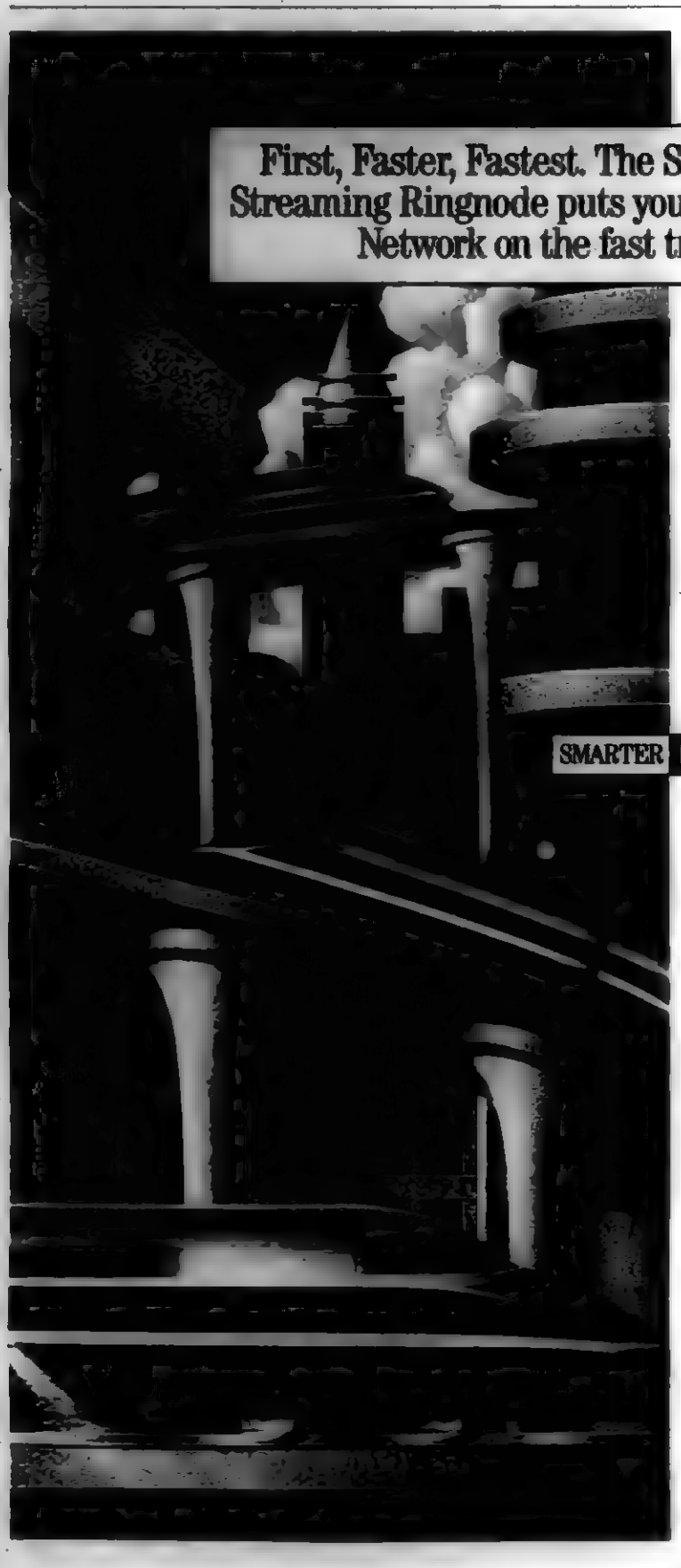
Of greater interest to the mortgage firm is a product now under development at IBM that will encapsulate 3270 within a LU6.2 connection, Smith said. This would allow users to access 3270 mainframe applications, "which will stick around for 10 years or more," from intelligent, graphics-based PC environments such as Microsoft Corp.'s Windows.

The information systems department could then "parcel all the handshaking and steps users need to go through to access a particular host application, as a series of screens," Smith said.

IBM will announce encapsulation of 3270 data streams within LU6.2, probably around the same time it announces VTAM 4.2, a company spokesman said. LU6.2 encapsulation will enable 3270 devices to transmit over APPN networks; however, the throughput will not be as good as over the "native APPN connections" that will be possible through the dependent LU server requester.

The new VTAM software also supports full-duplex, channel-based connections between two hosts, "so you can be reading over one channel and writing over another," an IBM spokesman said.

The basic monthly licensing charge for VTAM 4.1 ranges from $583 to $12,010, depending on CPU size.



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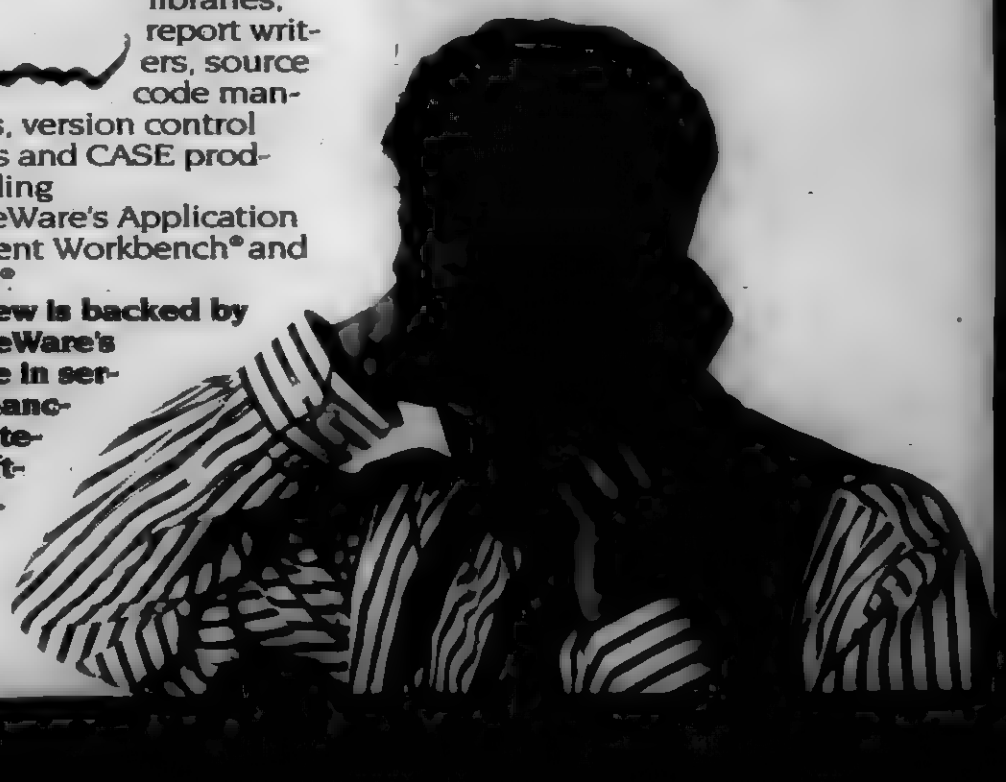

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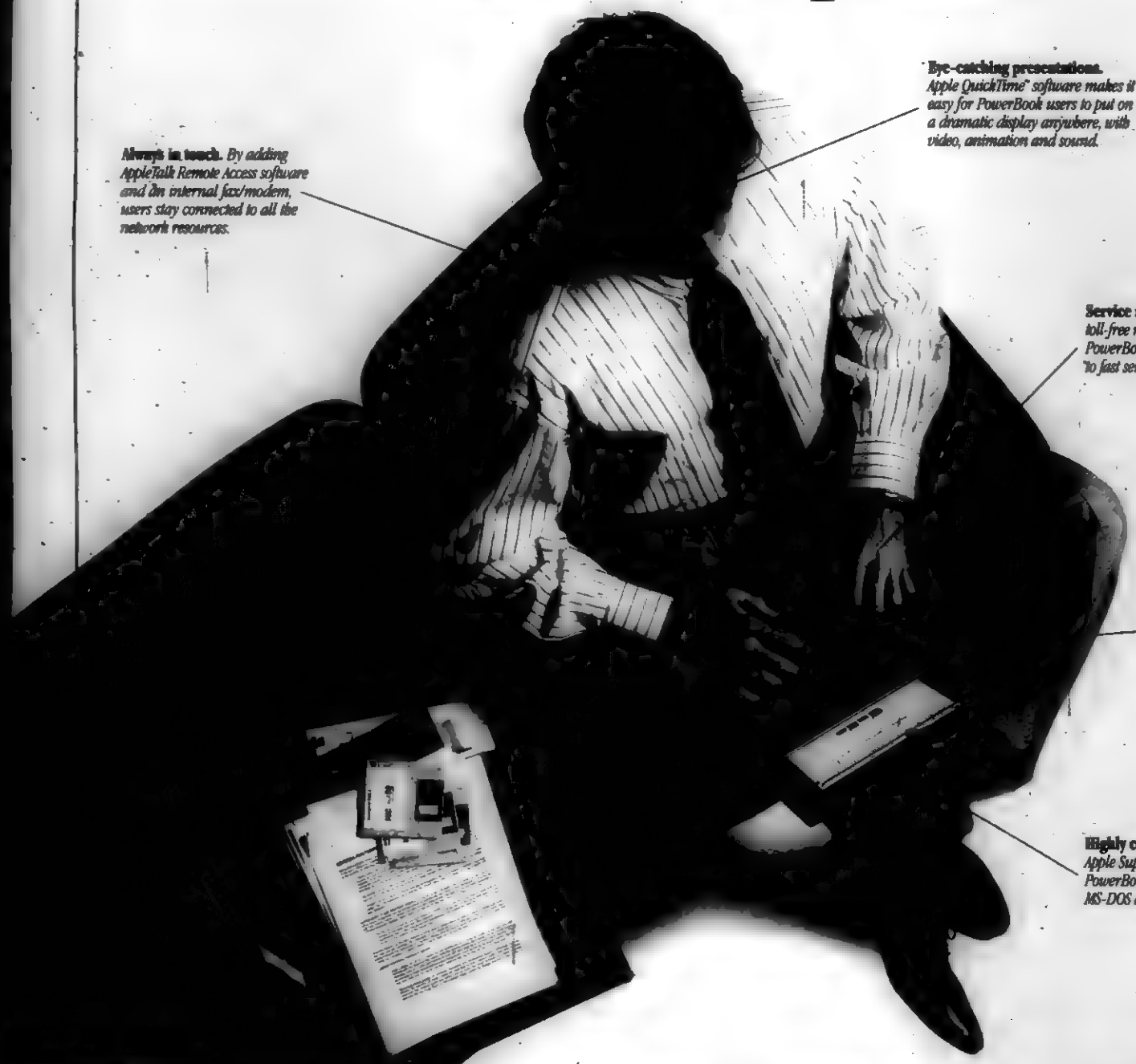

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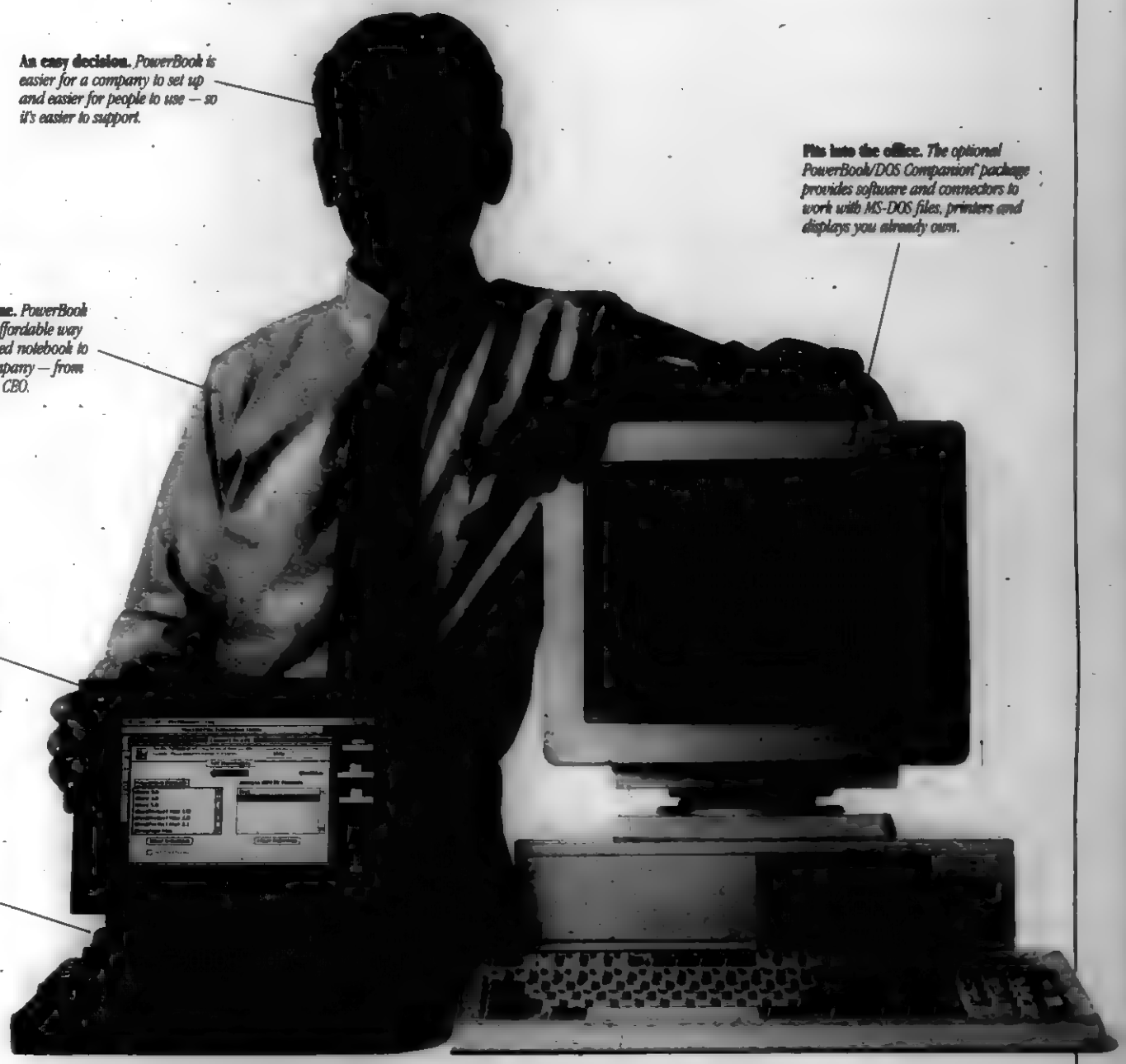

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An on-line gold mine?

As multimedia quest begins, pioneers scramble to see which technologies pan out

By Ellis Booker

Make way for the prospectors. In recent months, a caravan of computer, cable television, telephone and software companies have set off on a gold rush, announcing products and cross-industry alliances aimed at delivering multimedia services to a broad audience of subscribers.

Like the original gold rush, this movement, too, has taken on a life of its own, leaving the prospectors drunk with possibility but unmindful of precedent or nagging weaknesses in their strategy.

"The nature of capitalism is not to spend a lot of money understanding things.... Rather, you throw money at the wall and see what sticks," said Charles B. Kreitzberg, president of Cognetics Corp., an interactive design company in Princeton Junction, N.J.

"I don't think anybody has a clue exactly how this [market] will all shake out," he added.

Asked whether the current excitement around on-line multimedia services recalls the (ultimately disappointing) videotex craze of the late 1970s and '80s, some analysts bristled.

"The technology is far more powerful [per constant dollar], meaning there is at least the technological richness necessary for a successful user experience," explained Mitch Kapor, chairman of the Washington, D.C.-based Electronic Frontier Foundation and founder of Lotus Development Corp.

But even Kapor acknowledged that it is not clear what services and applications will drive the market. "At this point, most of the players are acting on faith, not certainty," he said.

More than movies

Kapor and Kreitzberg agreed that video-on-demand will be an important beginning application — although picking movies "interactively" is not generally what the proponents of on-line multimedia tout as their target application.

Kapor was also adamant that future "highly interactive" networks must be open, in both their technical design and their operating policies, if they are to achieve their full potential.

"Users and third-party developers should be able to determine the content and purposes of the network. If this is not the case, then the necessary conditions to permit the large-scale innovation will not be present," he said.

Whether media companies are conceptually prepared to allow this fluid definition of "content" is a serious question, according to Douglas Davis, author of the recently published book *The Five Myths of Television Power: Or, Why the Medium is Not the Message* (Simon & Schuster, Inc., $20).

"The market and viewers are far ahead of the people providing the services," said Davis, who added that the audience for the interactive services will be "so individuated and so 'hip' that you can't give them too much or too many choices."

These services will flop, Davis argued, if their providers "decide to offer multimedia on some kind of show biz level."

Viewer mistrust

To illustrate how historically reluctant networks have been about these issues, Davis cited study after study indicating that 1) viewers prefer "unmediated" news and 2) viewers hate and mistrust the way programming is aimed at them.

"There's a lot of reason to take a jaundiced view," Davis concluded, "not about the market but about the people who are serving it."

Kapor was a bit more charitable: "The 'killer apps' of the PC era, like [Lotus'] 1-2-3, emerged after the fact. You need a period of experimentation by garage innovators to come up with the one killer app in 10,000 efforts."

Davis, meanwhile, is optimistic that within five years — "probably sooner" — it will be commonplace to watch what is now called cable TV via a computer. The computer will become the repository for programs and information, organized and presented in an increasingly modular fashion so that users can manipulate them to suit their needs.

In May ...

▶ **US West made a $2.5 billion investment in Time Warner, Inc.'s entertainment business — the largest alliance yet between a regulated local telephone company and a cable TV operator. The two partners plan to offer interactive entertainment and information services to Time Warner's 7 million subscribers.**

▶ **Chicago-based General Signal Corp., the world's largest supplier of cable and TV equipment, announced plans to integrate Intel Corp. and Microsoft Corp. technologies into its next-generation addressable cable TV converters. The future set-top box, which will feature Intel's 32-bit chips and General Signal's digital compression and graphics circuitry, will provide conventional cable services as well as interactive multimedia.**

▶ **Tele-Communications, Inc. (TCI), the nation's biggest cable TV operator, announced plans to deploy a $2 billion fiber-based nationwide network by 1996. Also, TCI, along with Time Warner and Sega, announced the Sega Channel, which will pilot an interactive games channel to several thousand homes this fall.**

They want their MTV

Consumer demand for new forms of entertainment, more than any other factor, is fueling the evolution of North America's two fundamental networks: telephone and television.

"Both fundamental networks will handle two-way, switched wideband traffic well before the year 2000," The Insight Research Corp. in Livingston, N.J., projected in its latest report.

But Insight's analysis also argued that the two networks will operate separately through the year 2000, creating "an extensive level of overlapping, interconnecting and competing capabilities."

While phone companies will begin to provide some TV distribution, and cable TV operators may provide access to the switched phone network, Insight said it does not believe the two camps will fully compete with each other.

"We believe the two networks will compete to some degree, but not across all services," said Michael French, vice president at Insight. "The majority of their services will be unique." He said this separation hinges on technical matters and on "the massive infrastructure investments that have taken decades to put into place."

In addition, French said, current regulatory thinking encourages competition among phone and cable TV service providers, even if a confluence of networks becomes technically feasible.

— Ellis Booker

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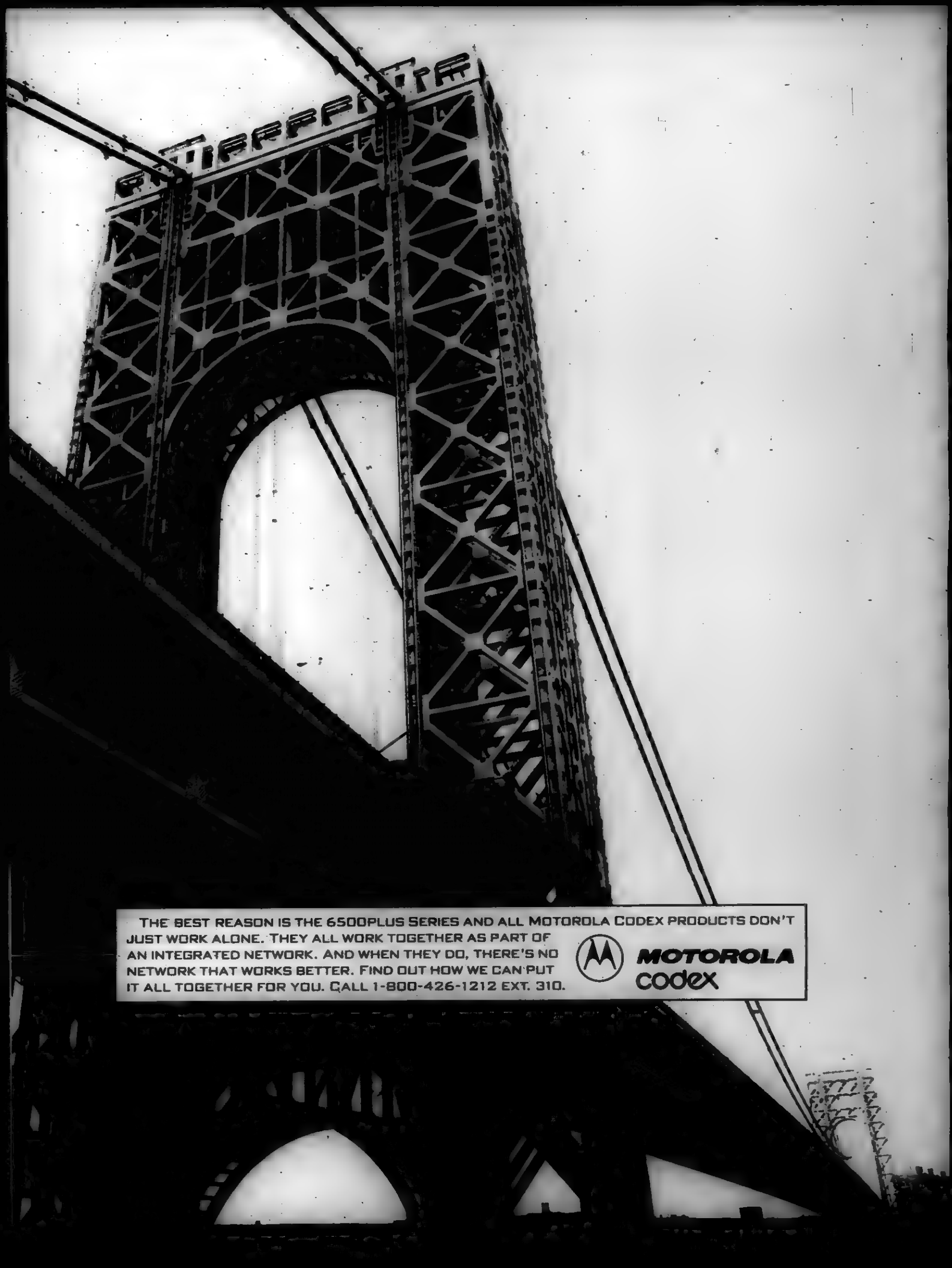
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Doing lunch

What's wrong with this picture?

Last week at the giant Comdex technology extravaganza, I entered the usual mobbed lunch area and asked a stranger if he'd mind sharing his table with me. We soon started chatting, and I discovered he was on the horns of a dilemma.

He works at the IRS, and his group was six months into prototyping a customer service application. They were working with three almost-identical customer sites, using high-speed modems to dial into the sites and download data to the IRS systems. Pretty simple.

The problem was that at one of the sites, the modem would sometimes dial three, four, five or more times before getting a connection. There were no such problems at the other sites. They checked out the lines (OK) and checked out the modems (OK). They thought the problem might be in the data encryption software. But if so, why did things work with two sites and not with the third?

In all, a pretty vexing yet very pedestrian problem. So he came to Atlanta for some help. After all, some 1,000 vendors were there displaying some of the fanciest state-of-the-art information technology ever created, such as Pentium-based computers and Windows NT. Some of the technology was actually shipping.

For all his searching on the Comdex floor — amid the show barkers, the latest in multimedia, the vendors claiming their machines and software support vaporware operating systems, the 50-MHz PC screamers — he couldn't find anyone to help him out. It was just too ordinary a problem to which to apply such wonderful technology.

That's what's wrong with this picture.

❧ ❧ ❧ ❧ ❧ ❧

All of a sudden and almost in unison, some of the leading PC application vendors are hitting their stride in successfully porting their applications to Windows after some halting starts.

If you'll recall, vendors such as Lotus and WordPerfect cried foul when Microsoft announced a few years ago that it was switching development efforts from OS/2 to Windows. Shortly thereafter, Microsoft sported Windows versions of key applications such as word processing and spreadsheets and promptly sucked up the market for Windows apps. Competitors complained that Microsoft application teams were privy to information from the operating system side of the company — information not shared the same way with other companies.

The claim was never proved. But it's worth noting that the likes of Borland, Lotus and WordPerfect — the leading application companies in the MS-DOS world — have now hit the streets with sound Windows offerings, and all around the same time frame. Just a coincidence, or did they actually have the same disadvantages to overcome?

Bill Laberis

Bill Laberis, *Editor in chief*

Word wealth

Regarding "Utility powers up text retrieval" [CW, April 26]: If these expenditures are correctly quoted, then nuclear generation cannot be economically viable. As a certified data processing professional, I am astounded by such a large budget for word processing.

The software that models and runs the Crystal River Unit 3 facility did not cost that much and requires far fewer resources to operate. Nancy Smith is processing words when she speaks of preemptive multitasking.

Christopher J. Clement
Palm Harbor, Fla.

Skip the Clipper

The article on the Clipper encryption chip ["Fed encryption plan gets mixed reaction," CW, May 10] was a good summary of the current debate. However, the government should not be in the business of marketing chips. This goes double when the chip is vital to privacy of information and triple when the government is seeking a monopoly position in the market.

Also, at least one aspect of the Clipper's security is very weak: A single code is used to extract the serial number from any Clipper chip. If this code is leaked or cracked, the first layer of security is permanently gone for Clippers.

The Clipper is simply the latest in a long series of governmental assaults on our privacy and liberties. We should not be taken in.

Gary D. McGath
Penacook, N.H.

For more on Clipper, see next page.

E-mail trail

"Coping with the deluge" [CW, May 17] is somewhat perplexing. Here we're in the "electronic age" and we're complaining about lack of disk space? I never remember hearing about the lack of file cabinet space when we were all sending paper memos to one another.

It seems a tad ironic that after we wean users from paper and get them to use electronic messaging, we start complaining that they are using it too much. This is not an electronic-mail problem; this is a communication problem.

If someone keeps sending me useless memos, I do one of two things: I either ignore and throw out everything from that person, or I gently tell him to be somewhat more particular about what is reasonable to send to me.

Let's not penalize people for doing exactly what we want them to do: to fully embrace the new technology and use it to the hilt.

Pete Roberts
Corte Madera, Calif.

Payback time

David Kelly's description of what constitutes valuable work and drudgery ["This is freedom from drudgery?" CW, May 17] shows that he's gotten the bone-numbing computer hell he deserves.

The notion that chopping firewood, drawing water and producing food is beneath us created the demand for "labor-saving" devices such as computers in the first place. Now we figure out that the "information" Dave's computer (and yours and mine) "generates" creates tons of monotonous grunt work and further alienates us from one another. In the meantime, Dave whines that he can't approach the weird altar of "creative thought" because he's too busy consulting on, of all things, client/server and systems integration!

Take a break, Dave. Go split some wood.

T.J. Smith
Spokane, Wash.

Page 2 blues

I wholeheartedly agree with Michael Somand [Letters to the editor, May 3]. Last year's Page 2 of *Computerworld* was the perfect "executive summary" of this journal, and today's version is almost as useful as a deck of Hollerith cards.

I peruse at least 20 industry publications a month and, although I usually prefer to turn every page of *Computerworld*, returning to the office after a one- or two-week absence presents me with a reading backlog that the old Page 2 greatly relieved.

Bring back the old Page 2!

Dave Schewe
Sugar Land, Texas

Ed: We will — soon.

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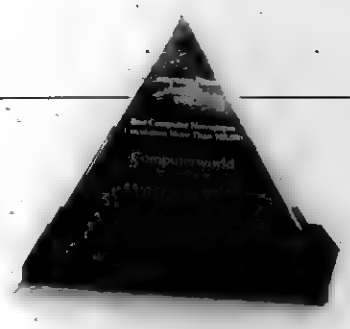

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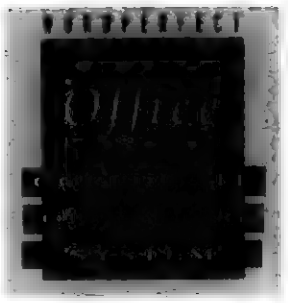

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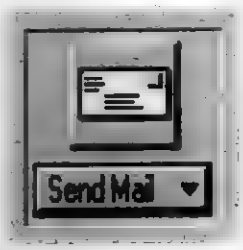

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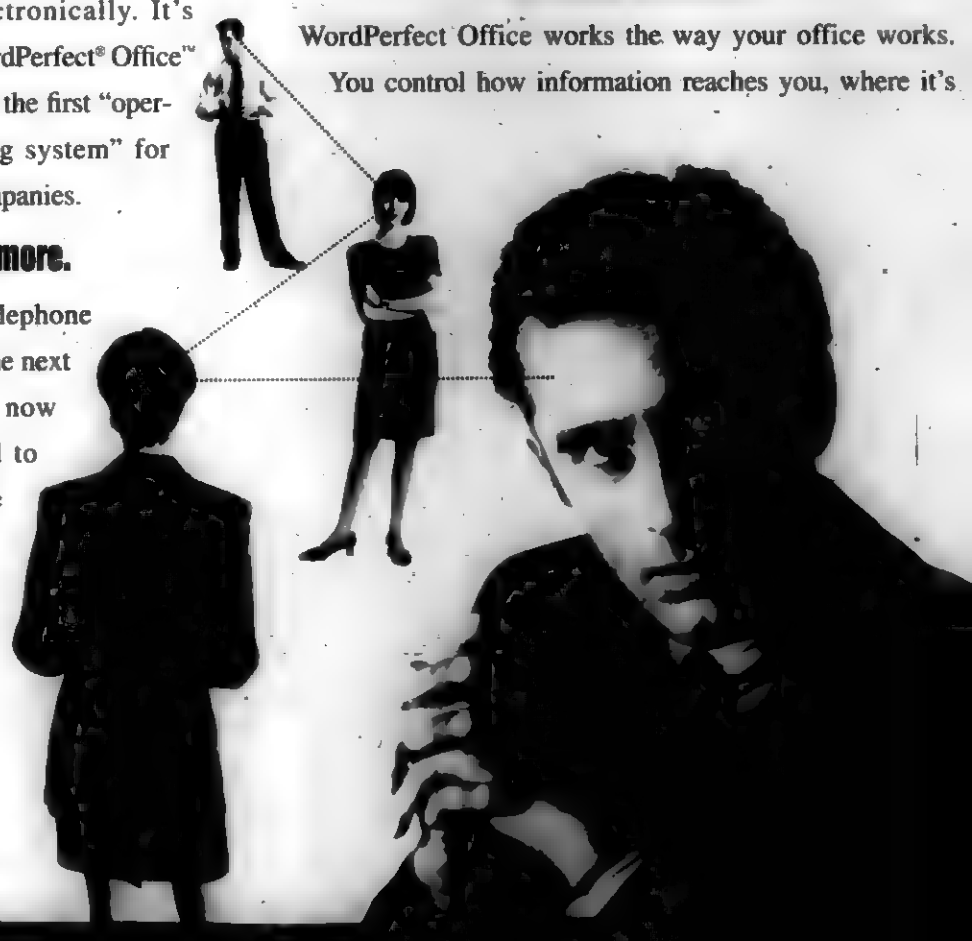

CORPORATE OPERA

filed, where it's routed after it leaves your desk. You can accept or reject meeting requests, of course, but you can also delegate them. You or your proxy can check for conflicts on any number of personal calendars across any number of networks — even across dissimilar computer operating systems — with a single keystroke.

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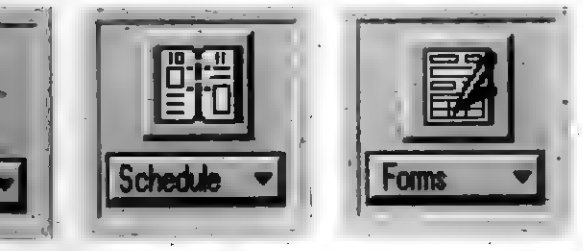

TING SYSTEM.

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Clipper gives Big Brother far too much power

Bruce Schneier

In April, the Clinton administration, cleaning up business left over from the Bush administration, introduced a cryptography initiative that gives government the ability to conduct electronic surveillance. The first fruit of this initiative is Clipper, a National Security Agency (NSA)-designed, tamper-resistant VLSI chip. The stated purpose of this chip is to secure telecommunications.

Clipper uses a classified encryption algorithm. Each Clipper chip has a special key, not needed for messages, that is used only to encrypt a copy of each user's message key. Anyone who knows the key can decrypt wiretapped communications protected with this chip. The claim is that only the government will know this key and will use it only when authorized to do so by a court.

There are numerous problems with Clipper: cryptographic problems, design problems, policy problems and philosophy problems.

Classifying the encryption algorithm is wrong. The NSA's refusal to allow public scrutiny of the algorithm gives ammunition to those who believe there is a secret "back door" that will permit the NSA to decrypt messages at will. The only way to assuage these fears is to allow academic cryptographers to examine the algorithm and publish their findings.

Clipper is also based on the Orwellian assumption that the government has a right to listen to private communications. It promotes

the power of government over the power of the individual. It assumes that the government is the good guy and private citizens are bad guys.

Why is the government now claiming there is something wrong with a private citizen trying to keep a secret from the government? This is not simply a little proposal of the government in some obscure area; it is a preemptive and unilateral attempt to usurp powers that previously belonged to the people. It also represents a fundamental shift in government policy, from a passive role of listening to an active role of regulating new technologies.

Clipper forces individuals to unconditionally trust that the government will respect our privacy. But consider this: The same law enforcement authorities that illegally tapped Martin Luther King Jr.'s phones can easily tap a phone protected with Clipper. During the past five years, local police authorities have been charged criminally or sued civilly in numerous jurisdictions for conducting illegal wiretaps.

As long as Clipper is optional, people who desire real privacy (both honest citizens and criminals) will use other encryption methods. However, because these methods will be secure from wiretapping, I expect the federal government to introduce legislation banning nonescrowed encryption and to reintroduce legislation forcing telephone-switch manufacturers to add circuitry to allow wiretapping.

By mandating a solution before allowing public discussion, the administration is overlooking some very important questions: How effective are wiretaps in law enforcement?

Why would any intelligent criminal use flawed encryption such as Clipper?

And, most importantly, is the ability to conduct wiretaps more important than the right to personal privacy?

Schneier is president of Counterpane Systems, a cryptography consulting firm in Oak Park, Ill. His book, *Applied Cryptography*, will be published by John Wiley & Sons in November.

PIAs: Agents of wireless anarchy

FIRE WATCH *by* John Gantz

Having just chaired a session at Comdex on the future of personal information appliances, or PIAs — things like the Sharp Wizard, the Hewlett-Packard 95LX palmtop and the Apple Newton — I can vouch for the excitement building in the industry for the concept of PIAs. Vendors are forming divisions around the concept. Wireless carriers are drooling at the thought of delivering signals to all these Dick Tracy devices. And storage vendors are trying to figure out how many megabytes they can get on a button-size disk.

That's what I can vouch for. What I can't vouch for is the ability of user firms to do anything constructive with these gizmos.

I think the market is inevitable — individuals will line up to buy, even if companies won't. But as you very well know, IS organizations are ill-equipped to deal with mobile computing in general, let alone wireless, handheld mobile computing.

These devices will enter your organizations like a swarm of gnats. The installed base for palmtops alone is already more than 4 million worldwide, and International Data Corp. is forecasting growth to 15 million in 1997. Add other PIA devices and you easily double that forecast.

Yikes! Just as the influx of PCs confounded IS managers in the early 1980s, PIAs will confound those of you managing systems and LANs in the 1990s. We're talking millions of addressable units demanding ad hoc, real-time access over shifting communications networks to corporate databases. We're also talking about addressable units consisting of proprietary hardware and software (necessary to get to wrist-watch size) and, therefore, built-in interoperability problems.

I expect the market to develop in the time-honored fashion. Vendors will offer proprietary products and fight for market share in hopes of becoming de facto standards. Users will decry the lack of standards but buy only for specific applications or functions because that's the only way to justify purchases in the short term. In about the third or fourth generation of devices, the need for application integration will push standards and interoperability — long after it's too late to build them into products in a rational way.

Once again, you'll be left holding the bag.

Sales forces automated with one kind of PIA will want to communicate with service engineers automated with another. Everyone will want to hook into the corporate E-mail network, which wasn't designed to support remote, wireless access.

You'll handle network incompatibilities with gateways, but before long, your gateways will have gateways. Device inventories, security and software licenses will be nearly impossible to control. Network management will be a joke. There'll be an element of humor in application development, too.

And don't expect any help from the vendors in managing unruly fleets of PIAs. They're too busy trying to keep venture capital or corporate development money flowing into their research and development sinkholes and getting products out to think about the problems you'll face supporting remote, mobile, wireless workers, devices and software.

So, for every ounce of PIAs you buy, order a similar amount of Tums.

Gantz is senior vice president at International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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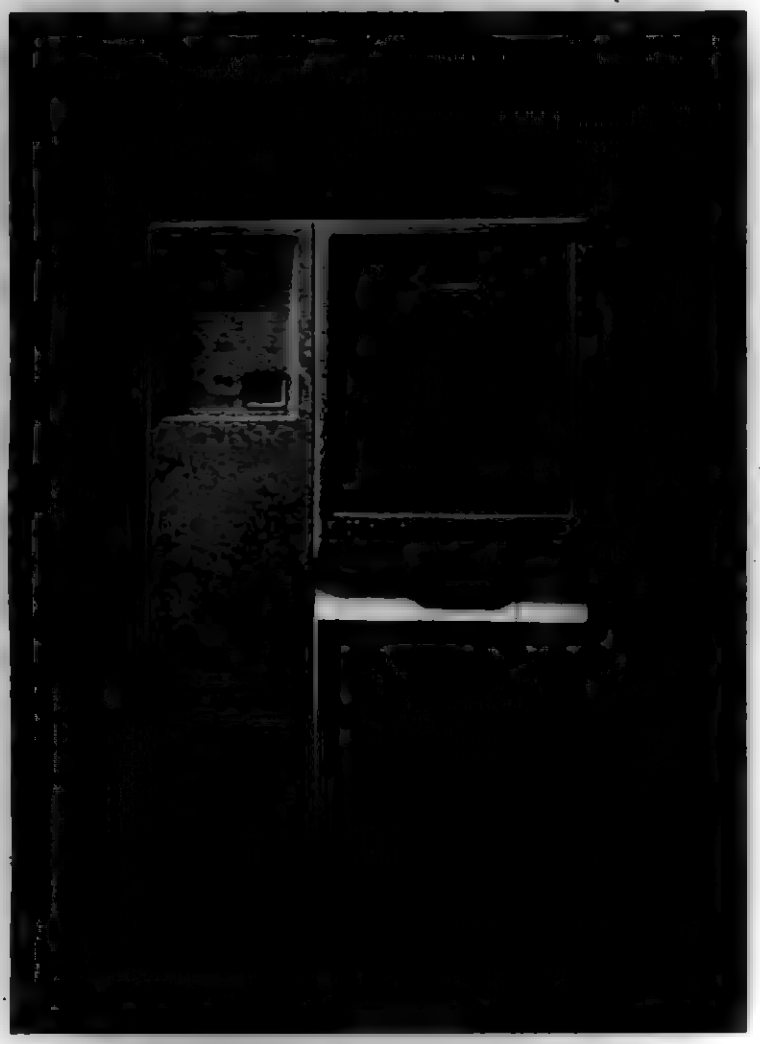

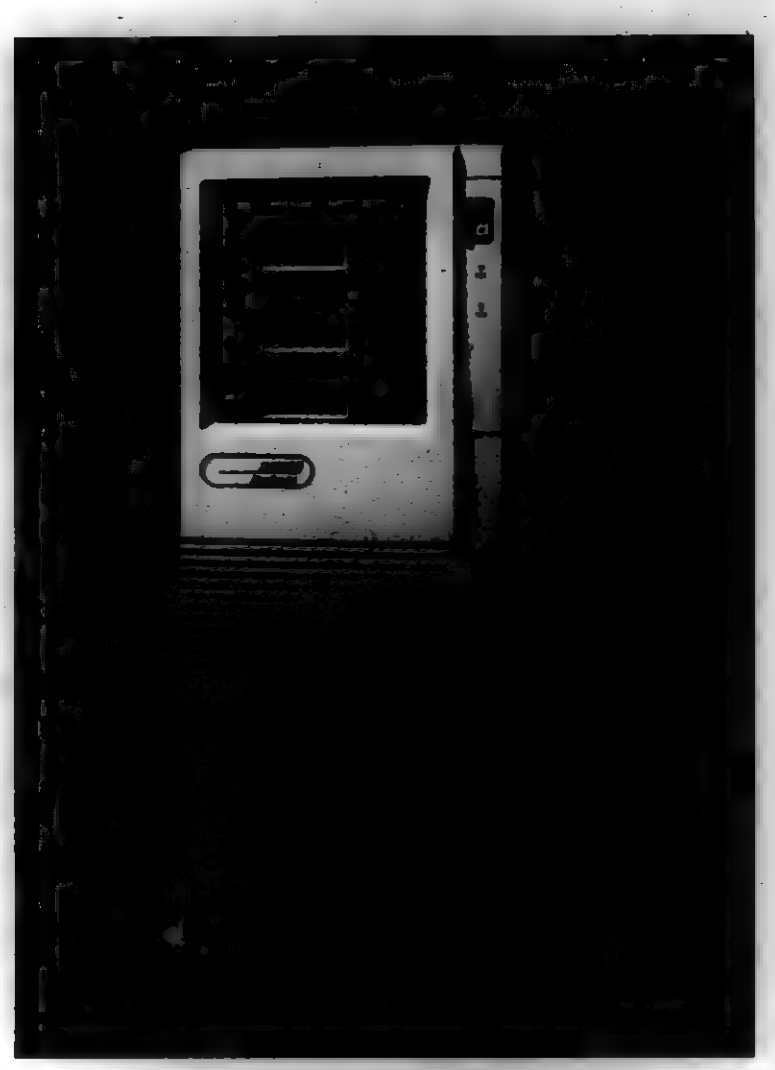

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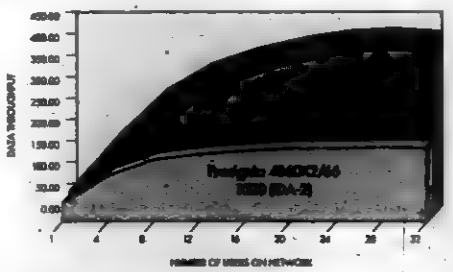

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Charles Babcock

Deferred payback

A first venture into client/server doesn't necessarily save money over a host-based system; in fact, it may cost more.

That at least is the conclusion of Forrester Research, a consultancy in Cambridge, Mass., that asked 25 large companies about their initial client/server investment.

Because each company was doing something different, Forrester staffers drew up a composite of the client/server systems they found — a system with five Novell NetWare servers and 140 I486 PCs. Then, for comparison, they mapped an equivalent Application System/400 host-based system with the same number of dumb terminals and PCs.

Researchers went to appropriate vendors and asked for standard prices to come up with hardware/software/network expenses. Conclusion: Implementing an application on a new PC LAN client/server system will cost slightly more than building from scratch on an AS/400.

Customer service trial

The typical application served by both of Forrester's model configurations was a customer service system meant to put better information into the hands of employees fielding customers' calls. This choice was not random. Half of those interviewed said they had picked customer service for their first client/server effort, citing reasons such as an ability to install call-recognition systems that route callers to familiar service personnel, easier retrieval of account data and immediate capture of problem descriptions.

To build and operate such a system for 140 users over four years costs $2,154,000 for the PC LAN version and $2,005,000 (or $149,000 less) for the AS/400 version.

Hardware and system software represented just over a quarter of the total expenditure for both configurations. Application development was costlier for the AS/400 system — just under $250,000 costlier on average — and took seven months longer. That advantage for client/server was offset, however, by support and maintenance costs, which were $248,000 heavier for the PC LAN system. Training likewise was less than half as much on the AS/400, reflecting the advantage of an established computer architecture.

So where is the big advantage of moving to PC LAN client/server?

One answer is that after the initial system is built, the network infrastructure has been put in place and there is more internal expertise to make a new system work. Hence, the cost of second, third and fourth systems gets chopped in half, said Forrester senior analyst Neil Hill.

Another is that client/server offers an organization a much more flexible computing resource, bringing data and applications closer to end users and putting tools in their hands to prototype their own applications. The rapid spread of powerful 486 PCs on desktops makes client/server systems more feasible.

Indeed, one is tempted to cast out one of the key assumptions made by Forrester for the purposes of its study: that both the client/server and AS/400 builders are starting from a blank slate.

While there are many AS/400s in use, most of them may be presumed to be heavily used. PCs and PC LANs, on the other hand, are frequently underused. What if one can make better use of existing infrastructure by building client/server applications? The system cost would then come down to a more reasonable level.

Savings will probably elude those going for the quick fix through client/server, but those who commit to this approach in the interest of creating more flexible, competitive systems will undoubtedly find that persistence pays.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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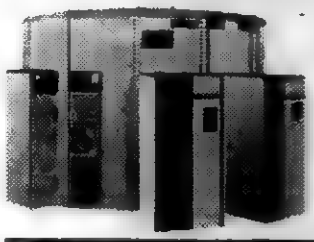

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Legent opens Windows to data center

Offers products to help manage, monitor end-user computing

By Gary H. Anthes
PHOENIX

■ Legent Corp. took another step out of the data center recently, unveiling five products for Microsoft Corp.'s Windows and enhancing other products for distributed computing.

Leading the way was a new product for downloading, displaying and analyzing the output of mainframe performance monitors. PC-based Paramount provides a common graphical user interface to mainframe-based tools, allowing users to combine on one screen and manipulate and correlate the output from multiple products from Legent and other vendors.

Paramount is based on the NaviGraph product licensed last year from Landmark Systems Corp. in Vienna, Va. Initially, it will accept feeds from Legent's Astex, NetSpy, LanSpy and Mics products and from Landmark's Tmon series of monitor products.

TCP/IP support

Legent also announced XCom for Windows and extended the XCom product line for file transfer and software distribution to support Transmission Control Protocol/Internet Protocol communications.

XCom, previously available only for IBM's Systems Network Architecture networks, can transfer data between any of more than 25 operating environments.

Appleton Papers, Inc. in Appleton, Wis., has been using the DOS version of XCom since January and recently bought the Windows version as well.

Terry Sweet, systems programmer, said XCom for Windows will be used for unattended nighttime file transfers from the mainframe to the PC. The objective is to allow end users to produce their own reports and ad hoc queries from local relational databases rather than from batch mainframe Cobol reports.

Sweet said the Windows version of XCom will allow him to run and monitor file transfers and 3270 emulation simultaneously. He said it is also less cumbersome for the novice user than is the DOS version.

Air Products and Chemicals, Inc. in Allentown, Pa., uses 10 Legent products and said it welcomes the Windows announcements.

"We've standardized on Windows and Ethernet, so it's important that our vendors come along," said H. William R. Townsend, manager of computing services operations. "We and Legent need to recognize a shifting away from a mainframe orientation to more of a multiplatform orientation."

Other announcements

Legent also rolled out the following products:

- **N-Vision for Windows**, which moves session management from the host to the workstation and offers simultaneous access to multiple applications, each appearing in its own window. It is based on software rather than emulator boards.
- **JobTrac PC**, which enables users to graphically build and forecast job schedules and make flowcharts.
- **Sar PC**, which allows Windows users to view, access and print host reports locally, offering users on-line viewing and on-site printing.

Steve Heitmeier, systems programmer at Steelcase, Inc. in Grand Rapids, Mich., said he recently acquired both the DOS and the Windows versions of Sar PC. He said the Windows version has the advantage of allowing users to select a font that shows all 132 report columns at once, even on a standard 80-column screen.

Pendulum swings back to IS

In speeches and technical sessions at its recent user conference, Legent pointed out that end users, impatient with the pace of activity in the glass house, have attempted in recent years to wrest the reins of information systems management from the data center manager.

But now, Legent argued, those same users are becoming overwhelmed by the accelerating pace of technology change and the lack of tools for managing distributed systems. The pendulum of IS control is now swinging back in favor of the traditional IS management professional, Legent said.

That idea seemed to strike a responsive chord among the 1,100 mostly mainframe-centric conference attendees.

"Users have gotten tired of doing backups, they are tired of having the cleaning crew knock their servers off-line, and they realize they are not equipped to handle disaster recovery, tape storage and fire protection," said H. William R. Townsend, who manages worldwide computer operations at the $3 billion Air Products and Chemicals.

Townsend said there is a bottom-up movement from users at his company to seek help from the central IS staff, something he said he welcomes but has no incremental budget to support. In response, Townsend said he has undertaken a broad array of cost-cutting and efficiency-improving measures — such as consolidating maintenance agreements, terminating little-used software licenses and bringing in automated system management aids — that are allowing him to tackle system management chores for remote users.

Townsend said IS managers should be more aggressive in reducing their own costs while simultaneously seizing the opportunity presented by the befuddled end user. "If they don't, they will be out of jobs in five years," he said. — *Gary H. Anthes*

Client/server

Bank enlists PCs, Macs to speed information retrieval

By James Daly
ATLANTA

If time is money, The Prudential Bank & Trust Co. had been spending lots of cash just sitting on its hands.

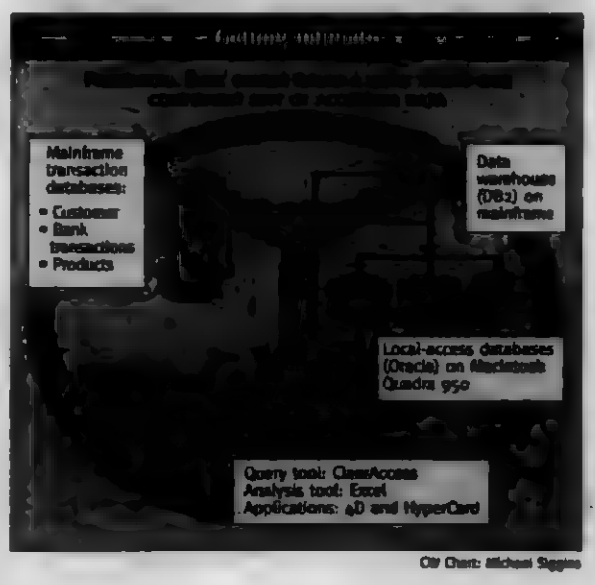
With the financial marketplace growing increasingly competitive and Prudential drawing up plans for expansion, obtaining crucial decision-making information quickly and easily became a critical business requirement for the $150 million financial services firm.

Previously, all of Prudential's core data processing, including the reporting function, was handled by outside vendors using a variety of IBM mainframes. Requests were sent directly to the vendor's information systems departments, which generated reports. The reports were printed at the bank — generally seven or more days after the initial request — and then forwarded to the business manager. If additional information was needed, he sent another report request.

"Users felt that they were running blind," said David Rowan, vice president of Prudential's information services.

Something had to change, he said, and it needed to change fast. Rowan and his team gathered and began brainstorming about a client/server system. They knew they needed to achieve three simple objectives:

- Eliminate the reporting backlog by reducing the information delivery cycle from days to minutes.
- Give users a more flexible analysis capability, providing the ability to create "what-if" queries to the corporate database and drill down into the data to uncover new trends or correlations.
- Reduce IS operating costs. The hope was that users could perform their own reporting and data analysis without requiring too much IS involvement.



CW Chart: Michael Siggins

The data warehouse they created receives its data from existing transaction systems, Rowan said. Data on the mainframe is extracted on a nightly basis, transmitted using Remote Job Entry and stored in several departmental Oracle Corp. local-access databases running on Apple Computer, Inc. Macintosh Quadra 950 computers. Users access the data from a mix of Macintoshes and PCs.

Rowan said the bank also has access to transaction data on a DB2 database that is accessed via Apple's Data Access Language (DAL), which enables interactive data access to multiple database servers. Part of the

Bank, page 40

Security

No summer vacation for June viruses

By James Daly

June brings with it three nasty and destructive viruses that will eat you up faster than bugs at a barbecue.

One is Sub-Zero B, a variant of the well-known Jerusalem virus, that activates on June 6. It is a memory-resident generic file infector that hits .COM, .EXE, .SYS, BIN., .PIF and overlay files when they are executed.

Following infection, Sub-Zero truncates executed files on the last Friday of any subsequent month. On its activation date, it will attempt to format the hard disk.

Another ugly customer is the Kennedy virus, which is sometimes called Dead Kennedy or 333. It is a generic infector of .COM files, including COMMAND.COM. The virus activates on three important and sorrowful dates in the history of the Kennedy clan: June 8 (the assassination of Robert Kennedy in 1968); Nov. 18 (the death of patriarch Joseph Kennedy in 1969); and Nov. 22 (the assassination of President John F. Kennedy in 1963).

Upon activation, the virus displays the message: "Kennedy is dead — long live the Dead Kennedys," which relates to a former rock group from the San Francisco Bay area. These text strings can also be found in the code: "command.com," "The Dead Kennedys."

The Kennedy virus can cause several system problems that may result in a loss of data, including cross-linking of files, lost clusters and file allocation table errors.

The late bloomer of the bunch is Crazy Eddie, a memory-resident virus that activates on June 28 as well as on every Monday that falls on the 28th. On these dates it corrupts the system hard disk by overwriting it with characters from memory.

Crazy Eddie infects the hard disk partition table as well as COMMAND.COM, .COM and .EXE programs. The first time an infected program is executed, the virus infects the hard disk partition table. Once the partition table has been infected, Crazy Eddie will become memory-resident when the system is rebooted.

As with all viruses, these activation dates are for general awareness and are not exclusive. June is also peppered with many nondestructive nuisance viruses, according to officials at Fifth Generation Systems, Inc., a developer of utility and data security software in Baton Rouge, La. And remember to keep backing up those floppies.

WATCH

Viruses expected to activate in June

June 1,8,15,22,29 Ah, Kamasya, Demon	June 12,19,26 Italian Pest, Phenome, Migram
June 2 Victor, Flip, Tormentor	June 16 June 16th, Victor
June 4,11,18,25 Frere Jacques, Smack, Payday	June 13 Sunday, Monxla
June 5 Italian Pest, Phenome Migram, Frog's Alley	June 18 Skism, Form
June 6 Sunday, Jerusalem (Sub Zero B), Kennedy	June 20,27 Sunday
June 7,14,21,28 Garfield, Exterminator, Badguy	June 24 Form
June 9,16,23,30 Victor	June 25 Sub Zero
June 10,20,30 Day 10	June 28 Crazy Eddie

Source: PGS Virus Watch, Baton Rouge, La. CW Chart: Michael Siggins

Primavera offers Windows-based planner

By Michael Fitzgerald

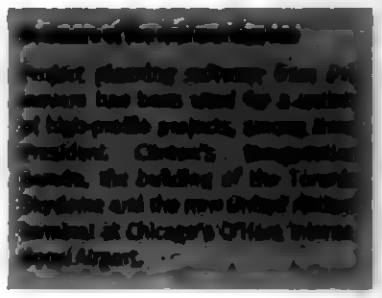
BALA CYNWYD, PA.

It took four and a half years, but Primavera Systems, Inc. has released a version of its high-end project management program for Microsoft Corp.'s Windows environment.

Primavera Project Planner for Windows combines Project Planner 5.1 for MS-DOS and Primavera's hourly scheduler, Finest Hour 5.1. The Windows version can share data with the DOS-based product, according to company officials.

"We think it offers a chance for people to look at their existing information in a very different way," said Richard K. Faris, Primavera's vice president of technical development.

Under Windows, Primavera Project Planner — or P4 — lets users attach graphical objects to a variety of layouts and to display data in bar charts, histograms and other forms. Multiple schedules can also be compared on-screen at the same time, and users can reportedly attach live graphics to the file, such as a diagram or a picture.



Faris said Primavera also took advantage of Windows to create extensive on-line Help files; for example, an animated tutorial assists users. Primavera estimated that its current users can be up to speed on P4 within two hours and that newer users will be slowed only by the time it takes them to learn principles of project management.

OS/2 no more

The Windows version took a long time to develop in part because the company initially developed it for IBM's OS/2. Primavera abandoned that effort, along with plans to develop project software for the Unix market and for Digital Equipment Corp. VAX systems.

"Unix and VAX project management markets are moribund," Faris asserted. He added that with Unix vendors readying an application programming interface to let Windows applications run under Unix, "we may never have to port from Windows."

Primavera Project Planner for Windows requires a 486-based PC with at least 8M bytes of random-access memory. The software costs $4,000.

PCs to get voice functions

By Stephen P. Kiett Jr.

Creative Labs, Inc., a leading vendor of PC sound and video boards, and Voice Processing Corp., a maker of speech recognition software, have teamed up to bring voice-enabled PCs into the home and business markets.

Creative Labs in Milpitas, Calif., has licensed Voice Processing's VProCommand technology to provide the software engine for its VoiceAssist speech-recognition system.

VoiceAssist allows Microsoft Corp. Windows users to execute voice-activated commands and includes 32 pretrained Windows commands to get users rolling. It supports an active vocabulary of 1,000 words for up to 30 applications for a total vocabulary of 30,000 words. VoiceAssist is shipping now with Creative Labs' Sound Blaster 16 audio expansion card for $279.

VProCommand is a desktop adaptation of Cambridge, Mass.-based Voice Processing's continuous voice-recognition technology for the telephony industry.

VoiceAssist is not meant to be the "Holy Grail of voice recognition systems," said Jeffrey Hill, vice president of product development at Voice Processing, "but rather an initial assault to get people used to the idea of talking to their computers."

Hill said Sound Blaster has an installed base of more than 3 million, and Creative Labs is shipping 120,000 cards a month, which represents a significant market for developers.

Based on Sound Blaster's widespread acceptance, analysts said, Creative Labs has the potential to do well with VoiceAssist. However, they questioned the practicality of VoiceAssist in the corporate marketplace because multimedia has yet to take off.

"In the short term, it's going to be a niche product," said Ted Julian, an analyst at International Data Corp. in Framingham, Mass. He said the product has good potential for disabled users and for users "who just want to do cool things with their PCs."

VoiceAssist supports DOS 3.3 and above, Windows 3.1 and OS/2 1.3 and above. A VoiceAssist application programming interface is available to developers of PC-based speech-recognition applications at no charge.

Bank enlists PCs

CONTINUED FROM PAGE 39

DAL software resides on the client while the rest resides on the server. Most Macintosh-to-host access in the past has been through terminal emulation. Prudential uses Fairfield Software, Inc.'s Clear Access to access the DB2 database.

Double-barreled gun

Management used a two-pronged approach to middleware, Rowan said. It chose DAL for connectivity to the DB2 data warehouse and Oracle's SQLNet to facilitate connectivity to the Oracle database. Once queries are constructed, they can be saved for later use or published on the network for others to use, he added.

Rowan noted that Acius, Inc.'s 4th Dimension and Microsoft Corp.'s Excel spreadsheet are important in manipulating the system because the user can freely analyze data and execute SQL queries to the data warehouse. "IS gives up micro control, but yields broader impact on the business," he added.

Six months after it was begun, the project was finished. Rowan said that users can now access data more directly, without the intervention of the IS department. The reporting backlog is a thing of the past.

Users can also examine the data in new ways, taking advantage of specialized reporting and analysis tools to strip away levels of data until they hit the mother lode of information they are looking for. Using the former system, data would need to be rekeyed into spreadsheets or other reporting tools to create a custom report.

In addition, the majority of the reporting function is handled by the users themselves, rather than by outside vendors. Estimated annual savings in reporting costs: $500,000.

Perhaps most importantly, Prudential is now ready to face the time-critical challenges of the financial market with a quick and muscular system. "Analysis was reduced from a normal one-week turnaround to under five minutes in some cases," Rowan said. "This is power."

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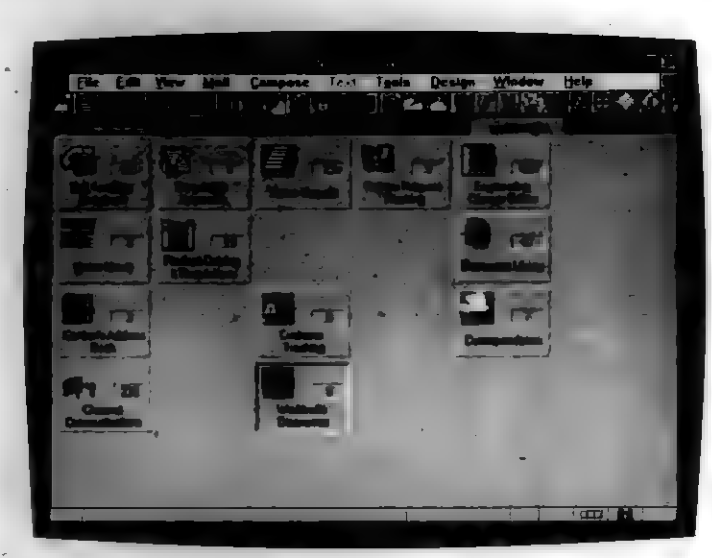
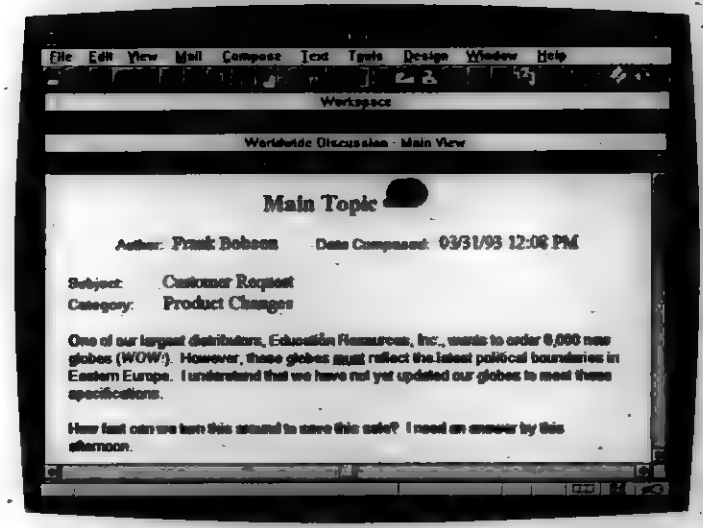
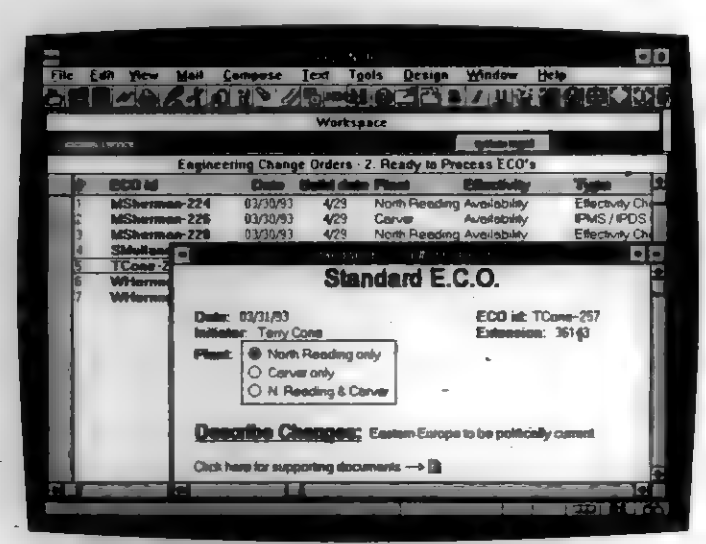


1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems worldwide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.



5. Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.

6. After lunch he opens a document from Ellen in product development, who has responded with the necessary changes, and scheduling information. The new art was scanned directly through Lotus Notes: Document Imaging from the art department. James approves the art for manufacturing.

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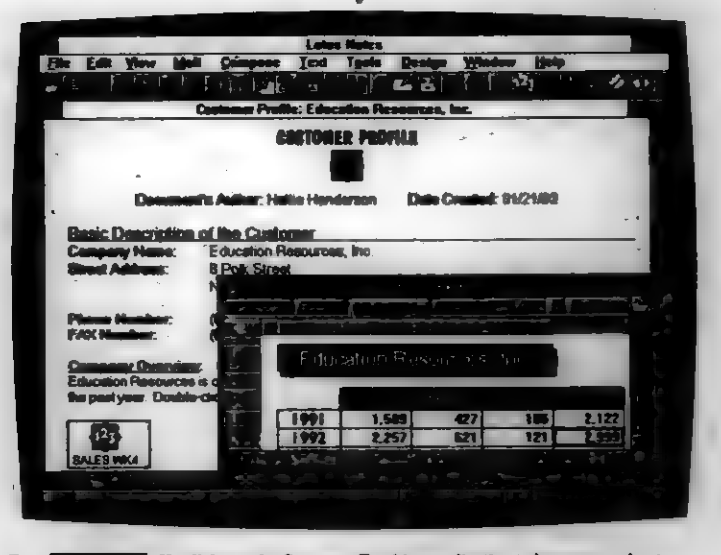
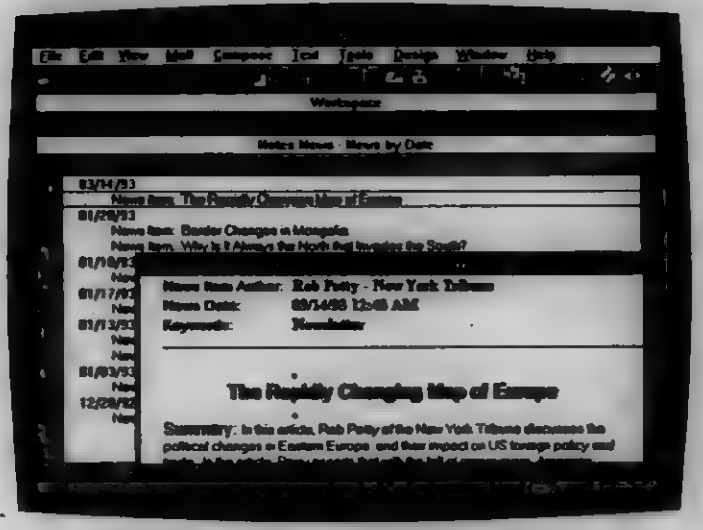
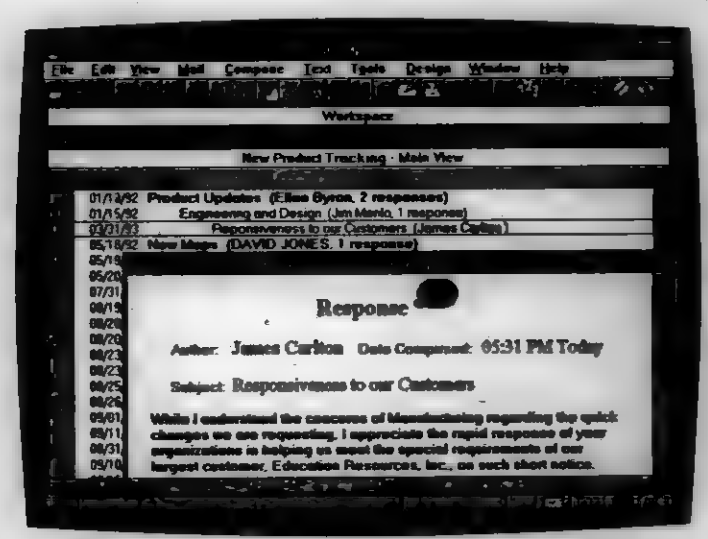


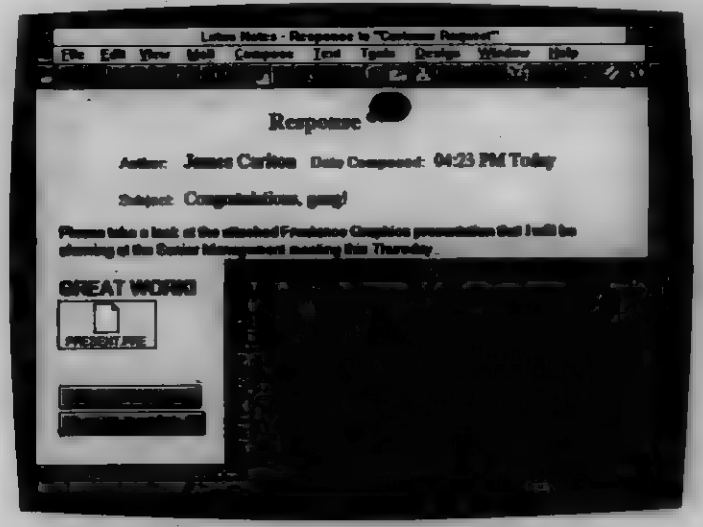
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database so everyone can see how the team rearranged the world to save a big account.

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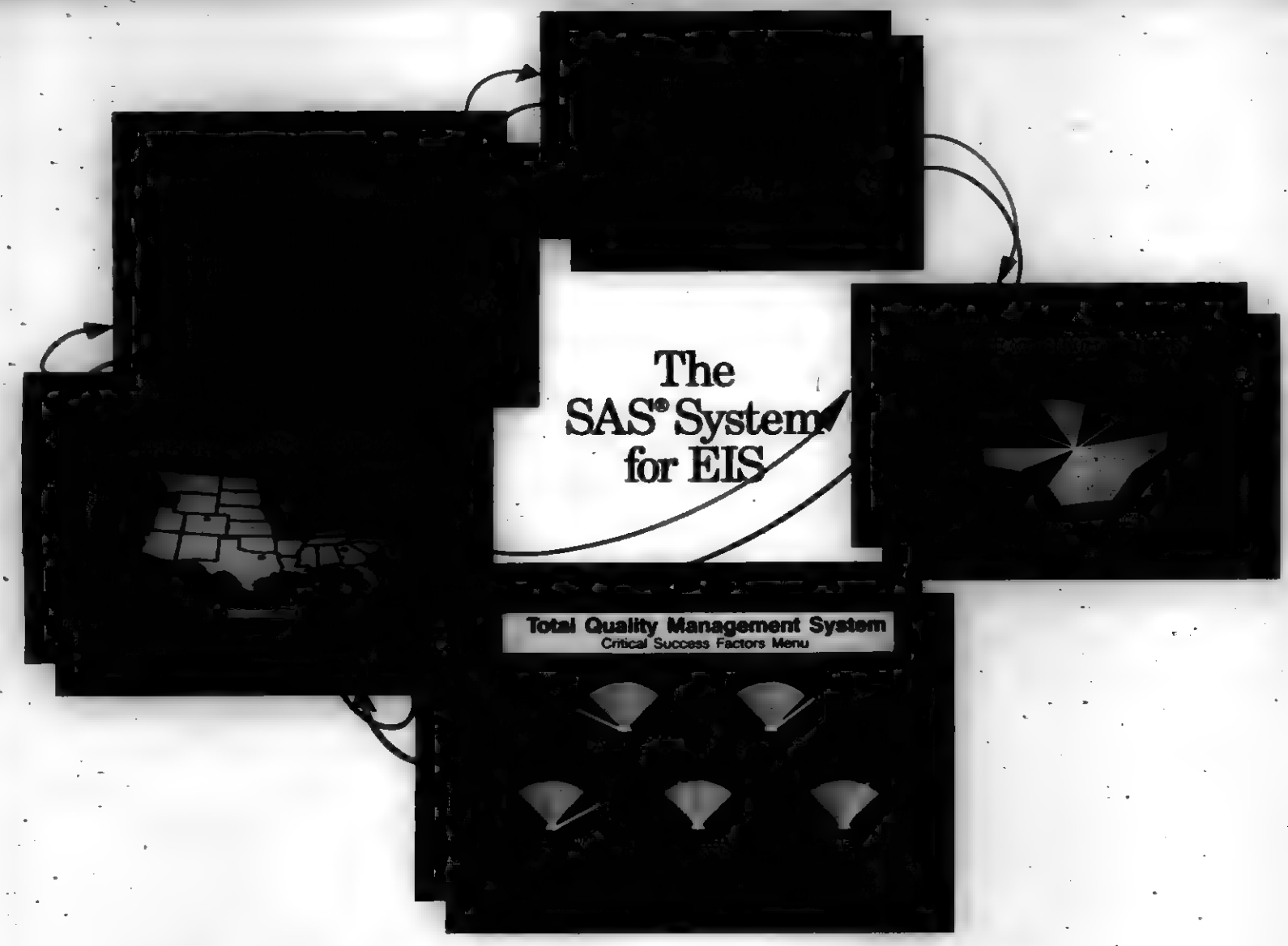

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Paul Gillin

NT great for some

Will Windows NT make the big time? It's becoming pretty obvious that, lacking serious bugs, it will be a slam-dunk winner on power users' desktops. Microsoft said 80% of the applications in the Sun Solaris catalog are already being ported to NT, and it pledged that the Top 200 Windows applications will run seamlessly on the new operating system. Can't argue with those numbers.

But what about the corporate server? Given Microsoft's spotty history there, I'd bet it's in for a long, slow haul. Consider these factors:

• Microsoft has had practically no success selling products that don't come out of a shrink-wrapped box. Its multiuser SQL Server database is an asterisk on the market share charts. LAN Manager was steamrolled by Novell's NetWare. Even Lotus is winning the E-mail wars. Complex products such as server operating systems require long sales cycles, relationship building and lots of negotiating.

Windows NT's scalability may be a paper tiger. Microsoft said corporate IS will flock to NT because it will run on everything from a PC to a mainframe. But scalable operating systems are nothing new and have never had a big competitive edge in the computer industry. VMS is scalable, but DEC never penetrated the mainframe data center or the desktop with it. Users haven't asked for mainframe NetWare or desktop MVS. Unix has made few inroads outside of workstations and minicomputers. So scalability has a lousy sales record.

What users want is a good set of application programming interfaces and middleware utilities that let them leverage their existing investments. Microsoft should concentrate on giving them that and working Windows NT into the computer mix over time. But don't expect users to throw their exist-

Gillin, *page 47*

DOS, Unix coexistence matures

DOS, Windows emulation just the beginning for running PC applications on Unix

By Christopher Lindquist

DOS and Microsoft Corp. Windows emulation software for Unix workstations has been around for years, but new approaches to running the thousands of PC applications under Unix are appearing.

There was a time when Unix users needing to run PC software had to procure an Intel Corp.-based machine and fill up more desk space. Then along came DOS and Windows emulation software that let them run their PC applications on the workstation — slowly. Now, as hardware performance and emulation software have improved, and with Windows applications flooding the market, the issue has turned more to *how* to run those applications.

Literal emulation is still the most common approach, with a "virtual DOS machine" being created in software for the application to run on. Such emulation is available in products from several companies, including Mountain View, Calif.-based Insignia Solutions, Inc. in SoftPC, as well as several Unix workstation and software vendors. These include SunSoft, Inc. in Solaris, Novell, Inc. in UnixWare and IBM in the RISC System/6000's AIX.

But while that process of emulation has improved with advances in hardware and software, it still has some limitations, according to users. One user familiar with several emulation packages said implementations of Insignia's SoftPC vary greatly from vendor to vendor and graphics performance can be slow. "But the biggest use of products like SoftPC is for those people who need to do both 'real' engineering and office automation stuff," he said. He added that users then find the native Unix office automation applications to be of lesser quality than their DOS and Windows counterparts. For those users, the trade-off in performance may be acceptable.

However, new approaches to running PC software, particularly Windows packages, on Unix are on the horizon. Sun Microsystems, Inc. has announced plans for the Windows Application Binary Interface (WABI), which would allow Windows applications to run as native Unix programs by "cloning" the Windows application programming interface (API) on Unix. Meanwhile, Microsoft has partnered with Insignia and granted it access to Windows source code, thereby giving the company an advantage in emulation and a head start in creating a counter-WABI technology.

Such API-level emulation would be faster than standard emulation, as it would no longer require the creation of an entire virtual PC. Instead, the Windows application would make API calls as necessary, and those would be mapped to Unix functions.

Sun's approach could have another effect — the wresting of some Windows API control from Microsoft. "If [Sun] can re-create the API, that has the effect of weakening Microsoft," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

In theory, once Sun had sufficient users running Windows applications on WABI, Microsoft would be less likely to change the Windows API and risk offending an installed base of Windows product users.

Indeed, Sun Chief Executive Officer Scott McNealy has called for the creation of a Public Windows Interface that would limit some of Microsoft's control of the API.

But Sun has far to go, according to Microsoft. Paul Maritz, senior vice president of systems software at Microsoft, said Sun is underestimating the size of its endeavor. "It's expensive to be in the cloning business," he said.

Even if Sun or Insignia does succeed in allowing Windows software to run on Unix at the API level, that is not the end of the story. While the approach would be faster, it still would not be as fast as running a ground-up Unix application on Unix. Nor are the approaches likely to allow Windows applications to take full advantage of all the features of the various Unix operating systems, such as the graphics libraries supplied by Silicon Graphics, Inc.

Emulation software, *page 47*

Colliding worlds

DOS AND WINDOWS EMULATION PACKAGES ON UNIX WORKSTATIONS ELIMINATE THE NEED TO HAVE TWO MACHINES ON A USER'S DESK. SEVERAL APPROACHES EXIST:

Company	Product	How it works
		Available on several platforms, including Hewlett-Packard Co. and Intel, Inc.
		Runs DOS Version 3.3 programs on RISC System/6000 workstations
		Runs DOS applications under Unix System V

*Under development

VXM Technologies software divvies up chores among Unix, NT systems

By Elisabeth Horwitt
BOSTON

A small software vendor has designed a package to facilitate the distribution of downsized work loads across a mixed bag of Unix and Microsoft Corp. Windows NT systems.

VXM Technologies, Inc. recently announced Pax-2 Res, the newest member of its Soft Mainframe family for load-balancing batch jobs across distributed, networked systems.

The software family, which includes VXM's existing Balans product, can automatically allocate jobs to CPUs sitting idle on a network or balance the work load across a group of networked servers, said VXM President Franco Vitaliano.

Focus on fairness

Pax-2 Res implements these capabilities so all job requests are sent to a centralized server, which matches requests with available resources and enforces fairness. This procedure prevents one user from bogging all CPU resources with one huge job, Vitaliano said.

The centralized administration feature makes Pax-2 Res particularly suitable for companies that are downsizing applications from mainframes, Vitaliano said.

Such companies will likely want to "know where the scheduler is and where each resource is" for security and administrative purposes, he said. "They may not like the idea of having jobs anywhere and everywhere."

Previous VXM products distributed scheduling tasks across multiple systems.

These environments need not be modified to support Pax-2 Res.

Pax-2 Res reportedly can also distribute "make" files, which convert source code to binary format, across multiple machines. This cuts the time it takes to do major conversion jobs, according to Vitaliano.

Pax-2 Res is available for the following platforms: Sun Microsystems, Inc.'s Scalable Processor Architecture SunOS 4.1.X, IBM's RISC System/6000 AIX and Silicon Graphics, Inc.'s Iris. Versions for Hewlett-Packard Co.'s HP/UX and Digital Equipment Corp.'s Alpha running Windows NT are due soon. The software will run as is in these environments.

The product is priced at $6,900 for a 50-client node license and at $9,500 for an unlimited client site license.

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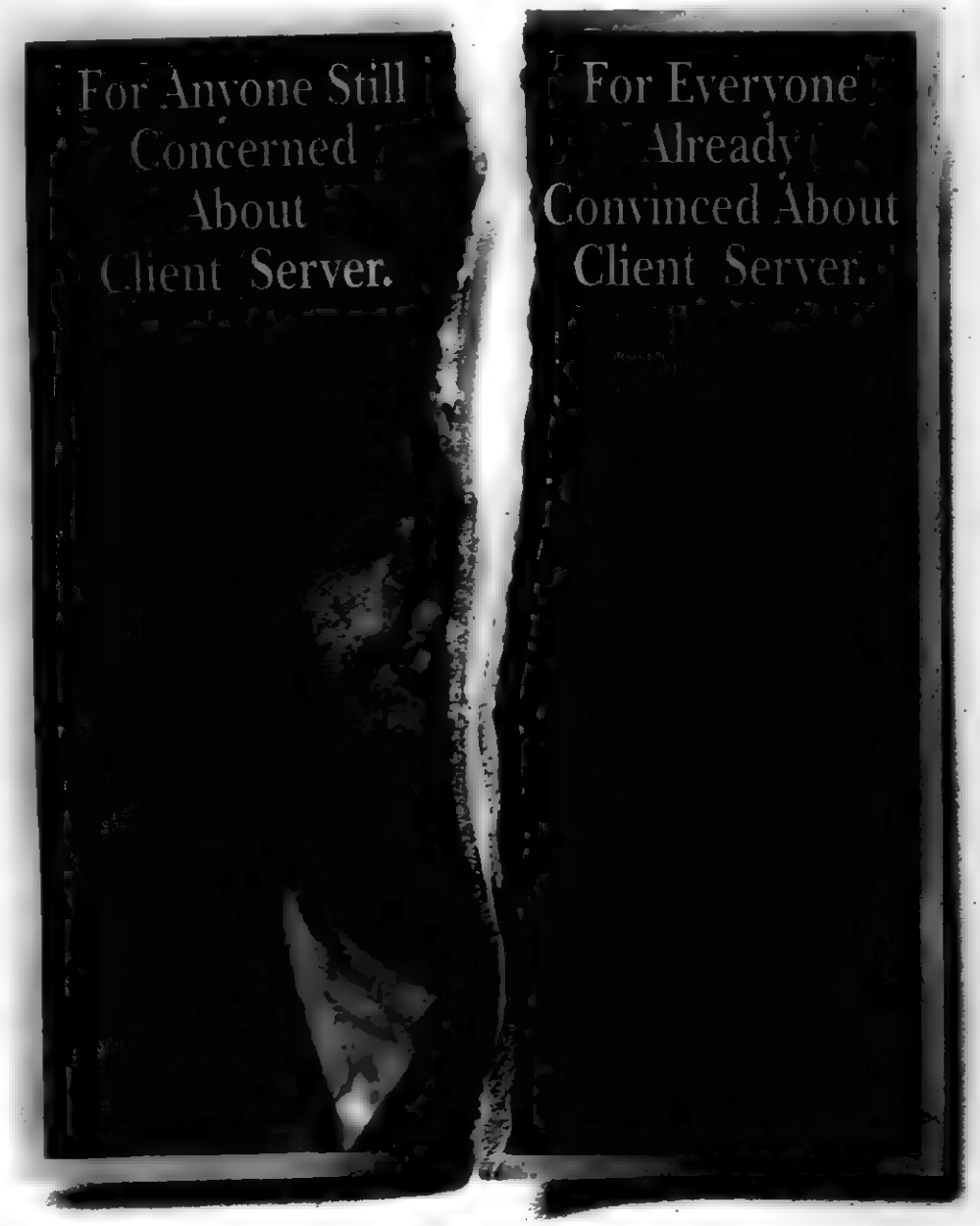

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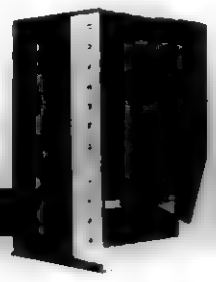

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Client/server

Server makers pushing mainframers to downsize

By Kim S. Nash

Server makers hope to entice wary mainframe users to downsize applications to networked servers by building in systems administration and other management features common in the big iron world.

New machines from Wyse Technology, Inc. and Auspex Systems, Inc., for example, sport improved on-line backup, capacity planning capabilities and other basics for moving large amounts of data to many users.

Observers — and even vendors — acknowledge that downsizing will not take hold in most shops until mainframe users are comfortable with the fact that systems management and other utilities to which they are accustomed will be ready for prime time in a client/server environment.

Sales across the server arena may have fallen short of expectations set a few years ago because potential users have been cautious about wholesale downsizing projects, they said.

"Customers don't want to move [applications off a mainframe] unless they know they will still have strong data management," said Dave Becker, manager of server product marketing at Wyse.

Even at sites where client/server architectures live, users have often elected to use off-the-shelf distributed applications that can accommodate mainframes as servers, such as human resources programs from PeopleSoft, Inc. and Dun & Bradstreet Software [CW, May 24].

To address users' concerns about the reliability and strength of servers as anchors for large distributed applications, Wyse, for example, recently built several security features typically found on multiprocessing servers into its new single-processor Decision 486SE model. Decision 486SE includes password-protected booting and chassis locks, the San Jose, Calif., company said.

On the high end, Auspex's NS 6000 NetServer lets users dedicate different CPUs for various functions. For example, the system supports up to four Ethernet processors, two file servers and three storage processors. Auspex, in Santa Clara, Calif., plans to deliver the NS 6000 late this year.

Profitably Positive

Plymouth, Minn.-based Tricord Systems, Inc. is due to announce a line of servers running Intel Corp.'s Pentium processor this month, according to Mark Garver, vice president of corporate strategies. The PowerFrame ES5/100 enterprise server, announced last month, rounds out the company's high-end line. Tricord is expected to receive "at least 100" Pentium chips from Intel this quarter and an undetermined number in the fourth quarter, Garver said.

Emulation software

CONTINUED FROM PAGE 45

For that to occur, applications will have to be built not to be emulated but to actually be ported to various platforms, according to Jeff Elpern, vice president of sales and marketing at Machine Independent Software Corp. in San Francisco. Elpern's company is developing a code library for Windows developers that will allow them to write Windows code, then recompile it to run on Unix with little or no performance loss, letting the application compete on an equal footing with native Unix programs.

Elpern said this strategy will not allow current Windows applications to run unmodified on Unix, but he noted that several vendors, including KnowledgeWare, Inc., are beginning to employ cross-platform development strategies to save time and money when creating software for multiple environments.

Also, Elpern said, his company will be far from alone in the arena. Eventually, most software vendors will implement cross-platform development of some kind to stay competitive. "We think everybody will pursue a strategy in this category," he said. "These technologies will kill all Unix-only applications."

No substitutes for DOS

While users said the prospect of running Windows applications faster on their Unix workstations was appealing, they predicted that Sun's forthcoming WABI product would not reduce the need for DOS emulation.

"We are anxiously anticipating WABI," said Harry Perrin, vice president of investment systems at the Teachers Insurance Annuity Association in New York. "If it performs as advertised, we're very interested in using it."

Perrin said WABI is appealing because it was designed to let users run the latest releases of mainstream Windows programs, such as Lotus Development Corp.'s 1-2-3, without having to wait for a Unix port, which can take up to two years.

But, Perrin said, his unit needs to run several DOS applications for which there are no Unix equivalents, such as Software Publishing Corp.'s Harvard Graphics and Lotus' Freelance, as well as commercial real estate applications that do not have enough mass market appeal to merit a Unix port.

To run these applications, Teachers Insurance has roughly 120 licenses for Insignia's SoftPC DOS emulation software. Perrin said his unit was one of the first beta-test users of SoftPC and has been using it for more than two years with great success.

Perrin said he has yet to find a DOS application that cannot run on Unix via SoftPC.

The only real complaint that users of his unit have voiced, Perrin said, was that graphics-intensive applications tend to run too slowly. To solve this problem, Perrin upgraded those users who needed to run Freelance often to SPARCstation 1s.

Perrin is also evaluating Sun's version of SoftPC, called SunPC, which dramatically increases the performance of DOS applications when paired with Sun's Intel Corp. 486-based Sbus accelerator board. However, while the board offers great performance for a power user, Perrin said he does not anticipate "buying more than a handful of them due to their significant expense."

While Teachers Insurance is happy overall with the performance of SoftPC, Perrin said he would like to be able to log on to Novell NetWare servers through a DOS window on a Unix workstation.

—Stephen P. Holt Jr.

Gillin

CONTINUED FROM PAGE 45

ing stuff out just to achieve scalability.

• Novell will pull out all the stops to defend its position in LAN servers, and it will have massive industry support in doing so. Microsoft hopes to feast on the base of NetWare v3.11 with its Advanced Server version of NT, which will boast advanced security and auditing features, TCP/IP connectivity and available SNA services.

Furthermore, Microsoft claimed the base version of NT will have more networking built into it than NetWare v3.11. That sounds pretty attractive, but running up the steep slope of Novell market share will require more than just snazzy products. NetWare is nearly as entrenched in corporate America as DOS/Windows, and Novell has a lot more experience dealing with the networking needs of corporate IS managers.

Don't forget Novell's all-American image. In an industry that sees Microsoft's quest for dominance as an unnerving throwback to IBM's reign in the 1970s, Novell is winning a lot of fans just for being anti-Microsoft. That won't stop developers from writing for Windows NT if they can make money at it, but in an either/or decision, the question of which they're most comfortable with will.

For NT Advanced Server to displace NetWare, it must demonstrate complete compatibility with the Novell product while offering significant added value. Given that NetWare is a moving target and Novell has its own enterprisewide irons in the fire, that's going to be a tricky task for Microsoft. Not impossible, but difficult.

• Microsoft still has a lot of work to do to gain support from the major workstation and data center hardware vendors. Those vendors that have endorsed NT or are likely to endorse it — such as DEC, Sequent and HP — are hedging their bets by off-setting Unix strategies. Sun and IBM will give in only if their backs are to the wall. So the mid-range and large systems markets are no slam dunk for Microsoft.

Meanwhile, the Unix community is at last coming together. Microsoft executives dismiss the Common Open Software Environment initiative as being too little too late, but don't be so sure. Unix has lots of loyal adherents and a large installed base. Novell's purchase of Unix System Laboratories has brought needed stability to the Unix community. This market will take years to settle down, testing every ounce of Microsoft's vaunted patience.

NT will be a huge success on the high-end Intel desktop and will move quickly into the mainstream during the next three years as hardware price/performance improves. If the code is clean and the applications come, it will relegate OS/2 to the low-end desktop and halt any momentum Unix has built in the Intel market. It'll probably hold its own in the RISC workstation business, too.

But get ready for a wild ride in the enterprise where all bets are off and the only sure thing is that users will have more choices than ever by this time next year.

Gillin is Computerworld's executive editor. His MCI Mail address is 575-4139.

E-mail from the top down

E-mail designed for both mainframes and LANs eases user frustrations

By Lynda Radosevich

While electronic mail for networked PCs is the rage, using it on an enterprise level poses some daunting managerial challenges for mixed mainframe/local-area network shops.

These include making sure the user directories on different networks are available to each population of users and keeping the directories updated. In addition, information systems departments have to drum up the expertise required to maintain different E-mail systems and the gateways that connect LAN- and host-based mail.

Some companies have circumvented these headaches with a top-down approach, which involves implementing an E-mail system that runs on large systems and desktop computers alike.

For example, some are using a mainframe-based E-mail package from Fischer International Systems Corp. in Naples, Fla. Called Emc2/TAO, or Electronic Mail Communication Center/Totally Automated Office, the system houses the E-mail server on an IBM mainframe or Application System/400 and supports clients on mainframes, AS/400s or PCs.

Mix and match

Users can adopt any combination of client and server platforms, a mix-and-match configuration that enticed some users, including Consolidated Rail Corp. (Conrail) and Super Value, Inc., away from LAN-based E-mail.

For example, Rich Kenney, a self-proclaimed PC bigot and manager of office systems at Conrail in Philadelphia, was charged last year with updating a homegrown E-mail system based on IBM's CICS and designing a method to move electronic documents around the company. CICS is a transaction-oriented database/data communications system for mainframes.

Fischer's Emc2/TAO splits E-mail into server and client software. Server software runs on IBM mainframes (MVS, VM and VSE), the AS/400 or OS/2-based PCs. Client software runs on mainframe platforms (under CICS, CMS and VTAM), the AS/400 and MS-DOS- or Windows-based PCs. Client software for Apple System 7, various Unix platforms and OS/2 are expected to ship next quarter, according to Fischer.

In the midst of this project, Conrail, which has 25,000 employees and roughly 7,000 E-mail users, was integrating LANs into its company-wide computing environment. At the time, "I wasn't impressed with mainframe companies' grasp of PC concepts," Kenney said.

Goodbye to gateways

However, after looking at Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s LAN-based package, Kenney and a company advisory group chose Fischer's Emc2/TAO because it allows the railway's PC networks running Novell, Inc. NetWare to exchange mail with the IBM 3090-600 mainframe without gateways. More importantly, resources such as the directory database and fax gateways are centralized on the mainframe but are accessible to all platforms, Kenney said.

"This helps keep the architecture simple and our administrative costs down," he noted. Additionally, the Fischer software included calendaring and scheduling across the different hardware platforms.

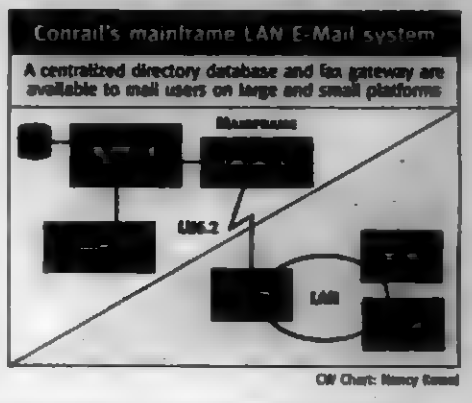
The biggest challenge in installing the Fischer system was replicating specialized functions, such as customized print commands, that had been developed in-house, Kenney said.

Now the railroad is in the process of upgrading PCs to the Microsoft Windows operating environment. Kenney said the Windows-based Emc2/TAO client software is helping employees make the transition to Windows' graphical interface because "the application is familiar and some of the keystrokes are the same."

However, the mainframe might not host the company's E-mail system indefinitely. "We're evaluating every piece of the IS structure. The mainframe will be the E-mail server and host the directory database now, but that may change over time," Kenney said.

For Super Value, a grocery wholesaler based in Minneapolis, the objective of installing a new E-mail system last year was to supplement electronic data interchange systems and allow departments to send mail and faxes both internally and to other organizations.

Super Value has 35 distribution centers that service 5,000 supermarkets throughout the country. The grocer picked Fischer's mainframe-based E-mail server largely because all the employees already had 3270 terminals or PC emulation software. This meant the company could launch its new E-mail system without shelling out money for new hardware platforms.



CW Chart: Nancy Gaudi

"We got into strategic E-mail applications for around $40,000," said Bernie Grutsch, director of buying systems and inventory control. "Plus we liked the single directory" feature. Emc2/TAO also has LAN-like features such as spell-checking and file foldering. Additionally, it has plug-in fax functionality, Grutsch said.

Super Value is using the mail system for critical applications such as automatically updating 700 remote buyers each day on pricing for commodities. Next, the wholesaler plans to add work-flow capabilities to E-mail "for all those forms that require sequential review," Grutsch added. The company is evaluating work-flow software from Fischer.

"Originally, I saw mainframe E-mail as a short-term fix, but now I don't know," said Grutsch, who added that he is surprised at the options available on the mainframe server platform.

Dropped Series/1 users turn to third parties to fill void

By Elisabeth Horwitt

When IBM quit manufacturing and supporting its Series/1 communications controller, the company largely left it up to users to figure out a migration path to another platform.

The main challenge facing users in this endeavor is that the Series/1 has no real equivalent on the market today — from IBM or any other company, said Steve J. Jackowski, president of systems integrator and software vendor Syzygy Communications, Inc., in Scotts Valley, Calif.

This is because IBM designed the Series/1 as a specialized computer system equally suitable for reading plant floor process instrumentation data, controlling conveyor lines or acting as a communications controller for automated teller machines. But today's users are not looking for yet another proprietary box, no matter how specialized, to replace the Series/1.

"Even if IBM had said, 'Here's a replacement [hardware platform],' people might not have bought it .... They wanted a more open system," said Barry Pearlman, a vice president at VisaNet Engineering, a division of Visa International, Inc. in San Francisco.

Helping hand

Fortunately, most corporations can now find a third-party product or service to meet their Series/1 migration needs. Participating vendors include Cipher Systems, Inc. in North Plains, Ore., Computer Information Enterprises in Tustin, Calif., and DataTrend, Inc. in Eden Prairie, Minn.

R.I.P.

IBM shipped more than 100,000 Series/1 machines worldwide between 1976 and July 1991, when it stopped manufacturing the product. IBM estimates that approximately half of those are still installed.

Companies' needs vary widely, depending on the complexity of applications running on the communications processors, the Series/1 operating system in use and financial and programming resources.

In some ways, the simplest strategy is to rewrite applications to the platform of choice, which is what Visa did. Luckily, the company was already using both Series/1s and IBM PC ATs for access points that enable banks and other customers to reach VisaNet settlement and authorization services, Pearlman said. The company just moved to IBM Personal System/2s.

"We've been very fortunate"

Series/1, *page 53*

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Series/1 users turn to third parties

CONTINUED FROM PAGE 49

that moving over to PC ATs and then to PS/2s caused very little impact to the network or the host systems, Peartman said. "We had a dual configuration for reliability, so we could pop in a PS/2, make sure it was working, then pop out the Series/1."

However, this strategy is not feasible for companies whose Series/1s run large, complex applications. Payless Drug Stores in Wilsonville, Ore., for example, "briefly considered rewriting our applications, but we're talking hundreds of thousands of lines of code and umpteen thousands of dollars," said Gary Smith, a systems analyst.

Payless instead hired Cipher Systems to port Series/1 applications to Intel Corp. 80286- and 80386-based PC platforms, using an enhanced version of Computer Information Enterprises' Hummingbird. Hummingbird is a portable version of the Series/1 operating system, EDX, which runs on standard PC platforms, including IBM PC clones.

Cipher offers HBX, an enhanced version of Hummingbird that runs on Intel 80386 and 1486 platforms, as well as on Micro Channel Architecture-based PCs.

Portable EDX versions enable users to move their applications to standard PC platforms without the expense of code conversion or rewriting of applications.

However, some companies may avoid porting operating systems because it requires their information systems departments to continue supporting a proprietary environment. "Programmers [for the Series/1] are scarce," one user said.

Also, some 30% of Series/1 installations use proprietary operating systems that IBM introduced prior to EDX and that are not portable to standard PC platforms, a Cipher spokesman noted.

For such companies, DataTrend offers two options. One is conversion of Event Driven Language (EDL), the proprietary Series/1 language, to C, running on AIX. The cost is $500 to $5,000 per CPU, depending on the complexity and size of the code. The service takes three to six months.

"If the applications are doing a good job, it's better to convert, because otherwise you have to retrain people on producing new reports and screens," DataTrend President Mark Waldrep said.

A slightly less expensive migration option from DataTrend is having the vendor translate only the "convertible" aspects of EDL — about 70% to 80% of the source code — and leaving it up to internal programmers to handle those parts of the code that do not have a one-to-one correlation with C.

DataTrend also provides software that enables an IBM RISC System/6000 running AIX or an IBM PS/2 running OS/2 to emulate a Series/1. This option is less expensive and time-consuming than conversion but does require the user to continue maintaining the Series/1 proprietary programming language and applications indefinitely.

Series/1 users

What people are doing with their old Series/1s:

- Harry Pearlman, vice president, VisaNet Engineering: "They're making breakwaters out of them; we're recycling the cabinets to repackage PS/2s. They have some value, but it's marginal."
- Jeff Scheff, manager of store systems, Giant Food, Inc.: "We're recycling some in our warehouses for attendance [tracking] until we catch up" to those sites with an ongoing strategy to convert to RS/6000s running C.
- Gary Smith, systems analyst, Payless Drug Stores: "Anyone in the market for a boat anchor?

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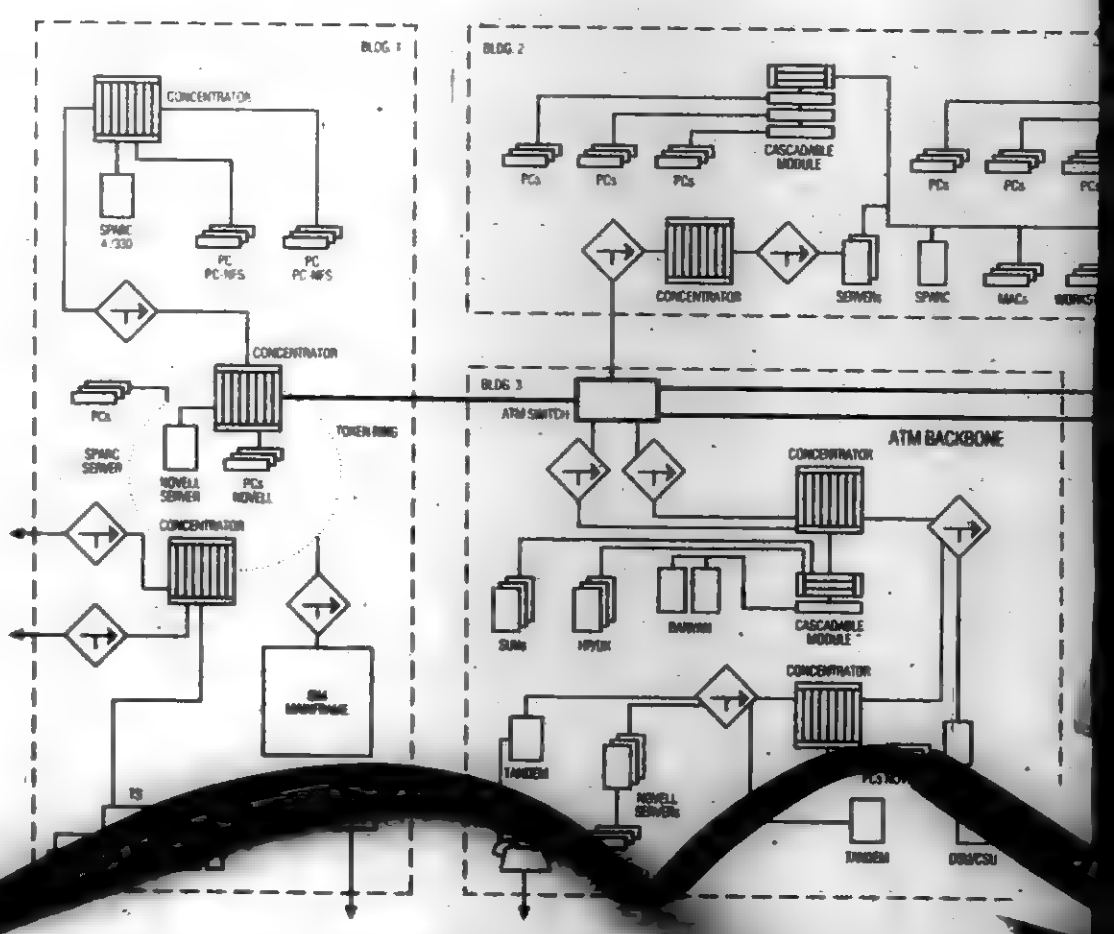

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[redacted]

Electronic data interchange

Sterling Software, Inc. has introduced the Sterling Commerce Connection, an electronic commerce product.

The product offers integrated access to a variety of data networking services such as electronic data interchange (EDI) transactions, file transfer, electronic-mail messages and electronic catalogs and libraries.

Commerce Connection for the PC is desktop software that offers EDI and full E-mail and library service capabilities. The Commerce Connection E-Mail Service is an add-on module that provides interpersonal messaging services such as user-based E-mail administration, access to other public E-mail systems and distribution list creation.

An EDI PC package of Commerce Connection costs $2,000. The E-mail service module costs $200.

▶ *Sterling Software*
4600 Lakehurst Court
Dublin, Ohio 43017
(614) 793-7000

Texas Instruments, Inc. has added Desktop EDI and Unix EDI to its line of electronic data interchange (EDI) products. The standards-based software supports the ANSI X12 standard and Un/EDIfact.

Desktop EDI and Unix EDI provide Gateway, an integrated communications manager that supplies unattended autodial capabilities and controls linkage to major communications protocols. An EDI Translator that converts data transmission formats into computer document formats and vice versa is provided, the company said.

Desktop EDI prices start at $4,000; Unix EDI prices begin at $50,000.

▶ *Texas Instruments*
6550 Chase Oaks Blvd.
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Fax

Incotel, Inc. has introduced an IMX-entry-level fax and messaging system.

The IMX-Elf consists of hardware and software that integrates advanced fax and messaging capabilities throughout an organization. It is compatible with Group 3 fax machines. Users receive an assigned identification code and password and an assigned mailbox to receive faxes.

Other features include automatic retry and alternate routing and the ability to specify document delivery time.

A complete turnkey system costs $75,000.

▶ *Incotel*
5 Penn Plaza
New York, N.Y. 10001
(212) 594-8340

Micro-to-host

Digital Communications Associates, Inc. (DCA) has announced Version 2.1.2 of the Irma Workstation for Windows, PC-to-mainframe software.

This version includes client support for the Systems Network Architecture local-area network gateway from Eicon Technology Corp. and DCA's Select Communications Server.

According to the company, it also enables PCs to access gateways such as Novell, Inc.'s NetWare for SAA and DCA's IrmaLAN/EP.

Any Transmission Control Protocol/Internet Protocol stack that conforms to Microsoft Corp.'s Winsock application programming interface can be supported, the company said.

Prices range from $495 to $19,495.

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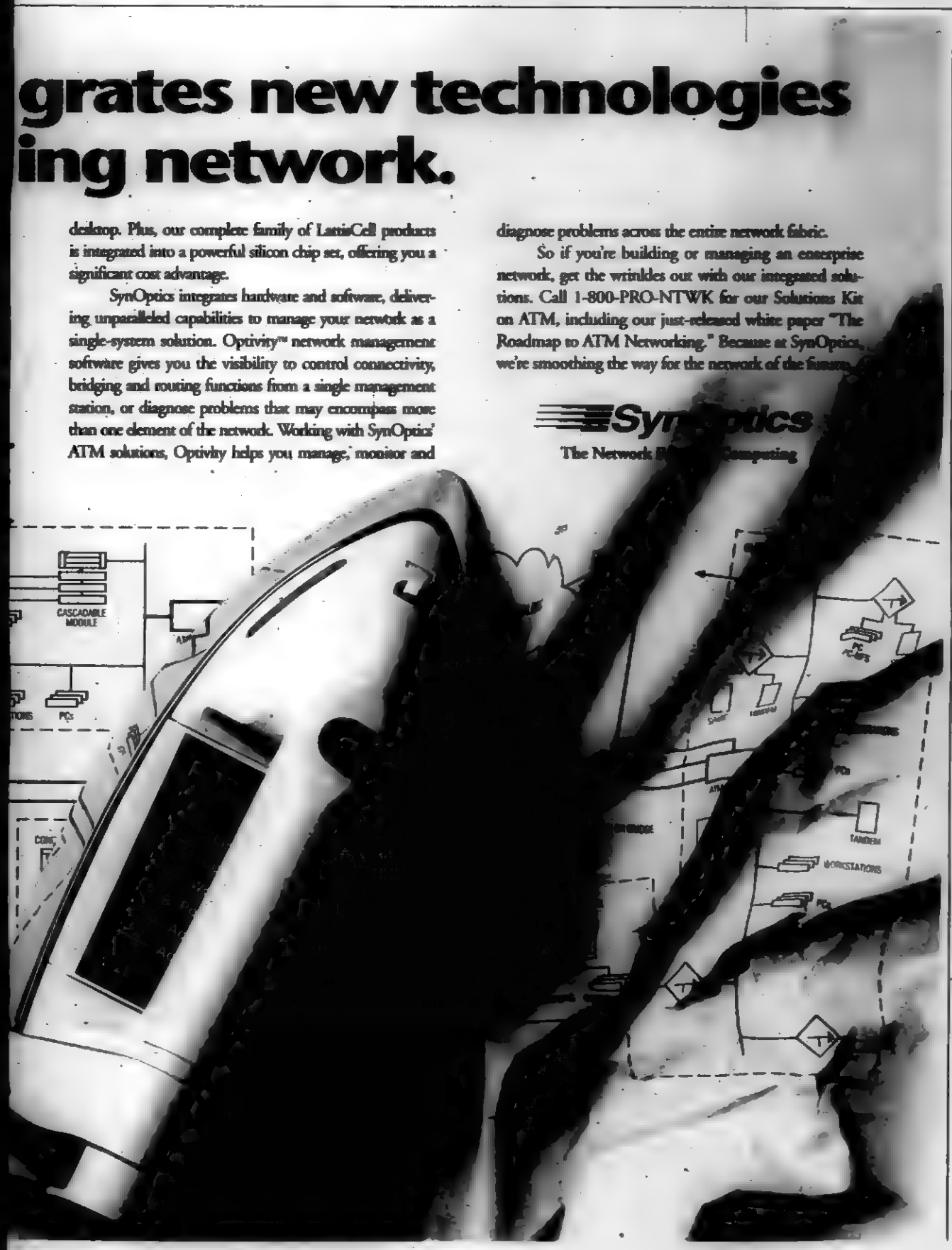

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While other mainframe disk companies have been slow to deliver high data availability, the new Symmetrix 5500 ICDA™ from EMC now brings the unbeatable combination of superior performance and continuous operation to high-end mainframe computing. What's more, EMC is shipping this product today.

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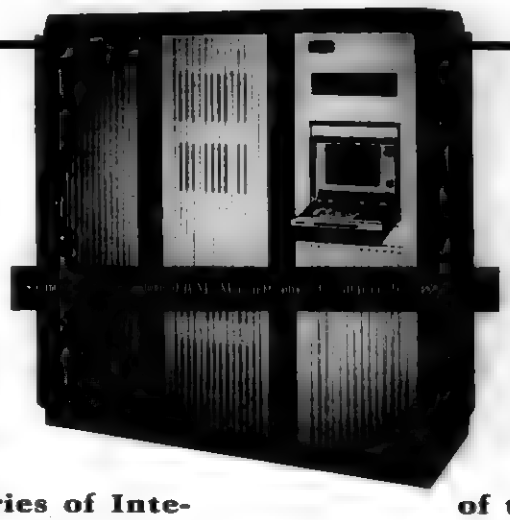
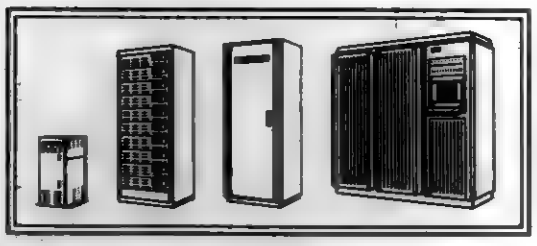


The Symmetrix 5500 is the latest evolution of the high performance Symmetrix Series of Integrated Cached Disk Arrays (ICDA™), and was designed for IBM and compatible mainframe sites that need continuous operation – 24 hours a day, seven days a week. With redundant hardware components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime, the Symmetrix 5500 offers the highest level of data availability you can find in the market today.



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

And, the Symmetrix 5500 incorporates the high performance, small footprint and low cost of ownership that has become the hallmark of the Symmetrix Series. Over 1,000 Symmetrix installations worldwide are proof of the widespread acceptance of Symmetrix ICDA™ technology.

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Mainframe operating systems

Will VM 2.1 draw users?

By Johanna Ambrosio
WHITE PLAINS, N.Y.

IBM hopes the newest release of its VM operating system, Release 2.1, announced earlier this month, will entice even more customers to convert to its Extended Storage Architecture (ESA).

Thus far, only about 30% of the VM customer base has moved to ESA, even though VM/ESA has been available since March 1991, according to Charles Lickel, VM product manager at IBM's programming laboratory in Endicott, N.Y. Before that, there were three VM versions on the market.

If the new release of VM/ESA does not persuade customers, the fact that IBM will stop providing service on some of the older VM versions in December may push them to make the move. The other older VM versions go out of service in June 1994. "By the end of 1993, we expect 50% of the customer base to be on ESA," Lickel said.

One user that will update VM this year is Kelly, Douglas & Co., a $3 billion food wholesaler in Vancouver, British Columbia. The major driving factor, said Doug Hirschfeld, information systems vice president, is the move into client/server applications where the mainframe will function as a server and OS/2 workstations as the clients.

"Doing program-to-program communications with VM in its older forms is very complex," Hirschfeld said. "And the older VM versions will no longer be supported, anyway."

Although Kelly Douglas will move from VM/XA 2.1 to a more current version of the operating system, one thing the company will keep is its tried-and-true Professional Office System (Profs)/VM application.

"IBM moved everyone to OfficeVision/VM, but that has a maintenance fee, where Profs didn't," Hirschfeld explained. "So I've kept Profs, and it runs just fine under VM/ESA."

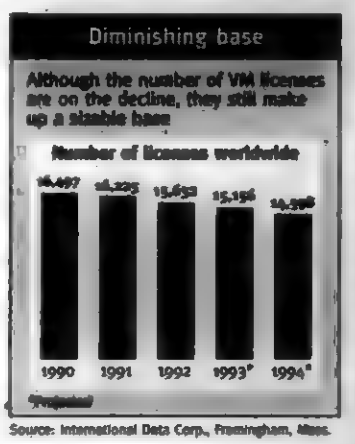
Like many other users, Hirschfeld runs VM with another IBM operating system, VSE. Lickel said about 30% of MVS customers also run VM, and about half of VSE customers run VM.

"VM plays in two areas: as a 'Hypervisor,' where you can test a new release of MVS or VSE and put it through its paces, and as an interactive operating system for applications and development," Lickel said. In addition to office applications, other popular VM uses include technical design, decision support and technical computing.

Since making the move to IBM's Client/Server unit in November 1992, the Endicott laboratory has also begun working directly with customers. About two dozen engagements have been completed so far, said laboratory director Leslie Wilkes, which include helping users convert to newer versions of VM and doing client/server projects. About half the laboratory's 900 programmers work on VM; the other half work on client/server products.

Despite the business, which Wilkes characterized as "very healthy," there is an early-retirement program under way at the Endicott laboratory that should be completed by July. Wilkes said she is not sure how many programmers will retire.

Still, VM is a $5 billion business annually when hardware and software are added up, according to Gartner Group, Inc. analyst William Malik. "Other operating systems may be more exciting because they're newer, but that's like saying my heart is boring because it keeps beating," Malik said.



Source: International Data Corp., Framingham, Mass.

Virtual extensions

VM Release 2.1 sports an easier install program, which speeds implementation of the operating system, according to Charles Lickel, VM product manager at IBM. Other features include the following:

- Support for "virtual" disks, allowing users to store data in short-term memory. The exact amount that can be stored depends on the amount of memory the customer's machine has, Lickel said.
- Enhancements to Shared File System and multitasking and support for a new release of VSAM.
- Support for the new Model 9 disk drives that another IBM unit, Adstar, announced last week, plus other new Adstar products.
- Future releases of VM that will be introduced in nine-month cycles, Lickel said, vs. the year or longer waits to which customers have been accustomed.
- The ability of VM to run on the new generation of parallel-processing mainframes that IBM is now developing, although Lickel would not commit to a ship date.
- Standards within VM, including Posix and the Open Software Foundation's Distributed Computing Environment.

—Johanna Ambrosio

Utility moves ahead with $10M redesign

By Rosemary Cafasso
SAN FRANCISCO

In 1992, the information systems group at Pacific Gas Transmission (PGT), a subsidiary of Pacific Gas & Electric Co., decided to cast aside its traditional IBM Application System/400 host-based operation.

Not that the AS/400 itself was going away. It was just that the system would no longer be the focus of the IS group's mission.

"The management view is that technology could and should provide flexibility for new organizational structures and project teams, as opposed to [providing] a militaristic, hierarchical structure," said Larry Levitt, manager of computer services.

PGT, which provides natural gas to customers in California and the Pacific Northwest, is now in the early stages of a multiyear, $10 million reengineering plan that will provide a long list of new functions — such as easier data access and workgroup technology — and shed the centralized computing function.

Phase one is under way now and includes linking 15 departmental local-area networks — a mix of Novell, Inc. and Banyan Systems, Inc. equipment. PGT is working with systems integrator International Micronet Systems to create one enterprisewide network that ties together the isolated LANs.

"This is the roadway system," Levitt said. "You have to have this in place first. The goal is every PC on every LAN will be connected together."

Scheduled for completion at the end of the year, phase one is expected to cost about $3 million.

Phase two, which began just a few months ago, will introduce new software tools, most of which will revolve around a new data architecture that Levitt's team established late last year. Levitt estimated its cost at about $5 million.

Previously, all corporate data lived in the AS/400's database, which users typically accessed from their PCs via terminal emulation software packages.

To improve that approach, Levitt's group set up a three-layer data architecture. The bottom layer is the corporate AS/400 data, or information from what are now called legacy systems. A middle layer will be based on a Sybase, Inc. relational database management system, which PGT selected at the beginning of the year. It will include copies of the legacy data in a more user-readable format that

$10M redesign, *page 57*

ON SITE

Pacific Gas Transmission
San Francisco

Goal: To move away from a centralized computing structure and provide users with easier access to information.

Implementation: A several-year, three-phase, $10 million project that links LANs and opens the host database to users.

NCR tools foster less complex business revamp

By Thomas Hoffman

NCR Corp. recently unveiled workflow process management software that analysts said is well-suited to meet customers' interdepartmental workgroup needs.

Processit is a group of software modules compatible with Microsoft Corp.'s Windows and built to allow end users to design, monitor and re-engineer their business processes throughout their enterprises.

Processit was designed to allow users to alter their business processes without making any changes to the application and vice versa, according to Daniel L. Beatty, assistant vice president of coordination technologies at NCR.

He said the work-flow package is targeted at high-volume, transaction-intensive industries, such as banking and insurance, to help streamline mortgage and claims processing.

NCR's timing could not be better, analysts said, because competitive visual work-flow offerings

NCR tools, *page 57*

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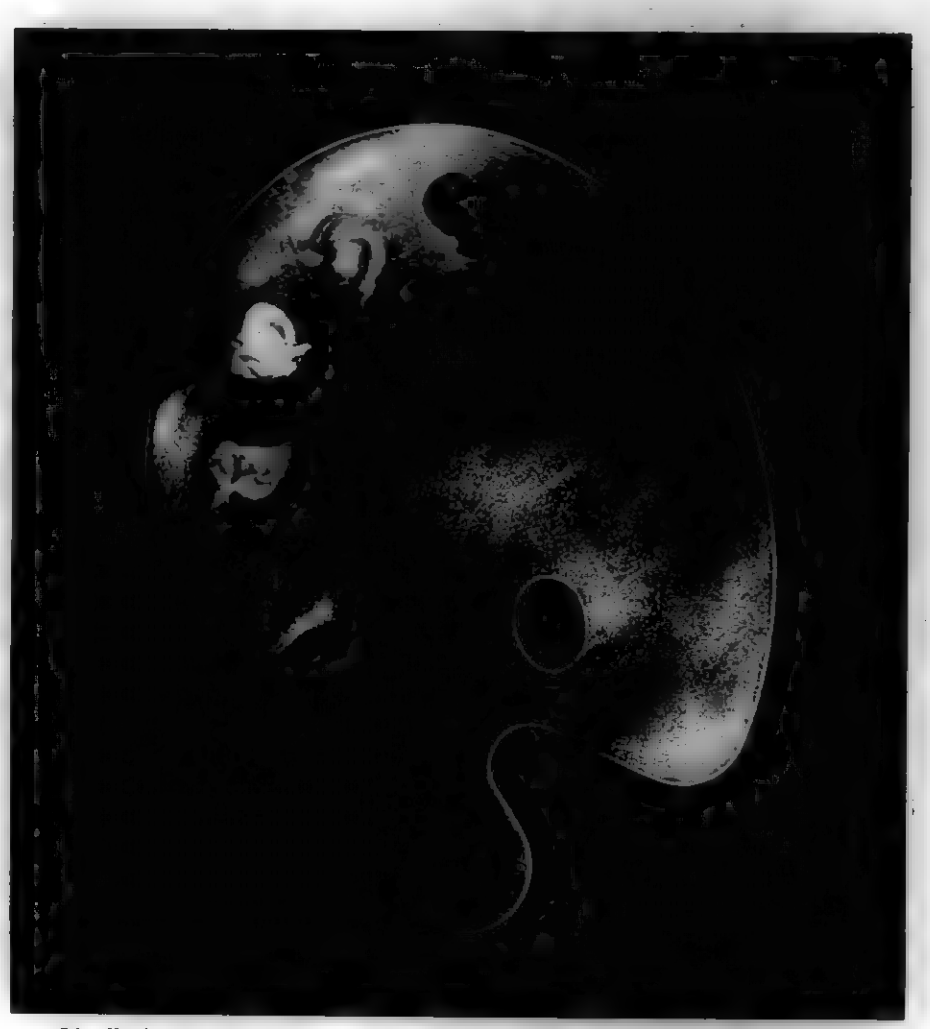

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$10M redesign

CONTINUED FROM PAGE 55

users can access directly. The third layer is the user layer, made up of local data stored on PCs.

The pivotal piece of the new architecture is the Sybase DBMS, which PGT is running on a Compaq Computer Corp. SystemPro server. It will eventually replace the legacy database.

In the meantime, it will serve as the "user view" to corporate data that previously was difficult to get to. New applications will be built to work with the Sybase DBMS as well, including an executive information system.

Currently, the team is reviewing software from Pilot Software, Inc. and Comshare, Inc. and said it expects to make a decision in the next three to six months.

In addition, Levitt has selected Powersoft Corp.'s PowerBuilder to design new applications. While other tools were reviewed, PowerBuilder "gave the best overall application development environment and relatively robust access to the SQL DBMS," Levitt said.

At the same time, the team brought in Lotus Development Corp.'s Notes to assist the team orientation for which the company is striving. "We are using it to support project members across multiple locations, and that's an important part of the management vision," Levitt said.

Phase three is scheduled to begin next year and will include linking PGT with customers, suppliers and partners. Levitt has no technical details for this phase yet.

NCR tools

CONTINUED FROM PAGE 55

— such as market leader FileNet Corp.'s Visual Workflow — will not begin shipping until later this year.

"This is really good that they [NCR] are coming out with this now, because they're beating everyone out," noted Mary Ann Richardson, a senior analyst at Datapro Information Services Group, a Delran, N.J., market research firm.

Analysts seemed equally impressed with ProcessIt's automated work-flow capabilities. For example, most work-flow products — such as those marketed by FileNet, ViewStar Corp. and Recognition Equipment, Inc. — require an image to be present to trigger a work-flow procedure. Not so for ProcessIt, according to Scott McCready, a principal at IDC/Avante Technology, a Framingham, Mass., research firm.

McCready said he was smitten with several features in ProcessIt, including a minute-by-minute process reporting feature that enables users to check on the status and efficiency of a particular process in their organization.

That is an essential requirement for any work-flow system, noted Krystyna Filistowicz, a director at Dataquest, Inc. in San Jose, Calif. "The important element of work flow is that it provides the potential to re-engineer processes within the organization and to examine the process to see how efficient it is," she said.

The work-flow suite was designed to run on any Windows-based PC client attached to an NCR System 3000 Unix server.

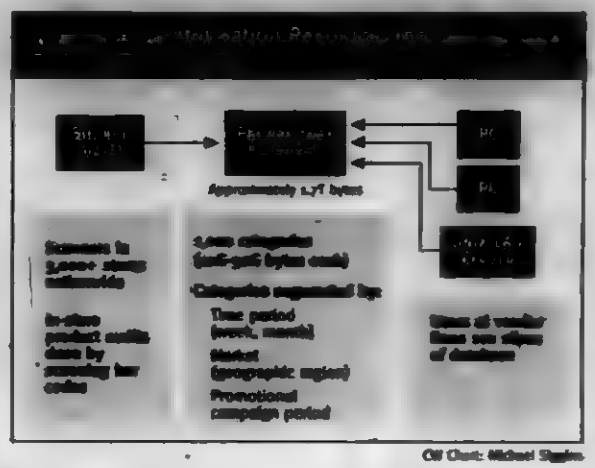
A typical 30-user configuration for ProcessIt is priced at about $1,245 per user and is available now.

Grappling with huge databases

By Jean S. Bozman

Some might call it the database that ate Chicago. Closing in on 2T bytes, it grows by 100G bytes per month.

And Information Resources, Inc.'s (IRI) proprietary database of supermarket data, fed by supermarket scanners at more than 3,000 stores, shows no signs of slowing down. The company uses the consolidated database to track 1 million products nationwide, allowing its customers, including food and soap manufacturers, to pinpoint regional buying patterns.



Gil Chait: Michael Siglins

But information systems managers at IRI, as elsewhere, focus on ensuring that the database does not become unwieldy. That is why IRI's database is actually a collection of 10G- to 20G-byte "slices" that group data into hundreds of product categories.

The $276 million firm uses artificial intelligence programs to help users navigate the jumbo-size database (see chart).

IS managers at IRI and other large database sites said breaking databases into manageable pieces is a major challenge because they save reams of transactional data in a central repository for end-user query and analysis. However, they must balance the value of storing consolidated data in a huge database against the personnel and equipment associated with operating it.

Large mainframe DB2 systems, for example, use multimillion-dollar mainframes and require a staff of hundreds to maintain the system and the database.

Databases grow extra large when they are fed an increasing amount of transactional data. The largest databases are already breaking records: IRI's homegrown database is about 1.7T bytes; Nynex Corp.'s Market Intelligence Tracking and Analysis System (MITAS) is more than 400G bytes; and United Parcel Service, Inc.'s Delivery Information Automated Lookup System (Dials) is passing 1.5T bytes in size. Most databases are considered large when they become tens of gigabytes in size, users said.

Large database size complicates daily maintenance, including backups and recovery, users reported. Global reorganizations of the database are usually ruled out, as are off-line backups that would take the system down.

In many cases, database administrators prefer to add database tables rather than change the setup of existing tables. Some create database slices that can be pieced together for a single system view. Others archive aging data to keep an oversize database from outgrowing its host.

Routine tasks can go into overtime where large databases are concerned. Even backing up a 7G-byte Oracle Corp. database can take several hours, noted Michael Higgins, technical support manager at Byer California, a San Francisco women's apparel manufacturer.

Higgins said he plans to keep his Oracle 7 databases at less than 10G bytes and to run several on a cluster of Sequent Computer Systems, Inc. Unix systems using Oracle's new Parallel Server option.

To avoid management headaches, IS managers at the Seattle Municipal Courts decided to remove aging data from an 8G-byte Informix Software, Inc. database running on a Sequent computer. Starting this spring, aging data will be purged on a monthly basis. That will preserve uptime for more than 200 on-line users in the court system, said Brian Backus, director of information and revenue at the municipal courts.

Does all the trouble of maintaining a jumbo database make economic sense? For some large organizations it does, said Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

But many of the large databases face a brave new future, as IS managers consider whether to move them — or parts of them — to less costly Unix servers or parallel processors.

"It depends how large the database actually is and if it exceeds the storage and administrative capabilities of an open system," DePalma said. Sites that can justify the high expense "know when they're making money, and the marketing organizations that need this data tend to be profitable." Over time, Unix servers will be viewed as suitable alternatives to mainframes for large mission-critical databases, DePalma said.

Meanwhile, users said the consolidation of many months of data provides a rich information base on which companies may forecast their future business and product plans.

Nynex's 3-year-old MITAS DB2 database is viewed as a central information warehouse for the telephone firm's customers. Managers developing new products and services can stimulate a test market by querying use patterns in the 400+-G-byte customer database.

To support MITAS, IS managers must decide how best to maintain, update and organize it. "The issues are what information do we want, how long should we hold it, and what should we index?" said John Tedesco, director of marketing IS at Nynex. The firm boosts DB2 performance by adding indexes that complement DB2's query optimizer, he said.

Partitioning is another way DB2 administrators make large databases easier to manage. UPS' Dials database is partitioned into 13 monthly segments to track 12 million packages each day, said Ilse Lefas, data resource manager at UPS information services in Mahwah, N.J. It is also divided into 2G-byte datasets, a physical limit for DB2.

"If you visualize a Rubik's cube," Lefas said, "you can visualize that we have a dimension of time, a dimension of geographic location and a dimension of data types."

Running a very large database usually entails great expense and high overhead, users agreed. But some, such as IRI, said they feel the benefits are well worth the trouble.

"It's like buying the best manufacturing tools for our business," said Ned Heinbach, president of IRI's Data Systems Division. "We are optimizing the database structure, in multiple dimensions, to fit our unique kinds of data. The efficiency more than covers the cost."

Jumbo tips

IS managers said the following techniques aid in managing a very large database:

- Avoid global reorganizations of the database.
- Partition an IBM DB2 database into smaller pieces.
- Increase the use of multistreamed on-line backups to tape.
- Archive aging data to slow growth of the database.
- Extract database subsets for daily queries by end users. —*Jean S. Bozman*

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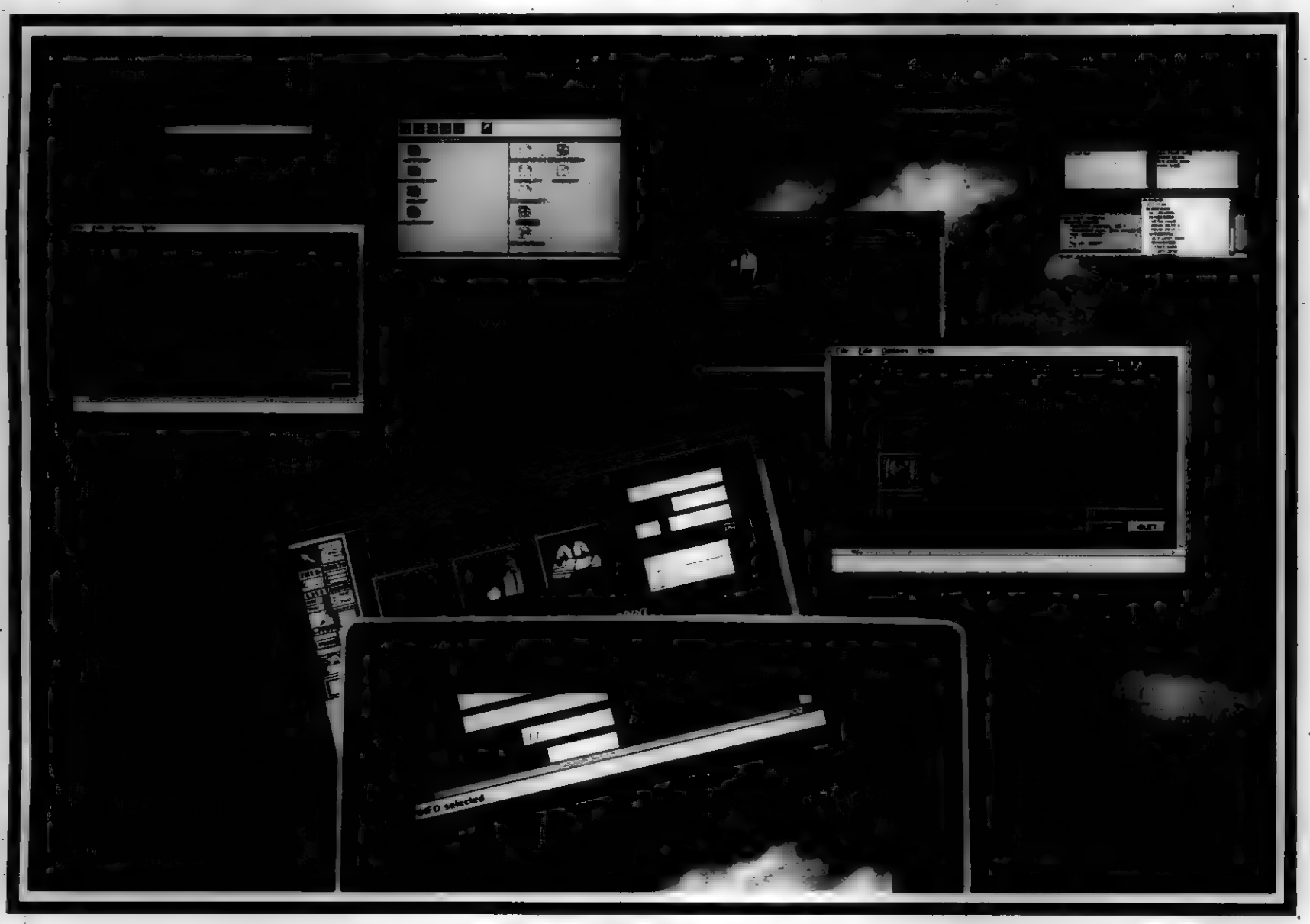

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Novell nourishes NetWare app development support

By Michele Doetert
PROVO, UTAH

Novell, Inc. is moving to beef up application development support for its NetWare local-area network operating system, hoping to prevent Microsoft Corp.'s Windows NT and IBM's OS/2 from making inroads into its more than 60% market share of LANs.

Novell succeeded in the file-and-print LAN market largely because it supported all popular desktop operating environments, such as DOS, Windows, OS/2, Unix and Apple Computer, Inc.'s Macintosh. "We believe that your computing environment should be modular; choose the best desktop for your needs, then choose the best network operating system," said John Edwards, vice president of Novell's Desktop Products Division.

However, this modular approach can be a hindrance in the customized client/server application market because developers must write to at least two environments: the NetWare Server application programming interfaces (API) for the server side, plus the desktop APIs for each supported client type.

In contrast, developers writing for Microsoft's NT Advanced Server LAN operating system or IBM's OS/2-based LAN Server need only write to one set of APIs for both client and server.

"Both Microsoft and IBM are attacking Novell from the application server side, hoping to first insinuate OS/2 and NT application servers into existing NetWare LANs and then gradually drive out the NetWare," said Craig Burton, president of The Burton Group, a network research firm in Salt Lake City.

Novell's first weapon in the fight for the hearts and minds of application developers is UnixWare, its SVR4-based Unix/NetWare integration product. Developers can, with little modification, port their Unix applications to the UnixWare server, from whence they can be accessed by both Unix and NetWare clients without modification.

"We're very interested in UnixWare, both as a development platform and for access to all those Unix applications," said Victor Pigoga, a project leader at Blue Cross/Blue Shield of Rhode Island in Providence.

Novell has also beefed up NetWare support for object-oriented application development. A January agreement with HyperDesk Corp. in Westboro, Mass., will let Novell bundle HyperDesk's Distributed Object Management System (HD-DOMS) with NetWare. HD-DOMS will allow developers to treat NetWare system software and services as objects to be reused and will thus promote efficient modular application development, according to Edwards.

Thirdly, Novell has developed new "universal clients" for each supported desktop. These new client redirectors, which can address any version of NetWare, contain a set of Virtual Loadable Modules (VLM), which provide network services for file-and-print redirection, as well as their own APIs for NetWare-specific support. A single redirector supports both DOS and Windows, thus reducing the number of client types to write to; redirectors are also available for OS/2 and Windows NT clients.

"Application developers can save themselves a lot of work by writing once to these VLM APIs, which are the same across all clients," said Bob Young, Novell's vice president for NetWare.

Novell is also publishing, in conjunction with third-party application developers, a standard set of NetWare APIs for such bleeding-edge applications as imaging, telephony and multimedia.

Exchanges partner on client/server system

By Thomas Hoffman

The Chicago Mercantile Exchange (CME) and the New York Mercantile Exchange (Nymex) have joined forces in a three-year application development effort designed to create a standardized, client/server trade clearing system for 35 common and 85 total brokerage firms.

The two futures exchanges are using Texas Instruments, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering (CASE) environment to build better integrated, distributed applications to replace their respective batch trading-floor and back-office systems. The joint effort is expected to speed development and save as much as $22 million through shared project costs and resources.

CME's Don Serpico: *Chose TI because it had 'happiest users'*

But do not equate sharing resources with shared systems. CME and Nymex are planning to keep their operations independent from each other, according to Stephen C. Daffron, senior vice president of strategic planning and information services at Nymex.

However, Daffron and his CME peer did not rule out the possibility of creating redundancies between each other's trading-floor and back-office systems in the event a disaster strikes either exchange.

"The distributed technologies available today aren't ready for these types of fail-back and recovery," added Don Serpico, senior vice president of operations at CME.

CME relies on a dozen Tandem Computers, Inc. Cyclone processors, along with an IBM Enterprise System/9330 mainframe, and Serpico said he wants to ensure that a

Exchanges, *page 64*

Development tools

Cadre to support two object-oriented methodologies

By Garry Ray
PROVIDENCE, R.I.

■Cadre Technologies, Inc. last week announced a new line of development tools that support two well-known object-oriented programming methodologies.

Called ObjectTeam, the workbenches will be available this June in versions supporting either the Rumbaugh Object Modeling Technique or the Shlaer-Mellor object modeling method. Both versions will be available for Unix, VMS and Microsoft Corp. Windows 3.1 and can generate C++, Ada and SQL code, company officials said.

According to the company, ObjectTeam for Rumbaugh supports a wide number of functions called for in the Rumbaugh Object Modeling Technique.

Types of support

The tool supports object, dynamic and functional models; and object, state, data flow and event trace diagrams. It also generates code for a variety of databases including ANSI standard SQL; Oracle Corp.'s Oracle 7; and object-oriented databases such as Versant Object Technology's Versant, Object Design, Inc.'s Objectstore, Objectivity, Inc.'s Objectivity, Ontos, Inc.'s Ontos and Raima Corp.'s Raima.

Aimed at multiple programmer development efforts, ObjectTeam for Rumbaugh also supports a multiuser repository and a Basic script language for access to repository contents, according to the company.

ObjectTeam for Rumbaugh "is one of the few tools to support all phases of development" using the Rumbaugh methodology, said Keith Schomburg, a senior associate programmer at IBM's Networking Systems Division in Research Triangle Park, N.C. Schomburg, who has been beta-testing the product, said: "Other tools I've tried have drawbacks or don't support all of the method."

ObjectTeam for Shlaer-Mellor is a complete implementation of the Shlaer-Mellor object-oriented design and analysis method, Cadre officials said. The workbench supports work product generation, design checking, documentation and report generation.

In addition, the tool was designed with the aid of the methodology authors.

Steve Mellor, vice president of Project Technology, Inc. in Berkeley, Calif., and co-developer of the methodology, said, "We reviewed [Cadre's] specifications for correctness against our method." Mellor, who acted as a consultant on the ObjectTeam design, added that the workbench is "possibly the most complete implementation compared with others" that are now available.

ObjectTeam for Rumbaugh and ObjectTeam for Shlaer-Mellor, with pricing beginning at $3,995 and $10,000, respectively, is slated to ship in June, company officials said.

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Exchanges

CONTINUED FROM PAGE 61

switch to client/server computing has no effect on its fault tolerance.

In the early stages of the distributed development effort, Serpico said, CME will keep its Tandems as the first checkpoint for any transactions being routed, while the IBM mainframe will be used to transfer information for back-end processing. He said the mainframes may eventually be phased out for cost savings if CME can develop a fail-safe client/server environment.

Nymex, which also operates under a Tandem environment, wants to ensure the same security. "We'll be keeping our settlement and clearing systems on Tandem until we're comfortable with moving to the distributed architecture," Daffron said.

CME and Nymex have both tapped Deloitte & Touche to consult on the joint effort. The exchanges are committing a combined $22 million to the joint software development phase. Serpico said it would have cost the exchanges twice as much to develop the software independently. He said the exchanges have begun working with TI's IEF Release 5.1 to develop the distributed applications.

IEF Release 5.2, which analysts said is geared toward developing graphical user interface-based client/server applications, is currently in beta testing and is expected to roll out by year's end, when CME and Nymex plan to switch over.

Serpico said the two exchanges chose TI over other CASE vendors, including KnowledgeWare, Inc., because "it had the biggest client base and the happiest users."

Serpico said the existing batch trade management system is ill-suited to support real-time trade matches. CME is working on a joint effort with the Chicago Board of Trade to automate that system. Under that four-year project, the two organizations have been testing handheld computers for their brokers and clerks to conduct audits [CW, Feb. 10, 1992].

Currently, trade discrepancies among member firms often take four hours or more to settle under the batch environment. With a client/server configuration, Serpico said, he hopes to complete those transactions within seconds.

But the joint application development efforts go well beyond trade clearing, Daffron said. Unlike rival exchanges in London, most U.S. exchanges have not yet integrated their own back-office systems. It is more costly and less efficient for member firms such as Merrill Lynch & Co. to trade on an American exchange, Daffron said. "By integrating our back-office systems, we can help our clearing members to reduce their costs," Daffron said. He said Nymex has not yet determined the cost savings that would be passed on to member firms.

The distributed architecture is expected to trigger other cost savings. By moving the bulk of its core applications off its mainframes, CME expects to reduce considerably its $2 million annual hardware and software maintenance fees. CME's annual information systems budget is $20 million.

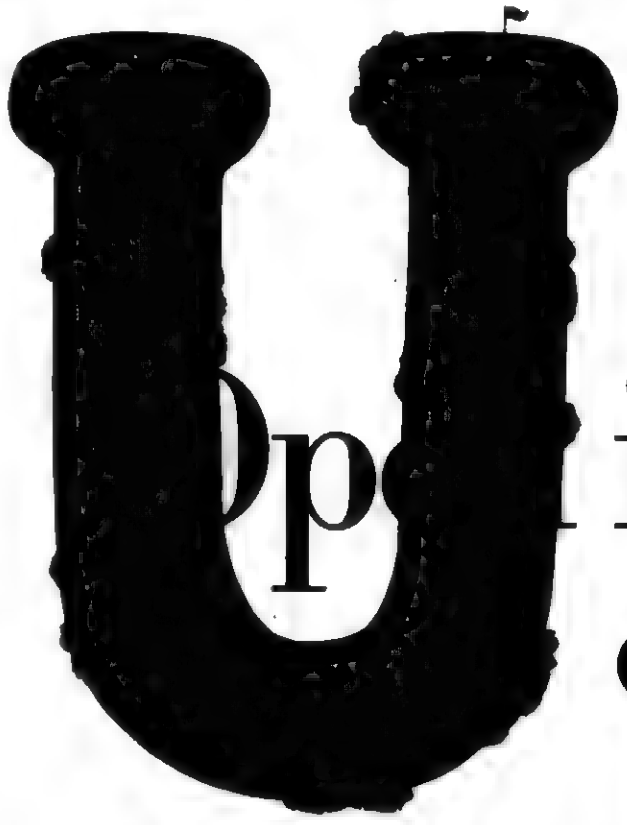
Daffron said both exchanges are evaluating Unix platforms from IBM and Hewlett-Packard Co., along with Digital Equipment Corp.'s Alpha AXP environment running under VMS. Nymex expects to choose a platform by year's end. Future Nymex applications for the platform will include trade settlements, trade captures and risk management.

Once the architecture is in place, Daffron said, Nymex plans to roll out a new application every six months.

Tale of two exchanges

New York Mercantile Exchange
Computing platform: Tandem's fault-tolerant Cyclones.
Number of Tandem trading-floor terminals: 400.
Commitment to joint application development project: $7 million.

Chicago Mercantile Exchange
Computing platform: Tandem's fault-tolerant Cyclones and IBM's ES/9330 mainframe.
Number of Tandem trading-floor terminals: 300.
Commitment to joint application development project: $15 million.



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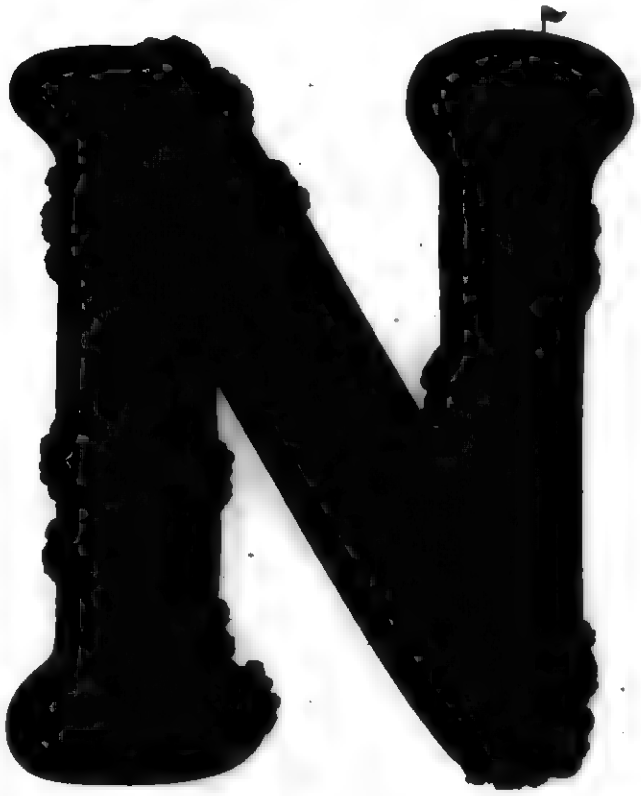

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Programming aids

Blue Sky sharpens Windows tools

By Melinda-Carol Ballou
ATLANTA

Blue Sky Software Corp. last week announced a new version of its WindowsMaker Professional C/C++ code generator that includes a what-you-see-is-what-you-get (WYSIWYG) prototyper and tool bar support.

The company also previewed Visual SQL, a tool said to let developers incorporate database access into their applications as they build them.

The latest WindowsMaker Professional product — Version 5.0 — lets users choose the compiler they want without locking them into a specific compiler, company officials said. Compilers supported include Microsoft Corp.'s Visual C++, C6 and C7; Borland International, Inc.'s C++; the Zortech division of Symantec Corp.'s C++ and others.

The new version of WindowsMaker will reportedly generate ANSI C, Microsoft Foundation Classes or Object Windows Library code and let users set attributes and properties for control of both windows and dialog boxes. It also offers drag-and-drop editing and predefined application templates for faster development, the vendor said.

The tool bar support facilitates the defining of tool bars for applications, and the WYSIWYG prototyper aims to let users generate C or C++ source code directly from their prototypes. Special effects, such as three-dimensional buttons and patterns, are also available with Version 5.0.

Visual SQL lets users visually map data from the target databases into the application screens using a mouse. While designing data-entry screens with a screen painter, developers can reportedly add database actions directly behind buttons and other controls by pointing and clicking.

Visual SQL saves time by generating C code for the application design, which will then make direct calls to both the Windows and database application programming interfaces, the company said.

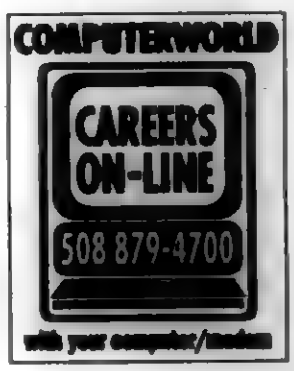
The product also offers a development-hastening Preview Mode to let developers test-run the application without first having to go through the traditional compile-and-link cycle.

Visual SQL will generate source code for access to Oracle Corp.'s Oracle, Microsoft Corp.'s SQL Server, Commandel Industries, Inc.'s Integra SQL, Borland's dBase files and all databases supporting Microsoft's Open Database Connectivity standard.

Separately, Blue Sky announced a new version of RoboHelp, the company's Windows Help authoring tool. RoboHelp 2.0 offers the ability to use a single text source for both Help and documentation. Also, a graphical debugger and intelligent agent guide developers to the location of a potential error before compiling the code, the vendor said.

Users can visually add context-sensitive Help by placing the included Help button in the application's dialog box and then clicking on the button to link in the associated Help topic. The new version also supports the Windows 3.1 Help Engine.

WindowsMaker 5.0 and RoboHelp 2.0 are scheduled to ship during the second quarter for $1,096 and $495, respectively. Visual SQL is slated to ship during the third quarter and will cost $4,900.



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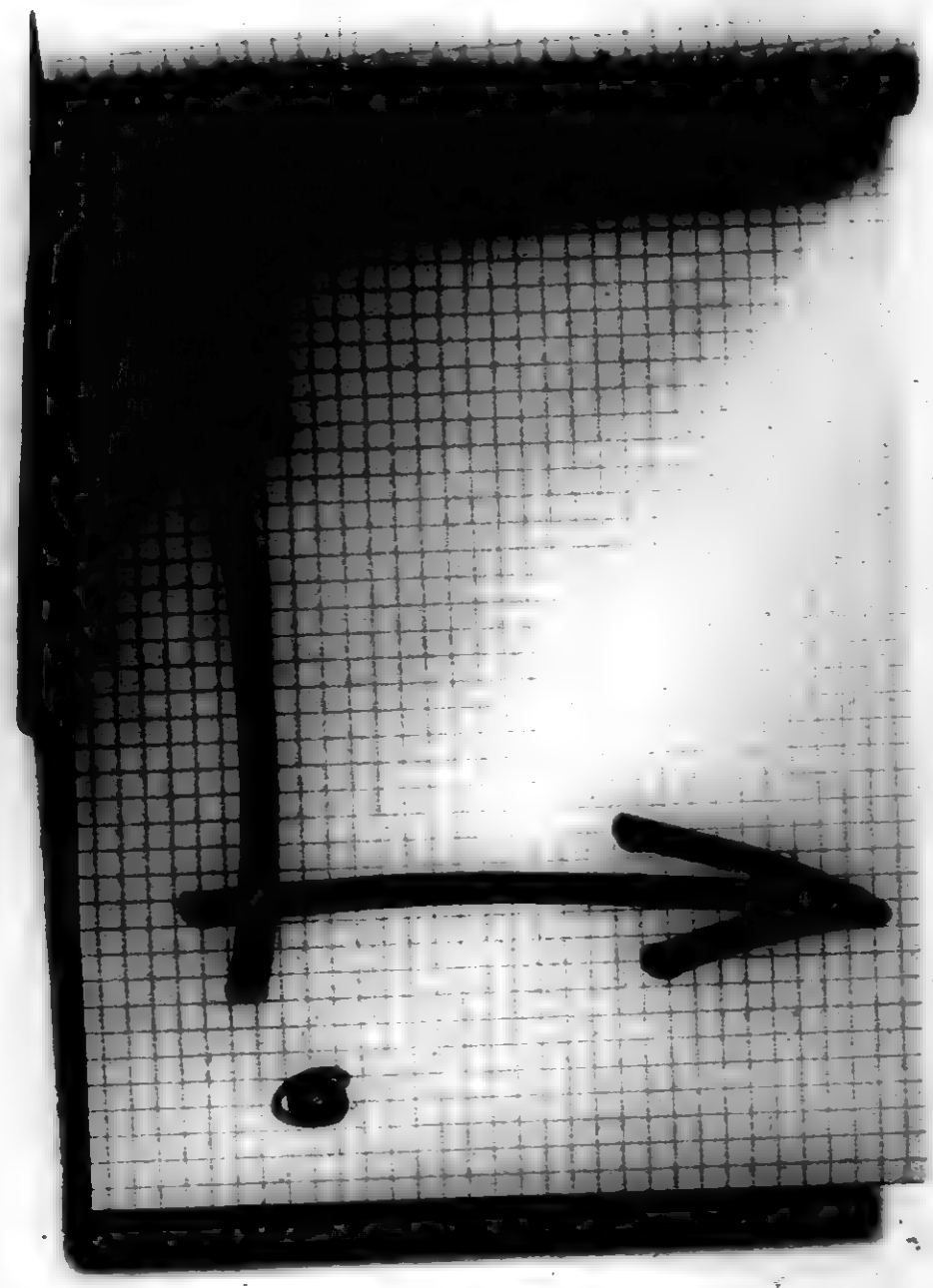

On The Excitement Scale, Where Does Managing Data In A Client/Server Environment Fall?

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A bridge too late?

After more than a decade of acrimony, PC managers are allying more and more with mainstream IS. Just how this odd couple will tame an "out of control" PC universe worth billions remains to be seen.

by joseph maglitta & carol hildebrand

Robin McClaran

Pacific Telecom's Roland Michaud: *'The politics can be constant'*

They are the Jerry Rubins of computing — rebels turned status quo. And according to some, none too soon.

A decade after the first PCs began appearing on corporate desks in significant numbers, sweeping technological changes are transforming a diverse array of microcomputer managers into a wider ranging, more mainstream force.

"The traditional war between IS and PCs was over a long time ago," says Priscilla Tate, executive director of the 2,000-member national Microcomputer Managers Association (MMA). The New York-based group, the world's largest organization for PC professionals, recently celebrated its 10th anniversary.

In many organizations today, PC managers are increasingly becoming allies with traditional information systems groups in hopes of taming the costly, often chaotic explosion of end-user and workgroup computing that PC managers helped create in the early 1980s.

The stakes are huge: Companies worldwide spent nearly $90 billion on PC hardware alone in 1992, according to International Data Corp., a Framingham, Mass., market research firm. The figure is predicted to modestly increase this year.

Observers say the rapid spread of newer technologies, especially local-area networks, groupware, notebook computers and client/server computing, is stretching microcomputer managers into areas once considered solely the province of IS.

"Things have changed dramatically," notes

A bridge too late?, *page 72*

ENTERPRISE MANAGEMENT

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Two opposing forces in modern business are on a collision course: the need for specialized, localized hardware and software solutions, and the need to cost-effectively unite those information resources into a manageable business asset.

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Organizations today have a mixture of older, centralized systems and new, distributed systems—a wide variety of technologies provided by an even larger number of vendors.

The challenge is managing this diverse collection of resources. The nature of the problem requires a "best-of-breed" multi-vendor solution.

That's why the leaders in information technology listed here are committed to creating and providing Enterprise Management solutions.

What Is Enterprise Management?

Enterprise management is a strategy for integrated monitoring, measurement and control of multi-vendor networks and computer systems to serve enterprise business needs. It is a technological framework into which multiple management tools, applications and displays can fit, providing end-to-end management of network elements and resources.

Enterprise management requires an organizational commitment to, and consensus on, a common open management platform and a set of open management standards for use throughout the enterprise.

The Benefits

Implementing an enterprise management strategy provides considerable benefits:

- Continuously high levels of reliable and responsive service.
- Smooth incorporation of new client-server solutions with existing mainframe approaches. Your investment in existing mission-critical applications is preserved and augmented.
- Change and increasing complexity can be accommodated more quickly, without jeopardizing system and network availability.
- Greater optimization of network and system resources ensures high quality service is maintained at the lowest possible cost.
- Automation of management processes allows systems administration and operational costs to reduce steadily as your enterprise grows.
- Network and data security is enhanced.

What You Can Do Today

To achieve the benefits of enterprise management, take these steps:

- Develop organizational consensus on a strategy and on a management platform:
  - working with your key vendors and carriers, develop a strategy for implementing this enterprise management architecture within your organization.
  - establish purchasing guidelines that all parts of your organization can follow so that their evolving information systems can fit into the enterprise management approach.
- Select a common open management platform for use across your enterprise that:
  - enables management of products and services from multiple vendors.
  - is standards-based.
  - enables integration of management tools and applications from multiple vendors.
- Review existing management tools and interfaces and prioritize upgrades that move the organization toward enterprise management in the most cost-effective and rapid manner possible.
- Favor distributed and object-oriented management solutions.
- Use management solutions that incorporate open management standards such as the Simple Network Management Protocol (SNMP), the Common Management Information Protocol (CMIP) and the OSF's Distributed Management Environment (DME).
- Automation is a key element in effective enterprise management. Move toward "self-managed" systems.
- Require the use of open management protocols in new information system purchases and deploy open management protocols in existing network elements, distributed systems and vendor-specific management systems.

Contact the leading vendors listed here. They can provide you with additional information on the enterprise management strategy that's right for your organization, and the products and services you need to implement it.

SOURCES OF ENTERPRISE MANAGEMENT SOLUTIONS

These industry leaders have come together to promote the business benefits of an Enterprise Management Strategy. They can be contacted directly or by using the reply card below.

The Partnership Legend illustrates relationships that have formed to provide these complex, multi-vendor solutions.

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A bridge too late?

CONTINUED FROM PAGE 69

Naomi Karten, president of Karten Associates, a Randolph, Mass., management consultancy that publishes a newsletter on end-user computing, "In some organizations, people who were the caretaker of the trivial are now in charge of some of the important things that are mission-critical."

Instead of concentrating on establishing guerilla PC beachheads for fed-up mainframe users, as in the early days, microcomputer professionals now work on client/server systems, LANs and wide-area networks and even help with the corporate data structure.

At the same time, downsizing has pushed desktop platforms and networks higher on the agenda for mainstream computing groups.

"In the past, PCs and LANs were auxiliary parts of IS," says Steven Kight, an internal consultant at Blockbuster Entertainment, Inc. in Dallas. "Now all that's changed 180 degrees."

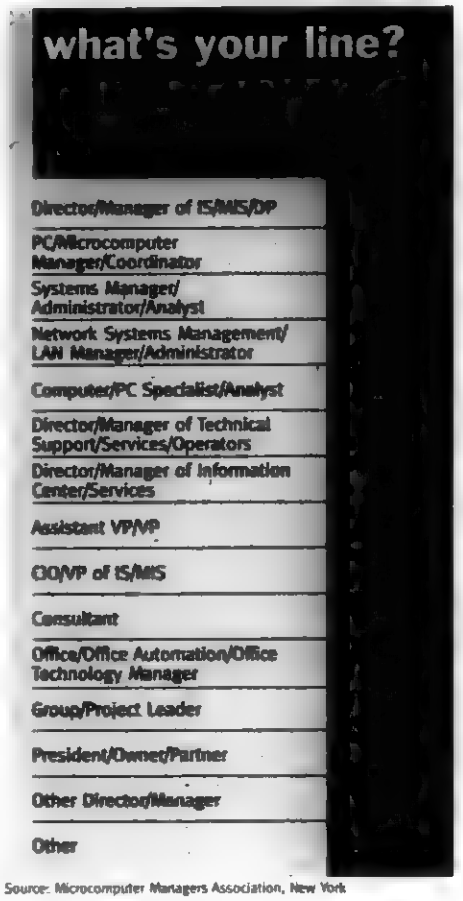
The result is that IS and microcomputer managers, whose views of computing have traditionally differed, now find their missions, concerns and even roles converging.

Lines blur

At Blockbuster, for example, Kight and his group handle PC-specific tasks such as upgrading hardware to run Microsoft Corp.'s Windows. But they also consult on issues that five years ago would have been tackled by corporate IS.

"For instance, we recently acquired a couple of companies here in Dallas: Sound Warehouse and Music Plus," Kight says. "Now we're looking at the point-of-sale systems for these two chains, which are PC-based, and we're providing support, defining requirements and figuring out what the equipment's going to be looking at."

The expanding and blurring duties are evident in a string of new titles, including management services analyst, manager of end-user support and business consultant, among many others (see chart above).



Source: Microcomputer Managers Association, New York

Experience also varies widely: Some staffers are noncomputing professionals, such as engineers or accountants, pushed into the role. Others are trained computer specialists. Some are situated in business units; others report to IS.

But regardless of position, background or location on the organizational chart, microcomputer managers and traditional IS staffers are being thrust together by spotty past performance, savvier users and economic concerns.

The original PC revolution opened a Pandora's box that both revolutionized and traumatized computing and the way companies do business. Today, high use and huge spending on PCs and networks have become major concerns for many organizations.

Support record mixed

According to a recent study by consultancy Nolan, Norton & Co. in Boston, some 55% of all employees in large corporations now use personal computing technology. Some 70% of those are connected to LANs, according to the report, which was commissioned by Ford Motor Co., AT&T, Bell Labs, Xerox Corp., Sprint Corp. and several other large clients.

Others have estimated that "shadow spending" on technology, especially PCs, by user departments in some cases inflates corporate technology spending by up to 50%.

"There's a significant financial investment in these assets, and they're scattered all over the enterprise," notes Mark T. Bolton, manager of information technology at Square D Co. in Knightdale, N.C.

"If I were a CFO or a CEO, I'd be asking tough questions on the size of this investment and its [return on investment]. Forward-thinking CIOs are realizing that, in fact, the total of inventory and asset needs to be managed comprehensively. To do that, you need some organization or function to make it happen," he says.

Yet at the time more efficiency is needed, the rapid spread of desktop and distributed computing is straining acquisition, support, training and planning services to the breaking point.

Information centers, established by some companies to handle end-user concerns, have had mixed success. Though some did a decent job and managed to protect vital data, many never garnered enough political muscle to succeed. A more serious problem was that many IS groups initially considered end-user support to be undefined, messy and insignificant.

"IS never called the shots in most companies," says John Halloran, managing principal at Nolan, Norton. "The power was defined by the end users."

Unfortunately, Halloran says, business units and their PC managers — many of whom were pushed into the job with little or no training — frequently did poor jobs.

This led a 1992 Nolan, Norton study, "Managing End-User Computing," to conclude: "The end-user computing situation often appears unmanaged and out of control. . . . Particularly when viewed from the traditional IS perspective, the environment appears to have taken on an undisciplined, *laissez-faire* life of its own."

Users help one another

In this environment, nontechnical users often remain frustrated; many are turning to nontechnical peers for help.

Unfortunately, according to Nolan, Norton, that has also created an invisible but huge problem. The consultancy estimates that the average large firm spends $12,000 to $16,000 in hidden PC support costs per year for each desktop, the result of workers providing technical support to co-workers.

This financial pressure comes at a time when many end users have become more sophisticated and proficient in their use of more affordable PCs and workstations.

A bridge too late?, *page 74*

MMA: Spunky midget gets big

—Robert Knight

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Books and articles

"Management of the information center," *Journal of End-user Computing*, Summer 1992. Idea Group Publishing, Harrisburg, Pa.

"Information resources management for end-user computing: an exploratory study," *Journal of End-user Computing*, Summer 1992. Idea Group Publishing, Harrisburg, Pa.

"The effects of information centers on the growth of end-user computing," *Information Management*, November 1992. Auerbach Publishers, Boston.

Managing the information center resource: Success in end-user computing, Arnhouse, Donald (ed.) and Whalen, John (ed.), 1992. Loose-leaf reference guide updated regularly. Auerbach Publishers, Boston.

SYSTEMS MANAGEMENT

Meeting the new demands posed by Distributed Computing

Distributed systems demand the same level of management and availability that IS has historically provided in a mainframe environment. Yet the technical approach to distributed systems management is fundamentally different from that applied to centralized systems.

Hardware and software resources to be managed tend to be more numerous, widely-dispersed and provided by a wide variety of vendors. Put simply, old approaches to systems management cannot be incrementally extended to manage these new distributed systems. A new approach is required.

Why A New Approach Is Necessary

When compared to the centralized mainframe environment, tracking and intervention tools for distributed systems management still appear somewhat primitive - even as the number and variety of systems IS professionals must manage is increasing. At the same time, IS professionals are expected to provide backup and recovery services, fault isolation and repair capabilities, and updating procedures that provide levels of service similar to those users have come to expect from centralized systems. These demands all threaten to increase administrative and support expenses. And if these systems are poorly managed, there's a real chance such expenses may actually erase the cost reductions achieved through downsizing.

Effective distributed systems management addresses these issues. It provides the considerable business benefits of distributed computing within a context that allows for effective management of IT resources and costs.

What You Can Do Today

- Implement remote management solutions that bring the problem to the troubleshooter, not the other way around.

- Develop organizational consensus on an enterprise-wide open management platform that can interface with your legacy systems and newer distributed systems.
- Acquire management tools and applications for distributed systems that integrate with the open management platform you choose.
- Favor object-oriented management solutions.
- Place open management agents on systems, clients and servers throughout the enterprise that will communicate with your management platform.
- Take an application-oriented view towards the utilization of system resources. This allows you to target your management focus on areas likely to provide the biggest and quickest return to end users.
- Create automated responses to system problems - responses that automatically alert system managers when problems occur, or which resolve problems at the same speed they occur.
- In the switch from centralized to distributed processing, leverage the expertise, skills and methodologies of existing MIS personnel. And remember that legacy systems are likely to play a key role in mission-critical applications for many years to come.

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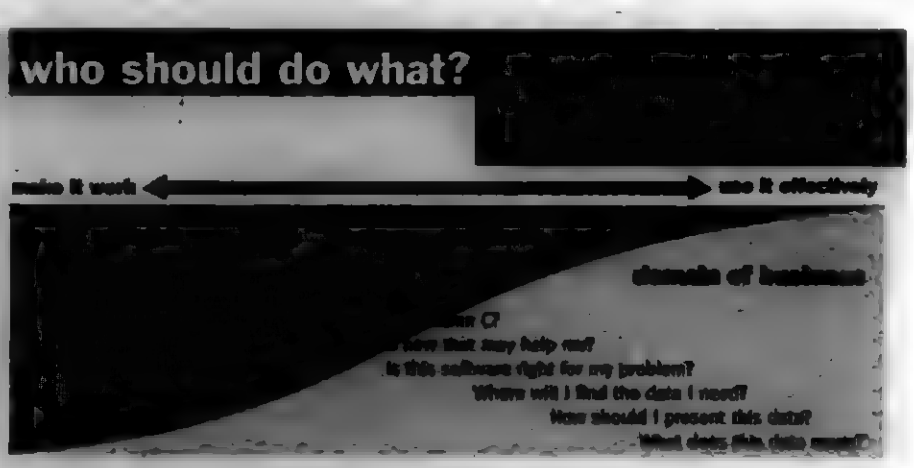
A bridge too late?

CONTINUED FROM PAGE 72

"Five years ago, [end users] were taking mainframe financial reports, inputting them to a spreadsheet program and running an analysis. All they had to learn was how to do a simple download," says Bruce Linker, assistant vice president at the Group Information Technology Division of Dean Witter Reynolds and president of the MMA. "Now people are learning to write macros in the accounting department."

Culture clashes

While cooperation between end-user computing managers and IS is improving, the fundamental pride of each profession is still evident.



Source: Nolan, Norton & Co., Boston

As a result, some worry that deep cultural differences could harm both groups and, ultimately, blunt corporate efforts to maximize PCs' use.

Roland Michaud, a supervisor of network services at Pacific Telecom, Inc. in Vancouver, Wash., says an old-fashioned "programmer mentality" that clings to old methods can put mainframers at odds with micro people.

"Programmers tend to want to hold off as long as they can. They're uncomfortable with change," Michaud says. "But the micro world changes almost daily."

It works the other way, too, Karten notes. "People who have been PC-focused may not understand the bigger IS world." As a result, Karten, author of the book *Managing Expectations: Dealing with People Who Want More, Better, Faster, Sooner, Now!*, says many microcomputer managers need to learn lessons about structure from the mainframe world.

Bolton agrees that culture clashes are "the toughest part" of bringing PC specialists, IS and end users together. "As control has shifted from an individual to a centralized focus, there's been a lot of emotional pain to let go of that control . . . and adhere to corporate standards. There have been some tremendous struggles to gain control of the assets."

Other problems loom. Because demand for PC and client/server applications is high, many end-user, IS and PC managers are inundated with demands beyond their ability to cope.

Michaud says the battle for staff and resources is an ongoing challenge. "The politics can be constant," he says. "It can be a problem . . . to stress the importance of microcomputers within the organization vs. the attention given to mainframe legacy systems."

Wayne Dunn, manager of end-user support at the Massachusetts Bay Transportation Authority in Boston, compares the plight of his peers with IBM's plight. "They had to make the shift slowly and painfully, but in the end they set themselves up pretty well with the way they've spun off their Personal Systems group and their OS/2 group. That's the way it's going to happen throughout the industry."

Optimism and infrastructure

Despite rapidly changing roles, PC managers continue to express pride and optimism in their profession and its importance to the firm.

"I'm in the right part of the business at the right time," Dunn says.

Linker agrees that downsizing has "solidified our jobs," noting "there are more PCs out there, more end users. We're not just limited anymore to teaching people to use shrink-wrapped application packages."

But exactly how firms will decide to handle PC support in the future is far from decided.

The MMA's Tate, who worked as a microcomputer manager at Manufacturers Hanover Trust Co., says the current shifts have played havoc with traditional job descriptions but will ultimately lead to new titles.

She says she believes that the typical MMA member is a good model for the future. Such professionals, Tate says, are "not just a liaison between technical and business people but a new breed of microcomputer executive in the IS department."

Regardless of who does what, many agree that among the most important near-term tasks will be to plan and create the information and networking infrastructure that will let widely scattered desktop systems share data across the organization.

Among them is Steven Gehlen, senior systems engineer at Nike, Inc. in Beaverton, Ore. The issue "isn't so much a matter of a challenge from the end-user standpoint as it is a challenge to build the infrastructure" to support the new direction, Gehlen says.

Future roles fuzzy

Exactly who will do what toward that end remains unclear.

Though no one seems sure of exact figures, there are relatively few microcomputer managers in the U.S. Too bad, because Halloran estimates that firms could save about $3,000 in annual support costs for each PC by employing a microcomputer manager.

"That means if you have 100 PCs, you're saving 3 million bucks," he says. "It's hard to show people the savings because you have to convert them to some kind of [full-time equivalent], and that's hard to do."

At the same time, the role of traditional IS in supporting end users appears to be actually diminishing, according to Nolan, Norton.

Right now, both groups tend to tackle different corners of the challenge, the consultancy says. IS is typically involved with less structured tasks such as managing performance, planning for and acquiring resources and identifying demand. In contrast, microcomputer managers tend to be concerned with operation activities such as troubleshooting, help desk calls or software and equipment installation.

Companies are experimenting with different approaches. Square D, which has about 3,000 PCs in its two divisions and corporate headquarters, is now recentralizing PC control. The manufacturer also tries to better integrate microcomputers by running a PC component through every function.

"For any project to support a business or user environment, we always have a PC group involved with it. We have integrated that function throughout," Bolton explains.

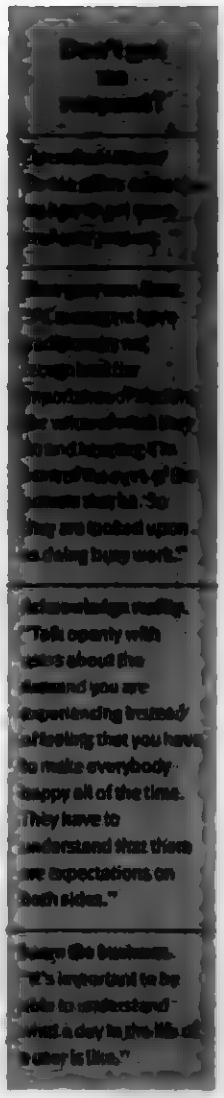
The next step, he says, is to begin central tracking of PC assets, which company officials say they hope will simplify budget planning for business units.

Although the past decade has seen many huge changes for microcomputer managers, one thing hasn't changed: the passion for PCs.

"If anyone believes for a moment that they're going to be living well in the mainframe world 10 years from now," Kight says, "they're kidding themselves."

How well former PC revolutionaries and traditional IS can get together in this new downsized world will undoubtedly make or break the futures of both groups. ■

Free-lance writer Robert Knight contributed to this article.



FirstLine blurs IS and users

There are IS departments with high-profile PC teams. Then there's Janet Wilson and FirstLine Trust. In her shop, it's hard to tell the programmers from the users.

Midway through a seven-year downsizing project, the Toronto-based mortgage bank is pursuing a strategy that blurs the traditional roles of IS and end users. The company runs on 350 networked PCs, with a Digital Equipment Corp. VAX available via gateway.

Wilson, vice president of information technology at the bank, says the more interchangeable the roles are, the faster the company can change. "You've got users in IS and IS in the user community. It's a really fuzzy line sometimes as to whether some of them are users or programmers," Wilson says.

For example, she says many IS staff members could easily be called users. "They work with the development team on functional specifications and testing," she says.

The group is organized into "pods" that include members of the business units. IS compensation is linked to how well end users receive the systems.

Wilson says teaming like this lets users work in a looser environment. "We don't need such a highly structured IS department now," she says. "We're much more fluid and able to cope in a business environment."

What makes this mix possible? She attributes it to changing skills, not new job descriptions. "We have internal IS people with business skills, and managers of user groups have an understanding of what machines can do for them."

The result? A business that can think on its feet. "I truly believe that the closer a business person can look like an IS person and vice versa, the better off you're going to be and the faster you're going to change," she says.

—Carol Hildebrand

NETWORK MANAGEMENT

Ensuring flexibility, consistency and reliability

What Is Open Network Management?

Even if your network copes with your enterprise needs now, is it prepared to handle the way your organization will move and use information tomorrow? Your network will need to support applications far more complex and powerful than those you're using today. And it will need to do this flexibly and reliably, across organizational and geographic boundaries.

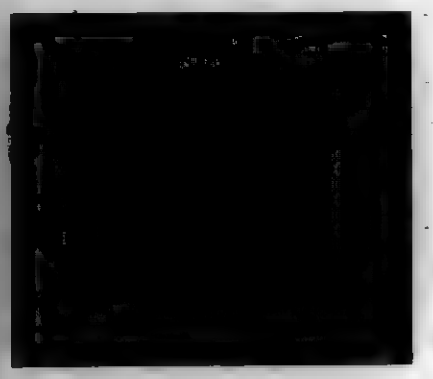
Without an integrated, open approach to network management, building and managing a network that will evolve successfully to meet these demands is impractical. Without effective network management, cost control is impossible.

The Benefits

Networks have become a crucial determinant of enterprise efficiency and competitiveness, which is why effective network management is now more essential than ever to the health and success of your organization.

Network availability, for example, is essential to mission-critical applications such as customer service, inventory management, EDI and product development. Network management enables consistent, reliable network service that organizations can depend on. An integrated network management approach will enable your enterprise to quickly respond to requests for new services to meet evolving business needs. This is especially crucial in a period when use of network-based applications is growing rapidly.

Integrated network management provides a foundation for higher levels of automation of administrative and operational tasks. It also improves responsiveness to user needs while substantially lowering support costs. Integrating your network management solution into a broader enterprise management strategy is far more cost-effective than investing in closed, vendor-specific solutions on an ad hoc basis. And it provides your IS department with the information necessary to track costs and optimize network resources while maintaining desired service levels.



What You Can Do Today

- Address network management from a strategic perspective. Ad hoc solutions and their incompatibilities will ultimately cripple your network.
- Choose an open platform for managing your enterprise network that is compatible with other enterprise management choices. Gradually, eliminate proprietary management interfaces, instead choosing new equipment based on open standards such as SNMP and CMIP.
- Place standards-based management agents on existing network devices.
- Make the use of open management protocols a requirement for new network purchases.
- Acquire management tools and applications for networks that integrate with the open management platform you choose.
- Favor object-oriented network management solutions.

Contact the leading vendors listed here for more information. They are committed to helping you implement an integrated management approach to building and managing open, interoperable, multi-vendor networks.

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Joanne Kelleher

The Shadow knows

If you aren't afraid of your shadow, maybe you should be.

Several information systems executives have recently described to me, in eerily similar terms, IS-like structures that seem to be lurking just outside their field of vision. They say they don't have a clear view, but they know what's out there — individuals and groups in business departments performing end-user support and business analysis functions — and they sense that these "shadow organizations" are growing rapidly.

These executives usually hasten to add that they don't have a problem with others picking up a burden that, for a variety of reasons, they haven't been able to handle. Someone has to do it, and they don't have the time or the money or even the expertise in their operations.

Top executives won't loosen the purse strings enough to cover the hiring of staff for end-user training, one IS executive explains. "They say, 'What's so difficult? Tell them to read the manual.'" And as for using existing IS staffers.... Well, truth be told, in many cases the end users already know more than they do.

It's pretty clear why business departments aren't waiting around for instructions from IS central. What isn't so clear, though, is what kind of role is going to be left for IS personnel when these shadow organizations have dug in, filled out and become more real to business departments than the folks with the official titles.

Those of you in the top echelon probably don't have much to worry about. If all the action moves out from under your existing structure, you can probably get a diplomat-type posting out in the new heartland, handling border disputes and coordinating high-level policy initiatives. The underlings may not be so lucky.

In a recent article, "The Future Role of the CIO," published in a company newsletter, CSC Index, Inc. principals Leslie Ball and Susan Falzon predicted that during the remainder of this decade, "IS people will be relied upon less, victimized in part by the very technologies they advocate." The authors go on to suggest that IS organizations will have to become flatter, more flexible and more entrepreneurial.

In some places, that scenario is already reality.

Be prepared

My best guess is that anyone who wants to stake out a secure place in the technology structure of his organization had better move quickly because the ranks of the shadow IS groups are filling rapidly. Some IS professionals may be able to slide into the remaining slots — those who are smart enough to be networking now.

It won't be easy, and it will probably mean making some detours into unfamiliar areas. It will also mean striking up conversations with strangers. And it will mean spending extra hours learning the ins and outs of PC and network operating systems and applications. Like old age, however, it is probably better than the alternative.

Stand where you are, rubbing your eyes and waiting to see if those shadows are phantoms or real, and you'll be flattened by a very real new cadre of technical experts.

How big a threat is this, really? No one knows exactly because these folks aren't on any official III census. They don't necessarily have identifying titles, and they don't stick their heads into IS departments because they don't think those departments have anything they need.

The very idea of end users with delusions of self-sufficiency is pretty hair-raising for any career-minded IS staffer. But what's even more sobering is that these know-it-alls seem to be right. The people who've started to notice these developments haven't been alerted by screams for help but rather by the small rustlings of distant activity.

If you haven't heard those sounds yet, listen harder. That's the future taking shape out there in the shadows.

Kelleher is *Computerworld*'s features editor.

Executive Track

Patricia M. Woolsey is now **Washington Gas'** senior vice president in charge of information systems, human resources and corporate communications.

Woolsey is a 23-year veteran of the Washington, D.C.-based utility. She most recently served in the capacity of vice president and general manager of the company's Virginia division.

At **United States Trust Co.** in New York, **Philip S. Felice** has been promoted to vice president. Felice, who has been at the financial services company since 1985, is a manager in the systems development department of the Computer Services Division. He is responsible for cost-effective systems development and support.

Terrell Jones

Jeffrey Katz

Bruce Parker

Three executives helping to steer AMR Corp.'s newly minted IS subsidiary **Sabre Technology Group** have been elected vice presidents of **American Airlines**.

Wearing the new titles are **Terrell B. Jones**, president of the group's Sabre Computer Services unit; **Jeffrey G. Katz**, president of the Sabre Travel Information Network; and **Bruce D. Parker**, president of Sabre Development Services.

Carol E. Chamberlain is the new associate dean of technical services and systems development for university libraries at **Northeastern University** in Boston.

In her new post, Chamberlain, who formerly served as chief of the acquisitions department at the Pennsylvania State University Libraries, is responsible for the Northeastern library's computerized support operations, holdings and information resources and services.

In Livingston, N.J., **The CIT Group, Inc.** recently promoted **John J. Fischer** from vice president to senior vice president of systems and technology. A joint venture of The Dai-Ichi Kangyo Bank Ltd. and Chemical Banking Corp., The CIT Group is an asset-based finance company.

Intelligence Files

Password pluckers

Anyone who has ever forgotten a computer password will be happy to know that a new breed of software is being sold over the counter to bail out forgetful users and their network administrators. However, the password-cracking utilities have an obvious downside if they fall into the wrong hands.

When the author installed one "password plucker," the on-screen menu offered options such as "reveal user names and passwords" and "reveal forgotten file passwords and/or decrypt file." He selected the latter option, and the program found the password in four seconds.

Source: "Password Pluckers for Sale" by Robert Kane, *Infosecurity News*, May/June 1993.

Jargon-free reports

Chief information officers often need to write business reports to justify or promote an information technology project. When the report is going to general managers, it should focus on business issues and keep the technology-related information to a minimum.

Stamp out jargon, reduce acronyms to an absolute minimum and translate technical information into plain English.

Source: "Writing Reports That Work" by Edward Wakin, *Beyond Computing*, March/April 1993.

Client/server telephony

Most of the action in computer/telephone integration has been on mainframe computers or private-branch exchanges. But the architectural wave of the future will be client/server call processing, which will have standard interfaces to Microsoft Corp. Windows-based software and will thus put telephony applications in the hands of desktop PC users.

One of the long-term advantages of client/server call processing is the ability to share expensive resources among many users.

Source: *Siag*, April 1993.

RAM violation

Caution: Loading copyrighted software into the random-access memory of a computer is the equivalent of creating a copy of that software and thus violates federal copyright law. So ruled the Ninth U.S. Circuit Court of Appeals in *MAI Systems Corp.* v. *Peak Computer, Inc.*

Source: "Intellectual Property Update," *The National Law Journal*, May 3, 1993.

Calendar

JUNE 6-JUNE 12

Equipment Resources Planning Institute. Washington, D.C., June 7-8 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2997.

JUNE 13-JUNE 19

Seventh Netron Users Conference. Toronto, June 13-16 — Contact: Leslie Connell, Netron, Inc., Toronto, Canada (416) 636-8333.

Enterprise Network: Building and Managing for Change. Boulder, Colo., June 13-18 — Contact: International Communications Association, Dallas, Texas (214) 233-3889.

The Outsourcing Conference. San Francisco, June 14-15 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Client/Server World. Boston, June 14-16 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Electronic Messaging '93. Atlanta, June 14-17 — Contact: Electronic Mail Association, Arlington, Va. (703) 875-8620.

International Teleconferencing Association Conference '93. Washington, D.C., June 14-17 — Contact: International Teleconferencing Association, Washington, D.C. (202) 833-2549.

DME

Distributed Management Environment

consensus-based solution to the creation of universal management standards

With the emergence of distributed, multi-vendor computing environments, the creation of a standards framework to facilitate their effective management became a top priority. As a result, leading vendors, working through the Open Software Foundation (OSF), have developed a set of open, vendor-neutral standards known as Distributed Management Environment (DME).

DME was conceived to get the most out of today's advanced distributed computing technologies, open standards, interoperability and object-oriented technologies. Its standardized framework represents an industry consensus on application program interfaces (APIs) and protocols for open management. DME is a 'living' standard, evolving as technologies evolve, enhancing the latest industry developments.

Why DME Works

DME builds on existing standards. It is not an alternative to other standards. Rather, it represents a complementary approach that encompasses existing SNMP and CMIP standards and endorses interfaces devised by the Network Management Forum, X/Open and others.

DME is the product of a multi-vendor, consensus-based process. As a result, DME maps to your computing environment and manages growth in multi-vendor systems and networks. And because DME is the product of industry consensus, it accelerates the process of reaching consensus within your organization.

DME is based on a comprehensive set of requirements developed through an open, industry process to meet specific objectives and address real needs.

DME is vendor neutral. It enhances competition in the management market. This will result in lower costs and better solutions for users.

The Benefits

DME's wide-ranging benefits include:

- A scalable, distributed architecture that can accommodate growth in multi-vendor networks and distributed systems.
- Better management, interoperability and integration through the implementation of common management services and standardized protocol and object definitions.
- Reductions in time and costs for system administration and training.
- Tightly integrated solutions utilizing object-oriented design, for easier and more flexible integration of scalable, distributed, multi-vendor architectures.
- Greater longevity of systems resulting from standards-based, backwards compatibility.

What You Can Do Today

No matter where you are in the development of your network, we suggest evaluating DME as you build your enterprise management strategy. Portions of the DME will be available during 1993 from a number of vendors. Complete implementations of DME will begin appearing in 1994.

Contact the Open Software Foundation for more information on DME and how it can provide you with a framework for managing growth in a multi-vendor systems and networks. Or, contact these leading vendors who have committed to supporting DME.

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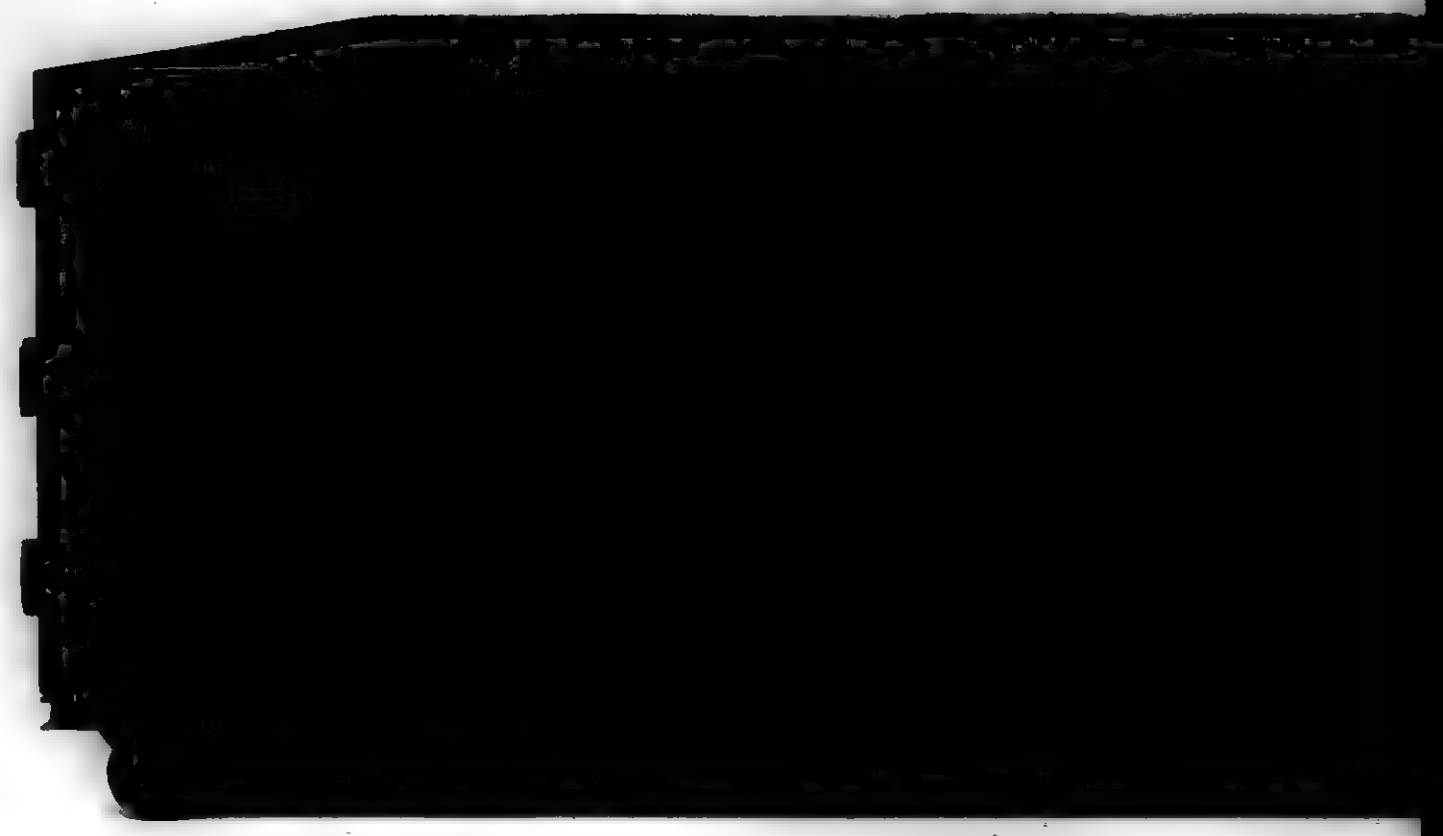

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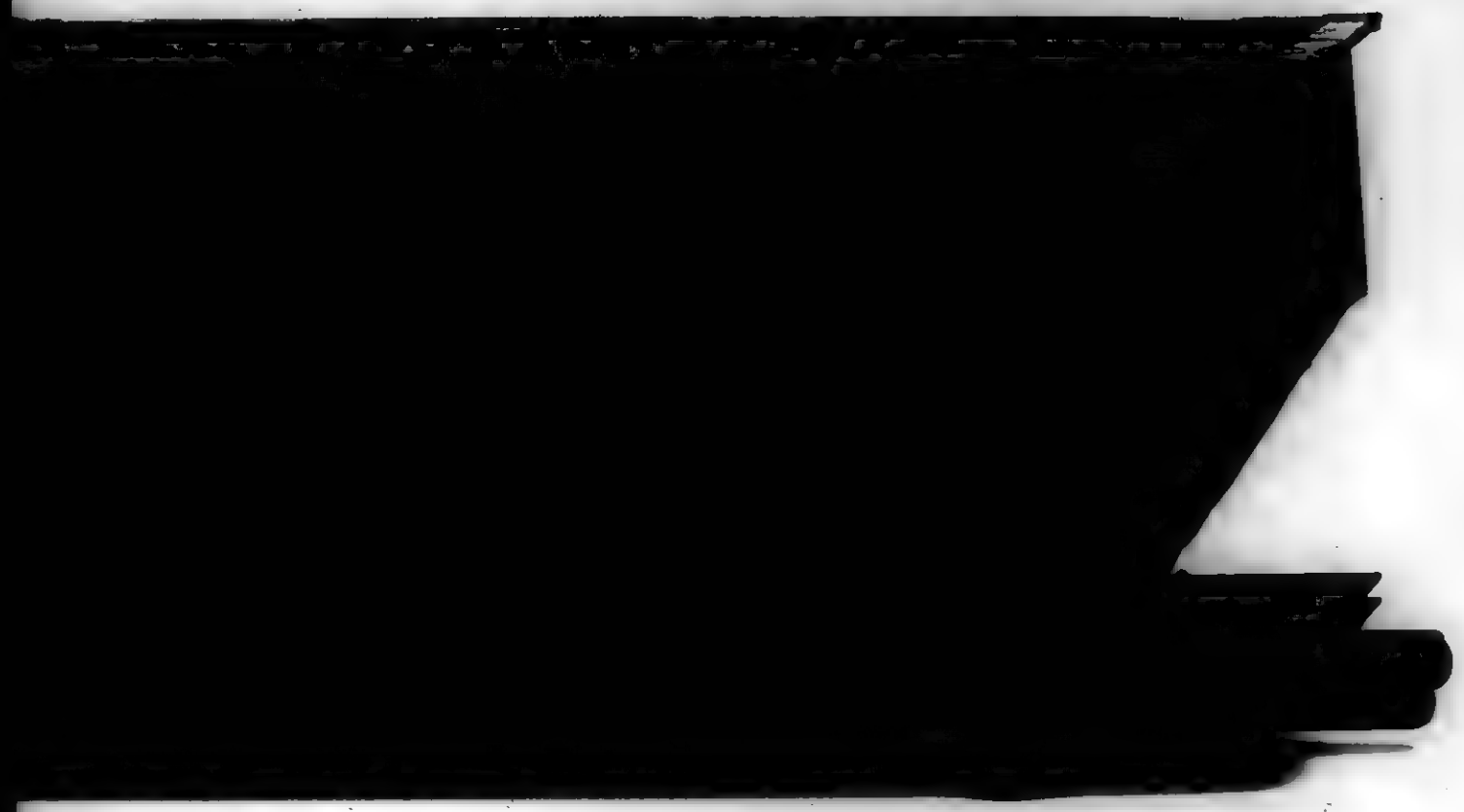

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RAPID APPLICATION DEVELOPMENT METHODS CAN SPEED SYSTEMS DELIVERY BY AS MUCH AS 1,300%. BUT MOST COMPANIES GET 0% IMPROVEMENT BECAUSE THEY TALK ABOUT CHANGING TOOLS, NOT TECHNIQUES.

By W. Burry Foss

Many information systems groups would kill to speed up application development even a little bit. After all, getting applications to users faster is less expensive and means happier customers and coders.

That's why when companies such as a Houston division of a $104 billion energy company talk about 25% increases in delivery of components for $20 million and $30 million systems, IS chiefs want to know *how*.

Rapid application development (RAD) methods, that's how.

As its name implies, RAD helps get systems out faster, through a combination of speedy design iterations, data modeling, user/developer teamwork and automated development tools. In fact, some proponents claim 25% faster delivery is on the conservative side, with 500% and 1,300% increases possible for some firms.

Unfortunately, I'm going to have to burst some bubbles here. Most companies using RAD will have little or no increase in their delivery times because they fundamentally misunderstand what RAD is about. RAD isn't about fancy automated tools but about significantly rethinking development methodologies and management techniques. The idea is to accelerate learning so developers can use new techniques for business good.

RAD's success depends on companies adopting ideas such as the following:

- **Incremental delivery of system components.** The system never gets delivered in its entirety. The first component comes out in three to four months and the rest at three- to six-month intervals. No delivery takes longer than six months.
- **Teamwork.** Developers work in teams, and teams work closely with business users, showing users timely iterations before finalizing the design.
- **Achievable goals.** Workers, not management, set deliverables, which are goal-driven.
- **Less waste.** With an eye toward innovation, developers work to eliminate unnecessary steps in the system development methodology. For instance, the energy company developed a template for on-line screen generation in its first delivery and reused it to replicate extra screens in later releases.

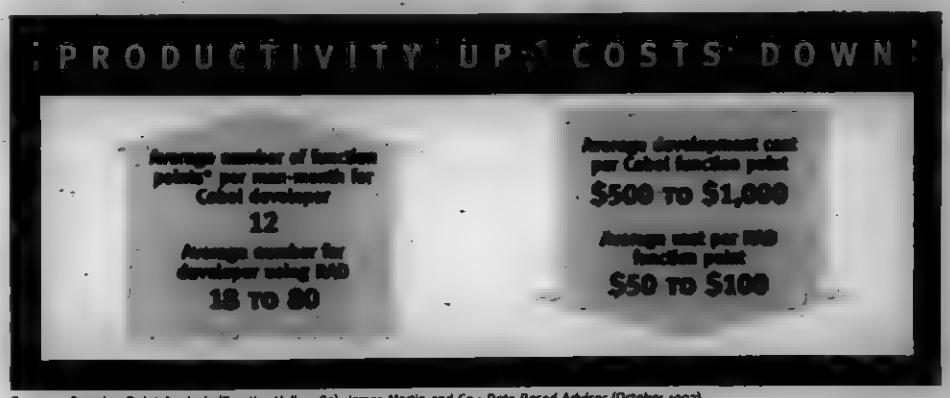
INSIDE

Big bang is bust

Contrary to popular belief, using whiz-bang tools in development can actually extend delivery time. That's because you just can't drop new tools into a rigorous, linear way of defining requirements, designing systems and building them and expect them to work miracles. The 1970s "big bang" approach to systems implementation, in which all functionality is delivered at one time, isn't working.

For instance, one company, which planned to deliver its real-time process control software

Development, *page 83*



Sources: *Function Point Analysis* (Prentice-Hall, 1989); James Martin and Co.; *Data Based Advisor* (October 1992).

Foss is a senior associate at the management consulting practice of International Systems Services Corp. in Stamford, Conn.

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Development

CONTINUED FROM PAGE 81

all at once, had to terminate the project after repeatedly failing to meet its delivery deadlines. At the point at which the company halted work, the system was 18 months overdue.

"Using RAD in an IS setting is a formidable challenge because our discipline expects precision, rigor and tools to be the solution," says Bob King, a RAD sponsor at The Travelers Corp. in Hartford, Conn. RAD has been in use at Travelers since 1990.

The Houston energy company, for its part, broke a pattern of changing requirements and extended delivery schedules by altering the rigid '70s ways of managing projects. It instead adopted RAD and its management technique of delivering systems incrementally, in releases.

The oil company's IS team set initial "breakthrough" goals in which developers finished core applications, such as a tax subsystem for natural gas accounting, early. The developers could then focus on creating remaining pieces of such a system more quickly — pieces that contained important functionality, such as interfaces to the general ledger and accounts payable system.

This project, which was slated to last one year from the start of construction, took seven months — four months for the first core systems with remaining pieces released three months later.

What is most striking about this case is that developers did not use cutting-edge tools. The fanciest IS got was an applications generator that made code production easier. Otherwise, developers worked with conventional technologies such as Cobol. The concentration was on understanding business requirements, applying database technology and learning how to work effectively in teams.

Developers at the Virginia Department of Taxation opted to keep things simple as well. They created the organization's massive tax accounting system — a synthesis of 1,500 programs and 40 databases — by coupling conventional third-generation language and database technology with RAD management techniques. Currently, users wait no more than a year for any new functionality.

IS personnel say the project thrived because they focused on setting aggressive but achievable goals and ensuring new functions every three to six months.

Under the gun

IS continues to be under pressure to deliver systems more quickly, and even phased waterfall proponents may turn in desperation to RAD to satisfy critical business needs. In this way, RAD has sprung up in small pockets in many organizations, even though these companies haven't openly embraced it. It is in these renegade groups that RAD gets its best public relations; if it works there, it is more likely to find a home in the organization at large.

At Travelers, for example, IS in one of its insurance divisions was under extreme time pressure to deliver business applications. Because delivery took an average of 18 months using traditional development methods, the group turned to RAD hoping to capitalize on automated development tools. In the long run, the tools became incidental as the group came to rely heavily on teamwork, involved business partners and the creation of risk-taking, team-based decision-making in IS.

Today, this group is using RAD to aid in enhancing applications and is delivering pieces in three to six months. While the company is still not using such methods for its mainstream development activities, King says, RAD acceptance is growing steadily.

Face it: Old habits die hard. But RAD can help to significantly increase development productivity, as long as IS groups approach it as a new way to manage development, concentrating on teamwork and a project orientation. Otherwise, no software tool, no matter how advanced, is going to make any difference. •

INTERVIEW

James Martin: 'You are taking a terrible risk if you don't do fast development'

James Martin, the so-called "Father of CASE," says he believes one of the biggest myths about RAD is that it can be done only with small systems. Martin, chairman of James Martin and Co. in Reston, Va., and a frequent speaker and author, says that, in fact, large systems are at risk if they don't use RAD techniques. He recently spoke with senior editor Lory Dix about this and other RAD issues.

Q. How can RAD be applied to large, mission-critical business application development?

A. What you do is split the very big, complex application into small pieces, with each piece a RAD in its own right. I like to call those multi-RAD projects. Each piece would be finished in three months and be highly visible to the businesspeople. You would use GUI prototyping during the requirements planning stage. You'd do requirements tracing from the business requirements to code modules (with CASE tools to help). You'd appoint a software repository coordinator to make sure all the different pieces fit together.

I've seen it done with large systems — 2 million lines of code.

People say bringing in RAD is a risk. I'm saying the opposite — you are taking a terrible risk if you don't do fast development.

Q. Do you have any examples of what happens when you don't use RAD for large projects?

A. One bad example happened just recently at the London Stock Exchange. The exchange tried to build a system called Taurus, which would enable it to get all the share certificates into electronic image form. It was completely redesigning what goes on in the stock exchange. They were using conventional systems development methodologies, and it ended up a total catastrophe. After about five years of work, it didn't happen.

Total losses, including those to banks and brokers, were more than $4 billion.

The London Stock Exchange chairman referred to the software in this instance as an "invisible palace." How could anyone know what developers were doing when the software was invisible?

If they had broken the project into small pieces, building each piece in three months and making it all highly visible using GUI prototyping, they might have avoided this catastrophe.

Q. Is RAD applicable in all cases?

A. The life cycle is much more applicable to business systems than engineering systems. Code generators don't work very well for scientific computing because of the heavy, complex logic requirements.

Q. What are the most common mistakes you see companies making when it comes to RAD?

A. Lack of training is a problem. You've got to understand that this is not just iterative prototyping but a life cycle that information technology people need training in.

Using poor tools is another problem, as is mismanagement. This life cycle needs to be managed professionally, like an engineering discipline.

Lastly, people won't let go of old life cycles. Everybody in the British government, for instance, wants to do the SSADM [development methodology], and that just doesn't work for fast development.

Teams are [redacted]; hierarchy is [redacted]

Self-managed IS work teams help build the skills necessary to survive in flattened organizations

By Joe Panepinto

BUZZWORDS COME and buzzwords go, but work must still get done. At least that's the view from those on the front lines — the information systems personnel who are required to pay homage to the latest management trend and still deliver quality service to increasingly impatient end users and customers.

Source: 1992 CSC Index, Inc. Survey, Cambridge, Mass.

Lately, fashionably up-to-date IS organizations have been touting the effectiveness of self-directed work teams. These groups of IS personnel span functional and technical areas and are responsible for doing their work with little or no management supervision.

But working in self-directed work teams can be a mixed bag in terms of career direction, opportunity and day-to-day responsibilities. It can be jarring for the uninitiated, but for those who have already worked in teams, it's a chance to garner new skills that help in flattened organizations where fewer clearly defined career tracks exist.

"We more or less set our own work pace; we don't have to report to a manager on a regular basis, and we deal directly with our clients," says Jim Petro, knowledge-base coordinator at LTV Steel Co. in Cleveland.

Petro is a veteran member of an eight-person data administration team that has members at three LTV sites and serves the data modeling needs of more than 300 people. To Petro, while working in an IS team has meant more job satisfaction because of the autonomy it affords, it has also meant more responsibility.

Petro and each member of the team are responsible for the database modeling, design and coding for roughly 15 databases. They are also responsible for hashing out the duties of each team member at a weekly meeting run by a "manager of the week."

Expect to broaden skills

In addition to accepting more responsibility, team members must also widen their skill set to include technological experience, communication, team-building and consensus-oriented skills. These skills enable IS members to move horizontally on different technical tracks or vertically on the few existing managerial tracks, says Nick Vitalari, a consultant at CSC Index, Inc. in Cambridge, Mass.

"We've seen a significant flattening of our organization," says Mary Sitko, quality and training manager at Dana Corp., a Toledo, Ohio-based automotive and truck component manufacturer. At Dana, there are 10 IS teams in a department of 75 employees. Sitko says her department went from having 15 supervisors five years ago to having none and from six managers to four "coaches" — manager substitutes selected randomly. Coaches are team members with special responsibilities such as having the final say in capital expenditures.

But being a coach does not present a clear step upward in terms of career path. In many firms, middle management has been largely eliminated. As a result, team membership prepares IS personnel well for flattened career paths.

Horizontal movement accepted

"In the past, the important thing was always upward mobility," Sitko says. "Now it is more acceptable to move horizontally to different technical positions. This gives you lots of breadth so you're more valuable to the company."

"Most organizations who go to teams have cross-functional teams that allow IS personnel to step out of their narrow specialties," says Madeline Weiss, president of Weiss Associates, a Bethesda, Md., management consulting firm.

Medtronic Corp., a Minneapolis maker of implantable medical devices, for example, has a 90-member IS department that is currently organized into 16 functional teams aligned with the company's six lines of business. Team members may cross over to other teams when the project load changes, says Tom Morin, vice president of IS. This builds a valuable knowledge base.

Texaco, Inc. Research and Development's 12-person computer systems and networking team adds to this knowledge base further by instituting an employee-swap program in which employees from its Beacon, N.Y., site spend five to six weeks working at its Port Arthur, Texas, site, and vice versa.

"You really need to understand what's going on with everyone's end users and customers to communicate effectively within a team," says Ralph Fleming, a team member at Texaco.

Panepinto is a free-lance writer based in Amherst, Mass.

Paradise or purgatory?

In the worst case, self-directed work teams sound like some kind of subcommittee purgatory. In the best instance, they sound like a nonhierarchical paradise. In reality, they fall somewhere in between.

Positive outlook

You're developing wider skill sets in a flattened organization — the ability to come to a consensus, form teams, solve problems and adjust to new projects.

Negative outlook

You're getting new responsibilities that you never wanted — dealing with poor performance, decision-making, budgets, hiring and firing decisions, capital expenditures and training decisions.

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LAN administrators picking up new roles

Jobs in

By Alice Bredin

Most local-area network administrators agree on one thing: Their title is misleading. During the past few years, they have devoted less time to fixing LAN hardware and more time to answering users' questions, interconnecting LANs and expanding their technology base.

At a large multinational firm in New Jersey, for example, LAN administrator Keith Fletcher used to spend the majority of his time keeping the network running smoothly. Now, with less troublesome LANs, 30% of his day goes to helping users — up from 10% during the last few years.

"I always had responsibility for software support, but because people are using more packages, it's more of my job now," Fletcher says.

LAN expansion

The increase in responsibility also encompasses the task of expanding the LAN while improving system performance at the same time. LAN administrators agree that understanding the technology that helps them increase efficiency is crucial. The most important technologies include Simple Network Management Protocol, protocol analyzers and routers, bridges and gateways.

Gordon Craig, LAN/wide-area network administrator at the Texas Rehabilitation Commission in Austin, keeps up with this technology by spending 60 to 90 minutes a night reading about LANs.

One of the more difficult areas is interconnecting departmental LANs, LAN administrators say — not learning the actual technologies but finding where to acquire the skills to apply them.

"Finding someone to teach you about these technologies is tough because not too many people know them," says Rein Hofstra, LAN administrator at Blue Cross/Blue Shield of Florida in Jacksonville.

Hofstra makes up for this skill shortage by reading books and getting practical help from people in other departments who are familiar with the topic. The time frame for learning a technology, he says, is approximately one month when he has assistance vs. up to six months when the skill is self-taught.

Interplatform connections

Wayne Robertson, network administrator for corporate information systems at Saint Agnes Medical Center in Fresno, Calif., found himself in a similar situation.

Robertson is busy networking the hospital's minicomputers, but because there are so few resources for learning interplatform connection, he visits companies that have succeeded in doing the same thing. "We copy other people, do some tests and make a lot of mistakes," Robertson says.

These technologies are not difficult to learn, Robertson says, but finding the time to attend conferences is hard. "If you go to all the different conferences and seminars, you can end up being out of the office 30 days a year."

Finally, if you are linking LANs to larger systems, you must familiarize yourself with how the larger systems operate. Fletcher, for example, mastered the IBM 3270.

"Because I'm pulling things off the mainframe, I have to understand what the mainframe offers users and the type of interface it had," he says.

Fletcher says he wants to offer the same information on a PC, and "if users are used to working with an invoice number, I cannot suddenly call it a package number."

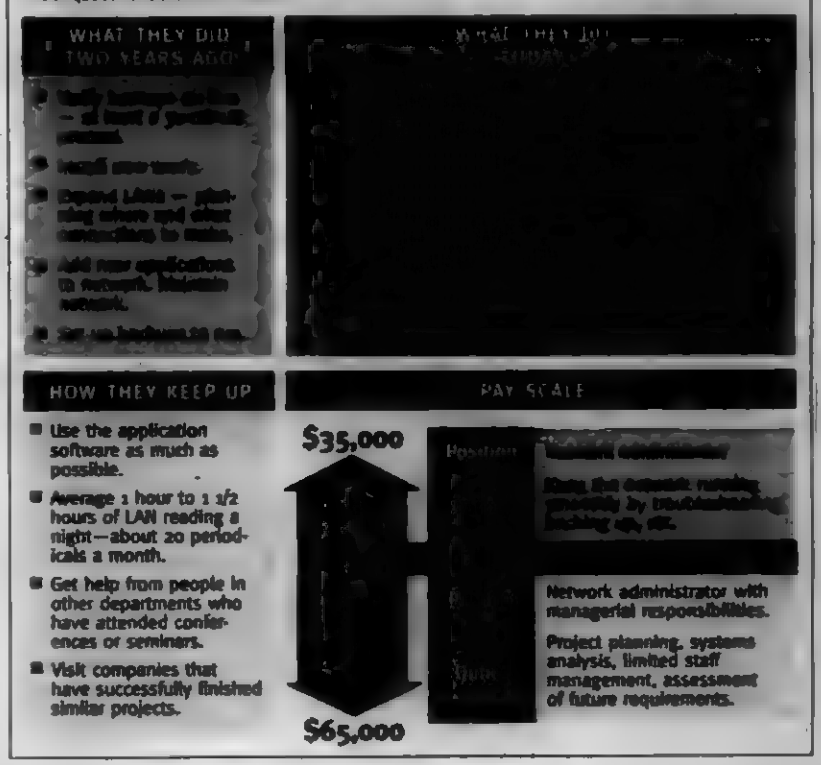
But, Fletcher adds, he does not need to be a mainframe expert.

"I don't have to know how to write mainframe code," he notes.

Bredin is a free-lance writer based in New York.

LAN administrators: You're not in Kansas anymore

LAN administrators are less tied to troubleshooting and are building more sophisticated skills such as network planning and design. It's hard to keep skills current, however, due to inadequate resources and time.



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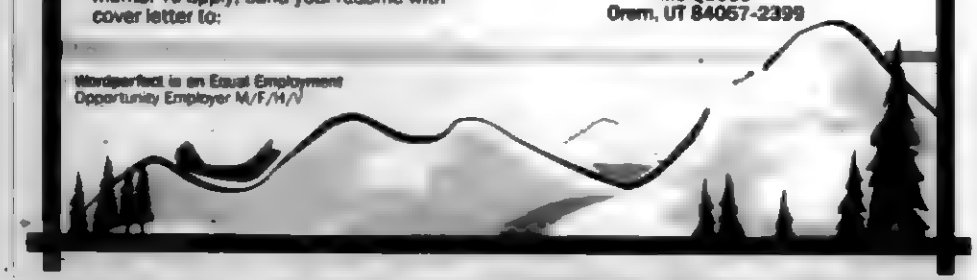

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INVITATION FOR BIDS

The United Nations Industrial Development Organization (UNIDO), with headquarters in Vienna, Austria, is reviewing the scope of services and contracts related to hardware maintenance and facilities management of its leased IBM 3090 250J.

UNIDO is therefore seeking companies with actual experience in the provision of outsourcing services, which either directly or through sub-contracting could offer full integration services in the areas of facilities management, system software maintenance, hardware maintenance and applications development support.

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Companies interested in receiving relevant bid documentation should send a letter of interest to be received at UNIDO not later than 18 June 1993, stating company background, year established, staffing and turnover, experience in handling similar contracts with name(s) of client(s) and briefly describing the nature of services provided, as well as curricula vitae of key staff.

All correspondence and/or enquiries should be addressed, in English, to:

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UNIDO
P.O. Box 300, A-1400 Vienna, Austria
Tel: 43-1-211 31/4833, Fax: 43-1-230 82 72

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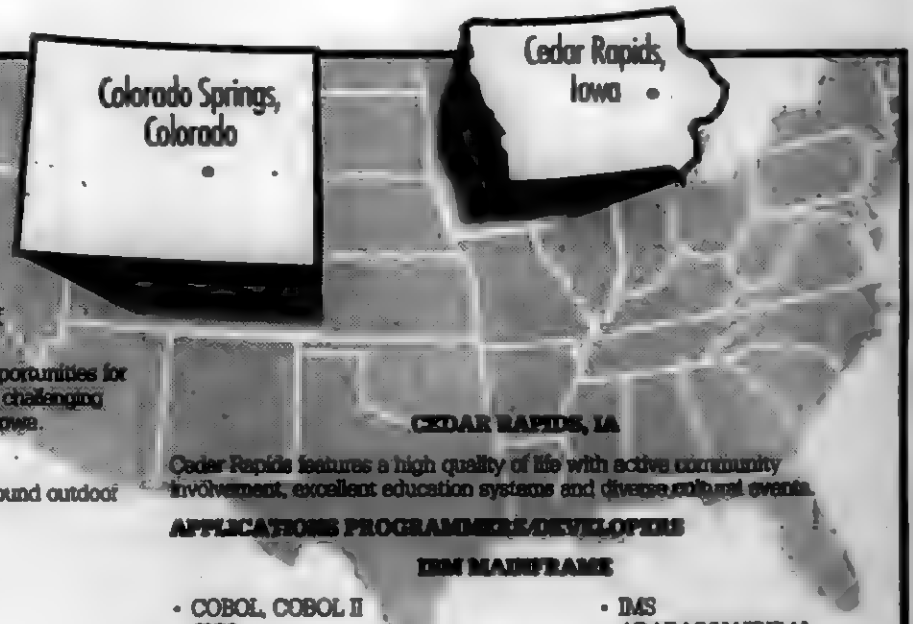

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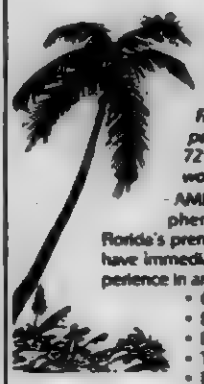

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Sizing up superstores

Computerworld asked three computer executives to visit a computer superstore in their area and report on the store's value for the corporate buyer.

OVERALL IMPRESSIONS

Superstores have a lot to offer for the weekend computerphile, but reactions are mixed when it comes to their worth for the corporate buyer. Their best attributes are convenience, the chance to see products side by side and the opportunity for a reality check for prices.

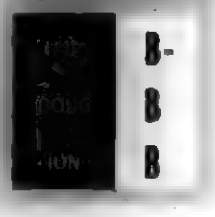
Ed: "Unless you are lucky to find a mature salesperson with sufficient experience, the superstores are useful primarily for convenience value."

Doug: "It seems to have something for the computerphile in us all. The wide variety is good from a volume discount point of view. Buyers are almost faced with too many decisions."

Jon: "Clean-room mentality comes to mass marketing retail. The fact that you can eat off the floor at these places gives them a sense of professionalism. This is critical, especially at the IS level. It separates superstores from some of the PC boutiques."

REPORT CARD

How well do superstores meet corporate IS needs?



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PRODUCT SELECTION

Fair, but you can usually do better through other channels. Some narrow product lines are well-stocked.

Ed: "Brand-name products are well-represented; you can get everything from disks to Novell NetWare v3.11. However, selection is more limited than that of many mail-order operations. The selection of hardware is generally adequate for repairs such as system component purchases, and mainstream software products are in good supply."

Doug: "I was pleasantly surprised to see a well-stocked collection of almost every Macintosh model available, from the high schooler's Mac Classic to the screaming Quadra 950. There also was a good collection of printers and other peripherals available. During my visit, there were three product demonstrations, which gave me a taste of Ami Pro and a nibble of multimedia."

PRICES

Competitive but on the high side. Best buys are individual system components.

Doug: "The prices fell somewhere between retail and mail order, but I really didn't see any prices out of whack."

Ed: "System pricing seems to have become more competitive but is still slightly higher than normal IS channels. Components such as disk drives and memory are lower than the manufacturers' pricing — about 20% to 25% for disk drives. Software seems reasonably priced but is roughly 5% to 10% higher than the best mail-order and other corporate resellers. Even these differences can often be resolved because many stores have a 'meet the competition's price' strategy."

Jon: "Prices are very close to traditional resellers, especially for hardware, and some are even a few dollars less."

SALES STAFF EXPERIENCE

Many floor representatives are at the level of knowledgeable hobbyists. They know narrow product lines but lack real-world corporate computing experience.

Doug: "These weren't your typical, straight-out-of-high school salespeople. They seemed knowledgeable and eager to help. Most appeared to be between 20 and 30 years old and had a modicum of technical expertise."

Ed: "Corporate buyers must do their homework, because although the salespeople are generally knowledgeable on narrow product lines, they lack exposure to competitive products and business computing issues such as networking, host computing, system scalability and the reality of supporting large numbers of users in the workplace."

Jon: "I spoke with the store manager and inquired as to the mix of personnel. Yes, they had the usual suspects — power users, home enthusiasts and a smattering of Home Shopping Club refugees. But the real news is that the bits and bytes boys and girls were there in force — downsized, outsourced but still determined. I made a mental note to drop by the personnel office and pick up an application — just in case."

TECHNICAL SERVICE AND TRAINING

While it's difficult to determine this on a site visit, technical service seemed up to par. Well-rounded classes and seminars are also provided.

Doug: "CompUSA provides a training center with a variety of classes and a good selection of magazines and books. The training is offered in the typical levels from beginning to advanced."

Jon: "Each Computer City outlet has a fully equipped training center that caters to both the home and corporate user communities, at a price point that will impact the PC training industry."

Compiled by Jodie Naze, associate editor, features.

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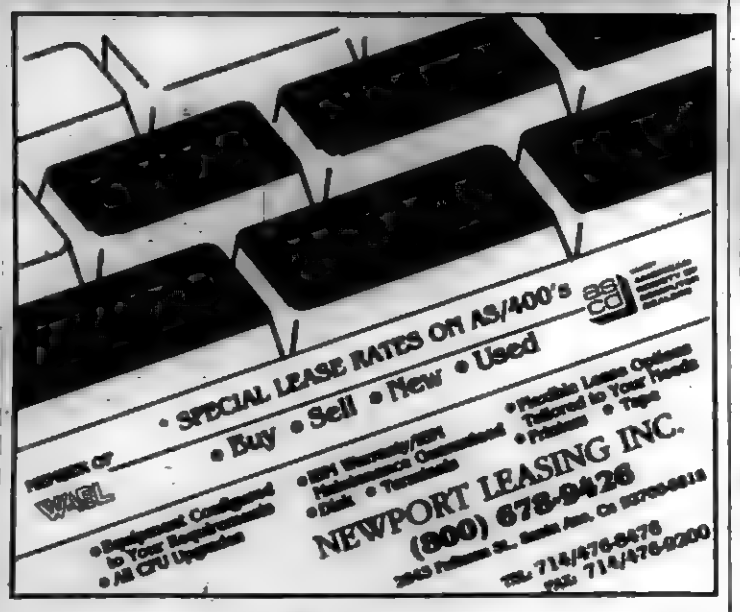

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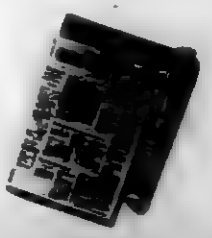

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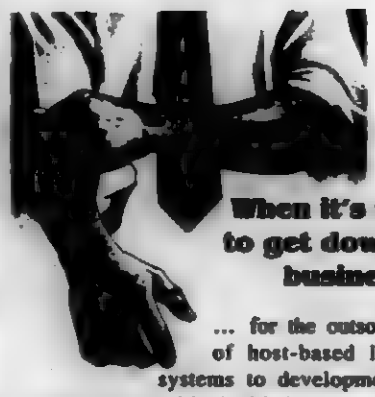

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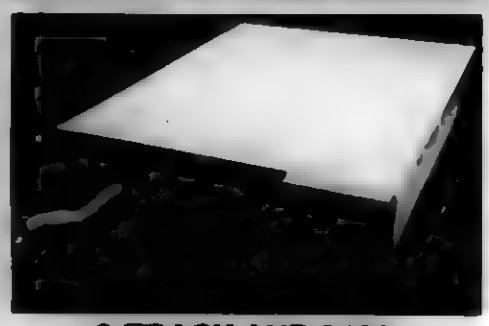

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Percent

Advanced Logic Research	35.7
Compression Labs Inc.	22.8
Digital Systems Int'l. Inc.	22.3
Rasterops	21.9
Wyse (H)	19.7
Chipcom Inc.	18.4
Centigram Communications	17.6
Cambex Corp.	16.0

Bell Computer Corp.	-27.5
3 COM Corp. (H)	-27.3
Group 1 Software	-23.1
Groupware Technology Inc.	-13.7
Sequent Computer Sys.	-13.6
MathSoft	-13.2
Ingram Corp.	-12.5
State of the Art	-12.5

Dollar

Intel Corp.	6.50
Zilog Inc. (H)	6.25
IBM	4.13
Centigram Communications	3.00
Motorola Inc. (H)	2.38
System Software Assoc.	1.38
Compression Labs Inc.	3.25
ITT Corp.	2.13

3 COM Corp. (H)	-10.25
Bell Computer Corp.	-9.00
Wellfleet Communications (H)	-6.50
EMC Software Inc.	-3.75
Novell Inc.	-3.63
Computervision Corp.	-3.25
Group 1 Software	-3.00
Sequent Computer Sys.	-3.00

[redacted]

Too good to last?

Valuations are currently very high for many technology stocks. Is the market due for a correction?

Curt Monash
President, Monash Information Services
"Almost every stupidly priced stock I can think of is overpriced. This suggests that a correction may well be coming up.

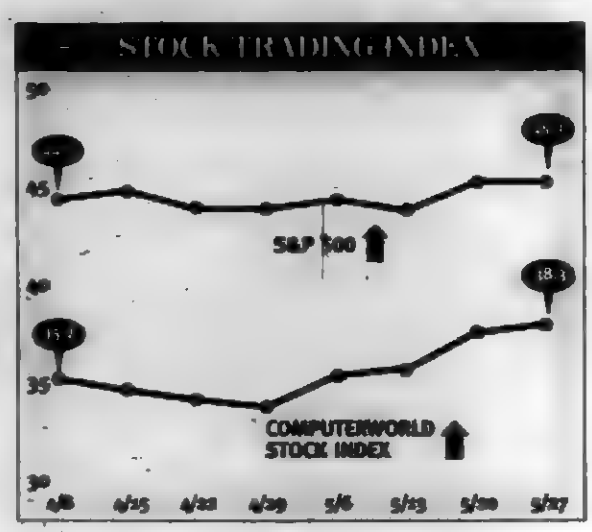
"Even the companies whose fundamentals are bulletproof are at amazingly high valuations. The slightest surprise can take the stocks down, like Novell, even though the companies are fundamentally solid.

"The only way to make money right now, other than the greater fool theory, is to find names that have been overlooked. Intersolv is one that seems low to me."

Michael Murphy
Editor, "California Technology Stock Letter"
"I would separate technology stocks from the general market. You will probably see a correction in the general market — maybe not too drastic but lasting fairly long — while a lot of tech companies that have good news will just continue to grow.

"Anything related to PCs that can avoid price pressure will grow. Systems and disk drives have suffered from price pressure, but networking and PC component companies have avoided the pressure so far."

— Derek Slater



Exch	52-Week High	52-Week Low		May 28 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT & SERVICES						
OTC	39.13	9.63	3 COM Corp. (H)	27.25	-10.25	-27.3
NYS	80.25	61.38	American Info Techs Corp.	72.13	-0.63	-0.9
NYS	62.38	40.63	AT&T (H)	61.13	1.38	2.3
OTC	3.56	0.75	Artel Communication Corp.	2.81	-0.13	-4.3
OTC	24.50	10.25	Banyan Systems Inc.	16.13	0.88	5.7
NYS	56.75	42.88	Bell Atlantic Corp.	53.88	-0.25	-0.5
NYS	57.50	46.75	BellSouth Corp.	51.88	-0.25	-0.5
NYS	6.25	3.63	Bolt, Beranek & Newman	5.00	0.38	8.1
OTC	18.50	9.50	Brodertrout Technology	12.00	0.63	5.5
NYS	104.50	44.00	Cabletron Systems (H)	103.25	1.63	1.6
OTC	20.00	3.75	Centigram Communications	20.00	3.00	17.6
OTC	41.00	17.75	Chipcom Corp. (H)	39.00	-0.50	-1.3
OTC	56.25	21.38	Cisco Systems Inc. (H)	53.00	-1.00	-1.9
OTC	18.75	5.50	Compression Labs Inc	12.13	2.25	22.8
OTC	34.50	11.00	CrossComm (H)	34.00	0.75	2.3
OTC	4.63	0.88	Data Switch Corp.	3.13	-0.13	-3.8
NYS	22.13	12.38	Digital Comm. Assoc.	12.88	-0.13	-1.0
OTC	12.75	4.50	Digital Systems Int'l Inc.	5.50	1.00	22.2
OTC	44.00	4.25	DSC Communications (H)	43.00	1.75	4.7
OTC	9.50	4.75	Fibronics Int'l Inc.	6.38	-0.25	-3.8
OTC	26.00	8.75	Filenet Corp.	13.00	1.50	13.0
OTC	4.38	1.50	Gandalf Technologies Inc.	3.13	0.00	0.0
OTC	2.06	0.69	Gateway Communications	1.13	0.00	0.0
NYS	15.13	2.88	General Datacomm Inds. (H)	14.50	0.00	0.0
ASE	3.75	2.00	Go Video	2.44	0.13	5.4
NYS	37.75	30.63	GTE Corp.	35.13	-0.25	-0.7
NYS	84.25	62.50	ITT Corp.	83.50	2.13	2.6
OTC	52.75	29.88	MCI Communications Corp. (H)	52.00	0.88	1.7
OTC	14.25	2.25	Microcom Inc. (H)	4.63	-0.38	-7.5
OTC	24.25	4.75	Netrix Corp.	5.25	0.00	0.0
OTC	19.00	8.75	Network Computing Devices	11.00	-0.25	-2.2
NYS	15.00	5.38	Network Equipment Tech.	8.13	1.00	14.0
OTC	23.25	8.00	Network General	9.63	0.25	2.7
OTC	15.75	8.50	Network Systems Corp.	9.38	-0.25	-2.6
OTC	71.75	14.63	Newbridge Networks Corp. (H)	68.00	-0.38	-0.5
NYS	46.00	30.50	Northern Telecom Ltd.	35.38	-1.00	-2.7
OTC	35.25	22.50	Novell Inc.	27.63	-3.63	-11.6
NYS	92.50	75.63	Nynex Corp.	83.13	1.63	2.0
OTC	30.00	14.50	Octel Communications Corp.	22.00	0.50	2.3
OTC	6.13	3.38	Pemiel Data Comm Networks	4.38	0.00	0.0
OTC	38.25	10.25	Picturetel Corp.	20.00	-1.88	-8.6
OTC	15.25	4.63	Proteon Inc.	5.50	-0.13	-2.2
NYS	31.75	10.16	Scientific Atlanta Inc. (L)	31.75	-0.50	-1.6
NYS	80.75	29.69	Southwestern Bell Corp. (L)	38.13	0.50	1.3
NYS	33.25	21.00	Sprint Corp.	32.50	1.13	3.6
OTC	27.00	10.50	Standard Microsystems Corp	16.50	-0.25	-1.5
OTC	18.50	6.88	Stratacom Inc.	14.25	1.50	11.8
OTC	125.50	27.00	Synoptics Communications (H)	119.00	-1.13	-0.9
OTC	7.13	4.13	Telebit Corp. (H)	4.13	0.00	0.0
OTC	9.38	2.13	Telematics Int'l Inc.	6.75	0.63	10.2
OTC	25.50	13.38	US Robotics	23.75	-1.00	-4.0
NYS	43.00	32.88	US West Inc. (L)	43.00	-0.13	-0.3
OTC	55.50	12.00	Wellfleet Communications (H)	47.75	-4.50	-8.6
OTC	13.00	7.00	Xircom	12.50	0.25	2.0
COMPUTER WORKSTATIONS						
OTC	6.75	2.50	Advanced Logic Research	4.75	1.25	35.7
OTC	65.25	41.50	Apple Computer Inc.	56.75	-0.75	-1.3
OTC	24.25	11.25	AST Research Inc.	16.50	1.00	6.5
NYS	12.50	3.50	Commodore Int'l	3.88	-0.25	-6.1
NYS	58.50	23.13	Compaq Computer Corp.	57.63	0.38	0.7
OTC	49.88	15.00	Dell Computer Corp.	23.75	-9.00	-27.5
NYS	85.00	50.25	Hewlett Packard Co.	83.50	-1.00	-1.2
NYS	36.50	16.13	Silicon Graphics (H)	36.00	0.25	0.7
OTC	41.00	22.50	Sun Microsystems Inc.	30.13	0.25	0.8
NYS	32.13	22.25	Tandy Corp.	31.13	1.63	5.5
OTC	11.00	7.75	Zeos International Ltd.	4.25	0.25	6.3
COMPUTER SYSTEMS						
ASE	18.38	4.63	Amdahl Corp	5.50	0.25	4.8
NYS	9.75	4.25	Convex Computer	6.63	0.25	3.9
OTC	6.13	1.88	Cray Computer	2.75	-0.13	-4.3
NYS	32.88	19.00	Cray Research Inc.	29.13	0.13	0.4
NYS	13.88	7.13	Data General Corp.	11.38	0.88	8.3
NYS	49.25	30.38	Digital Equipment Corp.	44.00	-2.38	-5.1
NYS	38.63	26.75	Harris Corp.	35.50	0.00	0.0
NYS	100.38	45.88	IBM	52.88	4.13	8.5
OTC	22.00	5.50	Kendall Square Research	16.50	1.75	11.9
NYS	127.50	83.00	Matsushita Electronics	119.25	1.75	1.5
OTC	23.75	8.25	Netframe	16.25	-1.00	-5.8
OTC	15.50	9.25	Pansallan Computer	14.25	-0.25	-1.7
OTC	18.75	6.00	Pyramid Technology (H)	18.38	0.50	2.8
OTC	24.00	12.13	Sequent Computer Sys.	19.38	-3.00	-13.4
OTC	14.50	1.38	Sequoia Systems Inc.	2.00	-0.13	-5.9
NYS	48.38	29.50	Stratus Computer Inc.	34.38	-1.63	-4.5
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.00	0.0
OTC	19.00	10.63	TeleCard Systems	16.50	-0.25	-1.5
NYS	13.88	7.75	Unisys Corp.	11.38	-0.13	-1.1
SOFTWARE						
OTC	66.25	25.25	Adobe Systems Inc.	66.25	0.50	0.8
OTC	21.00	10.25	Aldus Corp.	15.75	0.13	0.8
OTC	14.25	5.50	American Software Inc.	8.00	1.00	14.3
OTC	28.13	9.75	ASK Computer Systems	11.50	-0.50	-4.2
OTC	56.50	32.75	Autodesk Inc.	49.50	-2.25	-4.3
OTC	13.00	2.50	Bachman Info. Systems	3.13	0.38	13.6
OTC	43.00	32.00	BGS Systems Inc (L)	32.75	-1.00	-3.0
OTC	84.13	37.25	BMC Software Inc.	49.75	3.75	7.0
OTC	28.25	17.00	Boole & Babbage	23.25	2.00	9.4
OTC	76.50	17.50	Borland Int'l Inc. (H)	25.25	-0.63	-2.4
OTC	6.13	3.00	CE Software	3.25	-0.25	-7.1
ASE	30.25	8.25	Cheyenne Software Inc. (H)	27.25	-1.63	-5.6
OTC	19.50	8.25	ChipSoft	12.00	0.75	6.7
OTC	9.63	5.63	Cognos Inc.	6.50	0.00	0.0
NYS	31.38	10.88	Computer Associates (H)	28.13	-1.25	-4.3
NYS	12.38	2.75	Computervision Corp.	4.88	0.13	2.6
OTC	34.25	19.25	Compuware Corp.	23.75	-3.25	-12.0
OTC	34.75	5.75	Comshare Inc.	7.25	1.13	18.4
OTC	17.25	10.75	Corel Corp.	15.25	0.25	1.7
OTC	28.00	5.25	Easel Corp. (L)	6.38	0.63	10.9
OTC	25.25	12.00	4th Dimension	20.25	0.50	2.5
OTC	19.50	6.00	Frame Technology	7.00	-0.38	-5.1
OTC	20.75	10.00	Group 1 Software	10.00	-3.00	-23.1
OTC	35.25	19.75	Gupta	19.75	1.75	9.7
OTC	8.75	3.50	Hogan Systems Inc.	7.88	0.13	1.6
OTC	25.75	11.25	IMRS	18.50	0.50	2.8
OTC	34.75	18.50	Information Resources	34.63	0.63	1.8
OTC	69.75	12.13	Informix Corp. (H)	43.13	-2.38	-5.2
OTC	16.75	9.50	Intergraph Corp.	9.88	0.00	0.0

Exch	52-Week High	52-Week Low		May 28 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.88	Interleaf Inc.	9.13	0.25	2.8
OTC	18.00	6.75	Intersolv Inc.	7.25	-0.50	-6.5
OTC	16.00	7.75	Knowledgeware Inc.	10.25	-1.63	-13.7
OTC	54.75	26.00	Legent Corp.	29.00	0.75	2.7
OTC	36.75	14.75	Lotus Development (H)	34.50	0.25	0.7
OTC	23.00	7.75	MathSoft	8.25	-1.25	-13.2
OTC	23.25	5.25	McAfee Associates	6.75	-0.25	-3.6
OTC	11.63	1.88	Mega Software	10.25	-0.75	-6.8
OTC	15.00	5.25	Mentor Graphics	11.25	0.88	8.4
OTC	46.00	27.25	Micro Focus	34.88	-0.50	-1.4
OTC	19.00	4.38	Microbraft Inc.	6.38	0.63	10.9
OTC	95.25	65.50	Microsoft Corp. (H)	92.25	-0.25	-0.3
OTC	43.63	14.00	Oracle Corp. (H)	42.00	3.13	8.1
OTC	63.75	25.25	Parametric Technology (H)	33.00	0.25	0.8
OTC	40.50	22.50	Peoplesoft	32.75	1.50	4.8
OTC	8.13	3.50	Phoenix Technologies	5.00	0.38	8.1
OTC	40.00	25.38	Powersoft	27.00	-1.50	-5.3
OTC	61.50	17.00	Platinum Software	27.50	1.50	5.8
OTC	25.00	11.25	Platinum Technology	15.00	0.25	1.7
OTC	61.50	29.00	Progress Software Corp.	39.00	0.75	2.0
OTC	15.50	2.56	Quarterdeck Office Sys. (L)	3.31	0.25	8.2
OTC	24.50	11.75	Rainbow Technologies Inc.	22.25	-1.75	-7.3
OTC	15.75	4.00	Rasterops	8.69	1.56	21.9
OTC	15.25	3.63	Ross Systems	11.50	0.00	0.0
OTC	27.25	8.50	Sapiens Int'l. Corp. N.V.	20.50	-2.50	-10.9
OTC	15.00	6.75	Software Publishing Corp.	7.50	-0.13	-1.6
OTC	11.00	2.00	Software Toolworks Inc. (H)	10.88	0.13	1.2
OTC	4.50	0.75	Spinnaker Software	4.31	-0.13	-8.7
OTC	12.75	3.25	State of the Art	8.75	-1.25	-12.5
NYS	24.63	13.75	Sterling Software Inc.	19.50	0.38	2.0
OTC	19.75	8.00	Struct. Dynamics Research (H)	19.63	0.63	3.3
OTC	69.25	21.00	Sybase Inc.	69.25	-1.88	-2.6
OTC	44.25	5.88	Symantec Corp.	36.75	0.75	1.5
NYS	12.50	5.25	Systems Center Inc.	10.50	0.50	5.0
OTC	25.50	10.00	System Software Assoc.	18.63	2.38	14.6
OTC	7.00	2.50	Trimin Corp.	3.63	0.25	7.4
OTC	22.75	9.13	VieuLogic Systems	19.75	1.50	8.2
OTC	23.50	6.75	Walker Interactive Systems	7.25	-0.25	-3.3
OTC	3.19	1.38	Wordstar	1.75	-0.19	-9.7
SEMICONDUCTORS						
NYS	37.88	7.38	Advanced Micro Devices	28.13	-0.50	-1.7
NYS	21.38	9.00	Analog Devices Inc.	20.00	1.00	5.3
OTC	23.88	7.63	Atmel Corp. (H)	23.25	-0.38	-1.6
OTC	8.75	2.75	Chips and Technologies	3.88	0.38	10.7
OTC	39.75	13.00	Cirrus Logic	17.13	0.13	0.7
NYS	16.88	7.38	Cypress Semiconductor Corp (H)	13.38	0.63	4.9
NYS	16.13	8.00	Dallas Semiconductor	15.00	0.50	3.4
OTC	121.25	47.75	Intel Corp.	110.50	6.50	6.3
NYS	14.13	4.88	LSI Logic Corp.	13.00	0.50	4.0
OTC	32.25	13.75	Lattice Semiconductor	29.25	-0.75	-2.5
NYS	29.75	13.13	Micron Technology (H)	29.75	1.50	5.3
NYS	80.63	37.13	Motorola Inc. (H)	80.63	2.38	3.0
NYS	15.00	8.50	National Semiconductor	14.50	0.13	0.9
OTC	18.00	8.50	Sipex Semiconductor	8.50	0.25	3.0
OTC	42.25	22.25	SynOpsys (H)	40.13	0.13	0.3
NYS	66.00	32.25	Texas Instruments (H)	64.75	-0.13	-0.2
OTC	8.88	6.00	VLSI Technology	7.88	0.38	5.0
OTC	9.13	2.13	Wyse (H)	9.13	1.50	19.7
ASE	9.63	4.13	Western Digital Corp.	5.00	0.00	0.0
NYS	38.50	16.50	Xilinx (H)	36.00	-0.75	-2.0
OTC	31.25	12.66	Zilog Inc. (H)	31.25	4.25	15.7
PERIPHERALS AND SUBSYSTEMS						
OTC	38.75	11.75	American Power Conversion (H)	35.50	-1.75	-4.7
OTC	20.16	13.84	Banctec Inc.	18.50	0.50	2.8
OTC	18.00	6.25	Cambex Corp.	7.25	1.00	16.0
ASE	18.38	6.50	Cognitronics Corp.	7.13	0.00	0.0
NYS	25.50	11.88	Conner Peripherals	11.88	-1.63	-12.0
OTC	38.50	10.75	Creative Technologies Inc.	31.75	-2.50	-7.3
OTC	30.75	14.25	Data Race Inc.	22.00	-2.63	-10.7
ASE	17.00	4.75	Dataram Corp.	10.38	0.75	7.8
NYS	37.00	10.09	EMC Corp. (H)	34.00	-0.25	-0.7
OTC	10.50	5.38	Emulex Corp.	7.00	-0.25	-3.4
OTC	19.00	13.25	Evans & Sutherland	16.75	-0.50	-2.9
OTC	33.00	12.00	Exabyte	13.00	0.25	2.0
OTC	26.00	7.09	Intelligent Info. Systems	21.25	0.50	2.4
OTC	8.88	3.88	Iomega Corp.	4.38	-0.63	-12.5
OTC	34.75	5.75	IPL Systems Inc. (H)	7.50	-0.75	-9.1
OTC	24.00	10.75	Komag Inc.	19.00	-2.25	-10.6
OTC	19.63	5.88	Maxtor Corp.	7.13	-0.63	-8.1
OTC	12.63	7.13	Micropolis Corp. (H)	7.25	-0.25	-3.3
NYS	116.00	93.75	3M Corp	113.13	-1.75	-1.5
OTC	7.75	4.00	Printronix Inc.	6.88	0.13	1.9
NYS	17.25	6.88	QMS Inc.	14.75	-1.00	-6.3
OTC	17.88	11.63	Quantum Corp.	12.50	-1.00	-7.4
OTC	12.75	3.38	Radius Inc.	3.50	-0.25	-6.7
NYS	16.50	7.50	Recognition Equipment (H)	15.25	0.25	1.7
OTC	33.88	4.50	Relcom Inc.	5.00	0.50	11.1
OTC	27.38	12.00	Seagate Technology	16.25	-0.75	-4.4
NYS	45.00	18.00	Storage Technology (H)	38.63	-1.63	-4.0
NYS	27.88	16.88	Tektronix Inc.	22.25	-2.00	-8.2
NYS	98.88	66.75	Xerox Corp.	75.75	2.00	2.7
SERVICES						
OTC	23.75	14.25	American Mgmt. Systems	18.88	0.00	0.0
NYS	4.75	2.75	Anacomp Inc. (L)	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l.	26.75	-0.50	-1.8
NYS	56.13	38.75	Auto Data Processing	48.63	-1.00	-2.0
NYS	17.25	11.22	Ceridian Corp.	14.75	-0.13	-0.8
NYS	17.38	13.13	Comdisco Inc.	14.38	0.13	0.9
OTC	8.25	4.50	Computer Horizons	7.50	0.25	3.4
NYS	80.50	57.00	Computer Sciences	75.13	1.13	1.5
NYS	9.25	6.50	Computer Task Group	7.13	0.25	3.6
NYS	40.50	22.00	CompUSA Inc.	33.38	0.88	2.7
OTC	14.75	6.00	Corporate Software	12.25	0.00	0.0
OTC	22.50	7.38	Egghead Discount Software	8.50	-0.50	-5.6
NYS	35.88	25.25	General Motors E (EDS)	31.75	1.25	4.1
OTC	25.50	9.25	Inacom Corp.	17.75	-0.19	-0.7
OTC	15.38	6.25	Intelligent Electronics	13.75	-0.25	-1.8
OTC	13.00	6.63	Merisel	12.50	0.13	1.0
OTC	16.00	5.75	Microage Inc. (H)	15.75	1.75	12.5
OTC	43.00	21.75	Paychex	40.25	1.00	2.5
NYS	87.25	32.88	Policy Management Sys. (L)	34.88	-2.88	-7.6
NYS	38.00	16.81	Reynolds and Reynolds	37.13	0.63	1.7
OTC	32.75	22.00	SEI Corp.	32.25	0.50	1.6
OTC	24.38	16.88	Shared Medical Systems	22.13	1.00	4.7
OTC	13.75	5.75	SHL Systemhouse	11.88	0.50	4.4
OTC	29.25	10.25	Software Spectrum Inc.	27.00	1.75	6.9
OTC	32.25	20.75	Sungard Data Systems (L)	29.38	0.00	0.0
NYS	4.38	1.13	Ultimate Corp.	4.00	-0.13	-3.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
Note: Southwestern Bell Corp had a 2-for-1 split on 5/25/93.
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In Brief

Novell grows

Novell, Inc. fiscal second-quarter net income jumped 31% to $80 million, buoyed by initial sales of NetWare 4.0, upgrade products and rising royalty revenue. Revenue in the quarter leaped 25% to $225 million, the Provo, Utah, firm said. For the first half, Novell earned $151 million on sales of $430 million, an increase of 33% and 26%, respectively, from the same period last year.

SSA results up

Financial application software developer System Software Associates, Inc. (SSA) posted fiscal second-quarter profits of $6 million, a 20% increase from the year-earlier period. Revenue in the period grew 27% to $62.9 million, the Chicago-based company said. For the first half, the company earned $6.9 million, on revenue of $111.5 million.

Executive shuffle

IBM has hired Abby Kohnstamm as its first vice president of corporate marketing. Kohnstamm joins IBM from American Express Co. where she was a senior vice president. Meanwhile, Lucie J. Fjeldstad, IBM's general manager of multimedia, will retire today after 25 years of service.

SHORT TAKES Legent Corp. in Vienna, Va., has acquired Cleveland-based National DataGuard Technologies, Inc. and its Lifeguard automated disaster recovery software for corporate data centers. . . . Hewlett-Packard Co. has agreed to acquire Metrix Network Systems, Inc., a Nashua, N.H., network monitoring and analysis vendor. . . . Starlight Networks, a developer of multimedia network software management, has received $5 million in third-round venture financing from a group of European investors.

Dell cites notebooks for profit drop

By Kim S. Nash
AUSTIN, TEXAS

■ Dell Computer Corp. blamed a weak notebook computer line last week for most of a 49% profit plunge in its fiscal first quarter. But a lingering PC price war — although not as fierce as it was at this time last year — has taken a bite out of Dell's earnings as well, analysts said.

Make no mistake: The 9-year-old company is not about to wither, analysts agreed, noting that Dell set record sales for the quarter ended May 2 of $672.4 million, up 84% over the same period a year ago (see chart).

However, the lack of a competitive notebook means Dell has missed out on a fast-rising demand for portable computers from both home and business buyers during the past several months, said Matt Cain, a program director at Meta Group, Inc. in Stamford, Conn. "Dell's portables are underpowered and pretty expensive" compared with offerings from rivals, Cain said.

Delays annoy users

Moreover, Dell has disappointed would-be customers with continued delays in getting an i486-based notebook into the multiple distribution channels the company uses. Meanwhile, Compaq Computer Corp., Toshiba Corp. and Texas Instruments, Inc., among others, are preparing 486-based laptops for imminent release [CW, May 24].

As Cain put it: "A situation like that means you're going to get hurt."

Chairman and Chief Executive Officer Michael Dell agreed. Despite the recent hiring of John Medica, a key figure from Apple Computer, Inc.'s PowerBook group, profits for the next two quarters will take a hit as Dell pauses to rethink its laptop strategy, Dell said in a prepared statement.

The company has tried to escape painful price skirmishes on other PC fronts by enlisting warehouse outlets such as Wal-Mart Stores, Inc. and Price Club. "The big guys" such as IBM and Compaq are not moving products through such outlets right now, so Dell may have some breathing room, said Van Baker, service director of distribution channel strategies at Computer Intelligence/Infocorp in Santa Clara, Calif.

"Dell is trying to re-create the scene when they dominated superstores before seeing competitors come in," Baker explained. He said Dell sales were squeezed after IBM, Compaq and Apple decided to sell PC lines through computer superstores, such as Bizmart, Inc. and Computerland, Inc.

Falling share

For example, during the first three months of this year, Dell's share in terms of PC units sold at all levels via the superstore channel has steadily dropped from 18.9% in January to 16.6% in February to 13.8% in March, according to Baker.

"Now they want to find channels where they don't yet have those competitors to deal with," he said.

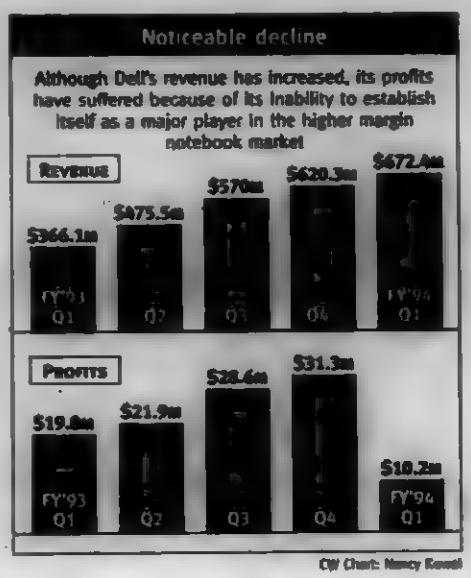
Yet, observers see no end to the PC wars, saying that prices will continue to fall. For example, buyers can get various configurations of 386- and 486-based PCs for 20% to 30% less than they could at this time in 1992, according to John Murphy, editor and publisher of "The PC Street Price Index" newsletter in Gibbsboro, N.J.

"As long as there are more than 10 vendors making PCs and three vendors making chips, the wars will go on and on and on," Murphy said.

The market has seen little pricing stability, with PC makers forced to slash price tags at least every three months to stay on par, he added.

However, the ferocity of the battle has begun to ebb, according to Cain. "You don't see the angry back-and-forth of a year or 18 months ago."

Vendors have begun to wage feature contests, he said. Today's deluxe PC comes with more glitz than its forebears, such as multimedia add-ons. Better meat-and-potatoes features, such as faster I/O, higher capacity disk drives and additional warranties, are also on the table, Cain noted. "It's not so much dollars now, but more of a give-back to users in terms of functionality," he said.



CW Chart: Nancy Rowell

AST Research to buy Tandy's PC business

By Stephen P. Klett Jr.
IRVINE, CALIF.

AST Research, Inc. last week said it plans to purchase the bulk of Tandy Corp.'s PC manufacturing operations for roughly $175 million.

Tandy said the transaction would include the sale of its laptop/portable subsidiary Grid Systems Corp., Tandy-Grid Europe and manufacturing plants in Texas and Scotland.

Tandy/Grid's share of U.S. PC shipments in 1992 was roughly 3.4%, while AST garnered 2.8%, according to Framingham, Mass.-based International Data Corp. Combined, AST and Tandy shipped 190,000 units in the first quarter of this year, which would make AST the fourth-largest PC player behind IBM, Compaq Computer Corp. and Apple Computer, Inc., IDC analyst Ted Julian said.

While details of the deal were sketchy, the impending transaction comes down to a couple of key points: Tandy wants out of PC manufacturing so it can focus on retailing, while AST is seeking to boost manufacturing capacity.

AST "is buying the ability to manufacture Grid [products]," Julian noted.

While AST would now manufacture all Grid products and sell the Grid line under its name worldwide, Tandy is expected to retain the rights to sell the Grid line under its own name in the U.S., Julian said.

Bill Lempesis, president of Lempesis Research in Pleasanton, Calif., concurred. "If Tandy is out of the PC manufacturing business, it doesn't mean it is out of the PC reselling business," he said, referring to the possibility of Tandy selling AST machines. "Tandy can probably move more AST equipment than its own."

An AST spokesman declined to comment on the company's plans for the Grid product line, saying there were too many details that still needed to be worked out. "Our intent is pretty simple — our goal is to expand market share," he said.

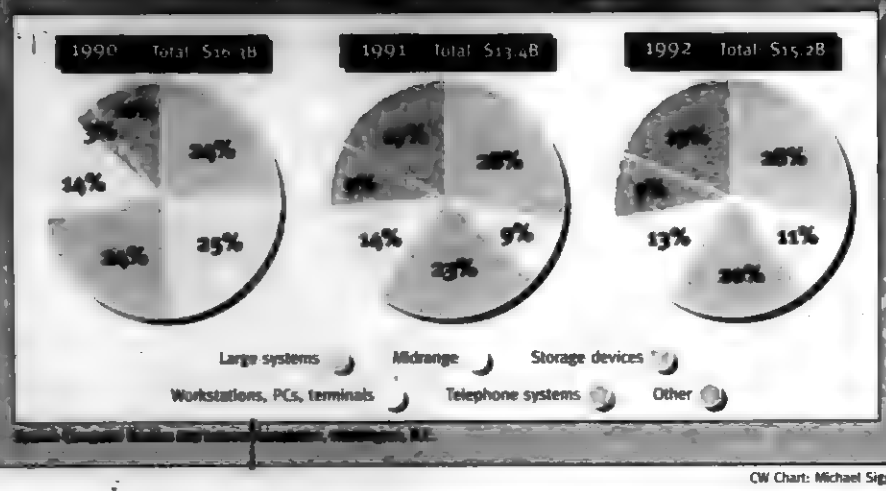
Tandy officials did not return calls by press time. However, earlier this year Tandy said it would spin off its manufacturing operations into a separate company.

Final approval of the deal is subject to the drafting and approval of a definitive purchase agreement by each company's board of directors and regulatory approvals. Subject to these constraints, AST said it expects the transaction to be completed in July.

INDUSTRY PULSE: Leasing industry

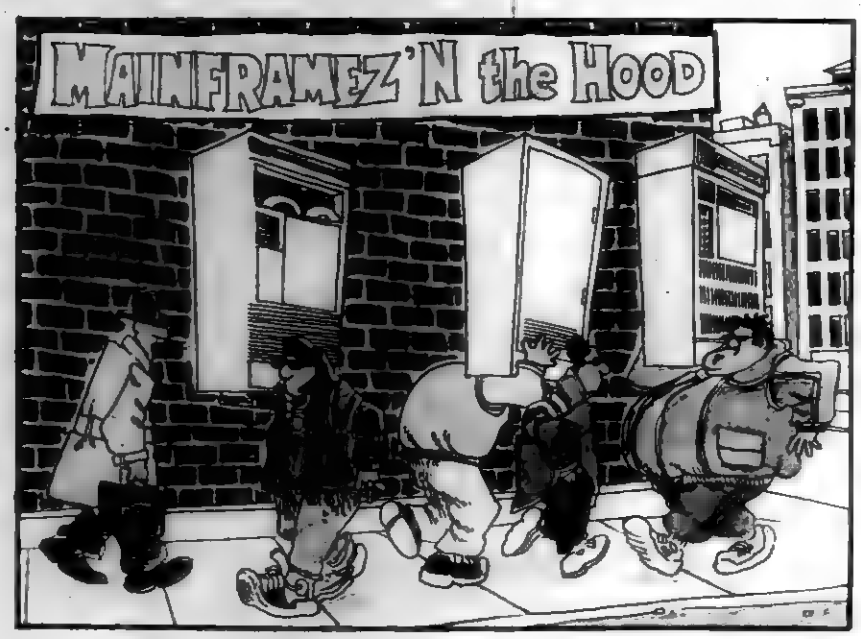
Based on surveys of 330 leasing companies that buy, sell and lease new and used computer equipment

1. IBM, IBM Credit Corp. practices
2. Product life
3. The economy
4. Competition
5. Funds availability



CW Chart: Michael Siggins

The Fifth Wave *by* Rich Tennant



Inside Lines

Nested Object-ions

In a heated exchange at a Comdex/Spring '93 panel, Microsoft Vice President Mike Maples bristled at a statement made by Lotus Vice President John Landry, who said Microsoft is the only operating system vendor not working with the Object Management Group to develop common object-oriented standards. Landry: "Everyone is working with OMG except Microsoft." Maples: "We're on the same footing as the other operating system vendors. But it's a function of when the standards are available. We're not going to wait for committees and meetings to deliver something."

It'll cost ya

Customers said IBM is tweaking the PS/2 line's software bundles. Currently, high-end PS/2s ship the Model 95 ship with OS/2 2.0. IBM will soon ship these systems with DOS and Windows for $99 more. IBM is also supposed to release models with OS/2 2.1 on them, one customer said.

Unprevent-a-bull

The French government is moving more aggressively to divest itself of state-controlled companies such as Compagnie des Machines Bull, which it hopes to sell within the next 18 months to two years, according to Axel Leblois, head of the money-losing company's U.S. operations. Although Bull has been on the so-called privatization list since 1986, political pressure has recently increased to get the government out from under money-sapping operations such as Bull, carmaker Renault and several aerospace, insurance and steel firms, Leblois said. The government has said it wants to sell most, if not all, of its 72% stake to shareholders IBM and NEC. But IBM, for one, "is going through so much turmoil of its own right now — I just don't know," Leblois said. IBM owns 5.7% and NEC owns 4.7% of Bull, which lost about $114 million on sales of $5.7 billion last year.

Freedom writer

DEC will be announcing changes to its software licensing practices next week at the Digital Equipment Computer Users Society Symposium, according to sources. Multiuser licensing will be extended to include VAXstations, and personal use licenses will be transferable across VAX and Alpha platforms, they said.

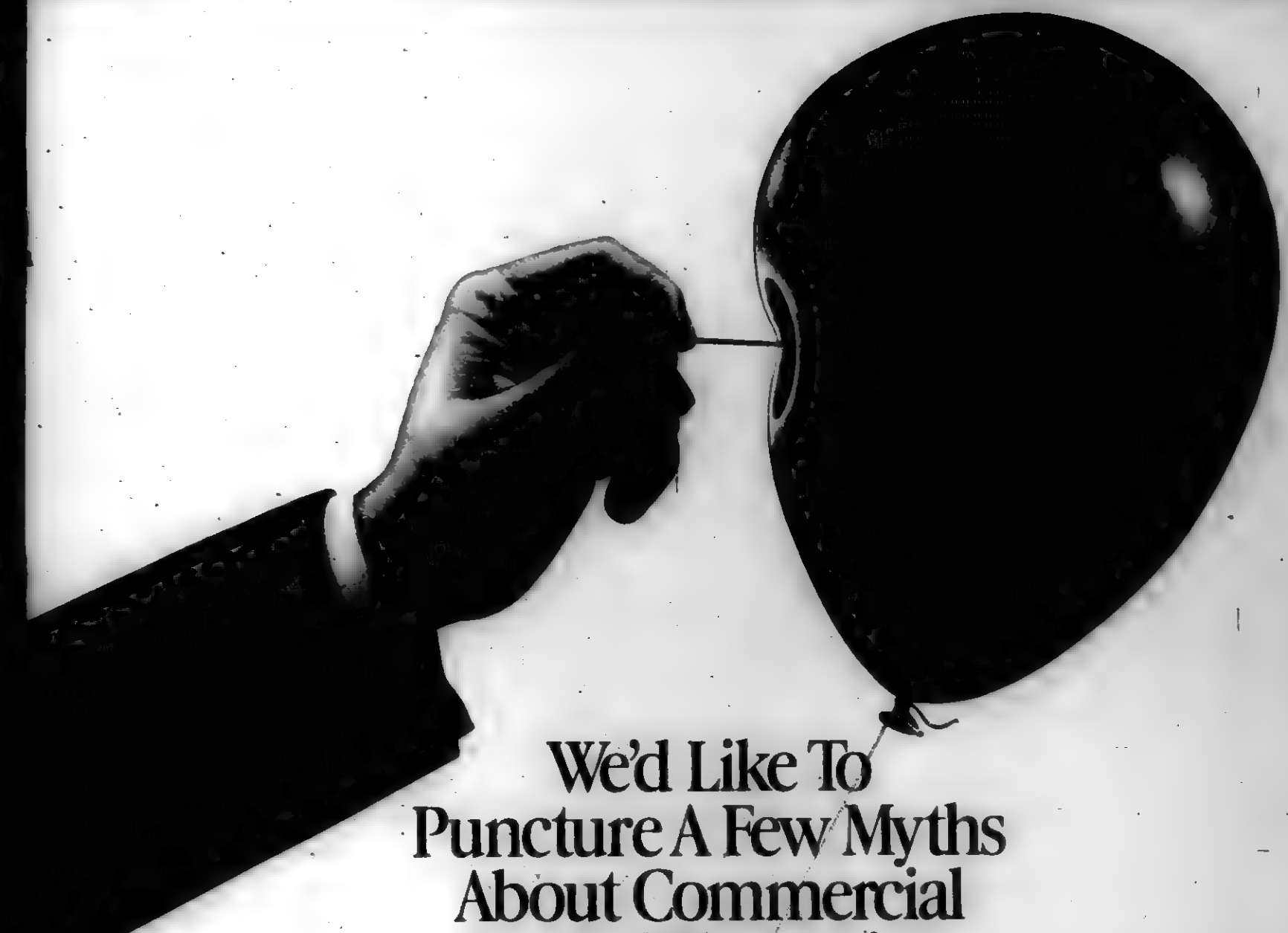
Quick! What's a six-letter word for . . .

Just when you were getting used to the term "middleware," you may have to figure out a substitute. TechGnosis, Inc., a software vendor, said it has been granted a registered trademark for the word from the U.S. Patent and Trademark Office in recognition of the company's "early use" of the term.

Blind faith

Last week's NextWorld Expo got off to a cacophonous start. First, there was a static-filled sound system during the early portion of Steve Jobs' keynote. Then, hundreds of attendees who couldn't get into the overflow hall to hear him talk began hammering on the doors and chanting so loudly that Jobs stopped in mid-sentence. The rambunctious Next devotees soon streamed in and filled every square centimeter of the aisles. A local fire department spokesman said they would launch an investigation to find out who was responsible for packing the crowd in hallways, outside the exits and then letting the overflow jam the aisles.

A New Jersey consulting firm that just embarked on an office-wide trial of various wireless technologies has some key advice for those who may follow its lead: You can't make your popcorn and use your portable/cellular phones at the same time. If your phone closet is near your microwave oven, the popcorn will keep on popping while phone users will get blown away by static because the microwaves and phones operate at close to the same frequency, cautioned Danny Briere, president of TeleChoice, Inc. Phone, fax or CompuServe News Editor Alan Alper with news tips at (508) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



We'd Like To Puncture A Few Myths About Commercial Parallel Processing.

Myth: Parallel processing is a promising technology, but not yet a deliverable business solution.

Fact: Some of the world's most successful companies have been using our parallel processing systems to extend their business leadership.

Commercial parallel processing is the natural successor to today's mainframe applications. We've been perfecting and delivering the technology for almost ten years. Helping hundreds of customers around the world tap multi-million dollar profits formerly hidden in their enterprise.

Our systems help our customers process far more information than conventional mainframes can handle. This new information has given them a far better understanding of *their* customers and their markets. Some have used it to fundamentally redesign their operations, resulting in hundreds of millions of dollars in increased revenues.

Myth: Parallel processing has no practical commercial applications that mainframes can't handle.

Fact: Conventional mainframes don't have the power to extract the information you need to succeed from the sea of data your enterprise produces.

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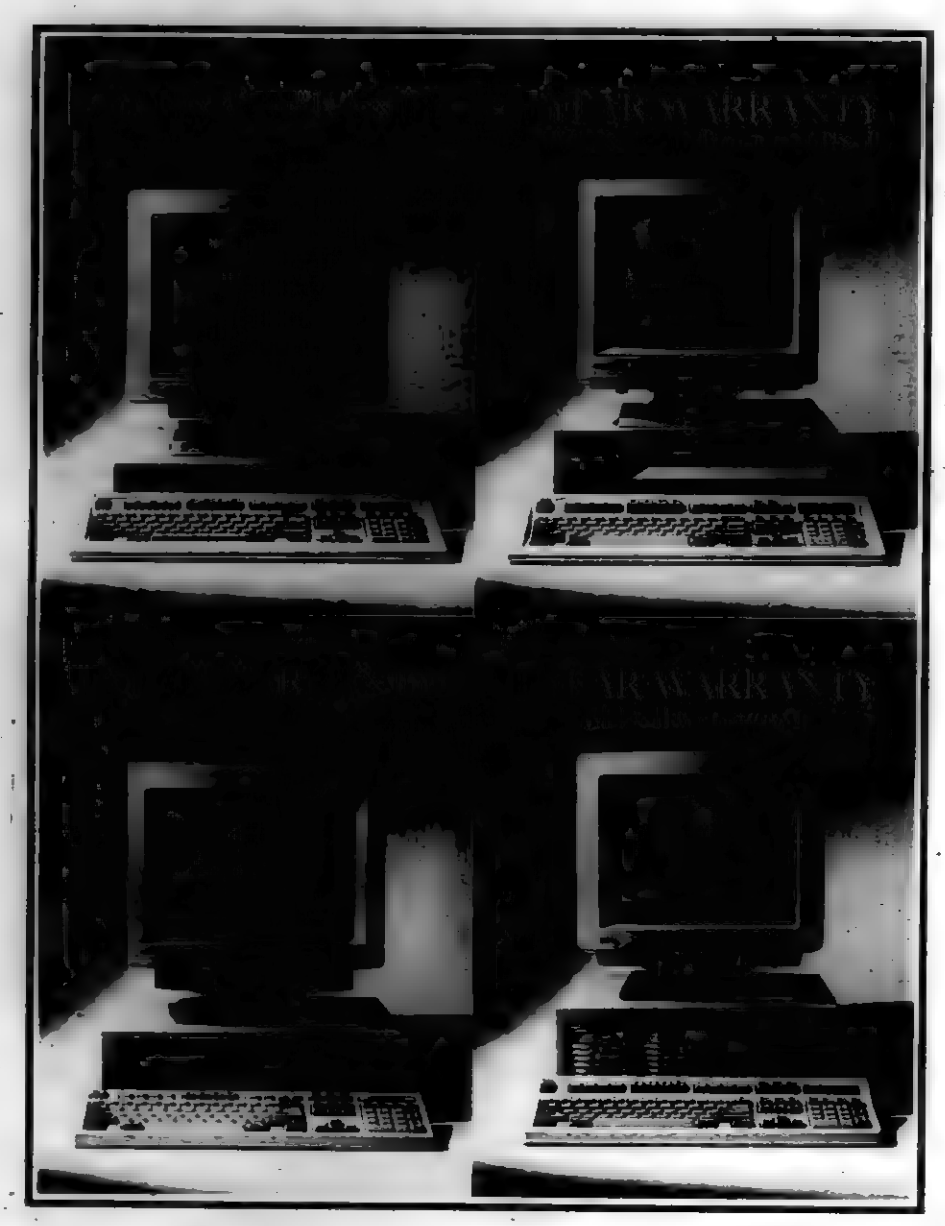

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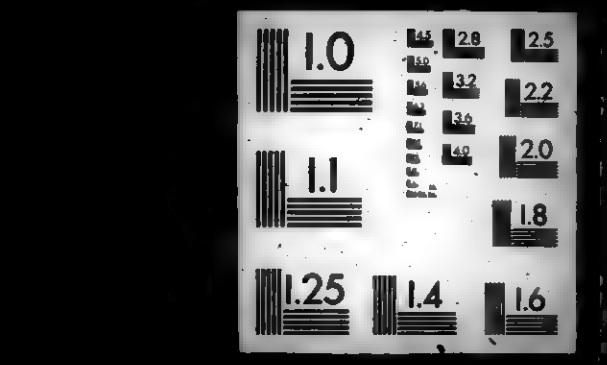
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COMPUTERWORLD

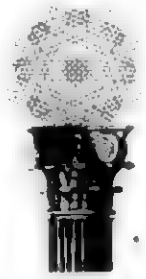
Inside

GLOBAL NETWORKING
MCI and BT will form a $1 billion venture to offer one-stop global network shopping. *Page 1*

DECUS QUEST
DEC executives will attend the DECUS meeting in a bid to gauge customer mood and concerns. *Page 15*

SECURITY FLAP
Government officials say recently proposed encryption technology is unlikely to be forced on users. *Page 21*

SMITHSONIAN AWARDS
The annual *Computerworld* Smithsonian Awards are given to organizations using computers to improve society. This year's finalists help disabled children, research human origins, fight disease and engage in other noble pursuits. Stories begin on *page 85*.



Client/server fallout

Need for central IS grows

By Nell Margolis

■ Client/server computing, often viewed as siphoning clout away from corporate information systems departments, may in fact be pumping power into a new kind of centralized IS structure.

So said more than a dozen users and industry observers who last week revealed a trend toward recentralization of IS services at large companies, driven in part by the demands of client/server systems. It is a trend corroborated by a survey of more than 100 IS professionals at midsize and large companies (see chart).

"I've always thought that either extreme — centralization or decentralization — makes no sense," said Du Wayne Peterson, former Merrill Lynch & Co. chief information officer and current chairman of Du Wayne J. Peterson Associates in Pasadena, Calif. "You've got to have some of both."

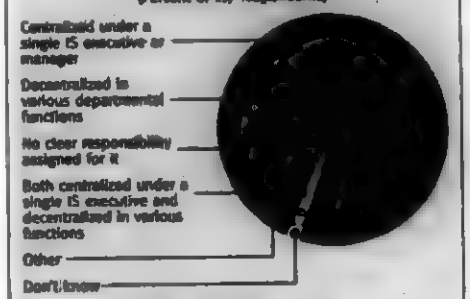
Nothing, he said, hammers the conundrum home more sharply than client/server. On the

Central IS, *page 16*

Point of control

Users are starting to corral their client/server systems into a more centrally managed structure

How has responsibility for client/server computing changed or been assigned at your company?
(Percent of 117 respondents)



Reasons for change of assignment
(Percent of 148 responses*)

Better control of system	26%
Pool company expertise	20%
Encourage transition to client/server	20%
Other	34%

*Multiple responses allowed

Source: Computerworld Database Division, Framingham, Mass.

Vendor allies seek to boost wireless LANs

PC Expo announcement may aid interoperability

By Lynda Radosevich and Joanie M. Wexler
CALABASAS, CALIF.

■ The proprietary world of wireless local-area networking could finally crack open later this month when a group of vendor heavyweights publicly backs a common wireless LAN protocol.

A consortium of networking, chip and desktop vendors plans to make a pitch for wireless interoperability on the eve of PC Expo, which opens June 28 in New York. The goal is to allow users to mix and match various vendors' wireless LAN adapters — including credit-card-size Personal Computer Memory Card International Association interfaces — as they do today in the wired LAN world.

The group is spearheaded by laptop connectivity vendor Xircom, Inc. here and includes chip maker Advanced Micro Devices, Inc. Also strongly considering backing the protocol to circumvent sluggish standards activity are Compaq Computer Corp., Dell Computer Corp., NEC Corp. and Sun Microsystems, Inc., Xircom confirmed.

However, Phil Belanger, Xircom's director of marketing for wireless products, noted that some of the negotiations are not yet final.

Vendor allies, *page 14*

Novell boosts management

Revamped NMS adds remote monitor, tighter integration

By Elisabeth Horwitt
PROVO, UTAH

The next version of Novell, Inc.'s NetWare Management System will have the standards support, integrated applications and price/performance it needs to compete with offerings from the likes of Hewlett-Packard Co. and Sun Microsystems, Inc. in the enterprise network management arena. It is expected to debut at Interop '93 in August.

The current NMS product, NetWare Services Manager Version 1.1, is primarily suited to managing individual NetWare local-area networks. Version 2.0, however, will be much closer to Novell's original promise, more than a year ago, of a multivendor, distributed, enterprise network management platform, according to sources close to the company.

Key enhancements to Version 2.0 include support of the Simple Network Management Protocol Remote Network Monitoring, or RMON, standard, tighter bundling of applications for managing different types of network systems and centralized management of multiple remote LANs and servers.

All this will be offered at a price significantly lower than either the current NMS or compet-

Novell, *page 12*

Data processing vs. the 'bean counters'

Faster product cycles at odds with accounting rules

By Mark Halper

Meet technology's latest albatross: product depreciation schedules.

With vendors injecting new wares into the market at burst-mode speeds, information systems chiefs are trying to convince their financial officers that typical five-year and longer depreciation cycles are not appropriate anymore.

Instead, users are advocating two- and three-year periods and, in some cases, are suggesting that equipment come off the books after a year — a process known as fully expensing.

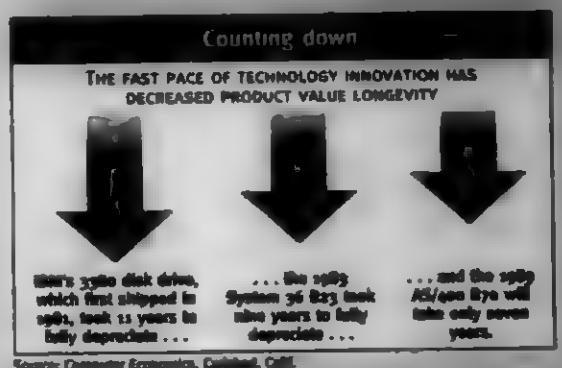
"We've radically adjusted our depreciation schedule," said Jerry Kopecky, manager of MIS operations at IVI Travel, Inc. in Northbrook, Ill., which now has a three-year cycle. "You have to be crazy these days to have a depreciation cycle of five years on a CPU."

And IVI Travel may not stop at three years. "It's at three right now, but for things

Bean counting, *page 24*

Counting down

THE FAST PACE OF TECHNOLOGY INNOVATION HAS DECREASED PRODUCT VALUE LONGEVITY



Source: Computer Economics, Carlsbad, Calif.

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Network Systems

Recent events suggest the
administrative burdens of your network
could grow substantially.

ALAN LEVENSON

Gerald Verchick helps Nevada Power light up Las Vegas while keeping costs down. Page 67.

NETWORK STANDARDS

Cooperation — real and intended — is the byword in the LAN area. As 13 vendors demonstrated FDDI interoperability over unshielded twisted-pair copper wiring last week (*page 4*), a coalition of vendors is ready to back a standard for wireless LANs at **PC Expo** later this month. *Cover 1.* Next week's **EMA** conference will focus on the X.400 standard and its impact on global E-mail. *Page 2*

NETWORK MANAGEMENT

Banyan unwrapped management products for its **Vines** network operating system (*page 12*), while rival **Novell** has positioned itself to release a more enterprise-oriented version of its **NetWare** management system. *Cover 1*

CLIENT/SERVER

The rush to client/server systems is one factor driving decentralized firms to recentralize IS — but not in the old glass house. *Cover 1.* **NASDAQ** goes client/server with a Unix trading workstation that grabs transactions from mainframes and distributes data to a wide variety of clients. *Page 4*

DATABASES

Oracle and Novell customers say they are eager to see their vendors team up to stave off **Microsoft**'s advances, but only if the partnership simplifies product installation and support. *Page 12.* **Sybase**'s Replication Server — due this week — is said to be key to advancing the firm's client/server scheme and differentiating its **System 10** from rival **Oracle 7**. *Page 15*

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MCI, BT form global partnership

By Joanie M. Wexler
WASHINGTON D.C.

The competitive telecommunications tide shifted yet again last week when worldwide carrier BT and MCI Communications Corp. said they will combine their networking might to deliver consistent global services.

The embryonic plan includes the eventual formation of a joint-venture company, a $4.3 billion BT investment in MCI for a 20% stake in the carrier and MCI's acquisition of BT North America, Inc. for $125 million. The deal nipped at the heels of an earlier AT&T announcement also aimed at providing one-stop shopping for global telecommunications buyers [CW, May 31].

AT&T's approach, however, is to form partnerships with local Postal Telephone and Telegraph (PTT) authorities abroad to satisfy expanding multinational customers.

Multinationals have long been hankering for a single point of contact for global network services. They want to be relieved of the headaches and service setup delays associated with different service offerings and regulations among myriad foreign telecom authorities.

> Both partners will distribute services created by the MCI/BT joint venture. MCI will handle the Americas and the Caribbean, while BT will take responsibility for the rest of the world.

However, BT and MCI "haven't really ironed out the details yet, so it's too early to say how we might benefit," said a spokeswoman at MCI customer Citicorp in New York.

"We would hope to be closer to one-stop shopping, but there are many companies with many different regulations [for MCI and BT] to overcome. So services could be a long way off," she said.

Rick Malone, a partner at consultancy Vertical Systems Group in Dedham, Mass., predicted that users will eventually leverage better contracts because of likely tit-for-tat warring among fewer global players.

With the consolidation of global carriers, he said, the sales call "becomes a direct mission against the other competitor — like the Coke and Pepsi wars. Pricing is likely to be better through negotiation because of the nature of combatance," he said.

In one sense, "the AT&T approach has a big advantage" to users, said Berge Ayvazian, a vice president of telecommunications at The Yankee Group, a Boston consulting firm. "It entails much greater involvement by the regional carriers" across the world, so users should wind up with better support in each region.

By contrast, the MCI/BT approach is to jointly build their own worldwide network infrastructure that bypasses PTT involvement. This means the venture's global reach will not leverage existing regional infrastructures and technical and regulatory expertise, Ayvazian explained.

MCI and BT intend to invest $1 billion in the joint venture, which will "combine the best of breed" of the carriers' offerings, the MCI spokeswoman said. These include the network management services of Syncordia, an outsourcing company that BT set up in 1991.

The two carriers, which are fiercely competitive in the U.S., offered few details about how they will tread in their currently overlapping markets until a definitive agreement and regulatory and shareholder approvals fall into place next year.

Also up in the air is MCI's current 25% stake in Infonet, a global value-added network service provider owned by 11 large telecommunications companies. Infonet's biggest global competitor today is BT, according to Larry Morgan, Infonet's vice president of marketing.

Morgan said Infonet "doesn't expect MCI to continue being a shareholder," as the other 10 Infonet shareholders are likely to vote MCI out on a conflict-of-interest basis.

MCI President Daniel Akerson would only say, "We will have to sort through what happens to Infonet and our 10 partners."

MCI and BT said its joint venture will operate as an "equal partnership," although BT will hold about 75% equity in the venture. Ayvazian interpreted this to mean that BT is "reserving a spot for an Asian partner."

Cross-border bedfellows

The BT/MCI deal is the latest and largest partnering effort to deliver consistent global telecommunications services to expanding multinational companies

A SAMPLING OF GLOBAL CARRIER ALLIANCES	AT&T WorldSource	BT	GNS/ Syncordia	Infonet	MCI
AT&T (U.S.)					
Deutsche Bundespost Telkom (Germany)				■	
BT (U.K.)			■		■
France Telecom				■	
Cable and Wireless (U.K.)					
Kokusai Denshin Denwa Co. (Japan)	■			■	
PTT Telecom (Netherlands)				■	
Singapore Telecom	■			■	
MCI (U.S.)		■	■	■	
Telstra (Australia)	■			■	
Telefonica (Spain)				■	
Swiss PTT				■	
Unitel (Canada)	■				
Belgacom (Belgium)				■	
Televerket (Sweden)				■	
Korea Telecom	■				

■ CURRENT PARTNERSHIP ■ NEW PARTNERSHIP

Source: The Yankee Group, Boston

CW Chart: Janet Genovese

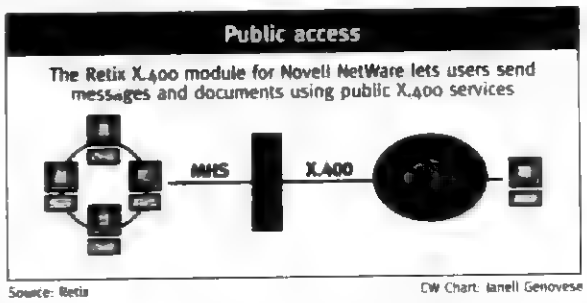
E-mail barriers receding

X.400 standard poised to spread messaging around the world

By Lynda Radosevich

X.400 is finally coming of age, encouraging users to push electronic mail beyond corporate walls into the world — a trend that will be explored in depth at the Electronic Mail Association's (EMA) annual conference in Atlanta next week.

"X.400 is going to be everywhere. It won't be the exclusive way to exchange mail — Internet connections will also flourish — but it will be ubiquitous," said conference keynote speaker Walter Ulrich, a director at consulting company Arthur D. Little, Inc. in Cambridge, Mass. The International Standards Organization's X.400 messaging transport protocol and its role in fostering global E-mail connections will be featured in product announcements and sessions at the conference.



Source: Retix
DW Chart: Janell Genovese

In a survey sent to 400 EMA members, both end users and vendors picked 1993 as the year that X.400 will hit critical mass as a key messaging backbone technology. Conversely, users said that 1995 will be the year that the X.500 directory standard would become important to E-mail applications.

Other hot issues expected to be explored at the show are E-mail addressing and directory synchronization, administrative headaches in achieving interoperability across disparate platforms, tying E-mail into business systems and mobile and wireless E-mail, Ulrich said.

On the X.400 front, Retix and Novell, Inc. will demonstrate a new X.400 module for Novell's NetWare Global Message Handling Service (MHS) messaging software. Based on Retix technology, the module enables NetWare users to exchange messages, documents and files with users at X.400 destinations.

Because it runs as a native part of MHS, the module runs on the same machine and administration is familiar to NetWare administrators, said Arvind Argrawal, vice president and general manager of the messaging products division at Novell.

Unlike an X.400-to-MHS gateway, the module can use the NetWare directory service, including user aliases, so end users can avoid X.400's complicated addressing scheme (see chart at left).

The Retix X.400 for NetWare Global MHS will be sold for $6,995 through Novell channels within 60 days, the company said.

Meanwhile, the X.400 Applications Programming Interface Association (XAPIA), a nonprofit association of vendors and end users, will announce this week that the Institute of Electrical and Electronics Engineers (IEEE) accepted application programming interfaces (API) jointly proposed by the XAPIA and the X/Open Co. The APIs are now certified as international standards and published by the IEEE for vendors and users worldwide.

Without standard APIs, applications cannot necessarily communicate with X.400 services provided by different vendors.

Piece of the pie

Announcements at the EMA conference next week will include the following:

▶ **Lotus Development Corp. confirmed that it will release CC:Mail for Windows E-mail software Version 2.0, which features filtering and rules-based routing capabilities.**

Lotus will also unwrap a CC:Mail client for Hewlett-Packard Co.'s X.400-based OpenMail server. Lotus would not confirm reports that it will also announce a wireless version of CC:Mail for RAM Mobile Data and Ericsson GE Mobile Communications, Inc. systems.

▶ **Microsoft Corp. will introduce Mail gateways, including an updated gateway that lets IBM's Professional Office System act as a back end to Mail clients running PCs with 3270 emulation, said a source close to the company.**

▶ **Beyond, Inc. will introduce BeyondMail Release 2.0, an update that adds advanced work-flow and filtering capabilities to the E-mail software.**

▶ **Worldtalk Corp. will announce that it is extending the directory synchronization capabilities of its X.400 messaging integration software to work with both CC:Mail and Microsoft's Mail.**

— Lynda Radosevich

Relational databases

Microsoft upgrades Access in front-end query tool sweepstakes

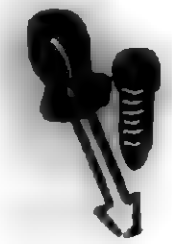
By Michael Vizard
BELLEVUE, WASH.

With the delivery of Version 1.1 of its Access relational database last week, Microsoft Corp. has embarked on a campaign to position the product as the leading front-end query tool for accessing reams of corporate data stored on distributed relational databases.

However, that campaign is likely to encounter stiff opposition as vendors square off over which one provides the best set of query tools for client/server applications.

Access 1.1 includes a number of added ease-of-use features and better integration with other Microsoft applications, but the major elements in the release are a set of Open Database Connectivity drivers that will give users a SQL interface to relational database management systems from Oracle Corp., Sybase, Inc. and Microsoft.

These drivers will make it possible for users to deploy Access, which comes with a set of visual query tools, as a front end to these databases. "We're seeing a lot of people using Access to get at data in products like SQL Server. People like the visual-oriented queries," said Julie Armstrong, services project manager at Corporate Software, Inc. in Canton, Mass.



Feature-rich

Access 1.1 ease-of-use features include the following:

•Faster text importing.
•Improved support for Btrieve.
•A setup wizard.
•A Windows Help compiler.

For example, Boatmen's Bancshares, Inc. in St. Louis is using Access as a front end for a tracking and administration application that will use an Oracle RDBMS on a back-end server.

Advantage Microsoft

According to Larry Allin, vice president of technology assessment, the financial services company originally leaned toward Paradox for Windows from Borland International, Inc. in Scotts Valley, Calif. "But the developer of the application convinced me that Access was a better end-user query tool and is integrated with other Microsoft applications. But as a programmer, I still think Paradox is a better database," Allin said.

Still, other sites said Access is a programmer's tool that does not belong on end user's desktops.

"About 90% of the users never develop database applications. We'll use the runtime license in Access to deploy the applications on users' desktops," said Glen Jurmann, section manager for office technology at Baxter Healthcare Corp. in Deerfield, Ill.

According to Allin, however, the backlog of applications that need to be developed is requiring information systems departments to give users tools that will allow them to build their own applications without IS' help.

> **"A lot of people are confusing low price with ease of use."**
> *— Richard Finkelstein, Performance Computing*

Chasing Microsoft into this market segment are Borland, which will add a SQL interface to Paradox this summer; Oracle, which has vowed to improve its front-end query tools; and Software Publishing Corp., which markets the Superbase RDBMS for Windows.

In addition, some IS shops are opting for less complex packages that provide access to RDBMSs.

For example, the Tire Division Information Systems unit of Goodyear Tire & Development Co. in Akron, Ohio, has opted to deploy the Approach RDBMS for Windows, which does not include a programming language. It was developed by Approach Software Corp. in Redwood City, Calif., to give users access to Oracle, dBase, FoxPro and Paradox databases.

According to Fred Hildenbrand, director of advanced LAN development applications, Goodyear users needed a robust ad hoc query tool that was easy to use, but they did not require a programming language for building applications.

Because of the various qualities and capabilities of the client/server tools that are available, Richard Finkelstein, president of Performance Computing, Inc., a database consultancy in Chicago, said IS directors need to be wary.

"A lot of people are confusing low price with ease of use. You have to remember there is a battle for market share going on, and some tools may not be appropriate for end users," he said.

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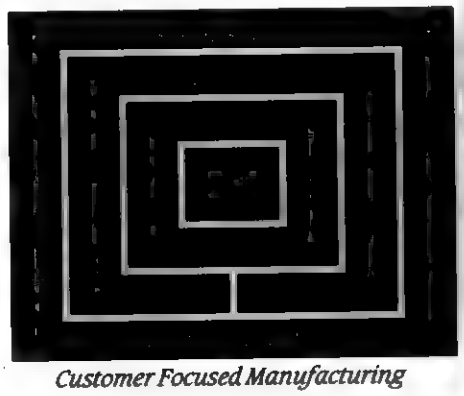

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NASDAQ makes client/server investment

SCO Unix chosen for its Intel multiprocessing capability and support

By Jean S. Bozman
ROCKVILLE, MD

The Santa Cruz Operation (SCO) went public last month on the screens of the NASDAQ electronic stock market. But SCO will soon make an appearance behind NASDAQ screens as well: Its Unix operating system will be the centerpiece of a client/server architecture that will distribute NASDAQ trading information to some 4,000 stockbrokers at 1,200 sites nationwide.

The National Association of Securities Dealers' (NASD) move to open systems is being made, in part, to help attract members to its organization, which now has 437,000 brokers and 5,250 firms. Many of those firms use dumb terminals or PCs to view the NASDAQ ticker, the association said.

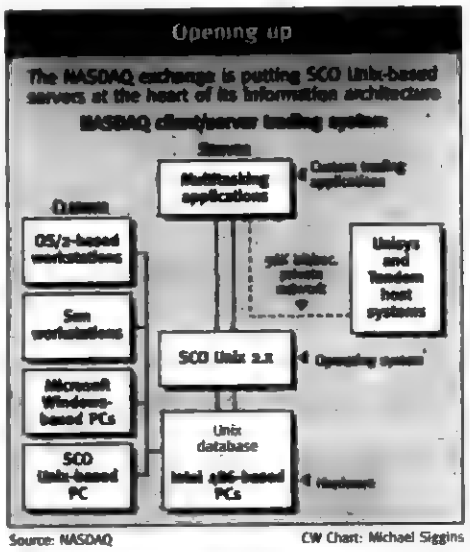
Wall Street analysts turned to Unix workstations several years ago in search of a competitive edge and high-speed processing. NASD has also portrayed itself as leading-edge because it operates the all-electronic NASDAQ stock market, which it claims is the world's second-largest securities market after the New York Stock Exchange. Unlike other markets, NASDAQ does not have a central trading floor.

Out with the old, in with the new

The NASDAQ Workstation II client/server system software will be installed at user sites in early 1994, after a year's development by a 20-person team. The plan is to gradually replace a homegrown database and aging Intel Corp. 80286-based IBM PCs that run DOS character-based applications. Some of the traders' old PCs ran the Xenix derivative of Unix now sold by SCO.

The new SCO-based workstations, which can operate as clients or servers, will combine Unix multitasking applications that support trading and analysis with a standard Unix database; NASDAQ has not yet selected which database to buy.

The workstations will display data from Unisys Corp. 1100 series and Tandem Computers, Inc. host systems that is broadcast over a 56K bit/sec. private network. The old network, now being upgraded, ran at only 9.6K bit/sec. (see chart).



Source: NASDAQ
CW Chart: Michael Siggins

NASDAQ selected the SCO Unix 2.X operating system because it can support server-based graphical user interface applications on the many types of Intel I486 platforms brokers use. One design goal was to standardize the environment without forcing independent traders to buy specific hardware.

The current workstations run on all custom code, according to Bob Riess, senior vice president of NASDAQ software development. "We wrote operating system extensions on top of DOS to gain multiprocessing capability." Using Neuron Data, Inc.'s Open interface application development tool, programmers designed code that can run on many clients, he said.

The wide variety of client machines at brokers' sites include Microsoft Corp. Windows-based PCs, Sun Microsystems, Inc. workstations, IBM OS/2-based PCs, Apple Computer, Inc. Macintoshes and other SCO Unix PCs. Most of the clients run on local-area networks running Transmission Control Protocol/Internet Protocol to accommodate interoperability, NASDAQ said.

Good provider

SCO Unix also provides a good foundation for client/server computing, according to Riess. "What Unix gives us is full multiprocessing capability, a good development environment and a lot of the kind of support you need in putting together a large-scale workstation environment," he said.

When development began last year, few vendors could meet NASDAQ's requirements. "There was no other alternative at the time," Riess said, referring to Unix software systems now coming on the market that can run on 486 machines. "But that doesn't change the equation for us. We were committed to getting this product out." He did not rule out future evaluations of Microsoft's Windows NT operating system, however.

Users like NASDAQ will see Unix competition heating up in the 486 market, where SCO pioneered, analysts said. "There are going to be a lot more Intel choices very soon," said Dave Smith, director of Unix systems research at International Data Corp. in Framingham, Mass. He pointed to SunSoft, Inc.'s Solaris, UnixWare from Novell, Inc.'s Univel unit and Next, Inc.'s NextStep as examples.

One and only

SCO's synthesis of Unix servers with PC applications was strengthened by its ability to run Microsoft code under Unix. "Most Unix users probably would have liked to have the productivity applications of the DOS world, but they had to use emulation," said Rikki Kirzner, principal analyst at Dataquest, Inc. in San Jose, Calif. "SCO was really the only vendor that had an integrated set of applications, which saved work for users."

Networking standards

FDDI over copper matures

By Lynda Radosevich
BOSTON

Fiber Distributed Data Interface (FDDI) technology, typically used in network backbones, moved toward desktop viability last week when 13 vendors demonstrated that their products work together over low-cost unshielded twisted-pair copper cabling.

At 100M bit/sec., FDDI provides the kind of bandwidth needed to shuttle big-byte applications — such as those supporting graphics, voice and video — between desktops and servers.

By porting FDDI to low-cost copper unshielded twisted-pair cabling and stimulating competition with interoperable products, vendors will be able to offer end-to-end FDDI connections for under $1,000 per desktop by the end of the year, predicted Charlie Robbins, director of communications research at Aberdeen Group in Boston.

The big shift

Crescendo Communications has seen sales of FDDI hubs and adapters shift from 60% fiber- and 40% copper-based products last year to 70% copper- and 30% fiber-based products this year.

However, users have more than FDDI to consider for high-speed networking. Switched Ethernet and duplex Ethernet (CW, May 24) are viable alternatives today. Asynchronous Transfer Mode is a fledgling technology, and 100M bit/sec. Ethernet is under development (see chart at right).

For Brian Cashman, manager of network hardware engineering at the University of Michigan in Ann Arbor, the FDDI demonstration helped validate what he sees as a possible solution to desktop bandwidth problems.

The university, which already has a fiber FDDI backbone, is considering FDDI over unshielded twisted pair for some twisted-pair Ethernet networks for applications such as medical imaging and large data transfers.

"Interoperability is motherhood and apple pie; it demonstrates that a standard is really working," Cashman said.

Participating in the demonstration were Cabletron Systems, Inc., Crescendo Communications, Inc., Digital Equipment Corp. and Interphase Corp. with adapter cards and hubs; 3Com Corp., Codenoll Technology Corp., Network Peripherals, Inc. and Silicon Graphics, Inc. with adapters; Micro Linear Corp. and Motorola Data Communications with chips; and Pulse Engineering and Technitrol, Inc. with copper transceivers.

The standard for FDDI over copper reached draft form in February and is expected to be finalized by year's end.

"The prices for all these technologies are coming down in real time," Robbins said, "but it's important to remember that the cost of the wiring is more than the other costs combined. That's why supporting Category 5 [copper cabling] is vital."

Fast LAN alternatives

LAN technology	Estimated cost per hub port	Estimated cost per adapter
Ethernet switching for Ethernet users	$700 to $2,000	No upgrade cost
Full duplex Ethernet for Ethernet users	$1,000 and up	No upgrade cost
FDDI over unshielded twisted pair	$800 to $1,000	$800 to $1,000
Asynchronous Transfer Mode	$2,000 and up	$1,400 and up
100M bit/sec. Ethernet	NA*	NA*

* Not available

Source: Aberdeen Group, Boston
CW Chart: Jewell Genovese

RANK 1992	1991	COM
1	1	GE MOTORS Detroit
2	2	N Irving, Texas
3	3	FORD MOTOR Dearborn
4	4	INTL. BUSINESS MA
5	5	GENERAL ELECT
6	6	MOBIL Fairfax, Va
7	7	PHILIP MOR
8	8	E.I. DU P
9	10	CHEVRO
10	9	TEXA

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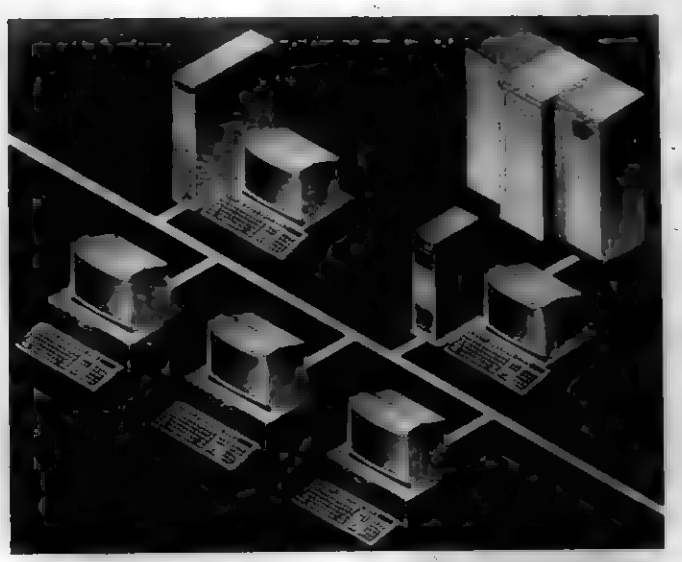

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Above: Windows NT delivers power, reliability and open architecture for client-server computing.

Right: This versatile operating system platform includes versions for both clients and servers.

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News Shorts

The White House links to Internet

The White House has added a connection to the Internet to increase public access to the administration, the Office of Presidential Correspondence announced last week. Staff members will read and acknowledge the incoming electronic mail, but the White House may not have the capability to send replies before year's end. President Clinton's Internet address is president@whitehouse.gov. Vice President Gore's address is vice.president@whitehouse.gov.

3Com offers peek at financials; suit filed

3Com Corp. last week predicted its fiscal fourth-quarter sales would total $167 million, a 33% increase over the same period last year. The company expects earnings per share to reach 40 cents, a 100% increase over last year's fourth quarter. The estimated results were below analysts' expectations. Separately, a shareholder class-action lawsuit was filed against 3Com and some of its officers and directors, alleging actions violating federal securities laws. 3Com said it intends to defend itself against the claims "vigorously."

IBM adds to systems management line

IBM's SystemView architecture-in-waiting got a much needed boost last week. The company announced a uniform way of collecting systems and performance management data from many IBM mainframe packages. Called Enterprise Performance Data Manager/MVS, the modularized software also stores the data in a DB2 database and presents it in graphical form; the package ships this month.

Tandem, ViewStar to pitch joint system

Tandem Computers, Inc. in Cupertino, Calif., and **ViewStar Corp.** in Emeryville, Calif., said they will jointly market a client/server document handling system early next year. Tandem's NonStop SQL relational database servers will handle images, text and fax data for **Microsoft Corp.** Windows clients on PC local-area networks. The company is considering tiered pricing for the servers but provided no details. ViewStar offers per-user pricing.

Vendors back PC configuration method

Intel Corp. and **Microsoft** last week announced that they would establish a special interest group (SIG) to advance their Plug and Play ISA Specification. Plug and Play ISA was designed to make PC configuration virtually automatic. More information on the Plug and Play ISA SIG will be announced next month.

Fiber tentacles grow longer

Pacific Bell last week announced plans to build a fiber-to-the-home network for an upscale development of 111 homes in Orange County, Calif. The network, based on **ADC Telecommunications, Inc.** network access devices, will initially support Integrated Services Digital Network and T1 services. It will handle video, interactive multimedia, image transfer and other services in the future, the carrier said.

SHORT TAKES Gilbert Williamson, who recently stepped down as chief executive officer at **NCR Corp.**, has been named to the board of directors at **The Santa Cruz Operation.** . . . **Unix System Laboratories, Inc.** has started a branding program to let users know which vendors are basing their transaction processing monitors on USL's Tuxedo monitor. . . . **NCR** has introduced Comten UTSCON-1, software designed to provide access between BX.25 terminals and **Amdahl Corp.**'s UTS mainframe environments.

News shorts, *page 16*

Imaging investment puts money in bank

Texas Commerce system said to ease post-acquisition agony

By Nell Margolis
HOUSTON

Post-merger melding of information systems tends to be a nightmare at worst and a headache at best. But when an acquisition increased the size of Texas Commerce Bancshares' Consumer Credit Operations Center by about 67% last month, "it was a non-event," according to Senior Vice President Allen Cournyer.

Aided by an imaging system that eliminated all paperwork from the generally unwieldy consolidation process, the 300-person unit "turned into 500 overnight, with just an increase in our fax capacity, the addition of a laser [printer] to print more loan documents and a switch of phone numbers," Cournyer said.

The slick segue is the latest benefit the $17 billion subsidiary of New York-based Chemical Banking Corp. owes to its imaging operation, but far from the first.

Two years ago, a ViewStar Corp. imaging and workflow system on a Compaq Computer Corp. platform operating across a Novell, Inc. NetWare local-area network catapulted Texas Commerce into the consumer loan business. The experiment, launched to bring order to the bank's back-room functions, propelled the bank to player status in a market it had entered only a year earlier [CW, March 15].

In the past year, Cournyer said, the bank tripled its loan volume, knocked issue time down from several days to about 90 minutes and pared its loan processing staff.

However, industry observers cautioned, Texas Commerce's experience may still be more the exception than the rule.

"Does imaging work?" asked Frank Capek, a vice president at The Chase Manhattan Bank NA who spoke at an American Bankers Association conference late last month. Technologically, he said, the answer is yes. However, too many firms are still charging headlong into imaging the wrong way, for the wrong reasons and with predictable results, he added (see box).

"Whether or not imaging will be successful [in a firm] is largely a question of how the business is organized," noted Bruce Silver, an analyst at BIS Strategic Decisions in Norwell, Mass. Both technologically and with regard to corporate dynamics, he said, the more autonomous the business unit, the better its chances of successfully implementing an imaging application.

In addition to skirting the political and technological hassles that persist when two or more business units join forces on a massive project, Silver noted, the benefits of an imaging project undertaken by a single, autonomous unit are easier to demonstrate, quantify and thereby justify to top management.

Texas Commerce, meanwhile, has a few new numbers to flash around if it is asked to justify its investment in imaging.

Earlier this year, the bank acquired about 65% of the deposits of the former New First City Bank from the Federal Deposit Insurance Corp., upping its number of branches from 92 to 125. In the process, it greatly increased its loan volume, Cournyer said.

However, he added, with the addition of two fax machines and 200 more Compaq SystemPro 486 machines to accommodate internal users acquired from New First City, the imaging system is already handling the increased volume without disrupting business.

Pitfalls to avoid

Speaking before an audience of IS and banking professionals, Frank Capek, a vice president at Chase Manhattan Bank, ticked off a list things crucial to avoid in imaging implementation:

- "Beware applications involving complex, unstructured desktop image manipulation — you know, WORN: Write Once, Read Never."
- "Taking what people are used to doing — for instance, comparing figures between different documents — and translating it into image is considerably difficult. Logic tells you there's some kind of structure under there, but it isn't necessarily easy to find."
- Do not chuck the microfilm, Capek said: There are still plenty of uses for it — for instance, the document you absolutely need to have on file but rarely need to eyeball.
- Watch out for the ill-structured pilot project. "Don't pilot the technology — it usually works," Capek said. "Pilot the application — and let the user's real, underlying need be the driver, no matter how unglamorous that need may be."

Paper forms head for trash at waste firm

By Michael Vizard
LOMBARD, ILL.

The local trash collector is about to become a knowledge worker thanks to the efforts of Waste Management, Inc.

Waste Management is in the process of installing customized Intel Corp. 80286 PCs running Microsoft Corp. Windows in its 12,000 garbage trucks. One hundred trucks have already been equipped with PCs; the balance should be outfitted by year's end.

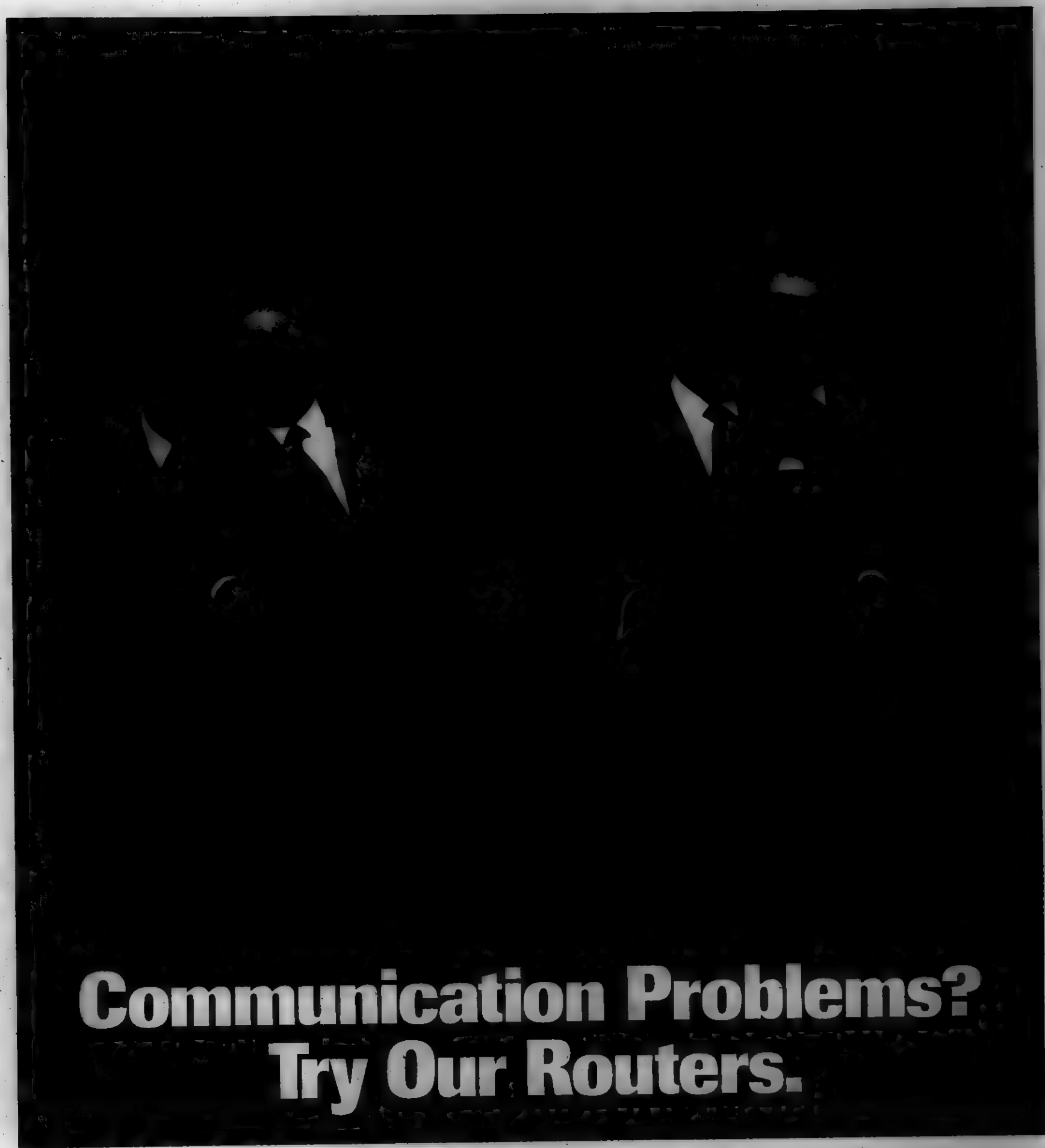
Using a touch screen and an application that was developed with Microsoft's Visual Basic programming language, drivers are linked to dispatchers who can automatically change a truck's route. Workers can also fill out routine forms or relay data about a customer back to the home office using a wireless modem.

The decision to deploy PCs in the trucks is part of an overall campaign to eliminate paper — or internally generated waste — at Waste Management. The $8.7 billion firm specializes in environmental waste management services ranging from garbage trucks to water treatment plants and disposal of radioactive material.

Waste Management has adopted the Notes groupware offering from Lotus Development Corp. in Cambridge, Mass. "We have a big push on to become a green company by becoming a paperless office," said Stephen Michael, senior director of information systems.

Michael said his premier application is a Notes 3.0-based, 45M-byte database that will serve as a directory service for an intelligent electronic-mail hub that Waste Management is building to integrate its dispersed E-mail system.

The goal is to give users access to names and addresses of other users. They will then be able to contact one another using a custom application that Waste Management is building on top of a SoftSwitch E-mail gateway and Hewlett-Packard Co.'s OpenView software.



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Users remain skeptical about DEC focus

By Craig Stedman
ATLANTA

Digital Equipment Corp. will face many obvious questions about its transition to Alpha AXP, its plans for Microsoft Corp.'s Windows NT and ongoing support for older products at this week's Digital Equipment Computer Users Society (DECUS) spring conference. A key concern, one that will not go away, is price/performance across the company's product lines.

Terry Shannon, an analyst at D. H. Brown Associates in Port Chester, N.Y., said an informal survey conducted at a recent regional DECUS meeting in New Mexico pointed to price/performance, interoperability, DEC's commitment to OpenVMS and its software pricing and licensing issues as users' leading concerns.

Given DEC's attempts during the past two years to address its price/performance shortcomings, the prominence still given to that issue surprised Shannon. "I think their price/performance is damn good right now," he said.

A source at a major aerospace customer, however, said the perception of high software costs played a key role in that company's decision to replace a dual VAXcluster 8650 with Sun Microsystems, Inc. workstations. The largest number of complaints about DEC received during a recent poll on the DECUS electronic bulletin board involved pricing, he added.

With information systems managers facing more skepticism from their bosses about buying DEC products [CW, Dec. 14, 1992], DEC management is planning to lend a bigger ear than it did at DECUS conferences in the pre-Robert Palmer days, when the company emphasized technical issues.

As a measure of DEC's concern, Palmer will speak in Atlanta, and at least four DEC vice presidents are scheduled to make presentations. The vice presidents will also hold a joint session added at the eleventh hour: a panel billed as the Digital Listening Forum, in which users will get the chance to engage the assembled executives with questions and comments.

Room for more

About 3,300 attendees were registered to attend this week's DECUS meeting in Atlanta, down from 3,400 at last year's spring conference. DECUS officials are hoping some walk-in business will boost the actual attendance number. The organization is "pretty satisfied" with the advance figure, but even a small decline will press its already strained budget.

"They're probably just trying to figure out how nervous their customers are," noted George Kerns, assistant vice president of cellular information management operations at GTE Telecommunications Products and Services in Atlanta.

Put up or sell off

Monte Ford, director of information services at Bank of Boston, said officials there view the Alpha technology positively but have lingering concerns about DEC's strategic focus. He said the bank still wants DEC to clarify what kind of company it is and what products it is pushing. He cited Sun as an example of a vendor that has honed its focus to a proper pitch.

Conversely, others said they are hoping DEC will step up its move to sell off some of its lesser software programs to third parties, unless it turns around and takes a renewed interest in those products.

Concerns about continued support for OpenVMS and supporting software also loom large. Kerns said GTE's attendees at DECUS will be looking for word on DEC's long-term plans for both the ACMS transaction processing package and the Rdb database.

Angelo Pergantis, database administrator at PacifiCare Health Systems, a Cypress, Calif., health maintenance organization, said he also wants the Rdb question addressed.

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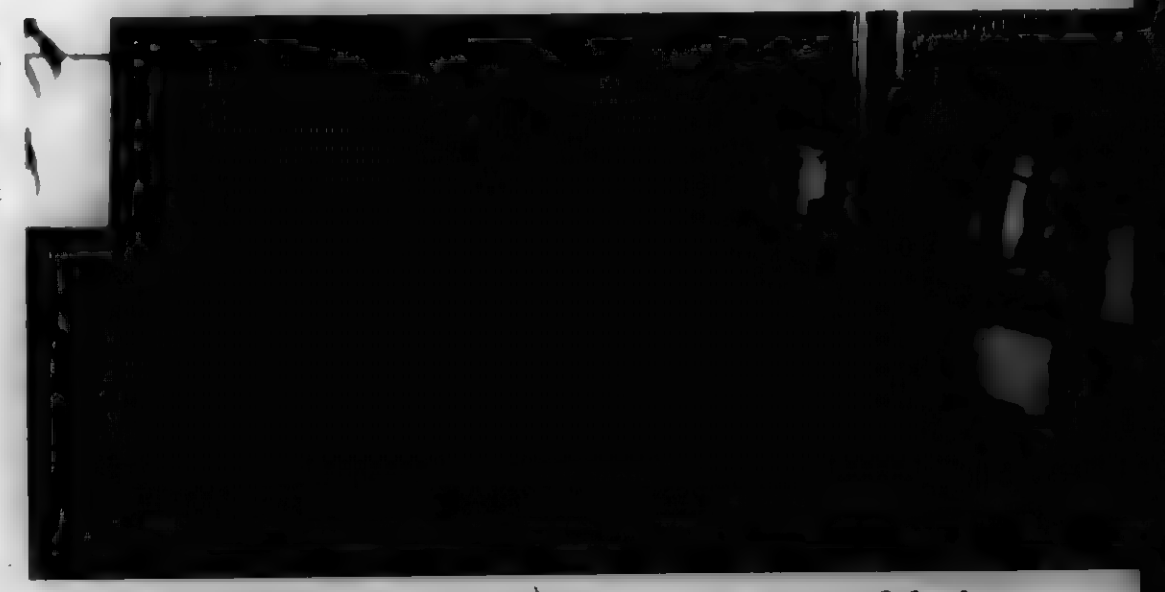

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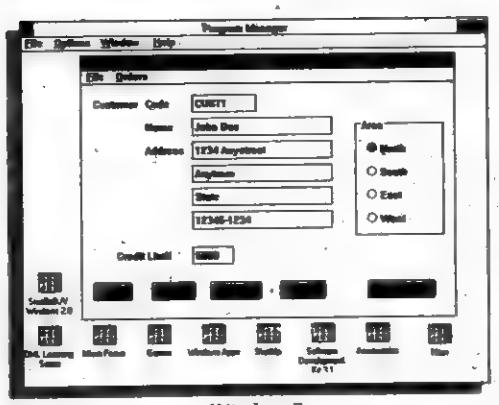

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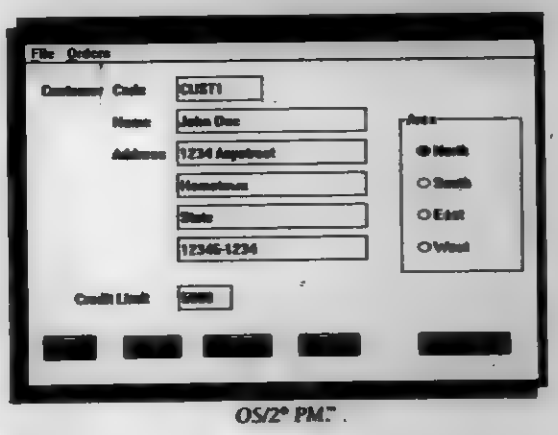

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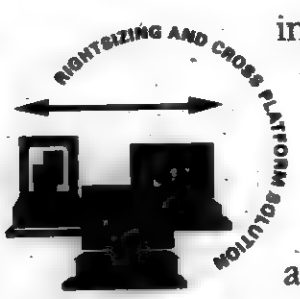

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Banyan expands net services

By Michele Doctert
AMSTERDAM

Banyan Systems, Inc. last week announced several 'ease-of-management' enhancements to its Vines network operating system.

Revealed at the Association of Banyan Users International Conference, Banyan's new Simple Network Management Protocol (SNMP) Agent Release 2.0 will allow network managers to manage their Vines 5.X networks, along with other multivendor networks, from a single SNMP-based platform, such as those from Cabletron Systems, Inc., Sun Microsystems, Inc. and Hewlett-Packard Co. The product is scheduled for release this month and is priced at $695 per server, the Westboro, Mass., company said.

Users hailed the multivendor support in the new SNMP agent. "Having one integrated network management method to use across our entire global network will save us a huge amount of administrative time," said Art Beckman, manager of client support services at Pacific Gas and Electric Co., a California utility.

The new agent, which also works with Banyan's Enterprise Network Services (ENS) for Novell, Inc.'s NetWare, can run over Transmission Control Protocol/Internet Protocol, Vines IP, Apple Computer, Inc.'s AppleTalk or Novell's IPX/SPX protocols. Banyan has developed a NetWare Server Management Information Base for the retrieval of NetWare server statistics via ENS for NetWare.

The new agent has also been enhanced to support Trap and Set requests, allowing users to manage their networks by defining parameters and events that automatically trigger responses, such as alarms or server shutdowns, according to the company.

Although all SNMP agents can report to management stations, Banyan's support for Trap and Set, as well as its broad protocol support, put it in front of competitors such as Microsoft Corp. and Novell.

Other announcements

Banyan also announced Release 3.0 of the Vines assistant, priced at $699 per server and scheduled for July availability. It features enhanced network capabilities such as the ability to send alarms if certain thresholds, such as server disk use, are exceeded. The alerts can be sent automatically either to a management console or to any user via electronic mail.

Finally, Banyan users will soon be able to manage their Vines networks from the same management console as their IBM mainframes via a new NetView Service Point. Priced at $2,195, it is slated for an August release and will support the NetView command structure, passing more than 80 Banyan alerts to a NetView console.

"A lot of our large customers still rely heavily on their mainframe network and wanted to be able to manage their LANs from the same platform," said Bob Martin, Banyan's network management product manager.

Although Vines, like NetWare, has long reported information into NetView, the new NetView Service Point provides two-way communication: Managers can manipulate Vines servers directly from the NetView console.

Oracle, Novell bundle up

By Kim S. Nash and Michele Doctert

Customers of Oracle Corp. and Novell, Inc. are eager to see the two cozy up to stave off Microsoft Corp.'s advances in the server world, but only if the partnership simplifies product installation and support, users and analysts said last week.

Oracle 7, the latest database from the Redwood Shores, Calif.-based firm, will be bundled with Novell's NetWare 4.0 network operating system for a price that is 10% to 15% lower than the cost of buying the two products separately, analysts familiar with the plan said. Novell and Oracle declined to comment on the relationship, which they plan to announce next week.

The deal will also give users one-stop support, allowing customers to call either Novell or Oracle with service questions regardless of which product is problematic.

"That alone is great news," said Michael Corey, president of the International Oracle Users Group.

With plans also in the works to bundle Oracle 7 with Novell's UnixWare, users and analysts characterized the partnership as an anti-Microsoft strike.

"It's a real war, an anti-NT war," said David McGoveran, president of Alternative Technologies, a consulting firm in Boulder Creek, Calif. He noted that Oracle has yet to formally commit to building a Windows NT version of its database as have other database players, such as Informix Corp. and The ASK Group, Inc.'s Ingres Products Division.

Microsoft has pushed increasingly hard into the server end of client/server computing by pricing its SQL Server back-end database at a low price of $499. With its Novell partnership, Oracle can get Oracle 7 into the hands of PC users more cheaply than it could working alone, according to Corey.

Still unclear is the degree to which Oracle 7 will be integrated with NetWare 4.0 beyond Oracle's NetWare Loadable Module (NLM) version, observers said. For the relationship to be worth Oracle's while, the database has to be optimized for NetWare, analysts agreed. Otherwise, Oracle does not have a leg up on other database makers with Novell pacts, such as Gupta Corp. Gupta sells an NLM version of its SQL Windows database and tool set.

One user, however, has his own idea about what he wants to see.

"It would be really great if Oracle used NetWare's directory and security services," said Jeff Levine, MIS director at Rapp, Collins, Marcos, a New York-based advertising firm.

Such cooperation between the products would mean Levine would have fewer security worries when outside clients tap into Rapp, Collins' databases because managing user access rights is easier with NetWare's directory services, he said.

Novell boosts management

CONTINUED FROM COVER 1

ing Unix-based offerings from HP, Sun and IBM, sources said.

Novell declined comment.

Version 2.0 "is leaps and bounds ahead of Version 1.1, which was a baby product," said Ravi Gulati, president of Stonybrook Services, Inc., an NMS application developer.

"New features, particularly the RMON support, give NMS a whole new level of access to the network that we really like," said a beta-test user at a major aerospace firm.

RMON is a Simple Network Management Protocol (SNMP) spec that defines how a remote management node collects and sends key network statistics to a central management station. Novell is expected to provide RMON Netware Loadable Modules (NLM) that can sit on each LAN segment and report back to the central NMS console.

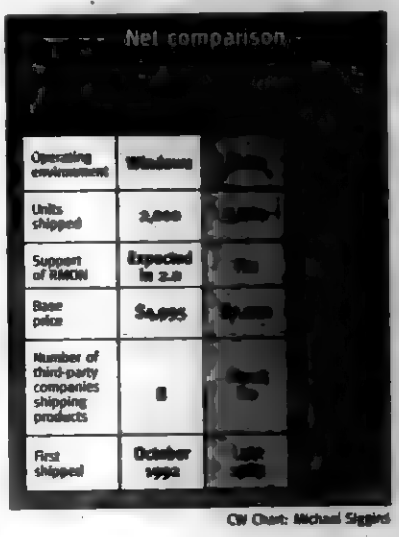
Novell will drop the price of the central platform to less than $3,000 and charge about $900 per LAN segment for RMON support, Gulati said. "Most users can afford that," he said.

In contrast, HP delivers RMON on its LANprobe, a proprietary box priced at $3,095 per LAN segment.

Support of RMON will be key to Version 2.0's competitiveness as an enterprise management platform, industry sources said. Novell is trying to leverage its strong NetWare base, which makes up an estimated 65% of the network operating system market, to become more of an enterprise network and network management provider, said Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif., research firm.

No contest

For some NetWare users, choosing NMS, which has shipped as an SNMP-based manager since October 1992, was close to a no-brainer. ITT Fluid Technology Corp., for example, found that it could implement an NMS NLM on a NetWare server on each network segment it wanted to monitor, at a cost



CW Chart: Michael Siggins

of $500 per segment, said Andrew Kiolbasa, coordinator of end-user computing.

Each server module collects key information that can then be accessed by the central, Microsoft Corp. Windows-based console.

"This is much more cost-efficient than implementing Unix management systems at each location, which is what we thought we would have to do" with HP's OpenView or Sun's SunNet Manager, Kiolbasa said. "Why implement Unix platforms to manage DOS systems?"

In addition to incorporating NetWare Services Manager, Novell's own application for managing NetWare servers, NMS is gaining the support of a growing horde of third-party applications for managing hubs, routers and workstations. For example, ITT Fluid Technology recently began implementing NMS Version 1.1 in combination with Router Manager for Cisco, an NMS application recently shipped by Stonybrook.

Among the features that Kiolbasa said he wants from the next NMS release is a way for the system to recognize when a file server locks up. Kiolbasa said he would also like to see tighter integration of Novell's hub, server and LAN segment management applications under NMS' graphical user interface. Version 2.0 should fix this by integrating a group of hub, NetWare and LAN management applications under a single user interface and map/discovery utility, sources said.

In addition, the new version is expected to interact directly with NetWare v3.11 server utilities to track areas such as software and hardware configurations and print service status, a vendor source said.

Version 2.0 is also expected to manage NetWare 4.0, with its enterprise-oriented NetWare Directory Services and systemwide administration utilities.

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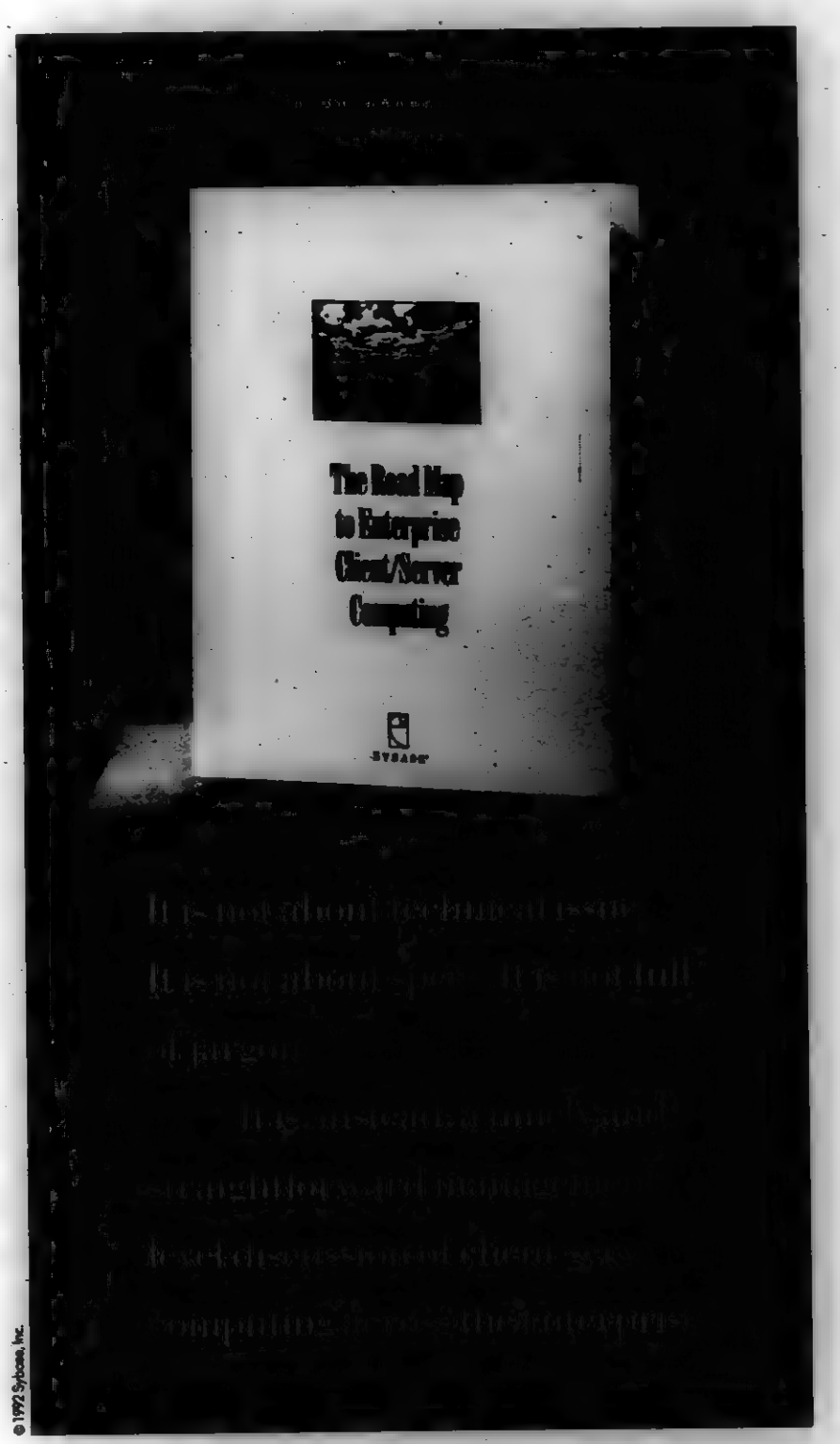

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AT&T assumes majority position in EO

By Michael Fitzgerald
CHICAGO

■ Affirming the importance of personal communications in its strategic plans, EO, Inc. investor AT&T said it will buy a majority interest in the start-up.

EO is perhaps the first company to ship a personal communicator, a portable device designed to let individuals compute and communicate everywhere.

The EO 220 and 440 Personal Communicators combine pen computing, electronic mail, fax and cellular phone capabilities in a sleek package. EO's products use AT&T's Hobbit microprocessor, while potential competitors, such as Apple Computer, Inc.'s Newton, have opted for other chips.

AT&T's investment "definitely adds to our comfort level that this technology is going to be around," said William Tsang, manager of medical systems at Pfizer Pharmaceuticals, Inc. in New York. Pfizer is examining a variety of approaches to pen computing, including EO's, and Tsang said vendors have realized that the "pen is not the main thing anymore; portability and communications are."

EO began shipping its products in volume in April, but observers said it has not sold many machines.

One source close to AT&T said the company's difficulty in marketing its products was behind AT&T's increased investment.

The source said that if AT&T controlled EO, it would then be able to step in and aggressively pursue new marketing plans, such as one that AT&T and Go Corp. are currently discussing that would give seed machines to high-profile users [CW, May 31].

"AT&T sees this platform as the next telephone, which makes it potentially very big and very important," said Portia Isaacson, president of Dream IT, Inc., a consultancy in Colorado Springs. She said AT&T's marketing muscle and cash reserves should help boost EO's sales.

AT&T currently owns 20% of EO and will up its stake to 51%, pending approval by EO's board and shareholders. Once the deal is complete, AT&T's name will go on EO's products. EO's products will also be sold through AT&T's retail phone stores.

Vendor allies seek to boost wireless

CONTINUED FROM COVER 1

Participating companies will advocate a Xircom-designed peer-to-peer wireless radio-based LAN protocol called Netwave, currently before the IEEE standards committee alongside three competing proposals. Netwave will be applicable to desktop LAN and PCMCIA adapters alike.

Microsoft, along with Intel Corp., Hewlett-Packard Co., Canon U.S.A., Inc., Xerox Corp. and others, will announce wireless technology this week in New York, where Microsoft demonstrates its "At Work" office architecture, sources close to the company said. The "At Work" vision will include infrared and data-over-cellular connections in office devices such as fax machines and printers based on the Windows interface, the sources said.

For Younkers, Inc., a department store chain based in Des Moines, Iowa, "a standard like this absolutely is important" to help reduce wireless costs and force competing vendors to increase functionality, said Dan Smith, senior vice president and chief information officer.

Younkers is installing 2,500 NCR wireless point-of-sale devices in 54 stores. Wireless standards will "open" the devices and increase the store's flexibility in choice of vendors, cards and product features, Smith said.

First appeal

The common wireless LAN technology, if it catches on, will likely have initial appeal in the portable computing arena, observers said.

"The portable area is probably where a standard is most needed," acknowledged 802.11 committee member Bob Rosenbaum, who is also director of marketing at desktop-oriented wireless LAN vendor Windata, Inc. in Northboro, Mass.

"All laptop vendors will eventually integrate [a wireless link] into their computers. So users want to know if they buy a Toshiba here and a Compaq there, they can communicate properly," Rosenbaum said.

Typical applications will arise when users need to create temporary LANs, such as when employees form a workgroup in a conference room, users from different firms collaborate at an industry meeting or an accounting team arrives at a client for an audit.

The timing is ripe because while user attraction is high, there is not a large installed base of neophyte wireless PCMCIA devices yet, said John Donovan, program director at WorkGroup Technologies, Inc., a consultancy in Hampton, N.H. This means that standards would not require a lot of swapping out, he explained.

Xircom said its protocol controls access to the network medium, such as radio or infrared waves. While Xircom's own product implementation will couple the protocol with radio spectrum in the 2.4-GHz frequency range, other vendors could license Netwave and run it over other wireless media and frequencies, Belanger said.

IBM, NCR and Spectrix Corp. also have proposals on the table at the IEEE, which means the typical standards-committee "religious" wars are raging.

In this case, the committee must decide whether an Ethernet-like, peer-to-peer access mechanism such as Xircom's and NCR's or a technology with a central unit controlling network access, such as IBM's and Spectrix's, is more beneficial to the user community, Rosenbaum said.

Standards du jour

Compaq Computer Corp. and Dell Computer Corp. may align themselves with Xircom, but their weight may not give sway to Xircom's standards proposal, as the two companies have one product that supports PCMCIA between them. Compaq continues to say it will not build PCMCIA into its notebooks until it sees a need in the market.

Toshiba America Information Systems, Inc., which supports PCMCIA in several of its portables, is likely to support the competing NCR scheme currently under consideration by the IEEE standards body, according to a source at Toshiba. Toshiba's market clout could turn the industry away from the Xircom protocol.

The source said Toshiba will not wait for the IEEE to set a standard before deploying wireless links in its notebooks, since it expects up to a two-year delay from the slow-moving body.

Toshiba plans to soon let customers test its wireless technology. When the IEEE does set a standard, "we will support it," the source said. The source added that engineers from all the firms are engaged in talks.

—Michael Fitzgerald

Pocket-size computers

PDA market heats up with new choices

By Ellis Booker
CHICAGO

With the unveiling of their jointly developed Zoomer system, Casio, Inc. and Tandy Corp. last week became the latest entrants in the race to equip professionals and consumers with personal digital assistants (PDA).

The announcement, made at the Summer Consumer Electronics Show, followed a disclosure last week by Sharp Electronics Corp. in Mahwah, N.J., that it will ship in the third quarter a PDA based on Apple Computer, Inc.'s Newton Intelligence system. It is expected to ship by the end of the summer and carry a price of approximately $1,000.

Casio officials, who claim to have sold 700,000 personal organizers in the U.S., said the Zoomer PDA will target a broad consumer market. They conceded, however, that initial customers will likely be more sophisticated business users and current users of digital diaries. Casio said Zoomer would be available in September through the major consumer electronics chains at a suggested retail price of $699.95.

Tandy officials said they hope to have Zoomer, priced at $699, in all of their Radio Shack outlets by October.

Slow but steady

"This year, we see only 40,000 [PDA] units being shipped by all vendors," said Jeffrey Henning, senior industry analyst at BIS Strategic Decisions in Norwell, Mass. However, BIS predicted that number would grow to 120,000 units by 1994. "We're pessimistic in the short run, optimistic in the long run," Henning said.

Zoomer's built-in applications include a 50,000-definition dictionary, a 100,000-word spell checker, a 660,000-synonym thesaurus, a 28-language translator, a sophisticated calculator and three games. Creators of the 16-ounce unit emphasized their PDA's 100-hour battery life. Zoomer uses three AA alkaline batteries.

Casio and Sharp were flanked at the Zoomer announcement by a number of software partners, including GeoWorks in Berkeley, Calif., which has supplied its Geos object-oriented graphical user interface operating system to the unit; and Palm Computing in Los Altos, Calif., which developed the organizer's core applications: a date book, address book and to-do list manager.

In addition, America Online, Inc. in Vienna, Va., has worked with Casio and Tandy to develop an interface to its on-line information network. And Intuit in Menlo Park, Calif., has supplied a "pocket" version of its Quicken financial management software.

In related announcements, Motorola, Inc. announced plans to develop a version of its Embarc wireless data service for the Zoomer, and SunDisk Corp. in Santa Clara, Calif., said it would provide low-power, flash technology-based Personal Computer Memory Card International Association mass storage cards for the Zoomer.

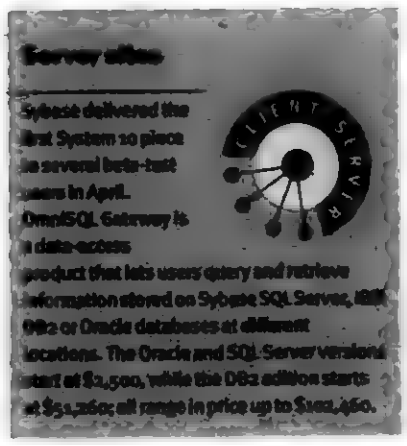
Sybase to deliver Replication Server

Software will provide unified view of distributed data across enterprise

By Kim S. Nash
EMERYVILLE, CALIF.

Sybase, Inc. plans to unveil today a critical piece of System 10, its latest database architecture, that is expected to point to key differences between its take and rival Oracle Corp.'s take on client/server computing.

Long awaited by users, Sybase's Replication Server was designed to give users a coordinated, global view of data spread across different geographic and/or technological locations, analysts and users familiar with the product said. To be priced and sold separately from the



SQL Server 10 database engine, Replication Server can also help different departments share up-to-date information.

Oracle's Oracle 7 database accomplishes similar goals but takes a different tack on the distributed model. Oracle 7 uses functions, such as triggers and snapshots, in its database engine to replicate data across different servers. Oracle will charge users extra for those features.

"The Sybase approach is a very viable alternative to Oracle," said Colin White, analyst at Database Associates in Morgan Hill, Calif.

No verdict yet

However, because neither Oracle 7 nor Sybase System 10 is up and running in full force yet, the jury is out on which company "hits a performance or data availability high," White added.

Several Sybase user group attendees have put Replication Server at the top of their wish lists [CW, May 3]. Although the product will not be generally available until late this year, some users such as The Chase Manhattan Bank NA will receive early copies.

"This is a major product for us," said Gene Friedman, vice president of applied technology at Chase. The New York-based bank plans to use Replication Server extensively in several areas as part of a large distributed computing project [CW, May 24]. Chase will get copies of Replication Server this month, Friedman said.

Sybase has gradually unveiled pieces of System 10 since announcing the product line in November 1992. The SQL Server 10 database engine is not expected to ship until the end of the year.

In a separate matter, Sybase last week said its APT Workbench, a tool that helps users develop 32-bit client/server applications, is available on new platforms. The tool now runs under Sun Microsystems, Inc.'s Solaris 2.1, Digital Equipment Corp.'s AXP OpenVMS and MS-DOS.

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News Shorts

Artisoft board fires founder

The board of directors at **Artisoft, Inc.**, the Tucson, Ariz., vendor of network cards and LANtastic, a leading peer-to-peer PC network operating system, has unceremoniously dumped C. Jack Shoof, the company founder, as chief executive officer and chairman. The board replaced him with President and Chief Operating Officer William Keiper. Although Artisoft's earnings have slumped in the last two quarters, sources close to the company cited "differences in managerial style" as the reason behind the termination.

HP drops the Ethernet price floor

Hewlett-Packard Co. announced last week what may be the least expensive Ethernet local-area network adapter on the market. The $119 (list price for individual card) 10Base-T adapter competes with similar cards from market leaders **3Com Corp.** and **Standard Microsystems Corp.** that range from $150 to $200. Though HP is a small player in the market, this move could spark a new round of vendor price cutting, observers said. Soon the price cuts are unlikely to matter to some purchasers of new PCs: Manufacturers have said they plan to include Ethernet connecters on the motherboards of future PC models.

Copper FDDI hits hubs

Cabletron Systems, Inc. said it will announce today networking modules for its smart hub and desktop adapters that allow users to leverage the cabling economies of the neophyte 100M bit/sec. Fiber Distributed Data Interface over unshielded twisted-pair technology. A four-port hub module is priced at $3,695, and an eight-port version costs $6,695. Cards range from $995 to $1,395, depending on the PC bus.

New servers from NCR

NCR Corp. added a mix of **Intel Corp.** 1486 and Pentium-based System 3000 servers to fill gaps between its low- and high-end offerings. The 10 Unix-based servers, ranging from the new low-end System 3410 uniprocessor to the 16-processor System 3575, have been bundled with NCR's fault-resilient LifeKeeper FRS software. NCR, which tallied $1 billion in System 3000 revenue last year, has begun shipping the 486-based machines, while the Pentium-based servers are scheduled for general availability in the third quarter.

Novell router matures

Increasingly enterprise-minded **Novell, Inc.** enhanced its software-based multiprotocol router last week with source-route bridging for IBM protocols and a router version that bundles wide-area network links into the routing package. Previously, users had to buy WAN connectivity separately.

Elementary, my dear computer

Last week, grade-school students at the Orion School in Redwood City, Calif., built a multimedia PC as part of a program to teach them about technology. No word yet on how the PC reacted when a first-grader tried to feed it a cookie.

SHORT TAKES **BF Goodrich Aircraft Wheel and Brake Operations** will use **Cincom Systems, Inc.'s** Control:Manufacturing software to standardize on Digital Equipment Corp. VAXs. . . . **Prodigy Services Co.** is positioning itself as the link between cable TV operators and producers of interactive products. . . . **Motorola, Inc.** said its Electronic Mail Broadcast to a Roaming Computer wireless net service will support **Hewlett-Packard's** 100LX handheld computer. . . . **The Stolen Computer Registry**, a clearinghouse for data on stolen computers, is accessible by modem.

Re-engineering the railroad

Canadian operation upgrades host to improve customer service

By Johanna Ambrosio and Rosemary Cafasso
MONTREAL

Canadian National Railways (CNR) is making the politically incorrect move of installing mainframe software to get its traffic-management system back on track. When the $100 million job is completed in early 1995, the railroad will have replaced about one-third of its major production applications with updated versions.

"I realize this sounds heretical," said Ronan McGrath, vice president of information systems and accounting at CNR. "But this is a 200 MIPS system, and client/server is not yet suitable."

The new software, called Transportation Support System (TSS), uses IBM's DB2 database management system and is written in Software AG of North America, Inc.'s Natural fourth-generation language. To run it, CNR will upgrade its 3090 mainframes to an as-yet-undetermined large model of IBM's Enterprise System/9000 family.

CNR is purchasing TSS from Santa Fe Pacific Corp., a railroad company in Schaumburg, Ill. [CW, May 31]. This is the first sale of TSS, said Santa Fe Vice President Chuck Shultz; Santa Fe just implemented TSS last year and is still writing and installing some parts of it, he added.

The major part of TSS, traffic management, will help CNR improve customer service. Like other railroads, CNR has recently started to provide customized contracts that specify how and when a cargo will get from one point to another. That level of service requires CNR to bill an automobile manufacturer for the transportation costs of a specific car, for example, and to report to customers if there are any problems along the way.

But back in the 1970s, when CNR's current systems were implemented, the main idea was to save costs by piling as much cargo on a train as possible.

In addition to this traffic-management component, TSS includes integrated programs for billing, invoicing and other functions. All will replace existing CNR systems. The new software, in turn, will have to be translated into French and then interfaced with other production systems for payroll, accounting and finance. Although McGrath declined to specify what CNR is paying for the software, he said the cost of interfacing it to the rest of CNR's production systems is greater than that of the package itself.

While it installs TSS during the next 18 months, CNR will also build a graphical user interface for end users, likely to be based on Microsoft Corp.'s Windows NT operating system.

"This is assuming NT reaches an appropriate level of production ability," McGrath said. A decision of which desktop environment to use will not be made until late next year, he added.

Central IS

CONTINUED FROM COVER 1

one hand, this approach embodies decentralization by giving hordes of increasingly sophisticated users a powerful platform and an unprecedented entree into corporate information. On the other hand, its alarming potential for time- and money-wasting duplication of effort begs for central oversight.

Helene Runtagh: *GE has a 'passion for integrated diversity'*

For example, the need to root out duplicated effort is spurring firms to centralize the management of efforts involving architecture, strategy definition, quality management and coordination between central IS and what has been rolled out into business units, said John Morency, principal consultant at Strategic Networks Consulting in Rockland, Mass. Bankers Trust Co. is apparently taking that approach.

"With client/server, there is no way you can survive without centralization," Peterson said. "It may not be massive, but you do need coordination."

In Chicago, Commonwealth Edison Co. is in the early stages of implementing a client/server system. Eventually, supervising analyst Phillip C. Yandel said, about 50% of its 19,000 employees are expected to be up on the Novell, Inc. NetWare-based local-area network. Centralized management, Yandel said, is also in the game plan.

"Supposedly, we were already centralized," he said. But pockets of lone-wolf developers and programmers had sprung up within the IS ranks during the years. In fact, Yandel said, the client/server system is being implemented in part to satisfy the yen for more sophisticated applications and easy corporate data access.

Putting the chief information officer in charge of the client/server operation, he said, is calculated not to rein in the lone wolves' creativity but to ensure that it is being exercised with the most efficient use of precious corporate resources. "We're hoping to give them the thrill of hacking while we keep the control we need," he said.

There are questions in large IS shops about what should be centralized, Morency said. The struggle to answer those questions is forging new kinds of IS leadership. "What we're beginning to see is the CIO acting as a sort of in-house outsourcer," he said.

For instance, when one of General Electric Co.'s product divisions recently cast about for IS-enabled ways to enrich customer service, the group's IS head was unaware of a client/server inventory management system linking GE's lighting and appliance divisions to customer sites and letting them satisfy specific customer demands with unprecedented speed and accuracy.

But the products business got clued in via GE's Information Management Council, a centralized IS consultancy and strategy group made up of CIO Helene Runtagh and GE's 15 business IS heads. It meets at least quarterly and communicates electronically each day. Using skills and resources already honed in the lighting and appliance IS groups, the anonymous products group "is putting in a vendor management system as we speak," Runtagh said last week.

But "the decentralized aspects [of IS] are alive and well at GE," she said, adding that her title reflects GE's "passion for integrated diversity: Leverage central IS, but only where it makes sense."

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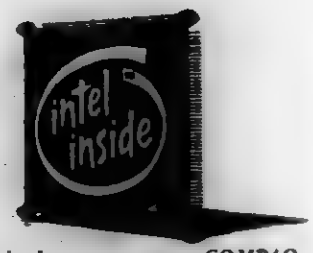

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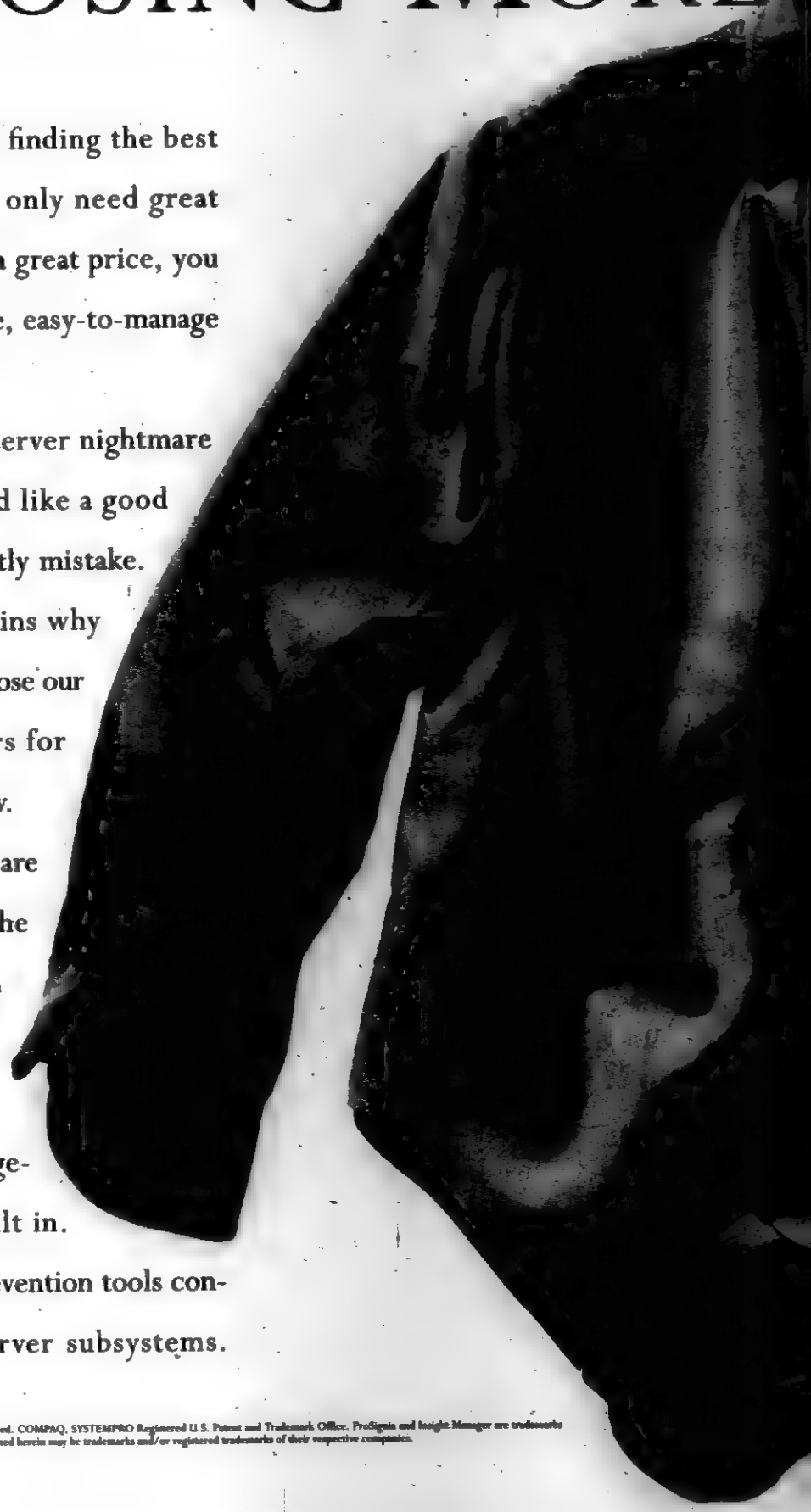

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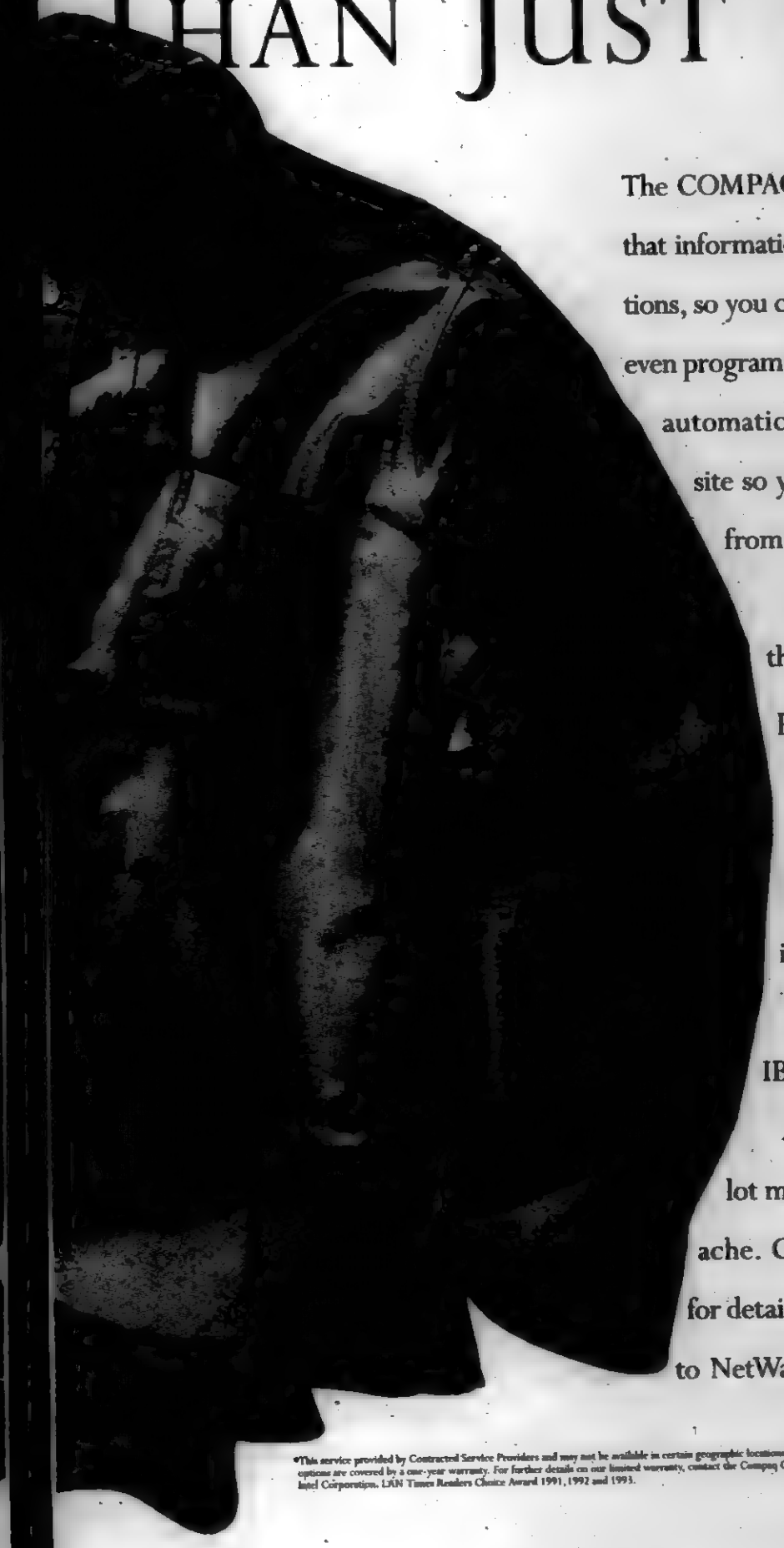

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Workgroup computing

Apple servers win kudos but users hunger for more

By James Daly

Corporate information systems managers who have slid Apple Computer, Inc.'s trio of new workgroup servers into place already have some feedback for Apple: Nice job, but they cannot wait until new models based on the speedier reduced instruction set computing-based PowerPC chip come out early next year.

The Motorola, Inc. 68040-based server is "a wonderful machine, but I don't think Apple went far enough," said Dr. Warren Young, director of neuropharmacology computing at the Scripps Research Institute in La Jolla, Calif.

Young, who works with two models that service the needs of more than 200 researchers and scientists, said Apple could have done a better job with remote administration functions, particularly in terms of smoothly disconnecting a user from the server.

And while initial satisfaction runs deep, users were also quick to point out areas in need of improvement. These ranged from pleas for better audit trails to complaints about the key slot.

"When you twist it one way, it locks the machine. But if you twist it the other, it turns it off," said Michael Keithley, who manages a Model 95 as IS director at Creative Artists Agency, Inc. in Beverly Hills, Calif.

That is not to belittle what Apple has already done. In the past few weeks, power-starved corporate Macintosh users have listened anxiously for the squeal of braking delivery trucks hauling Apple's first true dedicated server, the high-end Workgroup Server 95, as well as beta-test versions of the Workgroup Server 60 and 80.

> "I can have someone who doesn't even know what Unix is managing this thing."
>
> — *Michael Keithley*
> *Creative Artists Agency*

Many users say the workgroup server line will add much-needed processing power to setups that had reached their limit. The servers are based on enhanced versions of the Macintosh family's high-end Quadra, but they contain elements to enhance their specialized role as servers.

A special processor-direct slot, for instance, helps provide fast hard disk I/O. A second-level memory cache cuts the time the microprocessor spends getting information from random-access memory.

The hardware is driven by a server version of A/UX, Apple's version of Unix, which delivers high-performance network services to data-intensive workgroups of as many as 50 simultaneous users. The servers are targeted at workgroups ranging from five to 200 workers; prices start at $3,079.

In the making

Apple reportedly plans to introduce workgroup servers targeted at specific tasks. The company has started down this road with the Model 95, which has an optional configuration designed specifically for a database environment.

Willing to wait

Although new power is always a potent lure to users, Apple could face slower than anticipated acceptance of the servers from users willing to wait another six months or so for the new PowerPC-equipped models. "There are many people out there who are drooling for these machines with a PowerPC chip, and I'm one," said one technical manager.

The Macintosh's legendary reputation for ease of use could appeal to users entwined in creating a client/server architecture. "I can have someone who doesn't even know what Unix is managing this thing," Keithley said.

Many users said they will also be freed from the typical headaches associated with server setup and maintenance. Of particular importance is savings in the area of "soft costs" — installation, service and support. A cost/benefit analysis issued in January by Gartner Group, Inc.'s consulting services in Stamford, Conn., said the life-cycle cost of maintaining a Macintosh for five years is $4,000 less than a PC running Microsoft Corp.'s Windows and nearly $10,000 less than a DOS system.

Those are dollars-and-cents issues to which IS managers can relate.

"When I think of trying to operate a Unix server, I think of seven programmers constantly trying to keep the thing going," said Brian Comnes, manager of the information center at Airways, Inc. in Redwood City, Calif. "Apple's server can provide a lot of the same capabilities without a lot of fuss, so it could really change our life."

Falls short

It can provide a lot of the same capabilities — but not all. Some are willing to wait for the models based on the more powerful PowerPC chip because the current crop of workgroup servers is just not powerful enough.

"They're nice, but I'm not getting rid of my Sun [server] just yet," said James Yip, manager of technical services at Ernst & Young in Toronto.

Although few of the new Macintosh servers are actually up and running, buyers had no shortage of plans for the new machines. Most users are employing a mix of homegrown and store-bought software and are developing long-term plans for custom software.

CA revs manufacturing software

By Thomas Hoffman
INLANDIA, N.Y.

Computer Associates International, Inc. significantly bolstered its flagship manufacturing software line last week by announcing plans for Unix and client/server versions of its shop-floor packages.

Many of the new features, including the ability to place blanket purchase orders and paperless shop-floor orders (see story far right), were warmly received by several of CA's 1,300-plus manufacturing software users.

Van Camp Seafood Co. in San Diego recently customized its CA-PRMS Version 8.2C shop-floor package by integrating its batch-order entry module with increased electronic data interchange (EDI) capabilities through a special arrangement with CA, said Jack Boyle, the seafood firm's director of MIS.

Boyle said he was interested in several of the new modules added to the latest release, CA-PRMS 8.3, including blanket purchase orders and an "orderless" shop floor, a feature that allows users to generate work orders with less paperwork and maintenance.

But because Van Camp upgraded to CA-PRMS 8.2C in December, the company has no immediate plans to upgrade to versions 8.2F or 8.3, Boyle said.

The new features appear to have arrived too late for at least one CA-CAS user. Sherwin-Williams Co., the Cleveland-based paint company and a longtime user of CA-CAS, canceled its CAS maintenance contract last fall because CA was too slow to introduce enhancements to the shop-floor suite, according to Jim Cleveland, Sherwin-Williams' manager of data management services.

Sherwin-Williams continues to run and maintain CA-CAS Version 1.3 in its Amdahl Corp. mainframe environment, Cleveland said. But the paint supplier grew restless waiting for significant enhancements to arrive on CA-CAS and instead modified it by splitting its inventory control procedures.

Cleveland said he was dismayed at what he felt were a lack of enhancements made to CAS Version 1.4 in 1992. Cleveland described CA-CAS as "a functionally rich product that just stagnated."

CA plans to port its CA-CAS shop-floor manufacturing package to Hewlett-Packard Co.'s HP/UX Unix environment by the end of the year, according to John Capobianco, director of business applications. He said CA will later port CAS versions to IBM's AIX environment and other Unix platforms. CA-PRMS will be ported to Unix by mid-1994.

Still, several users said they plan to migrate eventually to CA-CAS 3.0 because the latest release contains a 21st century date support mechanism. Users of CAS versions 1.3 and 1.4 whose systems run on a 20th century calendar likely will face system crashes unless they move to the newer release or migrate to other packages, industry observers said.

Boyle said CA's plans to deliver CA-PRMS on desktop environments with graphical user interface (GUI) tools appeals to Van Camp because the company has several networking projects planned between its host IBM Application System/400 Model D60 and its PCs during the next year.

"Further integration [of manufacturing software] to the desktop seems to be an industry trend, so CA seems to be right on the leading edge with that," Boyle said.

Analysts also lauded CA's plans to deliver its manufacturing products on Unix and GUI database-independent client/server platforms because the industry is expected to shift its reliance from midrange and mainframe computers to distributed environments in increasing numbers during the next few years.

New lineup

- **CA-PRMS 8.3:** A shop-floor control package for AS/400s made up of 25 different modules. New modules include an orderless shop floor and blanket purchase orders. Beta testing began in early April. General availability by September. It will be priced at roughly $15,000 per module.
- **CA-CAS 3.0:** An enterprisewide manufacturing system for MVS, VSE or VM systems refreshed with new features such as sales analysis and operational performance measurement capabilities. Beta testing began in January. General availability next month. Priced at $80,000 to $100,000 per module.
- **CA-PRMS: Order Configurator:** A rules-based product configurator designed to create customer orders based on specific requirements. Slated for early shipment this summer.
- **CA-PRMSVision:** A Microsoft Corp. Windows-based decision support system. Beta testing began in March. Shipments planned for late summer.
- **CA-CAS:EDI:** A Windows-based facility designed to speed administrative and maintenance processes using EDI with suppliers. Beta testing since October, it is due for early shipments next month, with general availability in August.

Fed officials pan ban of old encryption specs

By Gary H. Anthes
GAITHERSBURG, MD.

Federal officials responsible for shaping information security policy said last week that legislation mandating use of the government's recently proposed encryption technology — and banning the use of older but popular techniques — is neither wise nor likely.

In April, the White House said it intended to establish as a federal standard an approach to encryption called "key-escrow." This method would require that the keys needed to unlock a coded conversation be kept by government-approved agencies and retrieved only for court-approved wiretaps.

Dubbed "Clipper" for voice communications and "Capstone" for data, the approach is intended to balance the conflicting objectives of users — who demand absolute security and privacy — and law enforcement agencies, which are looking for a legal "backdoor" into coded criminal communications.

Protecting rights to privacy

But the idea has been challenged by civil libertarians who fear abuses by a technologically empowered Big Brother, and by some users, especially those such as banks that have made large investments in cryptography based on the older Data Encryption Standard (DES), which some fear could be banned by the government.

Protesters so far include the Computer and Business Equipment Manufacturers Association, Information Technology Association of America, Computer Professionals for Social Responsibility, Electronic Frontier Foundation, Business Software Alliance, Software Publishers Association and Information Systems Security Association.

Raymond Kammer, acting director of the National Institute of Standards and Technology (NIST), acknowledged that a ban on existing techniques would be considered. "But my personal opinion is, I can't see doing anything that would take away any freedoms we now enjoy," Kammer said.

"We tried to come up with a technique that would *not* require legislation," said Clint Brooks, adviser to the director of the National Security Agency, which developed and now strongly supports the key-escrow approach.

Brooks predicted it would be years before criminal use of DES would be widespread enough to present obstacles to law enforcement agencies, which cannot crack DES codes. "Let's wait and see if legislation is needed," he said.

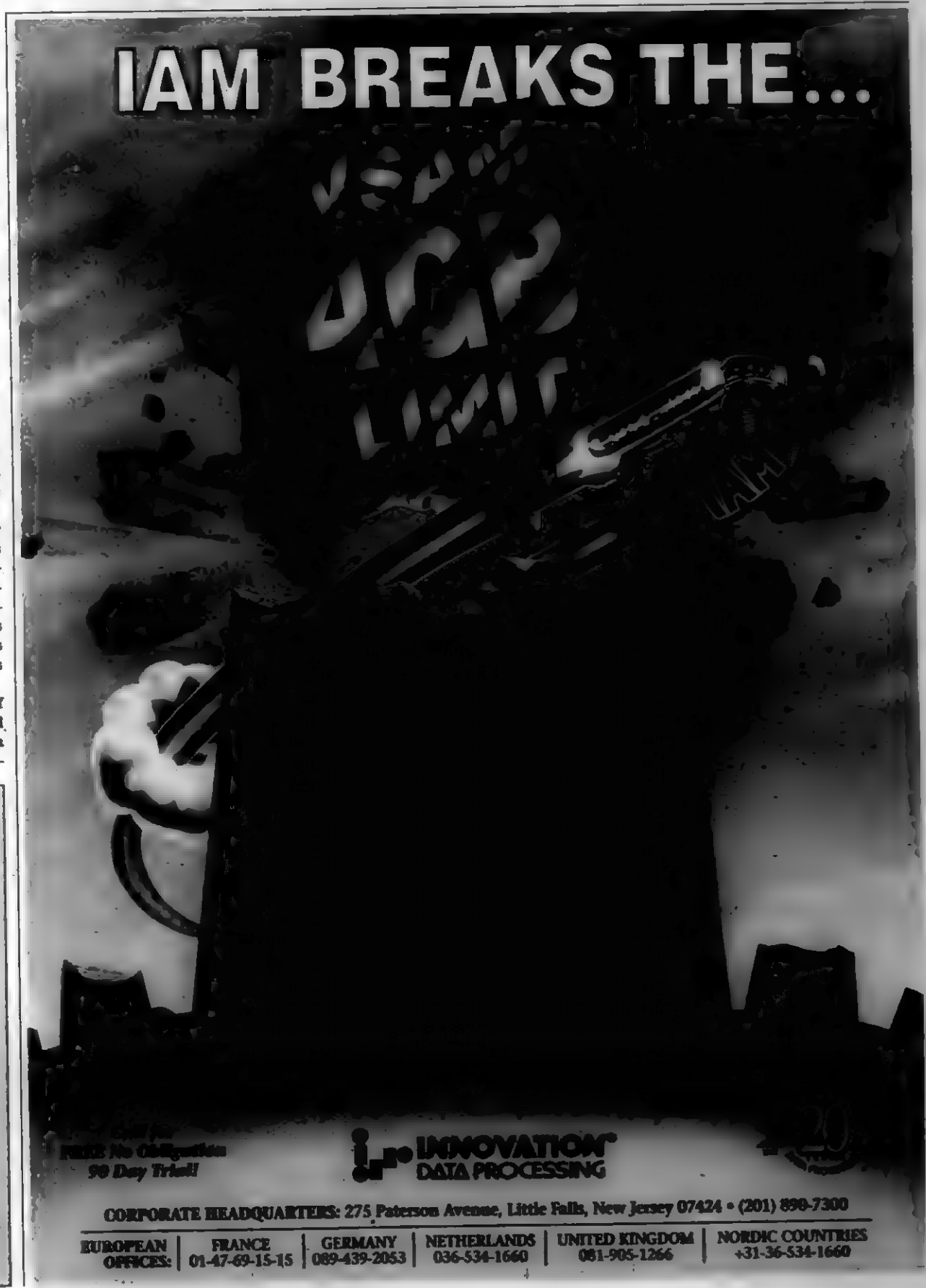
While the majority of those attending a public hearing at the NIST last week spoke out against the government's proposal, a few strongly defended it, saying criticisms are either misdirected or deal with fixable flaws.

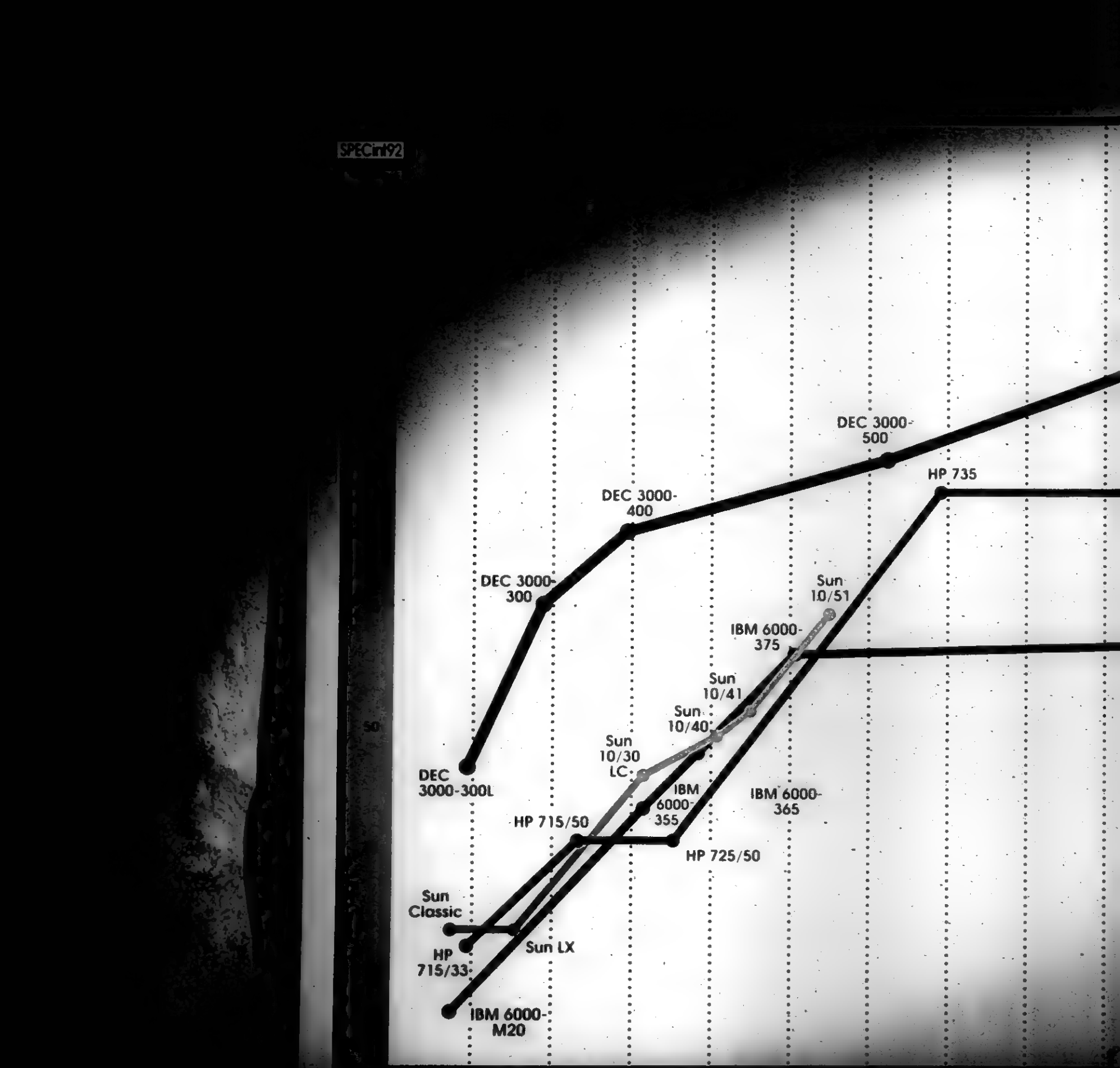
Donald Alvarez, national defense science and engineering graduate fellow at Princeton University, outlined six ways that Clipper could be breached but finished by saying, "I definitely believe it is possible to address the needs of both [users and law enforcers], even with the Clipper and Capstone chip sets."

Keyed up

In a statement filed with the Computer System Security and Privacy Advisory Board, Citicorp raised the following concerns about Clipper:

- The private sector was not adequately consulted.
- The algorithm used in Clipper/Capstone is not compatible with other commonly used encryption methods and will cause costly disruptions for businesses.
- The algorithm — which is to be secret but will be examined by a handful of government-chosen experts — "will undergo inadequate scrutiny and hurried review."
- The databases and access systems associated with Clipper may be flawed and insecure.





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CONTINUED FROM COVER 1

like CPUs, we're looking at decreasing it more, to two or maybe even one year," Kopecky said.

Driving this change in depreciation schedules is a classic good news/bad news scenario taking place in hardware life cycles.

The good news for IS chiefs these days is that computer vendors are so imbued with the spirit of one-upmanship that suppliers are racing to market with faster and better minicomputers and microcomputers at the breakneck speed of every six to nine months.

The bad news is that these product life cycles are so accelerated, they are outpacing users' depreciation schedules.

The result is that vigilant accounting departments can — and often do — put the kibosh on a computer purchase because the not-so-old stuff is still on the books.

"Accountants don't like it when earlier models are obsoleted before they [have] run their full depreciation cycle, and accountants control the money," observed Lawrence Simonsen, MIS manager at Valtek, Inc., a Springville, Utah, industrial valve manufacturer.

"With products coming out faster than depreciation life cycles, it presents a fiscal problem," agreed Jerry Affholter, systems manager at Medstat Systems in Ann Arbor, Mich.

Bob Voyles

Change needed

In today's competitive climate, when forestalling the purchase of information technology can translate into a strategic slip, IS directors are realizing that where the lead hits the ledger, change is in order.

"It's at the point where you want different cycles on different equipment. CPUs are changing, but peripherals are changing at a slower pace," Kopecky said. Meanwhile, although IVI Travel's move last year to a three-year cycle for all new products will help it keep pace with technology's advances, Kopecky noted, "That still doesn't help me with stuff I bought two or three years ago."

Simonsen expanded on that idea, saying that because accountants are more amenable to shortening cycles for lower cost items, users can more realistically expect to alter the book life of PCs and local-area network servers than of multiuser systems priced at more than $100,000.

In fact, last year, Valtek switched from a three-year to a one-year cycle for PCs and from five years to three for servers, he said. But large systems have been a harder sell to the accounting department. "We plan to go to three years, but right now, they're still at five," he noted.

The main obstacle to shortening product life cycles is the Internal Revenue Service, which mandates a five-year depreciation cycle on computer equipment. The IRS will permit shorter cycles, but only if the user undertakes the daunting exercise of proving obsolescence of existing equipment, according to Michael Erbschloe, vice president of Computer Economics, a Carlsbad, Calif., consulting firm.

"It's a complicated, time-consuming task," Erbschloe said. "You have to make a good case, and most people avoid it."

IS shops usually have an easier time proving obsolescence on technical workstations in which vendors make quantum advances in refresh rates from one generation box to the next, Erbschloe said. In these cases, users can usually prove that new workstations will yield fivefold greater performance and greater price/performance gains, he said.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., noted that some companies keep more than one set of books. For tax accounting, these companies use IRS-mandated depreciation cycles, but for corporate accounting they might apply more aggressive schedules, he noted.

As a compromise, accountants often agree to a measured approach under which they write off portions of their equipment each year. A typical example, he noted, would entail prematurely writing off one-fifth of all equipment each year on a five-year cycle. Then, the firm does not take a big hit at once.

An IRS spokesman said users can take an accelerated depreciation whereby they take bigger write-downs early in the five-year cycle. But he cautioned that if a computer is used for personal reasons more than 50% of the time, the IRS does not permit the accelerated schedule. He said he is unaware of any IRS plan to shorten depreciation cycles.

Recourse for IS managers goes beyond internal accounting changes. Users have been beseeching their suppliers for help with their depreciation dilemmas. And to some extent, they are getting results, in the form of upgradable equipment.

"You buy into a platform you know is upgradable so you're not killed by the five-year depreciation law," Erbschloe noted. "That way, you don't have book losses, and you don't have accounting on your butt. People like to refer to 'Velcro serial numbers,' where you keep your serial number but you change the internal parts of the machines."

Despite the buzz and confusion about redefining depreciation, no one seems to be asking product developers to slow down. Users seem resigned to taking the good with the bad. "What's the alternative? For vendors not to come out with products so quickly?" Kopecky asked.

He supplied his own answer: "No."

Mired in the PC depreciation bog

While the depreciation lag plagues users of all technologies, it is particularly irritating to PC users.

PC prices are plummeting so quickly that the latest and greatest desktop machines are often available for less money than the depreciated value of a company's current mix of slower PCs.

Because the slower goods have a higher book value, accountants want to keep them active because they are a boon to a firm's asset statement.

"It's a catch-22," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consulting firm. "But that's what accounting is all about. It's a joke."

For companies such as Exxon Corp., which has close to 300,000 PCs, the quandary is huge, Dzubeck said.

So while companies may buy new equipment, they do not always send the old stuff to the trash heap or the aftermarket.

"There's a PC at a security desk at TI that I swear to God might have once been an oscilloscope," Dzubeck mused.

And what about software?

Michael Erbschloe, vice president of Computer Economics, noted that because software is often licensed rather than purchased, it is frequently considered an operating expense rather than a capital expense, and thus depreciation does not apply.

But Dzubeck pointed out that users tend to buy, rather than license, PC application software.

"Some accountants believe it's a capital expense," he said.

What is more, he noted, even when a user purchases a license rather than property, depreciation can apply.

"Because of the way contracts are written, you essentially buy it," Dzubeck noted.

While the PC depreciation bog is thick, IS managers are stuck in equally soupy quagmires in other product categories.

For instance, some companies have classified network hubs as part of their physical buildings and have assigned 20-year depreciation terms, Dzubeck noted. Upgrading to emerging Asynchronous Transfer Mode technology will be tricky for these firms.

Likewise, many telecommunications carriers are forced by their regional regulatory agencies to take 20- and 30-year depreciation cycles in order to help keep rates at a near steady level, Dzubeck added.

—Mark Halper

Damned if you do, damned if you don't

What bothers the beancounters, besides the IRS, is the simple economics of it all.

If a company assigns a piece of hardware a five-year depreciation cycle, it writes off 20% of the hardware's value for each of the five years. From an accountant's perspective, getting rid of the equipment prematurely represents multiple jeopardy.

First of all, the company would have to adjust current and earlier financial statements.

And the pain is hardly lessened by selling recently outdated equipment in the aftermarket, where it automatically fetches less than book value, especially once replacement models hit the scene.

"If you buy a $10 million box and sell it, taking a book loss, accountants flip out," said Michael Erbschloe, vice president of Computer Economics.

Not only do profits take a hit, he said, but "the IRS is always curious about selling things before they depreciate. It raises the audit flag."

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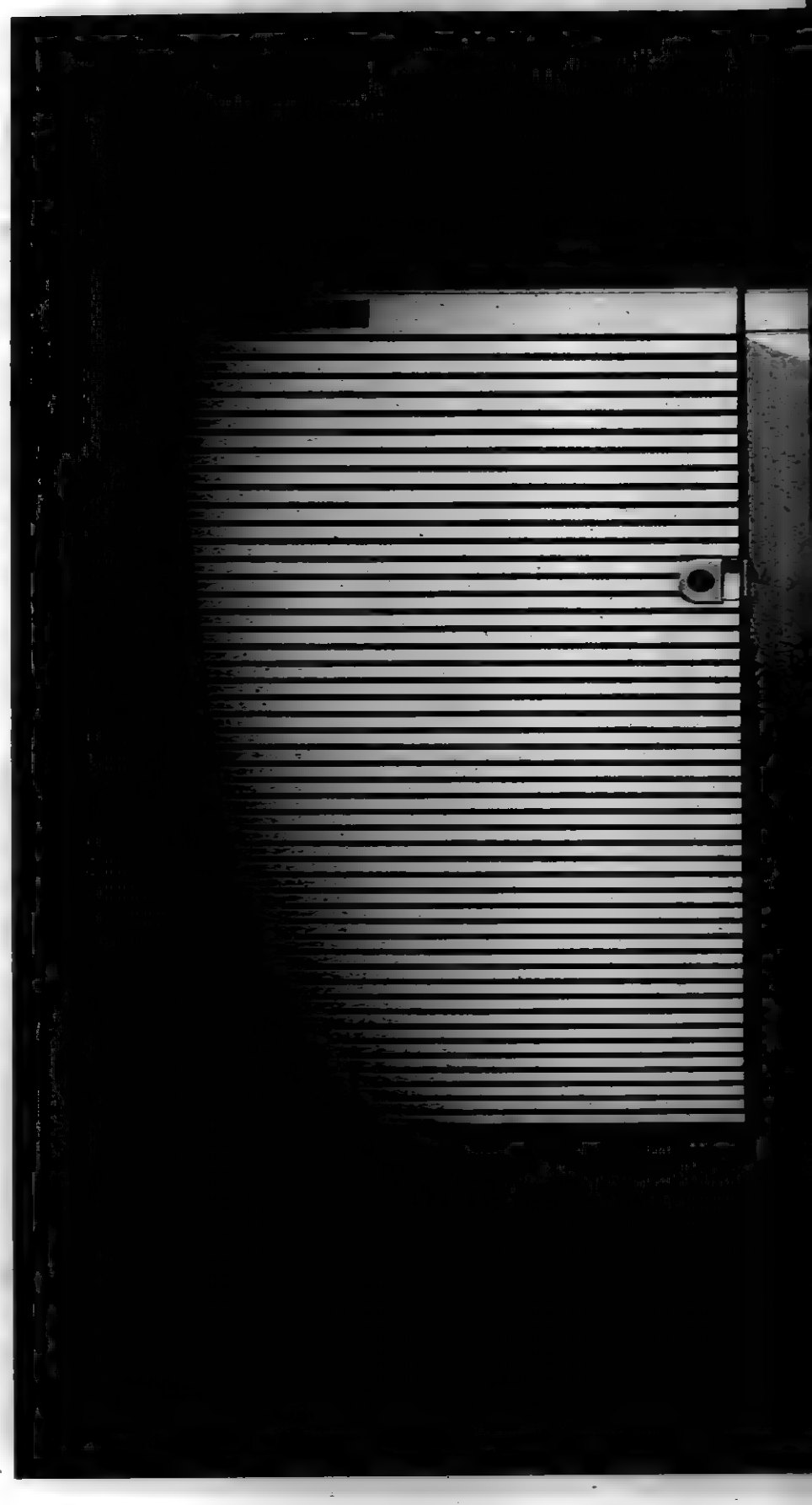

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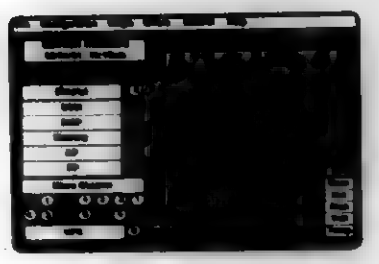
It even tolerates

and recovery capabilities. MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



The MASS/2 option has a user-friendly GUI that lets you distribute computing power across your organization from a central location.

Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
Available Slots	8 Micro Channel®	12 Micro Channel	12 Micro Channel
MASS/2	optional	standard	standard

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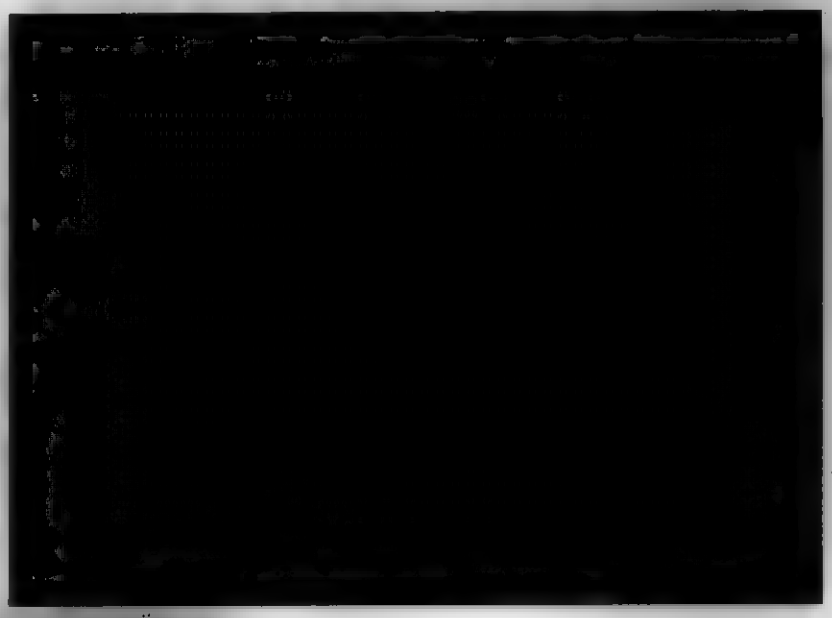
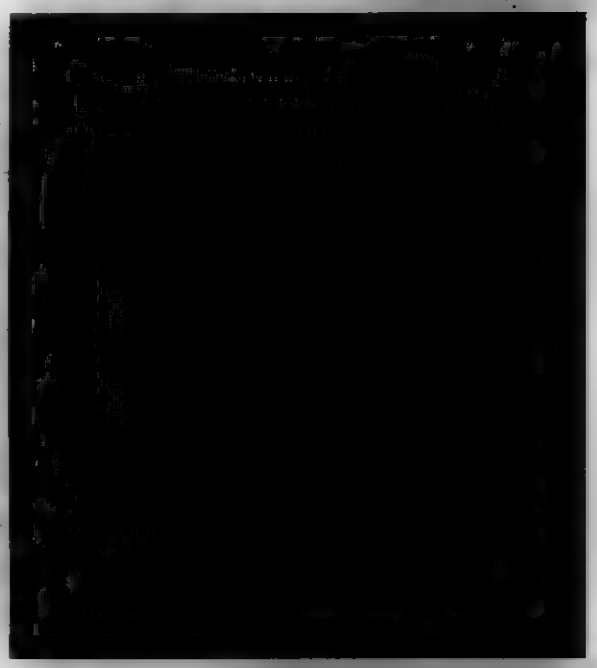
— Bertrand Russell

EXOTIC, eerily familiar fractals. Car-crash simulations. Clinical images that probe the inside of the human body. Computer graphics have opened new vistas in many fields. The striking images on this page illustrate some of the advanced work in simulation, visualization and modeling. Collectively, they also make a fascinating gallery. Enjoy the view.



Modeling complex, dynamic systems. Velocity vectors are used to illustrate the complex flow field around a skier during a jump. Blue represents slow air speed; yellow represents high air speed. (Photo courtesy of Cray Research, Inc. and Fluent, Inc.)

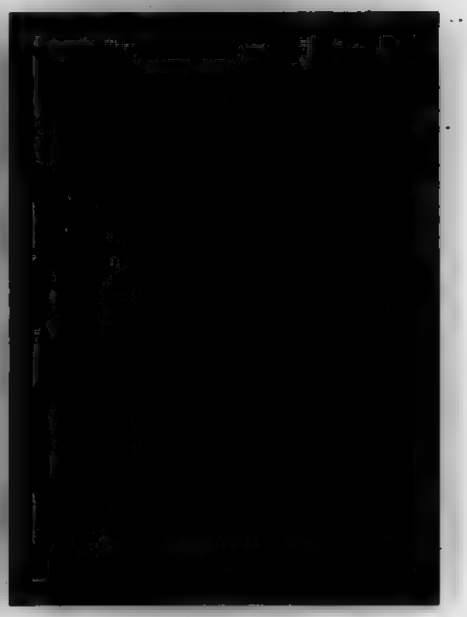


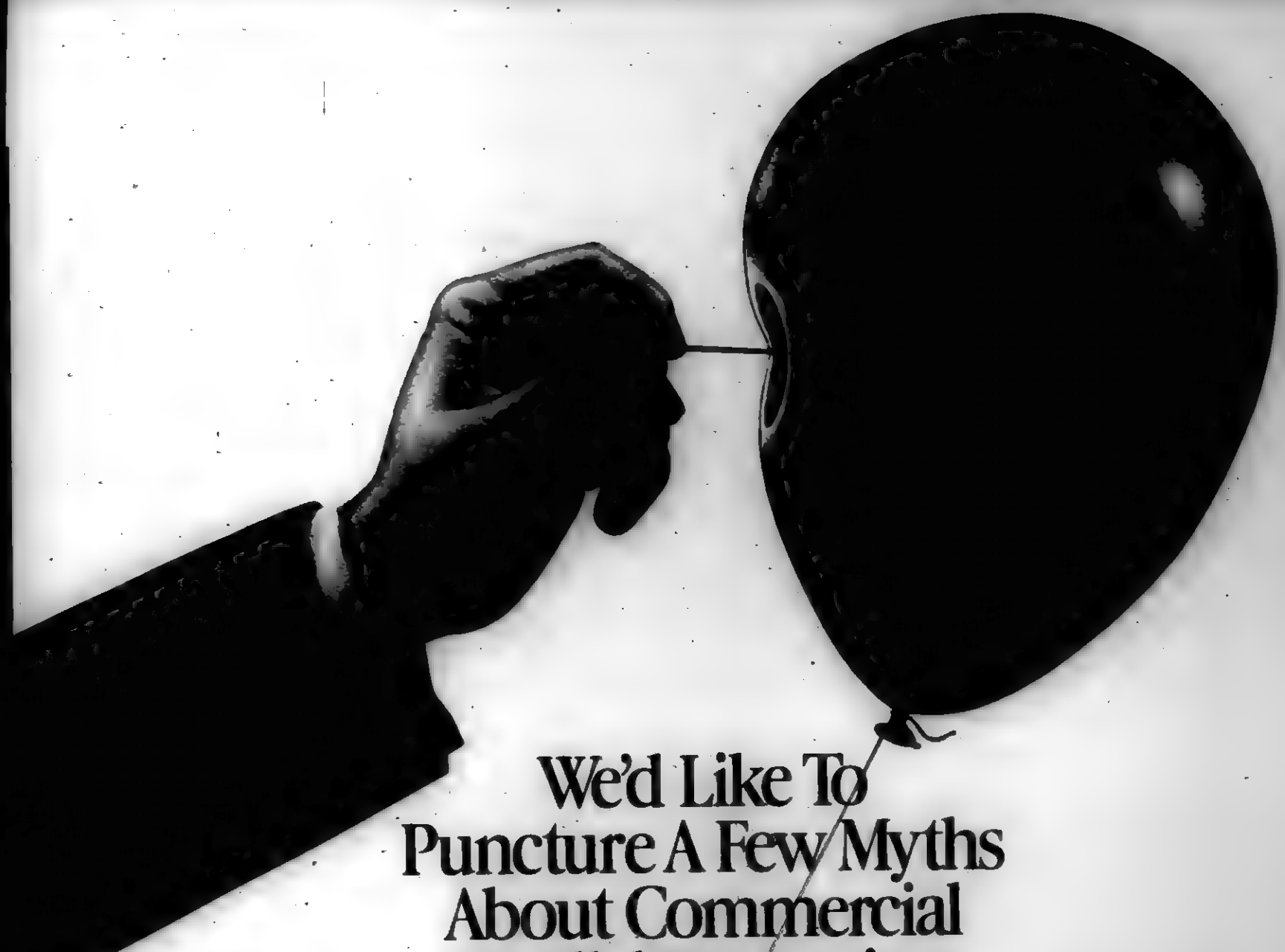
A Julia set fractal. IBM researcher Benoit Mandelbrot coined the term "fractal" in 1975 to describe the action of iteratively calculating simple mathematical transforms of "fractional" dimensions. (Photo courtesy of Visual Numerics, Inc.)

A depiction of a column of ozone over the Earth one day in the fall of 1987. (Photo courtesy of NASA Goddard Space Flight Center and Convex Computer Corp.)

Proton radiation beam treatments are precisely delivered to patients at Loma Linda University Medical Center. The screen shows a layout of the radiation dose beam that is about to be released. (Photo courtesy of Sun Microsystems Computer Corp.)

An electromagnetic solution (far right). Designers of a 'stealth' aircraft see how radar and other electromagnetic waves reflect from the vehicle's surface. (Photo courtesy of Cray Research, Inc.)





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Setting priorities

Andrew Tobias, the personal money management specialist, once wrote that few Americans grasp the principle that a dollar *not spent* is worth more than a dollar earned.

Tobias' lesson flashed to mind recently as I listened to the CIO of a health care company talk about how information systems are helping to make his company more viable and shockproof, despite a five-year moratorium on capital investment in new equipment.

The company has priorities other than information technology, this CIO said. If it is going to spend money, it will spend it in areas that impact patients — diagnostic equipment, nursing staffs, upgraded facilities.

In some ways, this organization is an extreme case. The health care industry is under the gun right now. Futhermore, the previous IS regime seems to have been particularly profligate.

Even so, this man is convinced his company and his industry aren't that unique and that IS managers everywhere will soon be asked — no, not asked, but *expected*, to operate like business managers.

Now what the heck does that mean exactly? For several years, every other conference speech, article and consultant briefing have preached the gospel of IS involvement with the business. Is this just one more variation on that tattered theme?

No, I don't think so.

What this CIO seems to be talking about, and what other indicators seem to be pointing toward, is a much more substantive kind of mind-set change. Think of it as the difference between trying to "justify" IS expenditures to an external authority and making the hard decision to apply the brakes yourself.

What we're talking about is the coming of age of IS. Like all passages, it isn't quite what it was cracked up to be, and it is more about self-regulation than new privileges. It's about putting the interests of the business as a whole above departmental priorities.

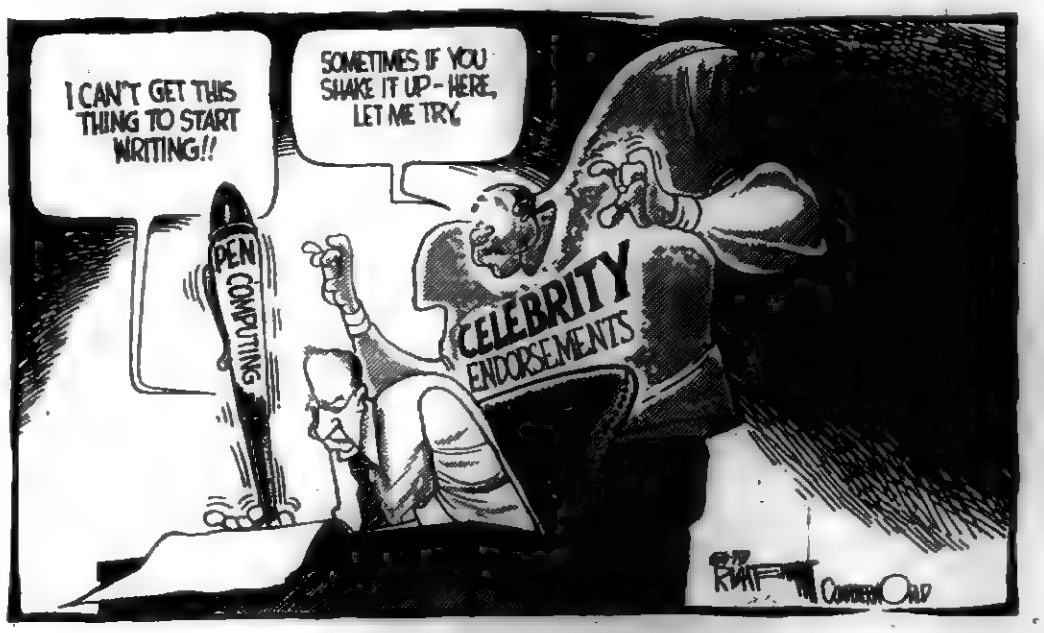
This is a tough time to be shoved into the decision makers' circle. The trade-offs right now are much harder than they've been for a long time. Important technologies are emerging that offer substantial paybacks not only in dollars but also in operating efficiency and quality improvement. Client/server computing, large-scale LAN integration, imaging systems and object-oriented development are all worthwhile investments that are not difficult to justify.

But then, justification isn't the issue anymore. What it comes down to is which of several easily justified investments will produce the biggest return. Is moving all plant sites to Unix workstations and LANs more important than investing in a new fleet of trucks? Sometimes the answer will be yes. Sometimes it will be no. And sometimes it will be an in-between — a gradual rollout, a phased move, something "client/server-like," as a prelude to the real thing.

What it comes down to is this: Being a business manager often means learning to make do.

Joanne Kelleher

Joanne Kelleher, *Features editor*



Don't hold breath waiting for Windows NT

Finally! A few signs of sanity are appearing in the computer industry news media.

Bill Laberis' editorial in the May 24 issue of *Computerworld* looks past the hype and promises to reveal the naked truth about Windows NT. Microsoft has courted the press and promised the moon and stars. The time has come to put up or shut up.

I would be a little worried if I were banking my future on NT, a la DEC. Microsoft is already backpedaling on its promises, and the release date is still undefined.

Even more worrisome, Microsoft is planting stories about Windows 4.0 (Chicago). NT is not even a reality yet, and the company is focusing attention on yet more vaporware.

Given Microsoft's past history of delayed shipping dates for Windows 3.0, I would invest in carrots and sticks. These are the tools that Microsoft seems to use the most — and something the media seems to relish.

J. R. Beecham
Lantana, Fla.

Wrong standards

Charles Babcock's commentary "The reach of NT" [CW, May 17] was off base in comparing Windows NT with MVS. But the really funny part was the characterization of LU0 as a standard LU protocol.

LU1 and above are standard protocols. LU0 is defined as the protocol for any conversion that does not follow a standard protocol. It has no standards at all.

David A. Brask
President
Brask Technologies, Inc.
Long Grove, Ill.

Catch this bus

Your readers are being misled by "Vendors support faster EISA" [CW, May 17].

The Micro Channel Architecture was introduced in 1987 at a data-transfer rate of 10M byte/sec. Today it is boasting the highest performance available on any bus out there, including local buses. However, we announced 160M byte/sec. data-transfer rate in February 1992 at BUSCON.

R. H. Zakharian
President
Micro Channel Developers Association
Redding, Calif.

How quickly Microsoft forgets

If you want evidence for the old adage that great wealth and power can inflate a man's ego, consider the commentary of Bill Gates in *Computerworld*'s "Face to Face" interview [CW, May 24], in which the Microsoft chairman rewrites history.

Gates argues that 12 years ago he "could have taken any hardware model ... as a standard" for MS-DOS and been successful, implying that IBM was merely along for the ride. Every word I've read on the rise of the PC in the 1980s indicates that it was a the other way around.

It was IBM's marketing strength that gave the PC its initial velocity, and IBM's endorsement of the Intel/Microsoft standard that enabled those firms to achieve their dizzying profits.

Certainly let's give Bill Gates the jockey credit for riding his horse to victory with all the finesse and determination of a champion. But now that he stands in the winner's circle, Bill Gates has taken to grand delusions of having created the horse.

Or worse, perhaps he believes there never was a horse, that he floated to Microsoft's stratospheric capitalization with the wings of a deity. I suspect that Mr. Gates has simply forgotten the details of his mortal triumph.

We are told this is a common transgression among billionaires, but nevertheless it is one I would never have guessed such an intelligent man might make.

Craig D. Singer
Manager of information systems
Redwing Carriers, Inc.
Tampa, Fla.

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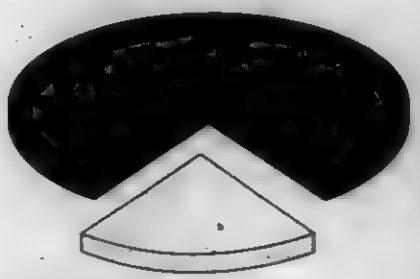

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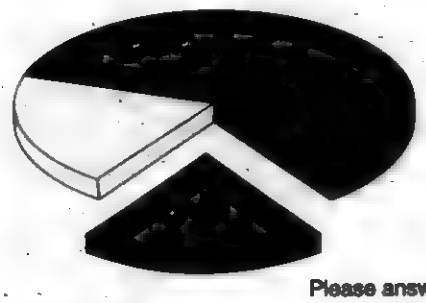

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Get ready to 'morph' yourself

Gary L. Senese

The motion picture industry is abuzz about a technical innovation that allows an image to be smoothly transformed into something very different right before viewers' eyes. Many of us have seen and enjoyed this special effect in recent movies. They've even invented a new word for it — transmorgraphication — a.k.a. "morphing." Most dictionaries don't even recognize the term yet, but it is also an apt descriptor for what is happening to the role of the analyst in IS.

Analyst/programmers are "morphing" into business analysts. This is an extremely difficult shift, one that entails acquiring whole different skill sets and assuming different responsibilities. Not doing it is not an option, however. It is the only way we can continue to add value to our organizations commensurate with our costs.

In the old days, the analyst/programmer (or programmer/analyst for us real old-timers) worried about the capabilities of a particular technology and how to use it efficiently to achieve a desired result. Now, we have more to worry about than bringing unique technology to bear on a specific problem. We have to figure out how to integrate IS into the fabric of the enterprise and actively help functional departments achieve their objectives. Doing this right requires true partnership between information systems and functional departments.

The business analyst must become an accepted member of the functional organization who shares the vision, mission and goals with other associates. This may be assisted by organizational change (dotted- and solid-line relationships) or by incentive systems that compensate all involved for achievement of objectives. The critical factor, however, is how well the job of business analyst is calibrated to the needs of the business.

Business analysts must know and do things that no programmer/analyst ever did. They must have a thorough understanding of systems management, including the systems development life cycle. They must be proficient at project management, technical resource management and vendor management. They must understand functional disciplines, be able to speak and listen cross-functionally and develop enterprisewide vision.

Some will argue that this transformation threatens our heritage and that we are giving up the technical foundations that made us what we are. I respond to that with a loud and positive YES! That legacy has been eroding for years as technology became more available.

Our ability to understand and manage technology is still critical to ensure its effective application. We must recognize that the most important thing is how we use our skills and knowledge to add value to our organizations.

Our value lies not in the application of languages and tools but rather in the use of IS capabilities to drive business performance improvement.

Senese is vice president of management information services at Rubbermaid Commercial Products, Inc. in Winchester, Va.

Interconnectivity: Small gain, big price

COUNTER-INFORMATION *by* Michael Schrage

Interconnectivity has more than one syllable, but it has still become the IS mantra for promising quantum leaps in organizational productivity. Like digital Dr. Doolittles, CIOs swear that if only their computers could interoperate, everything would be just hunky-dory, productivity-wise. Interconnectivity, they insist, is essential to recoup the multimillions invested in their computer systems.

Of course, enterprisewide offerings such as Microsoft's Windows NT, Novell's NetWare and Oracle's System 7 were all designed to cater to this avowed lust for machine interconnectivity. This is what the market says it wants.

Unfortunately, both managers and marketers seem to have a basic misunderstanding about the link between productivity and interconnectivity. We all use a global technology system that is a paradigm of interconnectivity. It's called the telephone network. Just tap a few keys and you can talk to virtually anyone in the world. Reach out and touch someone.

There's absolutely no denying that telephone interconnectivity is a tremendous boon to both personal and organizational productivity. Federal Express and American Airlines absolutely couldn't exist without global voice interconnectivity. But let's be honest. How much time do you spend on the phone that's genuinely productive? 30%? 50%? 75%? What percentage of the calls that you make really matter? What proportion of the calls that you receive make a difference?

Remember how much time you've wasted playing telephone tag? But now there's voice mail, you say. Gee, a voice-mail investment means you're no longer just talking about interconnectivity, you're talking about installing and maintaining an entire data retrieval system. In other words, interconnectivity simply gives you a platform that requires still further investments to get productivity gains.

The analogy holds with network interconnectivity. Everybody wants to share data? Great! Who pays the cost of maintaining and enhancing data integrity? Want interoperable software? Super! Um, which programmers are now responsible for making sure upgraded versions can run enterprisewide? Is interconnectivity something that people can take advantage of for free? Or do they have to pay for cross-platform access?

A new way to waste time

If someone slapped a three-minute limit on all our phone conversations, we would certainly become more productive in some ways. Similarly, the ability of my machine to freely interconnect and interoperate with any other machine on the net may have no positive bearing on my productivity at all. Don't forget how much time we waste futzing around with spreadsheets and desktop publishing systems. Interconnectivity may be the best medium yet for enterprisewide futzing around.

The point here is not to devalue interconnectivity. I think interconnectivity is very important. My concern is with managers who cavalierly refuse to understand the relationship between cost and benefits. Interconnectivity has undeniable benefits; it also involves extraordinary costs.

Indeed, although the cost of "installing" interconnectivity is high, the costs of maintaining it and taking advantage of it are even higher. In other words, the cost/benefit is such that I think it's extraordinarily unlikely that organizations will see quantum leaps in productivity from their interconnectivity investments. The costs are simply too high.

Interconnectivity for the sake of interconnectivity is an indulgence — just as a lot of the phone calls we make at the office are. Having PCs doesn't inherently make you more productive, nor does networking them. Productivity doesn't come from transparent interconnectivity. It comes from cost-effective interconnections.

Schrage is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science. His Internet address is schrage@media-lab.media.mit.edu.

Charles Babcock

Chip madness

At a Comdex dominated by Windows NT, there was a strong undercurrent of interest in hardware, especially the impending desktop systems based on the speeds of Pentium, Alpha and the PowerPC.

Pentium has grabbed an early lead and stirred up a lot of interest. Every vendor that could lay claim to a Pentium chip had whipped together a system. But even so, it was possible to come away from glimpses of Alpha and the PowerPC with a sense that IBM and DEC could still become merchant chip suppliers, using RISC to compete with Intel's dominance.

DEC was showcasing the Alpha AXP PC in its floor space by lining it up with an Intel 486/66-MHz PC, a Pentium 52-MHz system and a Mips 4000 SC-50. It test-drove the four PCs by running a common application concurrently. For each of four application runs, the 150-MHz Alpha PC finished first.

IBM, by contrast, seemed to employ a hide-and-seek strategy. In a distant corner of the show, the company had thrown up a hastily assembled display of the PowerPC with two skimpy fact sheets and a screen wired to a purported PowerPC. I say purported because the unit was out of sight below the countertop. For all I knew, those wires might have led to an Apple Quadra because the application running was a Macintosh graphics program. The PowerPC, of course, ran the application faster than the 486-based machine alongside it.

The low-key IBM spokesman, Tom Wilson, agreed his exhibit was somewhat scantily clad, but he pointed out that the PowerPC 601 was the winner of the "Most Significant Technology" award at the show. He handed me a blue button with a surface layer of a PowerPC chip etching and pointed out a microscope where I could occupy myself looking at the chip's circuits.

The PowerPC chip is much smaller than the Pentium chip, a 120mm square compared with a 264mm square, giving IBM the prospect of reaching a higher fabrication output per wafer. Even though it is smaller, the PowerPC has twice as much cache on the chip — 32K — and it runs on something like 6 watts of electricity to Pentium's 14, Wilson said. The PowerPC will sell for $374 per CPU, compared with $950 for Pentium.

All of which may mean IBM can design a RISC chip that is competitive with Intel.

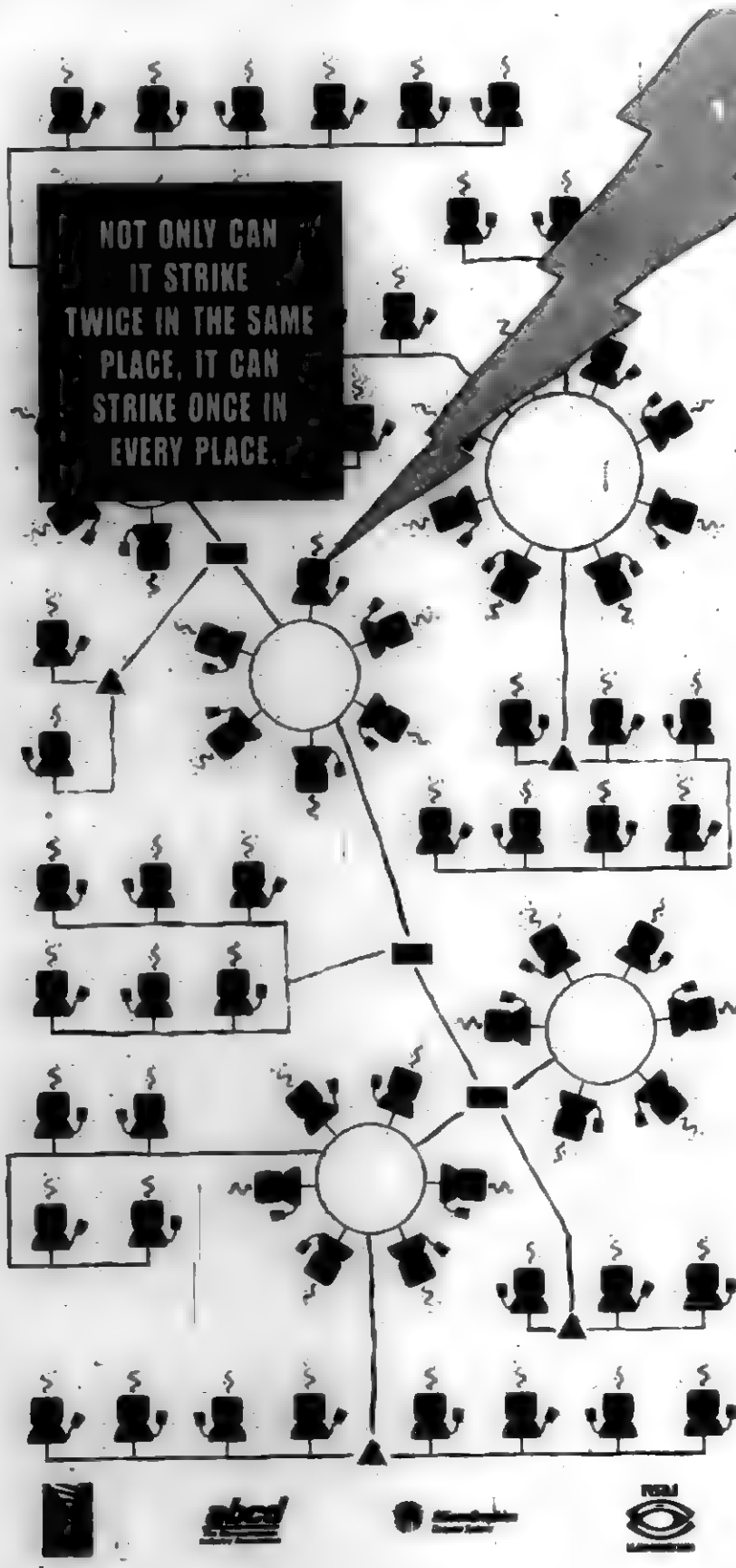
DEC likewise staged an artful comparison to Intel without mentioning the Pentium's reputed egg-frying heat. It encouraged passersby to walk around to the back of its exhibit where an armhole had been created into an Alpha system. "You can touch the chip and see how it isn't any warmer than this counter," said Jonathan Roskill, the DEC spokesman at the exhibit. Actually, you could touch the chip's heat sink, which, using the circulation of a normal fan, dissipated the heat of the chip. The heat sink felt slightly warmer than room temperature.

Is Alpha faster? The answer is yes, but DEC chose to run applications that are common to its VAX customer base, so the results won't tell a PC user much.

More relevant were the test results detailed by Egil Juliussen, president of the Computer Industry Almanac, at a Comdex session on PC power platforms. Using a 386SX as a base unit, Juliussen had measured integer and graphics output for the Alpha, Pentium and 486DX. He found that the 486DX was five to eight times as fast as the 386SX in integer processing and five to 10 times as fast on graphics processing. Pentium was 15 to 25 times as fast in integer processing and 20 to 30 times as fast on graphics. Alpha was 35 to 40 times as fast on integers and 50 to 65 times as fast on graphics.

None of this is conclusive, but it is an indicator of how hot RISC PCs may become in the near future.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.



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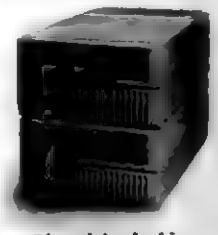

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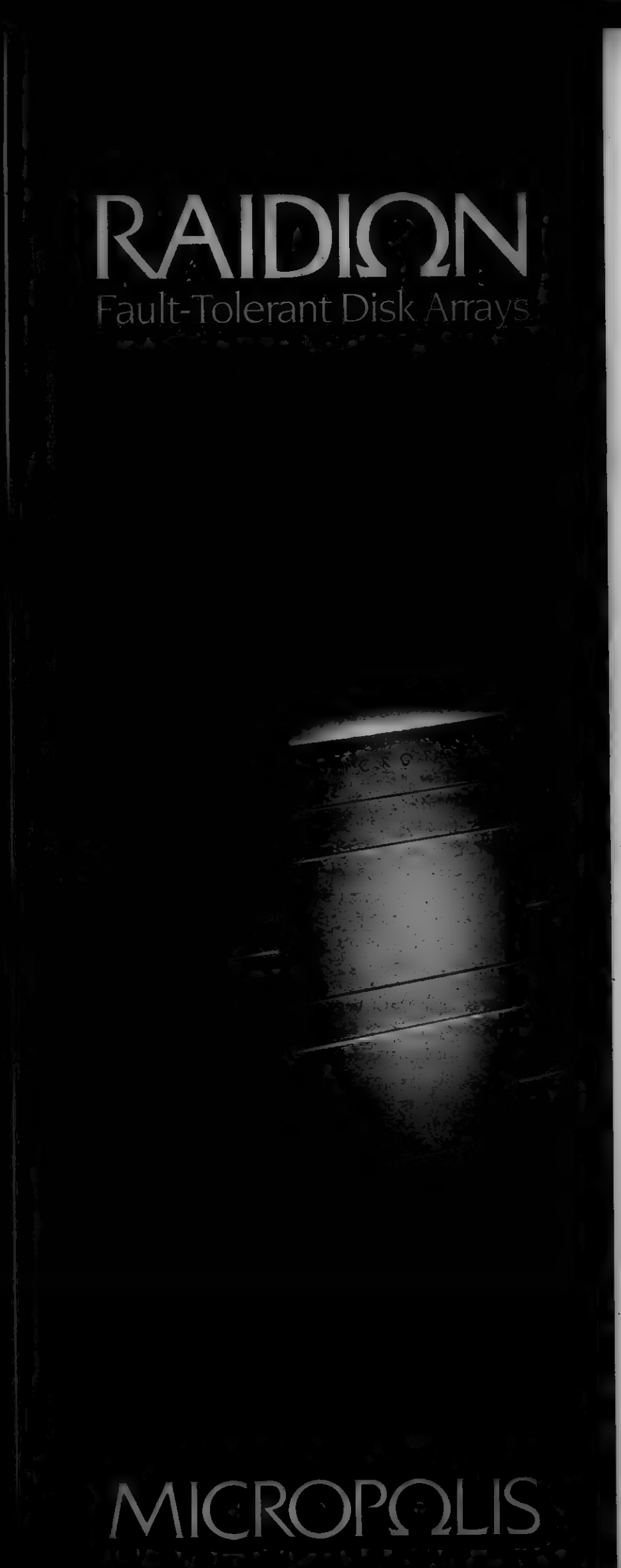
RAIDION

Fault-Tolerant Disk Arrays



MICROPOLIS

NetWare 3.11 and 4.0

Networking Experts Agree: RAIDION IS A WINNER

Corporate Computing *"The Micropolis Raidion was our overall winner with an impressive combination of high performance, low cost, and unparalleled expandability."* May, 1993

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LAN *"The Raidion array had the most thorough documentation of the tested drives. The Raidion software was the most robust, as well."* June, 1992

PC WEEK *"PC Week Labs found that the array performed admirably - successfully backing up data and easily restoring it upon drive failure."* May 25, 1992

LAN TIMES *"It was a breeze to integrate and didn't add any overhead to installation time... Micropolis has done an excellent job on a great product."* May 25, 1992

Take it from the industry's leading publications: when it comes to reliable, cost effective, fault-tolerant data storage, there isn't another disk array like RAIDION.

You won't find another array as easy to grow with either; a basic RAID 5 array can be expanded, module-by-module, up to 32 modules, totaling 93 Gigabytes. No wonder RAIDION has become the array of choice for networks running Novell NetWare 3.11 and 4.0.

Call 1-800-395-3748 to get the latest word on RAIDION in our new brochure and the name of your nearest Micropolis Authorized Distributor.

LAN TIMES

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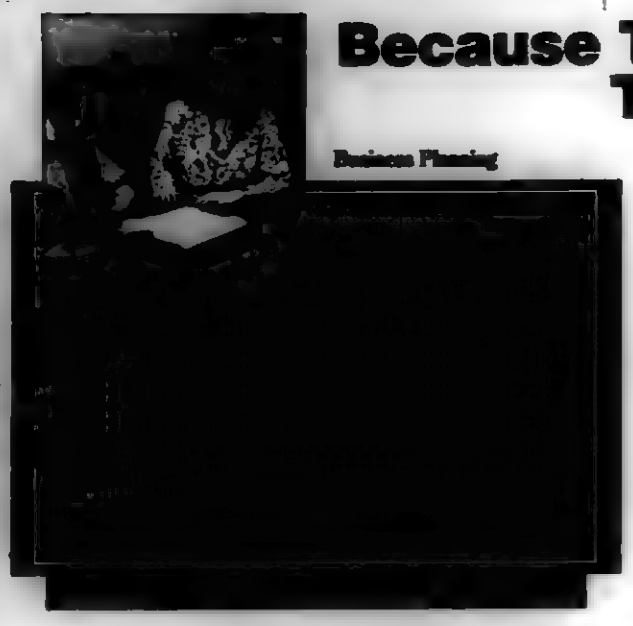
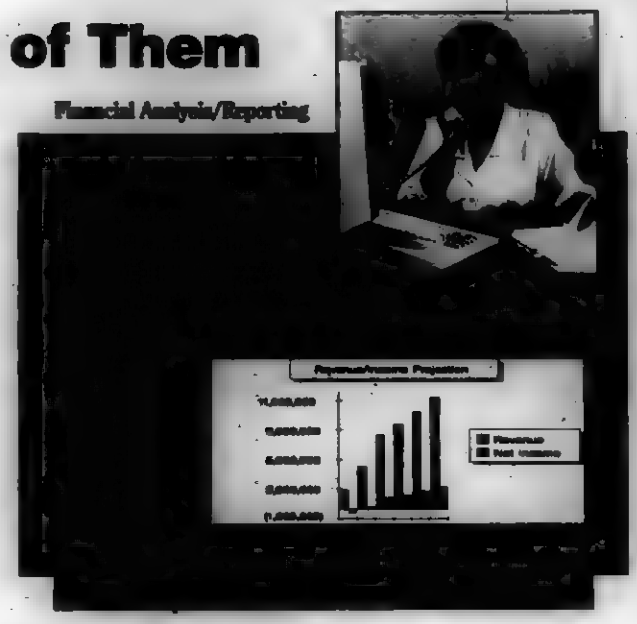


Because There Are More of Them Than There Are of You...



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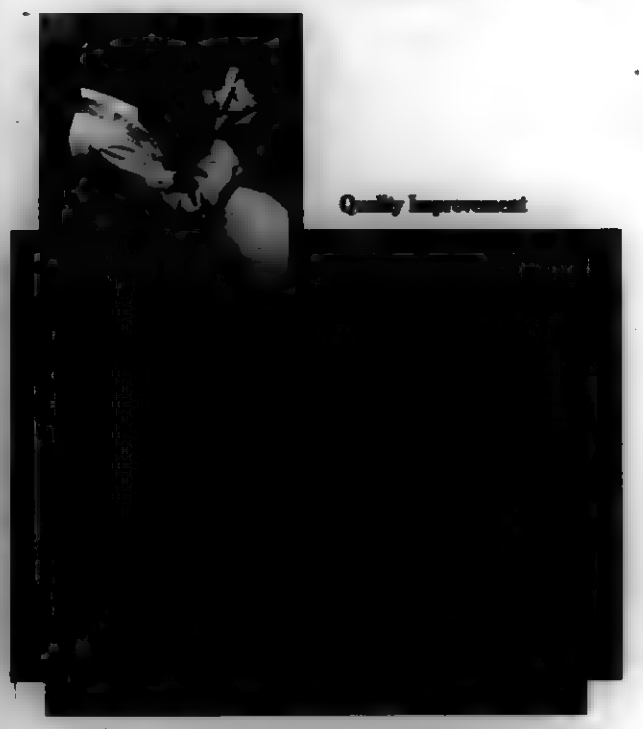

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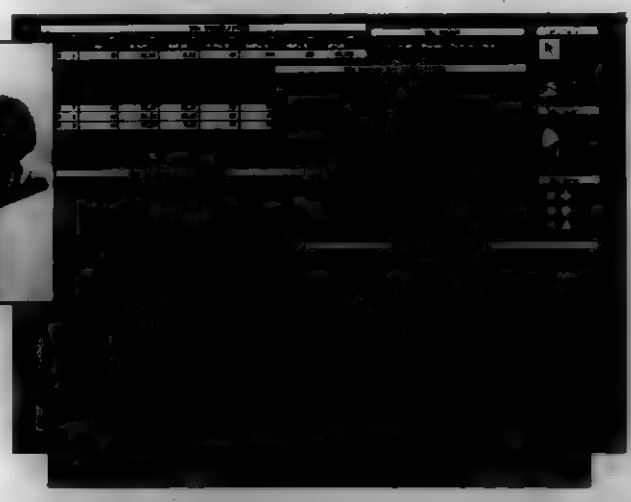


Desktop Computing

What BBS users say about Comdex, 38
Where users shop, 38
Help line, 42

Mac users: We want better support

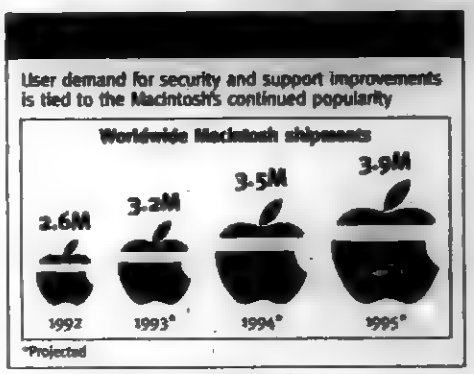
By James Daly

■ With the Macintosh heading deeper into multiplatform environments, corporate customers continue to request better product support and network security from Apple Computer, Inc., according to a recent survey by the MacIS user group.

Demand for better product support offerings headed the group's most recent Top 10 issues survey of its members, drawing endorsements from 71%. Network security ranked a close second with 69%.

Apple delivered its model for support at the recent Enterprise Computing Conference in San Francisco [CW, April 12]. Apple's full program will be a multitiered affair, offering options such as on-site support personnel, personalized training, televised briefing for remote sites, an on-line CD support database and configuration management utilities. The program should be available starting in September, Apple sources said.

Apple will also offer seven-day, 24-hour technical support for its recently introduced servers.



Source: "The Hartsook Letter," Alameda, Calif.

Keep those promises

MacIS members said support has moved into the No. 1 position in part because Apple presented its strategy. Users interviewed said they are impressed with the Apple plan and want the company to make good on its promises.

"In the past Apple's support has been very lackluster," said Alistair Jacques, director of support and development at Northwest Airlines in Minneapolis. "But the signs are very good at this point that this will change. It's very heartening — if they deliver."

The plans also represent a quantum leap away from Apple's past indifference about providing industrial-strength enterprise support. "Apple is now talking about things they wouldn't have even known about two years ago," said Robert Keim, director of information management at Arizona State University in Tempe. "It's a really significant awakening."

The remaining concerns on the MacIS "priority issues" list for Apple include the following:

- Unify and enhance network security; improve hardware security.
- More effectively communicate Apple's PowerPC strategy by releasing more information (i.e., how it will be positioned against Intel Corp.'s Pentium chip and Microsoft Corp. Windows NT products). Provide support for the transition to PowerPC.
- Ensure cross-platform support, providing more information and making other Apple services uniformly consistent with the Apple Open Collaboration Environment.
- Deliver full documentation for the Virtually Integrated Technical Architecture Lifecycle (Vital) in electronic formats, instead of just in unwieldy paper volumes. Also, form a Vital consortium to improve and expand Vital marketing efforts.

Macintosh users, *page 46*

Bye-bye, VAR?

Vendors' electronic distribution systems could forever change users' buying habits

By Michael Vizard

Slowly and inexorably, the buying habits of most purchasers of PC software are about to undergo a radical change as Microsoft Corp., IBM, Novell, Inc. and a variety of third-party players begin to put in place electronic software distribution systems.

At the recent Comdex/Spring '93 show, both Microsoft and IBM showcased electronic software distribution systems that PC software vendors said have the potential to fundamentally realign the various channels that make up the software market. This is because the systems would encourage customers to purchase software directly from the vendor rather than through a reseller.

Specifically, Microsoft said that by the end of this year it will deliver technology, code-named Hermes, that will be able to monitor and distribute software to individual clients using a Windows NT Advanced Server system.

Downloading updates

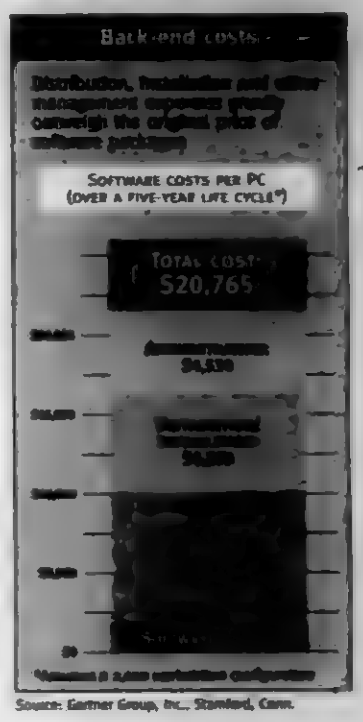
Hermes, demonstrated at several user gatherings in recent months, will include client software that will essentially identify the software packages and configurations of each PC system attached to the network. As a result, a network administrator will be able to download a software update to all users on the network who have a specific version of a particular software package.

IBM, meanwhile, demonstrated a similar capability running its LAN NetView offering on top of OS/2, and Novell already has a service for tracking software that has been downloaded from a NetWare server.

The advent of these electronic delivery systems, along with the growing interest in CD-ROM as a medium for storing software, promises to change the buying habits of most PC users. Instead of purchasing floppy disks loaded with an individual software package, users will be able to purchase multiple software packages on a single CD-ROM disk.

"Every one of our major customers is talking to us about license management and software distribution," noted Sharon Stoffolano, director of systems development at Corporate Software, Inc., a software distributor and integration service in Canton, Mass.

As customers move more toward a site licensing model, organizations are expected to deploy CD-ROMs on a server that individual users can then browse. When a customer decides to purchase a specific software package, it can call the software vendor and have an electronic key downloaded to it that will remove the encryption



Source: Gartner Group, Inc., Stamford, Conn.

software for that package from its CD-ROM server.

This transaction will then be recorded using the electronic delivery systems developed by IBM, Microsoft and Novell. Billing will automatically be integrated with a customer's purchasing system.

Slow to move

But most customers are just beginning to get their arms around site licenses, and very few of them have begun integrating their software purchases with their purchasing systems.

"Most people want to take advantage of site license deals, but they are not yet ready for electronic delivery services," Stoffolano said. "We're working on building a strategy for electronic delivery

Electronic distribution, *page 42*

HP releases new PCs

By Michael Fitzgerald
SUNNYVALE, CALIF.

Hewlett-Packard Co. last week continued its bid to become a serious player in the PC market, releasing 54 configurations of five new models of desktop PCs.

The Vectra 486M, 486MI and 486XM series will ship this month, and a Vectra Pentium is slated to appear in the fall. HP also said it will introduce the Vectra N and NI this month.

Notable features include a proprietary local bus graphics design, standard infrared on the high-end 486XM series and the option to include Personal Computer Memory Card International Association (PCMCIA) slots on the XM and MI. The MI, NI and XM feature a 10Base-T connection on the motherboard. Prices will range from $1,169 to $3,749.

Features such as PCMCIA slots drew the interest of users such as Larry Cook, microcomputer systems administrator at Eaton Corp.'s Truck Components Operation/North America.

Built-in PCMCIA slots "would be of interest to us," said Cook, who has several end users of HP's PCMCIA-capable 95LX palmtop.

Reseller focus

Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass., said HP "is becoming a very serious player, and they're doing a lot of innovative stuff for a player of their size."

HP's focus on distributing through resellers, where its strength in printers makes it a significant player, has helped it get PCs into retail chains such as Inacom Corp. that usually focus on the Big 3 PC companies: IBM PC Co., Apple Computer, Inc. and Compaq Computer Corp.

"HP PC sales have really ramped up in our stores, and we like them — they're like dealing with Compaq of old," said Rick Inatome, Inacom chairman. Inatome said HP's ability to ship has been a bright spot during the current PC backlog crisis.

Still, Henning said HP needs to add notebook computers to its product line before it will have a serious shot at cracking the Top 5 PC makers.

Christopher Lindquist

Pump down the volume

I have just survived yet another Comdex week. Fortunately, it ended right before the long Memorial Day weekend, so there's been time for the ringing in my ears to fade and the swelling in my hand from handshaking to subside to the point that I can type again.

This year's Comdex/Spring '93/Windows World was one of the noisiest in memory. Multimedia presentations pumped through thousands of watts of amplification, thanks to an endless stream of Windows and OS/2 events. Next time I'll bring my earplugs.

The decibel level went up accordingly on bulletin boards, too. Seems some people got the idea that Windows NT and OS/2 2.1 were actually (snicker) *released* at the show. These gullible folks were wondering why they hadn't been able to pick up their new favorite operating system at Egghead yet.

Some wiser and more knowledgeable users informed them that they had at least a couple of weeks to wait for OS/2 2.1 and perhaps three months for Windows NT.

The IBM and Microsoft announcements also fueled the debate over "What should my next operating system be?" on several boards. Every poor user who posted a question like that was soon set upon by the forces of good and evil (who's who depends on your prejudices), all trying to win another convert to their faith.

The arguments for and against each operating system were not focused on any particular area but ranged from elegant soliloquies on architecture to vitriolic personal attacks on support staffs and CEOs. At least one Windows NT beta-test user wondered whether Bill Gates would stick to his word to not ship the product until beta-test users stopped complaining about bugs: "He promised that NT would not be released until we all did not have any more 'bugs'! It was in the paper at Windows World. He promised."

Of course, if the computer industry really worked at that level of quality assurance, we'd still be word processing on Selectrics.

Meanwhile, OS/2 2.1 beta-test users discussed the final shrink-wrapped version of the updated and improved operating system. Several commented that OS/2 2.1 is what OS/2 2.0 should have been, but better late than never. One beta-test user aired his concern that IBM's technical support is still not up to snuff. Apparently IBM is aware of the issue, and IBM executives were heard at Comdex saying that resources are being devoted to making support a nonissue in the near future.

And speaking of support and operating systems: Know any MS-DOS 6.0 support representatives? Seen them on the street recently? I didn't think so.

Seeing multiprocessor Pentium systems on the floor at Comdex sure made my 386/33 seem out of date. But before I could feel too sorry for myself, I found this on Usenet in alt.folklore.computers: "A certain large American company (which shall remain nameless to protect the guilty) was running its payroll on an IBM mainframe using punch cards for data entry until Dec. 31, 1992. On Jan. 1, 1993, it switched over to a 486-based superserver and PC-based data entry."

I feel better now — but I still want a Pentium.

Tagline: "C makes it easy to shoot yourself in the foot. C++ makes it harder, but when you do, it blows away your whole leg." — *Bjarne Stroustrup, developer of C++*

Anyone else out there still using punch cards? Anyone want to admit to it? If you have a candidate for the title of Methuselah of the Computing World, send it via the Internet to christ@netcom.com; CompuServe at 72360,2005; or MCI Mail through 549-8464.

Lindquist is a *Computerworld* West Coast correspondent.

FuziWare spreadsheet for Windows now $99

By Michael Vizard
KNOXVILLE, TENN.

While version management has become a serious bone of contention among the major suppliers of spreadsheets, FuziWare, Inc. is aggressively pushing a vision of spreadsheets that eliminates the need for multiple versions.

In response to competitive pressure, FuziWare has announced that it has dropped the price of its FuziCalc spreadsheet for Windows from $495 to $99.

"The reality of street prices is that all Windows software sells for about $100," said Robert Cathey, director of product marketing.

According to Cathey, FuziWare is targeted at those sites that have to evaluate multiple what-if scenarios using spreadsheets.

Fuzzy logic

Existing spreadsheets require users to create a version that corresponds to every possible scenario. But because FuziCalc uses fuzzy logic algorithms, users can plug a range of data into each spreadsheet cell, creating a range of probabilities across the same spreadsheet.

"Spreadsheets today require users to be artificially precise because you have to pick a specific hard number. With FuziCalc you can build uncertainty into the cells, and the bottom-line output will give you a range of results showing best-case to least-case," Cathey said.

For example, NationsBank in Atlanta uses FuziCalc to help determine which mediums provide the best return for its advertising dollar.

"We usually run a couple of models to determine things like how much time a camera is going to spend on a particular sign at a sporting event. Previously, we had to use guesstimation to review competing proposals across multiple versions of spreadsheets," said John Mauney, vice president of advertising at NationsBank.

PC buyers circumventing IS

Study says 87% of non-IS pros go through other departments

By Michael Fitzgerald

A recent study suggests that information systems departments have less control over buying PCs than one might think.

The study, called "Buying Strategies of the Hidden PC Buyer" and conducted by the Business Research Group in Newton, Mass., surveyed 500 non-IS professionals on how they order PC equipment for the office.

The survey showed that only 13% went through the IS department, making it the third most popular way PCs were purchased. According to the survey, corporate purchasing departments ranked first, with 42% of orders, while resellers were second, at 26%.

No other category was mentioned by more than 3% of those surveyed.

Buying their own

Purchasing department	42%
Local computer dealer	26%
[illegible]	13%
Computer chain	3%
Mail-order distributor	3%
Manufacturer direct	3%
Mail-order manufacturer	2%
System integrator/VAR	2%
Other	6%

Source: Business Research Group, Newton, Mass.

Warren Childs, an analyst at Business Research Group, said the numbers held across the board for hardware, software and peripherals, as well as for system upgrades and even memory upgrades.

A DOS world

The study also showed that 90% of users use DOS or Microsoft Corp.'s Windows as their base operating system, while Apple Computer, Inc.'s Macintosh was mentioned by 9%.

IBM's OS/2 and the various strains of Unix were each mentioned as desktop standards by less than 1% of respondents, according to the survey.

Tool gives PCs large system file tracking

By Michael Fitzgerald
MONTEREY, CALIF.

A start-up company has devised a way to simultaneously ease hard-drive overload and speed up systems access.

Hybrid Technology & Engineering is now selling Screamin' Demon, a software patch for Microsoft Corp.'s DOS and Windows environments that adds large system file-tracking capabilities to the operating system.

Screamin' Demon lets users track recent file use down to the level of the number of bytes read and written. It moves the most commonly used files to the front of the hard disk, reducing file access time. The byte-tracking feature was designed for people who bill clients by the hour to track their system time exactly.

The program will also do selective backup, storing only those files used most recently. The product comes with a compression algorithm that will automatically compress seldom-used files. It also comes with its own defragmenter and handles application licensing and duplicate tracking.

Screamin' Demon has an introductory price of $99.95. List price will be $120.

faster and easier

network printing.

Improving printing on the network.

HP offers a range of network printers that meet users' needs for reliability, performance and location flexibility.

Getting the best possible performance from network printers takes more than just hanging printers off a server. It takes a unique understanding of the role of printers in network environments.

From its position as the leader in business printing, Hewlett-Packard has developed a comprehensive strategy for getting the most out of networked printers. It's a strategy that offers simplicity across environments ranging from peer-to-peer LANs to complex enterprise networks.

HP's strategy evolved by looking at the distinct levels of needs within networked organizations. This strategy offers comprehensive network printing solutions by addressing the needs of people at all levels.

Improving network printing starts by taking care of the most fundamental needs—those of the people who use the printers every day.

Just like anybody using a personal printer, end-users on a network require reliability, convenient printer location and good printer performance.

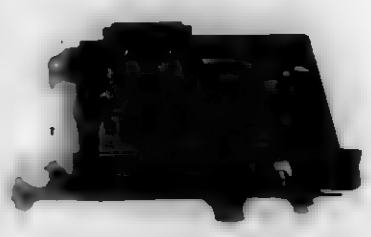
HP answers these needs with a wide range of printers and plotters designed to meet network users' needs. HP LaserJet printers, HP DesignJet plotters, HP PaintJet color printers, and the new HP DeskJet 1200C printers offer a full range of business printing capabilities. And they deliver the consistent, superior output quality that users demand.

HP printers and plotters share another common feature that makes them network-ready. They're built with modular I/O (MIO) slots, allowing direct network connection.

You can plug HP JetDirect network interface cards, or cards from third-party developers, into these MIO slots. Then you can connect printers directly to the network, *anywhere on the network*. So printers no longer need to be tethered to the parallel port of a file server or print server. You can locate printers where they're convenient for the people who use them.

Direct network connection has another big advantage for anyone who's ever waited for a print job to emerge from a shared printer. Data is sent to the printer at network speed, so you can take full advantage of your printer's data processing capability and engine speed. You don't have to pay the penalty of transmitting data through a slower parallel or serial port.

HP's MIO slot is the first step to a consistent network printing strategy that meets such a broad range of needs. It's the reason any HP network-ready printer can connect directly to virtually any PC LAN, UNIX system, or mini/mainframe environment. But what happens when multiple networks come together? Turn the page and see how simple HP makes it.

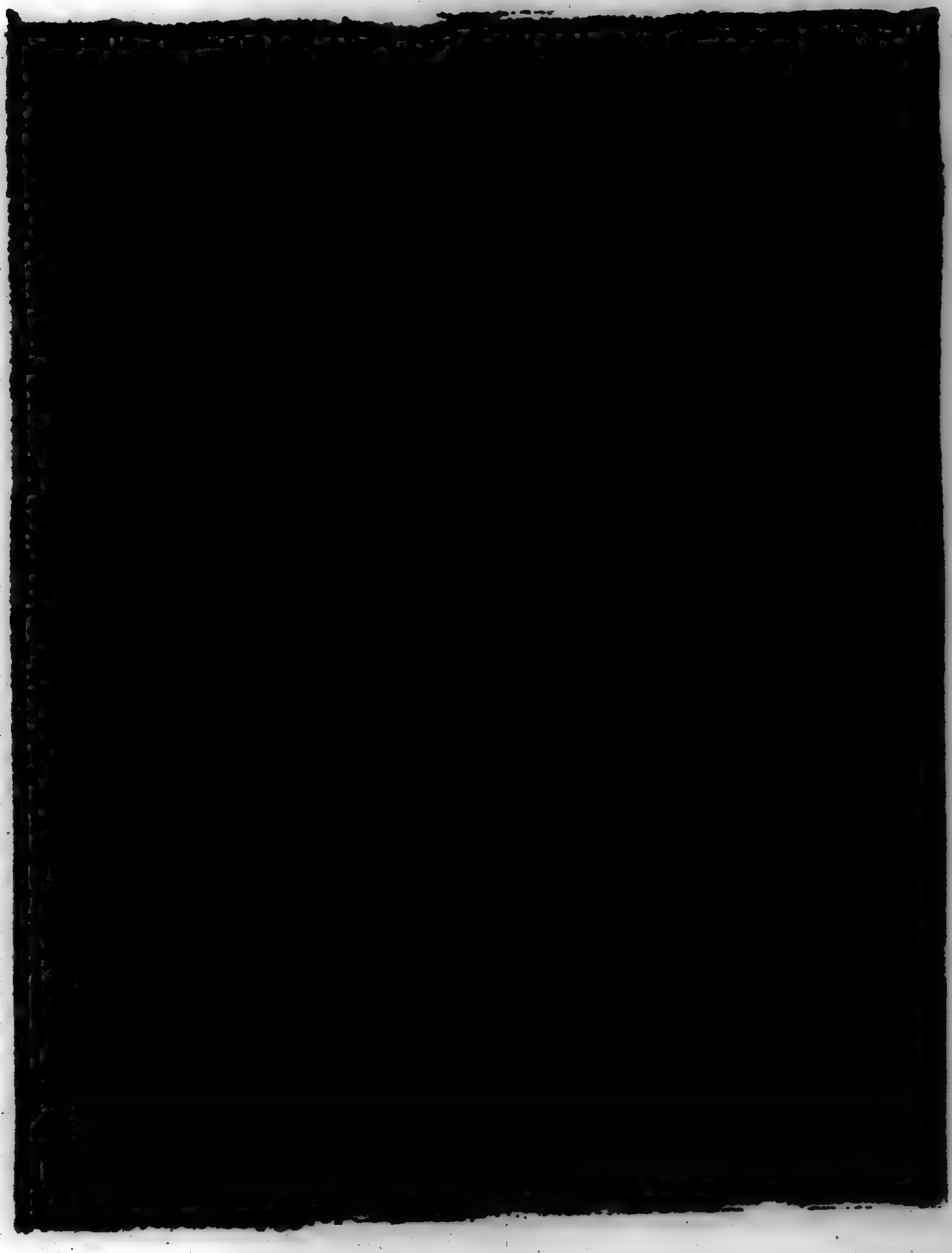


Overcoming the parallel port bottleneck.

When you send a print file over a network, it travels at *network speed* (10Mbits per second in the case of an Ethernet network). But to pass through a parallel port, the data slows down to a leisurely 10–30 Kbytes per second. And that can bring even the fastest printer to a crawl.

In addition, most servers send data through a printer's parallel port one byte at a time — and then check to see if the port is ready for the next byte before sending it. So printing large documents such as those with complex graphics can put an enormous processing load on a file server, and can be painfully slow.

There are two ways to increase printing speed and lighten the load on the server. One is by sending data at network speed all the way from the user's computer to the printer. The other is by sending it in larger packets. HP JetDirect cards and third-party interface cards let your server do both. They receive data in large packets, at network speed. So your HP printers can work at their top speeds, and your file server can dedicate more of its processing power to managing the network.



printing strategy has made
nect HP printers directly to
network in existence. The list
Novell® NetWare®, Microsoft LAN
Manager, Microsoft Windows™ for
Workgroups, Microsoft Windows NT,

printer languages and
systems. HP printers are
automatically between HP's PCL 5 and
Adobe's PostScript printer languages
(when the printers are equipped with the
PostScript language). And the newest
HP JetDirect cards can accommodate
nearly any PC LAN or UNIX network

nplifying the complexities.

IBM LAN Server, HP-UX, SunOS, Solaris, SCO UNIX, AppleTalk, Banyan VINES, and mini/mainframe environments including HP, DEC, IBM and Wang.

But sometimes connecting to one network isn't enough. These days, it's quite common to have more than one network operating system in an organization. And where there are multiple network environments, there are usually frustrations with trying to make everything work together.

So after taking care of the fundamental printing needs of reliability, performance and location flexibility, HP looked at solving the technical issues in complex network installations.

Consider a typical corporate situation. The R&D department uses UNIX workstations, the administrative staff produces PCL documents on a PC LAN and the marketing department relies on a Macintosh network to print its PostScript™ language documents. While the people at the computers work side-by-side in many cases, each network has its own printers, even though one could handle the workload of all three networks.

This is a fictional example, but the situation is very common. And it's a situation that runs counter to the goal of sharing resources, the original idea behind the networking of computers and peripherals.

running on Ethernet or Token Ring. Through close associations with major network operating system vendors — including Novell, Microsoft and IBM — HP ensures flawless printing and maximum performance. For example, HP JetDirect cards are Novell tested and certified.

HP also cooperates with other network interface card manufacturers to provide solutions for other environments, including Banyan VINES networks, and HP, DEC, IBM and Wang mini and mainframe systems. Third-party developers also provide many multi-environment solutions.

Today, HP equips every network-ready printer it builds with an MIO slot, so each can work with virtually any network operating system. It means printers are portable to any environment.

Some solutions even offer automatic network switching, so one printer can simultaneously service all the network operating systems in your organization. And that makes network printing in complex environments as simple as possible.

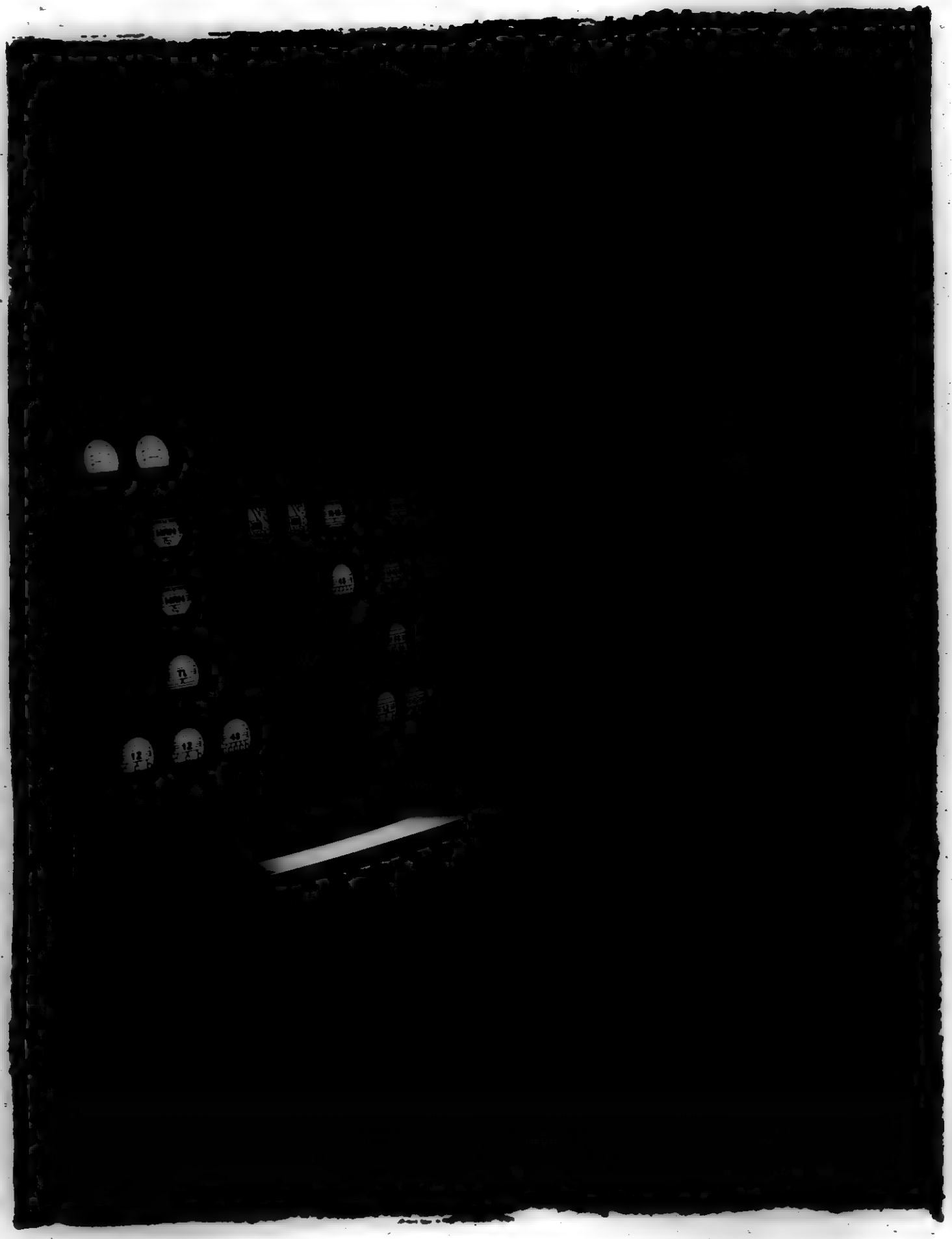
But you may want more than easy printer connectivity. The ability to manage printers like any other network node is also important. Turn the page to see how HP helps you do just that.

No
range of
And nobody
suited to networ
17-page-per-minute
printer. It comes pre-
of the box for multiple
I/O switching. It can switch
automatically among up to
protocols running on a single
LocalTalk and the high-speed
HP Bi-Tronics parallel port. The
also switches automatically
HP's enhanced PCL 5 and Adobe's
PostScript printer languages. So it can
easily be shared by nearly anyone.

The entire family of HP network-ready peripherals includes the HP LaserJet 4 and 4Si printers, HP DesignJet 650 and 650C plotters, HP PaintJet XL300 color printers and HP DeskJet 1200C printers. Each is equipped with a modular I/O slot, allowing you to directly connect the printer to your network through an HP JetDirect card or a third-party network interface card.

Install the new HP JetDirect card for Ethernet in HP network-ready printers and you can support 10 different network operating systems. The new HP JetDirect card for Token Ring supports five different network operating systems. Between HP's JetDirect cards and the MIO cards available from third-party developers, HP offers near-universal connectivity.

Many of these printers also support automatic I/O and printer language switching, providing additional support for multiple network environments. There are also third-party MIO cards that bring automatic network switching capability to HP printers and plotters.



HP continues to set the standards for business printing.

Over the years, HP has been setting the standards that have been driving the printer industry. For example, HP developed the PCL printer language that virtually every other laser printer manufacturer now emulates. HP also set the standard for print quality time and

Managing network printing into the future.

again; first with affordable 300-dpi resolution, then with Resolution Enhancement technology, and most recently with affordable 600-dpi resolution.

Now HP is setting new standards for ease and efficiency in connecting network printers.

Besides the sheer simplicity of the physical connection, HP also makes it incredibly easy to configure printers. HP JetDirect cards are shipped with installation and management utilities for popular network operating systems. For example, a utility for Novell networks lets you remotely set printer front-panel configurations.

HP JetDirect utilities and printer drivers are *built into* the new Microsoft Windows NT system software. HP JetDirect cards also come with software that lets you upload Windows 3.1 printer drivers to a Novell NetWare file server for automatic downloading to end-users' PCs. That can save network managers enormous amounts of time.

Once your printers are set up, HP simplifies the issues of day-to-day printer management. HP JetDirect cards can send information from printers to network management applications, where the printers show up as nodes. So network managers gain remote control over HP network printers.

HP JetDirect cards deliver extensive management capabilities to several networks through industry-standard SNMP (Simple Network Management Protocol) agents built into the cards. Currently there is SNMP support for Novell NetWare, IBM LAN Server, UNIX, Windows for Workgroups and Windows NT networks. Because of its wide acceptance as a network management protocol, SNMP compliance is an important element in simplifying printer management throughout an enterprise.

You can use SNMP-based network management software, such as HP OpenView, to troubleshoot remote network printers right from your office.

For example, you can find out which printers are under-used or overloaded, and who is using them.

If you operate a Novell NetWare LAN, you can also utilize the HP JetAdmin software that's included with HP JetDirect cards. It takes advantage of the cards' capabilities to let you see network traffic statistics, diagnostic information and printer front panel messages on your computer.

Network managers aren't the only beneficiaries of bi-directional printer communication. End-users can receive "status readback" information from HP printers on their computer monitors. A printer will tell them when it's off-line, when it's low on toner or paper, or otherwise requires care. Various forms of this capability are built into several operating systems, including Novell NetWare, Windows for Workgroups, Windows NT, UNIX, HP-UX and AppleTalk.

Novell NetWare users can rely on the HP JetPrint utility that comes with HP JetDirect cards. In addition to automatic visual and audio alerts when the printer needs attention, it offers "drag-and-drop" printing and point-and-click printer selection.

By offering the types of capabilities you've read about on these pages, HP has accomplished much of its strategy for network printing. But you can be sure the future holds even more exciting developments as HP works toward seamless enterprise network printing, *from* anywhere, *to* anywhere.

Simplifying the path to the future.

The benefits mentioned on these pages are simple to achieve in almost any network environment. And if you want more details on exactly what to do for your specific network, HP can provide the answers.

If you'd like to improve the performance and location flexibility of your network printers; if you'd like to simplify the technical issues; or if you'd like to improve management of your network printers, HP has technology briefs that can help. These fact-filled papers offer concrete solutions for specific networks. And HP will send them to you, free. For more details, just turn the page.

HP has the answers you need.

Get technology briefs on specific network printing environments, FREE.

No other company offers solutions for such a broad range of computing systems, from PC LANs to enterprise networks. No matter what network environment you operate, chances are Hewlett-Packard and its network printing partners offer you the ideal solution. So you can improve network printing performance, location flexibility and reliability; you can simplify the technical issues; and you can manage network printers more easily.

HP has prepared a library of technology briefs on specific network printing solutions for several environments. These technology briefs offer information you can use to improve network printing. And best of all, they're absolutely **FREE**. To receive a copy, just call toll-free: **1-800-553-1333 extension 7440** in the U.S. or **1-800-387-3867** in Canada, and ask for any of these briefs by name:

- Maximizing Printing in the Novell NetWare Environment
- Maximizing Printing in the UNIX Environment
- Maximizing Printing in Multiple and Mixed Environments
- Maximizing Enterprise Printing in Mini/Mainframe Environments
- Maximizing Printing in the Windows, Windows for Workgroups and Windows NT Environments

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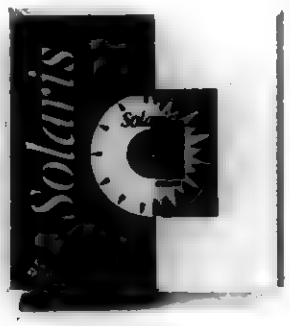

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TOCK

HELP LINE

Part of an occasional series of columns aimed at providing users with answers to technical questions. This week's questions and answers are provided by Corporate Software, Inc. in Canton, Mass.

Borland International, Inc.'s Paradox for Windows 1.0:

Q. I have made format changes to some numeric fields in a table, but those changes are not reflected in reports or forms based on that table.
A. When you create new objects with numeric fields, Paradox always formats the fields with the Windows default format. This means any changes you make to numeric fields in the table will not be reflected in reports or forms based on that table. You must select the field in the report or form and change the number format for that particular object.

IBM's OS/2 2.0:

Q. I am having problems getting OS/2 to recognize my COM3 port. Do you have any suggestions?
A. If IBM OS/2 does not recognize the COM3 port, edit your CONFIG.SYS file as follows: Add the statement (3,3E8,7) to the end of the lines that begin with COM.SYS and VCOM.SYS. The first 3 signifies the COM port (in this case COM3). The middle statement, 3E8, is the address for the port. The final number, 7, is the interrupt used by the COM port.

You can alter either the address or the interrupt as required by your system setup.

Microsoft Corp.'s Word for Windows 2.0:

Q. I've resized a graph in my Word document. When I send it to print, it prints out in its original size. Why?
A. Select Tools/Options/Print and be sure that the Update Fields option is not checked. Otherwise, when you send the document to print, it will continue to update that field and cause it to revert the graph to its original size.

Q. On my status bar, there are no numbers displayed at "At" and "Ln." What are these for, and why are they blank?
A. "At" indicates where the cursor is located in inches from the top of the page. "Ln" indicates which line the cursor is on.

If there are no measurements in these fields, there are a few things to check. The numbers will not appear if: Draft is selected under the View menu; Background Pagination is not selected under Tools/Options/General; Line Breaks and Fonts as Printed is not selected under Tools/Options/View; or there is no printer selected under File/Print/Setup.

WordPerfect Corp.'s WordPerfect 5.2 for Windows:

Q. How do I create a Dynamic Data Exchange (DDE) link from a slide in Lotus Development Corp.'s Freelance Graphics for Windows 2.0 in WordPerfect for Windows? Whenever I try to do this, the Paste Link option in WordPerfect is grayed out and I can't select it.
A. To create a DDE link from a slide in Lotus' Freelance Graphics for Windows 2.0 into WordPerfect for Windows, you must select the slide in Freelance under Page Sorter view.

In Freelance, first save the source file, and then select View/Page Sorter. Choose the slide to be linked and select Edit/Copy. In WordPerfect for Windows, select Edit/Link/Paste Link.

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Electronic distribution systems

CONTINUED FROM PAGE 37

systems that will allow us to integrate with the customer's purchasing system."

For software vendors, the most attractive element behind the changing software distribution dynamics is the fact that it is cheaper to distribute software on CD-ROMs. Also, electronic delivery systems will for the first time give vendors and information systems organizations a way to accurately count the amount of software that is actually in use.

IS directors will also benefit because they will no longer have to individually load software on each PC using floppy disks, which will serve to reduce distribution, administration and support costs (see chart page 37).

But while technologies such as Hermes represent nirvana in terms of administrating software allocation, David Coursey, editor of the "P.C. Letter" newsletter, noted that it will still be several years before this type of technology is perfected enough to make any substantial impact on IS organizations.

In addition, once the technology is in place, software vendors will be expected to take a cautious approach toward adopting it because they do not want to rile their distributors and resellers. But by combining electronic delivery systems with CD-ROM disks, many software vendors will be able to effectively cut distributors and many resellers out of the purchasing loop.

"I think that we'll see a lot more end users ordering direct because of these technologies. We'll have to see how this affects the channel," said D. Clive Winn, vice president of sales at WordPerfect Corp. in Orem, Utah.

"All of this will have to be worked out with the channels before it's widely adopted," added Robert Weiler, senior vice president at Lotus Development Corp. in Cambridge, Mass.

According to Stoffolano, Corporate Software, unlike traditional box pushers, will adapt by focusing on services that will initially help users install electronic delivery systems. After that, Corporate Software will provide the more mundane tracking, billing and monitoring services that most IS organizations prefer not to do across products from multiple vendors.

For instance

Two players are aggressively pursuing the market for electronic software distribution: InfoNow Corp. in Boulder, Colo., which provides a service that allows corporate customers to download software from an electronic store, and Frye Computer Systems, Inc. in Boston, which provides a set of utilities for distributing and updating software for Windows and DOS systems on a local-area network.

"It hasn't all gelled yet, but we're definitely heading toward electronic commerce," said John Ball, InfoNow vice president of marketing.

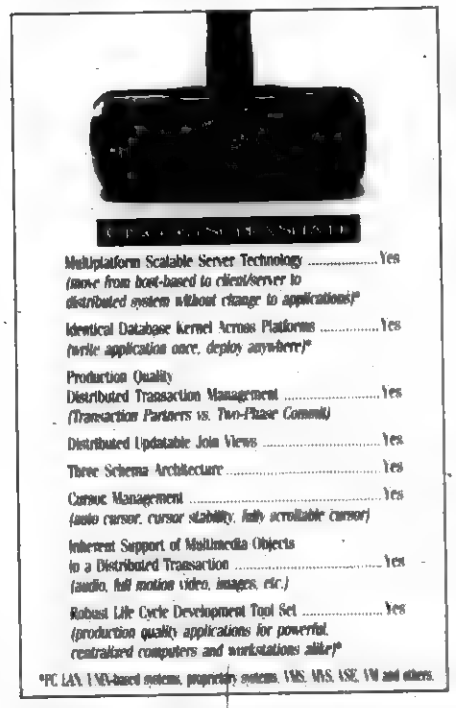
"For software, the simplest thing is not to distribute it on hard goods since its real value is as electronic bits. And when you add the fact that you can also deliver backup disks, updates and manuals electronically, you're talking about a savings of $12 to $15 per sale. That's a significant savings for software vendors," Ball said.

In the meantime, Russell Frye, president of Frye Computer Systems, said he will adapt his company's Software and Update Distribution System so it is able to recognize data from a variety of systems, including Microsoft's Hermes technology.

"Software vendors already know how to provide direct fulfillment, but they are so dependent on the channels that they are afraid to promote it," Ball added.

—Michael Fitzgerald

For enterprise-wide implementation of client/server systems, a powerful, fully featured database management system is an absolute must. SUPRA® SERVER, from Cincom, is a truly open, scalable database server designed from the ground up to deliver the full benefits of client/server computing across a full range of requirements. Other client/server database systems will eventually "hit the power wall" in the large scale use demanded by enterprise-wide implementations. In contrast, SUPRA SERVER has been built on 25 years of mission-critical database experience to deliver the robustness your business needs. In other words, the power is inherently available when and where you need it. SUPRA SERVER provides a common database serving PCs, UNIX workstations, Macs, VAXs, mainframes and others...all with an identical single system image.



Multiplatform Scalable Server Technology (move from host-based to client/server to distributed system without change to applications)*	Yes
Identical Database Kernel Across Platforms (write application once, deploy anywhere)*	Yes
Production Quality Distributed Transaction Management (Transaction Partners vs. Two-Phase Commit)	Yes
Distributed Updatable Join Views	Yes
Three Schema Architecture	Yes
Cursor Management (auto cursor, cursor stability, fully scrollable cursor)	Yes
Inherent Support of Multimedia Objects in a Distributed Transaction (audio, full motion video, images, etc.)	Yes
Robust Life Cycle Development Tool Set (production quality applications for powerful, centralized computers and workstations alike)*	Yes

*PC LAN, UNIX-based systems, proprietary systems, VMS, MVS, VSE, VM and others.

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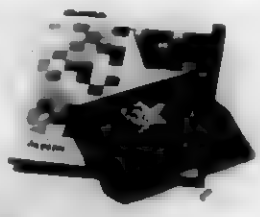

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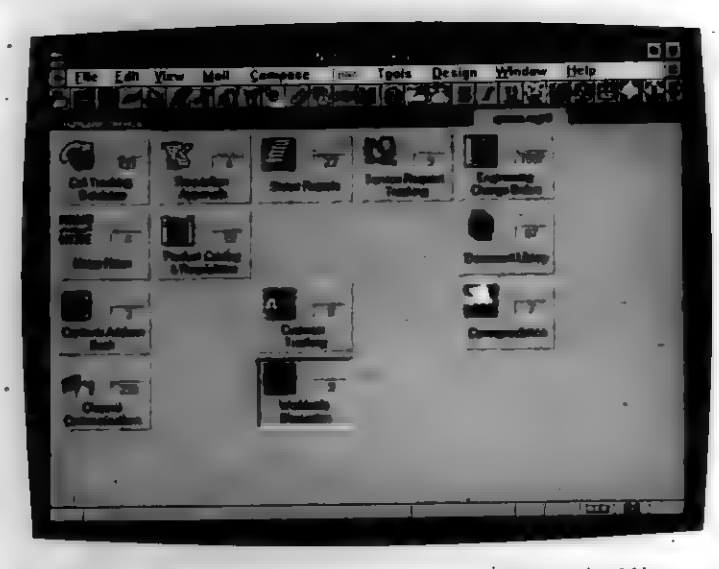
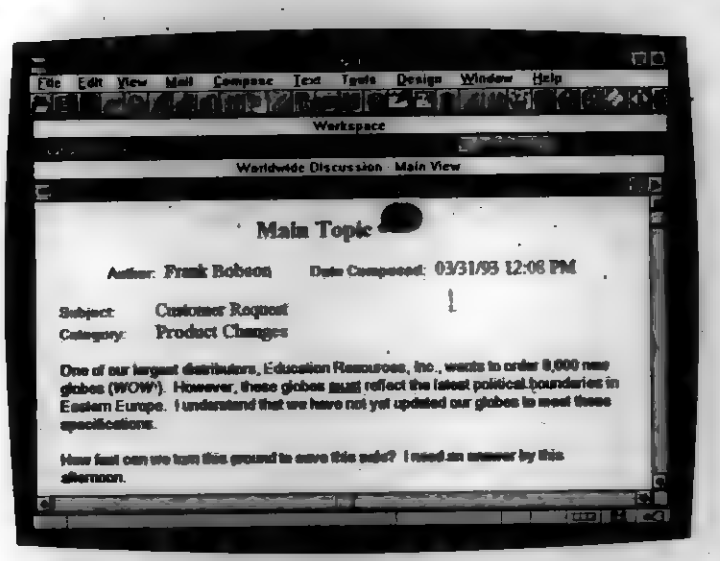
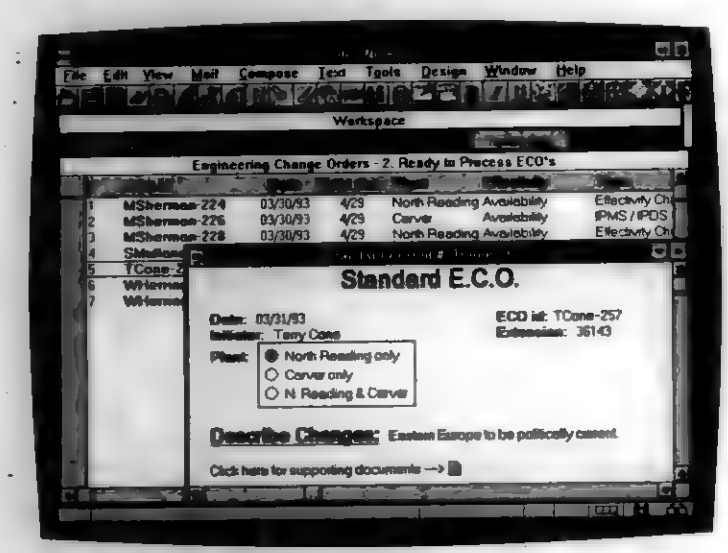


1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems worldwide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.



5. Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.

6. After lunch he opens a document from Ellen in product development who has responded with the necessary changes and scheduling information. The new art was scanned directly through Lotus Notes: Document Imaging from the art department. James approves the art for manufacturing.

How Lotus Notes Relea

Thousands of companies already know how Lotus Notes® helps them respond more quickly and effectively to the demands of everyday business. Now Release 3 extends that power to new dimensions.

Just watch how James Carlton, a new district manager at Global Publishing, uses Notes Release 3 to solve a major global problem in short order. See how he uses information from on-site and remote locations. From both inside the company and external sources. Across a

variety of platforms. How he uses applications such as Account Tracking, Newswire, and Engineering Change Orders to get a new product developed fast. And how he creates an informal team spanning a range of departments to do it.

With the new Release 3, Lotus Notes now supports all the leading GUI platforms: Windows;™ OS/2;® UNIX;®* even Macintosh.®

Which means the award-winning workgroup power of Lotus Notes is now readily available to help virtually all networked businesses improve

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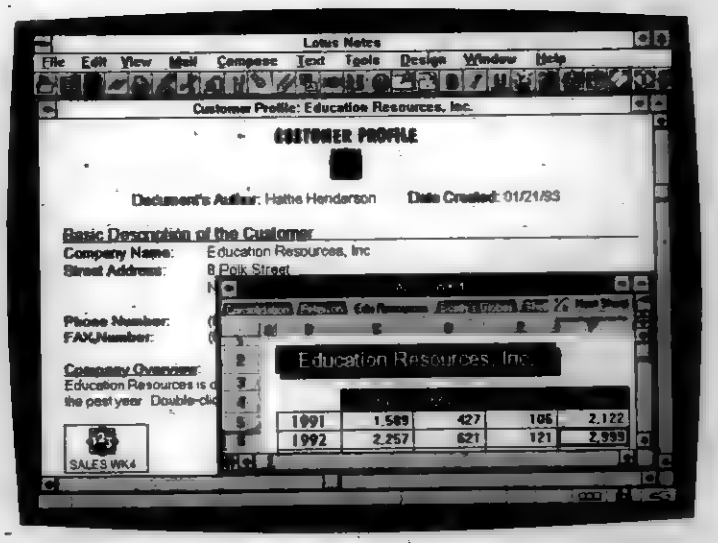
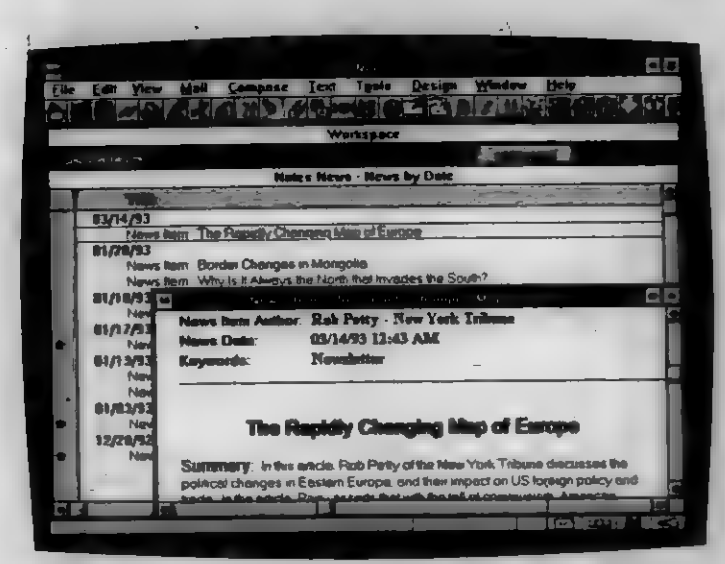
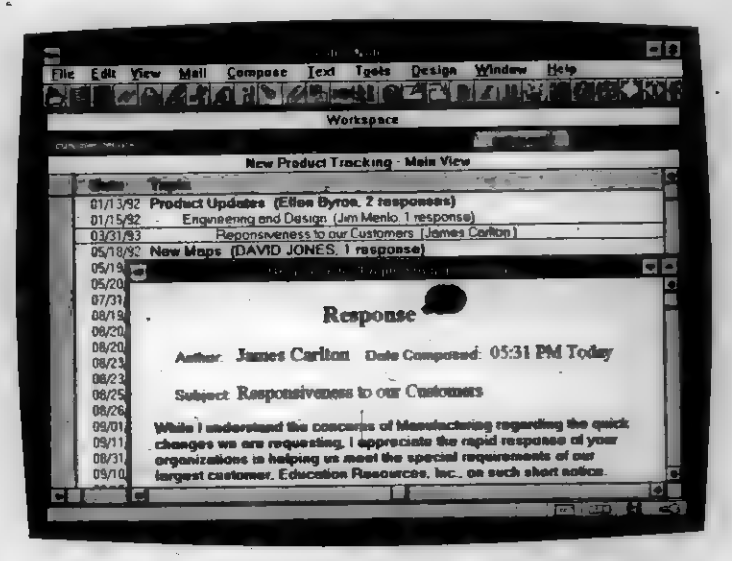


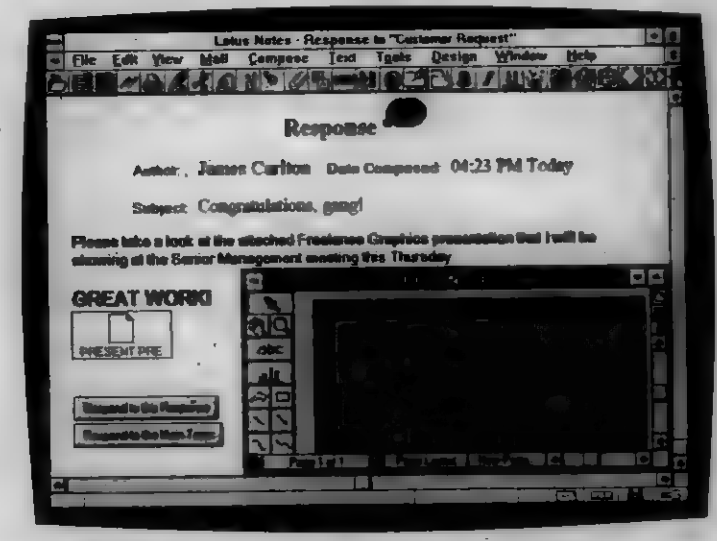
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database, so everyone can see how the team rearranged the world to save a big account.

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Brief

TI adds ink-jet printer

Texas Instruments, Inc. announced its MicroMarc ink-jet printer, the company's first foray into the ink-jet market. "We believe the ink-jet market will grow dramatically, and we want to participate in that growth," a TI official said. The MicroMarc costs $350 and has a resolution of 300 dot/in. It supports PCL 5 emulation.

Firmware agreement

Mips Technologies, Inc. in Mountain View, Calif., and **American Megatrends, Inc.** announced a joint development and distribution of firmware and Hardware Abstraction Layer (HAL) software for Microsoft Corp.'s Windows NT running on Mips R4000-, R4200- and R4400-based PCs. The firmware and HAL are elements for the Mips Open Design Center, a research center that assists manufacturers in building PCs using Mips reduced instruction set computer-based systems.

Harsh environments

A recent market research report shows that a class of computers known as "industrial PCs" has been booming. Those PCs, based on standard microcomputer technology but ruggedized for protection against the harsh environmental conditions of the factory floor, accounted for a $450 million worldwide market in 1992, according to Natick, Mass.-based market research firm **Venture Development Corp.** Venture Development also estimated that surges in that market in 1993 and 1994 will fuel further growth, bringing industry revenues to $760 million in 1997.

Dropping printer prices

Hewlett-Packard Co. last week cut the price of its HP DeskWriter C thermal ink-jet printer for Apple Computer, Inc. Macintoshes by $60 to $550, a month after shaving prices on two other members of the DeskJet family, the HP DeskJet 500 and the HP DeskWriter.

SHORT TAKES **IBM PC Co.** said it will bundle **Traveling Software, Inc.**'s Lap-Link V with its ThinkPad 720, making it the first company to bundle the new Lap-Link. . . . **Compaq Computer Corp.** was awarded a 1993-94 General Services Administration contract to sell PCs to the federal government. . . . **GE Rental/Lease**, which leases and rents PCs and workstations, has acquired **Selecterm**, a Boston-based PC rental concern, for approximately $8 million. . . . **Borland International, Inc.** and **WordPerfect Corp.** have extended their suite arrangement to include international versions of Borland Office. . . . **AST Research, Inc.** will add LocalMotion, an accelerator for Microsoft Corp.'s Video for Windows, to its Premmia desktop and server line. . . . **Spectrum Signal Processing, Inc.**, a Vancouver, B.C.-based company, announced that it has completed a prototype of a multimedia board based on the MWave digital signal processor from IBM and TI. . . . **AMR Corp.**'s American Airlines subsidiary will give its employees the option to buy **Dell Computer Corp.** PCs specially equipped to run the Sabre reservation system. AMR said it made the move to encourage employees to book travel electronically, reducing paperwork and freeing up reservation phones.

Mac users

CONTINUED FROM PAGE 37

- Offer better cross-platform support for Windows products, support binary large objects and improve connections scripting.
- Improve Apple remote access features with a remote access server. Also, increase dial-in security.
- Provide a protected memory mode in the Macintosh operating system. Include more understandable error messages.
- Develop an AppleLink database that includes known "bugs" for each version of the operating system as well as their expected resolution dates.
- Provide a more flexible licensing program by broadening distribution channels.

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- Upgradeable to Pentium Technology
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i486 DX2 50MHz SYSTEM
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- Upgradeable to Pentium Technology
- Accelerated Local Bus Video
- UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI)
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Utilities

Addstor, Inc. has announced DoubleTools, a product that allows MS-DOS 6.0 DoubleSpace users to enhance, view and manage their compressed disks.

Support for Bernoulli, floppies and other removable data is provided. DoubleTools has an environment-sensitive Help facility called The Advisor, plus background defragmenting disks. Users can read and write DoubleSpace compressed floppies on any DOS or non-DOS system with a Universal Data Exchange feature.

DoubleTools costs $99.95.

▶ *Addstor*
1040 Marsh Road
Menlo Park, Calif. 94025
(415) 688-0470

Espia Corp. has announced the Espia Image Exchange, a graphics utility.

The product was designed to expand the functionality of Microsoft Corp.'s Windows Object Linking and Embedding by adding seven new graphic file formats to the one used by Windows. Dithering, unlimited zooming and other functions have also been included.

Within a client application, Espia Image Exchange can display a subimage of a bigger graphic image. Users can import images in eight formats.

The retail price of Espia Image Exchange is $119; however, the product is also available directly from Espia for $99.

▶ *Espia*
Suite 204
23645 Crenshaw Blvd.
Torrance, Calif. 90505
(310) 517-8277

Peripherals

Lexmark International, Inc. has announced the IBM LaserPrinter 4039, a family of intelligent high-resolution printers.

With five models, the IBM LaserPrinter 4039 family has print speeds of 10, 12 and 16 page/min. and offers advanced networking capabilities.

The printers offer built-in PostScript and PCL5 compatibility and provide 600 dot/in. resolution with standard Print Quality Enhancement Technology.

Flash memory technology allows commonly used forms, logos and custom fonts to be stored in optional flash memory for speedier printing.

Prices range from $1,599 to $3,399.

▶ *Lexmark International*
740 New Circle Road
Lexington, Ky. 40511
(606) 232-2000

Micropolis Corp. has introduced Model 2108, a fast Small Computer Systems Interface (SCSI)-2 drive.

The product features 696M bytes of formatted data storage capacity and data transfer rates of up to 10M byte/sec.

A patented "observer-based" digital servo technology provides an average seek time of 10 milliseconds.

Model 2108 also has a rotational speed of 5400 rpm and a microprocessor that conforms to common command set and SCSI-2 definition.

Model 2108 costs $1,955.

▶ *Micropolis*
21211 Nordhoff St.
Chatsworth, Calif. 91311
(818) 709-3300

Training

Integrated Applications, Inc. has introduced an enhanced version of its Integrated Applications Digital-Audio Trainer (iadat), an interactive computer training tool designed to improve productivity in the workplace.

The product consists of an audiocassette-based training device that uses sight, sound and touch to enable more effective learning, according to the vendor.

Iadat enables users to listen and watch instructions or training programs on a computer. It simultaneously records screen action, verbal comments, questions and every keystroke the user makes.

Iadat is compatible with most MS-DOS PCs and any asynchronous RS-232 terminal.

Iadat costs $2,595.

▶ *Integrated Applications*
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When it RAIDs, it pours

Widespread benefits, falling prices aiding technology's acceptance

closer look: RAID

By Kim S. Nash

Let's start with the basics. Redundant arrays of inexpensive disks (RAID) storage devices lash together several ordinary drives to work as one coherent unit. The process is controlled via software or a combination of software and hardware. RAID devices can be cost-effective — and prices are coming down gradually — but they are not cheap.

Among the benefits of RAID are the following:

- Faster data access time.
- Increased data availability by making storage more fault tolerant.
- Ability to add more users to existing networks without necessarily degrading speed.
- Protection from losing information during drive failures because the date is duplicated and/or tracked and can be reconstructed on the fly.

But like boutonnieres and patent leather shoes, RAID is appropriate in some instances, excessive in others. RAID systems can certainly work magic in networked, minicomputer or mainframe configurations, analysts said. And that is where the devices are most often used, according to James Porter, analyst at Disk/Trend, Inc. in Mountain View, Calif.

However, potential users must match their applications to specific RAID levels. RAID subsystems are best suited for two general situations: applications that demand high data throughput or those that require high data availability.

"Usually, we're talking about scenarios involving mission-critical systems," Porter said, "whether or not that's in a large company." In other words, a small human resources or word processing application is not a likely target for RAID. A better candidate is a local-area network with more than 50 or 100 PC users running key applications off a fault-tolerant server. Such a scenario calls for RAID-5 systems, Porter said.

Meanwhile, smaller setups running imaging applications should consider RAID-3 devices, which can be optimized for a high data-transfer rate. That way, individual users are not held up while colleagues send or receive data-dense images.

If total data storage capacity warrants less than four disk drives, RAID-1 disk mirroring configurations are probably the most cost-effective.

Stand-alone

Although RAID is currently found most often in networks of PCs or Unix machines, some single-user applications can see benefits using RAID. For example, users of some large, customized graphics applications, frequently those running on Apple Computer, Inc. Macintoshes, may deem their data so critical that they want the fault tolerance and greater data integrity that RAID can provide.

"At a recent Mac show, I counted no less than eight vendors selling RAID for Macs," Porter said. "That's grown quite a bit in the last year."

The RAID business racked up $1.5 billion in sales worldwide in 1992 and is expected to top $2.8 billion this year, according to Porter. But the dynamics of the market will start to shift, he said, as more third-party providers put out more stable, less expensive arrays than systems makers such as IBM, Digital Equipment Corp. and Hewlett-Packard Co. By 1996, the share of disk array sales held by hardware makers will shrink from last year's 60% to less than half the total, Porter explained.

The Top 3 RAID vendors for 1992 were EMC Corp. with $314.9 million, IBM with $209 million and DEC with $204.9 million in sales.

Speaking of money, users have to watch their pocketbooks when they choose RAID. Plain and simple, RAID subsystems often cost more per megabyte for storage than individual disk drives, the experts agreed. That means that justifying RAID is a technical — not a cost-saving — issue, at least for now.

The good news on the money question is that disk drive prices — and eventually RAID prices — are likely to come down during the next several years, according to David Vellante, senior vice president and storage analyst at International Data Corp. in Framingham, Mass.

While the per-megabyte price for mainframe drives, for example, runs about $5.20, the cost will sink to approximately $1/megabyte within four years, Vellante said. In fact, minicomputer- and PC-level disk drives, which currently sell for about $3.50/megabyte and $3/megabyte, respectively, are also expected to drop to $1/megabyte by 1997, he said.

However, Vellante disagreed with Porter's RAID market growth predictions. Declining disk drive prices will keep simple disk mirroring, or RAID-1, attractive, perhaps delaying the acceptance of RAID-3 or RAID-5 products, Vellante said.

Nonetheless, the market is growing and will continue to do so as client/server computing sprouts at more and more user companies, analysts agreed. As PC use expands — and the operating systems running on them grow — so will the need for data storage, they said.

NT by another name

One impetus for installing high-capacity RAID storage systems is the arrival of memory-zapping Windows NT from Microsoft Corp., said Bob Katzive, an analyst at Disk/Trend. "As everyone knows, NT stands for 'needs a terabyte,'" Katzive joked at a recent RAID Advisory Board meeting.

RAIDs for all

Here is a sampling of third-party vendors offering RAID systems for different platforms:

PCs, networks:
- Pacific Micro Data, Inc., Tustin, Calif.
- Chantal Systems, San Diego.
- Storage Dimensions, Milpitas, Calif.
- Micropolis Corp., Chatsworth, Calif.

Macintosh:
- Mega Drive Systems, Inc., Beverly Hills, Calif.
- FWB, Inc., San Francisco.

Unix systems:
- Cambex Corp., Waltham, Mass.
- Data General Corp. in Westborn, Mass., offers RAID devices for various vendors' Unix boxes. Hitachi Data Systems Corp. plans to get into the business later this year, a source said.

Superservers:
- RAID is primarily available from superserver companies such as Tricord Systems, Inc. in Plymouth, Minn., and Netframe Systems, Inc. in Milpitas, Calif.

Minicomputers:
- IPL Systems, Inc., Waltham, Mass.
- EMC, Hopkinton, Mass.
- XL/Datacomp, Inc., Hinsdale, Ill.
- Storage Computer Corp., Nashua, N.H.
- ECCS, Inc., Tinton Falls, N.J.

Mainframes:
- EMC is currently shipping a mainframe-level RAID device. Meanwhile, Storage Technology Corp. in Louisville, Colo., and IBM have promised but not delivered similar systems.

RAID at a glance

RAID LEVELS

RAID-0: Disk striping
RAID-1: Disk mirroring
RAID-2: Complex error correction
RAID-3: Parallel transfer, parity drive
RAID-4: Independent transfer, parity drive
RAID-5: Independent transfer, no parity

Most common levels are RAID 1,3,5

Driving for more

Industrial Towel and Uniform, Inc. plans to add a RAID system from Tricord Systems, Inc. to two Tricord PowerFrame Model 40 superservers for 4.8G bytes of data this month. The New Berlin, Wis.-based company decided to go the RAID route because "ordinary storage configurations just wouldn't do justice to that much data," said Steve Knauf, chief information officer, referring to Industrial Towel's need to have nearly the entire 4.8G bytes of information available almost constantly.

The data in question primarily pertains to order processing and tracking. "If we lose a spec of it, we can lose track of what [business] we're doing," Knauf said.

RAID devices come in many shapes and sizes, as Cliff Fischer, technical support manager at Denver's CoBank NA, will tell you.

Fischer said he was surprised when a FailSafe array from Micro Technology, Inc. arrived in five big boxes containing various pieces of the RAID device. Once assembled, the 24G-byte array was so big that Fischer had to remove the hinges and door from his computer room's standard-size doorway. However, the vendor provided one nicety: Stapled to the side of the largest box was a preauthorized shipping order for the return of all the packaging for recycling.

Six months ago, Fender Musical Instruments Corp. installed Alpine Storage Manager, a RAID-5 system from XL/Datacomp, Inc. in Hinsdale, Ill. Besides the company's Scottsdale, Ariz., headquarters, Fender uses RAID at five manufacturing and distribution plants in the U.S.

One of the biggest jobs the Alpine system does is manage data generated by "several million" transactions zipping through a large bar-coding system, according to Ed Taylor, director of MIS. The system tracks guitar sales from inventory stocking to customer delivery. — *Kim S. Nash*

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PC Week - May 10, 1993

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Jean S. Bozman

In users' hands

When it comes to client/server user interfaces, the customer is always right.

Client/server technology should mean that people get to pick their favorite user interface and to use that PC or workstation to get at whatever data they wish — no matter where it is stored in an enterprise network.

That just happens to be the vision of IBM's Thomas Furey Jr., head of that company's newly minted client/server business unit. In March, Furey told attendees at an IBM briefing in Orlando, Fla., that his own study of the client/server universe convinced him that "religious" preferences for one type of PC or workstation or another no longer matter.

Noting that this was his personal opinion — and not necessarily that of IBM — Furey said PCs demand personal choices. "When you're dealing with the personal computer, people tend to break down into religious factions on the subject," he said. "I mean, people who are addicted to Macintoshes wouldn't take anything different, and people who like Windows wouldn't take anything different. Of course, people who like OS/2 or Unix-based systems are very much tied to their system of choice."

Unix workstation users may be tied to their system, but now they, too, have the option to run non-Unix applications on their workstation screen. In early May, a new bunch of interface options broadened users' choices about which computer application sits on their desktop.

Unix users, whether they are engineers or financial traders, can now elect to run Windows or Macintosh applications on their Sun workstations. That much can be done either by using Sun's Windows Application Binary Interface (WABI); by using a Sun/Macintosh interface; or by using Microsoft's solution: running emulation software from Insignia Solutions on Unix machines.

Better solutions

Before the new Windows interfaces appeared, Sun users who had turned to emulation software reported that emulation slowed performance and drained memory. Others relied on application developers to recompile Windows programs for use on Unix machines, but those programs sometimes cost more than $1,200 — three or four times the price of standard Windows software.

How well will the Unix/Windows solution work? Sun said it will certify WABI applications in waves, making sure popular spreadsheets and word processing packages work just as well on Unix workstations as they do on desktop PCs. That will take months of testing, at the very least. The first wave of Windows applications approved for use with WABI numbered about 15 packages.

Now, if the news from the certification front is good, Unix users will be able to go to the corner PC software store and buy any Windows application they want. The result might be that at least some PCs, which formerly shared desks with Unix workstations, will be moved to other people's desktops. That is what happened to side-by-side PCs and terminals after Microsoft Windows came along. One of them, usually the terminal, found a new home, perhaps in a dumpster.

What if the news is not good, and the combination of Unix systems and Windows or Macintosh applications proves cumbersome or unreliable? Then, Unix users will have new hardware options, as well. They will soon be able to run Unix applications on Intel 486 and Pentium desktops. That is happening with The Santa Cruz Operation's SCO Unix, and it will occur even more as SunSoft Solaris software and Next's NextStep software are deployed on Intel hardware.

Choices, choices

With such options, what exactly will define a user's desktop choice?

It may not be the interface, which can be transferred from owner to owner. It may not be the hardware because the same application will be able to run on powerful RISC or Pentium hardware platforms. It may not even be the operating system, as 32-bit applications are ported to run under Unix or Microsoft's Windows NT.

It may just be that, finally, the user has a say in what hardware and software will make him or her most productive.

"The base of power, where data is being collected and owned, is shifting to end users," Furey said, adding that the world's hierarchical organization charts are inexorably getting flattened.

So, instead of having standards committees make the final desktop decisions, IS managers may have to finally ask end users: "What computer would you like to have on your desk?" and then IS can figure out how to tie it all together.

Bozman is *Computerworld*'s West Coast senior editor.

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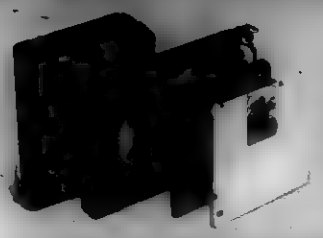

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Health agency cures diseased data center

Misuse by users cited for failure of calendaring program, data corruption

By Michael Fitzgerald
ATLANTA

"The best-laid plans of mice and men go oft astray."

The Centers for Disease Control and Prevention (CDC) ran afoul of Robert Burns' 17th-century warning when it implemented an organizationwide calendaring program earlier this year.

The agency spent more than six months evaluating network-capable calendaring programs before it settled on CaLANdar, a network calendaring system from Microsystems Software, Inc. in Framingham, Mass. While end users were not forced to use calendaring, the CDC did mandate that anyone who did want it had to use the new standard, and all nonstandard packages were removed. Still, data integrity problems popped up.

Louis Kahn, chief of computer and network operations for the CDC's national immunization program, said Microsystems Software and the CDC shared the blame on this one.

"The bottom line is, during the evaluation process people bought packages, and if someone bought a copy of the standard package before we implemented it, we let them keep it," Kahn said. "We then found that when we synchronized the calendaring program around the WAN, it corrupted everyone's database."

No data was lost as a result of the corruption.

What's in a name?

Kahn said the data corruption occurred because some users who had already installed CaLANdar did not follow naming conventions or were using their network identifier as a calendaring log-on.

The CDC fixed the problems over the weekend of May 22, cutting the bad links, fixing the data and cleaning out bad data. The system now runs fine.

Kahn said the CDC initially decided to standardize on a calendaring program when a number of managers began using the packages for their calendar, address book and scheduling features.

"If we were going to have calendaring, [management] wanted a way to do it across the centers, and to do that we needed a uniform calendaring system CDC-wide," Kahn said.

Now more than half of the CDC's 10,000 employees use CaLANdar, which will schedule meetings and synchronize them across the network. It runs over Microsoft Corp.'s Mail package.

Kahn said the CDC is also testing a way to synchronize data from Sharp Corp. Wizards, which it may give to top managers to improve their efficiency in scheduling meetings.

Emerald releases LAN backup equipment for NetWare

By Michele Dostert

Emerald Systems Corp., the San Diego-based network backup vendor, has introduced an inexpensive hardware/software backup solution for local-area networks running Novell, Inc.'s NetWare 2.X and 3.X operating systems.

The hardware/software bundles, called XpressTape for NetWare, include both workstation-based and file server-based NetWare Loadable Module configurations, with peak data transfer rates of 18M byte/min.

XPressTape drives have a Small Computer Systems Interface for faster backup and higher reliability, as well as support of Quick File Access for fast retrieval. Both full and incremental backup sessions can run unattended, and the software can handle open files. XpressTape can facilitate disk grooming by archiving dormant files to tape and deleting them from the file server.

The package comes in two capacities: 525M bytes, starting at $1,195, and 2G bytes, starting at $1,495. Adaptec, Inc. controllers are sold separately.

Emerald is also planning to release, within a few weeks, XpressTape support for Artisoft, Inc.'s LANtastic; Tiara, Inc.'s 10Net; and Novell's NetWare Lite peer-to-peer network operating system.

"We have designed XPressTape as a cost-effective, warrantied, high-capacity, DOS-based solution for networks needing up to 2G bytes of storage," said Andrew Eccles, Emerald Systems' director of product marketing.

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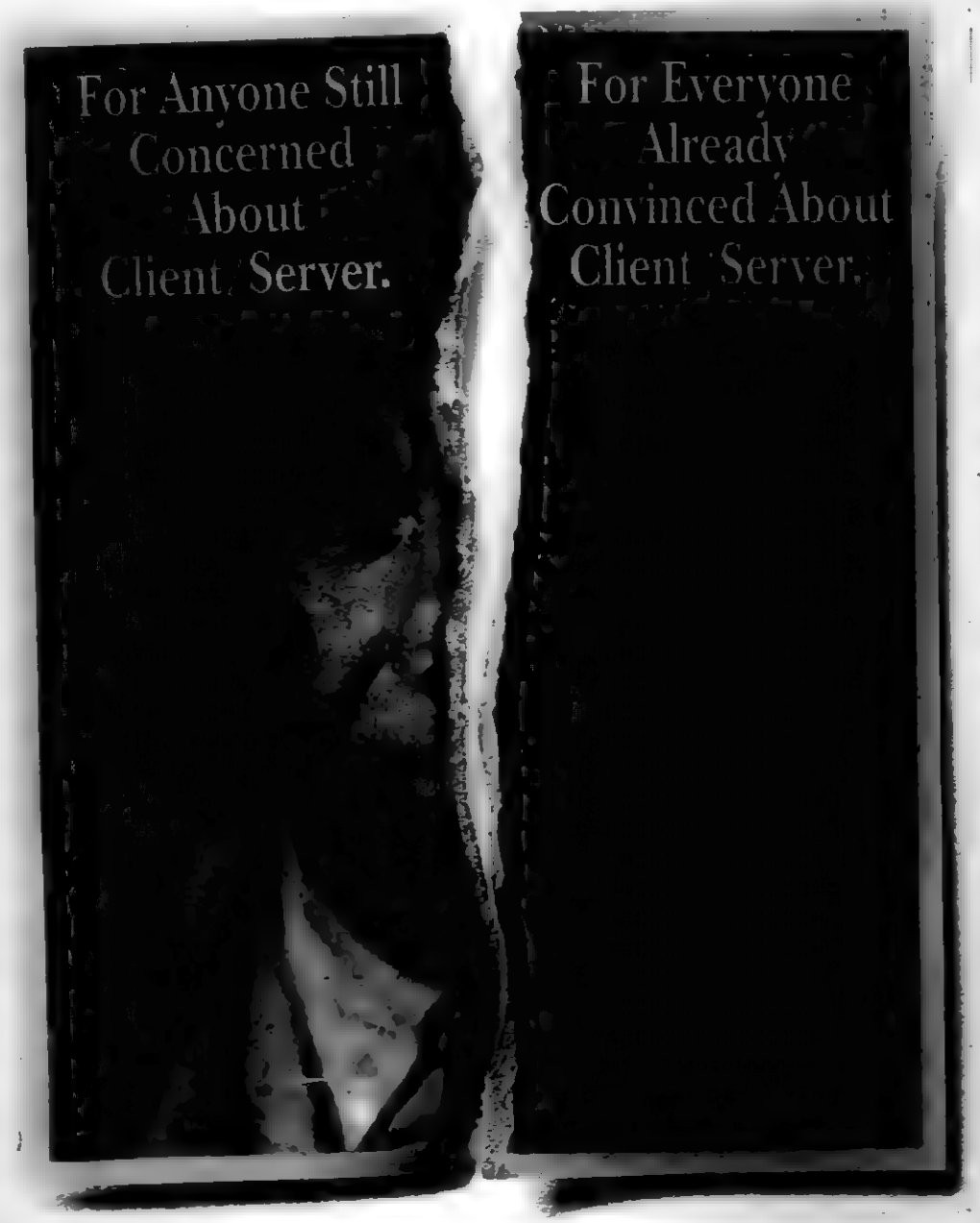

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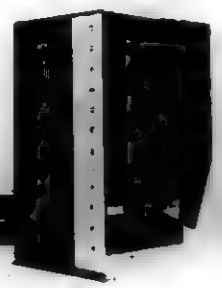

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Fax integration theme of software, server products

Combo will increase options for LAN/fax harmony

By Lynda Radosevich

By the end of this summer, users will have more options for integrating the plebeian fax with their local-area networks, thereby reducing paper flow and adding electronic organization capabilities to the fax processing.

At Spring/Comdex '93, Toronto-based Delrina Corp. announced a network version of WinFax Pro fax software. The software, which is scheduled to ship in the third quarter, lets users on a network share one or more standard fax modems, and it does not require a dedicated fax server.

Randall Meston, a senior engineer at KVOA-TV in Tucson, Ariz., uses the PC version of WinFax Pro and envisions using the network version to help organize the roughly 100 faxes per day that come into the TV station's newsroom.

"We want to computerize and centralize the tracking and routing of faxes so that people don't have to wonder, 'Who lost that sheet of paper?'" Meston said.

The fax software works with Novell, Inc.'s NetWare and NetWare Lite, Artisoft, Inc.'s LANtastic and Microsoft Corp.'s Windows for Workgroups. It can also work with messaging application programming interfaces (API) such as Vendor Independent Messaging, Microsoft's Messaging Application Programming Interface and Novell's Message Handling Service.

The API support allows users to integrate faxes with other Windows applications. For example, an incoming fax message can be attached to a work-flow form and routed through an organization, Delrina said.

WinFax Pro for Networks starts at $399 for two client licenses. One server license supports four fax/modems.

LAN fax server introduced

Also at Comdex, Futurus Corp. in Atlanta demonstrated a LAN fax server for its Team electronic-mail software for DOS and Windows PCs. Shipping now, the fax server is somewhat limited to use with Futurus Team, a Futurus spokesperson said. However, for Team users, the server allows fax viewing and sending from the desktop and the ability to send faxes from within Windows applications.

Pricing for Futurus Team Fax starts at $795 for a 25-user pack.

Fax resource accessing

WordPerfect Corp. said WordPerfect 6.0 for DOS word processing software, scheduled to ship June 28, will work with a fax specification that lets users access network fax resources from within WordPerfect. The specification is called FaxBIOS and is supported by $995 fax server software from Optus Software, Inc. in Somerset, N.J.

In addition, Microsoft will demonstrate in New York this week its vision of an integrated office based on the Windows operating system. A main component of the Microsoft office architecture is coordinating fax services with Windows. To that end, Ricoh Corp. in West Caldwell, N.J., plans to unveil this week a new fax machine designed to run over networks of Windows-based machines.

In Brief

Sun, Fujitsu partner

Sun Microsystems Computer Corp. said recently that it will jointly develop its next generation of MicroSPARC reduced instruction set computing chips with Fujitsu Microelectronics, Inc. in San Jose, Calif. Fujitsu Ltd. has been associated with Sun Scalable Processor Architecture (SPARC) chips since 1985. The MicroSPARC II, which is based on .5 micron CMOS technology, will be used in desktop computers, portables and servers that run SunSoft's Solaris 2.X operating system. Samples of the new chips are scheduled to be released to vendors later this year, according to Sun.

HP licenses infrared

Hewlett-Packard Co. has lined up a number of licensees for its serial infrared technology [CW, May 10]. Sun Microsystems, Inc., Intel Corp., Traveling Software, Inc., EO, Inc., Extended Systems, Inc. and the Portable Computer Communications Association have either licensed the technology or announced support for HP's efforts. Sources said NCR Corp., Zenith Data Systems and Tandy Corp. are expected to sign on as well. HP has scheduled an infrared standards committee meeting for June 28.

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[redacted]

Unix

Information Foundation has announced a new packaging and pricing strategy for its Unix System V, Release 4.2 products designed for Intel Corp.'s platforms.

The Enhanced Unix Desktop is Information Foundation's entry-level Unix offering and comprises the X Window System, a complete Unix runtime environment, graphical system administration tools, the graphical Unix Desktop Manager, the Windowing Korn Shell, a full implementation of Transmission Control Protocol/Internet Protocol, a full set of advanced Unix utilities and on-line Unix manual pages.

The license-only version of the Enhanced Unix Desktop costs $249. The tape version costs $290, and the disk version costs $399.

▶ *Information Foundation*
Suite 1900
1200 17th St.
Denver, Colo. 80045
(303) 572-6486

Workgroup software applications

Computervision Corp. has announced Personal Designer, Revision 6.0.

The product is part of the company's three-dimensional computer-aided design (CAD) software family. The revision comprises Personal Designer software that was created for mechanical design, a user programming language, a 2-D version of Personal Designer called MicroDraft, Personal Designer Data Extract and the Personal Designer/CADDS Direct Translator for interoperability between Personal Designer software and the company's CADDS workstation software.

A Personal IGES translator interchanges files with other computer-aided manufacturing and CAD systems with the Initial Graphics Exchange Specification (IGES) data exchange format.

Data can be exchanged within any system that can read and write in the Drawing Interface File Format with the Personal DXF translator.

Personal Designer costs $3,995.

▶ *Computervision*
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Epoch Systems, Inc. has announced EpochBackup, client/server enterprise backup and recovery software.

According to the company, the product offers a high-performance architecture that ranges from small to extremely large networks and adjusts to expanding enterprise configurations. EpochBackup automatically backs up and restores files that are on heterogeneous servers and workstations. The product is available on Sun Microsystems, Inc.'s Solaris 2.2 operating system and Sun Microsystems Computer Corp.'s SPARCserver 1000 system and SPARCcenter 2000.

Prices start at $2,200.

▶ *Epoch Systems*
8 Technology Drive
Westboro, Mass. 01581
(508) 836-4300

Clarify, Inc. has announced ClearSupport 2.0, a technical support management system, and ClearQuality 2.0, a defect tracking system.

The products are part of Clarify's customer service management system and offer a range of reports and other methods for extracting data from the database, the company reported. ClearSupport 2.0 provides enhancements such as parts and serial number management that enable users to follow an individual product through its life cycle, the company said. A variety of ease-of-use and administrative improvements and printing capabilities have been added. ClearQuality 2.0 has features that identify duplicate defects. Source-code control interfaces and numerous printing and reporting enhancements are included.

A typical ClearSupport configuration is priced at $6,000. ClearQuality is priced at approximately $4,000.

▶ *Clarify*
2702 Orchard Pkwy.
San Jose, Calif. 95134
(408) 428-2000

Storage

Tapedisk Corp. has announced Tapedisk, a software device driver.

According to the company, the product enables chosen digital audio tape and QIC-1000 tape drives to emulate hard disks, complete with a DOS-assigned drive letter designation.

Gigabytes of data can be accessed by users who can read, write and revise archive files that house hundreds of megabytes of data.

Tapedisk provides a variety of applications such as identifying and automatically storing only updated files, the ability for a single command to make an exact copy of all locally connected hard disks onto a Tapedisk cartridge and the ability to eliminate the need to download files to the hard disk from the tape. The product runs under MS-DOS 5.0 or higher, Microsoft Corp.'s Windows 3.1 and Windows for Workgroups.

Tapedisk costs $199.95.

▶ *Tapedisk*
2908 Pond du Lac Road
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Users turn to routers for managing bandwidth

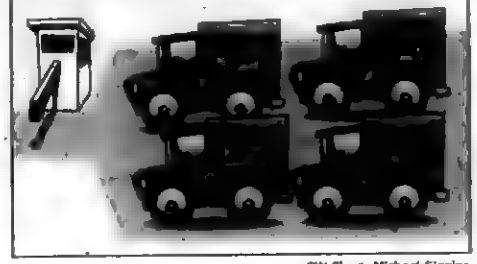
By Joanie M. Wexler

Companies scaling up their local-area network applications to run enterprisewide are faced with having to maintain the consistent response times LAN users have come to expect, which can be hamstrung by relatively sluggish wide-area links.

To police greedy LAN protocols, which were originally designed to run solo and will hog as much of the limited wide-area network bandwidth as they can get, many firms are allying with their multiprotocol router vendors against clogged wide-area arteries.

Who goes there?

Router schemes for managing bandwidth on multiprotocol backbones vary from prioritizing traffic by protocol to SNA class-of-service granularity



CW Chart: Michael Siggins

Router cops

Increasingly, routers — the cornerstones of LAN internetworks — are gaining filtering, compression and traffic prioritization algorithms designed to help users maximize their WAN circuit use. The prioritization schemes, which vary in sophistication and granularity from vendor to vendor (see box page 63), help ensure that no single traffic type on a multiprotocol backbone gets "starved" for bandwidth.

"The challenge is trying to run complex networks over low-speed lines," explained Kevin Tolly, president of Interlab, an equipment test lab and consulting firm in Sea Girt, N.J. "NetBIOS-based applications such as NetWare, Lotus' Notes and CC:Mail were not designed for low-bandwidth environments. Some people scaling up are starting to get burned."

"Everybody's first tack should be eliminating unnecessary traffic on WAN links [through filtering]," advised Jim Tretter, telecommunications manager at Multifoods in Minneapolis, a Wellfleet Communications, Inc. router shop. "Then, we need a mechanism to prioritize traffic effectively."

Multifoods is running an older Wellfleet platform that supports no traffic prioritization; however, this month the vendor will bring its older platforms in line with its newer Backbone Node line of routers, Wellfleet said.

This means the older line will support the same basic level of prioritization as the Backbone Node, called "protocol queuing." This scheme lets users specify traffic types to be dumped into various "bins" designated for high-, medium- or low-priority transmission. When the high-priority bin is empty, the router takes traffic from the next-level bin and so on.

Time-sensitive traffic, such as terminal-to-host protocols, usually has a higher rank than file transfers, as response time delays are more noticeable, and sessions can actually time out. Customers of vendors supporting the "bin" method can usually specify some number of packets or length of time after which the router will leave data still sitting in a higher priority bin and move on to the next, so that no traffic type is constantly neglected.

"What we'd really like is priority within a protocol — that's what people are used to with SNA," Tretter said.

Routers, *page 63*

Practically Speaking

In addition to traffic prioritization, data compression and packet filtering, vendors offer their own enhanced routing algorithms for higher throughput through bandwidth-, buffer- or media-constrained networks. Algorithms such as Open Shortest Path First, Novell, Inc.'s NetWare Link State Protocol and 3Com's Advanced Peer-to-Peer Networking routing algorithm take pains to update other routers in a WAN only when something in the network changes, not on a predefined basis. This reduces unnecessary communications overhead.

Multiplexers

NET takes T1 one better

By Joanie M. Wexler
REDWOOD CITY, CALIF.

■ Innovation graced the T1 multiplexer market recently when Network Equipment Technologies, Inc. (NET) introduced a device that brings to private networks the on-the-fly bandwidth allocation efficiencies found in public-switched Integrated Services Digital Network (ISDN).

NET's ISDNX Server Module, which conforms to National ISDN-1 Primary Rate (1.5M bit/sec.) standards, turns NET Integrated Digital Network Exchange (IDNX) backbones into flexible masses of bandwidth that can expand or contract in sync with shifting application requirements.

By contrast, in typical T1 networks today, users dedicate each of the 24 64K bit/sec. circuits that make up a 1.5M bit/sec. T1 to a particular application; those circuit allocations remain fixed until the user changes them or until a preset time, whether or not they are carrying traffic.

During the first half of next year, NET will add inverse multiplexing to allow the IDNX to play the dual role of private switch and public network access device, said Bob Schiff, NET's director of IDNX product marketing. The combined capabilities will represent NET's congestion overflow control scheme: The IDNX will decide on the fly whether a given application should run over the private backbone or the public Primary Rate ISDN network.

Some IDNX shops are intrigued by these capabilities because of growing corporate interest in full-motion video communications — an application ripe for ISDN because it requires a wide chunk of bandwidth when it is being used but runs sporadically enough that users do not want to nail up network resources for it.

NET, *page 62*

McData captures SNA

By Elisabeth Horwitt
BROOMFIELD, COLO.

McData Corp. recently added fodder to the industry debate over what type of communications box is most suitable for putting IBM Systems Network Architecture (SNA) over the corporate internetworking backbone.

McData announced Advanced SNA/IP, a protocol that is said to allow any SNA cluster controller or gateway to encapsulate SNA packets into Transmission Control Protocol/Internet Protocol (TCP/IP) and send them to any router.

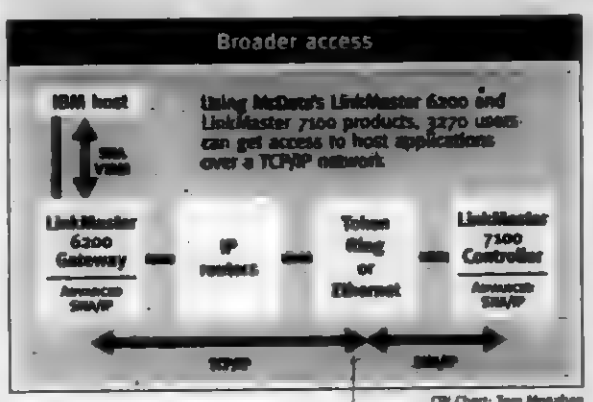
The vendor said it will make those specifications generally available for free in the hopes of generating an industry standard. SNA controllers, such as McData's LinkMaster family, connect SNA hosts, terminals and cluster controllers to local-area networks and router backbones.

If the SNA controller takes responsibility for putting TCP/IP headers on an SNA packet, routers can then handle SNA traffic as if it were straight TCP/IP, without tying up their CPU with SNA routing chores, a McData spokesman said.

Cisco Systems, Inc., meanwhile, is working on a host channel connection for its high-end 7000 router, which would eliminate the need for an SNA controller such as McData's to handle traffic to the host, a Cisco spokesman said. Cisco denied the need to offload SNA processing from its routers.

But some users felt differently. Howard University, for example, is in the process of connecting 60 buildings over a Fiber Distributed Data Interface (FDDI) backbone consisting of Cisco AGS Plus routers running TCP/IP. The routers will not need to handle SNA traffic because McData controllers will already have encapsulated the SNA within IP packets, said Lorenzo Washington, assistant director of telecommunications.

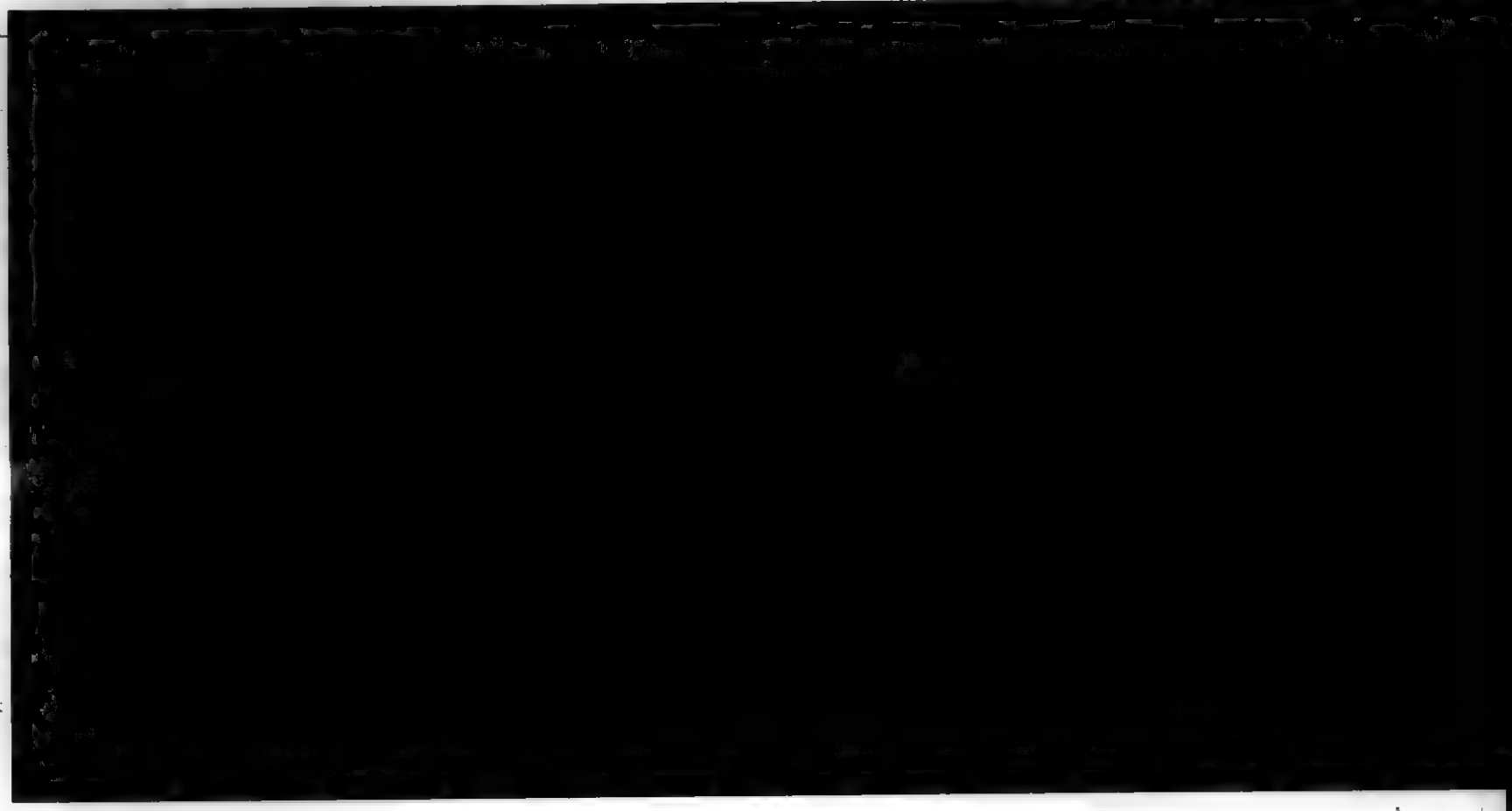
The university had already installed McData's 6200 channel-attached controllers as front ends to handle traffic to IBM mainframes at the university's data center. McData 7100 controllers were being used to put 3270 devices onto Ethernet LANs. Now the 7100s will be used to give those 3270 devices a TCP/IP-based connection to the FDDI backbone, Washington said. "I'd like my 3270 users to be able to use the same cable plant, concentrators and fiber-optic backbone" as PCs running TCP/IP, he said.



CW Chart: Tom Monahan

McData said its LinkMaster 6200 SNA communications processors will support Cisco's Remote Source Route Bridging protocol for encapsulating SNA into TCP/IP packets. In addition, McData said it plans to support a future industry standard based on IBM's Data Link Switching protocol.

Is there anything your mainfra



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HP bulks up net manager

OpenView for Windows readied for end users

By Elisabeth Horwitt

Hewlett-Packard Co. is grooming its OpenView for Windows, a runaway success in the network management OEM market, as an application-rich, end-user network management platform.

Like its big brother OpenView for Unix, the Microsoft Corp. Windows-based product uses Simple Network Management Protocol (SNMP) for managing networks and networked systems.

The Windows platform, which is much more widely installed than the Unix version, has primarily been an OEM product that network and systems vendors use to build network management systems.

Recent and upcoming HP announcements aim to position the product as a low-end platform that would be sold by value-added resellers, HP said. OpenView for Unix is sold directly to users.

OpenView for Windows could manage a particular type of network system or site, while the Unix-based OpenView manages the enterprise, the spokesman said. It is offering some of the same functionality and graphical look and feel as the Unix version.

In addition, HP is expanding third-party network management application support for its Windows product and plans early next year to introduce an application of its own for the platform. Workgroup Node Manager will enable OpenView for Windows nodes to actively monitor and manage SNMP-based devices, along the lines of the Network Node Manager HP offers for the Unix version.

An SNMP Management Information Base compiler will allow the Windows platform to interact with management functions that are specific to a given network device.

The newly released OpenView for Windows Version 7.0 incorporates an enhanced graphical user interface with a status and tool bar for quick access to frequently used commands and simultaneous displays of multiple network submaps. A new alarm manager performs alarm filtering, sorting and history reporting. In addition, the platform's SNMP services have been enhanced to support Novell, Inc. IPX networks.

Version 7.1, scheduled for release in August, will be able to automatically discover all Transmission Control Protocol/Internet Protocol and IPX devices on a network and lay them out hierarchically on a network map. The SNMP Manager will allow users to develop management applications that browse, poll and graph the statistics and data collected from SNMP-compatible network devices.

In addition, Remedy Corp. announced that its Action Request System, which tracks problems, will run on OpenView for Windows, as it now does on the Unix version.

A runtime license for OpenView for Windows 7.0 and 7.1 is $595.

NET takes T1

CONTINUED FROM PAGE 59

"What we might very well use this for is as an 'extension cord' to a carrier's ISDN service, which we are looking to for on-demand videoconferencing," said David McConnell, advisory telecommunications consultant at McDermott, Inc., a New Orleans-based IDNX shop.

The ISDN-over-T1 would fill in the gaps in locations where ISDN service is not available, McConnell explained.

Video on demand

Pacific Gas & Electric Co. is also interested in someday leveraging its IDNXs for efficient videoconferencing. "We want to schedule video sessions on demand, not make them permanent calls," said Jennifer Soon, IDNX manager at the utility.

NET estimates that users should realize 25% to 30% savings in hardware and transmission costs, largely because of increased bandwidth efficiencies.

For example, at the U.S. Air Force, which has been testing the ISDNX and inverse multiplexing modules, "we have offloaded video and fax call setup from a network administrator to the end users," said Lt. Col. Bill Thomas, director of the Air Force's Washington, D.C.-based information technology group. The Air Force runs a nationwide NET backbone.

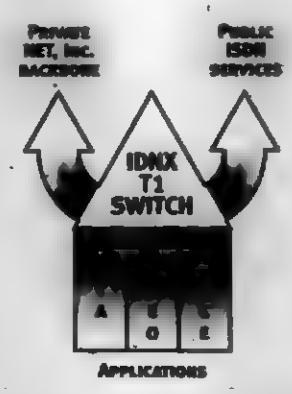
"We've gained better bandwidth utilization by letting users set up calls when they need them, rather than having an operator plan out end-to-end connections," Thomas explained.

The ISDNX will be generally available across the IDNX line next month in North America.

The $10,000 module supports up to seven Primary Rate Interfaces; users must also buy T1 interfaces for the module, which cost $4,750 for two T1 ports, Schiff said.

Mux goes AC/DC

Outfitted with ISDN and inverse multiplexing modules, NET's T1 switch can direct traffic over a public switched or private network



CW Chart: Tom Monahan

Routers aid bandwidth management

CONTINUED FROM PAGE 59

Some devices will rank services within Internet Protocol (IP) or by IBM Systems Network Architecture's (SNA) inherent class of service characteristics. IBM's 6611 Network Processor supports SNA class of service but so far has no mechanisms for ranking other protocols, the company said.

SNA prioritization

Meanwhile, router market leader Cisco Systems, Inc. supports three SNA prioritization levels in addition to protocol queuing, LAN-by-LAN prioritization and priority based on packet size, according to the company. Cisco said SNA users can rank traffic on a service-by-service basis, by which cluster controller the user is attached to or by an individual resource on a given controller.

However, "administering the router on an individual-resource basis sounds nightmarish," said Jon Castle, an engineer at Cisco shop Commonwealth Edison in Chicago. "We'll eventually squeeze IBM protocols through our routers, so we'll need the SNA schemes. But I can't see doing it down to the individual level."

Cisco shop Convex Computer Corp. in Richardson, Texas, uses Cisco prioritization in the IP world to "overcome serialization delay" when X Window System and character-based IP terminal traffic collides with Convex's multimegabyte-size file transfers, said Coyne Gibson, manager of information technology.

Share and share alike

Some vendors, including Advanced Computer Communications in Cupertino, Calif.; and Proteon, Inc. in Westboro, Mass., offer sophisticated bandwidth "sharing" techniques. Advanced Computer's routers take responsibility for dynamically allocating chunks of bandwidth to a given set of traffic based on need. Proteon ensures session integrity with a similar scheme, which requires network managers to reserve the amount of bandwidth they anticipate each protocol will require.

Who does what?

The router companies listed employ the following data prioritization schemes to some degree:

- **Protocol queuing:** Advanced Computer, Cisco, CrossComm Corp., Proteon, Retix, 3Com Corp., Wellfleet.
- **SNA class of service:** Cisco, IBM, Proteon.
- **Bandwidth sharing:** Advanced Computer, Proteon.
- **Prioritization within some routed and bridged protocols:** Cisco, Proteon, 3Com, Wellfleet.

No vendors today prioritize by application; however, if they did, users would likely suffer a performance hit and a destabilization of some applications, Tolly pointed out. It is for this reason that Commonwealth Edison prioritizes only its time-sensitive Digital Equipment Corp. Local-Area Transport protocol. "We don't rank any others because it does add latency to the router," Castle said.

In Brief

Printing standard support

Hewlett-Packard Co., IBM and Microsoft Corp. collectively voiced their support recently for an open standard for network printing management. Specifically, the companies rallied behind Simple Network Management Protocol (SNMP) for network printing. HP printers already support SNMP, but the company said voicing its support was necessary to help clear confusion about network printing management standards.

Dial-in Vines

Centrum Communications in San Jose, Calif., rolled out a version of its remote network server that supports **Banyan Systems, Inc.**'s Vines network operating system. The server will allow travelers or people working from home to connect to their corporate LANs using a phone line and modem.

EDS to deliver movies

Electronic Data Systems Corp. said it has reached a tentative 10-year agreement with hotel movie provider **Spectradyne, Inc.** in Richardson, Texas, under which EDS will deliver digitized movies to hotels. This will allow hotels to change movies on a daily basis. The initial phase calls for EDS to transmit via satellite, but by early next year EDS expects to install on-site mass storage.

Closer LAN/WAN ties

General DataComm, Inc. said recently that it will offer hardware installation, maintenance and support services to customers of internetworking vendor **CrossComm Corp.** in the continental U.S. General DataComm already resells the CrossComm II.AN family of routers. The companies said they are also collaborating on multimedia internetworking systems for sending a variety of traffic types across wide-area networking facilities.

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Emergency response

Toxins database nixed

By Mitch Betts
WASHINGTON, D.C.

For more than 15 years, entrepreneurs, fire fighters and some members of Congress have dreamed of a centralized database for tracking all hazardous material shipments in the U.S.

Then, whenever a truck or railcar crashed, officials could dial into the system and know what hazards they faced. A month ago, however, a blue-ribbon panel nixed that idea as just an expensive pipe dream.

Instead of an independent government system, the Transportation Research Board of the National Research Council said it would be more cost-effective to piggyback data on hazardous materials on electronic data interchange (EDI) and shipment-tracking systems already being implemented by private-sector shipping and transport firms.

Room for improvement

Rep. Douglas Applegate (D-Ohio), the lead sponsor of legislation to create the centralized database, naturally was disappointed with some conclusions of the report.

But he also said the study did verify that the current system of providing information to emergency responders is inadequate.

Applegate said he will press on for congressional hearings and federal pilot programs to demonstrate the value of computerized information to emergency responders.

Interest in creating a nationwide information system was prompted by highway accidents involving trucks carrying toxic chemicals or radioactive materials [CW, Aug. 20, 1990]. If the paper manifest or warning placards are missing or inaccessible, then fire fighters and other emergency personnel do not know what hazards are present.

The trucking industry was pleased with the report, which confirmed the industry's contention that the system proposed by Applegate would be impractical and expensive.

The research panel estimated that a centralized system would cost $300 million to start and $250 million a year to maintain, with no assurance that the information supplied to the government database would be reliable or helpful to emergency responders.

Step by step

The committee's report called for a phased approach of adding emergency-response capabilities to corporate information systems and then, perhaps, using a value-added network service provider to act as a clearinghouse.

"Making use of systems that [are] in routine daily use for business purposes would be the best way to attain reliability, and the costs of such a strategy would be much less than the costs of procuring a stand-alone system," the report said.

The study recommended that the U.S. Department of Transportation implement some pilot programs to test the technical, business and human factors involved in hazardous shipment information networks.

VisiNet network software to run under Novell NMS

By Michele Dostert

VisiSoft, a Norcross, Ga.-based subsidiary of Technology Dynamics, Inc., has announced that its VisiNet network management software will now run under and report to Novell, Inc.'s NetWare Management System (NMS) platform. No pricing has been announced, but the product is scheduled to ship in the third quarter of this year.

"Whereas NMS will just tell you that you have a problem, VisiNet on NMS collects the historical background of the problem into a database. With the performance data, you can not only diagnose problems but catch anomalies early enough to prevent problems," said Mitch Kramer, an analyst who follows network management issues at Patricia Seybold's Office Computing Group in Boston.

According to VisiSoft executives, VisiNet will add value to the NMS platform by giving user statistics on NetWare 2.x, as well as additional statistics on NetWare 3.x, from the NMS console. VisiNet will also let users monitor, from within NMS, activity on other network operating systems, such as Microsoft Corp.'s LAN Manager, IBM's LAN Server and other NetBIOS local-area networks. VisiNet on NMS will allow users to run both Simple Network Management Protocol and NetWare IPX applications on a single console.

Enhanced views

VisiNet, which can be launched through the NMS console like any other NMS application, will provide a power scripting language for enhanced alarm notification, hierarchical views of the network through a Microsoft Windows-standard graphical user interface and distributed network management.

VisiNet/NMS users reportedly will also be able to import bit-mapped files for custom backgrounds, allowing managers to overlay their logical network onto a physical map of the premises. Support for Microsoft's Dynamic Data Exchange and Object Linking and Embedding allows alarms to be passed to remote sites.

[redacted]

WAN software

ACC Systems has introduced the ACP 3000 Series of multiprotocol wide-area network (WAN) Small Computer Systems Interface communications processors.

The products were designed for Sun Microsystems, Inc.'s workstations and servers. The series functions as a network front-end processor with one or more WAN connections and provides Sun system users with protocols including X.25 and High-Level Data Link Control.

As many as 24 serial ports can interact with different processors and protocols and various operating systems.

Prices for the ACP 3000 Series start at $3,000.

▶ *ACC Systems*
Suite A
720 Santa Barbara St.
Santa Barbara, Calif. 93101
(805) 963-8801

Gateways, bridges, routers

LANart Corp. has announced its 24-port workgroup hub.

According to the company, the product is a managed wiring hub that, together with a companion 24-port extension hub, provides maximum flexibility and price/performance for as many as 48 users of Ethernet local-area networks.

The 24-port workgroup hub was designed for 10Base-T networks and comes standard with an AUI backbone port. It also provides 24 twisted-pair ports that can be used with either unshielded twisted pair or shielded twisted pair.

The 24-port workgroup hub with Simple Network Management Protocol (SNMP) support costs $1,995. The RS232-managed version costs $1,495. The 24-port expansion hub costs $1,195 for SNMP and $995 for RS232.

▶ *LANart*
145 Rosemary St.
Needham, Mass. 02194
(617) 444-1994

Xyplex, Inc. has announced the 220 Hub/Router, a module that creates an Ethernet subnet in any slot in the hub. It was designed for the Network 9000 Intranetworking Hub series.

When the product is added to a 10Base-T concentrator in a single Network 9000 slot, users within a small group receive their own dedicated 10M bit/sec. of bandwidth, the company said.

Through standards-based routing and bridging, users can communicate with other users connected to the network. The 220 Hub/Router supports routing of Digital Equipment Corp.'s DECnet, Internet Protocol, IPX and Apple Computer, Inc.'s AppleTalk.

The 220 Hub/Router costs $3,750.

▶ *Xyplex*
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

X Window System

Integrated Computer Solutions, Inc. has announced the Display PostScript Software Development Kit (SDK) for the X Window System.

The kit provides an open graphics development environment that runs across multiple Unix-based platforms, enabling portability of development work done on one Display PostScript system to another Display PostScript system.

Along with several enhancements, the SDK offers reference material and an extensive set of tools for programming for the X Window System.

A single user price of the SDK is $500.

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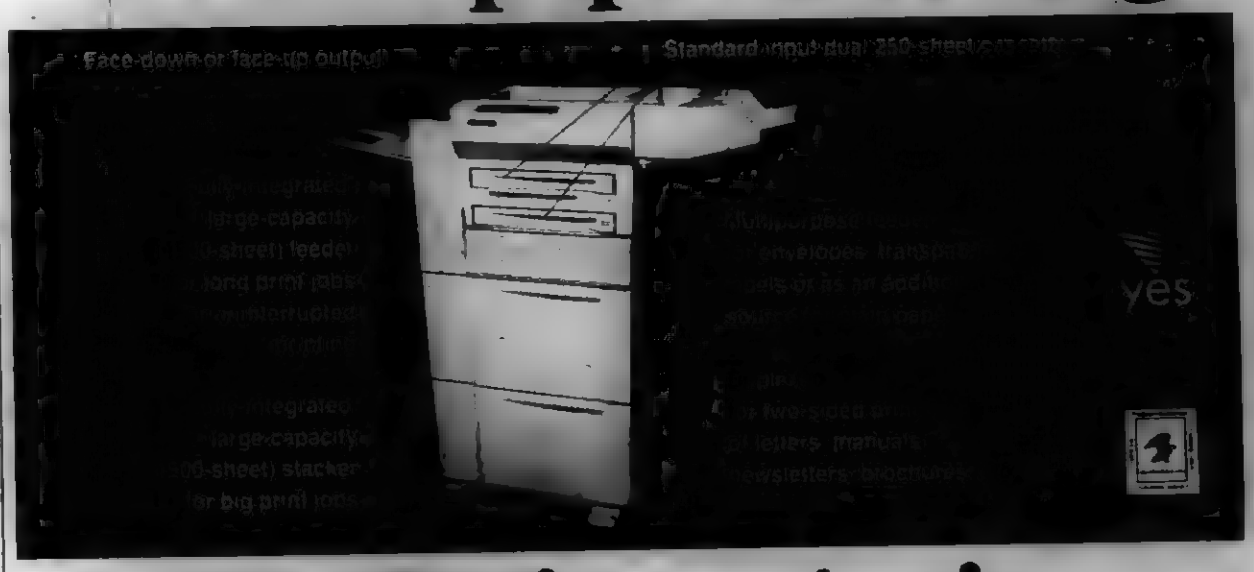

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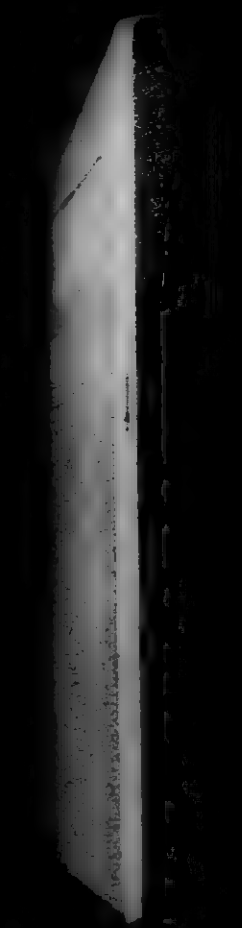

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Systems keep Las Vegas dazzling

By Thomas Hoffman
LAS VEGAS

This city has lights. Lots of lights. And those lights are not just on The Strip. Behind the famous flash and neon of miles of casinos, the homes and businesses of one of the fastest growing regions in the U.S. are gobbling electricity.

That means the Nevada Power Co. has had its hands full trying to keep costs down while attempting to meet electricity demands. The population of the Greater Las Vegas area has swelled more than 30% in the past 10 years, according to the U.S. Bureau of the Census. That growth has fueled Nevada Power's 8% to 10% annual customer growth.

Large commercial customers, including casinos, government agencies and military bases, represent about 40% of Nevada Power's revenue stream.

Analysts said the company's electricity rates are among the lowest in the nation. But like players in other industries, Nevada Power has been forced to keep its information systems budget flat for the past three years, according to Gerald Verchick, the utility's IS facilities manager. "The regional population growth has indirectly had an adverse effect on IS since we're being asked to provide more data while keeping a level IS budget," he noted.

For 1993, Nevada Power allocated $15 million, or 2.5% of its revenue, to corporate information technology.

Furthermore, deregulation in the utilities industry is posing a threat to Nevada Power's near-monopoly of this region.

As a result of these market changes, the $557 million utility has decided to take a sharper look at how it can position its information systems to help meet the needs of its 383,000 customers while keeping its competitors at bay. "The only companies that have survived where deregulation has occurred, such as the airline industry, were those with faster, cheaper information," said Sherry Jackson, manager of Nevada Power's information center.

Move to 4GLs

Nevada Power is leveraging its IS investments in several ways, according to Verchick. The utility has started to shift from its Cobol roots by developing more flexible applications using fourth-generation language (4GL) software.

For example, Nevada Power is currently writing code for Best, or the Budgeting, Estimating, Scheduling and Tracking system, a 4GL-based application that was developed using Software AG's Natural software suite. Best, designed to track the time and material needed for work orders, should be in prototyping by the end of this month. Verchick said Best will access data from a customer information system used daily by 750 of the company's 1,700 employees.

Mainframe application development using 4GL, object-oriented and computer-aided software engineering tools has become status quo in the utilities industry, according to experts. "It makes sense for them to do this in order to be as up-to-date as possible with a mainframe"

Nevada Power, *page 70*

ON SITE

Nevada Power
Las Vegas

Challenge: To serve a burgeoning customer base and forestall competitors.

Technology: ES/9000 Model 521 and RS/6000 servers, D&B Software's Millenium 4GL and Software AG's Natural 4GL system.

Results: Reduced CPU use; renegotiated hardware maintenance agreement. Total savings of $130,000 annually.

Nevada Power's Gerald Verchick *tries to balance customer needs with budgetary realities*

HP user-based pricing stalls

By Mark Halper

■ When Hewlett-Packard Co. began a transition from processor-based to user-based software pricing late last year, Rich Sevcik, the company's top minicomputer executive, said the switch would not be an easy one. He was right, as far as users of the proprietary HP 3000 line are concerned.

Although it has been six months since HP announced its shift [CW, Dec. 21, 1992], the company has yet to ship the NetLS user-tracking software that will ease HP 3000 shops into the new pricing paradigm.

HP plans to build NetLS into the MPE/IX operating system that drives the 3000 but will not commit to a date, outside of saying it will be available this year.

Users' frustrations came to light recently when an information systems buyer from one of HP's largest customers, State Farm Insurance Cos., aired her concerns at an open microphone session during an HP user conference in April organized by HP user group Interex in Seattle.

Kathryn Nemec, computer products administrator at State Farm in Bloomington, Ind., applauded HP's intentions but bemoaned HP's failure to date to build NetLS into the MPE operating system. Without NetLS, tracking software use is difficult at best, she said.

HP reassured her that it is working on the product. But it does not appear to be coming around quickly.

For instance, HP will not have early versions of the product to show developers who are flocking to an HP "technology camp" in Sunnyvale, Calif., this week.

Other users said they share State Farm's concerns but declined to talk about it on the record. However, they did say they are happy that HP is moving in the right direction, even if slowly, in making the complicated shift.

"I do get a sense of frustration from third-party software vendors and from users that things seem to be taking a long time," said Wayne Holt, director of research and development at HP software partner Software Research Northwest, Inc., a Vashon Island, Wash., developer of higher education administrative programs.

One user noted that even though HP does not yet offer NetLS to track use, it nonetheless charges the shop on a user-based schedule. The source, who asked not to be identified, said the IS shop simply guesses on the low side at its use and notifies HP that it will pay any difference if more users are uncovered later.

Jerry Kopecky, manager of IS operations at IVI Travel, Inc. in Northbrook, Ill., said HP has not communicated plans to offer NetLS anytime soon.

He suggested that in the interim, users may want to develop their own tracking software, or a third-party developer could seize the market opportunity.

As Sevcik noted during the NetLS announcement, one of the tricks will be coordinating with third-party software developers. But before HP and its software partners can begin to get their user pricing schedules in sync, developers will need NetLS specifications.

Once developers receive the specifications, it will still take about six months to write hooks to the monitoring software, noted Birkett Foster, president of M. B. Foster Associates Ltd., a Chesterville, Ontario, developer of end-user tools.

"The HP marketing team was perhaps premature in setting the stage for user-based pricing," Foster observed.

But as Foster and others said, as lengthy a process as it

HP users, *page 68*

Pricing options

Processor-based pricing (or double jeopardy): Users pay more for software as they upgrade hardware, even if they do not increase the number of users.

User-based pricing: Users pay for hardware upgrades only once. Software prices increase only as the shop adds users.

Johanna Ambrosio

Nobody is listening!

There is a massive disconnect going on in IS departments throughout America, based on what I've been hearing from the trenches lately. Conversations with programmers, analysts, database administrators, operations folks and mainframers of other stripes show that what is happening surrounding the adoption of client/server technology is downright disturbing. And this is not just a bunch of "dinosaurs" running scared from the specter of LAN operating systems; there is some of that, but the problem goes much deeper.

The central issue seems to be, in a word, communications. Many mainframers don't understand, because no one's explained it to them, why their companies are in such a rush to throw their mission-critical applications onto a bunch of immature technologies. The mainframers say that all they know, usually, is that someone "in management" has told them to do this new thing. And when they raise questions about a client/server project's robustness or chances of enterprisewide success, they are usually ignored because they are associated with "yesterday's" technology.

"It's like someone telling you: Here's 50 cents, now go and get me a Mercedes," one programmer said. "And if you tell them it's not possible, they give the 50 cents to someone who says he can. Then it turns out he can't deliver it, either."

What's especially onerous is that this is seemingly a breakdown in the core of the IS department. The "us" vs. "them" issues have been going on since the beginning of computing, with the IS and business sides of the house traditionally at odds. And even in the IS shop, there have been different factions for Cobol or Fortran, IBM or DEC. But this is much different. For the first time I can remember, in 11 years of covering this industry, IS managers are perceived as being the bad guys by their own troops.

Out of touch

As one database administrator put it, "IS management has been pressured to become more business-savvy. Well, they have." But in the process, he added, management has gotten out of touch with the "real" world of what is truly possible with today's technology. "Management will promise the business side anything, but no one checks with us to see if it can be done technically," a mainframer said.

What makes this brave new world of client/server computing even more difficult, mainframers said, is the lack of company support, money and time to learn the new technologies, which many mainframers say they want to do. One reason they're having problems is that the training and travel goodies are tending to go to the PC folks these days, and another is because it is almost impossible, especially without the boss' support, to find the time to learn a new job on top of doing your current one.

What amazes these folks is that this seems to be true even when the "server" in a client/server application happens to be a mainframe and when the company has no plans to get rid of the mainframe.

The frustration was evident recently at a database users' group in Dallas. What started out as a discussion of client/server database issues became Complaint Central within about 15 minutes. A small sampling of the discussion:

User No. 1: "Developers are resistant to learning new tools to deliver the client/server applications because they're under deadlines, and it takes time to learn these new tools."

Consultant: "Management feels that if you're working on a smaller box, it should take you less time to do things. They have no concept of the learning curve involved. I was working with one major company where the philosophy was, 'Since you know Rbase, you should be able to design the SQL Server database.' But they're totally different."

User No. 2: "Management says the mainframe mentality is dead, and they found a guy off the street to write the new application. Only that won't work because that guy doesn't have the ability to integrate across platforms and doesn't have a clue about backup and recovery."

Consultant: "People want more data and more ways of getting at the data. At the same time, they also want to move everything out onto smaller boxes closer to the end user. Those are mutually exclusive concepts."

If you're an IS manager and you get this column passed to you anonymously, maybe it's time to have a meeting with the mainframers to iron out some issues.

Ambrosio is a *Computerworld* senior editor, systems and software. Her MCI Mail address is 599-8003.

Lighting firm drives data to outer reaches

By Rosemary Cafasso

While many companies appoint their corporate host as the keeper of data as they migrate to client/server platforms, Lithonia Lighting Corp. in Conyers, Ga., is going in the opposite direction.

The $700 million manufacturer of lighting equipment has designated its distributed network of servers as the corporate database of record and updates its host system once a day, said Jeff Kernan, manager of information systems. The IBM mainframe, which runs Cincom Systems, Inc.'s Supra, is now stabilized, and all new development for the network is on IBM OS/2-based servers, he added.

The strategy, Kernan said, was essentially dictated by an existing network of independent agents that Lithonia supports. However, the strategy is not without risk and requires extra focus on such issues as data integrity and security.

"The step we are taking is the servers are now the corporate systems," Kernan said. "So we have a dispersed data strategy. It's all over the place. I attempt to synchronize it periodically, but it is not in lockstep."

Different drummer

Kernan said Lithonia's strategy may be unusual because the company provides information systems services to a network of independent agents in addition to its internal users.

Furthermore, the sales and inventory-related data that agents produce each day is a more accurate corporate picture than the host system, Kernan added.

This current structure is a transitional strategy as the company moves to a full-blown client/server environment. And Kernan said that while it has held up well, it could also stir up problems.

Lithonia does not have continuously updated information on the big corporate picture. So, if an executive wanted to scan sales activity across the country to determine how certain regions were performing, the data would present a slightly outdated view of activity.

Also, agents do not have direct access to real-time information on Lithonia's manufacturing operation. "Today, we have some discontinuity," Kernan said.

The plan is to pull the manufacturing facilities into the network in 1994.

Another potential problem concerns data integrity. "This is major, and I don't want to minimize it," Kernan said. "It is something we do worry about: Where is the data, and what is the right version?"

Yet Kernan said the speed of the sales cycle is just too fast to keep the "most up-to-date status on every order." Instead, the IS department developed monitoring tools that can alert the corporate staff to system bottlenecks so they can know "when an order gets choked."

HP user pricing

CONTINUED FROM PAGE 67

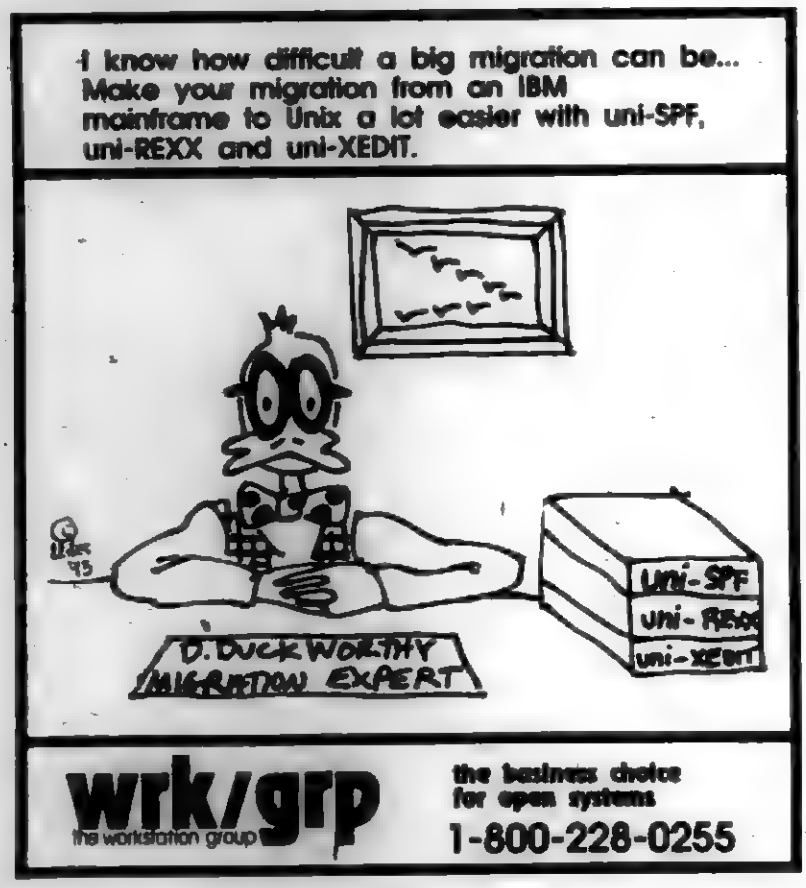
is, HP seems committed to user-based pricing. For good reason: Users are loud and clear about their interest in moving to a user-priced schedule to overcome the double price jeopardy they incur under traditional processor-based pricing.

In processor-based pricing, IS shops that already pay for a processor upgrade have to pay additional software fees to run on the stronger processor, even if they do not increase the number of users.

"I really dislike it when I change processors and get penalized by software vendors even though I haven't changed the number of people using a piece of software," Kopecky said.

Gary Osborn, chief information officer at Hughes Electronics Space and Communications Division, put it another way. "I like user-based pricing because with processor-based, every time we move up, vendors are sticking their hands out."

Tom Idema, chairman of HP user group Interex, agreed. "When a software vendor hands me a [processor-based] invoice, they may as well have a mask and a gun," he said. "It's robbery."



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Users speak out about the 'new' Wang

By Melinda-Carol Ballou

Wang Laboratories, Inc.'s reorganization into a software products company is causing grumbling among many users. But advice from those moving to nonproprietary client/server systems is clear: Move carefully and plan ahead.

Service and sales support at Wang has been going through significant changes as the company regroups, although Wang officials emphasize that they will continue supporting VS systems as long as users want and need them to.

But a Wang spokesman said user frustrations would be "short-term." He said accounts will be realigned, and people will be in place soon to service them. "The transition is well under way and should be completed by the end of June," he said.

Regardless, many are moving to open systems. For example, the Gas Research Institute (GRI) in Chicago will keep many VS systems to act as hosts in client/server configurations but will bring in Unix workstation platforms as well.

John Da Silva, a vice president at GRI, and Brendon Edenfield, vice president of information systems at Trans Leasing International, spoke at a recent Coexistence and Migration User Group conference in Chicago. They urged users to investigate options carefully before dropping proprietary Wang platforms.

"Start as early as you can to make plans so that you can move over carefully," Edenfield said. "We love the [Wang] machine and wouldn't move unless we had to. But the benefits are also tremendous once you begin to make the change."

Edenfield and others have been feeling the pinch during Wang's downsizing, according to a dozen or so users at the conference. Wang is expected to reach a low of 6,300 employees by the end of the month. Departing Wang employees are coming largely from VS systems manufacturing and to a lesser extent from sales and support, Wang said.

Wang has reduced the number of regions in its U.S. field service organization from seven to four, for example, and it will reduce its direct sales force and emphasize office software, computer-aided software engineering and imaging. Wang will use telemarketing, value-added resellers (VAR) and other third parties for many accounts.

For some end users, these changes have meant the loss of Wang resources.

"They have chosen the customer base that they want to focus on and have turned the rest of us over to VARs," Edenfield said. "Their salesperson told us 'maybe you're too small for us, maybe you should switch platforms.'"

"Wang has been proprietary all along. Now they are trying to be open and flexible, but I needed that five years ago," said Robert Ruzga, director of MIS at Rentokil Tropical Plants, a landscaping service company in Riverwoods, Ill. He added that changes in Wang personnel recently have been disruptive.

"I've had three different salespeople and three different maintenance people. I just wait for them to call me now," he said.

Nevada Power

CONTINUED FROM PAGE 67

approach," said Charles W. Newton, president of Newton-Evans Research Co., an Ellicott City, Md.-based research firm that focuses on the use of IS by utilities. Newton said most U.S. utilities have taken a conservative approach to offloading applications from their mainframes to distributed architectures because of the security that big iron offers.

Going distributed

Nevada Power continued that trend when it upgraded its IBM Enterprise System/9000 Model 320 mainframe to a Model 521 last month. By the end of this year, the company plans to have replaced the bulk of its IBM 3380 direct-access storage devices (DASD) with newer 3390 DASDs, increasing Nevada Power's storage capacity from 84G bytes to 110G bytes.

Nevada Power decided to upgrade its DASD because its applications were growing exponentially, Verchick said. For example, the utility recently replaced its Cobol-based accounts payable and general ledger systems with 4GL-based applications that were developed using Dun & Bradstreet Software Services, Inc.'s Millenium software. Because the 4GL applications are more feature-rich, they require more storage space, Verchick noted.

But Nevada Power was able to partly offset the costs of its mainframe and DASD upgrades when it negotiated a new five-year hardware maintenance plan with IBM last month. Under IBM's Systems Services Agreement, there are no maintenance increases for the first two years and only incremental upgrade charges for the remaining three years. Verchick estimated the deal will save Nevada Power about $30,000 annually.

The mainframe upgrade has added some CPU space, Verchick said. Still, Nevada Power saw additional opportunities to free its processors by moving some of its CPU-intensive engineering and resource planning modeling applications off the dual MVS and VM environments and onto a cheaper, distributed IBM RISC System/6000 platform.

"With the RS/6000, users feel they have better control of their work processes," Verchick said.

In the past, development of long-range planning models, designed to predict power requirements based on factors such as weather data and water availability, took up to two hours on the Model 320 mainframe, which was running at 96% capacity, according to Jackson. That type of modeling can now be done on the RS/6000 in less than 10 minutes, she said.

By moving the applications off the mainframe, Nevada Power is using 20% less CPU space and saving $9,000 per month, or more than $100,000 per year. Nevada Power leases the RS/6000 for $3,000 per month, while the ES/9000 machine costs $44,000 per month.

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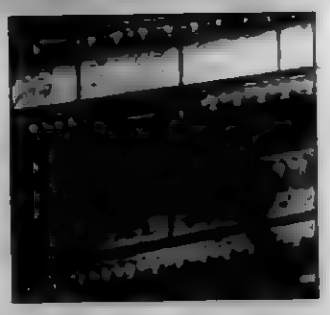

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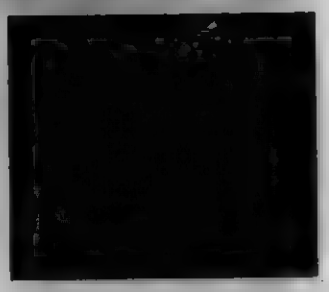

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- BIM-EDIT/OS - OS/MVS On-line Program Editor System
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- BIM-ICCF - Access to CICS transactions from within ICCF
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Data storage

Hitachi Data Systems Corp. has announced the 7600 Disk Storage Subsystem series designed for IBM-compatible mainframe computers.

The series comprises the 7690 Disk Storage Controller and the 7693 and 7699 Disk Arrays. The 7690 controller has a new intelligent "learning" cache algorithm to enhance performance. The 7693 Disk Array provides up to 90G bytes of storage in one frame.

The 7699 Disk Array provides up to 270G bytes of storage in a single direct-access storage device frame, the company said.

Prices for the 7690/7693 Disk Array range from $425,000 to $2 million. The 7699 is slated to ship during the third quarter of 1994.

▶ *Hitachi Data Systems*
750 Central Expressway
Santa Clara, Calif. 95056
(408) 970-1000

Utilities

Softworks, Inc. has introduced Performance Solution Version 1.1, an integrated tool designed to improve systemwide performance.

The product consists of three components: HiperLoad Plus for VSAM, I/O Plus for VSAM and I/O Plus for XSAM. The components work in tandem to decrease I/O operations.

According to the company, Performance Solution optimizes VSAM, QSAM and BSAM processing dynamically. A "time-of-day" sensitivity feature gives users the ability to balance processing work loads.

Based on file processing history, the product can also automatically choose an optimal buffering technique.

License fees begin at $24,000.

▶ *Softworks*
7700 Old Branch Ave.
Clinton, Md. 20735
(301) 856-1892

Executive Software, Inc. has started shipping Version 2.1 of I/O Express, an automatic data-caching software product.

An I/O View graphics utility has been added to this version that pinpoints and displays boosted system speed and increased I/O throughput.

According to the company, I/O Express speeds up response time and can eliminate I/O bottlenecks on Digital Equipment Corp.'s VAX/VMS systems. With an I/O View menu, users can select several new functions, including a Graph Utility and a Report Utility.

With the Graph Utility, users can create a real-time, bar-graph depiction of the I/O activity on the system.

A graphic representation of the I/O activity over a designated period of time is achieved with the Report Utility, a feature that sends output to a printable file.

Prices range from $450 to $19,900, depending on CPU model.

▶ *Executive Software*
6th Floor
701 N. Brand Blvd.
Glendale, Calif. 91203
(818) 547-2050

Jensen Research Corp. has announced Xrefplus Release 2.4, a Job Control Language and procedure cross-reference utility.

According to the company, the product was designed to provide easy and efficient access to critical system information. Xrefplus operates on MVS, MVS/ESA and MVS/XA operating systems in batch and interactive modes.

New features include a job scheduler exit point, critical data set reporting and an ISPF interface created to increase productivity. A reference database of key cross-reference information can be made with Xrefplus DB, an optional add-on product.

Prices range from $12,000 to $27,000.

▶ *Jensen Research*
169 Ramapo Valley Road
Oakland, N.J. 07436
(201) 337-4000

Power supplies

EPE Technologies, Inc., a subsidiary of Square D Co., has announced the EPS 6000 three-phase uninterruptible power supply family, designed for large data center and computer mainframe applications.

According to the company, EPS 6000 is 100% rated for nonlinear loads with crest factors as high as 3.5 and offers output voltage distortion of less than 4% total harmonic distortion. Computer-aided fault diagnosis, telemonitoring capabilities and remote signaling and reporting systems features have been provided for ease of service and maintenance.

EPS prices range from $75,000 to $100,000.

▶ *EPE Technologies*
1660 Scenic Ave.
Costa Mesa, Calif. 92626
(714) 557-1636

Para Systems, Inc. has introduced the LANMaster software. The product is Microsoft Corp.'s Windows-based software designed to work in conjunction with the company's Minuteman PM Series uninterruptible power supply.

The software provides information including power load, AC voltage and temperature. The information is shown on a monitor in bar graph and LED format. In the event of a utility power failure, the software can automatically activate a timer, enabling users to keep working while warning them of a potential system shutdown.

LANMaster disables all log-ins when a power failure is detected; when power is restored, it informs users and returns to a normal monitoring state. An unattended shutdown capability is also provided.

LANMaster software is priced at [redacted]19.

▶ *Para Systems*
1455 LeMay Drive
Carrollton, Texas 75007
(214) 446-7362

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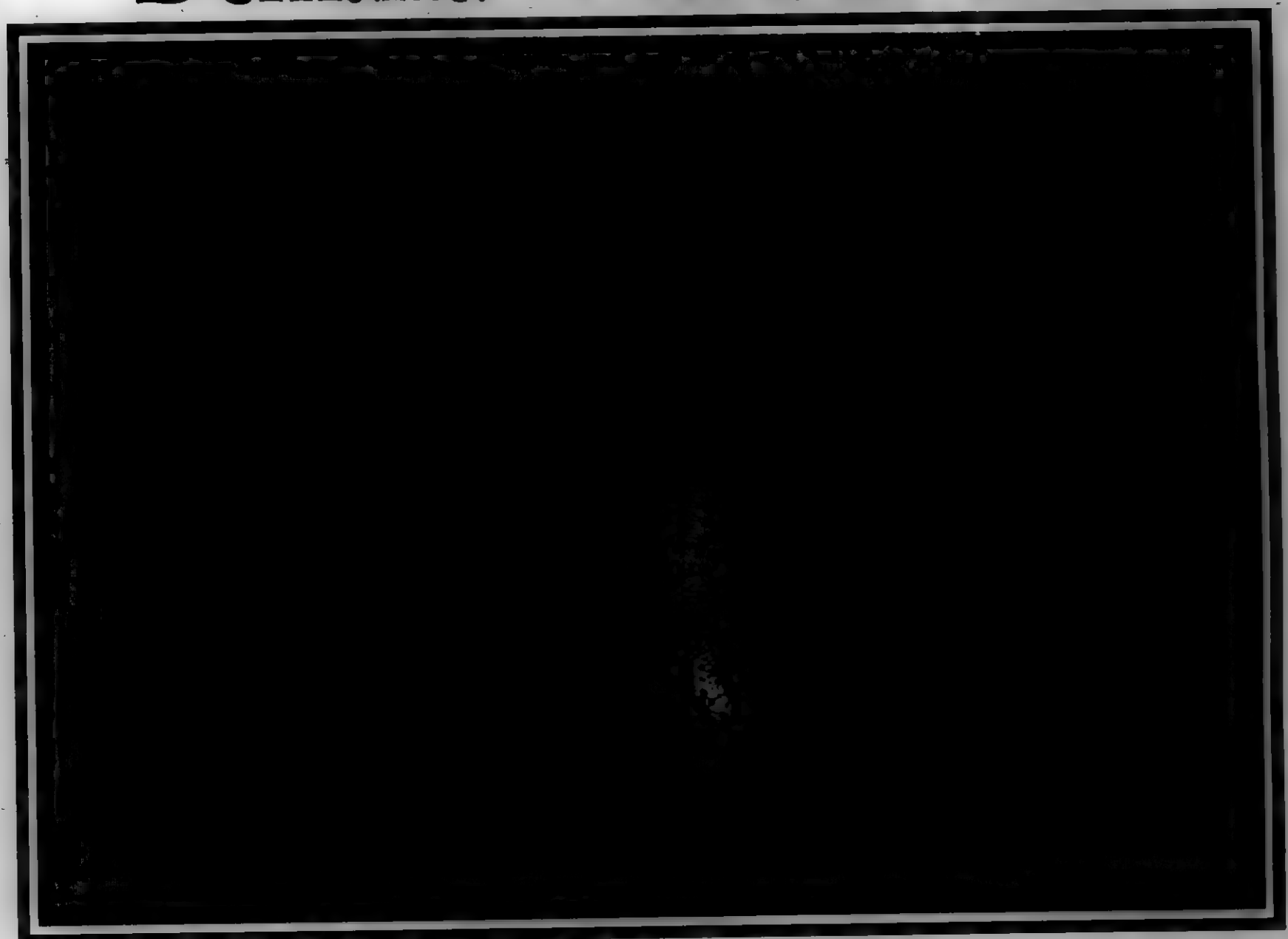

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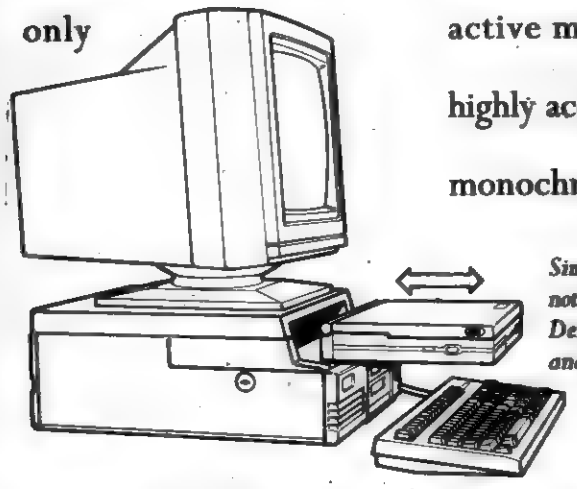
THE COMPAQ LTE LITE. FOR THEIR TIME WORKING. AND

OK, we're not saying you live on three hours of sleep, or that you eat Chinese takeout every night. And even if you do, we're not saying that a COMPAQ LTE Lite 486SL notebook is suddenly going to change all that.

What we will say is that it could make your life a lot simpler. Particularly if you travel.

You see, on one hand, these new computers are lightweight, compact notebooks (6.3 pounds, 8.5"x11"). They're available with three different screens: the COMPAQ UltraView – the world's only black and white, active matrix VGA; a 256-color active matrix; and the highly acclaimed passive monochrome MaxLight.



Simply slide the LTE Lite notebook into the COMPAQ Desktop Expansion Base and you have a full-function, fully connected desktop computer.

There's the integrated EasyPoint trackball. And each has a range of innovative power-conservation features to help extend battery life.

But what also makes these notebooks unique is

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PEOPLE WHO SPEND HALF THE OTHER HALF WORKING.

that they double as full-sized, full-featured 486 desktop PCs.

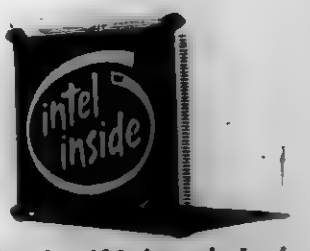
By simply sliding your LTE Lite notebook into the COMPAQ Desktop Expansion Base, you're instantly connected to printers, peripherals and your network. No floppies, no fumbling with wires, no headaches. And the extra slots and drive bays increase expansion capabilities. Best of all, you're using the same hard drive. So whether you're in the office or on the road, your files are always with you. The expansion base also offers you a keylock to secure your notebook.

Of course, if you don't need all the functions of a full-sized PC, but want easy connection to your peripherals, choose the new Enhanced QuickConnect – a one-step system with integrated Ethernet and SCSI support.

And like all of our PCs, these notebooks are backed by CompaqCare. Which includes a free, three-year worldwide warranty, and a year of free on-site* service in the U.S. or Canada.

For information on the COMPAQ LTE Lite 486SL, call 1-800-345-1518. Because if you work out of the office on a regular basis, you really lead two lives. So they're perfect for you. And you.

COMPAQ



Unlike other 486 chips, the Intel 486SL, with an integrated numeric coprocessor, provides higher performance and extended battery life.

No wires, no interface boxes, no headaches. The optional fully integrated COMPAQ SpeedPAQ 144 Modem connects the LTE Lite directly to a cellular phone so you can send e-mail and faxes.

*This service is provided by Contracted Service Providers and may not be available in certain geographic locations. Certain restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. For further details on our limited warranty, contact the Compaq Customer Support Center.

Fact:

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To some it's blasphemy. To others it violates a natural law. The fact is, backup and restore on complex networks can be dramatically simplified. But only with Conner NetWorker™ software. It frees the network administrator because end users perform their own backup and restore. It automates sophisticated tape and file management while preventing accidental or deliberate data loss. It manages and controls all backups from any workstation... even remotes. Multiple backup requests are serviced simultaneously so users can work without waiting. And if you think all this slows it down, think again. Conner NetWorker dramatically increases I/O rates. Running as a NetWare Loadable Module, Conner NetWorker supports up to 250 clients on 26 servers with minimal performance impact and includes automatic fault recovery. It's perfect for networks with ever increasing storage demands. It's perfect for mixed NetWare environments with UNIX, DOS and Macintosh systems. It drives today's most reliable, highest capacity backup devices and loaders from Conner, including Digital Linear Tape (DLT), 8mm and DAT. And now you have security without sacrifice as loader tapes are used by anyone without manual intervention while the administrator controls access to each individually. The larger your network, the more you need Conner NetWorker. It's the simplest, most powerful backup and restore solution for complex networks. And that's a fact.

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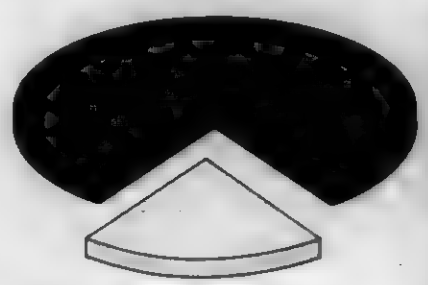

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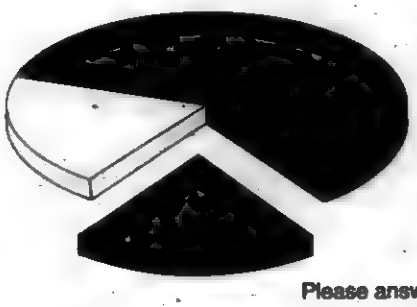

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SAS soft-pedals object-oriented tools

By Gary H. Anthes
NEW YORK

Contrary to popular perception, vendors do not always hype their products:

■ "I don't see [object-oriented programming] as a panacea," said James Goodnight, president of SAS Institute, Inc. "We've had subroutine libraries for years that have done the same thing as objects."

■ "We don't expect everyone to jump on the object-oriented application development bandwagon immediately," agreed Linda Fineman, application development project manager at SAS.

■ "Our strategy with object-oriented applications development is to provide a robust set of tools without alienating those people who opt not to use [them]," added Jamie Robbins, SAS' applications development marketing manager.

If that all sounds like damning with faint praise, listen to this user of SAS' new object-oriented programming (OOP) tools:

"OOP is quite a revolutionary approach; it makes a big difference," said Khasha Dehnad, manager of decision support executive information at The Depository Trust Co. in New York, which recently built an executive information system (EIS) using SAS' object-oriented products. "It's not just a way of programming. It's a way of thinking."

Dehnad used SAS/EIS, a development environment that includes a collection of predefined displayable objects for building an EIS, to build a pilot "management by objective" system that will allow senior managers to capture and monitor performance against goals.

Productivity increase

Dehnad also used the SAS/AF application development facility, with its new Frame feature, to create objects not already supplied in SAS/EIS. In creating the EIS, he said the technology reduced development effort by a factor of 10 for functions for which SAS supplied a predefined object and by roughly 50% in cases where the user had to create his own objects using Frame entries.

Dehnad said he used SAS/AF to create an organization chart object represented by an icon that the user can click on to traverse the company's chain of command.

SAS, *page 78*

Object creation

A Frame entry is a new kind of catalog entry available in Release 6.08 of the SAS system. Like Program entries, their predecessor, Frame entries are used to build and run interactive applications. But object-oriented programming concepts give Frame entries enhanced capabilities to create more graphically oriented applications. They are templates for creating objects that can be displayed as icons.

Down the road

SAS CUSTOMERS SAY OBJECT-ORIENTED PROGRAMMING IS A "FUTURE"

Has your organization embraced object-oriented technology?

On a scale of 1 to 5, with 5 being very important and 1 being not important, how do you rate the following attributes of an application development system?

	1 (Not important)	2	3	4	5 (Very important)
Fast prototyping	15%	6%	18%	26%	41%
Portability of code	10%	10%	19%	25%	36%
Menu-driven developer's tools	8%	17%	30%	27%	18%
Object-oriented	9%	14%	36%	26%	15%

Source: SAS Institute, Inc., Cary, N.C.

CW Chart: Michael Siggins

Tool kit maker vows to crank up idle systems

By Melinda-Carol Ballou
MINNEAPOLIS

Want to take advantage of the processors that are idling on your network or create a single "virtual computer" system out of multiple platforms?

Vendors ranging from Hewlett-Packard Co. and Convex Computer Corp. to software manufacturers such as VXM Technologies, Inc. have touted the performance and other benefits of distributing application processes across networks. A lack of flexible, easy-to-use development tools, however, has prevented users from taking better advantage of their underused systems.

Aggregate Computing, Inc. will seek to remedy that situation later this year when it releases NetShare, a set of tools that will go into beta testing this month. The tools are scheduled to ship during the fourth quarter on Unix workstations from Sun Microsystems, Inc., HP and IBM.

Resourceful

NetShare will transparently determine which computers are in an environment, the availability of the computers and which resource fits an application's need and then remotely execute an application, according to John Rymer, an analyst at the Patricia Seybold Office Computing Group, a Boston consulting firm. NetShare will allow users to take and execute applications in parallel on separate machines.

The Resource Management Service provided by NetShare determines what the machines are doing on the network and how busy they are.

NetShare is made up of three components — a Remote Information Base (RIB), a Decision Making Interface (DMI) and a Remote Execution Service (RES) — and a set of application programming interfaces (API) to the components.

RIB includes a database that stores information about network resources; information in the database is collected from agents that represent those resources, Rymer said. These agents collect current values for a resource and forward them to the RIB so the database is constantly updated. (The resources are set up as objects in the RIB.) Intelligent resources, such as operating systems or database management systems, can forward information directly to the RIB. Aggregate Computing provides an API to the RIB so third parties can forward information to it.

"We have an object-structured database so that every characteristic about a machine is an object such as software licenses, for instance, and other attributes," said Joan Wrabetz, Aggregate president. "It's extensible so that users can add other resources. We don't cite policy and we allow users to customize [the facility] as they need to. In this way, an application can [be set up to] choose a machine based on its needs."

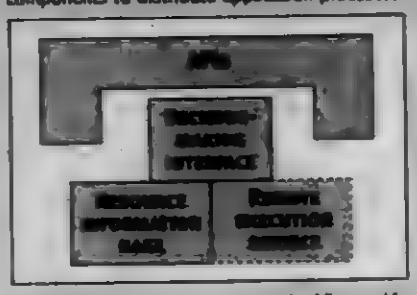
NetShare's DMI allows applications to communicate with the RIB.

The RES lets developers execute multiple tasks in parallel: A single client can start multiple jobs on remote processors and then wait while each remote node returns its results.

"NetShare will be a valuable contribution to distributed object computing services [since] environments such as DCE, ONC and NetWare have stabilized the basic plumbing required for distributed applications but don't provide all the services required by developers to create useful applications on distributed platforms," Rymer said.

Three-pronged

APIs will let developers access the NetShare components to distribute application processes



Pricing will start at $10,000 for a network of five machines.

NetShare will offer hooks into either Sun's Open Network Computing (ONC) or the Open Software Foundation's Distributed Computing Environment (DCE).

Aggregate is currently shipping NetMake, a parallel version of the Unix "make" utility that uses NetShare as its core technology. NetMake will find machines that are relatively idle but have the same operating system version and appropriate CPU to run the processes in parallel.

User reaction

Users of these products have already experienced some of the performance advantages of NetShare and said they look forward to the development kit.

Ken Streeter, a software engineer at Lockheed Sanders, Inc., a defense electronics manufacturer in Nashua, N.H., is currently using NetMake with a pool of Sun workstations.

"We've seen about about a five-fold improvement. Things that took 15 minutes now take three," Streeter said. He added that a NetShare developer's tool kit would enable his company to develop distributed compute-intensive signal applications.

NetMake user Milo Chan, a vice president at JP Morgan Securities, Inc., a New York securities firm, said any computationally intensive application could benefit from a distributed API such as NetShare "where the work load can be broken up across multiple processors." He added that the product was simple to install and that JP Morgan experienced "dramatic improvement" in the compile time of its financial and analytic applications after it brought in NetMake.

SAS soft-pedals object-oriented tools

CONTINUED FROM PAGE 77

It allows the user to zero-in on a given manager's performance and then trigger a Gantt chart, variance report or detailed goals listing for the employee.

A user can click on a predefined "hot spot" in the organization chart, triggering the execution of SAS code that, for example, graphically displays a given manager's subordinates or summarizes and displays the manager's goals. The chart object is re-created at runtime to reflect the latest changes in a master personnel file.

Dehnad's enthusiasm for objects extends beyond initial application development to maintenance as well, where he described the contribution of the approach as "phenomenally great."

"If the programmer quits, I know what the object is, how it works, where to find it and so forth," he said. In addition, changes to an object are made once in the library where the object resides and are effectively propagated to all applications that use the object.

Tough sell

Demonstrations of the Frame feature of SAS/AF drew standing-room-only crowds at SAS' recent user conference here, but SAS acknowledged that many users remain uncommitted to the technology.

Indeed, in a recent survey of its customers, SAS learned that just one in four had embraced OOP. And although the survey showed users generally felt the technique was important, they said other things — such as fast prototyping and portability of code — were significantly more important (see chart page 77).

Fineman said resistance to OOP stems more from the natural tendency of programmers to avoid change than from any fundamental characteristic that makes the technology unsuitable in certain circumstances.

Of SAS' apparent caution in touting the benefits of the technology, Fineman said, "artificial intelligence was hyped as the solution to everything, but then people found it was not. People were so disappointed they kind of wrote it off. That could happen to OOP, too."

The Information Technology Co. in Gainesville, Fla., is using the object capabilities in SAS/AF to speed application development. The types of things that previously were changed between batch runs — such as time periods, companies or geographic areas to be considered in market-share analyses — are now set up in displayable objects that can be changed on the fly.

The increased ease of use and decreased development time will enable users to try what-if analyses that they might not have bothered with previously, said Randy Lawton, systems analyst at the company.

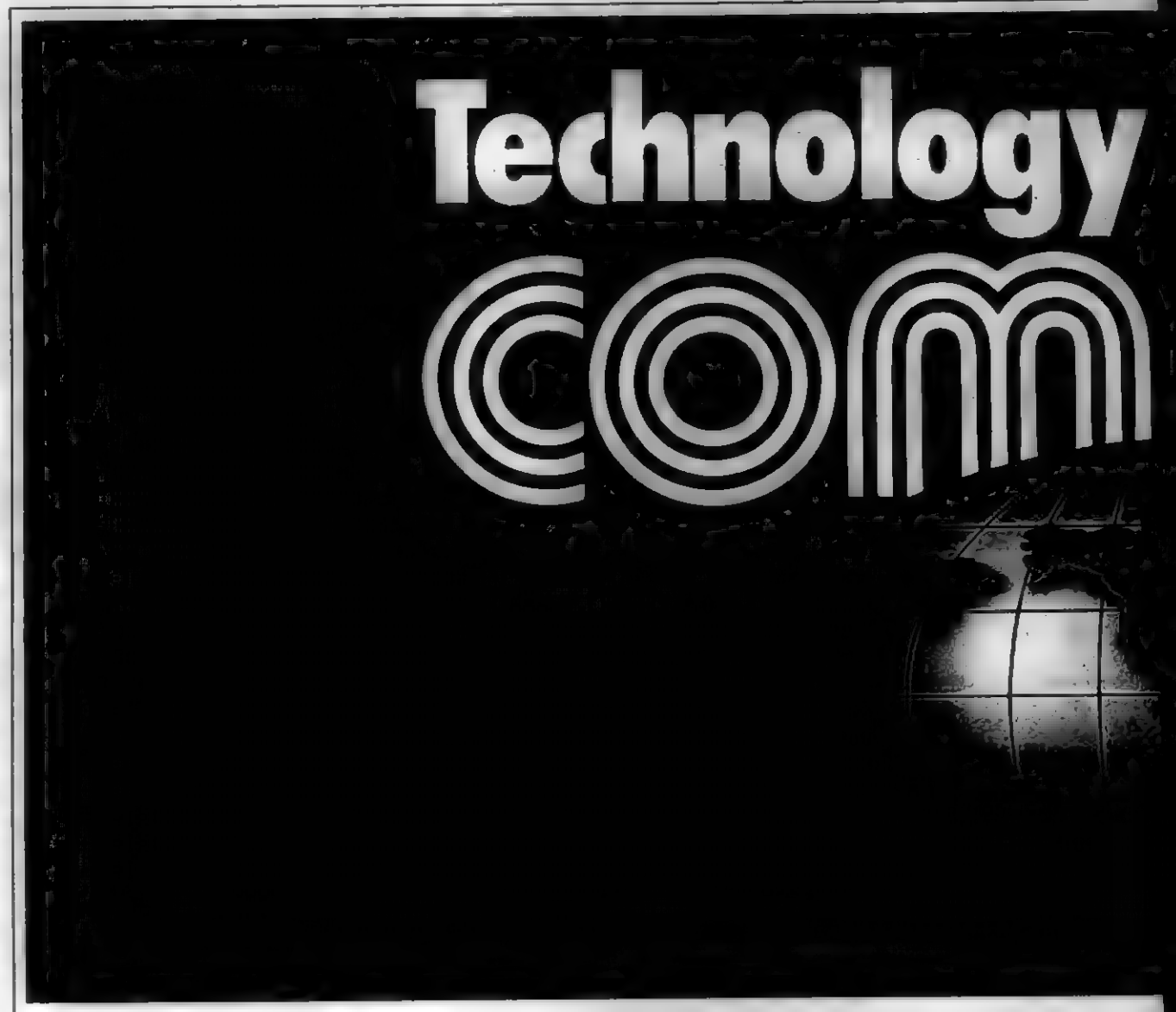
Lawton said objects enable programming standards to be defined and enforced. "For example, if you want text-entry fields to always be yellow, SAS has a text-entry field object and you can set the color any way you want and then put it in a standard library," he said.

Craig MacDonald, staff consultant at Information Industries, Inc. in Kansas City, Mo., uses the Frame feature to create reusable objects that less technically sophisticated application developers then use as system building blocks. "When they use this code, they have to write only about three lines in their programs to get it to operate," he said.

In Brief

Reaching for more platforms

Blyth Software in Foster City, Calif., recently outlined its plans for porting its application development tools to new platforms. Currently based on Microsoft Corp. Windows and the Apple Computer, Inc. Macintosh, Blyth's Omnis 7 Version 2 will be extended to be binary-compatible with IBM's OS/2, Microsoft's Windows NT and the Open Software Foundation's Motif Unix environment. Blyth said it expects the cross-platform products to be available in 1994.



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[redacted]

Languages

Micro Design International, Inc. has introduced the Express Development Language (XDL).

According to the company, XDL is a fourth-generation language that includes object-oriented extensions for developing complex custom applications.

The product is part of the company's Express Development Environment (XDE), which comprises a specialized program editor, a pseudo-code compiler, a Project/Source code manager, execution engines and a set of built-in object classes.

An assortment of functions is provided with the built-in classes that offers standard Microsoft Corp. Windows controls, Visual Basic Custom Controls and accessibility of Borland International, Inc.'s dBase-compatible databases. Users can build applications with serial communications, charting, multimedia, graphics and more.

The Professional Development Version of the XDE costs $695, and the Corporate Version costs $1,295.

▶*Micro Design International*
6985 University Blvd.
Winter Park, Fla. 32792
(407) 677-8333

Compilers

Liant Software Corp. has announced that SunSoft, Inc. will bundle Version 2 of Liant's high-performance LPI-C compiler and the Motif version of its CodeWatch debugger with SunSoft's Interactive Software Development System.

According to Liant, the Interactive Software Development System is an optional extension to SunSoft's Interactive Unix System. Designed for Intel Corp.'s X86-based platforms, Version 4.0 of the Interactive Unix System is a 32-bit multiuser, multitasking operating environment.

Version 4.0 can be used for point-of-sale, factory automation and process control. Liant's LPI-C Version 2 is an ANSI C compiler that is used for developing Unix applications for Intel's X86 and Sun Microsystems, Inc. Scalable Processor Architecture platforms. It generates highly optimized code that runs up to 80% faster than its predecessors, the company reported. LPI-C Version 2 also has the ability to compile pre-ANSI source code.

The Interactive Unix Software Development System costs $795.

▶*Liant Software*
959 Concord St.
Framingham, Mass. 01701
(508) 872-8700

Code libraries

EMS Professional Shareware has started shipping an updated version of the PAL Utility Library.

The library has an additional 119 products for a total of 434 public domain and shareware Paradox Application Language products for users of Borland International, Inc.'s Paradox.

According to the company, the products are compressed onto 12 1.44M-byte disks or one CD-ROM and are detailed in an indexed database that is included.

Users can find specific Paradox products by searching by name, vendor, release date, free text across descriptions or type.

An assortment of types of files is provided that contains Applications, Data Entry, Data Dictionary, Configuration, MailMerge and Paradox for Windows, among others.

The library costs $69.50 on disk or CD-ROM.

▶*EMS Professional Shareware*
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

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Strength *in* numbers

IS consortia can help companies tame technology troubles and cut costs. But getting there takes money, time and nerves of steel.

Trader Joe's Fred Morsheimer *was unsatisfied with Specnet, a consortium of IS managers from the retail industry (see story page 83)*

By Tim S. Nash

Picture this: Top information systems managers from rival automakers, stoked on coffee and danish, lay aside deep rivalries and advise one another on the finer points of establishing PC end-user help desks.

Unlikely, you say? Guess again: The meeting happened recently in the cornfields outside Bloomington, Ill., when Toyota Motor Corp., Mazda Motor Corp., Mitsubishi Corp.'s Diamond Star Motors and others gathered for an annual informal meeting to hash out common IS problems.

Increasingly, IS managers in industries ranging from oil, utilities and automobile manufacturing are seeing distinct money-saving possibilities in brainstorming and teaming up with rivals.

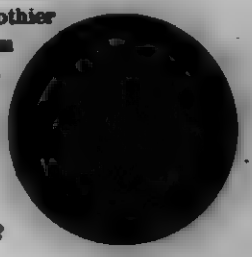
More and more companies are willing to shell out as much as $1 million a year in hopes of finding new and better ways to tackle common IS challenges, such as redesigning telecommunications setups or reducing application development backlogs — many of which are cropping up in big client/server projects.

Supporters say collaborating with competitors could be a matter of survival.

"You worry at first about sharing too much," says Rex Schemerhorn, IS director at Diamond Star in Normal, Ill. "But we all pretty much know what's taboo." Since 1989, Diamond Star has been meeting informally with several other Japanese carmakers with large U.S. plants.

Mike Connors, senior vice president of MIS at The Gap Stores, Inc., agrees: "No, you don't want to be partners with your competitors. But in this economy, you want to be smart."

The San Francisco-based clothier co-founded Retex, a consortium of 90 specialty retail companies that banded together to leverage their combined buying power to save money on equipment and services.



Participating in the half-

IS consortia, *page 82*

IS consortia

CONTINUED FROM PAGE 81

dozen or so IS consortia isn't quite sleeping with the enemy. But participants warn that it does take a certain amount of grit and faith.

To avoid divulging sensitive information, many consortia-goers are briefed by superiors before attending meetings with rivals, says Jim Weber, president of Omicron, a 12-year-old consortium of large New York and Chicago firms.

"I've found that giving up secrets is not a problem. You get past it," Weber says.

Gaining an edge

There are other issues to sidestep, too, including past failures such as Specnet (see story page 83). Skeptics like to say that such infighting will prevent consortia from becoming a major force in IS.

Plus, notes Richard Murray, consultant at Nolan, Norton & Co. in Boston, more and more companies are depending on technology systems to give them a leg up on rivals. And that, he contends, means IS know-how is better kept secret.

To illustrate, Murray notes that five years ago the health care industry might have been a good consortium candidate. But growing fears that the Clinton administration's health care agenda will slice deeply into profits have made these firms wary and insular, he says.

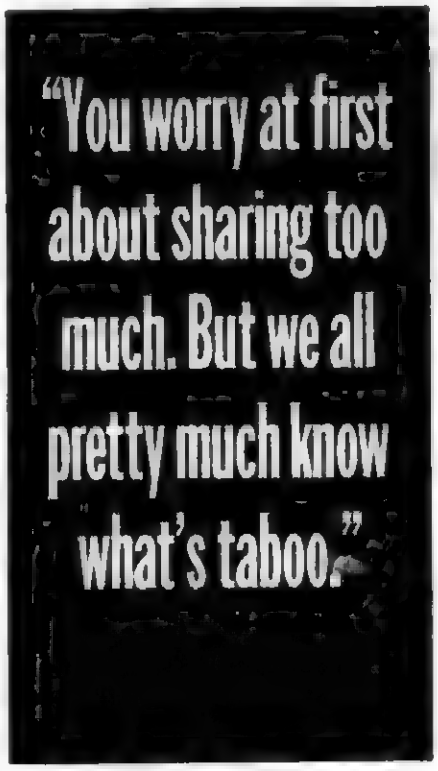
"They won't want to give away technology innovations," Murray argues.

Antitrust laws and bitter rivalries also deter some industries, such as wood products, from forming IS consortia, he adds.

Nevertheless, a good number of Fortune 500 firms — in some historically cutthroat industries — choose to participate in IS consortia (see chart below). Some groups are reporting booming growth.

The Petrotechnical Open Software Corp. (POSC), for example, began with five oil companies in 1990. It now boasts more than 75 participants.

"The oil industry is *very* competitive," says Ted Lumley, chief of technical computing at the Dallas-based exploration and production unit of Mobil Oil Corp. "But we just said, 'Look, we have enough in common in uncontroversial areas to really get something done.'"



Lumley's division and four other petroleum firms founded POSC to set industry standards for application development and client/server computing.

Members say consortia pay off in different ways, depending on their goals and the strength of the commitment among members.

Connors, whose company was a member of Specnet before founding Retex, was all for another go-around with the consortia concept because he believed IS professionals in the same industry can teach one another about new technologies and save money on services and equipment, he says.

Indeed, cost-saving is among the most attractive lures, according to boosters.

Bottom-line advantages "are there for the taking when you work together on some projects," says Greg Purdue, director of software development at Paul Harris Stores, Inc., an Indianapolis-based clothier and Specnet member. The firm dropped Sprint Corp. in 1991 because of a special deal Specnet worked with MCI Communications Corp.

Consortium members get discounts based on the volume of calls they place each month via MCI, ranging from 6% to 7% of their annual phone bills.

Paul Harris Stores, for example, saves $7,000 — about 7% — off its typical yearly charges, Purdue says. "That kind of kickback helps, let me tell you," Purdue notes. Retex has a similar telecom deal with MCI.

Specnet has also cajoled vendors to provide special services. Sterling Software, Inc. and MCI agreed to jointly offer electronic data interchange equipment to Specnet members at a discount.

"Any type of group where we can get control over vendors is good," Purdue notes.

Sometimes control comes via togetherness. Take POSC, which counts hardware and software makers such as IBM, Digital Equipment Corp. and Sybase, Inc. among its members and maintains close ties with the Open Software Foundation.

Three years into a five-year business plan, POSC is poised to roll out petroleum-specific data and process models in July.

Lumley says software makers and other oil companies will be able to use the models as blueprints for building Unix-based client/server systems customized for the petroleum industry.

He adds that POSC has racked up more than 800 work-years on the project so far. "That's a huge investment," he notes.

But not as huge as the cost of joining many consortia.

At POSC, for example, each of the five founders promised in 1990 to chip in $1 million per year until this year, plus annual dues of between $1,000 and $500,000, depending on yearly sales. Those sums can deter some firms, Purdue acknowledges. (In contrast, Omicron charges $12,500 the first year and $9,000 annually thereafter.)

Patience is a virtue

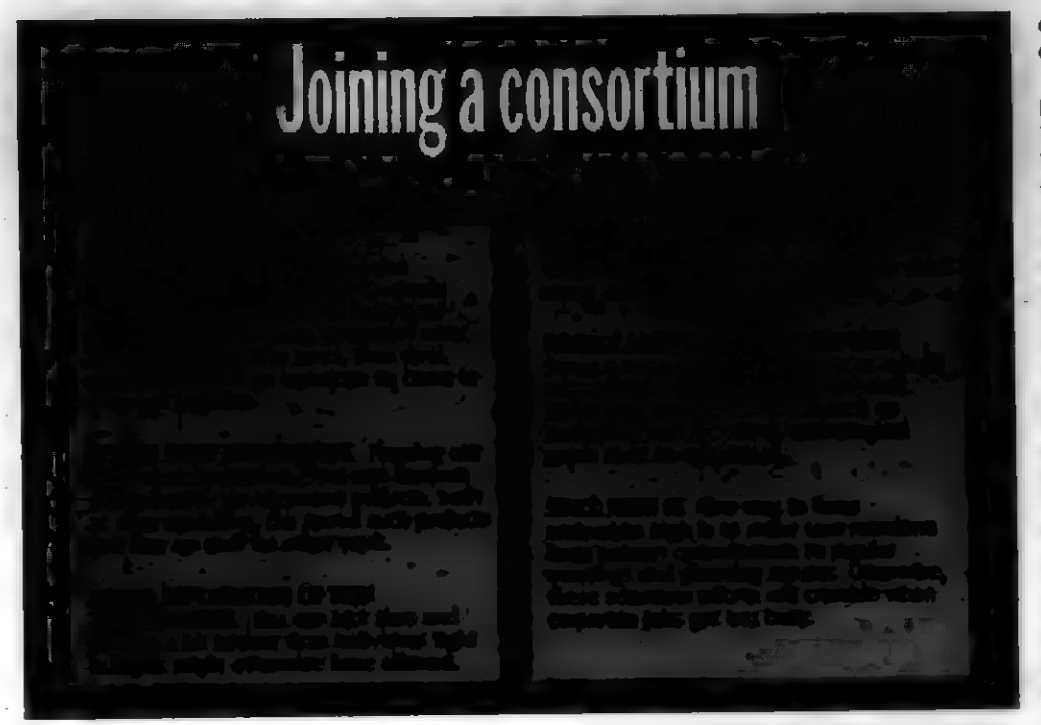
Also needed with that ante is a hefty dose of patience. Purdue says he does not expect to see any tangible benefits from POSC until 1994 — after a four-year, $3 million-plus investment.

"But," he says confidently, "the goods will be there."

Purdue cites the improved performance and better data sharing opportunities that a well-laid client/server operation can yield. He's also counting on common data access methods and user

Alive and in consort

CONSORTIUM	INDUSTRY	FOUNDED	LOCATION, PHONE	NO. OF MEMBERS	MEMBERS	GOAL
[illegible]	[illegible]	[illegible]	St. John, Newfoundland (709) 579-7000	5	Chevron Canada Resources Mobil Oil Canada Properties Petro-Canada Resources Partnership	[illegible]
[illegible]	[illegible]	[illegible]	Scottsdale Labs, N.J. (201) 329-2000 New York, N.Y. (212) 930-0800	75	Booz, Allen & Hamilton Inc. Bear, Stearns & Co. Bond Products, Inc. New York Transit Authority Quotron Systems Co.	[illegible]
[illegible]	[illegible]	[illegible]	Houston (713) 544-3000	75	BP America, Inc. Chevron Corp. Mobil Corp. Texaco, Inc. Amoco Inc.	[illegible]
[illegible]	[illegible]	[illegible]	Ridgefield, Conn. (203) 333-6677	200	Barnes & Noble, Inc. The Gap Stores, Inc. General Nutrition, Inc. Petco Stores	[illegible]
[illegible]	[illegible]	[illegible]	New York (212) 244-0700	100**	Paul Harris Stores Weldenbooks	[illegible]



interfaces to speed up report-writing.

Further, he'd like to see off-the-shelf applications from value-added resellers that he can buy and use immediately. "Giving software companies the specs we develop should guarantee plug and play," Lumley says.

Tired industries get boost

But supporters say consortia can help even when problems aren't as au courant as client/server computing. They are equally helpful in dealing with managing data storage or greasing conversation between CICS mainframes and Unix workstations, to name two.

The auto industry — which some say is too mired in bureaucracy to step lively among new IS ideas — is a good example.

Diamond Star, which manufactures the Mitsubishi Eclipse, sidestepped potential problems in swapping IBM and third-party mainframe disk drives by talking first with a rival automaker that had recently done the same thing, Schemerhorn says.

He and his staff gathered intelligence about making the switch during a meeting of Japanese car companies that have plants in the U.S.

"It's like a user group, but there's common jargon," Schemerhorn says. "We all work on the same kinds of things but are at different stages. You can find a counterpart to give you some good do's and don'ts."

That's how Schemerhorn avoided potential glitches in a large-scale rollout of PCs at the historically mainframe-centric site. Competitor Mazda, which has a few thousand PC users, walked Diamond Star through setting up internal user groups and help desks. "We learned from their experience," Schemerhorn says.

The group persuaded a local IBM representative to host the meeting on a neutral ground: a regional sales office. Although IBM hosts, Schemerhorn says attendees control the agenda. "It's not an IBM fest," he says, though members asked IBM to make presentations on topics such as OS/2 networking.

While all this might sound like group therapy to some, other observers counter that members get more out of meeting than simple catharsis. Utilities are a strong example.

Atlanta Gas & Light Co. might "still be developing applications" were it not for its membership in a utility consortium, says Vice President of IS Bill O'Neal.

The company bought a skeleton customer service system from Brooklyn Union Gas Co., then customized the application for Atlanta's specific needs. The system was installed in 22 months, two months ahead of schedule.

Some analysts say they believe the utility business is ripe for sharing some software development burdens such as front-end application analysis and design work.

That's because government regulations on the industry force common data reporting and tracking methods. Companies can share data models and, in some cases, entire business designs.

Some firms have, as part of an 8-year-old task force, dedicated to building an efficient customer information system geared specifically for utility companies, says Richard Evans, director of software engineering at Cincinnati Gas and Electric Co.

Evans says it was tough at first because the firms run diverse hardware platforms. Plus, regulations varied widely between states, he explains.

Participants jumped these potholes by focusing on general customer service tasks that could be translated into reusable templates for IBM DB2-based applications — a platform they all use. Applications developers at a few dozen utilities across the U.S. banded together to cut development costs by sharing front-end application design work.

For example, firms such as Brooklyn Union and National Fuel Gas Co. in Buffalo, N.Y., together sketched minimum requirements of an efficient customer service application, then each went off to draw up different parts of the design.

Consorting with rivals may sound scary at first, but the relationship doesn't have to be cantankerous. Supporters say consortia can deliver less expensive IS gear and smooth the transition to new technologies.

But, the consortia-wise add, don't make the leap of faith without a safety net of carefully planned administrative rules and guidelines about off-limit subject. You don't want to give away all your secrets. ■

Things don't always work out

Despite all the current popularity, IS managers would be wise to keep in mind that, as with marriage, not all consortia work out.

Consider Specnet, forerunner to today's Retex consortium.

Formed in 1991 by IS managers at several top retail specialty firms, the consortium had lofty goals. And it worked — for a while.

Members used their collective buying brawn to muscle MCI into providing cheaper long-distance telephone rates, saving a total of $6.5 million, according to the National Retail Federation (NRF), a New York association of retailers that oversees Specnet.

However, 10 of 12 founding board members defected last August after disagreements over how the NRF spent that savings and Specnet's pot of membership fees.

"We were extremely dissatisfied with how [Specnet] was run," says Fred Morsheimer, MIS director at Trader Joe's, Inc., a specialty foods chain based in South Pasadena, Calif. "We didn't know where our money was going some of the time. And other times, we thought it shouldn't be going where it did."

"It just didn't work the way we imagined it would," says Richard Paul, former Specnet chairman. He says Specnet board members clashed with NRF officials over which body should make financial decisions.

The tiff has not yet turned into a legal battle, but bad blood clearly flows between the NRF and ex-Specnet members. — *Ken S. Nash*

Intelligence Files

Just-in-time hospitals

Hospitals need to improve customer service and reduce costs, and yet entrenched and compartmentalized hospital bureaucracies resist improvements such as just-in-time inventory systems.

"Stockless" inventory systems require cooperation and information flowing among various hospital departments, but that is not likely to happen unless there is serious pressure from upper management. Top management backing for interdepartmental coordination is elusive, however. A survey of 250 hospital department managers found that coordination of this sort was not rewarded by their superiors.

Source: Pennsylvania State University news release, April 27, 1993.

Third wave

What comes after client/server? Industry analyst William Bluestein says the next wave will be "social computing." He defines that as technology embedded in the way people work, live and play — and satisfying the currently unmet needs of Joe Sixpack. The emerging technologies will be even smaller computers for true mobility; new operating systems that are invisible; wireless Internet-like networks; and on-line services that provide answers, not just access to raw data.

Source: "The Third Act," a report from Forrester Research, Inc., Cambridge, Mass.

Tool time for managers

Technology is only one enabling element in the output of an information systems department. Of equal if not greater importance are the people responsible for producing the systems. Productivity and effectiveness in the IS group are directly impacted by the first-line managers, many of whom may not have had a chance to develop the managerial knowledge and skills needed to establish productive work environments.

Those wishing to understand and make a difference in the management of IS professionals need tools for measuring these differences.

Source: "Measuring the Information Systems Supervisor's Work-Unit Environment and Demonstrated Skill at Supervising," Thomas W. Ferratt, Larry E. Short and Ritu Agarwal, *Journal of Management Information Systems/Spring 1993*, Vol. 9, No. 4, pages 121-144.

Withholding payment

Many companies focus on improving customer service in front-end processes (such as sales), but customer service often breaks down in the back office due to erroneous invoices and poor delivery. These administrative problems, in turn, can hurt the company's cash flow because customers will withhold payment on the disputed invoices. In a survey of 102 large companies, 51% said they have withheld payment of a supplier's invoice because they were dissatisfied with the level of customer service they received.

Source: Resource Evaluation, Inc., Harrison, N.Y.

Mitch Betts

What about ethics?

These days, IS executives may do windows, but they don't do ethics.

The troubling thing is . . . oops, I used the dreaded "E word" up there. As computer security guru Donn B. Parker once said, talking about ethics makes people's eyes glaze over, so you have to give them juicy examples to keep them interested.

So — quick — consider the case of Julie, a bank IS executive who was asked by the marketing department for access to customer data extracted from mortgage applications. Marketing wanted to use the data, which included income and debt history, in a marketing campaign.

Although several mortgage managers complained, Julie delivered the data anyway, figuring it was not her job to be a data cop. Eventually, a local reporter working on a story about privacy got on the case, and the bank CEO had to diffuse a potential public relations disaster.

Afterwards, the CEO reprimanded Julie for not taking responsibility for ensuring data privacy and not raising the issue with senior executives.

This real-life scenario (with some details disguised) is courtesy of H. Jeff Smith, an assistant professor at Georgetown University, and his column in the March/April issue of IBM's *Beyond Computing* magazine.

'Not my job'

After interviews with dozens of IS professionals, Smith has come to the conclusion that many of them consider data privacy and other ethical issues to be "not my job," even when they harbor private concerns.

Another real-life scenario involves car dealership software, which prints out fancy calculations that bamboozle consumers into thinking it is cheaper to buy a car with a loan than to pay cash. The software vendor denied wrongdoing and said it was merely computerizing a common industry practice.

Fortunately, the Federal Trade Commission put a stop to that nonsense. But both cases raise an interesting question: Why do we depend so much on the threat of publicity or government action to get some ethics around here?

Thank goodness some flagrant abuses are exposed and stopped, but it is doubtful that any government body could ever be vigilant enough to put an end to abuses of the power of computer technology.

That sobering point was made by John A. Loughney, professor of philosophy at Westfield State College in Westfield, Mass., during the Computer Ethics Institute Conference in 1992. Loughney suggested part of the problem is that the organizational culture of the corporation is not well-suited to considering the larger social ramifications of our work with information technology.

In most companies, the emphasis is on putting systems into action as quickly as possible — an atmosphere that makes it hard for someone to raise a hand and point out some ethical glitch. It certainly is not considered a career-enhancing move.

No procedure in place

That's why it was hard for Julie to stand up to marketing. After all, she thought her job was to facilitate the business use of data as soon as possible. And in most corporations, there is no readily available forum or procedure for raising ethical doubts.

All of this reminds me of an idea floated by Ben Shneiderman of the University of Maryland a few years ago. He urged organizations to develop a "social impact statement," much like the government's environmental impact statements, at the outset of every IS project so social and ethical issues can be raised before the project design gets too far along.

We do need to develop corporate mechanisms for raising social and ethical concerns, but at the same time we must remember that ethical conduct is mostly an individual matter. While company ethics programs may come and go, real ethics are embedded in the little decisions that individuals make on a daily basis.

The TEN Commandments of Computer Ethics:

1. Thou shalt not use a computer to harm other people.
2. Thou shalt not interfere with other people's computer work.
3. Thou shalt not snoop around in other people's computer files.
4. Thou shalt not use a computer to steal.
5. Thou shalt not use a computer to bear false witness.
6. Thou shalt not copy or use proprietary software for which you have not paid.
7. Thou shalt not use other people's computer resources without authorization or proper compensation.
8. Thou shalt not use other people's intellectual output.
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.
10. Thou shalt always use a computer in ways that demonstrate consideration and respect for your fellow humans.

Source: Computer Ethics Institute, Washington, D.C.

Betts is *Computerworld*'s national correspondent, based in Washington, D.C.

Executive Track

James J. Cunnane has been appointed senior vice president of finance and administration at **General Dynamics Corp.**

In this expanded capacity, Cunnane, a 15-year veteran of the Falls Church, Va.-based company who has served as its chief financial officer since 1989, will oversee information systems and administrative services.

A recent promotion has expanded the duties of **Brad Iversen**, marketing services executive at **NationsBank Corp.**, into the areas of Olympic sports and IS. Iversen, who joined the Charlotte, N.C.-based company in 1988 as a consumer marketing division executive, is now also spearheading marketing strategy for the bank in its capacity as a sponsor of the 1996 Olympic Games and taking on responsibility for automated banking.

Kenneth King is the new executive director of the **Corporation for Research and Educational Networking** (CREN). The Washington, D.C.-based company is the not-for-profit corporate parent of **Bitnet**, a network connecting some 550 higher education networks in the U.S. and 700 international affiliates.

King, who came out of retirement to help spearhead a new networking agenda for Bitnet as head of CREN, brings four decades of higher education/information technology experience to the post, including stints as vice provost for computing at Cornell University, vice chancellor for university systems at the City University of New York and director of computing at Columbia University.

In Purchase, N.Y., **John L. Scala** has been named **managing director of MIS at National Realty and Development Corp.** In addition to his new responsibilities, Scala will continue in his current position of controller.

Neil Chernoff recently joined the management consulting firm **CSC Index, Inc.** as a vice president in the San Francisco office. Chernoff comes to CSC from Booz Allen & Hamilton, Inc., where he served as chief information officer.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact senior editor Nell Margolis at (800) 343-6474 to pass along the news.

Calendar

JUNE 13-JUNE 19

Electric '93. Atlanta, June 15-17 — Contact: Walter Charnizon, Continental Exhibitions, Inc., New York, N.Y. (212) 370-5005.

Rapitech International. Santa Clara, Calif., June 15-17 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Successful Mainframe Downsizing in the Financial Industry. New York, June 15-17 — Contact: Uniforum Association, Santa Clara, Calif. (408) 986-8840.

IS as a Service Organization. New York, June 16-17 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 622-7373.

Enterprise '93. Boston, June 16-18 — Contact: Enterprise '93, Framingham, Mass. (508) 879-6700.

Mobile Communications Technologies, Applications and Regulations. Boston, June 17 — Contact: Mobile Computing Series, Boston University's Center for Information Technology, Tyngsboro, Mass. (508) 649-4200.

JUNE 20-JUNE 26

Conference of the Applied Dynamics International Users Society '93. Copper Mountain, Colo., June 20-23 — Contact: The Applied Dynamics International Users Society, Ann Arbor, Mich. (313) 973-1300.

Mobile Computing Forum. Dallas, June 21-23 — Contact: Daniel J. Edelman, Inc., Mountain View, Calif. (415) 968-4633.

Network Security in the Open Environment (NETSEC). Washington, D.C., June 21-23 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2310.

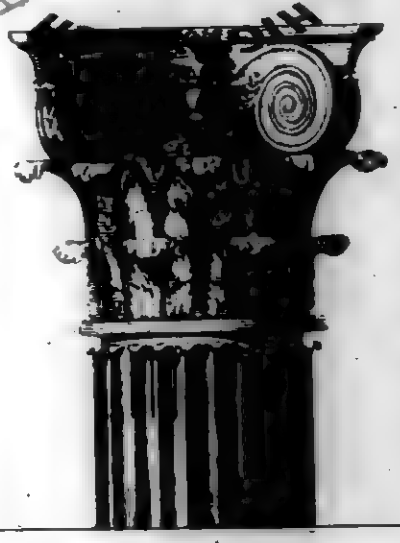
James Martin World Seminar. Atlanta, June 21-25 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

M Technology Association Conference. Washington, D.C., June 21-25 — Contact: M Technology Association, Silver Spring, Md. (301) 431-4070.

Fourth Annual Worldwide Personal Communications ComForum. Alexandria, Va., June 22-24 — Contact: ComForum, Chicago, Ill. (312) 938-3500.

In Depth

Heroes



On the next few pages, you'll meet the finalists for the fifth annual *Computerworld* Smithsonian Awards. These finalists have taken the power of computers and applied that strength to help the disabled, explore human origins, fight disease and refine social services; in essence, they are improving the world in which we live.

In that sense, they are winners all.

Disabled but enabled

Multimedia lets handicapped kids access mainstream curricula

You take it for granted that you can read a book, take a class or write prose. But for Rob Park, a physically disabled 19-year-old, such activities are natural only thanks to a collection of multimedia software tools.

Park, who has cerebral palsy, is one of numerous disabled students using Gateway programs from the Center for Applied Special Technology, Inc. (CAST) to help him participate in mainstream classrooms using the same curriculum as his peers.

"Most tools in the present classroom don't actually work for *everyone* in the classroom," says David H. Rose, executive director at CAST, a nonprofit organization in Peabody, Mass. "We want to take the existing curricula in the classroom and make it fully accessible to *all* kids, including those with disabilities."

EDUCATION & ACADEMIA

CAST's first program, Gateway Stories, is Hypercard-based and lets teachers and therapists scan the text and images of printed books into an Apple Computer, Inc. Macintosh. The program enhances the books with speech and sound. Disabled students can use special input devices that enable them to read a book independently.

Another program, the Gateway Authoring System, is a blank template that lets students create their own stories and pictures through digitizing tools and scanners.

"It's a great tool for class participation," says Voski Chakirian-Sprague, an occupational therapist at Skyline Elementary School in Tacoma, Wash. "We scan journals and poems written by the regular students on the Gateway so [the disabled kids] can have access to everyone's work."

For someone like Park, who is legally blind and for whom use of the standard keyboard is difficult, the possibilities are endless. "I wouldn't be where I am today without CAST," he says. "It's allowed me to be independent." Park will be a freshman at the University of Massachusetts at Lowell this fall.

—*Joyce Chutchian-Ferranti*

▶ **Multimedia** *helped Rob Park go to college*

In from the Outback

Satellite system delivers education, health care to Australian aborigines

Last fall, an elderly aborigine tribesman died at Yuendumu, a remote outreach of the Australian Outback. According to the dictates of tribal ritual, his goods were distributed among his kin so his spirit could live on.

A year ago, that critical ceremony would have taken weeks or even months, much of it involving long, dry, dangerous treks across the Tanami Desert to reach relatives in other pockets of the vast but virtually unpopulated region. But this particular tribesman died during the first hours of a systems implementation three years in the making — so his spirit was rekindled within hours across a network.

MEDIA, ARTS & ENTERTAINMENT

Fifty years ago, says Terence Nickolls, chief executive officer of New South Wales-based videoteleconferencing systems supplier AAP Communications Services, the Australian government relocated the Tanami aboriginals to reservations in the Tanami Desert, where distances are measured in hundreds of thousands of kilometers. The move, Nickolls says, virtually stranded the tribes.

"We've had a satellite network for about 10 to 12 years, for the company's benefit," Nickolls

Outback, *page 88*

A prestigious group
The following list (continued on pages 88 and 89) contains a brief description of all 50 *Computerworld* Smithsonian Award finalists. The 10 award winners will be announced today in Washington, D.C. See *Computerworld*'s June 14 issue for the winners.

BUSINESS & RELATED SERVICES

[illegible], Inc.
Accessibility modules for the visually impaired.

Postal Buddy Corp.
Change-of-address kiosk for the U.S. Postal Service to eliminate incorrectly addressed mail.

McKesson Drug Co.
Acumax portable data management system to track warehouse merchandise.

Electronic Retailing Systems International, Inc.
Shelf-labeling system that ensures the price consumers see on the shelf is what they pay at the checkout counter.

Synthe-Voice Computers, Inc.
See story page 89.

EDUCATION & ACADEMIA

Stanford University
Multimedia for students that enhances learning by encouraging creativity.

Harvard Business School Publishing Corp.
Electronic distribution of education materials for timely access to data.

Harvard University Office of Information Technology
Custom textbook publishing to enhance learning.

Oklahoma State University
Improves the quality of campus life through convenient transaction processing for dining, vending and laundry and access to automated teller machines and laboratories.

Center for Applied Special Technology
See story for left.

ENVIRONMENT, ENERGY & AGRICULTURE

Australian National Parks and Wildlife
A system for access to environmental data for better planning, decision-making.

Organization for Tropical Studies
A database to speed species identification in the Costa Rican rain forest.

Paramax Systems Corp.
Weather-tracking system for more accurate, timely storm warnings.

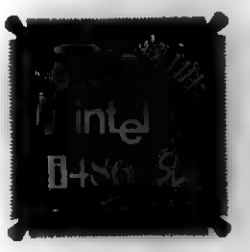
BP Exploration
A client/server system that enabled BP to put in place emergency response applications for oil spills.

[illegible] Information, Inc.
See story page 89.

Continued on page 88

Two PCMCIA 2.0 Slots, Type II (5mm) and Type "IV" (16mm): Twice the expandability. Easily accepts multiple cards including hard disk drives, modems and network adaptors.

LCD Status Bar: Delivers an instant read of the battery life remaining, power-saving mode, and a host of other key notebook settings.



Blazing 33MHz i486™SL: With built-in coprocessor support, delivers the ultimate in notebook processing power.

Some say the T4600 is Because in life, there

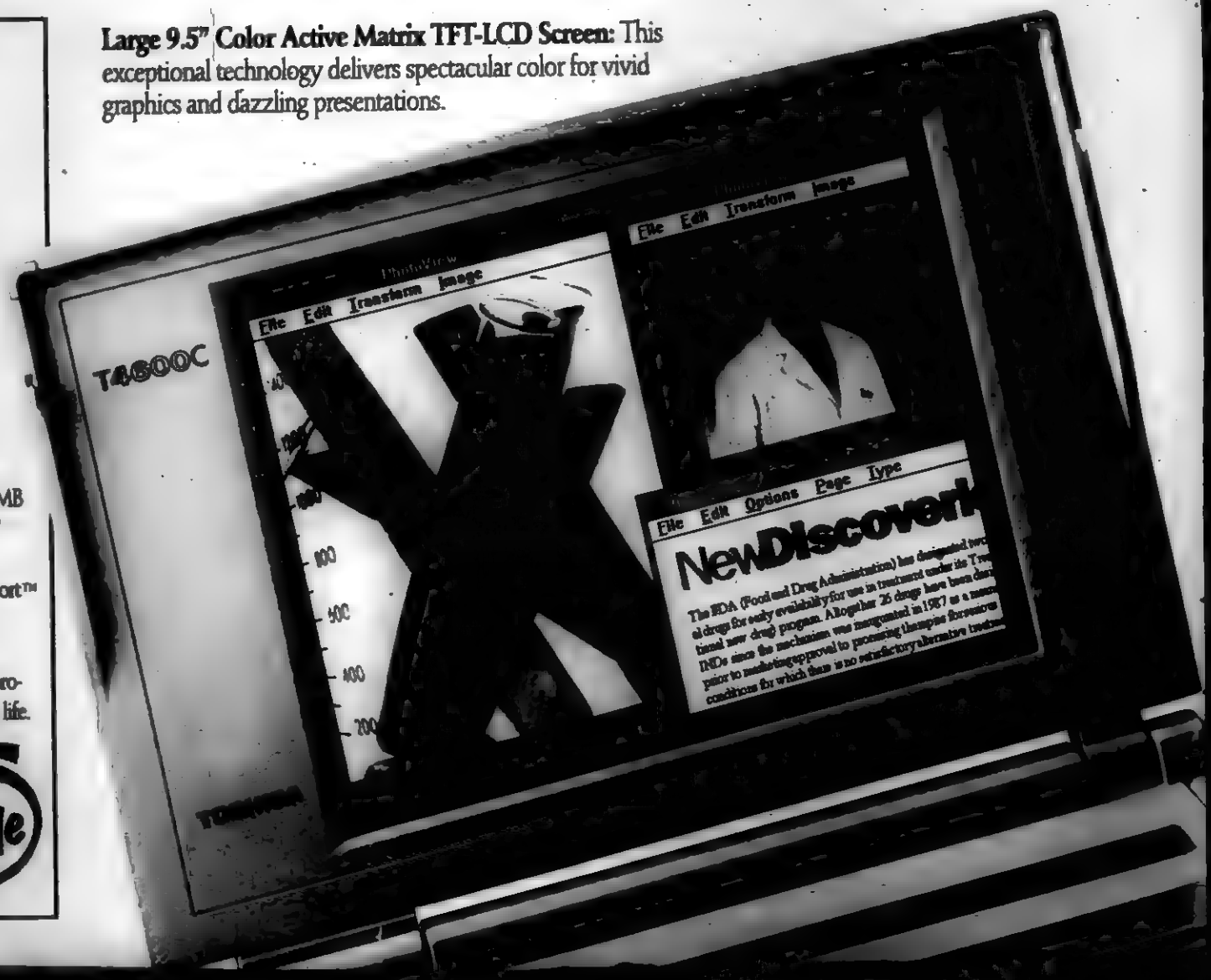
T4600C
- 9.5" color active matrix TFT-LCD screen
- 120/200/340MB HDD
- 6.9 lbs.
- NiMH battery

T4600
- 9.5" high-contrast, black and white LCD screen
- 120/200MB HDD
- 6.4 lbs.
- NiCd battery

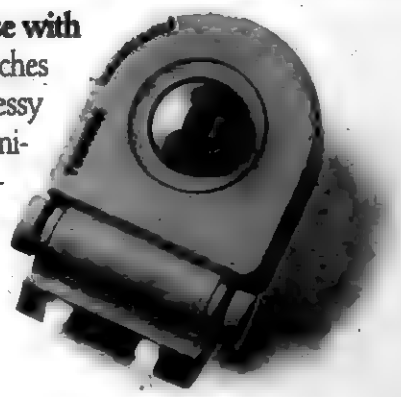
BOTH MODELS
- Intel 486SL/ 33MHz, 3.3 volt processor with 8K cache
- 4MB RAM expandable to 20MB
- Type II (5mm) and Type "IV" (16mm) PCMCIA slots
- BallPoint™ mouse w/QuickPort™
- Toshiba MaxTime™ Power Management system, and extensive 3.3v components provide industry-leading battery life.
- Pre-installed software: DOS 6.0, Windows® 3.1, and UltraFont.™

intel inside

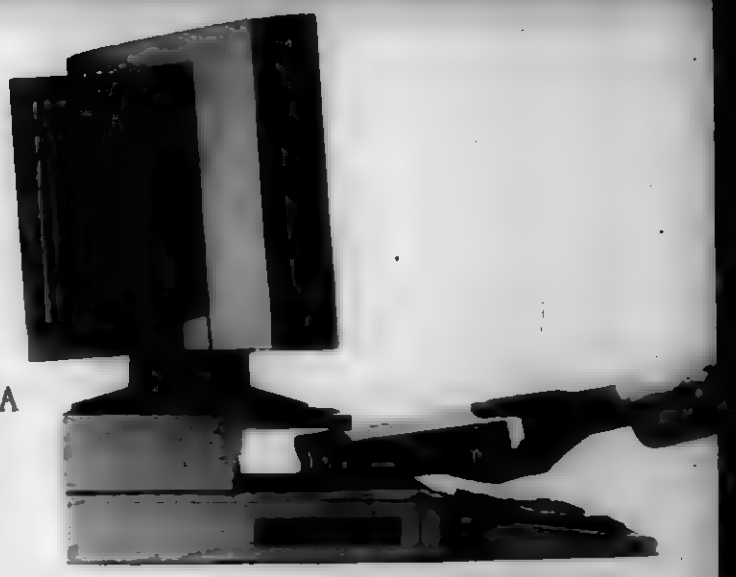
Large 9.5" Color Active Matrix TFT-LCD Screen: This exceptional technology delivers spectacular color for vivid graphics and dazzling presentations.



BallPoint™ Mouse with QuickPort™: Attaches easily, without messy cords, for ergonomically ideal input—perfect for Windows® applications.



Replace Your Desktop: Just snap your notebook into the Desk Station IV, and you're instantly connected to your printer, VGA monitor, mouse, and full-size keyboard. Now you only need one computer.



better than life itself. is compromise.

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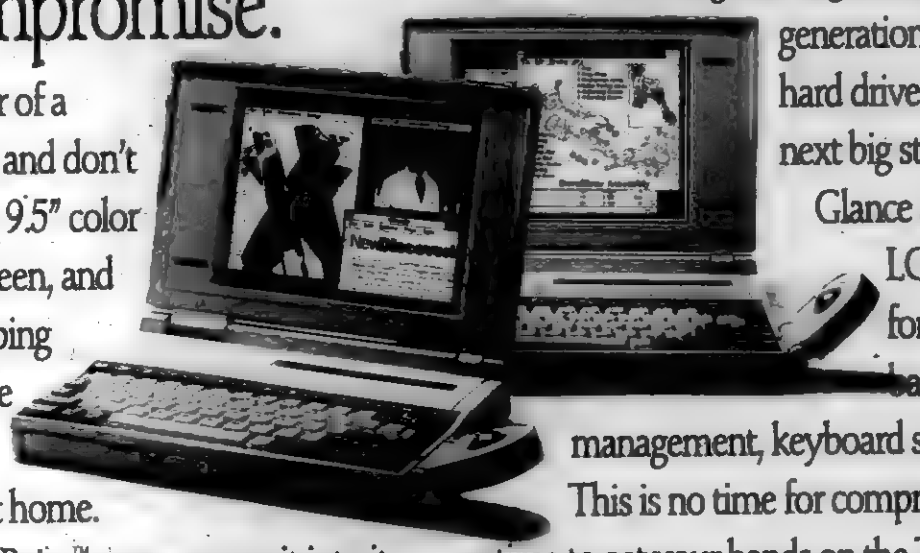
Get the awesome power of a 33MHz i486™SL processor, and don't sacrifice battery life. Add a 9.5" color active matrix TFT-LCD screen, and access all 185,193 eye-popping VGA colors. Pack a massive 340MB hard drive and never have to leave a file at home. Get your hands on the BallPoint™ mouse, snap it into its QuickPort™, and never waste a moment or a motion.



Carry two slots for industry-standard PCMCIA cards—including one large enough for the new generation of removable hard drives—and take the next big step in peripherals. Glance at the QuickRead LCD status icon bar for an instant read of battery life, power management, keyboard settings, and more. This is no time for compromise. This is the time to get your hands on the T4600 Series.

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In Touch with Tomorrow

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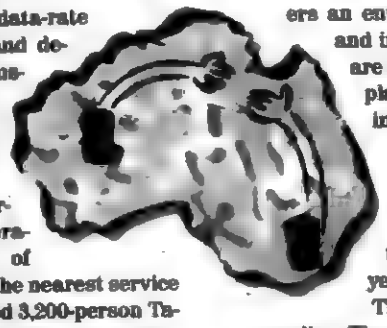
In from the outback

CONTINUED FROM PAGE 85

says. "I started to wonder, why couldn't this technology be used to bring communication to the Tanami people?" The answer to that question is ConferNet — a flexible, multisite network that weds satellite telecommunications equipment to low data-rate digital videoconferencing and delivers the mix through a custom-designed, Microsoft Corp. Windows-based graphical user interface.



Since it went live last November, ConferNet has overcome 120-degree temperatures, dust and distances of many hundreds of miles to the nearest service center to bring the estimated 3,200-person Tanami community out of exile. The network has been the means of delivering interactive childhood and adult education, emergency health diagnoses and government support programs.

And make no mistake about it: The Tanami people are, indeed, putting themselves on ConferNet, Nickolls says. They worked out the game plan for linking their far-flung community, he says. They also manage it: Users at each site control scheduling and call reservations via iconic commands.

The exercise of this control, he says, is "a convincing display of self-determination."

In the near future, ConferNet will give its users an entree into Australian media and information activities. Plans are afoot for international display and sale of Tanami paintings and crafts via ConferNet, says business adviser Peter Toyne.

First implemented at six sites, it will be extended to some 30 in the next few years, he says.

The network's user base is also expanding. The Chinese government has expressed interest in harnessing, for its own long distances, the technology that brought the Outback back in. — *Nell Margolis*

Holocaust memories

New museum's multimedia display vividly portrays Jews' plight

MEDIA ARTS & ENTERTAINMENT

More than half a century after the Holocaust, thousands of its victims "live" in timeless electronic space in a small computer room in Washington, D.C.

The new U.S. Holocaust Memorial Museum features a unique multimedia exhibit that preserves and digitally presents the faces, voices, songs and stories of men, women, children and nations in exhaustive, often painful detail.

Through a sophisticated blend of full-motion video, sound, text, photographs, maps and graphics, visitors at The Wexler Learning Center construct a customized electronic "tour" based on their own interests.

Using an electronic identification card, visitors can also "meet" a real person of their own age and gender from the past and track that person's fate through the Holocaust years between 1933 and 1949.

The exhibit, funded by the U.S. government, is a product of nearly four years of technological, scholastic innovation. Headed by Yechiam Halevy, an executive on leave from an Israeli database software firm, a team of nearly 50 technologists and researchers have labored since 1989 to collect and organize vast amounts of Holocaust data and create what he says is the world's largest networked multimedia system.

Visitors interact with 24 IBM 486-based PCs equipped with headphones and 19-in., Video Graphics Array touch-screen monitors. These workstations are located at the center and scattered about the museum.

Compressed digital information is delivered simultaneously to all users via a 150K-byte Novell, Inc. NetWare network and a superserver with 60G bytes of storage from NetFrame Systems, Inc. in Milpitas, Calif.

Although the museum has been open only since April 22, about 5,000 people visit each day, according to Halevy. Many seem moved by the digital encounter.

"My children didn't live in the same generation that I did, so for them it was just absolutely astounding," says Dorothy Hicks, 50, a nursing director in Woodbridge, Va. "We feel the same thing: How could we have ever let this happen?"

During the next year, Halevy, who serves as director of information systems, says museum staffers plan to focus on producing a related CD-ROM and allowing network access from remote locations.

"Chapter two is actually the educational message of this museum," Halevy says, "which is much more important than the physical walls." — *Joseph Maglitta*

▶ The Holocaust museum *preserves faces, voices and stories*

No bones about it

Fossil dating system helps solve puzzles about the Earth, our origins

SCIENCE

Scientists at the Institute of Human Origins (IHO) have used a computerized fossil dating system to prove that the genus *Homo* — our immediate ancestor — walked the rugged terrain of Kenya more than 2.4 million years ago, not 1.9 million years ago as was widely accepted in anthropology circles until recently.

Berkeley, Calif.-based IHO is applying its specialized automated dating system to studies of human origins and the Earth's history, solving questions about ourselves and our world faster and far more painlessly than ever before.

IHO programmers and researchers assembled existing commercial software into an automated system for tracking and evaluating animal remains, fossils and other data and samples. The system also uses specially built software bridges to control scientific devices such as laser beams and mass spectrometers, which judge a fossil's age.

Scientists, such as Myron Best, a geology professor at Brigham Young University, can now focus on understanding the data collected instead of spending hours in the laboratory manually pushing buttons, turning knobs and twisting valves. Previously, with manual methods, scientists could process just one sample each day; now they can work on 30 to 40.

Even as volume soars, precision has increased a hundredfold, says Alan Deino, an IHO geologist and principal programmer for the automated dating system. Less time spent on dating tasks means more time studying data "and upping the amount of organized data we are able to study," Deino says.

For example, because he can now process more samples, Deino can apply the principles of statistics to his data. That improves accuracy because researchers can more readily pick out "bad" data and anomalies, he explains.

One of the most important automation by-products is what IHO researchers call "telechronology," the process of dating specimens remotely via data uploaded over phone lines and controlled with special software bridges that activate spectometers and other devices.

An anthropologist digging for *Homo sapiens* remains in East Africa, for example, can key into a laptop information on the location and condition of fossil finds, then send the data to Apple Computer, Inc. Macintoshes at IHO.

Although the system is housed in Berkeley, laboratories worldwide can share it. Key components are Apple's Hypercard application, FileMaker Pro, a PC-based database from Claris Corp., and Procite, a PC-based bibliography organizer from Personal Bibliographic Services, Inc. — *Kim S. Nash*

ILLUSTRATIONS THIS PAGE BY STEPHANIE FAUCHER

Tumors in trouble

Image fusing improves cancer detection

For one 63-year-old woman with an abdominal tumor, techniques developed at the New York University Medical Center may have prolonged her life.

The center is improving cancer detection with its image fusion techniques, which, since 1986, have enabled doctors to diagnose tumors that may go undetected by more conventional imaging approaches. The female cancer patient is among the more than 40 people who have been diagnosed using these techniques, says Dr. Marilyn Noz, professor of radiology at the center.

NYU's image fusion combines two types of images: structural and functional. Structural, or anatomic, images by themselves offer clear anatomic detail but don't distinguish when an enlarged lymph node or abnormal bulk of tissue may not actually represent a cancerous tumor.

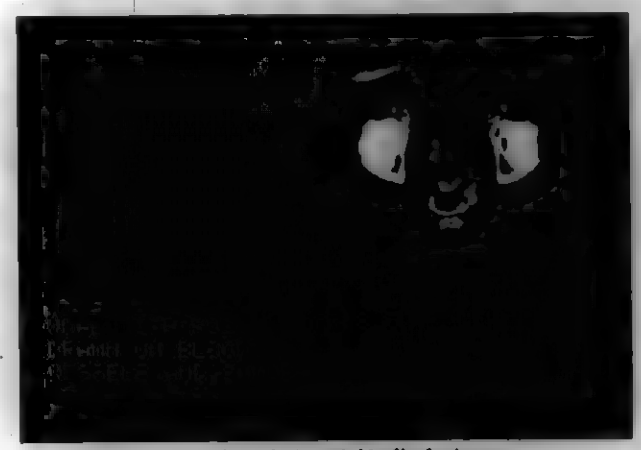
Functional images alone show the cancer's functions, including metabolic rate, tumor antigen concentration and chemical content. But these images often lack the anatomical landmarks that let doctors identify the precise location of the active portion of the cancer.

Merging the two images enables doctors to identify both the activity and the location of tumors for treatment.

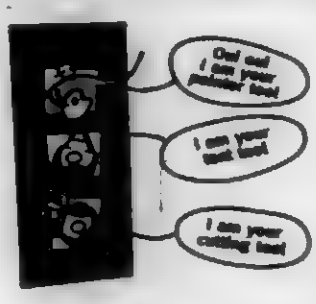
MEDICINE

Without image fusion techniques, "doctors have to literally hold up one film and put another on the viewbox and see if they can line them up," says Dr. Barry Wesseis, a professor and chief of the medical physics section at the Department of Radiation Oncology and Biophysics at George Washington University Medical Center.

—Melinda-Carol Ballou



▶Image fusion *pinpoints 'hot spots' to find a tumor*



Talking Windows

Software lets blind users access GUI apps

While the industry's transition to graphical user interfaces is a godsend to the DOS-wary, visual iconic displays present a considerable obstacle for users who cannot see.

Last June, Syntha-Voice Computers, Inc., a seven-employee firm in Hamilton, Ontario, introduced software, called Slimware Window Bridge, that enables blind and print-handicapped users to access Microsoft Corp. Windows applications through traditional Braille displays and speech synthesizers.

David Kostyshyn, the sight-impaired president of Syntha-Voice and part of Slimware's design team, says the group used artificial intelligence and pattern analysis to identify and translate Windows' elements.

BUSINESS & RELATED SERVICES

As the user moves the mouse, the software interprets the graphical text and translates it to the speech synthesizer or Braille display.

As users move the mouse, they hear a "blip" for every pixel moved. The tone of the blip raises or lowers to correspond to the direction in which the pointer is moving.

The Massachusetts Commission for the Blind in Boston is using the program to retain jobs in Windows environments for hundreds of blind people, according to Joe Lazzaro, adaptive technology coordinator at the commission.

Lazzaro, a blind beta-test user of the software, says, "It's pretty cool and very usable. It's a blessing in that it will create a situation in which other companies are going to copy it, resulting in more Windows programs for the blind and print-handicapped."

—Stephen P. Klett Jr.

You're fingered

Fingerprint system stops welfare double-dipping in L.A. County

The government is not typically known for being able to reduce costs *and* provide better social services to qualified needy people. The Los Angeles Department of Public Social Service (DPSS), however, is bucking government stereotypes and proving that, indeed, it can do good while cutting costs.

Over the years, the department has lost millions of dollars paying out fraudulent claims. In 1991, things started to turn around with the implementation of an Automated Fingerprint Image Reporting and Match (AFIRM) system.

The $9.6 million client/server system lets clerks at the 14 county DPSS offices scan in applicants' fingerprints to find out if they are receiving aid from another office. After scanning, the fingerprint images are sent to a central database to check for matching fingerprints. The process takes about five minutes, compared with the months it used to take for manual searches. Accuracy is 95%.

"We catch approximately 30 people a month who are trying to double-dip and beat the system," says Lisa Nunez, division chief at the Computer Services Division of the DPSS.

DPSS officials, however, point out that a match does not lead to criminal prosecution. "We just deny them aid. Technically, they have not committed a crime," says Eddy Tanaka, director at the DPSS.

GOVERNMENT & NONPROFIT

The system went live in June 1991. In the six months following, it helped detect 3,011 cases of existing fraud out of the 70,000 people on file, saving the county $5.4 million. By October 1995, AFIRM is expected to save the county $20 million. *—Stefanie McCann*

Waste not

Hazardous waste database tracks problem spots

There are about 2.2 million hazardous waste sites in the U.S. Some 700 governmental agencies track data on these sites, but the data has been hard to coordinate.

Until now. A PC-based neural network running a database developed by Vista Environmental Information, Inc. in San Diego tracks some 9.9 million records, which have data on 2.2 million individual problem spots.

Individuals and businesses can get data that might help when purchasing property or conducting business.

ENVIRONMENT, ENERGY & AGRICULTURE

Vista upgrades its files to show cleaned-up sites as reported. It uses both geographic information systems to map environmental hazards and the U.S. Census Bureau's database, which has street-by-street data. *—Michael Fitzgerald*

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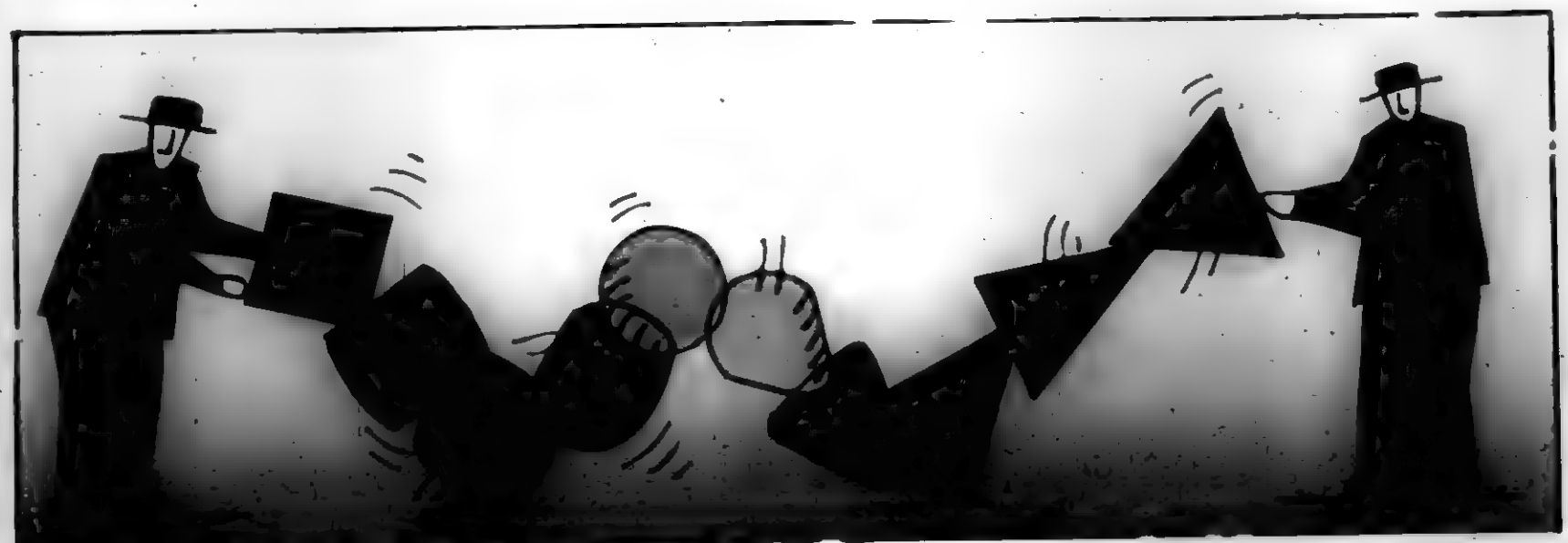

Change

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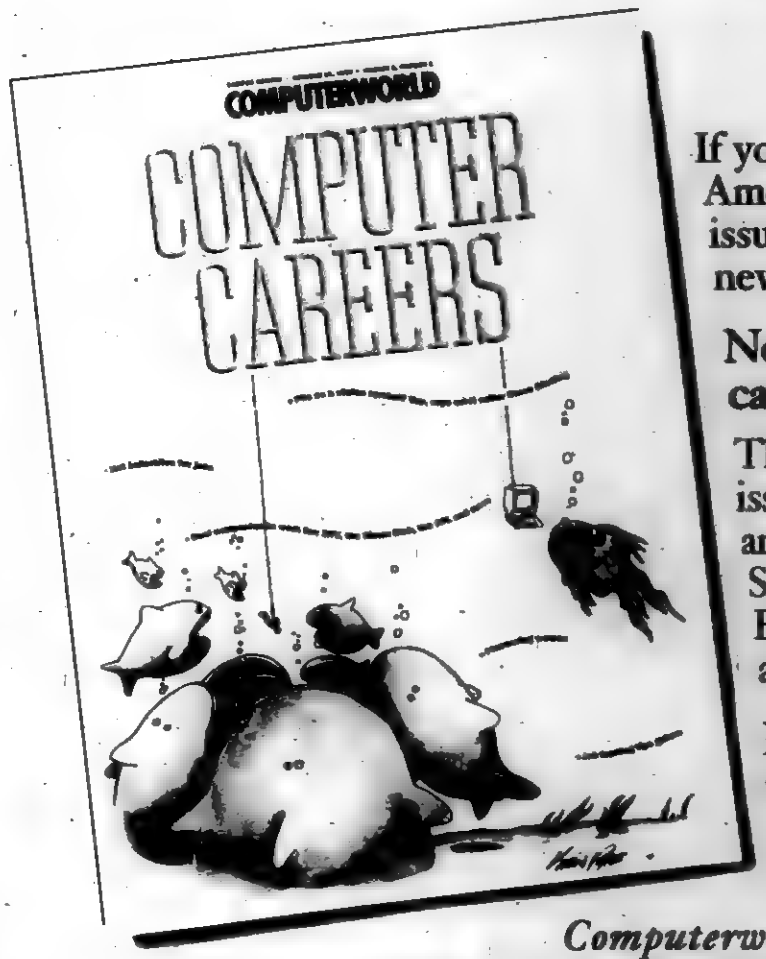

Issue Date: October 31, 1993
Close: September 17, 1993

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

Flexibility key to migration success

By Irma McCaffrey

It wouldn't be so bad if everything worked according to plan, but that rarely happens — especially when you're standing knee-deep in a major migration effort.

We were a start-up insurance company that had acquired a large base of policies that were maintained and issued by a company in Illinois. To handle this acquisition, we needed to move data processing to a mainframe vendor in Pennsylvania and our printing functions to a print vendor in Massachusetts.

Our three main objectives were to simultaneously migrate the print capability and the software and data processing; to convert from impact to laser printer technology; and to establish a quality control process.

Hurdles

The cutoff date from the Illinois service was firm — we had about eight months to complete the project.

The first step was to establish data links among the three locations. We hired a consultant because the staff expertise at each site was different.

To ensure the viability of the plan, we ran a pilot using one insurance form. As the project progressed, however, it was apparent that the communications links were undersized — we had underestimated the volume of data we needed to send, and the telecommunications setup needed to be more flexible.

The second hurdle was converting to laser printer technology. Fifty percent of the 45 forms produced in Illinois came from impact printers on multiple-part preprinted forms, whereas the Massachusetts vendor could handle only laser printing. To come up with a laser version of the preprinted forms, we decided to customize individual copies and do a unique sort on the print jobs prior to printing. This allowed us to mail the printed form with all the copies as a single unit as we had done previously.

The third hurdle was to limit the mail-merge rejection rate of the automatic mail-processing system. This was vital because once printed, the forms had to be processed through the print vendor's automatic folding, inserting and mailing operations.

Success factor

Overall, the success of an integration project ultimately reflects the quality of the team. Ours consisted of information systems members as well as an array of nontechnical people who understood the process of issuing a policy.

Once our team bought into the project, they produced results beyond my expectations. Do not be afraid to compromise or to seek alternatives during the project. Flexibility is the key to success.

McCaffrey is vice president of the Microcomputers Association New England Chapter and a technical services specialist at Arbella Mutual Insurance Co. in Quincy, Mass.

Pulling it together

GOAL: To help Arbella Mutual relocate print, mail and distribution functions

HURDLES:
- Establish data links among all four locations.
- Convert from impact to laser technology.
- Implement quality control of printed forms.

SKILLS NEEDED:
- An understanding of mainframes, minicomputers and PCs — how they work and interact with one another.
- Knowledge of impact print vs. laser technologies.
- Solid understanding of data communications.
- Familiarity with the insurance industry, forms they use and so on.
- Good interpersonal skills.

DO:
- Ask yourself if the project is feasible. If unsure, try a pilot.
- Have the right resources and time to complete the project.
- Have a good understanding of the technology involved.
- Have a precise goal. Vague concepts will cause trouble.
- Identify which goals are feasible and which are not.

DON'T:
- Oversimplify anything, especially technical aspects. In this case problems were caused by the conversion from impact to laser printer technology, the volume of data involved and staffing required.

CW Chart: Janell Genovese

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CLIENT SERVER APPLICS. To $75K Sybase Oracle Visual Basic
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Database administrators: Not just for mainframes anymore

Jobs

By Leslie Goff

Tell someone you're looking for a database administrator and chances are his response will be "Mainframe or PC?" As distributed databases proliferate, however, the skills of a classic database administrator in the systems department are gradually merging with those of the PC programmer who works with relational databases and tackles problems such as data backup and integrity in a client/server environment.

Consequently, want ads for positions under the heading "Database administrator" are not as plentiful as those for PC specialists who have experience with Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, Nantucket Corp.'s Clipper and other PC-based relational databases.

> **"A lot of us are a cross between a systems person and an applications developer."**
>
> *— Clayton Clendinen, Orlando Utilities Commission*

"With the client/server mood right now, a database administrator really needs to understand the workstation area and not just the mainframe," notes Clayton Clendinen, database administrator at the Orlando Utilities Commission in Orlando, Fla. "A lot of us are a cross between a systems person and an applications developer, and a lot would have the tendency to be mainframe-oriented."

Database administrators oversee the storage and distribution of corporate data. What was once a behind-the-scenes position with responsibility for maintaining a database in a single environment is becoming a more visible position responsible for ensuring the database security and integrity on a variety of platforms.

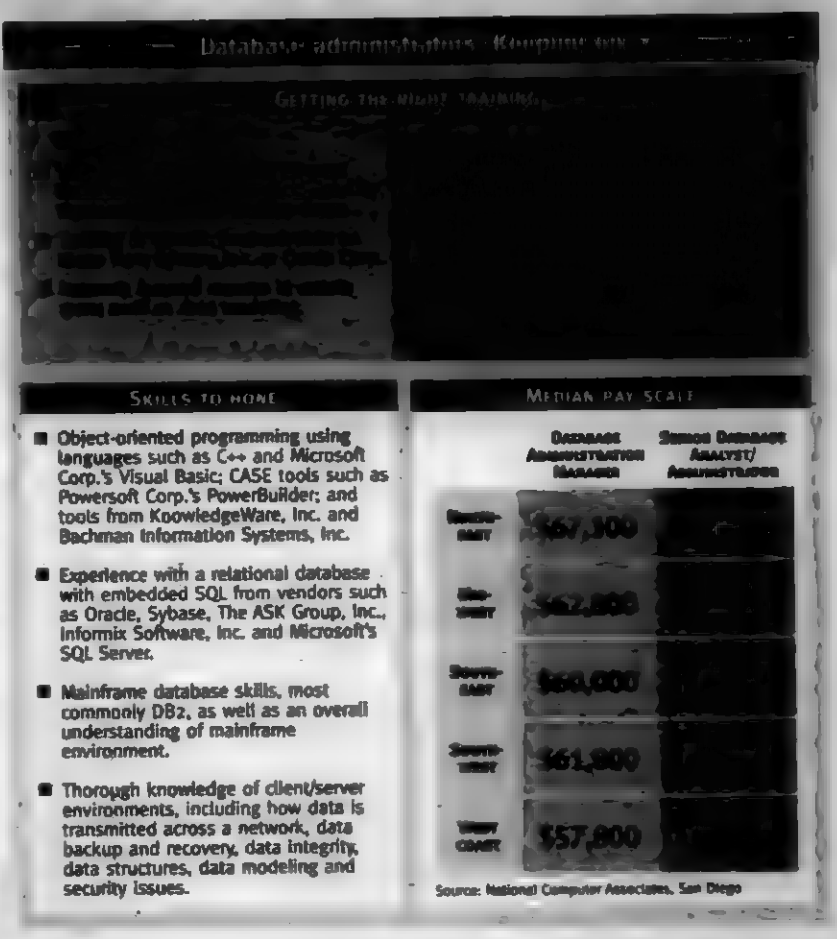
The systems-oriented database administrator working with DB2, Adabas and the like isn't going away, but may not go much farther without acquiring an in-depth knowledge of client/server — particularly how data is transmitted across a network and how distributed databases have changed the way companies use information (see chart).

Unlearning curve

Learning database administration in a distributed context also entails "unlearning" a lot of what you've learned on the mainframe, says Paul Olson, a consultant at Database Decisions, Inc., a consulting firm in Newton, Mass.

"You're coming at the data from a different perspective [in a distributed environment], and that's a difficult thing for people to adjust to," he says.

For instance, whereas a mainframe database is all character-based, a distributed PC database can have a graphical user interface that enables a database administrator to add user-oriented features such as pushbuttons or menus.



"A user is going to look at the database and say 'Make this as easy for me as possible,' " Olson says. "But what the user sees as simple is difficult to implement."

Richard Wonder, national director of the information systems division of Robert Half International, Inc. in San Francisco, says any database administrator looking to advance his career should scout companies that have embraced the Unix platform and are using a relational database with embedded SQL in a client/server environment. Companies that are re-engineering and moving in that direction are also a good choice.

Finding the right position remains tough, even for an experienced database administrator, in a market that remains soft. "For survival, I have to learn what I can about distributed databases, networking and Unix," says an administrator in the Midwest. "It may not mean more pay, but it would ensure my longevity. It's a long-term survival tactic."

Goff is a New York-based free-lance writer.

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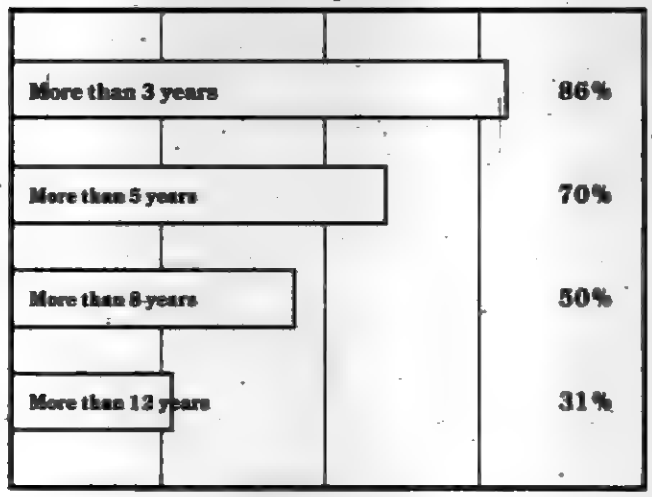

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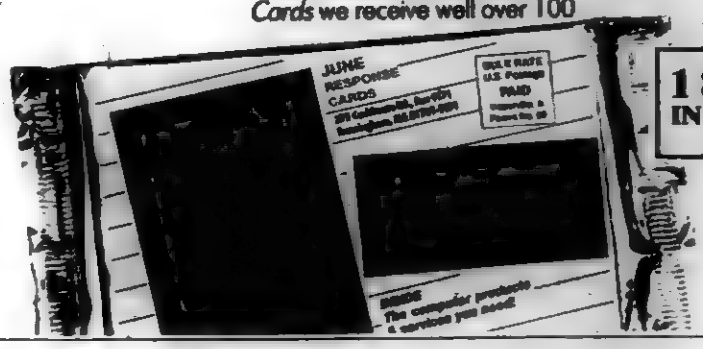

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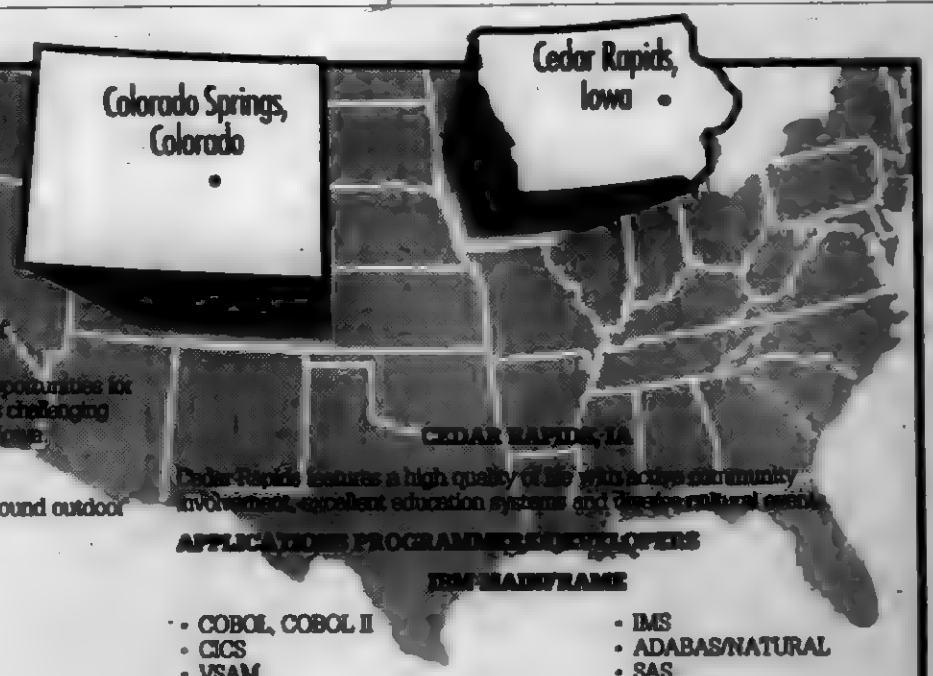

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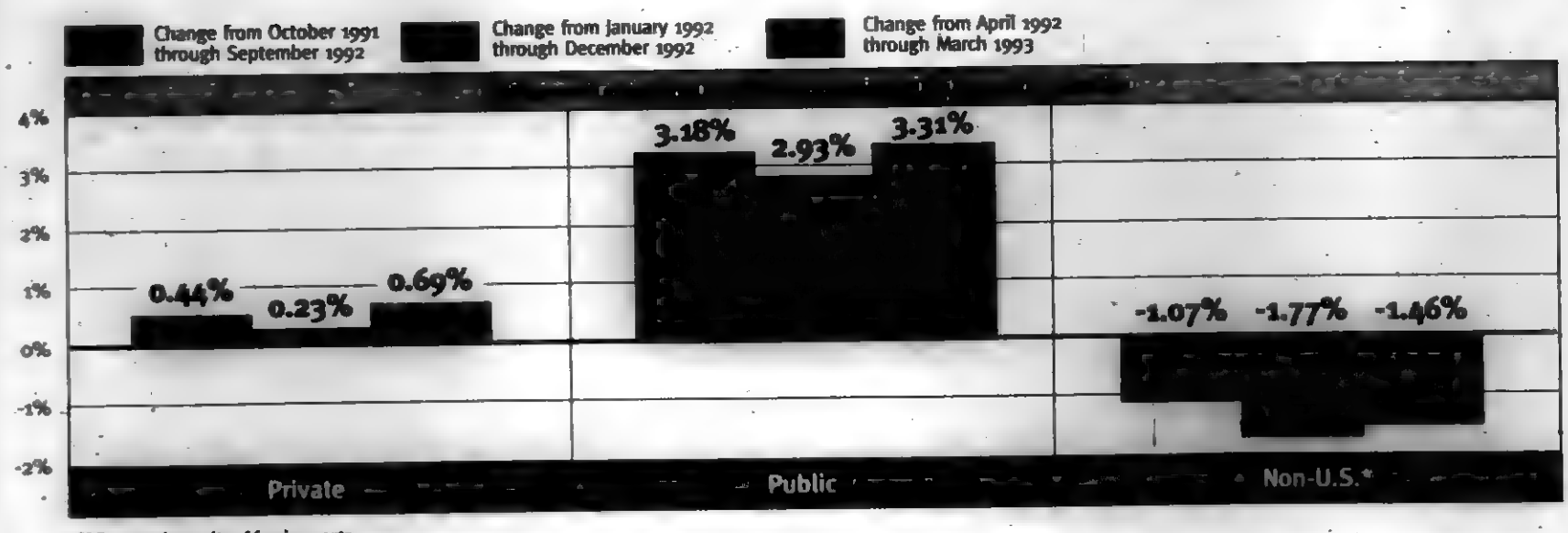

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Don't get stung by software contracts

By Naomi C. Mirlocca and Nathan D. Hollander

In today's ultra-competitive environment, you've got to protect yourself more than ever from vendors trying to make an extra buck. This is especially true when it comes to signing standard software contracts, which can actually be a very lucrative means for software vendors to collect additional revenue.

Let's start by saying that the standard contract *in no way protects the buyer.* In fact, some clauses seek to *make money* for the vendor. It's these clauses that vendors are free to search out and strictly enforce when they need the extra revenue. It's these clauses that you've got to recognize and modify before you sign.

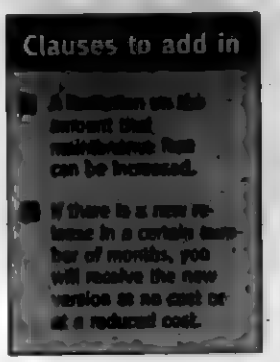
Your first reaction might be, "We've got a good, trusting relationship with our software vendor. This doesn't apply to me." But what happens if the vendor is bought out by a company with less scruples? You'll wish you had looked more closely at that contract. The following are problematic clauses you should watch for and some suggestions on how to modify them to your advantage.

1 **Software cannot be transferred.** Generally, software licenses are written for a specific CPU at a specific installation site. If your company moves the computer to a different site, the vendor can request a new license fee. This usually is an issue when companies are sold because the vendor sees it as a transfer of software.
Fix: Modify this clause so the software license can be transferred if the company, division or computer is sold. License the program to the computer so it can be moved from site to site.

2 **Limited software use.** This prevents a company from running a service bureau (i.e. processing another company's payroll using the software) without the vendor receiving additional royalties. This clause also prevents a company from running any of its other divisions' data on the software as well, which is especially troublesome if less than 50% of the division is owned by the company.
Fix: Modify this clause to allow any data owned by the company or affiliated companies to be run using the software, even if the affiliate is only partially owned.

3 **Software license cannot be disclosed or distributed to anyone other than the licensee's authorized employees.** Under this clause, you cannot hire consultants to make modifications to the software.
Fix: Modify this agreement to include consultants retained by your company.

4 **Additional fee for upgrades.** If you upgrade to a larger system, the vendor may hit you with an upgrade fee. This is the difference between the published software price and what you originally paid for it.
Fix: Eliminate the fee altogether if the reason for upgrading to a larger system does not relate to this application.



5 **The vendor's only responsibility is to use its best efforts, consistent with industry standards.** This exempts the vendor from any liability associated with the problems caused by software bugs.
Fix: Modify this clause so the vendor is responsible for damages resulting from errors caused when using the software, time spent finding the problem and monetary loss suffered by a customer or any related party.

6 **Changes to the program become the vendor's property.**
Fix: Any modifications you make are your property. The vendor should not be allowed to copy the code that is custom-written for you without paying a royalty fee.

7 **Limited number of backup copies.** A vendor usually limits you to one archival copy for backup and disaster recovery purposes of the software. The second copy is limited to the installation site or a second site that is owned or controlled by your company.
Fix: Modify this agreement so you are allowed two backup copies — one at your primary site and a second at the disaster recovery site that may be owned and/or operated by a third party.

8 **There is only a limited time during which a second copy of the program can be run for testing.**
Fix: This should not be allowed to stay in the contract. There is no set time limit that the copy of the program may be used for testing.

9 **A 30-day notice of intention from the vendor not to renew the maintenance agreement.**
Fix: Modify this clause so the vendor must give one to two years' notice of its intention to drop support of the product.

10 **Materials and documentation cannot be copied.**
Fix: Insist that you be permitted to copy all of the manuals for internal use.

Mirlocca is a senior consultant and Hollander is a practice leader at CSC Partners, a management and IS consulting firm in Bridgewater, N.J.

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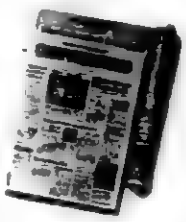

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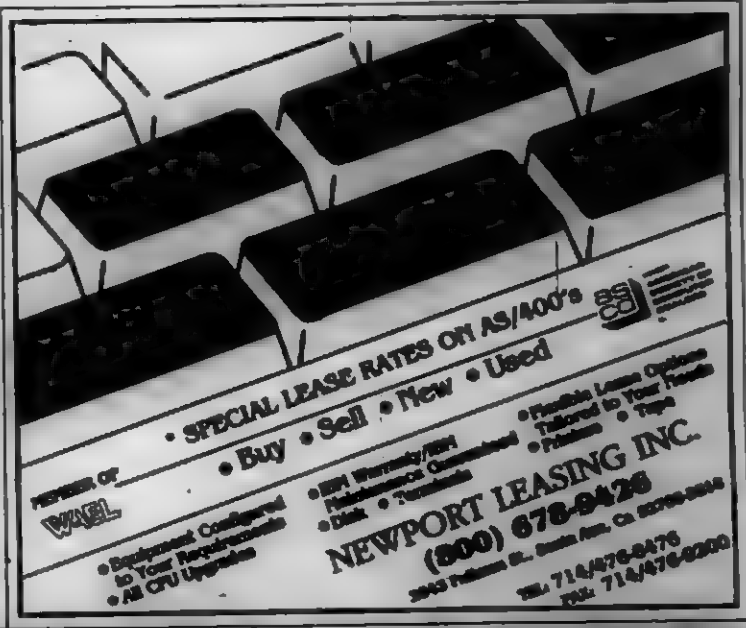

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Inquiries regarding the RFP should be addressed to:

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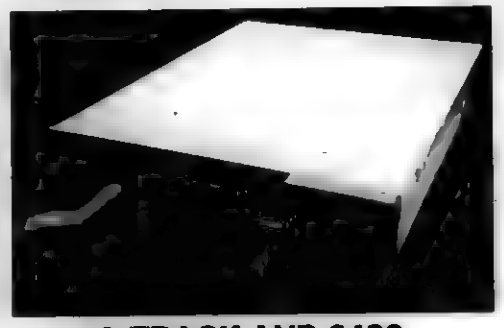

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Percent

[illegible]	22.7
[illegible]	19.0
[illegible]	17.1
[illegible]	12.9
[illegible]	12.5
[illegible]	12.5
[illegible]	12.0
[illegible]	12.0

QMS Inc.	-34.7
[illegible]	-25.8
[illegible]	-13.5
[illegible]	-12.0
[illegible]	-11.8
[illegible]	-11.8
[illegible]	-11.4
[illegible]	-10.7

Dollar

[illegible]	7.50
[illegible]	5.63
[illegible]	4.75
[illegible]	3.88
[illegible]	3.50
[illegible]	3.25
[illegible]	3.13
[illegible]	2.88

[illegible]	-12.50
QMS Inc.	-5.13
[illegible]	-4.88
[illegible]	-2.75
[illegible]	-2.50
[illegible]	-2.50
[illegible]	-2.38

[illegible]

Great expectations

Investors might think twice about buying a technology stock that is already trading at or near its all-time high.

But that high-water mark is not necessarily a cap for a stock's growth. The key issue, analysts agreed, is whether a company's earnings show continued momentum and whether those earnings can keep pace with Wall Street's expectations.

Newbridge Networks Corp. (NNCXF) illustrated that point last Wednesday. Already flying high after zooming up more than 400% in 1992, Newbridge issues rose 6⅛ on Wednesday as the company beat analysts' expectations for fourth-quarter earnings per share. Newbridge easily eclipsed its previous high and closed at 75⅞.

However, higher share price typically goes hand-in-hand with higher Wall Street forecasts for future earnings. Stocks that achieve premium values have an increased downside risk, not only if the company reports a difficult quarter but also if analysts' perceptions cause it to drop its expectations back down.

Robert Wilkes, communications analyst at Brown Brothers Harriman & Co., pointed to the decline of 3Com Corp. (COMS) as an example of that risk. 3Com sank 11⅛ on May 28 and continued to fall last week as Wall Street analysts cautioned against an unpleasant earnings surprise.

Part of the challenge for Newbridge, then, is for the company's management to guard against unrealistic future earnings estimates on Wall Street, according to Bob Kim, research analyst at SG Warburg & Co. Like other companies, Newbridge will supply market analysts with guidance on fixing a reasonable target for the next quarter's earnings.

Even at its current premium, Kim rates Newbridge stock a Buy. "As long as they meet or slightly beat expectations, they'll grow," he said.

Other computer stocks that may have room to rise, despite trading near their highs, include the following:

Hewlett-Packard Co. (HWP)

HP has traded in the mid-80s, nearly hitting a high of 89 recently. Shao Wang, an analyst at Smith Barney, Harris Upham & Co., said HP has aggressively contained expenses while demand for its new products across many lines has remained strong.

EMC Corp. (EMC)

Smith Barney analyst Barry Bosak said he expects EMC's 1993 earnings per share to be more than twice 1992's total. EMC finished Wednesday just off its 52-week high of 37.

—Derek Slater

Exch	52-Week High	52-Week Low		June 4 3 PM	Wk Net Change	Wk Pct Change
[illegible]						
OTC	40.00	9.63	3 COM Corp.	26.50	-0.75	-2.8
NYS	80.25	61.75	American Info Techs Corp.	73.50	1.38	1.9
NYS	62.38	40.63	AT&T	61.50	0.38	0.6
OTC	3.56	0.75	Antel Communication Corp.	2.63	-0.19	-6.7
OTC	24.50	10.25	Banyan Systems Inc.	15.25	-0.88	-5.4
NYS	56.75	43.25	Bell Atlantic Corp.	55.00	1.13	2.1
NYS	57.50	46.75	Bellsouth Corp.	53.00	1.13	2.2
NYS	6.25	3.63	Bolt, Beranek & Newman	5.63	0.63	12.5
OTC	18.50	9.50	Brooktrout Technology	12.00	0.00	0.0
NYS	107.00	44.00	Cabletron Systems	99.00	-2.25	-2.2
OTC	22.75	3.75	Centigram Communications (H)	21.00	1.00	5.0
OTC	63.50	17.75	Compcom Corp.	36.63	-2.38	-6.1
OTC	56.25	21.38	Cisco Systems Inc.	51.75	-1.25	-2.4
OTC	18.75	5.50	Compression Labs Inc.	13.00	0.88	7.2
OTC	36.00	11.00	CrossComm	30.00	-4.00	-11.8
OTC	4.63	0.88	Data Switch Corp.	2.75	-0.38	-12.0
NYS	22.13	12.38	Digital Comm. Assoc.	12.88	0.00	0.0
OTC	12.75	4.50	Digital Systems Int'l Inc.	5.25	-0.25	-4.5
OTC	44.00	4.25	DSC Communications	43.75	0.75	1.7
OTC	9.50	4.75	Fibronics Int'l, Inc.	6.00	-0.38	-5.9
OTC	24.75	8.75	Frenet Corp.	12.25	-0.75	-5.8
OTC	4.38	1.50	Gandalf Technologies Inc.	3.00	-0.13	-4.0
OTC	2.06	0.69	Gateway Communications	1.13	0.00	0.0
NYS	15.63	2.88	General Datacomm Inds. (H)	15.63	1.13	7.8
ASE	3.75	2.00	Go Video	2.63	0.19	7.7
NYS	37.75	30.63	GTE Corp.	35.00	-0.13	-0.4
NYS	84.88	62.50	ITT Corp. (H)	83.50	0.88	0.0
NYS	55.38	30.75	MCI Communications Corp. (H)	55.38	3.38	6.5
OTC	11.25	2.25	Microcom Inc.	4.00	-0.63	-13.5
OTC	26.25	4.75	Netrix Corp.	5.00	-0.25	-4.8
OTC	19.00	8.75	Network Computing Devices	9.75	-1.25	-11.4
NYS	15.00	5.38	Network Equipment Tech.	9.00	0.88	10.8
OTC	22.75	8.00	Network General	9.50	-0.13	-1.3
OTC	15.75	8.50	Network Systems Corp.	9.00	-0.38	-4.0
OTC	75.50	15.00	Newbridge Networks Corp.	75.50	7.50	11.0
NYS	46.00	30.50	Northern Telecom Ltd.	35.75	0.38	1.1
OTC	35.25	22.50	Novell Inc.	28.00	0.38	1.4
NYS	92.50	76.00	Wyse Corp.	85.00	1.88	2.3
OTC	30.00	14.50	Octel Communications Corp.	22.25	0.25	1.1
OTC	6.13	3.38	Pemtel Data Comm Networks	4.25	-0.13	-2.9
OTC	36.75	10.25	Picturetel Corp.	22.50	2.50	12.5
OTC	15.25	4.63	Proteon Inc.	6.13	0.63	11.4
NYS	53.75	14.25	Scientific Atlanta Inc. (H)	33.75	2.00	6.3
NYS	40.75	29.69	Southwestern Bell Corp.	38.50	0.38	1.0
NYS	33.25	21.00	Sprint Corp.	30.88	-1.63	-5.0
OTC	27.00	10.50	Standard Microsystems Corp	16.50	0.00	0.0
OTC	18.50	6.88	Stratacom Inc.	14.25	0.00	0.0
OTC	128.25	27.75	Synoptics Communications	106.50	-12.50	-10.5
OTC	7.13	4.13	Telebit Corp.	4.13	0.00	0.0
OTC	9.38	2.13	Telematics Int'l Inc.	6.63	-0.13	-1.9
OTC	25.50	13.38	US Robotics	21.50	-2.25	-9.5
NYS	45.00	34.88	U S West Inc. (H)	44.13	1.13	2.6
OTC	55.50	12.00	Wellfleet Communications	45.25	-2.50	-5.2
OTC	14.00	7.00	Xircom	14.00	1.50	12.0
[illegible]						
OTC	6.25	2.50	Advanced Logic Research	4.19	-0.56	-11.8
OTC	65.25	41.50	Apple Computer Inc.	55.00	-1.75	-3.1
OTC	24.25	11.25	AST Research Inc.	15.50	-1.00	-6.1
NYS	12.13	2.63	Commodore Int'l (L)	2.88	-1.00	-25.8
NYS	60.38	23.13	Compaq Computer Corp. (H)	59.75	2.13	3.7
OTC	49.88	15.00	Dell Computer Corp.	22.38	-1.38	-5.8
NYS	88.88	50.25	Hewlett Packard Co. (H)	86.63	3.13	3.7
NYS	37.63	16.13	Silicon Graphics (H)	34.25	0.25	0.7
OTC	41.00	22.50	Sun Microsystems Inc.	37.00	1.88	5.3
NYS	32.38	22.25	Tandy Corp. (H)	30.88	-0.25	-0.8
OTC	11.00	2.75	Zeos International Ltd.	4.13	-0.13	-2.9
[illegible]						
ASE	18.38	4.63	Amdahl Corp.	5.50	0.00	0.0
NYS	9.75	4.25	Convex Computer	4.38	-0.25	-3.8
OTC	6.13	1.88	Cray Computer	3.38	0.63	22.7
NYS	32.88	19.00	Cray Research Inc.	28.25	-0.88	-3.0
NYS	13.88	7.13	Data General Corp.	10.75	-0.63	-5.5
NYS	49.25	30.38	Digital Equipment Corp.	43.38	-0.63	-1.4
NYS	38.63	26.75	Harris Corp.	37.25	1.75	4.9
NYS	100.38	45.88	IBM	53.75	0.88	1.7
OTC	22.00	5.50	Kendall Square Research	17.00	0.50	3.0
NYS	127.50	89.00	Matsushita Electronics	126.00	4.75	4.0
OTC	23.75	8.25	Netframe	15.88	-0.38	-2.3
OTC	15.50	9.25	Parallan Computer	14.00	-0.25	-1.8
OTC	19.00	6.00	Pyramid Technology (H)	18.25	-0.13	-0.7
OTC	24.00	13.50	Sequent Computer Sys.	19.50	0.13	0.6
OTC	14.25	1.38	Sequoia Systems Inc.	2.00	0.00	0.0
NYS	48.38	29.50	Stratus Computer Inc.	31.63	-2.75	-8.0
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.00	0.0
OTC	19.00	10.63	TeleCard Systems	18.13	1.63	9.8
NYS	13.88	7.75	Unisys Corp.	11.88	0.50	4.4
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OTC	71.50	25.25	Adobe Systems Inc.	65.38	-0.88	-1.3
OTC	20.75	10.25	Aldus Corp.	16.13	0.38	2.4
OTC	14.25	5.50	American Software Inc.	7.63	-0.38	-4.7
OTC	28.13	9.75	Ask Computer Systems	12.25	0.75	6.5
OTC	56.50	32.75	Autodesk Inc.	49.88	0.38	0.8
OTC	13.00	2.50	Bachman Info. Systems	3.13	0.00	0.0
OTC	43.00	32.00	BGS Systems Inc.	33.00	0.25	0.8
OTC	84.13	37.25	BMC Software Inc.	51.13	1.38	2.8
OTC	28.25	17.00	Boole & Babbage	23.50	0.25	1.1
OTC	52.00	17.50	Borland Int'l Inc.	24.00	-1.25	-5.0
OTC	5.88	3.00	CE Software	3.63	0.38	11.5
ASE	30.25	6.25	Cheyenne Software Inc.	27.13	-0.13	-0.5
OTC	19.50	8.25	CompSoft	10.75	-1.25	-10.4
OTC	9.63	5.63	Cosmos Inc.	6.63	0.13	1.9
NYS	31.38	10.88	Computer Associates	27.25	-0.88	-3.1
NYS	12.38	2.75	Computervision Corp.	4.88	0.00	0.0
OTC	34.25	19.25	Computware Corp.	22.25	-1.50	-6.3
OTC	14.75	5.75	Consware Inc.	7.25	0.00	0.0
OTC	17.25	10.75	Corel Corp.	15.63	0.38	2.5
OTC	27.25	5.25	Easel Corp.	6.00	-0.38	-5.9
OTC	25.25	12.00	4th Dimension	20.00	-0.25	-1.2
OTC	19.50	6.00	Frame Technology	6.63	-0.38	-5.4
OTC	20.75	10.00	Group I Software	10.00	0.00	0.0
OTC	35.25	19.25	Gupta	19.25	-0.50	-2.5
OTC	8.75	3.50	Hogan Systems Inc.	7.88	0.00	0.0
OTC	25.75	11.25	IMRS	18.25	-0.25	-1.4
OTC	36.00	18.50	Information Resources	34.25	-0.38	-1.1
OTC	49.75	12.13	Informix Corp.	43.75	0.63	1.4
OTC	16.75	9.38	Intergraph Corp.	9.38	-0.50	-5.1

Exch	52-Week High	52-Week Low		June 4 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.88	Interleaf Inc.	8.63	-0.50	-5.5
OTC	18.00	6.50	Intersolv Inc. (L)	6.75	-0.50	-6.9
OTC	16.00	7.75	Knowledgeware Inc.	9.75	-0.50	-4.9
OTC	54.75	26.00	Legent Corp.	28.25	-0.75	-2.6
OTC	36.75	14.75	Lotus Development	34.13	-0.38	-1.1
OTC	23.00	7.75	MathSoft	7.75	-0.50	-6.1
OTC	23.25	5.25	McAfee Associates	6.25	-0.50	-7.4
OTC	11.63	1.88	Meca Software	10.88	0.63	6.1
OTC	13.50	5.25	Mentor Graphics	10.38	-0.88	-7.8
OTC	44.00	27.25	Micro Focus	34.00	-0.88	-2.5
OTC	18.75	4.38	Micrografx Inc.	5.75	-0.63	-9.8
OTC	98.00	65.50	Microsoft Corp.	94.00	1.75	1.9
OTC	44.63	14.00	Oracle Corp. (H)	44.38	2.38	5.7
OTC	34.25	15.38	Parametric Technology	30.63	-2.38	-7.2
OTC	48.50	22.50	Peoplesoft	33.00	0.25	0.8
OTC	7.13	3.50	Phoenix Technologies	5.00	0.00	0.0
OTC	48.00	24.88	Powersoft	24.88	-2.13	-7.9
OTC	41.50	17.00	Platinum Software	25.00	-2.50	-9.1
OTC	25.00	11.25	Platinum Technology	13.63	-1.38	-9.2
OTC	61.50	29.00	Progress Software Corp.	36.50	-2.50	-6.4
OTC	15.00	2.56	Quarterdeck Office Sys.	3.31	0.00	0.0
OTC	24.75	11.75	Rainbow Technologies Inc. (H)	23.75	1.50	6.7
OTC	14.00	4.00	Rasterops	9.63	0.94	10.8
OTC	15.25	3.63	Ross Systems	12.88	1.38	12.0
OTC	27.25	8.50	Sapiens Intl. Corp. N.V.	22.88	2.38	11.6
OTC	15.00	6.75	Software Publishing Corp.	8.13	0.63	8.3
OTC	11.75	2.00	Software Toolworks Inc. (H)	11.13	0.25	2.3
OTC	6.13	0.75	Spinnaker Software	1.38	0.06	4.7
OTC	12.75	3.25	State of the Art	10.25	1.50	17.1
NYS	24.63	13.75	Sterling Software Inc.	18.75	-0.75	-3.8
OTC	21.50	8.00	Struct. Dynamics Research	18.50	-1.13	-5.7
OTC	77.75	21.00	Sybase Inc. (H)	68.25	-1.00	-1.4
OTC	42.75	5.88	Symantec Corp.	17.63	0.88	5.2
NYS	12.50	5.25	Systems Center Inc.	10.13	-0.38	-3.6
OTC	25.50	10.00	System Software Assoc.	19.25	0.63	3.4
OTC	6.50	2.50	Telesis Corp.	3.63	0.00	0.0
OTC	22.75	9.13	ViewLogic Systems	18.50	-1.25	-6.3
OTC	23.50	6.75	Walker Interactive Systems	7.50	0.25	3.4
OTC	5.19	1.38	Wordstar	1.56	-0.19	-10.7
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NYS	92.88	7.38	Advanced Micro Devices	28.13	0.00	0.0
NYS	21.38	9.00	Analog Devices Inc.	19.38	-0.63	-3.1
OTC	24.38	7.63	Atmel Corp. (H)	23.88	0.63	2.7
OTC	8.38	2.75	Chips and Technologies	4.38	0.50	12.9
NYS	39.75	13.00	Cirrus Logic	20.38	3.25	19.0
NYS	14.25	7.38	Cypress Semiconductor Corp	13.88	0.50	3.7
NYS	16.13	8.00	Dallas Semiconductor	15.13	0.13	0.8
OTC	121.25	47.75	Intel Corp.	112.38	1.88	1.7
NYS	14.13	4.88	LSI Logic Corp.	13.75	0.75	5.8
OTC	33.25	13.75	Lattice Semiconductor	29.00	-0.25	-0.9
NYS	31.25	13.13	Micron Technology (H)	31.13	1.38	4.6
NYS	86.25	37.13	Motorola Inc. (H)	86.25	5.63	7.0
NYS	15.63	8.50	National Semiconductor (H)	15.63	1.13	7.8
OTC	17.75	6.50	Sierra Semiconductor	7.75	-0.75	-8.8
NYS	42.25	22.25	SynOptics	40.25	0.13	0.3
NYS	68.63	32.25	Texas Instruments (H)	68.63	3.88	6.0
OTC	8.88	6.00	VLSI Technology	8.00	0.13	1.6
OTC	9.38	2.13	Weitek (H)	9.13	0.00	0.0
ASE	9.63	4.13	Western Digital Corp.	4.88	-0.13	-2.5
OTC	38.50	14.50	Xilinx	36.00	0.00	0.0
OTC	31.50	12.66	Zilog Inc. (H)	31.50	0.25	0.8
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OTC	38.75	11.75	American Power Conversion	37.50	2.00	5.6
OTC	20.16	13.88	Banctec Inc.	19.00	0.50	2.7
OTC	18.00	6.25	Cambex Corp.	7.38	0.13	1.7
ASE	18.38	6.50	Cobratronics Corp.	7.25	0.13	1.8
NYS	25.50	11.25	Comdex Peripherals (L)	11.50	-0.38	-3.2
OTC	38.50	10.75	Creative Technologies Inc.	32.50	0.75	2.4
OTC	30.75	14.25	Data Race Inc.	22.00	0.00	0.0
ASE	17.00	4.75	Databasix Corp.	10.50	0.13	1.2
NYS	37.00	10.09	EMC Corp.	35.88	1.88	5.5
OTC	10.50	5.38	Emulex Corp.	7.25	0.25	3.6
OTC	19.00	13.25	Evans & Sutherland	16.88	0.13	0.7
OTC	33.00	12.00	Exabyte	12.50	-0.50	-3.8
OTC	26.00	7.89	Intelligent Info. Systems	21.00	-0.25	-1.2
OTC	8.88	3.88	Ionmega Corp.	4.25	-0.13	-2.9
OTC	21.25	5.75	IPL Systems Inc.	7.25	-0.25	-3.3
OTC	24.00	10.75	Kodiak Inc.	20.00	1.00	5.3
OTC	19.63	5.88	Maxtor Corp.	6.88	-0.25	-3.5
OTC	11.25	5.75	Micropolis Corp.	7.25	0.00	0.0
NYS	116.00	94.13	3M Corp	115.38	2.25	2.0
OTC	7.75	4.00	Printronix Inc.	6.75	-0.13	-1.8
NYS	17.25	6.88	QMS Inc.	9.63	-5.13	-34.7
OTC	17.88	11.63	Quantum Corp.	12.38	-0.13	-1.0
OTC	12.75	3.38	Rhomin Inc.	3.44	-0.06	-1.8
NYS	16.50	7.50	Recognition Equipment	15.50	0.75	1.6
OTC	13.88	4.50	Rexon Inc.	4.88	-0.13	-2.5
OTC	22.38	12.00	Seagate Technology	15.75	-0.50	-3.1
NYS	45.00	18.00	Storage Technology	39.38	0.75	1.9
NYS	27.88	16.88	Tektronix Inc.	23.38	1.13	5.1
NYS	88.88	66.75	Xerox Corp.	75.13	-0.63	-0.8
[illegible]						
OTC	23.75	14.25	American Mgmt. Systems	18.38	0.50	2.6
NYS	6.75	2.75	Arascomp Inc.	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	27.00	0.25	0.9
NYS	66.13	38.75	Auto Data Processing	49.25	0.63	1.3
NYS	17.25	11.22	Ceridian Corp.	14.38	-0.38	-2.5
NYS	17.38	13.13	Condisco Inc.	14.25	-0.13	-0.9
OTC	8.25	4.50	Computer Horizons	7.25	-0.25	-3.3
NYS	80.50	57.00	Computer Sciences	75.25	0.13	0.2
NYS	9.25	6.50	Computer Task Group	7.00	-0.13	-1.8
NYS	40.50	22.00	CompUSA Inc.	33.00	-0.38	-1.1
OTC	14.75	6.00	Corporate Software	11.75	-0.50	-4.1
OTC	20.25	7.38	Egghead Discount Software	8.38	-0.13	-1.5
NYS	35.88	25.25	General Motors E (EDS)	31.13	-0.63	-2.0
OTC	25.50	9.25	Ingcom Corp.	18.50	0.75	4.2
OTC	15.38	6.25	Intelligent Electronics	13.13	-0.63	-4.5
OTC	13.00	6.63	Merisel	12.63	0.13	1.0
OTC	16.25	5.75	Microage Inc. (H)	15.25	-0.50	-3.2
OTC	43.00	21.75	Paychex	41.25	1.00	2.5
NYS	87.25	32.88	Policy Management Sys.	37.75	2.88	8.2
NYS	38.50	16.81	Reynolds and Reynolds (H)	37.75	0.63	1.7
OTC	33.00	22.00	SEI Corp. (H)	32.25	0.00	0.0
OTC	24.38	16.88	Shared Medical Systems	22.25	0.13	0.6
OTC	13.75	5.75	Shl Systemhouse	11.38	-0.50	-4.2
OTC	29.25	18.25	Software Spectrum Inc.	26.75	-0.25	-0.9
OTC	33.75	22.50	Sungard Data Systems (H)	31.00	1.63	5.5
NYS	4.38	1.13	Ultimate Corp.	3.88	-0.13	-3.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Piracy losses charted

Software piracy is costing publishers and distributors as much as $12 billion annually, according to the Business Software Alliance. The Asian market continues to be the largest threat with more than $5.4 billion in losses estimated in 1992. European pirates absconded with $4.5 billion in software last year, while U.S. bandits pilfered $1.9 billion worth of packages in 1992, the alliance estimated.

Cray gets funding

Beleaguered Cray Computer Corp. in Colorado Springs, will soon receive an equity infusion of about $26 million. The company sold some common shares to institutional and private investors. The funding, which is expected to be set by June 11, will enable the supercomputer company to continue operating for the next year, analysts said. Cray, a spin-off from Cray Research, Inc., has hit development snags with its Cray-3 supercomputer, which caused some prospects to withhold orders.

Phoenix acquisition

Phoenix Technologies Ltd. in Norwood, Mass., has acquired Strategic Research Institute K.K., a system software engineering firm in Tokyo. The acquisition will make it easier for Phoenix to serve its Japanese OEM customers, which include Fujitsu Ltd., Hitachi Ltd. and NEC Ltd.

SHORT TAKES Pyramid Technology Corp. in San Jose, Calif., has promoted Chief Operating Officer John Chen to president and named him to the board of directors.... Sungard Data Systems, Inc. in Wayne, Pa., has acquired Information Systems of America, Inc., a provider of accounting and investor support software to the insurance industry.

Apple: No trial by jury

Hopes higher court will see merit in its infringement suit

By James Daly
SAN FRANCISCO

■ Faced with an unsympathetic judge and impending defeat, Apple Computer, Inc. last week abandoned its effort to get a jury trial in its copyright infringement case against Microsoft Corp. and Hewlett-Packard Co. It now plans to move the case to what it hopes is a more charitable appeals court.

After five years and millions of dollars in legal fees and just four weeks short of a jury trial, Apple attorneys last week indicated they would not contest the remaining issues in the suit. Judge Vaughan Walker summarily ruled in favor of Microsoft and HP.

Apple sued Microsoft and HP in March 1988, charging that certain visual elements in the Macintosh, including overlapping windows and the manipulation of icons, were not covered by the scope of a 1985 licensing agreement Apple inked with Microsoft. That pact was used in the development of Microsoft's Windows 2.03 and HP's New Wave, which is based on Windows.

Judge Walker, who has continually winnowed down the scope of the case, last month dealt Apple a severe blow when he ruled that the firm would have to prove that the visual displays on the Macintosh were "virtually identical" to the Microsoft and HP software. Apple had argued for an easier "substantial similarity" standard.

Apple attorneys said Judge Walker's guidelines missed the point of their argument. "The District Court was wrong in treating Apple's distinctive copyrighted graphical interface as a 'purely functional arrangement,'" said Apple general counsel Edward Stead.

Experts said Apple's legal maneuvering is not atypical. "Why go through the effort and expense when their chances of convincing a jury using Judge Walker's guidelines were negligible?" asked Ronald Abramson, an attorney and member of the intellectual property group at the New York law firm Hughes Hubbard & Reed. "Either side would have appealed."

An Apple spokeswoman said the company hopes an appeals judge will apply the broader substantial similarity infringement standard. Abramson said the appeals process could take two years or more.

Attorneys said Apple may not fare much better in the Court of Appeal for the Ninth Circuit, a moderate bench not known for taking a hardline approach to copyright infringement suits. "I don't think they're necessarily going to get a friendlier forum," said Richard Bernacchi, who specializes in intellectual property issues for the Los Angeles law firm Irell and Manella.

So suit-ed

It's been a long, struggle trip for participants in the case:
March 1988: Apple sues Microsoft and HP, charging that certain Macintosh elements were not covered by a 1985 licensing pact.
March 1991: Macintosh's visual elements are ruled original and not part of 1985 pact.
June 1991: Apple adds Windows 3.0 to complaint.
March 1992: Apple estimates $6.55 billion in lost revenue.
April 1992: Judge Walker decides that many of the Macintosh screen graphics were either not protected or come under original technology pact. Narrows core of suit from nearly 300 original points of contention to 20.
May 1992: Jury trial set for June 22.
June 1992: Judge dismisses all charges against Microsoft and HP. Apple seeks appeal.

DRAM shortage hits PCs

By Michael Fitzgerald
ATLANTA

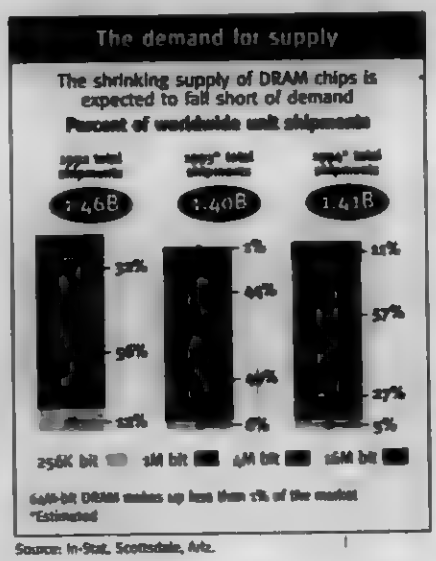
Vendors contend that dynamic random access memory chips are in short supply, and that shortage could affect users' ability to get DRAM upgrades or even entire systems. But the situation is not considered a replay of the 1988 shortages.

"There is a definite DRAM shortage emerging because there is a lot of demand," said Safi Qureshey, president and chief executive officer of AST Research, Inc., at a Comdex/Spring '93 panel. Qureshey said one irony is that "the biggest users of DRAMs are Nintendo and Sega, so we are competing with our kids for DRAMs."

Analysts said smaller computer vendors, which typically buy from the spot market, may have trouble getting DRAM chips. But large players such as IBM PC Co., Compaq Computer Corp. and Toshiba America Information Systems, Inc. typically purchase DRAMs on long-term contracts and are not likely to see their supply or pricing affected.

In addition, Qureshey's kids analogy is only partially true, said Dean McCarron, an analyst at MicroDesign Resources, Inc. McCarron said the games use pseudostatic RAM, a form of DRAM with embedded logic controls, while most PCs use DRAM without the logic controls. McCarron said pseudo-DRAM shows up mostly in portables, such as Apple Computer, Inc.'s PowerBook or Hewlett-Packard Co.'s 95LX and 100LX.

McCarron agreed that DRAM makers



Source: In-Stat, Scottsdale, Ariz.

cannot meet current demand. The situation will probably last through the end of the third quarter, when new capacity is scheduled to come on-line, he added.

"We're not going to see the kind of stuff we saw in '88, though," McCarron said. DRAM vendors at that time failed to see the market shift from 256K bits to 1M bit. The resulting shortage of 1M-bit chips drove DRAM prices through the roof.

Some observers blamed the International Trade Commission's spat with Korean DRAM makers, which were accused of dumping chips on the U.S. market and hit with a hefty tariff [CW, Nov. 9, 1992]. While the commission has lifted the tariff, supplies have not improved.

Mike Moshayedi, president of fast-growing RAM upgrade vendor Simple Technologies, Inc., said the IBMs and Compaqs of the world actually exacerbated current DRAM problems by placing large orders when the tariff rulings first went out last year. Moshayedi said, "We thought the situation would get better after the tariff relief, but it hasn't."

But Jim McDonnell, a marketing manager at HP's PC division, said, "They're blaming the ITC, but it really seems like it's an issue of poor forecasting. Worldwide, DRAM demand is up through the roof."

McDonnell said HP is currently meeting demand, and he said HP could find itself shipping systems configured with less memory than customers would like if the shortage continues. McDonnell said HP expects the situation to ease by the end of the third quarter.

Senior editor Michael Vizard contributed to this story.

Wysiwyg

Dances with GUIs

Actor Kevin Costner appeared in an early Apple II TV ad aimed at stealing customers away from IBM

Gwendolen Cates/Outline

HUMBLING THOUGHT

Only **36%** of 1,977 Americans surveyed think the office computer is a necessity, although it does beat the VCR

WHICH OF THE FOLLOWING DO YOU THINK IS A NECESSITY?

Automobiles	85%
Clothes washer	82%
TV set	74%
Home air-conditioning	47%
Microwave oven	44%
Car air-conditioning	42%
Office computer	36%
Second automobile	27%
Dishwasher	24%
Office fax machine	23%
VCR	18%
Home computer	11%
Cellular phone	5%

Source: Roper Organization (Report 93-1)

Quips & Quotes

"Pentium's not this magical elixir that everyone's going to drink of. It's just sand, damn it."

— Jeffrey Henning, analyst, RIS Strategic Decisions

WORD PLAY

Algorithm: When the vice president dances

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The Fifth Wave *by* Rich Tennant

InsideLines

Coming up

Tuesday's rollout of IBM, Novell, Lotus and Taligent's [illegible] plans to [illegible] client/server platforms at Interop. Worldwide Executive Director Jim Cannavino vowed to [illegible] "Unix and relational database experience in a pinch and will help this traditional move with us into new technology." Noted with interest: IBM does not openly back AIX, its current client/server platform.

Come into my parlor

Hewlett-Packard is expected next week to announce a deal with Synon, Inc., a software development company in Larkspur, Calif., that will enable AS/400 users to migrate their applications to HP's 9000 series of Unix workstations. This follows HP's efforts to attract users from other platforms, such as an alliance formed earlier this year with Wang to migrate its users over to the 9000.

Getting the lead out

HP is blaming the longer-than-planned lead times for its PA-RISC workstations, introduced last fall, on problems with getting the 100-MHz PA-7100 microprocessor to sit properly in its packaging. Deliveries remain stretched out six to eight weeks on the low-end HP 9000 Model 715 and eight to 12 weeks on Models 735 and 755. HP is trying to get the lead times down to less than four weeks during the summer, describing the hoped-for improvement as "imminent."

The object of its desire . . .

The Object Management Group (OMG) will demonstrate the fruit of its Request For Information for new Common Object Request Broker Architecture (Corba) services later this month at Object World. Eighteen vendors — including IBM, DEC and HP — have apparently dropped competitive offerings in favor of an entry by Sun for this particular piece of the OMG standard. Dubbed Joint Object Services, the Sun offering will handle several low-level services for Corba to help manage the storage and retrieval of objects.

Notes mail lives

Contrary to a report published last week, work has not been halted on the mail portion of Lotus' Notes software, according to a spokesperson. Lotus added new mail features — including text searching, macro support and directory improvement — to the recently released Notes 3.0 and is working on additional features, such as native X.400 and pager support, for upcoming releases of Notes.

Better late than early?

Cisco confirmed a report that its routers may support IBM's APPN Network Node a few months earlier than planned. Still, Cisco said it does not expect major user demand for Network Node until the second half of 1994 — its original shipment time frame. The accelerated rollout will be made possible by 3Com's "tremendous work making the protocol portable to a real-time environment like ours" rather than a Unix environment, a Cisco spokesman said.

Word on the street is that the Common Open Software Environment (COSE) coalition for a unified Unix look and feel has an update in store for this week's Xhibition show in San Jose, Calif. Items said to be on the docket include some, or all, of the following: a) A COSE update, b) A new COSE member and c) A white paper describing the COSE "process" and policies. DEC, meanwhile, is trying to get accepted into the COSE specification. It is offering to add the Habitat software layer that sits on top of DEC OSF/1 and adds compliance to Unix System V and Berkeley Unix to the COSE spec. DEC is pushing its ACA Services implementation of the OMG's Corba spec as well. Phone, fax or CompuServe Inside Editor Alan Alper with news tips at (508) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8158.

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You say: "Wrong. PC- and UNIX-based stuff. Windows. NetWare. *Open* stuff."

They say: "Well . . . So what? They can't image-enable *our* system, anyway. We've got multiple platforms, multiple languages, *all kinds* of networks . . ."

You say: "Wang can image-enable any environment. IBM. DEC. HP. UNIX. Windows. Anybody."

They say (after a pause): "No kidding?"

John L. Sullivan
WORLD'S CHAMPION

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The Newspaper of Information Systems Management
June 14, 1993, Vol. 27, No. 24, 156 Pages, $6/Copy, $48/Year

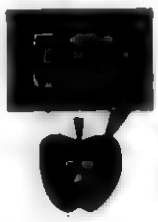
COMPUTERWORLD

Inside

OOP!

You've heard the hype; now here's the scoop on OOP. Users of object-oriented programming tools told *Computerworld* they're seeing productivity increases of up to 50%. They also report some success with code reuse.

But for now, there is still more tire-kicking than OOP production. Training is one obstacle; another — and a major hole in the technology — is a lack of business-oriented class libraries.
Page 107



Meanwhile, it doesn't look as though object DBMSs are going to take over, according to consultant Fabian Pascal. He says relational DBMSs are a better bet than object DBMSs, which are inflexible and need a lot of manual labor to maximize applications performance.
Page 127

IBM to reveal ATM plans

Products, architecture to roll in 18 months

By Elisabeth Horwitt
NEW YORK

■ IBM plans soon to make the first announcements about its long-rumored Asynchronous Transfer Mode strategy and will start rolling out products within 18 months, said Rick McGee, IBM director of networking systems architecture, last week.

One major piece of that strategy is Broadband Networking Architecture, which will provide ATM management features such as congestion control and give popular local-area network protocols access to ATM's 1G bit/sec. speeds.

IBM plans to elicit input from other vendors and to propose the architecture as an industry standard, possibly through the ATM Forum, McGee said.

IBM will also provide the first official details on the high-speed switches it has been developing overseas, an IBM spokesman confirmed.

One switch will support both ATM and Packet Transfer Mode, which is an IBM version of ATM that uses variable-length instead of fixed-length packets.

IBM users at the InterLab, Inc. New SNA conference said they were less interested

ATM plans, *page 15*

IS 'heroes' honored at award gala

William Habeck beams *from behind the Computerworld Smithsonian Transportation Award he collected for Bay State Shippers of Boston, which won for its on-line rail information system. For a more in-depth look at the fifth annual awards ceremony and some of the winners, please turn to pages 28 and 29.*

Client/server strategy

Compaq end runs midrange makers

By Michael Fitzgerald
HOUSTON

After gaining on the minicomputer market for four years, Compaq Computer Corp. said it expects to match its midrange brethren starting this fall with a major server and network management announcement. The move would bring true large-scale systems capabilities to PC servers for as little as $5,000, a Compaq official said last week.

Toward that end, the PC server leader plans to release its first server line designed from the ground up to run mission-critical applications, according to Virgil Hornstein, Compaq's director of systems marketing, North America.

> "I've been asking for this for 2½ years."
> — *Paul Bandrowski, Sara Lee*

The servers will boast a variety of mainframe-like features not found on the PC level before. They include the following:

- Monitoring software that will warn local-area network administrators if system components appear ready to fail, so the parts can be replaced ahead of time.
- A built-in, unlimited power supply with an orderly power-down procedure.
- System utilization monitors for performance tuning.
- Support for up to four processors.

Compaq will add other useful twists to its products as well. For instance, the servers will feature built-in CD-ROM drives to enhance software distribution.

Hornstein said Compaq has found that it takes even experienced LAN administrators more than one try to successfully install massive and complex products such as Novell, Inc.'s NetWare and that the installation process can take as long as 10 hours.

Consequently, Compaq is building CD-ROM versions of products such as NetWare with Compaq-designed scripts to make installation error-free and reduce install time to as little as 45 minutes.

Hornstein said Compaq will roll

Compaq, *page 14*

Low PC tags have their price

Backlogs, shorter life cycles bedevil buying plans

By Michael Fitzgerald

Analyzing what has happened in the PC hardware arena since Compaq Computer Corp. made its bombshell announcement of low-price PCs a year ago, two things are clear: Users pay less for systems, but product life cycles are shorter and backlogs take longer to fill.

Users said they like the price cuts, but some were venomous about backlogs and many protested product life cycles that have shrunk to as little as six months. Shorter life cycles, coupled with falling gross profit margins for PC vendors, raise the specter that vendors will not be able to continue investing in research and development over the long term.

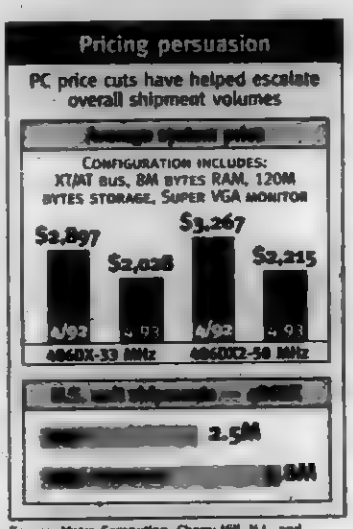
"As a technologist, I love the shorter product life cycles, but as a budget manager, product life cycles are a nightmare because our investment doesn't last nearly as long as it used to," said Louis Kahn, chief network administrator at the Centers for Disease Control and Prevention's Immunization Program in Atlanta.

Vendors beyond reach

Numerous users also complained that they have less contact with their vendors now than in the past, particularly with IBM and Compaq.

"Customer service lives up to my expectations, but I expect to get less than adequate service from these people," said Gerald Reid, director of information systems at the New York law firm of Milbank, Tweed, Hadley & McCloy. Reid said his firm recently started buying from

PC prices, *page 12*



Source: Metro Computing, Cherry Hill, N.J., and International Data Corp., Framingham, Mass.

Compaq sold Reid 90,000 units in the U.S. in first-quarter 1993, a poor showing for the PC maker. This year, its first-quarter U.S. unit sales were up 24% to 327,000 units, including 178,000 in March alone.

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Lynda Radosevich

PC SOFTWARE

Microsoft and Lotus took turns heating up the airwaves last week. **Microsoft** unwrapped a Windows framework designed to link office machines that garnered support from 60 vendors. *Page 2.* **Lotus**, meanwhile, bought **Approach** and plunged into the contentious Windows database fray. Separately, it is readying plans to add Notes to its application suite. *Page 4.* And Adobe ushered in the "electronic paper era" with the release of its Acrobat portable document format. *Page 24*

RE-ENGINEERING

A re-engineering project at **Lincoln National Life** resulted in a client/server system that accommodated the need to keep the look and feel of paper documents. *Page 48*

CLIENT/SERVER

Don't confuse getting rid of the mainframe with client/server. Think of client/server in terms of what the software does, not the platform it runs on. *Page 66*

UNIX

Unix support cropped up everywhere last week. **DEC** belatedly joined **COSE**, citing as the reason for the delay concerns about how COSE's process for creating Unix standards worked. *Page 14.* Meanwhile, **USL** is moving its **System V Release 4.2** operating system to the microkernel architecture. *Page 8*

E-MAIL

Beyond will unwrap a mail package this week with built-in work-flow applications and imaging support. *Page 4*

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BEST COMPUTER NEWSPAPER 1992 COMPUTER PRESS ASSOCIATION

A PUBLICATION OF IDG

Microsoft takes on the office

'At Work' backed by 60 vendors with component products

By Lynda Radosevich
NEW YORK

In the latest attempt to define a standard for the interaction of office devices, Microsoft Corp. last week unwrapped a software framework said to allow PCs, copiers, fax machines and telephones to communicate with one another over local-area, wide-area and wireless networks using Windows technology.

Lending weight to the announcement was the endorsement of 60 vendors, including several that demonstrated products or laid out specific plans for products to come. The first product to use a component of the new software is a printer from Hewlett-Packard Co. that is shipping now. Fax machines (see box) are expected to ship by year's end.

Called At Work, the framework includes a software development kit based on two Microsoft interfaces: Messaging Application Programming Interface, or MAPI, and the company's recently announced Telephony Application Programming Interface.

Benefits of this architecture will include the ability to manipulate office machines from a Windows screen on any peripheral device or desktop computer; to store fax, voice and electronic communications in one directory; and to enable the devices to share editable documents.

Certain capabilities, such as sending and receiving editable faxes from networked PCs, already exist. So what Microsoft is really adding here, users said, is the ability to unify the methods that various vendors use to link their devices.

"I think Microsoft is the best positioned to do it because they dominate operating systems and have tight links to the hardware vendors," said Ed Benack, an operations manager at a large Northeastern telecommunications firm. He added that the effort is something he would have liked to see 10 years ago. Other users agreed.

When manufacturers will add the At Work software to their machines, however, depends on when Microsoft delivers the tool kit, which it promised will be available this summer, said a spokesman at Xerox Corp. Xerox endorsed the At Work software and said it plans to build fax machines, printers and digital copiers that integrate with PCs.

Additionally, manufacturers must pay an undisclosed licensing fee for At Work software, a fact that is likely to have the biggest impact on pricing for low-cost items such as phones because the fee represents a larger percentage of the item's total cost than in higher priced items, according to Amy Wohl, president of Wohl Associates, a consultancy in Bala Cynwyd, Pa.

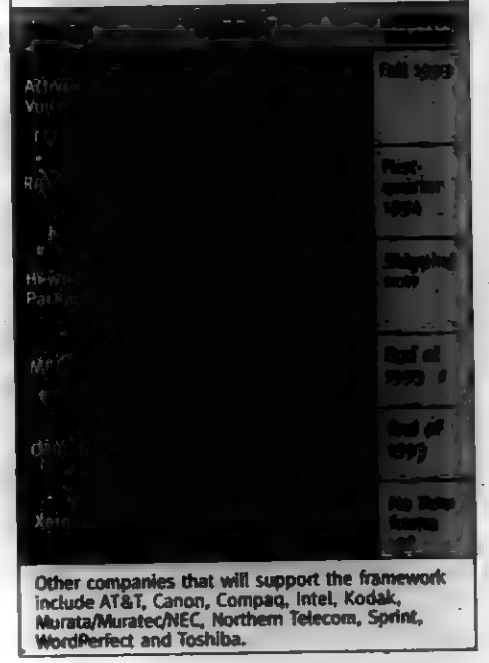
For Roy Gregory, manager of personal computing at food wholesaler Scrivner, Inc. in Oklahoma City, a standard approach to linking office equipment is worth more money.

"If it looks like a definite industrywide standard, I would be willing to pay a little more [for At Work-compliant products], possibly 5%," said Gregory, who is looking for networked fax hardware and software.

Besides indirect costs, users would not have to pay for At Work software because Microsoft Chairman and Chief Executive Officer Bill Gates said it will be included in the next major releases of Windows and Windows for Workgroups operating environments.

Hard at work

Product plans of vendors endorsing Microsoft's At Work framework include the following:



Other companies that will support the framework include AT&T, Canon, Compaq, Intel, Kodak, Murata/Muratec/NEC, Northern Telecom, Sprint, WordPerfect and Toshiba.

A look under Mobile Companion's hood

With Microsoft's At Work announcement came the first fruits of its Frontline Partnership with Compaq Computer Corp. [CW, April 19]. Compaq announced its Mobile Companion, a 1- to 2-pound 486-based tablet that uses pen input and wireless communications and was designed to work within the At Work framework.

Mobile Companion, an entirely new type of product for Compaq, will not hit the market until sometime in 1994 and will carry a price tag below $2,000, said Lorie Strong, Compaq's vice president of portable and software marketing. She said several hurdles must be cleared before the product is introduced, notably the creation of software that will synchronize data between a mobile companion and a deskbound PC and better wireless communications standards.

Compaq said it expects the Mobile Companion to be used as a second digital device by business users, as opposed to products such as Zoomer from Tandy Corp. and Casio, Inc.

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Notes will join SmartSuite

User needs drive Lotus to add groupware to package

By Michael Vizard
CAMBRIDGE, MASS.

As suites become the dominant force in selling Microsoft Corp. Windows applications, Lotus Development Corp. is looking to leverage some of that momentum with sites that have adopted its Notes groupware offering.

Though the details are still being worked out, Lotus plans to offer a version of SmartSuite that will include Notes at a higher price than the current $750 charged for SmartSuite, said Cliff Conneighton, director of Notes marketing.

The Unix version of Notes has "gone into beta testing, with the introduction release scheduled for no later than the end of the summer.

Setting the stage for this is the scheduled arrival next month of Version 2.0 of SmartSuite, which will include the ability to easily reformat files across diverse applications using Notes as an intermediate transport.

Customer requests are driving Lotus to offer Notes as part of a suite, Conneighton said.

Full suite

Among those customers is Waste Management, Inc. in Lombard, Ill., a Notes user in the early stages of making a commitment to Lotus' SmartSuite offering, which currently includes the 1-2-3 spreadsheet, the Ami Pro word processor, the Freelance Graphics presentation package, the Organizer personal information manager and CC:Mail client software.

"We'd like to see them put Notes in a suite to simplify billing," said Stephen Michael, senior director of information systems.

Once the integration of Notes and SmartSuite takes place, Lotus is expected to develop a document management system that will leverage the groupware capabilities of Notes, said Brownell Chalstrom, president of Chalstrom Consulting in Oakland, Calif.

"With mail and other workgroup applications, suites will be moving from loosely glued to superglued applications," Chalstrom said.

Close behind

But while Lotus enjoys an edge over its rivals in terms of application integration, Microsoft Corp. and Borland International, Inc. are expected to offer significant application integration enhancements later this year [CW, May 31].

And Lotus' short-term integration lead may not be enough for it to overcome Microsoft's substantial lead in the Windows software market.

"If somebody bought off on all the Lotus software, it makes sense to buy a suite with Notes. But there's an awful lot of people out there with Excel spreadsheets so I don't think the Lotus move will have a major effect," said Norman Weizer, president of Weizer Associates, Inc., a consultancy in Lexington, Mass.

BeyondMail to add routing, tracking to E-mail package

By Lynda Radosevich
CAMBRIDGE, MASS.

Beyond, Inc. will announce this week an updated version of its electronic-mail software that adds templates for routing mail around an office, support for sending document images in mail messages and the ability to connect to a database back end.

Available in the third quarter, BeyondMail 2.0 is aimed at the same advanced set of local-area network E-mail users targeted by Lotus Development Corp.'s Notes, said David Whitten, a program director at Gartner Group, Inc. in Stamford, Conn.

"The software includes a serial routing application that lets users select a sequence of recipients and assign due dates to each. The originator can track the progress of the message as it is routed.

Additionally, BeyondMail 2.0 comes with Watermark Software, Inc.'s image processing software. The software uses Microsoft Corp.'s Object Linking and Embedding technology to "point" to an image generated by scanners and in-bound fax gateways and stored on a file server. Users can embed a miniature document image in a mail message and click on the miniature to call up the image for annotation. The message can be stored in one place and "pointed to" rather than copied into the message, which saves disk space, a Beyond spokesperson said.

Maj. Jack Stackhouse, a chief systems engineer at the Materiel Systems Center at Wright-Patterson Air Force Base in Ohio, is testing several packages including BeyondMail to automatically route forms and send data across Novell, Inc. NetWare networks to remote Oracle Corp. databases. Additionally, the base wants to scan documents and store them in an optical jukebox, and then access and distribute the documents electronically.

"Our idea always has been to use E-mail as the transport" for data queries, Stackhouse said.

He added that he is looking at software from Wang Laboratories, Inc., Novell/Eastman Kodak Co. and Delrina Corp. but likes that Beyond bundles imaging and work flow into the E-mail software.

"It means I wouldn't have to buy additional licenses," he said.

BeyondMail 2.0 uses NetWare's Global Message Handling Service messaging backbone and will synchronize with the NetWare 4.0 directory service. It runs on DOS- or Microsoft Windows-based PCs and costs $995 for a 10-user license.

Test to ship

Beyond plans to send Apple Computer, Inc. Macintosh and Unix versions of its E-mail software to customer test sites by the end of the year and estimates a first-quarter 1994 ship date.

Acquisitions

Database firm adds depth to Lotus lineup

By Michael Vizard
CAMBRIDGE, MASS.

■ Lotus Development Corp. last week acknowledged its plans to acquire Approach Software Corp. in Redwood City, Calif., in a $20 million move that is expected to further complicate an already fractious Microsoft Corp. Windows relational database field.

For Lotus, the acquisition fills a long-standing hole in its overall product line that in recent months has been exploited by both Microsoft and Borland International, Inc. Similarly, Approach needed a white knight to fend off the marketing muscle of Microsoft and Borland as well as smaller rivals such as Software Publishing Corp.

Following the acquisition, Lotus' first priority will be to revamp the Approach database during the coming year by building in SmartIcons and tightening integration with Lotus' SmartSuite offering [CW, May 24].

Approach is a simple-to-learn, easy-to-use database similar to what a 1-2-3 spreadsheet user would want to use, said Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

The inclusion of Approach in SmartSuite will be part of a Lotus effort to distinguish Approach as an end-user database for what Lotus Chief Executive Officer Jim Manzi called "normal people."

In contrast, Manzi said the databases that Borland and Microsoft have recently opted to package in their suites are really programmer's tools ill-suited for end users. "The acquisition is aimed squarely at the suite market," Manzi said.

"A big piece missing all along in SmartSuite has been a database, especially now that Microsoft has a database in Microsoft Office," said Colin MacKenzie, a local-area network administrator at New England Telephone Co. in Framingham, Mass.

According to MacKenzie, persuading his management to adopt SmartSuite has been a challenge because it would have required the purchase of a database from another vendor.

APPROACH

Founded
1990 by Kevin Harvey with former Oracle and Claris engineers.

Product
Approach RDBMS for Windows.

Meanwhile, Approach users are looking forward to the resources Lotus will bring to the equation.

"The resources Approach will have in terms of engineering and marketing will be tremendous now," said Thomas Builerman, loss control manager at the property and casualty division of Cigna Co. in Milwaukee.

In addition to being a relatively simple database, Approach also provides a tool for downloading data from databases made by Oracle Corp., Microsoft, Borland and IBM via a set of predefined Powerkeys.

Microsoft has been particularly successful at depicting Access as a front-end query tool for high-end databases, such as Oracle's offering, that can be easily adopted by end users while also giving programmers the tools to build applications.

"If I don't need sophisticated logic, then Approach is a fine thing," Finkelstein said. "But Microsoft and Lotus can claim they do both the simple and complex. There's no way Lotus can claim to do the complex with Approach."

Thus far, Microsoft claims to have already shipped close to 900,000 units of Access worldwide.

"Access is somewhere in between an end user-tool and a programmer's tool. Access can extend up while Approach is only an end-user tool. Corporate accounts want a single database standard that they can give to both users and developers," said Mary Engstrom, a Microsoft group product manager for Access.

"Corporations don't want to support two different database standards, and they don't want to deploy something that's going to run out of power," added David Watkins, vice president of product management at Borland.

But Lotus maintains that Approach was designed to write and read to the formats of a number of back-end databases so IS managers do not have to support another database format.

"We don't really need a programming language. The most complicated thing we need is the ability to move data within the database," MacKenzie said.

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News Shorts

Storage Tek sues EMC over patent

Storage Technology Corp. has filed a patent infringement lawsuit against **EMC Corp.** in Hopkinton, Mass., alleging that EMC's Symmetrix product line impinges on Storage Tek's caching technology. EMC disputed the claim, saying in a statement that the suit was a surprise, especially because Storage Tek has "not been able to successfully develop a single product based on their caching technology."

Banyan directory works with NetWare

Banyan Systems, Inc. in Westboro, Mass., is expected to announce this week a new version of its Enterprise Network Services for **Novell, Inc.**'s NetWare network operating system. The product, which provides Banyan's StreetTalk directory and security services for NetWare users, has been enhanced to allow users of Banyan's Vines network operating systems and users of NetWare to exchange files.

More carrier legal battles

AT&T last week filed a complaint in U.S. District Court against **MCI Communications Corp.** for not complying with a stipulation in the Communications Act of 1934 that requires all common carriers to file tariffs for interstate services. **AT&T** named Bank of America, Chrysler Corp., Citibank NA, Kmart Corp., Caesar's World, Gateway 2000, Inc. and Compaq Computer Corp. as MCI long-distance customers being charged rates different from those on file at the FCC.

Sybase distributes database server

Sybase, Inc. formally unveiled Replication Server, a product under Sybase's System 10 rubric designed for distributed database computing. Priced between $16,500 and $43,850, Replication Server targets large users that want to synchronize continuously updated data in different geographic locations. Replication Servers for Sun Microsystems, Inc. Scalable Processor Architecture-based and IBM RISC System/6000 machines are due out in the fourth quarter.

Seeing the forest and the trees

Weyerhaeuser Co., a Tacoma, Wash., forest products company, said last week it would build its next generation of systems on **Hewlett-Packard Co.** HP 9000 Unix servers and workstations. The $9.2 billion firm plans to downsize some of its mainframe applications and build new client/server applications throughout its enterprise. Weyerhaeuser plans to spend $25 million on HP systems in the next few years.

Compaq execs sell stock

Seven Compaq executives, including its chairman, Ben Rosen, sold stock in the company last month, according to documents filed with the Securities and Exchange Commission. The trades drew attention partly because Rosen has never sold shares in Compaq before and partly because Compaq's stock has slipped in the last two weeks, after hitting a 52-week high. Rosen sold 83,000 shares, approximately one-sixth of his holdings, and gave another 17,000 to charitable causes. The other executives cashed in slightly more than 300,000 shares, mostly by executing options.

SHORT TAKES The **IBM Consulting Group** has launched the **IBM Multimedia Consulting Practice**, a worldwide organization whose charter is to define, analyze and recommend multimedia technologies for customers.... **HP** said it will announce today two fixed-configuration, aggressively priced local routers and will slash prices on much of its internetworking line by 18% to 24%.

News shorts, page 16

Network to save $40M/year

By Nell Margolis

Four of California's major health insurers last week banded together with Electronic Data Systems Corp. and health care network specialist Health Information Technologies (HIT) to launch a payment network expected to cut some $40 million a year in administrative costs.

Conceived by health maintenance organizations (HMO) TakeCare in Concord and HealthNet in Woodland Hills, the alliance also includes San Francisco-based Blue Shield of California and Woodland Hills-based PruCare of California.

EDS will implement the network — known as California Health Information Network — and HIT will provide the technology. While precise technological details have not yet been mapped out, according to executives from several of the firms involved, a key ingredient of the plan is that HIT will serve as a technological clearinghouse. To some extent, payors that join the network will not have to throw out their current technology.

The California Four hope to complete the first implementation of their joint venture to electronically determine eligibility and process claims this fall, said Mark Rose, general manager of information systems at PruCare.

While no official pilot has begun, a mini beta test is already under way at Los Angeles-based Cedars-Sinai Physicians' Association, a so-called independent physician association through which some 200 doctors serve approximately 50,000 patients at 15 HMOs.

The association has already installed claims-paying software from Woodland Hills-based software designer Fred Rothenberg & Associates, but the doctors who belong to the association are unable to access it. The software vendor hired HIT to help bring the doctors into the electronic loop.

The three-way link project is slated to come out of beta testing next month, said Fred Rothenberg, president of the firm.

Electronic need

Even before they have finished working out the details of their game plan, however, IS managers and executives from several of the health care payor organizations attested to the urgent need for electronic communications between health care payors and providers.

For starters, waste is inherent in the current, paper-logged system. Estimates of the savings potential in multiplayer electronic data interchange (EDI) range from $4 billion to $10 billion, according to the Workgroup for Electronic Data Interchange.

In addition, noted Brad DeMaso, provider IS systems administrator at TakeCare, the alliance marks an effort to read some true meaning into the word "standards" when it comes to EDI. "As it is," he said, "there are too many standards; it's just too complicated." The alliance, he said, offers a chance to "really standardize on a 'one black box' solution."

The black box in this case will be HIT's managed care specialized network, which currently processes about 200,000 claims and eligibility transactions a month using a Stratus Computer, Inc. XA 2000 Series 200 host.

The HIT network currently connects some 100 insurers with about 1,500 doctors' offices. The latter figure could be due for a boom: The four California Health Information Network allies represent a combined statewide membership of approximately 3.5 million subscribers.

Tandem to deliver Posix OS, RISC-based Cyclone

By Jean S. Bozman
CUPERTINO, CALIF.

Tandem Computers, Inc. is planning to update its line of fault-tolerant computers with a Posix-compliant version of its proprietary operating system and a reduced instruction set computing (RISC)-based version of the high-end Cyclone machine by year's end, company executives said last week.

Tandy's James Treybig: *'RISC move is critical for growth'*

The changes will reposition Tandem's flagship Guardian line as a more open system with greatly improved price/performance, said James Treybig, chief executive officer. Moving to RISC technology from complex instruction set computing processors in high-end Cyclone machines will also enable $2 billion Tandem to bring manufacturing costs in line.

"The movement of RISC into Cyclone brings our price down so we can be competitive across the board with no deterioration in margins," Treybig said. "This is critical for growth."

Tandem's last major hardware announcement — CLX/R and Cyclone/R machines based on RISC chips made by Silicon Graphics, Inc. — was made in the fall of 1991.

The company's new kernel for its Guardian operating system will support standards, such as Posix, in an effort to make applications written for Tandem systems more portable. Tandem also intends to support the Open Software Foundation's Distributed Computing Environment and Microsoft Corp.'s Open Database Connectivity, Treybig said.

Gary Sabo, director of product marketing for Tandem's Open Access Computing Group, said the new operating system and the RISC-based Cyclone would be introduced by year's end. "We are committed to delivering a Posix-compliant operating system by the end of the calendar year," Sabo said. But first, Tandem will deliver a Posix tool kit to users.

Tandem said it had briefed some of its users about the impending hardware and software changes. But Philip Newbold, vice president and information services director at Kaiser Permanente of Northern California in Walnut Creek, one of Tandem's biggest sites, said he had few details. Posix compliance will not change Kaiser's mainline Cyclone-based processing of hospital records, he said.

Other sites may find more use for Posix, industry analysts said.

Some analysts said the move toward a more open version of Guardian was long overdue. "They're reworking the Guardian operating system to do what IBM and DEC have already done, which is to provide Posix compliance," said Omri Serlin, president of ITOM International Co. in Los Altos, Calif., which tracks fault-tolerant systems. "It won't entail additional overhead, so it will be as efficient as running native Guardian code."

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USL makes microkernel move

Users will be able to host NetWare under System V Release 4

By Jean S. Bozman
SAN FRANCISCO

On the eve of Novell, Inc.'s acquisition of Unix System Laboratories, Inc., USL said it is moving its System V Release 4.2 operating system to a microkernel architecture.

The microkernel version, due to be officially announced this week, will allow Unix and Novell's NetWare network operating system to work well together, USL said. The microkernel version will allow users to host NetWare applications under the System V Release 4 operating system, analysts said.

USL's Michael DeFazio: *Estimates shipping to users in '94*

Users will be able to customize their operating environments by adding many such "personalities" to the basic microkernel for distributed applications (see chart). Michael DeFazio, executive vice president of USL, which is based in Summit, N.J., said these personalities would support applications written for NetWare, Microsoft Corp.'s DOS and Windows and the Apple Computer, Inc. Macintosh.

Users should gain indirect benefits from enhanced computer systems running System V Release 4. "A microkernel is much easier to maintain over the long haul because it's modular," said Julie Rodwin, a Unix analyst at Computer Intelligence/InfoCorp in Acton, Mass. That will make it easier for systems vendors to revise their implementations of System V Release 4, she said.

The microkernel is based on technology from Chorus Systems, Inc. in Beaverton, Ore. It provides a step on the way to delivering an object-oriented version of Unix in the late 1990s. The microkernel architecture's modular nature will lend itself to object-oriented programming that encapsulates system elements for use in distributed applications.

Aiding integration

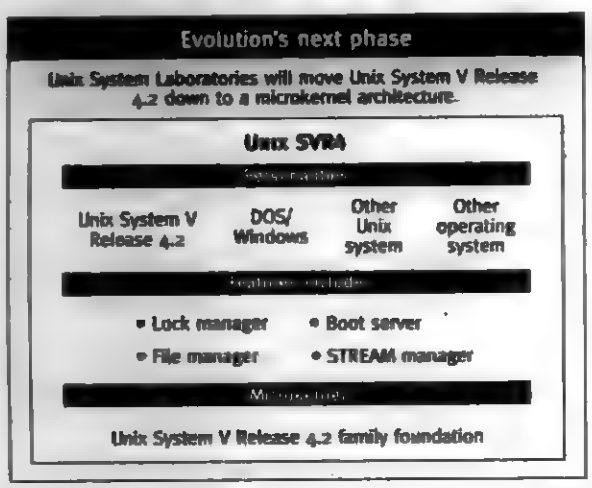
Industry analysts said the operating system evolution would aid the integration of Novell and USL software. "It is quite likely that the engineers at Novell and USL are struggling to merge two highly different operating system cores," said Peter Kastner, a vice president at Aberdeen Group in Boston. "A microkernel approach may in fact allow a lot of differences to be papered over."

USL will sell the microkernel operating system directly to systems vendors such as Unisys Corp. and Cray Research, Inc., which will optimize it for their hardware. Systems vendors and information systems directors will have the option of customizing System V Release 4 by tacking on additional services, such as support for single-system image, real-time functionality and fault tolerance.

The timing of the microkernel's release to the user community — which could be a year or more away — is unclear. "It's a phased rollout from the start," DeFazio said. "My estimate is that our OEMs will begin shipping product to users in calendar 1994." Others will follow in 1995, analysts said.

Meanwhile, DeFazio said, users can keep writing applications for System V Release 4.2 and Release 4.2MP for multiprocessors with the expectation that they will run under the microkernel version.

USL is building on several years of research conducted jointly by Unisys Corp. and Chorus, Kastner said. He also noted that System V Release 4.2 will compete with Microsoft's Windows NT, which is based on microkernel technology. Next, Inc.'s NextStep and upcoming versions of OS/2 are built on the Mach microkernel.



IBM, HP to become object-oriented allies

By Melinda-Carol Ballou
SAN FRANCISCO

■ IBM will line up additional support for its object-oriented strategy with the announcement this week of a technology alliance with Hewlett-Packard Co.

HP is expected to license portions of IBM's System Object Management (SOM) technology, an object-oriented framework for defining and managing binary class libraries and building distributed applications. IBM, meanwhile, will license portions of HP's Distributed Object Management Facility (DOMF) to let developers create applications that are interoperable, industry sources said.

IBM will also announce a developer's tool kit for SOM and distributed SOM (DSOM) this week. It will incorporate key services of HP's DOMF and ship by the third quarter, the sources said.

In addition, IBM is working with Apple Computer, Inc. to jointly deliver object technology based around DSOM later this year via its Taligent partnership. Discussions with others such as Sun Microsystems, Inc. are also under way, according to industry sources.

"If IBM is working with HP, Sun won't be far behind," said John Rymer, an analyst at Patricia Seybold's Office Computing Group, a Boston consulting firm. "This opens the floodgates a little bit to allow [Object Request Brokers] to communicate across platforms."

"It's everyone against Microsoft once again," said Liz Barnett, a vice president at New Science Associates, Inc., a consulting firm in Westport, Conn.

Cliff Reeves, manager of object technology products for IBM's Personal Software Products Division, focused instead on the benefits that standards will offer to developers of object-oriented applications. DSOM and SOM support the Object Management Group's (OMG) Common Object Request Broker Architecture (Corba) and use its Interface Definition Language to perform language mappings.

Triple layers

SOM, DSOM and DOMF will put layers in place to support distributed object computing for Taligent, IBM and Apple's next-generation object-oriented operating system.

"The goal of introducing SOM and of working with partners is to start putting a viable, nonintrusive standard in place that links islands of object technology," Reeves said. Microsoft Corp. has just started shipping Object Linking and Embedding 2.0 (OLE) — which is available only on its Windows operating platform. It will be widely adopted by third-party desktop developers and will eventually run on DOS and the Apple Macintosh.

But analysts said that while Corba and DSOM offer a framework for distributed object computing, OLE 2.0 merely provides a linking service for objects and is considered an interim step to Microsoft's next-generation Cairo environment.

"I don't think it's apt to compare them; there's no distribution of objects in OLE 2.0," Rymer said. "OMG is starting by defining infrastructure, and Microsoft is starting from the desktop and building the infrastructure as they go along."

While the OMG and its proponents seek to win out by supporting robust, distributed environments well before Microsoft does, the advanced technology alone is unlikely to succeed, according to Rymer.

"Microsoft clearly is not a front runner with this technology, yet it may not matter. To have distributed object computing is a remarkable accomplishment, but it must be accessible and cost-effective, or it may go the way of other marvelous technologies that were not packaged correctly," Rymer said. "They have to give people a reason to move in this direction rather than waiting for Microsoft."

At your service

The Object Management Group (OMG), the consortium working to build object-oriented standards, is scheduled to announce this week at Object World four low-level services for its Common Object Request Broker Architecture (Corba).

These services include events, naming, persistence and life-cycle services to help standardize the storage and retrieval of objects. They are the result of input from 18 vendors, including IBM, Hewlett-Packard Co., Digital Equipment Corp., Oracle Corp. and Sun Microsystems, Inc.

The current services come primarily from technology developed by Sun called Joint Object Services, behind which the other companies are uniting to meet the OMG's Request for Information, industry sources said.

The OMG is seeking to address low-level services initially and will put out a Request for Technology for others next month, including transaction services.

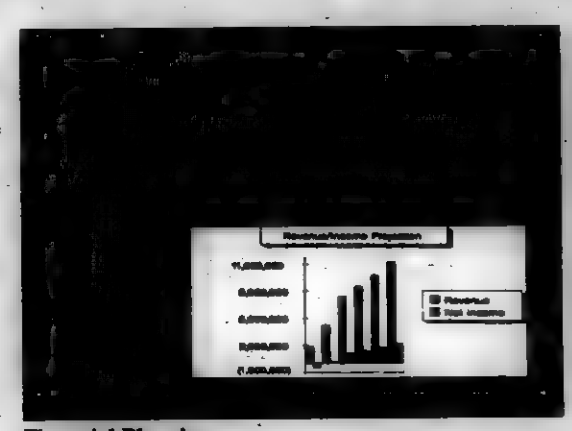
The more politically complicated, higher level services, such as linking and embedding (addressed by Microsoft's OLE and other technologies) will be tackled later on, OMG President Chris Stone said.

Interoperability is the goal of Corba 2.0, which is expected to ship during the first quarter of 1994.

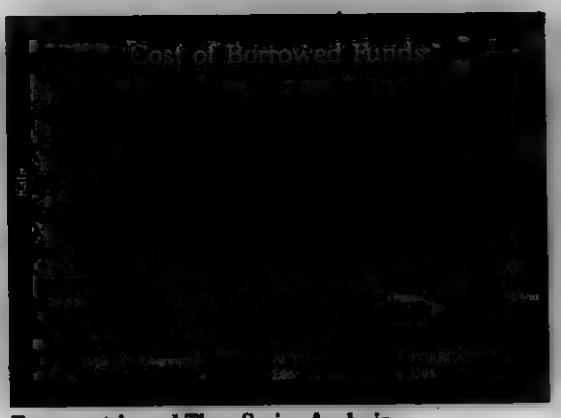
Microsoft has not yet come on board in support of Corba, although it is a member of the OMG.

Stone said the organization is engaging "high-level executives" at Microsoft in discussions, but it will take time, nurturing and customer pressure to bring the company on board.

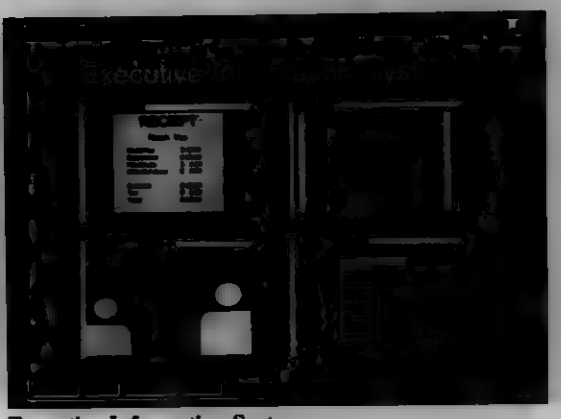
— *Melinda-Carol Ballou*



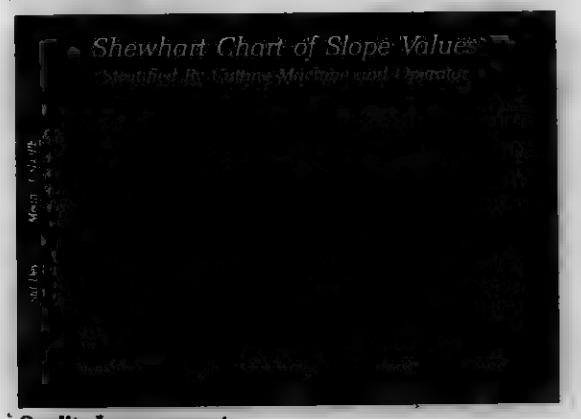
Financial Planning



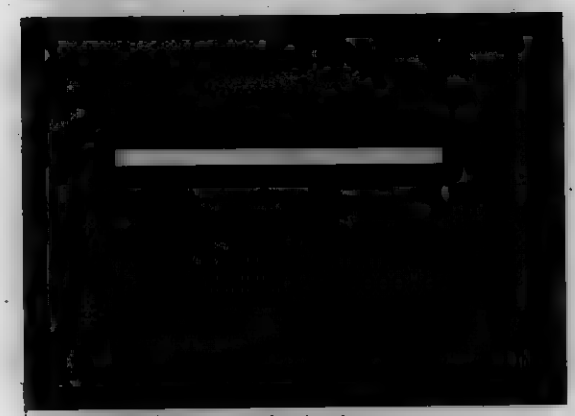
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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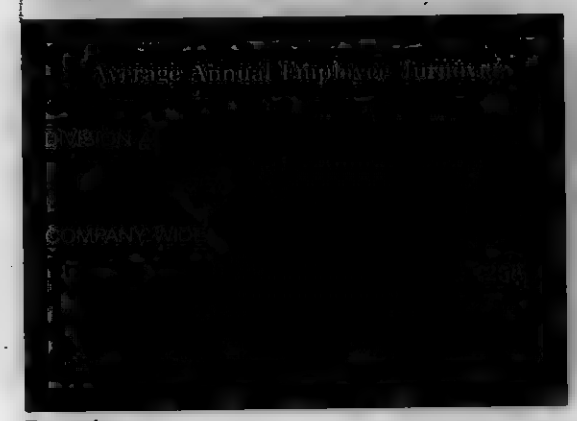

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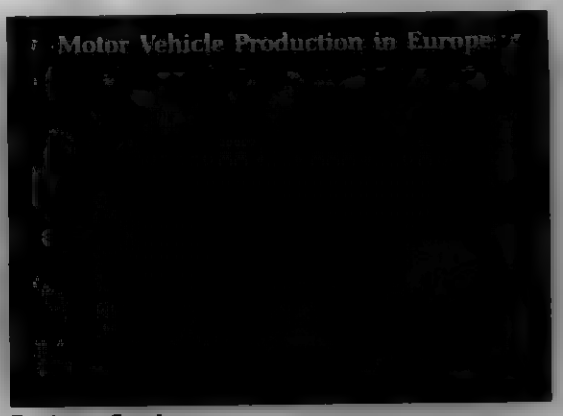

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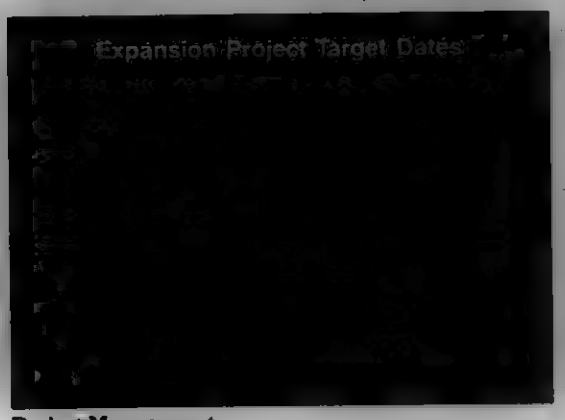


Project Management

Scheduling, calendaring top E-mail agenda

By Michael Vizard and Lynda Radosevich

As information systems managers get a handle on PC-based electronic-mail systems, many organizations are launching their first mail-enabled applications, with group-scheduling packages leading the charge.

To service this market, the major PC software suppliers are moving to provide cross-platform scheduling packages that will allow Microsoft Corp. Windows, DOS, Apple Computer, Inc. Macintosh and Unix users to schedule meetings across a variety of E-mail transports.

For example, Microsoft will announce at the Electronic Mail Association's annual conference this week that it will create DOS client software that will be tied into Microsoft's Schedule+ for Windows and Macintosh with the aid of Powercore, Inc. in Manteno, Ill.

And the MHS Alliance, a messaging consortium led by Novell, Inc., is spearheading an effort to create a standard application programming interface (API) for calendaring and scheduling applications to enable interoperability among various vendors' software.

Included in the effort are Powercore, Microsystems Software, Inc. and Campbell Services, Inc., whose packages make up 98% of the market for local-area network calendaring and scheduling software, according to MHS Alliance President John Rizzi.

An important component of the MHS Alliance strategy is getting the LAN systems to talk to IBM's Professional Office System (Profs) office automation environment, Rizzi said. To that end, the group is working with terminal emulation vendor Attachmate Corp. to provide an API that will span the LAN and mainframe environments.

In general, group-scheduling software is not expected to be widely adopted until the major software providers can supply a single approach that can be shared by users on different platforms across an organization, noted Matt Cain, program director for workgroup computing at Meta Group, Inc. in Westport, Conn.

For example, the Oregon State Treasury in Salem wants to migrate calendaring and scheduling functions off a Wang Laboratories, Inc. VS platform but must find a package that works with the Wang system and across Macintoshes and Windows PCs, said Joe King, network analyst.

All in the family

Meanwhile, vendors are trying to meet users' cross-platform needs within their own products. For example, WordPerfect Corp. in Orem, Utah, this month began shipping WordPerfect Office 4.0, which includes E-mail and a group-scheduling facility on Windows, Macintosh and DOS platforms [CW, May 17].

Powercore is delivering Windows and DOS versions of its Network Scheduler 3 software, with a Macintosh implementation set for year-end delivery.

At the same time, Lotus Development Corp. has been reselling Powercore software during the past two years but in recent months has outlined a separate group-scheduling initiative based on its Organizer for Windows software.

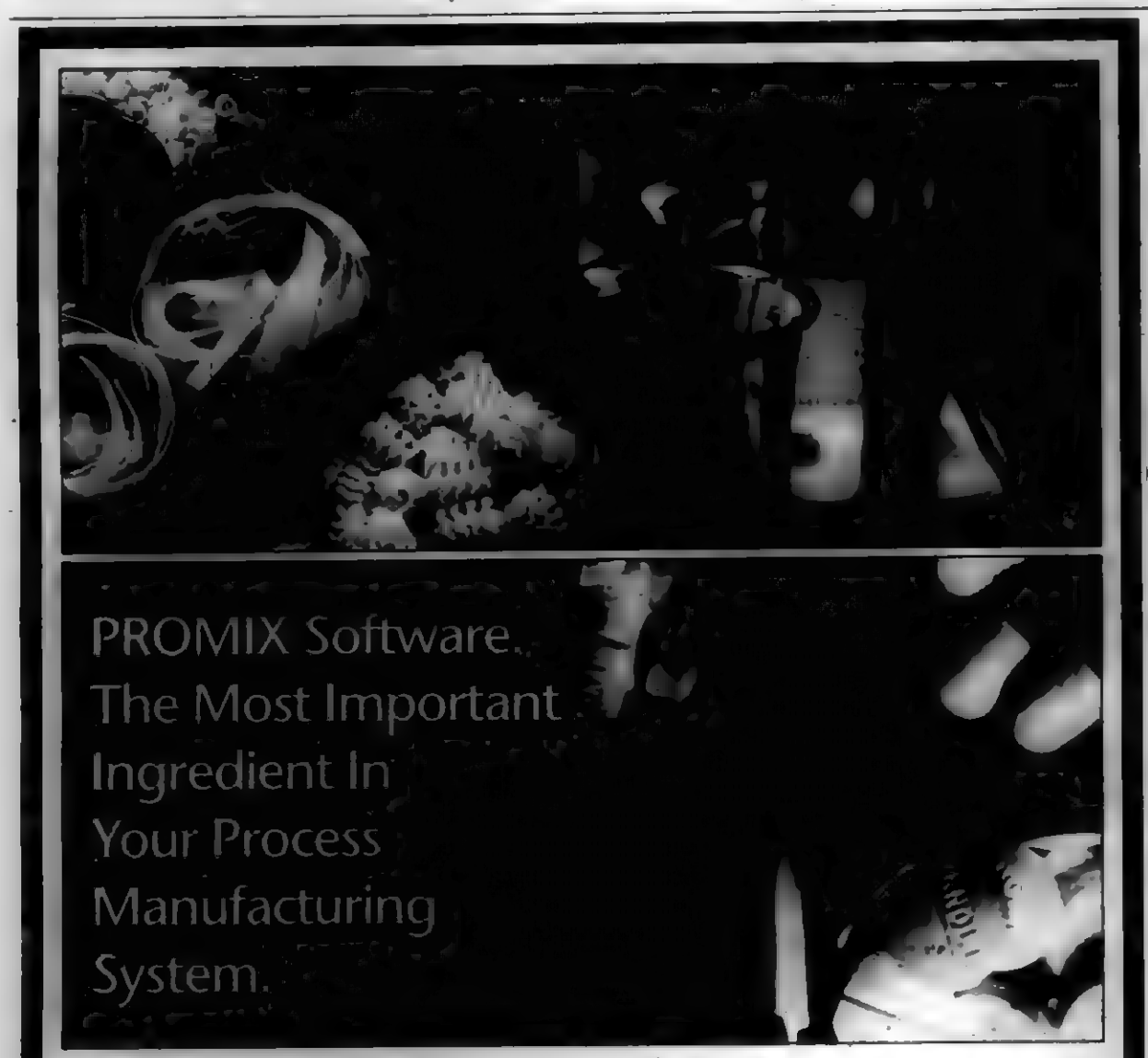
Organizer, which includes a personal information manager and scheduling facility that will be tied into Notes and other Lotus applications, will be ported to Macintosh and DOS platforms later this year.

Despite the lack of availability of group-scheduling software on every major platform, interest in it remains high.

However, Craig Goldman, chief information officer at Chase Manhattan Bank NA, noted that while group-scheduling packages have become a checklist item on purchase orders, instilling discipline in the average user to make use of such packages remains the greater challenge.

And while software vendors are racing to build up installed bases for their scheduling software, Cain said these packages will eventually be standard in robust E-mail packages.

Using Profs, which includes calendaring software, as a model, Cain said in the long term, he does not expect E-mail providers will be able to charge "a premium" for group-scheduling packages.



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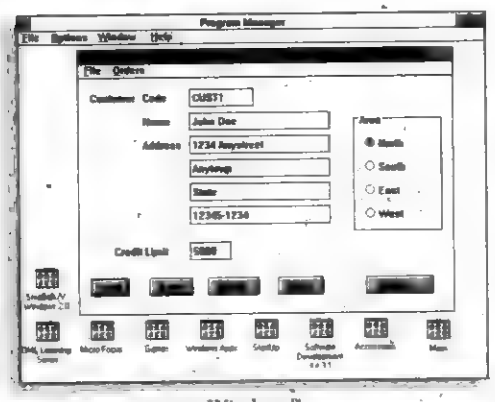

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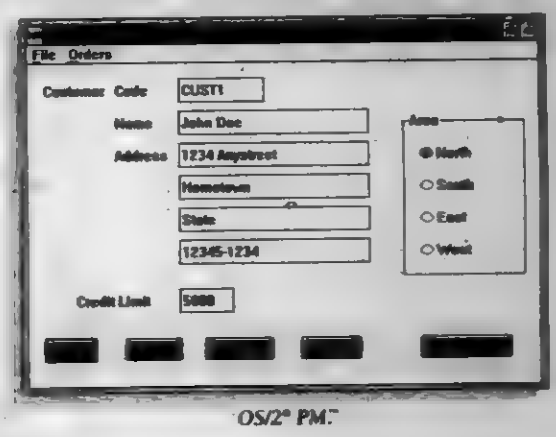

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Low PC tags have their price

CONTINUED FROM PAGE 1

Dell Computer Corp., and "they may pick the phone up quick but can put you on hold for ages."

Kicking off this cycle was Compaq's June 1992 announcement of its price-conscious ProLinea line, which was followed four months later by IBM PC Co.'s Personal System/ValuePoint release, a one-two punch that shook double-digit growth out of a supposedly mature PC market.

The aftermath felled some competitors, but Compaq has seen its U.S. market share more than double to 10% so far this year, and IBM has reversed long-term market share declines, holding at roughly 13%, according to International Data Corp. (IDC) in Framingham, Mass.

"Compaq collapsing the price umbrella and Intel dropping chip prices 60% were the two most significant events of '92 [in PC hardware]," said Bruce Stephen, IDC's director of PC hardware and pricing research.

Back in front

Analysts credited Compaq with reestablishing itself as the pacesetter in the hardware industry.

Meanwhile, most vendors have tried to beef up service and support in the face of three-year warranties from Compaq and IBM; all competitors have added features to hold up prices.

Vendors now have to go beyond hardware to provide "the total package: software, service and support," said Michael Coleman, IBM PC Co.'s vice president of marketing and brand management.

Ted Waitt, Gateway 2000, Inc.'s "head hog at the trough," said Gateway actually raised prices in the face of Compaq's initial product moves to reflect added features. He acknowledged that the Big Two's charge caused Gateway, which generates 97% of its sales in the U.S., to delay a planned 1992 expansion into Europe while it addressed its service weakness here.

> "It's going to be a long, hot summer; we'll see who's around in the fall."
>
> —*Michael Coleman, IBM PC Co.*

Still, the North Sioux City, S.D., mail-order vendor has seen its sales to corporate and institutional users grow from 33% of total sales in 1991 to between 45% and 55% of total sales today.

Gateway may have benefited from IBM's and Compaq's pell-mell channel expansion, which saw both companies, among others, enter the mail-order market.

As users shifted to Intel Corp. 1486-based systems, huge demand swamped many vendors — IBM, Compaq and Apple Computer, Inc. in particular — and backlogs remain lengthy, resellers and users said.

Apple, bushwhacked by lower prices on Microsoft Corp. Windows-based PCs, has seen profits slide (see story at right).

Boon to some

The backlog cloud seems to have a silver lining: Compaq and IBM's onslaught has fallen short of forcing massive numbers of smaller PC makers out of the business.

In fact, while Tandy Corp., Everex Systems, Inc. and some smaller companies have left the business or been forced to restructure, sometimes under bankruptcy protection, other companies have actually gained sales because their bigger brethren cannot meet demand.

"I've thought many times about sending a thank you note to [Compaq Chief Executive Officer] Eckhard Pfeiffer," said Robert Frankenberg, vice president and general manager of Hewlett-Packard Co.'s personal information products group.

Frankenberg's group has experienced triple-digit growth thanks to its renewed effort in the PC market and Compaq's inability to meet demand, he said.

Clouds on horizon?

The generally lower margins in the hardware industry worry some users, who said an R&D drop-off "has the potential to be a problem, but the big vendors are the ones who will survive, and they're the ones who are still [doing the research]," said Stephen Ades, director of IS at States Nitewear, Inc. in New Bedford, Mass.

"The other guys just clone them."

There will probably be fewer of those "other guys" by year's end, according to analysts and industry figures. They predicted continued industry consolidation, particularly if the current growth binge flattens out.

"It's going to be a long, hot summer; we'll see who's around in the fall," Coleman said.

Customer clout

"The fundamental reason Compaq changed was their corporate customers repeatedly hit them in the head with sledgehammers," said Bruce Stephen, analyst at IDC.

Weak quarter may reduce Mac prices

By James Daly

CUPERTINO, CALIF.

As if engaged in a long game of limbo, Apple Computer, Inc. executives charged with the task of deciding Macintosh prices these days must be asking themselves, "How low can they go?"

Last week, Chairman John Sculley announced that the company faces disappointing earnings in the second half and as a result will take "aggressive action to accelerate sales momentum for our Macintosh products." An Apple spokesman said that will translate into Macintosh price cuts, and a rebate program will begin today.

Eugene Glazer, an analyst at Dean Witter in New York, said the price cuts are needed to stimulate demand. While Apple's unit shipments rose in the first half, earlier price cutting significantly slimmed Apple's once average 40% profit margins.

Yet today the Macintosh still costs more than similarly configured IBM PC-compatible clones running Windows. For example, Apple's recently introduced PowerBook 185C costs $4,759, while a similar model from Toshiba Corp. sells for around $4,100.

But there are signs that may be changing. Last month, Apple cut some computer prices 16% and some printers 29%.

Observers speculated that Apple will lay off workers as part of its cost-cutting program. It cut 1,500 positions and chopped salaries in 1991 when profit margins slid.

Backlogs no longer exception

By Michael Fitzgerald

Reports that some backlogs in the PC industry are easing have many corporate users wondering when things will improve for them, especially because at least one major vendor insists that backlogs are a "fact of life."

Supply "is an absolute nightmare for us," said W. B. Lovan, assistant buyer of indirect materials at Caterpillar, Inc. in Peoria, Ill. "The old IBM announced products, then made you wait three to four months to get them. Tell me what's different today?"

Lovan said that in the wake of the IBM PC Co.'s inability to meet demand, several groups within Caterpillar have opted to buy from suppliers such as Digital Equipment Corp.

Michael Coleman, IBM PC Co.'s vice president of marketing and brand management, said, "We continue to ship more and more units every month. In fact, we have passed our expectations in terms of what we have shipped." Coleman did not say when IBM might catch up with its backlogs, which are even worse on its ThinkPad notebook lines than on its desktop products.

At Compaq Computer Corp., possibly the worst backlog offender, the vendor is sending systems out the door in record numbers, but its supply picture continues to look bleak.

Resellers acknowledged that they get more units from IBM and Compaq than in the past. However, John Howman, president of Allied Computer Group, Inc., a Milwaukee systems integrator affiliated with Inacom Corp., said, "They're making products in record numbers and distributing them through record numbers of channels." Howman said his backlogs were $1 million higher this year than last.

There may be no relief in sight.

"I think backlogs are a fact of life," said Ross A. Cooley, Compaq's senior vice president, North America. Cooley said short product life cycles mean "the majors will always have something constrained. We want to be able to say there's a minimal amount of unconstrained product."

Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., said short product life spans and shrinking profit margins make backlogs advantageous for vendors.

"Essentially, [vendors] want these big backlogs because [it lets them] transition from product cycle to product cycle profitably" without having to write off inventory, Brown said.

Matt Fitzsimmons, a Computerland Corp. dealer in White Plains, N.Y., who has decried the backlog situation, conceded that point. "At the rapidity with which [vendors] are introducing new products, it's healthy from a manufacturer's point of view to always have a backlog." Fitzsimmons said he fears that backlogs will indeed become the status quo.

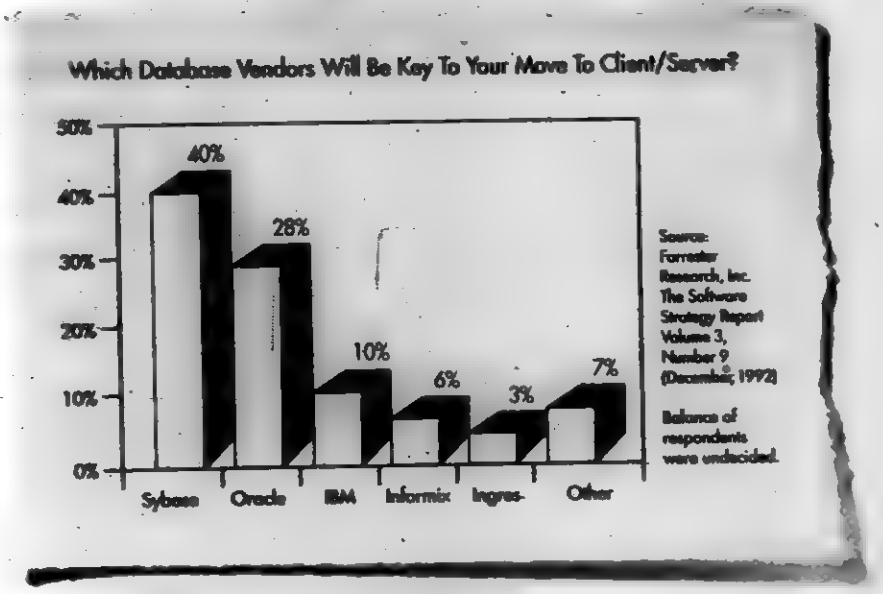
Brown, though, said it was not clear yet just how endemic backlogs are. He said that if Compaq is the only vendor that runs a backlog, it will backfire.

In the meantime, the backlog has created some strange scenarios. "We get customers asking us to buy their hardware for them [from another reseller] when we can't get it. It's a bizarre trend, but reality is if you talk to high-volume IBM/Compaq dealers, they source product from wherever it is," Howman said.

Monkeying around

The monkey is on Ross Cooley's back, which means Compaq has scored at least one victory against its massive backlogs. Cooley and Jim Hartzog, vice president of the PC division's product development, trade a 6-in. tall plastic gorilla back and forth, based on whether sales is ahead of manufacturing. About two weeks ago, Compaq caught up with DeskPro/M and DeskPro/i demand for the first time in roughly a year, and Hartzog handed the toy to Cooley.

The analysts have graphed the future of Client/Server computing.



And they have also spoken.

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Palmer vows to fire up DEC sales force

By Craig Stedman
ATLANTA

Digital Equipment Corp. plans to bring its top 800 sales and marketing managers together for three days starting July 7. Given the barrage of complaints DEC executives faced at the Digital Equipment Computer Users Society (DECUS) conference last week about the quality of the company's sales organization, it probably will not be a congratulatory meeting.

Bluntly acknowledging the criticism, DEC Chief Executive Officer Robert Palmer described his sales force as "probably the least productive in the world, fundamentally because they're not well-prepared" — a comment that drew applause from a user audience.

Palmer blamed the sales shortcomings on "a management failure" and said it will "take more than an afternoon" to resolve the problems. "Maybe a year from now, most of this will be fixed."

Frustration abounds

User complaints about sales were not hard to find at DECUS. Verifone, Inc., a Costa Mesa, Calif., maker of credit-card processing machines, got frustrated enough to have its sales representatives removed from the account. "We made a specific point of saying, 'We still want Digital products; we just don't want to deal with Digital sales,' " said David Roberts, an information systems employee at the conference.

Another user said his sales rep sold him a VAX 6000 that would not run his version of the OpenVMS operating system and memory cards that did not fit into his workstations. "You're just falling apart on us," he told a DEC official.

L. Charles Lemond, director of the computer center at Rhodes College in Memphis, had to buy Sun Microsystems, Inc. workstations after being an all-DEC shop in large part because of a weak sales job by DEC. "You have to go down and beat on the door to get them to sell you a computer."

Edward Lucente, DEC's new vice president of worldwide sales and marketing, is scheduled to present his plan for the sales organization at the July meeting in Boston, according to a spokeswoman.

But others said that while responses are slower on noncritical matters and telephone support, major problems are still being handled to their satisfaction. "In the past, they had some marginal people in field service," Lemond said. "All those marginal people are gone now."

DEC climbs aboard COSE

User support, process clarification bring change of heart

By Jean S. Bozman
SAN JOSE, CALIF.

Nearly three months after the Common Open Software Environment (COSE) ship for unified Unix set sail, Digital Equipment Corp. waved the standards-rigged vessel back to the dock and jumped aboard.

At last week's Xhibition '93 show, DEC executives said the company opted for a role in COSE after realizing it had to be a visible part of the unified Unix effort.

Users played a part in DEC's decision to join COSE, particularly those who use DEC's Unix workstations and Ultrix version of Unix.

"We supported the concept [of COSE], but we didn't yet endorse the process," explained Tim Yeaton, group manager of product management for DEC's Unix software group. Users noticing the gap asked about it. "The fact that we hadn't endorsed the [COSE] process made it difficult for our salespeople."

DEC's Tim Yeaton *wanted more info about COSE process*

He said DEC had wavered on COSE because it was asked to join just days before the March 17 announcement. But, after it wrote up a COSE white paper describing the collaborative process through which COSE members will share technology, DEC agreed to join.

That white paper said COSE will simply speed up the current standards process by funneling all final specifications to X/Open Co. in London, a standards body that has large information systems organizations and dozens of vendors as members. DEC's involvement in X/Open and the Object Management Group, a standards consortium, may have pushed it to join COSE, too, some industry analysts said.

Some users at last week's show questioned whether DEC can afford to ally itself with both Microsoft Corp.'s Windows NT and Unix industry groups. But Samuel Fuller, DEC's vice president of research, said it is possible to enthusiastically support both NT and Unix on DEC's Alpha machines.

"From a marketing point of view, DEC would have been better served to say, 'Forget about the details, let's just join,' " Fuller said. "We wanted to see the details of the [COSE] process written down. So we helped them pull it together and write it down. As soon as we got that done, DEC jumped in with both feet."

Some users at large sites agreed with Fuller's view. "They're appealing to an unbelievably wide group [of users]," said David P. Grubb, a manager of standards and technology assessment at University of California Lawrence Livermore National Laboratory in Livermore, Calif. "They want to ride any horse their customer base might want."

Still, he said, DEC's move may have confused users: "First, the ACE consortium was the way to go, then OSF. Now, they're a part of this [effort], too."

Other users found DEC's move unconvincing. "DEC now has three different operating systems: Unix, VMS and NT," said Michael Podhorodecki, a research and development manager at Labtam Australia Pty. Ltd. in Victoria, Australia. "This doesn't clarify anything."

Compaq end runs makers

CONTINUED FROM PAGE 1

out support and service plans combining its engineers and third-party service vendors in an effort to win the trust of information systems departments that have wide-ranging facilities to service.

"We know that four-hour service in 13 major metropolitan areas is not good enough," Hornstein said.

While "it doesn't make sense for us to add 20,000 people to our service and support organization," he added, Compaq will combine its current support with the third parties "that many of our customers have contracts with already" and establish relationships with software vendors such as Microsoft Corp. to provide effective service.

Users contacted reacted with enthusiasm. "I've been asking for this for 2½ years," said Paul Bandrowski, manager of advanced technology at Sara Lee Corp. in Chicago. "Today, we can cobble together a mainframe-like environment on the PC LAN, but we need something like these machines if we're going to move large-scale, mission-critical applications off the mainframes."

Sara Lee is considering reduced instruction set computing platforms for downsizing tasks but prefers to stay in the NetWare environment on Intel Corp. platforms, Bandrowski said.

Bigger fish to fry

The announcement will also lay the foundation for Compaq's effort to transform itself from a PC box maker into a company that can challenge the likes of IBM and Digital Equipment Corp. It is a strategy the company has discussed previously but has yet to fully implement [CW, May 25, 1992].

Compaq's current behind-the-scenes negotiations with Oracle Corp. and other major software vendors [CW, May 10] are expected to be an important part of the announcement.

Analysts said Compaq has put together an impressive strategy, assuming it can deliver on the pieces.

"I think Compaq could pull this off," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Compaq has waited to announce products that analysts said have been working well in its labs, Henning said. "They're trying to make sure everything is in place before they announce it."

At the same time, analysts said they doubt Compaq will be able to match its larger competitors in providing service, which Henning called "a serious weakness."

Still, users such as Louis Kahn, chief network administrator at the Centers for Disease Control and Prevention's National Immunization Program, said they like what they hear.

"Chances are I will buy that box as a file server and possibly even as a high-end workstation," Kahn said. "It sounds like Compaq will give me lots of fail-safe stuff built-in and scalability at a price comparable to a DEC Alpha or a Mips box."

Prices listed

Hornstein said Compaq will sell a base model of the new servers, with a 486DX2 33/66-MHz processor, for $5,000, while a Pentium model will sell for $6,000. Top-of-the-line pricing is expected to fall below $25,000.

Included are hot-pluggable internal disk drives, environmental controls that monitor temperature and power use, among other things, and Error Correcting Code, or ECC, random-access memory for higher availability data.

Rollout is scheduled for September, according to sources close to the company. Though Compaq will host 3,000 to 5,000 customers and industry leaders in a conference called Innovate '93 the week of Sept. 13, sources said the company will not introduce the products at that time.

Waiting for assurance

Compaq is delaying support of clustered servers running Oracle's Parallel Server until the database runs solidly on PC servers with The Santa Cruz Operation's SCO Unix, Microsoft's Windows NT and Novell's NetWare, sources close to the company said.

Compaq now intends the Oracle initiative, originally expected to be announced this month with a fall delivery date [CW, May 10], to be a major focus of its fall server announcement.

Compaq refused to comment, although it did acknowledge that software will be an important component of the fall announcement.

—Michael Fitzgerald

IBM to reveal ATM plans

CONTINUED FROM PAGE 1

in an architecture that is at least 18 months away from being an actual product than in current products that can meet their immediate Systems Network Architecture (SNA) internetworking needs.

IBM's future ATM strategy "is definitely interesting to us, but we're not at ATM stage yet. We're quite a few levels behind," said John Gagnon, a technical adviser at Fidelity Investment & Network Service, Inc. in Dallas.

Gagnon's group is just getting into the nitty-gritty of how to integrate SNA and LAN traffic over the same internetworking backbone without seriously hurting SNA users' service levels, he added.

However, IBM's ATM platform, dubbed Broadband Networking Architecture (BNA), will address a far broader population than just SNA users, McGee said. Its Multiprotocol Access Services will map SNA and popular LAN protocols to a new protocol optimized to take advantage of high-speed ATM backbones.

High on IBM's priority list is providing BNA support for NetBIOS and Transmission Control Protocol/Internet Protocol (TCP/IP), as well as Novell, Inc.'s IPX, McGee said. Despite its close ties with Apple Computer, Inc., IBM currently has no plans to provide ATM access services for AppleTalk.

IBM plans to work with other vendors on BNA with the goal of making the architecture an industry standard.

Part of that work will center on remedying several big gaps in current ATM standards, McGee said. For example, the ATM Forum has no plans to come up with a signaling protocol that would support interoperability across different ATM products. This is needed if users want to mix and match different ATM hubs and routers, as well as carriers' ATM services, in a cohesive, multimedia network, McGee said.

IBM has already developed "Advanced Network Control" protocols that define how ATM nodes can communicate to manage bandwidth, control congestion and set up workable routes across the network, McGee said. A key part of this BNA component is an intelligent directory for managing resources across an ATM backbone, no matter what network protocol those resources use.

However, IBM may have trouble getting its protocols adopted as standards in the ATM arena "where SNA is just one protocol out of many," said Rosemary Cochran, a principal at Vertical Systems Group in Dedham, Mass. IBM's specifications will compete against similar efforts by other ATM vendors, she added.

The above services will be available for IBM's ATM and Packet Transfer Mode switches, due in about 18 months.

Looking forward

Today's Advanced Peer-to-Peer Networking protocols would not become obsolete as a result of IBM's plans but would continue to manage routing and resource management across multinode SNA networks. BNA would work to manage resource-addressing across the underlying ATM backbone, said Rick McGee, IBM's director of networking systems architecture.

More immediately, IBM plans early next year to introduce the first products based on High-Performance Routing (HPR), an enhancement that is said to make APPN faster than TCP/IP. HPR will also incorporate sophisticated internetworking features that might be considered previews of IBM's ATM protocols.

For example, HPR nodes will provide adaptive rate-based congestion control. And they will monitor traffic patterns to help predict future bottlenecks and bandwidth needs and automatically adjust transmission speeds for optimal line utilization.

— *Elisabeth Horwitt*

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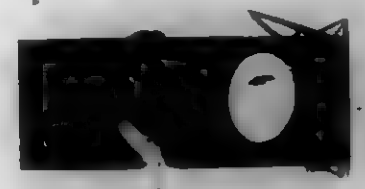

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News Shorts

The CIO phones ring

Sprint Corp. Executive Vice President and Chief Information Officer **Ron J. Ponder** is about to switch phone companies and take on the newly created position of senior vice president and CIO at AT&T. Separately, Arlington, Va.-based **Bell Atlantic Corp.** has nabbed **Ralph J. Szygenda, Texas Instruments, Inc.**'s information systems and services vice president and CIO. The longtime Texan will become Bell Atlantic's IS vice president and CIO, effective June 28.

IBM to support CICS on NT

IBM said last week it will develop a version of its CICS transaction-processing monitor to run under **Microsoft Corp.**'s Windows NT but did not specify its cost or availability date. The monitor is already available across most IBM hardware platforms and is also on **Hewlett-Packard Co.** and **Apple Computer, Inc.** Macintosh computers.

AT&T makes ATM strides

AT&T said last week it will begin a 9,000-mile trial of Asynchronous Transfer Mode (ATM) networking technology with Japan's primary telecommunications carrier, **Kokusai Denshin Denwa**, next month. To date, production ATM rates have not exceeded 155M bit/sec., though statewide ATM networks at slower speeds from regional carriers are coming up in North Carolina and New York.

Viruses threaten national info-structure

Representatives from U.S. industry joined the **National Computer Security Association** in Washington, D.C., last week to brief the public and the press on computer viruses. At the kickoff of the first annual National Computer Virus Awareness Day, held on Capitol Hill, users and computer security experts warned that the virus problem continues to escalate and threatens implementation of President Clinton's National Information Infrastructure. The kickoff was followed by a hearing on computer security chaired by Rep. Edward Markey (D-Mass.).

Computer Associates goes consumer

Computer Associates International, Inc. made its first splash in the consumer software market a bold one. CA introduced a Microsoft Windows-based personal finance package, called Kiplinger's CA-Simply Money, with plans to distribute free copies to the first 1 million people who request it. The toll-free phone number was besieged with requests for the package last week, with more than 1,300 calls each hour.

SHORT TAKES The move from analog to digital transmission of cellular telecommunications will greatly increase the difficulty of eavesdropping on cellular phone conversations and may ultimately resolve the cellular privacy problem, a new **Federal Communications Commission** report said.... **Micropolis Corp.** will announce price cuts today of up to 40% and **Novell, Inc.** compatibility for its Raidion LT line of fault-tolerant, 3½-in. RAID-5 storage subsystems.... Dennis H. Jones, CIO at Memphis-based **Federal Express Corp.**, was named 1993 IS Executive of the Year by the Lattanze Center for Executive Studies in Information Systems at **Loyola College** in Baltimore.... **Red Brick Systems** plans to unveil this week Version 2.0 of Red Brick Warehouse, a decision support database.... **Gupta Corp.** ported SQLWindows 4.0, a client/server development environment, to IBM's Application System/400.... **Nippon Life**, the world's largest insurance firm, has bought 2,000 AS/400s to use for all its customer-service applications.

X Windows, NT: Friends or foes?

By Joanie M. Wexler
SAN JOSE, CALIF.

■ The X Window System's days could be numbered, according to some attendees at last week's Xhibition '93 conference and trade show.

The anticipated force behind X's eventual demise is — what else — Microsoft Corp.'s Windows NT. The fledgling operating system weighed heavy on users' minds as they tried to get a grip on what is predicted to be the development platform of the future.

The NT threat to X, which functions as network "glue" among heterogeneous systems, lingered despite moves by several vendors to announce or demonstrate X development tool kits and X server software for NT last week. These companies included Age Logic, Inc., Congruent Corp., Digital Equipment Corp., Hummingbird Communications Ltd. and Network Computing Devices, Inc.

X marks the spot

These firms' X products will represent NT's meal ticket into many corporate enterprises — particularly Unix-heavy shops — and also protect user investments in X applications. Still, NT's inherent terminal emulation and 32-bit graphics application programming interface may eventually usurp X — sooner for some than for others.

For example, JC Penney Co. has already decided to move from X to NT, said Jim Ducatelli, manager of advanced technology at the Dallas-based department store chain. The reason is "the power of Microsoft, Bill Gates and the history of the company to provide applications economically," he said.

X is an architecture based on Transmission Control Protocol/Internet Protocol (TCP/IP) networks that allows users to tap into multiple networked hosts and display the various applications on their screen at the same time. That function parallels in the networked world what Windows allows users to do with their local applications.

X is also a bit-mapped protocol that puts very high-quality graphics displays on the user's desktop while distributing processing across the network. This "client/server" orientation is what will keep X alive for the next five to 10 years, according to Arthur Kreitman, president of New York-based Congruent.

Congruent introduced a tool kit at the show that allows developers to quickly recompile X applications to NT.

For the short term, "X is an easy way to build client/server applications because all the problems have been solved for you — like which part of the application to put on the client and which part goes on the server. But eventually, we will learn to restructure applications ourselves to support the client/server model, and X will be increasingly marginalized," Kreitman said.

Much speculation

Other opinions as to how complementary or competitive X and NT will be were all over the map.

"Within a year, there will be a dozen implementations of Telnet and FTP [TCP/IP services] from different vendors for NT," predicted X advocate Robert Dew, an electrical engineer at the National Institutes of Health in Washington, D.C. "None of them will interoperate."

However, Microsoft is relying on TCP/IP — the foundation of most corporate networks — and its related services for connecting NT into the corporate enterprise, said Mark Lewin, manager of Unix/independent software vendor relations at Microsoft.

For the small percentage of companies using X to consolidate multiple dumb terminals into one desktop box, NT will compete, Lewin acknowledged. However, for performing processing on a host and displaying output locally, NT will not match X, he said.

"NT may provide the connectivity piece but not the interoperability with nongraphical systems like mainframes that X does," added Richard Calligan, manager of the software development group at Advanced Research and Applications Corp. in Sunnyvale, Calif., an X tool kit developer.

On the other hand, NT could actually help X, said a software engineer at Boeing Computer Services who asked to remain anonymous. "If you have Unix programs hanging around and you want to get to them, you'll need X."

Larry Austin, computer systems specialist at The World Bank in Washington, D.C., said his company has no formal position on NT. However, he uses X server software "to allow us to choose our operating system and user interface separately." In that respect, there is no reason why X and NT could not complement each other, he said.

Reporter's Notebook

Heated opinions, pearls of wisdom and predictions for making users winners in the client/server world circulated on the Xhibition '93 floor. Among them were the following:

▶ "COSE [Common Open Software Environment] was a knee-jerk reaction to the Microsoft threat. One way COSE could add value would be to ask for user participation — something they don't get in Redmond," grumbled David P. Grubb, manager of computing standards and technology assessment at the University of California Lawrence Livermore National Laboratory.

▶ Judith Hurwitz, president of Hurwitz Consulting Group, however, challenged the user community to insist on participation in the Microsoft process, too, or "you will get what you deserve." If users don't speak up to Bill Gates and company, she said, "it will end up like the era when IBM dominated the industry and there was a slow pace of change for 20 years."

▶ The percentage of information systems staffs surviving the transition to client/server averages just 30%, said Allen Paller, director of open systems at Computer Associates International, Inc. in Islandia, N.Y.

▶ To counter this, Sheri Anderson, senior vice president of production and systems services at Charles Schwab & Co., where an estimated 80% to 90% survive, advised building a "nurturing" corporate culture that allows users dabbling in client/server technology to "make mistakes comfortably." When it comes to training, "do it over and over," she said. "People just don't get it easily. You have to repeat things frequently."

▶ "Spend as much money on education and training as you do on development tools," added Donald L. Dail, managing director of Andersen Consulting's client/server application development division. — *Joanie M. Wexler*

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Windows NT	**802.3*
	Token Ring (4/16 Mbps)
IBM LAN Server	**802.3*
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AppleTalk	**LocalTalk*
	**EtherTalk*
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*Standard in the HP LaserJet 4Si MX printer. **For operating HP-UX, SunOS or Solaris, a one-time purchase of $199 in configuration software is required. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. Microsoft is a U.S. registered trademark of Microsoft Corporation. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. †In Canada call 1-800-387-3867, Ext. 7299.
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HEWLETT PACKARD

'SuperAgent' eases network control

By Joanie M. Wexler

SUNNYVALE, CALIF.

Companies trying to get an automated grip on their sprawling networked computing environments finally found themselves en route to their goal last week when SynOptics Communications, Inc. announced a distributed information-gathering technology spanning desktops, systems and local- and wide-area network devices.

The "SuperAgent" technology, supported by enterprise management bigwigs Hewlett-Packard Co., IBM and SunConnect, Inc., will allow a single application running on these vendors' platforms and SynOptics' Network Control Engine in its smart wiring hubs to perform a specific task across multiple vendors' devices, technologies and protocols.

Intel Corp. and Novell, Inc. are participating by contributing software that allows desktop devices, operating systems, applications and servers to be included in the management sweep.

Combined with these platforms and software, SynOptics' SuperAgent serves as the eyes and ears of a distributed application covering hundreds to thousands of devices and reporting to the integrated central application on a single type of network behavior or attribute. This contrasts with most management approaches, where multiple applications separately gather detailed data about a single type of device, which is not usually integrated in an enterprise context on the management console.

"It boils down to economics and productivity," said Carl B. Condon, director of communications at SynOptics shop Bell Sygma Systems Management, an information technology outsourcer in North York, Ontario. "We've seen an explosion of protocols, and our network will grow from about 30,000 to 40,000 nodes over the next 18 months. It's hard to keep enough [human] skill levels out in the field; this helps us put more expertise back in a central place."

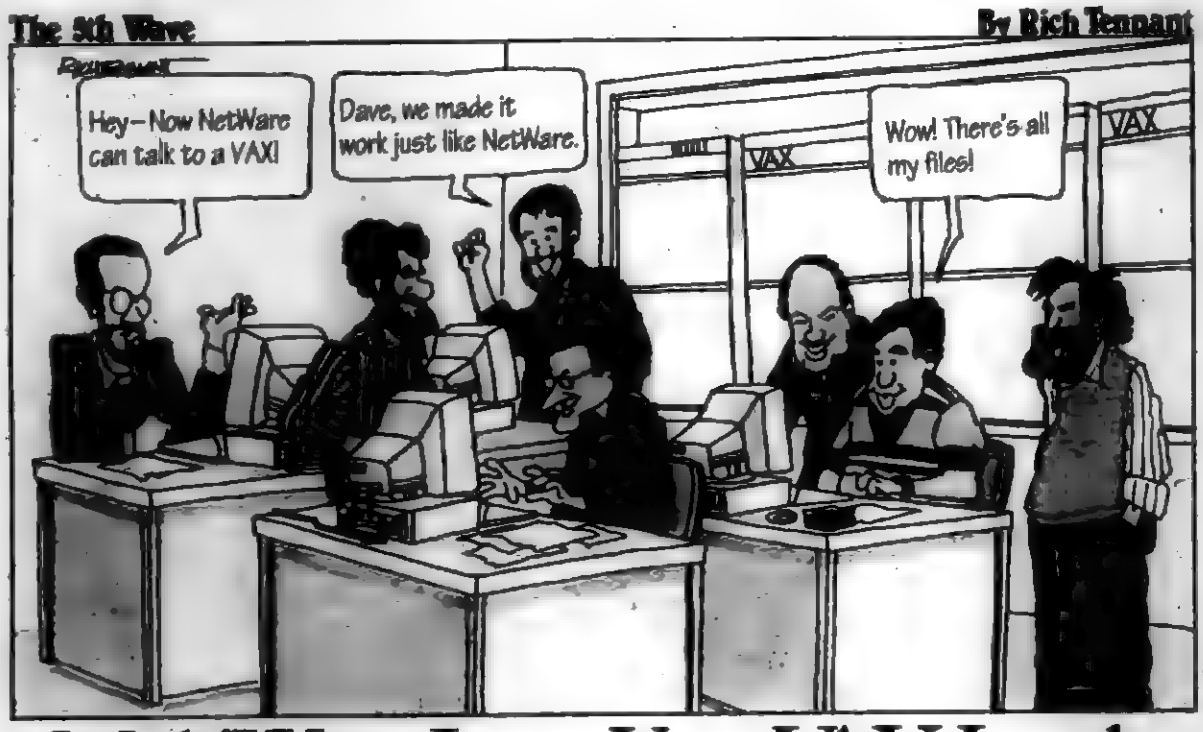
One SuperAgent-based application, concurrently announced by SynOptics partner NetLabs, Inc. for HP, IBM and Sun Microsystems, Inc. platforms, takes inventory of the devices, operating systems and applications running throughout the entire corporate network, precluding armies of workers from having to manually inspect and record equipment serial numbers, software versions and the like.

"While we expect our network to double in the next 18 months, we won't be doubling our staff," said Marcus Salyer, network manager at The Ohio State University in Columbus, a SynOptics shop looking to test SuperAgent technology this summer. Keeping tabs on equipment and software is especially important in an academic environment, Salyer said, because vendors often lease to universities computer products that they want back at a contracted time.

Ohio State is generally excited about off-loading routing data analysis to the network. "We want to push as much [automated] intelligence out into the network as possible to tell us what's wrong before users figure it out and so we can tell the network certain types of behavior we don't want," Salyer said.

SynOptics has not yet found a WAN management partner; however, SuperAgent-based applications will manage any equipment that complies with the Simple Network Management Protocol Management Information Base (MIB) II, including Digital Link, Inc.'s WAN access equipment, said Karen O'Neill, manager of SynOptics' integrated management program. The applications will also manage any systems conforming to the Host Resources MIB, a draft Internet Engineering Task Force standard, she said.

"The industry is very hungry" for such broad management, said Charlie Robbins, director of communications research at Boston consultancy Aberdeen Group. "The person who cares is the CIO. With all the complexity [of] LANs, operating systems and such, you don't know what you have anymore."



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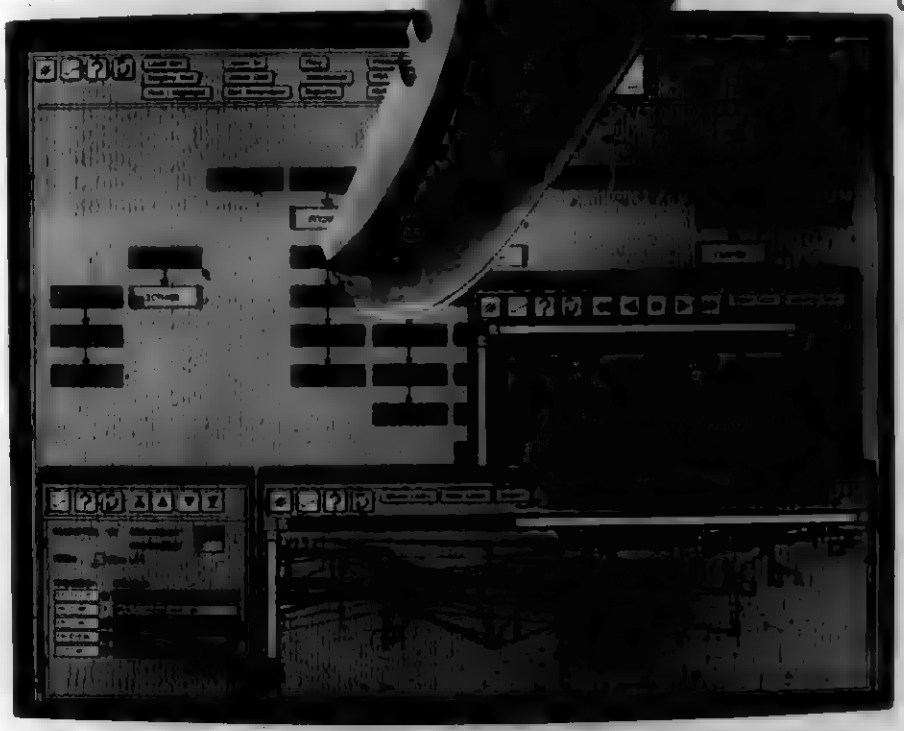

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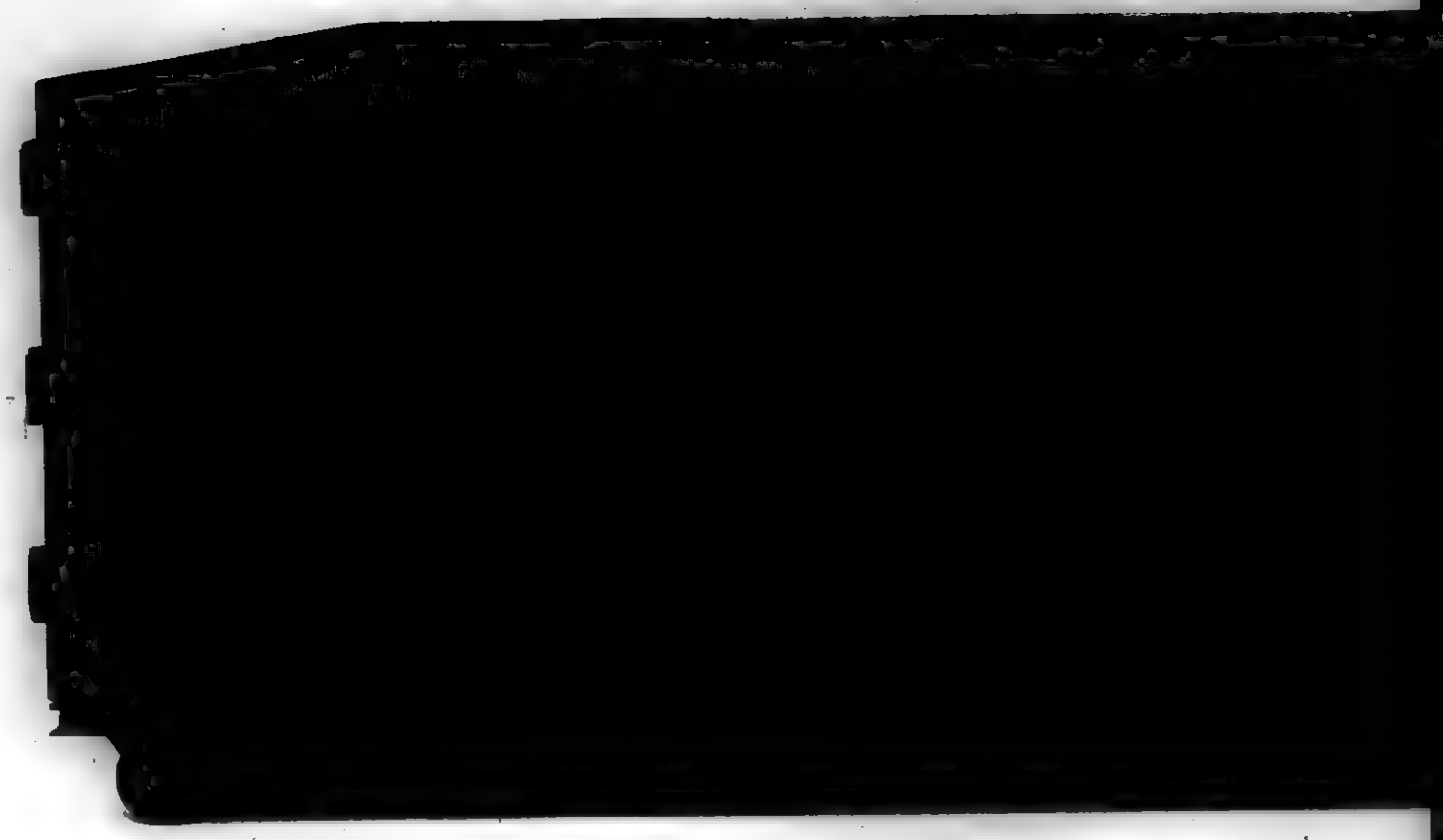

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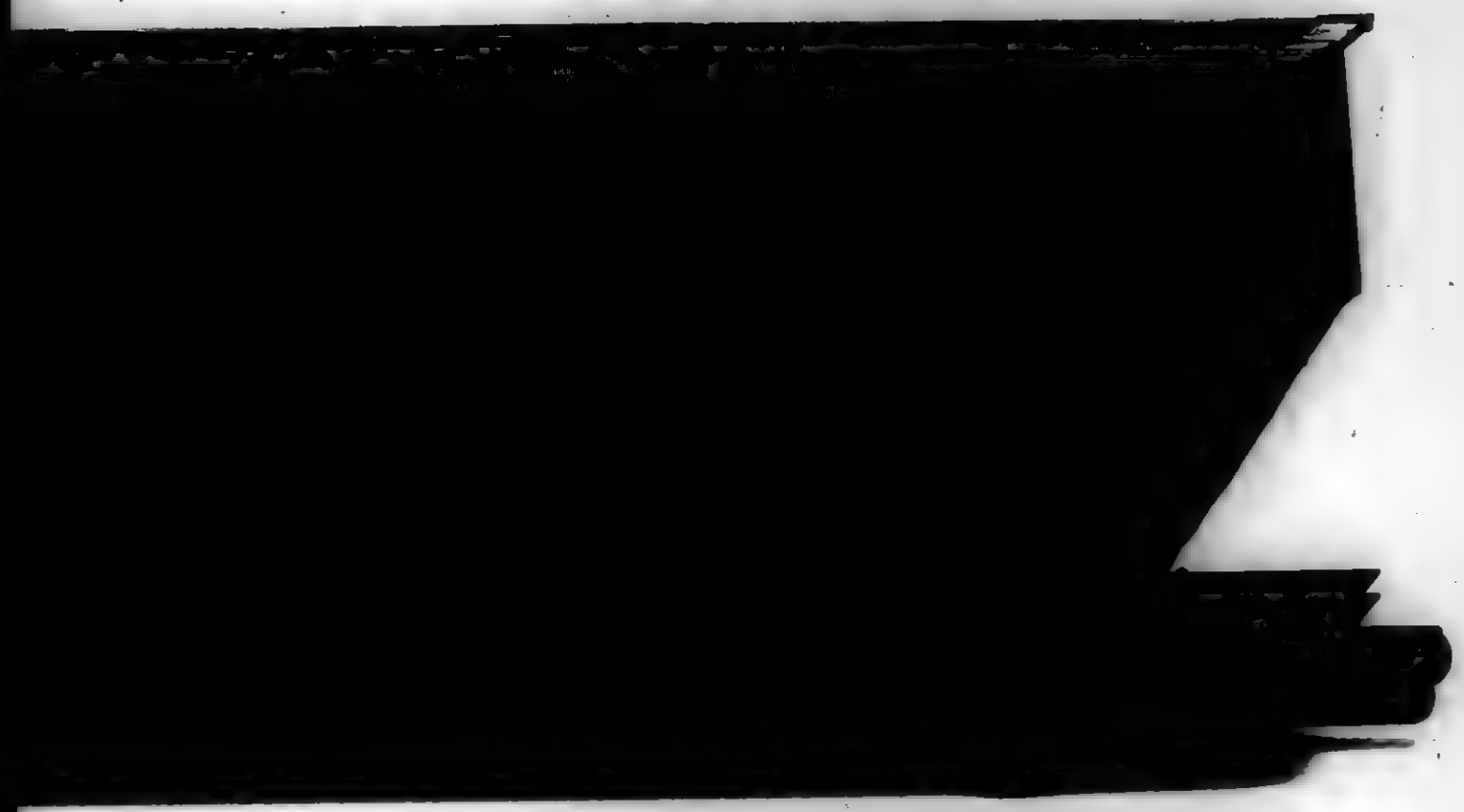

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Electronic publishing

Adobe to unveil cross-platform Acrobat

By Michael Vizard
MOUNTAIN VIEW, CALIF.

After two-plus years of development, Adobe Systems, Inc. will make good this week on its promise to fundamentally change the way individuals approach electronic documents.

This week in New York, Adobe is set to deliver its Portable Document Format (PDF) technology, which it will market under the name Acrobat. The arrival of PDF means that users of documents created using PostScript fonts will, for the first time, be able to read electronic documents regardless of which authoring tool or platform was used to create that document.

For example, a document created in WordPerfect Corp.'s WordPerfect word processor on the Microsoft Corp. Windows platform will be readable by a user on an Apple Computer, Inc. Macintosh, DOS or Unix platform.

"We're talking about a fundamental change in terms of replacing paper with electronic paper," said Esther Dyson, president of EDventure Holdings, Inc. in New York. "With Acrobat, you'll be able to give people documents to read across platforms and [still] maintain the integrity of the document in terms of its look and structure." However, she said users must understand that Acrobat only provides the ability to read or annotate documents (see chart).

"We're not talking about document exchange; we're talking about not creating unnecessary paper. People who produce paper should be worried; people who want to save trees should be thrilled," Dyson said.

Jumping through hoops

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ACROBAT READER
- Read-only software that allows users to view, navigate and print documents created in Portable Document Format (PDF).

ACROBAT EXCHANGE
- Allows users to annotate PDF files in addition to viewing.

ACROBAT PDF WRITER
- Produces PDF files from applications.

ACROBAT DISTILLER
- Translates PostScript files into PDF files.

One of the first companies to adopt Acrobat will be R. R. Donnelly & Sons Co., which is one of the world's largest printing companies.

"We'll be adopting Acrobat both internally for our own use as well as for the use of our customers," said Greg Phipps, a marketing manager at the printer's Waltham, Mass., office.

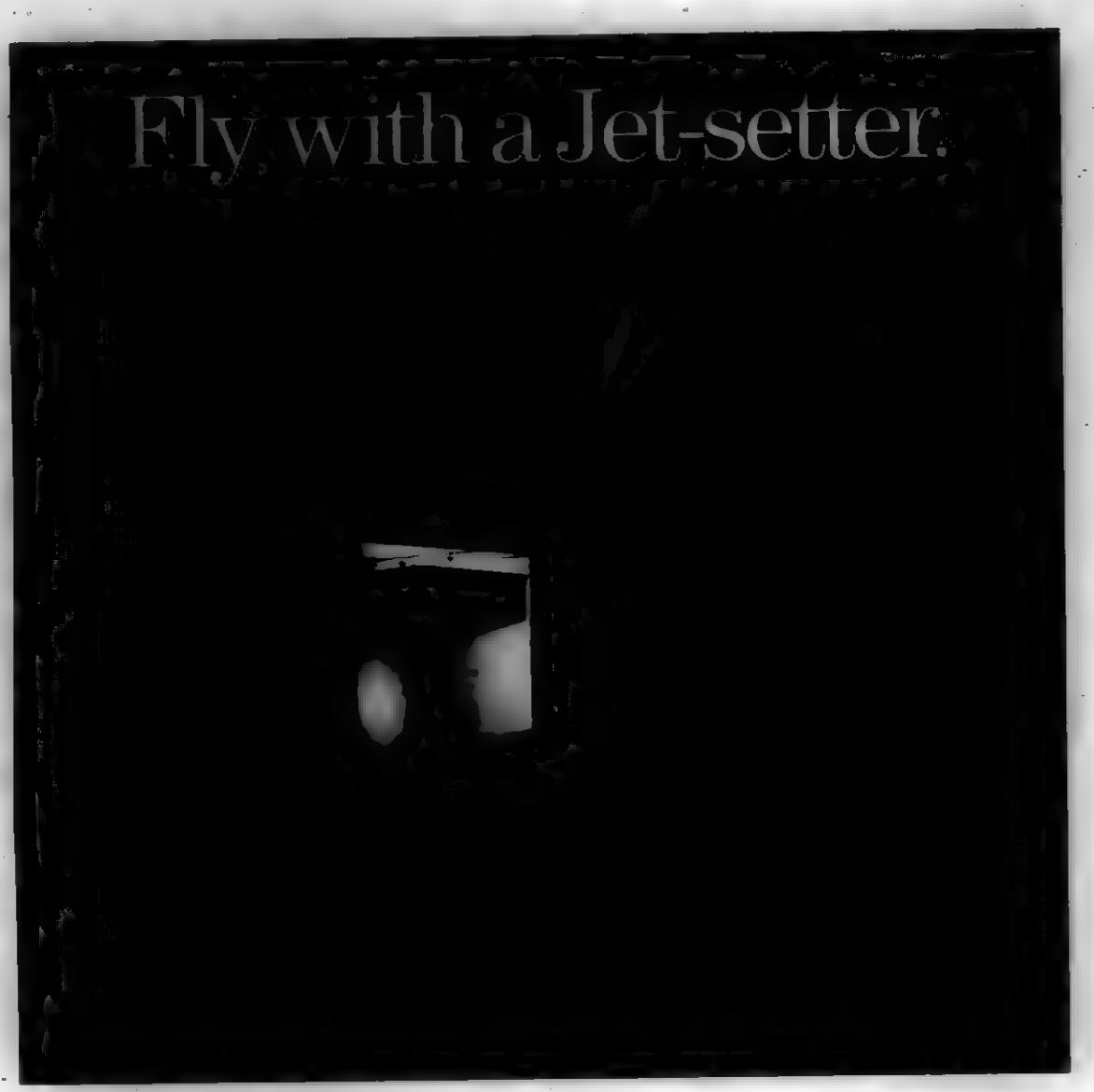
"The problem with electronic distribution of documents is that you couldn't maintain the vividness of the presentation. With Acrobat, you can maintain the headers, footers, graphics and bullets across platforms," Phipps said.

Phipps said R. R. Donnelly expects its publishing customers to begin offering site licenses for their publications. "For example, you might license something like *BusinessWeek* for distribution [electronically] across your site," Phipps said. Customers will benefit from lower subscription rates across a larger number of readers, while publishers will be able to cut down on their subscription and mailing costs, he added.

How successful Acrobat will be, however, will be directly tied to Adobe's ability to overcome resistance from Microsoft and Apple, which are jointly pushing an alternative to PostScript.

"The technology is there, but it won't become a standard until it is widely used. I suspect Microsoft and Apple won't support it until they have to," Dyson said.

John Warnock, Adobe's chief executive officer, said that because most documents are created using PostScript fonts, users will not have to change anything to take advantage of Acrobat.



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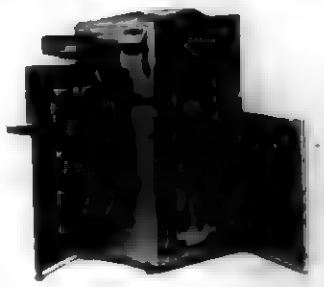
With the 1500-sheet *HP Paper Feeder* keeping your 17-page-per-minute printer busy on one end, the 2000-sheet *HP Output Stacker* makes sense on the other end. Especially in networked environments. Use the printer's upper output bin for smaller print jobs, the HP Output Stacker for heavier volumes. Together, the HP Paper Feeder and Output Stacker let your printer work unattended, day or night—even on weekends—without someone to put paper in or take it out. So you save both time and labor costs.

And the HP Output Stacker fits squarely under the printer—with just enough surface area to match the footprint of your printer and HP Paper Feeder. Lockable casters make it safe and easy to move from location to location.

Take high-capacity printing to new heights. See your authorized HP reseller or contact your HP sales representative. For more information call 1-800-752-0900, ext. 7009.



If the printer's output bin meets your needs, look into the HP Paper Feeder and the *HP LaserJet Printer Cabinet*—custom designed to hold supplies, as well as the printer.

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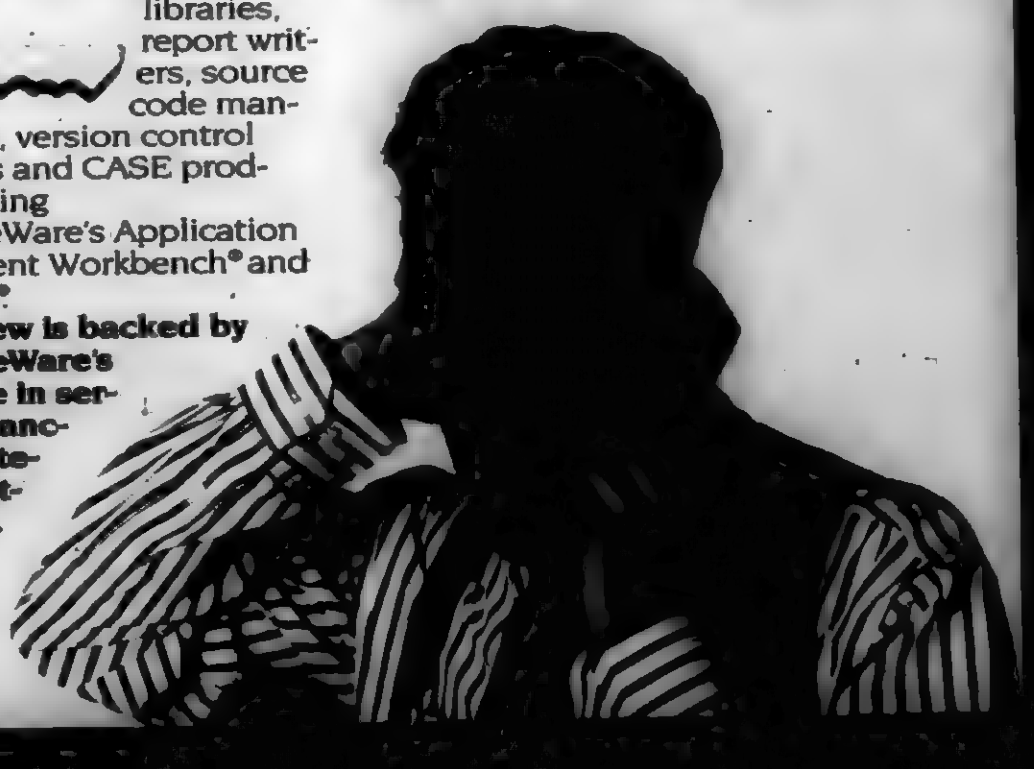

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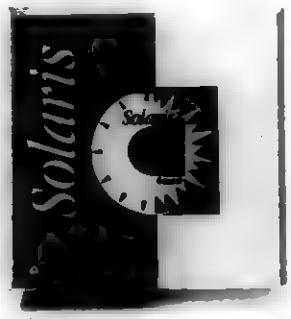

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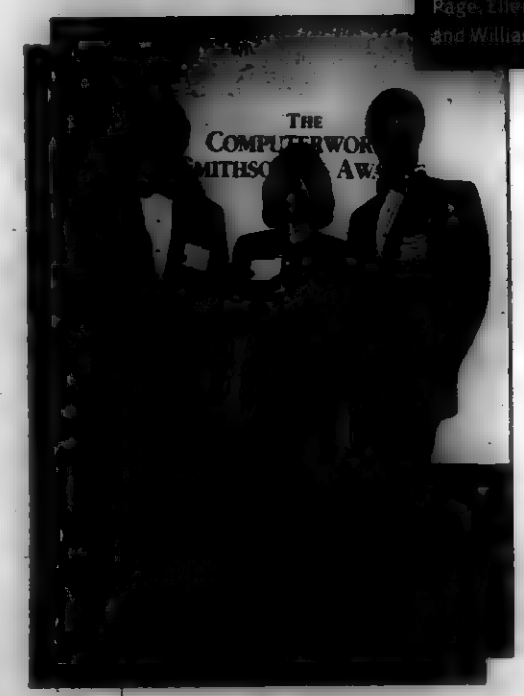
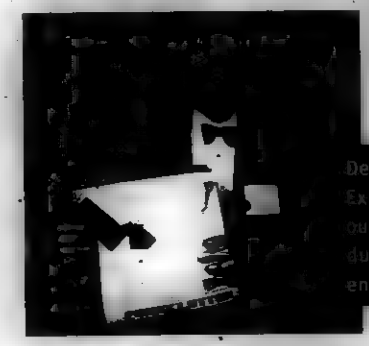


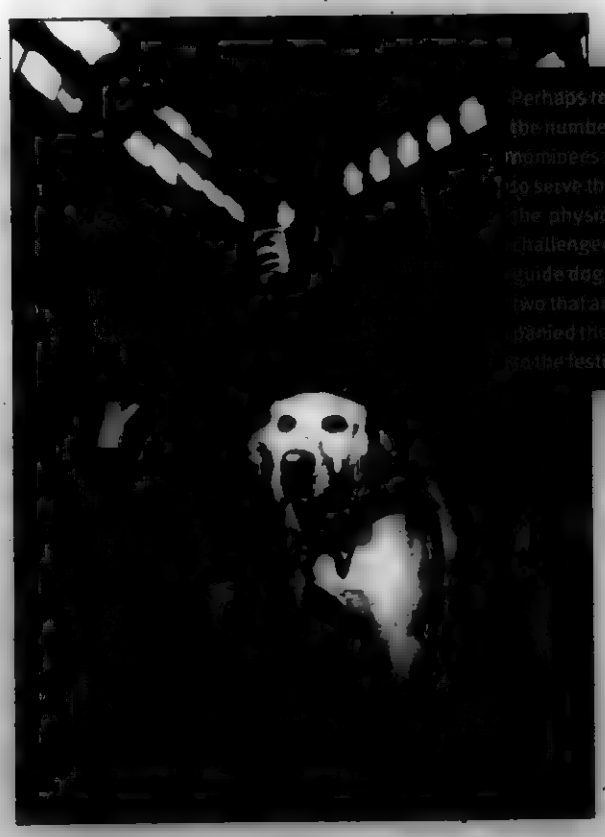
ALL PHOTOS BY CHIP SIMONS

Winners of the fifth annual Computerworld Smithsonian Awards in 15 categories were feted in style last week at a Washington, D.C., gala attended by 850 people. The program honors the best societal uses of information technology, spotlighting the creative heroes who set examples for future generations.

Enjoying the preshow festivities were (from left) Paul Jackson (Fannie Mae), Peter Freedman (Georgia Institute of Technology) and Larry Gary (Fannie Mae).

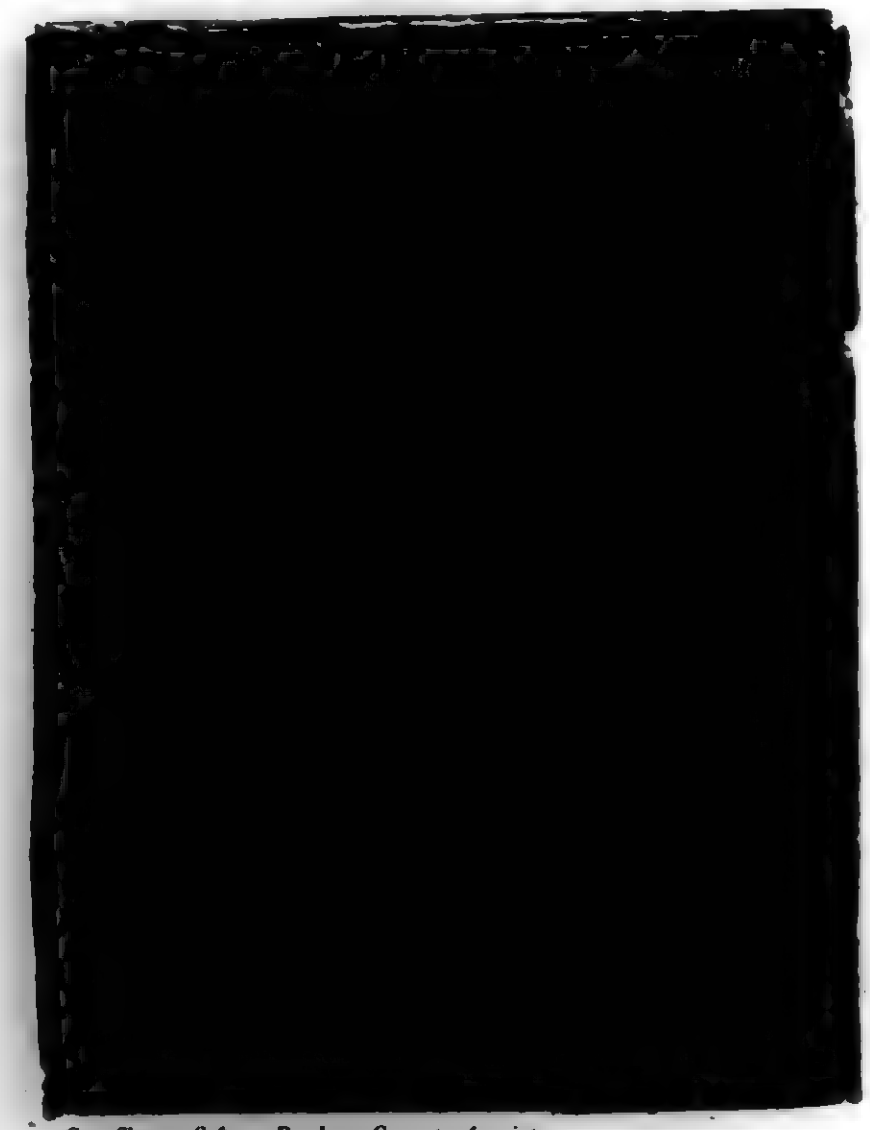


Dennis Jones of Federal Express Corp. takes time out to demonstrate the durability of a Fedex letter envelope.



Perhaps reflecting the number of nominees seeking to serve the needs of the physically challenged was this guide dog, one of two that accompanied their owners to the festivities.

"No more



Gary Slattery, Software Developer, Computer Associates

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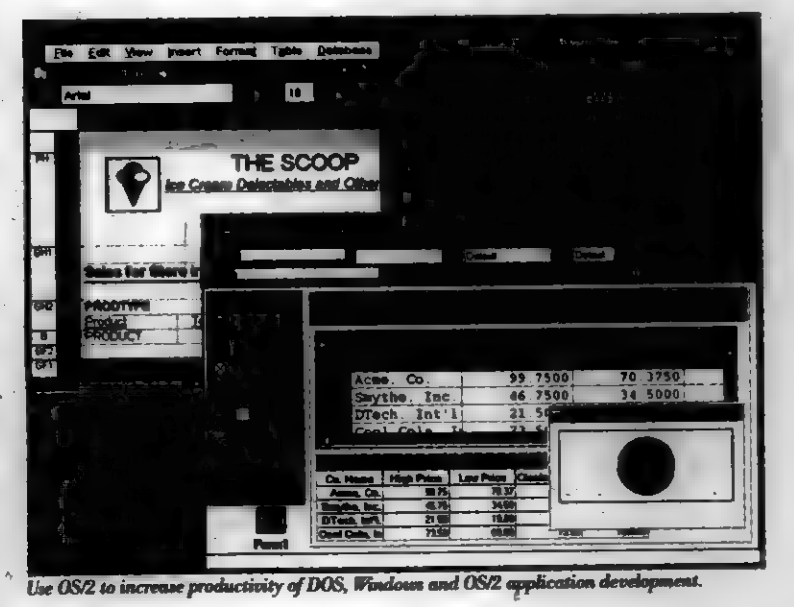

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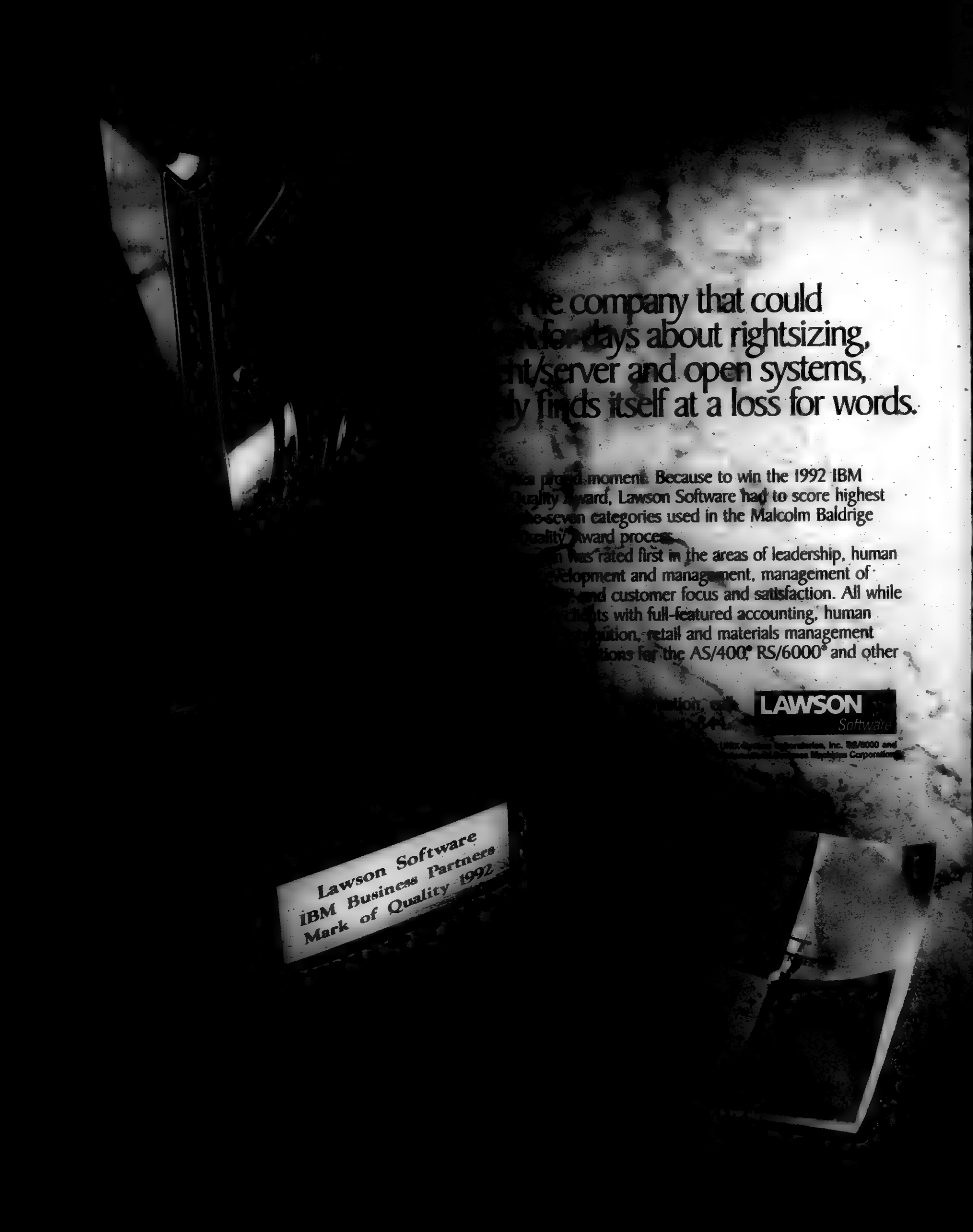

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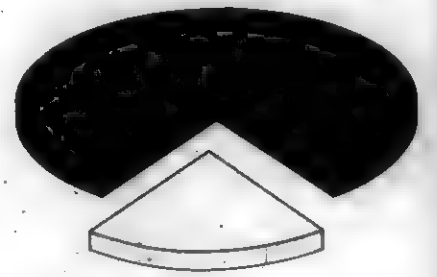

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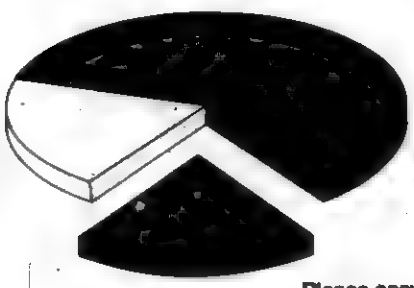

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Displaying the future

Quest for larger, more vivid screens drives development of display technologies

By Ellis Booker

Start with a silicon wafer outfitted with 307,200 tiny, movable aluminum mirrors. Next, aim a light source at this surface and precisely tilt each "micro-mirror" to control each pixel on the screen.

Voila! A thoroughly digital projection display — unmediated by either a CRT or an LCD.

Texas Instruments, Inc.'s prototype digital micro-mirror device (DMD) projection display was one of several next-generation systems discussed at last month's Society of Information Display conference in Seattle.

"The original work on this technology was done at Westinghouse in the '70s," said Frederic J. Kahn of Kahn International, a Palo Alto, Calif., consultancy specializing in projection and flat-panel displays.

According to Kahn, TI's decade worth of work seems to have paid off. DMD "is starting to look very much like a commercial product," he said.

Kahn also said TI's effort points to an exciting trend in the display industry: that of using a single fabrication technology to make a display device and its associated electronics. "In standard [flat] panels, you make the display part with one technology and the chips with another. Then you bond them together," he explained. Taken together, he said, these various processes make screens expensive.

Manufacturers of displays are also pushing to make systems larger and more vivid.

Key to this quest for bigger screens is a variety of flat-panel display technologies because a conventional CRT monitor larger than 40 inches would weigh well over 200 pounds.

At the display conference, for instance, Tokyo's Science and Technology Research Labs presented a paper on its experimental 40-in. diagonal, color plasma flat-panel display. The vendor is reportedly working on a 55-in. color plasma panel (see story below).

The TI projection prototype uses video from an unmodified National TV Standards Committee video source. In operation, the video signal is separated into its red, green and blue (RGB) components. Filtered light (red, green, blue) shines onto the chip and its mirrors, the movements of which are coordinated by the digitized RGB video signal.

Projection displays *may someday make CRTs and LCDs obsolete. Research on display technology is being fueled by a need for larger screens, particularly for high-definition television.*

Colorful variety

Capable of displaying 16 million possible colors, the TI display offers 640- by 480-pixel resolution, a contrast ratio of 50-to-1 and an aspect ratio of 4-to-3. This makes it comparable in quality to the best projection displays now available. TI's prototype projection system sends images up to 12 feet away to a 60-in. diagonal screen.

TI said both the electronics and the 17-micron square mirrors on its DMD chip — technically known as a "pixelated, micromechanical spatial light modulator" — are created using standard .80-micron CMOS semiconductor fabrication gear. This semiconductor-based design, according to TI, is more cost-effective than conventional alternatives and might someday be a low-cost way to manufacture high-definition television monitors.

Plethora of panels

Alternatives to the CRT have proliferated as fast as bad cartoons on Saturday mornings.

Flat-panel display technologies continue to receive enormous sums of R&D dollars, although manufacturers have encountered nagging technical and manufacturing problems that have made them somewhat less bullish on these technologies than just a few years ago.

The appeal of flat panels is twofold. First, they are the logical choice for portable devices. Until now, this has meant portable computers, but the dawning era of the personal communicator and personal digital assistant is expected to expand this opportunity. Second, several vendors are experimenting with flat panels for large (36-in. and above), high-definition television (HDTV) screens.

The total market for flat displays will grow from $2.7 billion this year to $4.8 billion in 1995 and to $8.8 billion in 1997, according to Stanford Resources, Inc. in San Jose, Calif. Of this, computers will account for $1.9 billion, $2.5 billion and $3.5 billion, respectively.

Flat-panel displays include the following:

▶ Passive-matrix LCDs, also known as supertwist nematic displays. A multiplexing scheme is used to control individual rows of pixels, with a transistor at the end of each row and column. This approach means voltage at each individual pixel cannot be controlled as precisely as with thin-film technology. Advancements are occurring in passive-matrix LCDs, however. One vendor, In Focus Systems, Inc. in Tualatin, Ore., has developed what it calls "active addressing," a technology to improve the viewing angle and response time of these screens.

▶ Thin-film technology (TFT) LCDs, also known as active-matrix LCDs. Each pixel has its own transistor or diode. Color TFT LCDs are created by adding three "sub-pixels" to this scheme. The focus of most of the R&D spending in the flat-panel industry, TFT LCDs will come to dominate the portable computer market, according to most observers. But relatively high failure rates in the manufacturing of these screens makes them more expensive than current passive-matrix screens. In addition, several firms are working on desktop and workstation versions of TFT screens. Sharp Ltd., for example, is readying the commercial release of a 17-in., 1,280- by 1,024-pixel TFT LCD for workstations.

▶ Plasma display panels. Plasma panels use ionized gases, such as neon or argon, that glow when exposed to a voltage. This basic display structure, if topped with different phosphors, can also support color. Color plasma systems have been shown by a few vendors, including Fujitsu Ltd., which is now shipping the first production color system, a 21-in. diagonal display. Plasma panels are of keen interest to backers of HDTV systems because they can support large (36-in. and above) screens.

▶ Ferroelectric LCDs. The key attribute of these LCDs is their ability to remember the contrast level at each pixel without being refreshed with voltage. Difficult to make larger and slower than competing technologies, these LCDs have trouble doing real-time video.

▶ Electroluminescence (EL) displays. These displays use a three-layer structure: an active layer of phosphor material layered between two dielectric layers. Unlike plasma and LCD displays, EL screens are solid-state devices. Last month, the leading EL vendor in the U.S., Planar Systems, Inc. in Beaverton, Ore., demonstrated a color prototype.

▶ Field-emission displays (FED). The most experimental of all types of flat panels, FEDs operate similarly to CRTs, except that instead of a single electron gun per emitter, an FED uses many micron-size, metallic tips as the electron beam source. Backers say FEDs will need only 50% of the power of TFT LCDs. — Ellis Booker

8:00 Home *Over breakfast, you check your calendar on your PowerBook Duo. The day looks like it'll be a breeze. You'll put a few finishing touches on the Q2 forecast presentation that's due in a couple of days, return a few calls, and have a free afternoon (for a change).*

9:15 Your Office *You slide your PowerBook Duo into the Duo Dock and start working. Suddenly, your e-mail chimes. Your boss wants you on the noon shuttle to Boston, to present the Q2 forecast to his boss. Also, a client wants to see you ASAP. You hit the eject button and go.*

2:50 Borrowed Office *A colleague is at lunch, so you borrow his Duo Dock. You log onto e-mail back at the home office and learn your group has just won a new piece of business. You incorporate this news into your presentation (and change a few colors while you're at it).*

3:30 Conference Room *You clip on the Duo MiniDock and run the presentation from your PowerBook Duo. Everybody's impressed — especially the guy who asks you a series of tough questions about a six-month-old project. You've got all your files, so you've got all the answers.*

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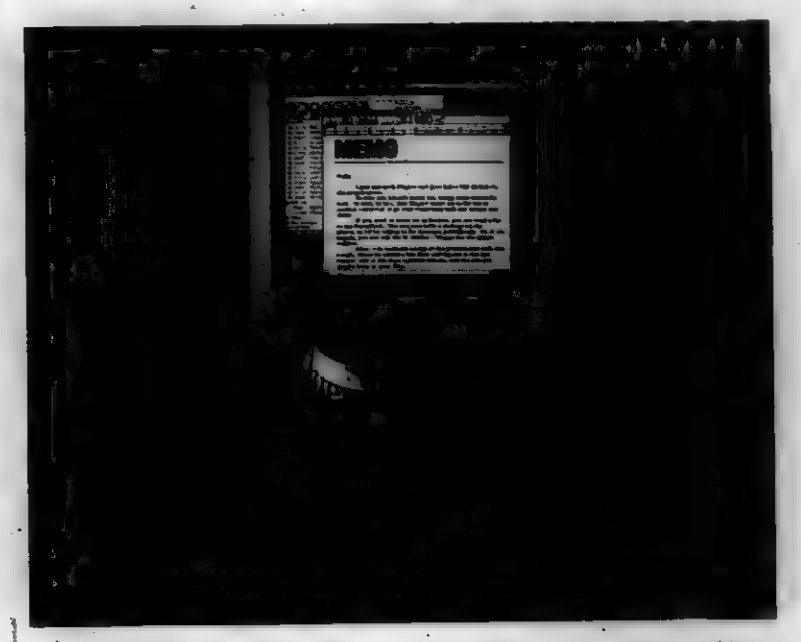
11:10 Your Client's Office *That $5 million project the client told you was off last week? It's on again. And due in two weeks. You type up a few job orders, which you'll fax from your PowerBook when you get to Boston. Now, however, you have to catch a cab for the airport.*

12:40 Noon Shuttle *All the files and software you use at your desktop are right here with you. You pull up the Q2 presentation and make the revisions to reflect the new assignment. Then you write a quick memo to your team, to make sure that everything's on schedule.*



7:00 Your Office *On the way home, you swing by the office to tie up a few loose ends. You see your boss. He heard the meeting went extremely well, and wants you to fly out and present to the people in London. Tomorrow. You send out a quick memo to update your staff.*

8:30 Living Room *Since you've got all your files and software right there with you, you could write a report, study the new research data or finish up those performance reviews. But hey, enough is enough. You settle back in your recliner and play a few rounds of Tetris.*

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PowerBook Duo from Apple

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IT's coming

For years, the world has been fed the information technology "productivity paradox" wherein huge investments in information technology were labeled as productivity-impotent. "There is no increase in productivity, despite what's been spent," cried the high priests of economic thought.

Suddenly, the tunes they are a changin'. I don't know when the change began, but I think I know why.

First, Intel Chairman Andy Grove told *Wall Street Journal* readers a few months ago that returns on information technology investments are nigh! They will come as a result of all the wonderful and heretofore unheard of applications that will grow out of the emerging networked PC world. What better reason do you need to go out and order a few pallets of Pentium-based machines? (My editorial interpretation here.)

Then, *BusinessWeek*'s cover trumpeted the "productivity payoff" from information technology. Yes, it's finally arriving. Thank God for the wonderful networked LAN environment, bringing information to everyone's fingertips and real productivity to the workplace.

Recently *Computerworld*, too, published a study that heralded significant gains from the deployment of information technology. Have users somehow unlocked the riddle of the productivity paradox?

Before we let the latest wave of hysteria turn off the few remaining lights of reason, let's examine the issue. Consultants and information technology academics profit when there are issues they can consult on or write about. Scores of them will now write and consult on the new productivity payoff theorem. Forget about the bald fact that advocates of LAN-based systems have not even begun to detail the real costs of this deployment. There's consulting money to be made!

Also, consider whether there ever was any productivity paradox to begin with. *Computerworld* has surveyed top CEOs and CFOs in three studies over five years, and in each study, a very consistent 75% of the sample answered "yes" to the question, "Are the benefits of information technology investments quantifiable?" Yet when we asked them how they measure those benefits, the executives said they resort largely to soft measures such as user satisfaction and perceptions of whether projects are completed on time.

That's because despite years of trying, some of the best and brightest minds in the world simply can't derive unimpeachable productivity return formulas for information technology investments.

Furthermore, no productivity input, like information technology, is an island unto itself. You simply cannot strip information technology out of a bubbling caldron of corporate economic activity and gauge how much flavor information technology alone adds to the broth. It's just not that simple.

So brace yourself for exaggerated reports of yet another paradigm shift. At least this one is inherently more upbeat than the last, as long as no one peeks at the man behind the curtain.

Bill Laberis

Bill Laberis, *Editor in chief*

Why worry?

Stop worrying about the Clipper chip and BigBrother ["Clipper gives Big Brother far too much power," CW, May 31].

No one is going to use it except contractors who are required to so they can have "unclassified, sensitive" telephone conversations with Defense Department agencies. Anyone who is paying attention, and really wants secrecy, won't use this precompromised crypto system.

The ostensible purpose of the Clipper chip is to let the FBI listen in on telephone conversations between drug lords. This is a goofy idea.

Is it reasonable to assume that AT&T is not going to warn Clipper telephone buyers? No sale, and fade out to sounds of laughter.

Robert V. Jacobson
New York

Doctor's orders

In "Health care data network fires up" [CW, May 24], the assistant vice president of EDI services at Blue Cross/Blue Shield of Louisiana and Mississippi said: "The same doctor who will spend $50,000 on a Mercedes won't spend $4,000 on systems because the car is a symbol of being a doctor and the computer is a symbol of being a businessman."

As a physician who has been intimately associated with the computer industry for more than 15 years, this type of thinking is symptomatic of what has been wrong with the industry's approach to users in general and physicians in particular.

The vast majority of vendors have rarely involved the doctor in system development. The IS industry still caters to the medical school gurus, the small-focus researchers and especially to the "businesspeople" in the health industry who sign the checks.

The emphasis seems to be on "bells and whistles" instead of meeting the needs of the practicing physician.

The needs of physician users are too important to be entrusted solely to the insular thinkers of the information industry. Come down into the trenches and ask the doctors what they really want and need from automation.

J. E. Goldberg, M.D.
Tulsa, Okla.

NCR neglect

Although *Computerworld* acknowledged NCR's entry into the Pentium arena in the May 10 issue, "It's almost show time for Pentium," the piece that ran on the day of NCR's and other Pentium announcements, "Pentium dearth slows system delivery" [CW, May 17], was suspiciously void of any NCR mention. This oversight appears to be inexplicable.

NCR's products were Intel's demo systems of choice for its initial Pentium launch in March.

What's more, the NCR 3360 is one of the very few systems that will ship in volume in June. This factor alone makes our product noteworthy.

And finally, early feedback and reviews from several prominent publications indicate that "NCR's Pentium-based machines may span the widest range" and that the System 3360 is the "fastest single-user machine that can run Windows today" and "an extraordinary machine by any measure."

When a vendor or product is clearly delivering a compelling advantage and unique value to its users, its absence in a roundup article is a disservice to all your readers.

Shary Hauer
Workstation Products Division
NCR Corp.
Dayton, Ohio

Fight insight

I want to commend you on your editorial "Fighting back" [CW, April 26].

The Society for Information Management is committed to providing international leadership in information technology to achieve business objectives. Software licensing is just the first area we intend to address vigorously.

We appreciate *Computerworld*'s fair and open coverage of our position on software licensing.

Robert M. Rubin
Elf Atochem North America, Inc.
Philadelphia

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Don't talk to me about paradigms

Michael Cohn

If you've heard them once, you've heard them a thousand times. These are the tired, trite, overused terms that make your skin crawl. While IS buzzwords come and go, these can't go fast enough. Each time someone uses one, you get the desperate urge to club the person with a keyboard.

▶ **Paradigm.** This is the favorite word of IS consultants. They love to blame everything on paradigms. They claim we can't see, hear or move because of paradigms.

I'd like to pummel the next person who says "paradigm." How can IS people have paradigms? Most days we don't even have lunch. Maybe we've missed the boat a time or two. But anyone would have trouble seeing, hearing and moving if they had beepers blasting in their ears and a couple hundred users on their back 24 hours a day.

▶ **Total quality management.** Having the words "quality" and "management" in the same phrase is scary enough, but "total" sounds arrogant to me. Let's be realistic: The only time you hear "total" in IS is when someone is complaining about a "total mess." Would anyone settle for "partial quality management"? Or "occasional quality management"? That we could probably manage.

▶ **Integration.** By now, businesses expect all their systems to be integrated, and IS is ready to help. We're planning to get all these platforms to work together — as soon as we figure out how to get the stuff to work by itself.

▶ **Infrastructure.** This is the big one, the most popular buzzword of the '90s. IS folks pontificate at power lunches about network infrastructure, staff infrastructure, management infrastructure or any other infrastructures they can think of.

Don't waste your time with infrastructures. You can't build one. You can't buy one. Sure, it would be nice to mold your organization into a flexible, future-oriented team of skilled professionals, and maybe that would qualify as "infrastructure." But, more likely, you'll end up moving a bunch of desks around, calling too many meetings and creating something a lot more like "intra-fracture."

▶ **World class.** I am everlastingly sick of the phrase "world class" — world-class IS department, world-class service organization. What does it take to be world-class anyway? I bet it requires a whole lot of infrastructures and total quality management.

▶ **System re-engineering.** Don't be fooled by this one. We never "engineered" these systems in the first place. Once they were compiled, we slammed them into production and called it a day. On second thought, let's not mess with this term. Your CFO can probably handle system re-engineering, but he might balk if you told it like it is and tried to sell the idea of "system re-winging it."

▶ **Client/server.** This is the most misunderstood term in IS. People used to define client/server as everything that wasn't a mainframe. Then someone came up with the idea that mainframes could be servers, or even clients, of some really pushy PC.

So let me give you my definition. Client/server is a simple, three-step process:

Step 1: Something tries to send some data.

Step 2: Something else tries to receive some data.

Step 3: The alleged data disappears somewhere in the middle, a bunch of beepers start to go off, and nobody gets a good night's sleep.

Cohn works for an integrated, world-class infrastructure in Atlanta.

Flip, flop; flip, flop – let's think about a compromise

LISTEN UP! *by* Elaine Bond

It is time to get off the pendulum ride that has many of us swinging back and forth between wholesale decentralization and recentralization.

These pendulum swings are knee-jerk reactions to the perception that the IS function isn't working. In the absence of any clear idea of what is wrong, companies hope a reorganization will make it work better. The hoped-for improvement seldom materializes, however, because decentralizaton is implemented in naive, radical ways that ensure cost escalation, redundancy and confusion.

The arguments offered in support of decentralization are usually something like this:

IS is a function like any other and should be treated as such. The business or functional unit heads should be accountable and responsible for their own needs. As the people closest to the action, they have the best view of what's needed and are best able to calculate trade-offs between investment in IS and investment in other functions within their units.

The implication of this reasoning is that centralized IS groups are neither as efficient nor as effective as decentralized groups and that business unit management can do as good a job managing the function as an IS manager can, and that decentralized groups will spend less to get more/better results sooner.

My experience is that some of this may be true in the early days of decentralization, but the benefits dissipate quickly and the warts inherent in decentralized organizations begin to appear. Here are some of the often-overlooked defects of decentralized organizations:

•**Loss of budget oversight:** Contention over IS issues becomes less visible to the most senior levels of management. This may seem like good news to top managers who feel they have enough to worry about dealing with budget allocations for units, let alone functions. It can be very bad news, however, if a unit is either underfunding the function or wasting resources.

•**Cost escalation:** The total cost to the corporation for IS almost always rises after decentralization.

•**Hidden problems:** There will be application development failures and service-level issues, but they will be less visible. Business unit heads won't turn themselves in or even ask for help from outside groups until there is a disaster or unless the auditors turn them in. Failures aren't reduced, just hidden.

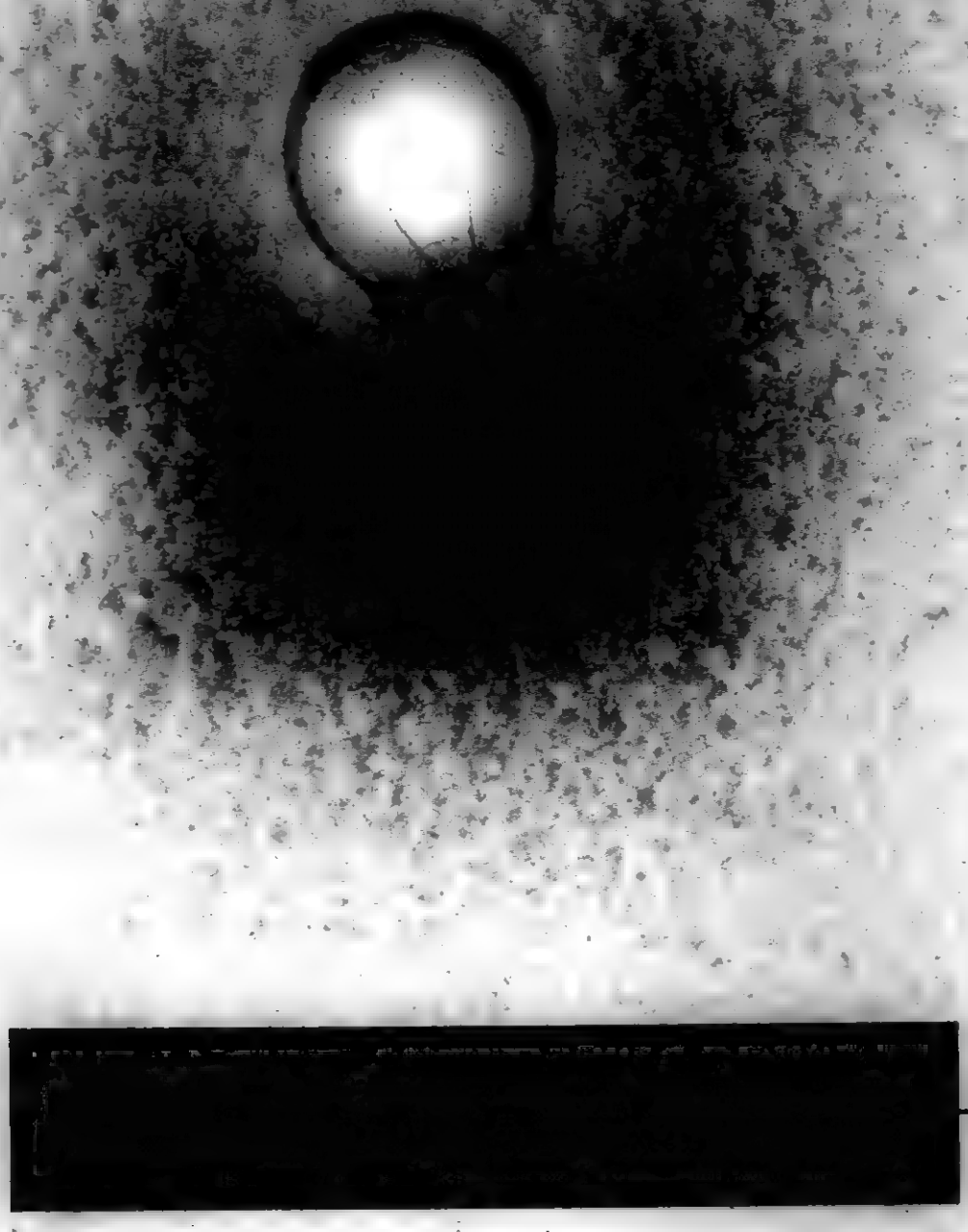
•**Balkanization:** Technology choices at the business-unit level are frequently suboptimized and incompatible with other units' choices. This is not a problem unless or until you try to move information across units or integrate or reorganize business units at some later point.

Does this mean decentralization is not effective? No, just that it isn't a panacea and that IS is still enough of a specialty area to require corporate-level guidance and governance.

Reapportioning the roles and responsibilities of centralized IS groups into a matrixed organization with corporate- and business-unit-level structures can and should work better than either extreme.

It makes a lot of sense. This kind of matrixed organization is, after all, just the organizational equivalent of the kind of technology structure we're all trying to put in place — highly distributed, networked computing, based on a well-defined but flexible architecture capable of accommodating plug-and-play components.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank N.A. She is a founder of the recently formed user advocacy group Open User Recommended Solutions (OURS).



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Charles Babcock

Shifting down

The appetite for data on the desktop is growing voraciously. In some cases, the sheer size and scope of applications that departments want to run is growing to near-mainframe proportions.

If an oil exploration unit wants to analyze seismic data, will it be frustrated by the 4G-byte address limit of its 32-bit systems? Will it wait in line for a small piece of someone else's supercomputer time, or will it look for a new breed of server that can push gigabytes of information through a high-bandwidth processor?

Since the mid-1970s, the supercomputer has been as remote from the desktop as the Siberian tiger. It might still appear that these two styles of computing are destined to remain worlds apart, but developments at Cray Research indicate a rapprochement — if not an outright intersection — could occur this year.

Cray is no longer simply creating a few very large locomotives like the Cray Y-MP C90, a 16-processor, $30 million machine. In an age of commodity computing, Cray is sticking to its large system concepts but is seeking to repackage them in smaller units that are closer to the desktop and presumably less expensive.

Although it still designs its own logic chips for the Y-MP line, Cray is about to launch two product lines that make use of CPUs from chip suppliers. However, this is not a plan to make Lego block supercomputers, assembling a big machine out of small, look-alike PC components. Cray spokesmen will tell you that prospect is inhibited by the severe I/O constraint designed into an Intel chip.

Rather, Cray will tap SPARC chips to come up with a superserver to sit atop the Sun Microsystems product line, and it will use DEC's Alpha chip to produce a massively parallel computer. Both product lines are due to appear before the end of the year.

The SPARC-based units, known internally as the "Super dragon" SMP line, represent an effort to broaden Cray's customer base, although its "mass appeal" will amount to a few hundred, not thousand, units, Cray said.

On the second front, massively parallel processing (MPP) systems have seldom lived up to their promise in sustained throughput. Cray views the creation of an MPP architecture as a much greater challenge than simply stringing together hundreds of microprocessors. The problem is creating access to memory and data in a system in which the memory is distributed alongside many small CPUs rather than pooled centrally.

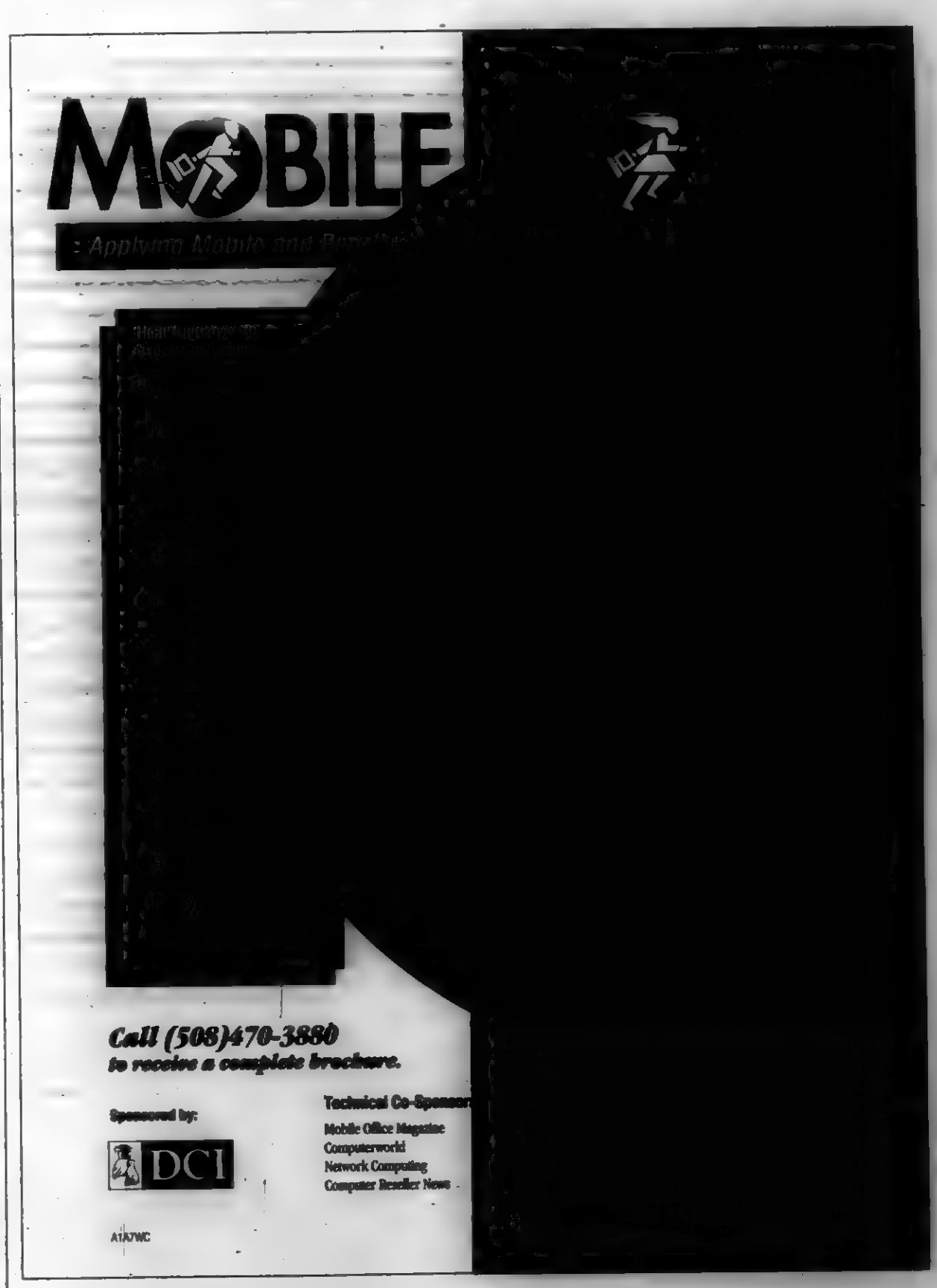
In addition, RISC microprocessors are difficult to design into MPP systems because they have limited memory addressing and are intolerant of latency. If the CPU doesn't find data when needed in the on-chip cache, it idles until the data arrives, which in an MPP system could be from some "far neighbor" point.

DEC's Alpha chip is an exception because it is 64-bit and because Cray had a hand in its design. But Cray must still use its Y-MP-based expertise in high-speed switching to surround the SPARC and Alpha chips with interprocessor communications and synchronization.

Martin Walker, director of parallel applications, claims Cray can avoid some of the blind alleys pursued by MPP pioneers. Cray has a chance to bring its hardware design and packaging and its parallel compiler expertise to bear on the MPP problem.

Performance rates on MPP systems tend to be "only 2% to 5% of the theoretical peak" due to throughput and synchronization constraints between processors, noted George Cybenko and David J. Kuck in the September 1992 issue of *IEEE Spectrum*. Cray thinks it will beat that low throughput and make MPP a more general-purpose technology by the latter part of the decade.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2787.



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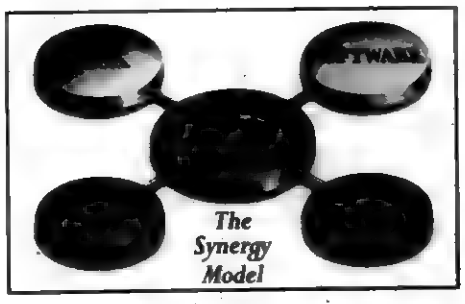

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David Coursey

NT isn't worth the wait

Windows NT is a bit like Bill Gates' legendary Porsche (the one that isn't street-legal in the U.S.): If you have to ask, well, you can't afford it. Or, in NT's case, you just don't need the level of joy NT is certain to provide.

NT's marketing history is not one of Microsoft's finest hours. Hardly anyone outside Microsoft really knows who's supposed to buy NT. And customers who think they're in the group would probably be better off waiting while someone else takes the plunge.

Here's a simple quiz for those of you who are considering NT: Are you willing to trust your mission-critical data and applications to a first-generation Microsoft operating system? Do you want to install 12M to 16M bytes of memory on all of your machines to run an operating system that claims 70M bytes of disk space and is often slower than Windows 3.1?

I didn't think so.

And if you have a new hire in your IS shop who urges you down the NT path, you might best consider that person an agent provocateur sent by your competition to bring your infrastructure to its knees.

Coursey, *page 57*

HP slims portable to under 3 pounds

By Mark Halper
SAN FRANCISCO

Although the computer industry likes to talk about "information at your fingertips," most users know that ready-made data actually resides a little further down, maybe closer to the knuckles.

So Hewlett-Packard Co. last week did its part to make information a bit more handy, at least for mobile workers, as it unveiled what analysts called the lightest ever portable Windows computer. It also features advancements in battery and storage technology.

Among other strides, HP built the new OmniBook 300 to run on the same AA batteries that power myriad consumer electronics products.

The 2.9-pound OmniBook is the first portable to incorporate technology that Microsoft Corp. made available last fall through its Portable Computing Initiative. It measures 11.1- by 8.4- by 1.4-in.

A Windows lightweight

Although many DOS portables weigh around 3 pounds, most Windows machines are closer to 5 and 6 pounds so the 20-MHz Advanced Micro Devices, Inc. 386-based OmniBook represents a leap forward, according to Tim Bajarin, president at Creative Strategies Research International, Inc. in Santa Clara, Calif.

Unlike other Windows-based portables, OmniBook uses read-only memory (ROM) to assume some of the storage duties normally assigned to a machine's hard drive. HP is loading the system's 10M bytes of ROM with Windows 3.1 and Microsoft's Word word processing and Excel spreadsheet programs.

Also included are HP's phone book, appointment book and financial calculator software and Traveling Software, Inc.'s LapLink Remote Access program. The ROM is housed on a Personal Computer Memory Card International Association (PCMCIA) card.

The OmniBook uses ROM *to accomplish storage duties usually done by the hard drive*

Users can call up the ROM-embedded programs by pushing one hot key rather than by booting up, according to HP.

HP is offering two storage options, both of which use built-in compression technology to essentially double storage space.

A 40M-byte PCMCIA hard drive offers 80M bytes of storage, and a 10M-byte PCMCIA flash disk offers 20M bytes of storage, HP said.

HP priced the hard drive version at $1,950 and the flash disk version at $2,375. The flash disk version includes two additional PCMCIA slots; the hard drive version houses one extra slot.

Bajarin said those prices are steep for this class of product, but market pressures should bring retail prices down to around $1,700.

Battery life is rated at up to five hours for the hard drive version and up to nine hours with the flash disk, HP said. That compares with about three hours on many notebooks.

While analysts noted that HP drew some of that extended life by compromising on screen quality — its Video Graphics Array-compatible screen is not backlit — they said a nine-hour battery life should attract users.

"When you get on an airplane to cross the country, you want to know if the battery will last or [if] you have to bring heavy batteries for replacement," said Barbara Isgur, president of BSI Consulting in Woodside, Calif.

Although the OmniBook can run on four AA batteries, it comes standard with a rechargeable nickel metal hy-

HP portable, *page 46*

Potholes appear in Pentium path

By Michael Fitzgerald
SANTA CLARA, CALIF

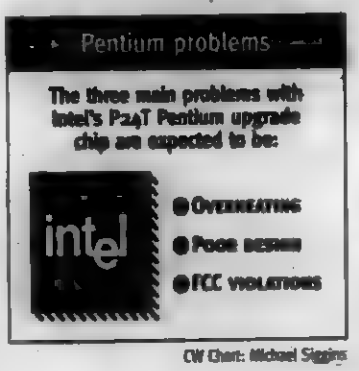
Intel Corp. thought it was doing users a favor when in mid-1992 it began encouraging hardware vendors to design a special version of its OverDrive upgrade socket into their PCs. Foresight may have become oversight, however, because the chip that plugs into the socket — code-named P24T — has a number of problems.

The socket was designed for an OverDrive version of Pentium slated to come out in mid-1994. Intel and systems vendors billed the socket as an easy way for users to upgrade their I486 systems to Pentium performance. For most users, this appears to remain a viable upgrade path. But Intel recently had to acknowledge that some hardware vendors did not properly design their systems [CW, May 17].

The potential problems are threefold:

- The chip may overheat because of poor implementation by systems vendors.
- The chip may not work in the system design.
- Some 486 systems may not meet Federal Communications Commission specifications when Pentium is installed.

Intel has acknowledged the first two issues and said it is working with vendors to minimize problems. The potential for FCC violation "is not one I've heard of anywhere," said Dennis Carter, Intel's vice president of marketing. Sources at major hardware vendors insisted that some designs, mostly those from third-tier clone makers, could very well violate the stringent FCC Class B certification guidelines that apply to computers.



CW Chart: Michael Siggins

Bruce Franca, deputy chief engineer at the FCC's office of engineering and technology, said the agency was "monitoring" the situation, but at this point sees no need to require manufacturers to resubmit 486 systems running P24T parts when the parts become available.

"If it's a problem, we'll be able to tell quickly, but for the most part, a computer that was operating at 50 MHz should be able to move up in frequency without a problem — if it's well-designed," Franca said.

The possible consequences of having a system that violates FCC regulations center largely on interfering with communications, such as telephone calls.

Analysts downplayed the issues around the P24T, citing the lengthy period between now and when it will actually come to market.

"[The press] is beating the horse before it's even born," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. "You have to remember that these are problems with something that's still in the lab, so Intel might be able to fix it by the time it comes out."

Users contacted, however, expressed some reservations about the OverDrive upgrade path.

"That chip will be out and stable for at least a year before we think about upgrading with it," said Anthony Hodge, IS specialist in institutional and international portfolio management at Metropolitan Life Insurance Co. in New York.

Pentium path, *page 52*

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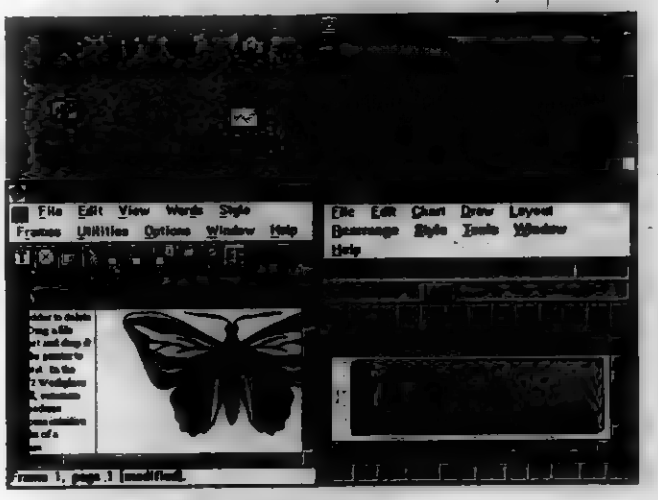

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IBM

System duplicates paper policy applications

By Stephen P. Kiett Jr.
FORT WAYNE, IND.

While computers may never completely replace the "paper" office, their screens can be configured to look like paper.

Lincoln National Life Insurance Co. has implemented a client/server system that was designed to replicate traditional paper policy applications on screen via a graphical user interface (GUI).

The goals of the two-year-plus, multimillion-dollar reengineering effort were to improve the turnaround time of processing policy applications, increase the accuracy of tracking applications and cut processing costs.

The Policy Production System (PPS) combines artificial intelligence-based software with a client/server architecture to automate the underwriting function of processing new policies.

Lincoln contracted American Management Systems, Inc., a systems integrator in Arlington, Va., to help design and implement PPS and to provide consulting services. American Management has designed similar systems for other insurance providers, including Mutual Benefit Life Insurance Co. in Newark, N.J.

According to Matt Henderson, vice president of information systems at Lincoln, the new system consists of roughly 10 IBM 1486-based Personal System/2 workstations, 20 PS/2 Model 55SXs and a PS/2 Model 95 server operating under OS/2 1.3. The PCs connect with a 3090 mainframe via a Token Ring local-area network, and Presentation Manager is used as the GUI. The PCs communicate with the mainframe via LU6.2.

ON SITE

Lincoln National Life Insurance Co.
Fort Wayne, Ind.

Challenge: To increase business volume, reduce unit costs and speed turnaround time of processing new policy applications.

Technology: Artificial intelligence-based underwriting software system; client/server network of IBM PCs connected to a 3090 mainframe using Presentation Manager as a GUI.

Results: New policy processing time cut by up to 35%; "clean" applications can now be turned around in 24 hours where a week was previously required.

The PCs serve two primary functions: build-support, which is data entry and processing, and automated underwriting. The Model 95 acts as an application code repository and provides security functions and some access to the 3090. The mainframe is used as a central data repository, feeding client data to the workstations and maintaining records and tracking works in progress. It also connects with systems outside of Lincoln such as the Medical Information Bureau, which provides Lincoln with a prospective client's medical background.

The GUI was designed to resemble a paper application to make the system more user-friendly for Lincoln's 20-plus new-business departments, Henderson said.

One of the biggest hurdles to overcome, Henderson said, was retraining Lincoln's mainframe CICS and Cobol programmers to work in a client/server environment. "After some initial apprehension, our people went all-out.... They became committed to the technology and the benefits it would provide to Lincoln, and they caught on very quickly," he said.

In the past, when a new application arrived at Lincoln from a field agent, it was sent to a series of mail desks where it was matched with relevant information, such as medical documents, that had been mailed in separately. A data-entry clerk then input the data into a terminal using a complex series of codes.

The application was then bounced back and forth between the underwriters and various departments in paper form before it could be approved. Each department had to log on to the system separately, and information such as the applicant's address had to continually be retyped.

Henderson said this process created a large volume of paper printouts and a lot of rekeying of data for each application, which led to a 30% data error rate. It was also extremely hard to keep track of where an application was.

Working simultaneously

Now, when an application arrives from the field it is immediately keyed in on a PC in the data-entry department and then sent to all relevant departments electronically. This allows several people to review and work on the application simultaneously and has virtually cut paper shuffling out of the process, Henderson said.

According to Henderson, PPS has resulted in considerable cost reductions. For instance, the underwriting staff has been cut by roughly 25% to about 20 people, and processing time has been cut by an average of 25% at the home office; Henderson said this figure will jump to at least 35% once all the field offices are brought on-line. It is now also possible to turn "clean" cases around in 24 hours, where a week was required before.

"The primary external benefit is in the area of customer service. We can now issue policies much faster with nearly 100% accuracy," Henderson said.

Another major plus, he said, is that staff members know where an application is at all times.

Automatic approval

Once an application has completed the processing circuit, it is sent back to the underwriting department for final evaluation. PPS' expert underwriting facility then attempts to underwrite or evaluate the case for approval automatically.

If it is a "clean" case — for example, an application from a 25-year-old male of average height and weight with little or no history of medical problems — more often than not it is approved and sent back to the field agent. If, based on a programmed system of checks and balances, the computer determines an application to be risky, it alerts an underwriter and highlights danger areas for further review.

The majority of processing at Lincoln's home office is now done on the new system, and Lincoln is in the process of bringing its 37 field offices on-line, which is the final step in the transition, Henderson said.

The company plans to have three field offices on-line by the third quarter of this year.

HP portable

CONTINUED FROM PAGE 45

dride battery, the company said.

The OmniBook also includes support for infrared transmission at 115K bit/sec. Standard memory is 2M bytes, expandable to 8M bytes.

Other features include a full-size keyboard, unlike the smaller keyboards found in lightweight DOS portables.

At a joint HP/Microsoft press conference announcing the product last week, Microsoft Chairman Bill Gates said other PC vendors have not yet licensed the technology that enabled HP to make its portable computing advancements.

Analysts said they do not doubt that technology will march on toward smaller and peppier machines. "I think around Fall Comdex, you'll see smaller 486-based portables," Bajarin said. "Which means HP may have a six-month window."

Windows NT source code goes to higher ed

By Christopher Lindquist

Microsoft Corp., taking a cue from the Unix world, has announced plans to present several universities and research institutions with copies of Windows NT source code.

It was the similar licensing of Unix to the University of California at Berkeley by AT&T in the mid-1970s that resulted in the pervasiveness of Unix on college campuses around the country. But while those involved in the source-code distribution plans do not predict a similar scenario for Windows NT, at least for the short term, they all indicated that the move can only help advance Windows NT's cause.

"Microsoft is making a really smart move here," said Tom Doeppner, research associate professor in computer science at Brown University. Doeppner said the benefits of having Windows NT source code available works both ways: The university gets access to an up-to-date commercial operating system on which to perform research, and Microsoft can take some results from that research and apply it to the commercial release of Windows NT.

However, it is the fact that Windows NT is indeed a commercial product that brings up a question: What will Microsoft do to prevent the splintering of Windows NT into incompatible flavors, as happened with Unix? Several commercial releases of Unix, including Sun Microsystems, Inc.'s SunOS, are based on the Berkeley version of Unix.

David Thacher, Microsoft's group product manager for Windows NT, acknowledged the company's concern about maintaining control over commercial releases of Windows NT but added that Microsoft "won't restrict the flow of code for research purposes."

Thacher said Microsoft will allow researchers to commercialize add-on products to Windows NT like any other developer, but anything requiring changes to core Windows NT code would have to go through Microsoft first. "We will not allow multiple versions" of Windows NT, he said.

Despite this issue, academicians seemed excited at the prospect of getting the source code into their schools. "We'll be able to resynchronize where we are in relation to the commercial world," said Howard Wactlar, vice provost for research computing at Carnegie Mellon University. That, he said, will help the universities in their mission to "create knowledge and transfer it to society."

Such knowledge transfers could also help Microsoft. "We get the benefit of some of the best research minds in the world working on new theories with Windows NT," Thacher said. And that "makes it more likely that we'll be able to implement the technology they deliver in our product line."

Right to the source

The following universities and organizations will be receiving Windows NT source code for research purposes from Microsoft in the near future

- Brown University
- Carnegie Mellon University
- MIT
- Stanford University
- Xerox Palo Alto Research Center

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Hallmark offers do-it-yourself cards

Macintosh Centris to anchor touch-screen system

By James Daly
KANSAS CITY, MO.

Not sure what sort of greeting card to send to an elderly aunt or bratty nephew? Not to worry. Design your own.

Starting this month, Hallmark Cards, Inc. will install the first of more than 1,200 in-store computerized kiosks that will enable befuddled card buyers to design and print their own customized work. Along the way, the $2.3 billion sultan of salutations hopes to move toward a just-in-time inventory policy that could trim the tremendous expenses involved in printing more than 11 million cards a day.

Hallmark hopes to cut *its printing costs with in-store, card-producing machines. But users will pay a hefty $3.50 per sentiment.*

The computational guts of Hallmark's Touch-Screen Greetings kiosks will include an Apple Computer, Inc. Macintosh Centris 610 sporting a Motorola, Inc. 68040 chip, 12M bytes of random-access memory, a 230M-byte hard drive and CD-ROM.

Although Hallmark uses mostly a mixed bag of IBM Personal System/2s and PC clones in its corporate offices, Mike Vandemark, technical development manager, said the Macintosh's legendary ease of use made it a cinch for first choice in the touch-screen project. "We're dealing with a very not-computer-literate consumer, so we really needed to make it easy to use," he said.

By the end of the year, project manager Jim Holthus said the card-producing kiosks will be installed nationwide at local grocery stores and pharmacies such as those owned by Walgreen Co. and Osco Drug, Inc.

New way to shop

The kiosks, which are about the size of a video arcade game, may afford another benefit: By adding a refreshing and fun spin to the sometimes tiresome job of picking out the right greeting card, Hallmark could pump more dollars into its coffers. The cards will not be cheap — $3.50 a pop as opposed to less than $2 for most greeting cards — but Hallmark officials are betting the novelty factor will pay off.

Vandemark said card buyers using the touch-screen kiosks will be presented first with the image of a salesperson, who will walk them through the card-design process. A series of screens will appear, asking questions such as "Who is the card for?" "What is the occasion?" and "Is the recipient male or female?"

Navigational buttons will present the user with a series of design suggestions. Approximately 800 card designs will be available, but the possibilities for customization are limitless, as users will be able to write their own message on the front, back or inside. Once designed, a Tektronix, Inc. ink-jet color printer will print out the finished masterpiece.

Best-sellers

Apple custom-designed the software, which will incorporate an automatic product-ranking feature.

That function will allow the best-selling cards at each location to appear on the screen first, thus maximizing sales.

Card selections are updated monthly using compact disks that will be installed by servicepeople.

Each unit will be networked to a central server back at company headquarters to gather sales data and keep tabs on the kiosk's maintenance history, the company said.

Ultimately, Holthus said, he would like to be able to update the entire network's software at the touch of a button.

For instance, Halloween cards would be deleted from the inventory on Nov. 1 and replenished with fresh Christmas card designs.

Other ideas on the drawing board include plans to use remote diagnostic software to repair faulty machines.

To ensure a steady revenue stream, each kiosk also has 24-hour, on-line technical support provided by Apple's service department. Retailers are guaranteed a four-hour response time and restoration of service in no more than eight hours.

Pentium path

CONTINUED FROM PAGE 45

Hodge said his division has been buying PCs with the intent of using the OverDrive upgrade path; he added that he does not expect the P24T part to be a significant problem.

The P24T's potential problems appear to be far-removed from the worlds of users who purchase hardware from major vendors. The design issues that caused the problems seem to have been centered on lesser known clone vendors.

While analysts agreed that poor systems designs are not Intel's fault, they said the company has moved aggressively to correct the situation, including designing a new P24T port.

Intel said it would announce in the fall a verification program to tell users which systems conform to P24T specs.

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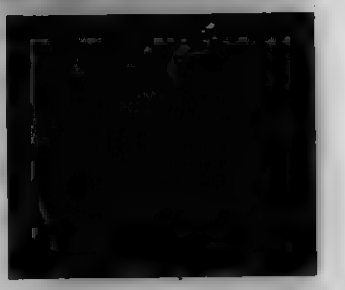

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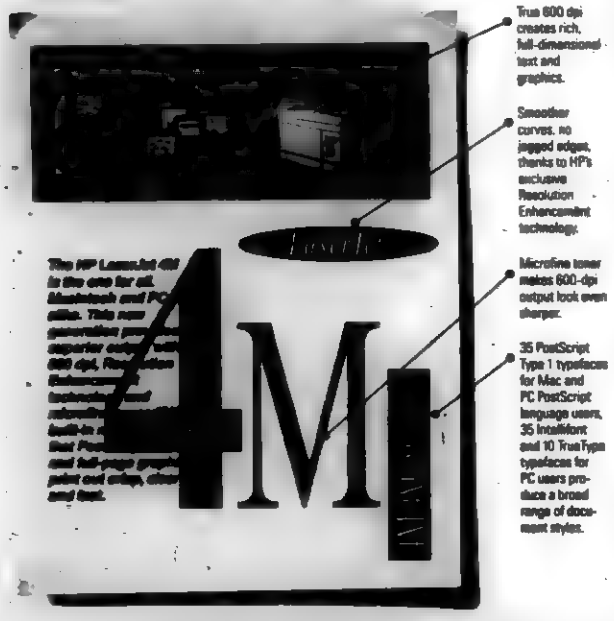

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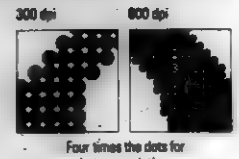

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HEWLETT PACKARD

Execs can sign papers by remote control

Pen computing-based system allows addition of handwritten notes

By Mitch Betts

Pity the corporate chieftain who must postpone a vacation trip to Aruba because the Figgenbottom contract has to be signed next Tuesday.

Now, a technological solution will let the executive go to Aruba, take along a pen computer and still sign the contract with the company in New York.

This "virtual writing" system for signing documents from remote locations, known as TeleSignature 2000, was developed by SDB Systems, Inc. in Fort Myers, Fla.

Simply put, the executive signs an image of the document on the pen computer and then, via modem, sends that signature back to the home office, where a pen plotter signs the paper in ink.

Legal and secure

The actual process is more complicated, however, partly because of the need to make the whole affair legal and secure.

The host system is an IBM-compatible PC that runs the special software and hooks up to a boxy contraption called the Scanner/Writer Unit. It scans the document at the outset and houses the ink plotter that affixes the signature to the paper.

Access is controlled by passwords, and the Scanner/Writer Unit has a security door to prevent someone from switching documents in the middle of the process.

The remote system — the one that can be used in a hotel room or vacation cottage — is a pen-based computer tablet loaded with the vendor's software. Both the host and remote units have 14.4K bit/sec. modems for two-way communications that are encrypted for security.

TeleSignature 2000 *enables users to send electronic signatures from remote locations*

Because the remote user can see the whole scanned page by scrolling around on the pen computer, he can read the "fine print" and add handwritten notations, the vendor said.

Any pen computer

The system sells for approximately $5,000, not including the host, remote computers or modems.

Neal Kramer, executive vice president of SDB Systems, said the software will work with any pen-based computer or any laptop computer equipped with a digitizing tablet.

Applications include signing checks, loan settlements, purchase orders and documents during video- or teleconferences. Records of the time and date of each signature — but not the signature itself — are stored to create an audit trail.

Dallas attorney Benjamin Wright, the vendor's legal consultant, said long-distance signatures would be valid in most instances, given that courts have already approved signature marks sent by telegraph and telex.

The legal issues may be trickier in some special cases, such as documents that must be notarized or comply with government regulations, Wright said.

Banks will accept remotely signed checks, he added, if the customer signs the same sort of legal agreement needed for ink-stamped checks.

TeleSignature 2000 got an important tryout during a videoconference on June 3, when an agreement between the chambers of commerce of Mexico and Florida was signed by officials in Mexico City and Tampa, Fla.

Coursey

CONTINUED FROM PAGE 45

Early on, it seemed NT would be the next Windows release for nine out of 10 of us, a more powerful replacement for Windows 3.X with built-in networking. I'm not sure exactly when Redmond changed the tune, but many people are still expecting to "upgrade" PCs to NT as though it were the next release of DOS. And come to mention it, moving to DOS 6.0 might not be such a good idea, either.

But if you're in the group that thinks NT is the Next Thing for everyone in your office, please send a small donation to the charity of your choice in *Computerworld*'s name because I'm about to save you big bucks.

Here's David's quick guide to whether NT is for you: Have you seriously considered OS/2 or Unix for building client/server applications? Are you running Unix or NT desktops because they offer more power and greater security than Windows? If the answer to those questions is yes, then you are a candidate for NT, although either Unix (my choice) or OS/2, or in a stretch, plain-vanilla Windows, might be a better choice, as would be an Apple Macintosh, especially with PowerPCs in the mix for 1994.

> **Are you willing to trust your mission-critical applications to a first-generation operating system from Microsoft?**

For mere users the question is simpler: Has someone from corporate IS whom you don't know very well told you you're getting NT — and a new, much more powerful desktop PC to run it? No? Then you are probably safe from hitting the upgrade trail for another year until a developmental project called Chicago becomes the next must-upgrade for rank-and-file Windows users.

Before I get labeled as anti-NT (although I do have one of those IBM Nice Try shirts from Spring Comdex) let me wonder aloud why we need yet another operating system.

I am unclear as to exactly what NT does that OS/2 or Unix don't already do as well or better, with the benefit of being, especially in Unix's case, more mature environments.

NT also seems to me more than a little transitional, perhaps a victim of ever-lengthening development cycles and the need to get something out the door. Customers who buy NT today could start moving away from it in only 36 months, perhaps less.

Maybe that's why one Microsoft estimate is that only 10% of Windows' 25 million users might be candidates for NT.

Here's the scenario: Microsoft promises the world in a next version of Windows called NT. Microsoft then discovers the world isn't deliverable on God's seven-day schedule but will require years of development by mortals, even Microsoft mortals.

A decision is made to break the project into two pieces — NT and Chicago. Client/server shops get NT; the rest of the world waits for Chicago, which is due in about a year.

Plan confusion

That plan confuses the market but otherwise works well enough until NT is delayed and starts banging up against the object-oriented operating systems such as Microsoft's Cairo and IBM/Apple's Taligent, which should begin emerging from the shadows in 1995. At that point, what's a customer to do? Buy NT and make the switch to Cairo in 1996, wait or buy something else?

Microsoft has yet to make it clear that buying NT will get customers any real advantage when Cairo happens. Although I am certain they can conjure something up.

But in this light, NT could be but a short-term fix and one customers must weigh carefully before making a big investment.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

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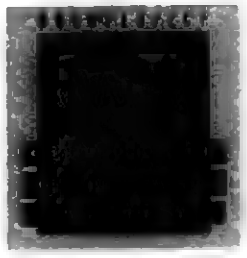

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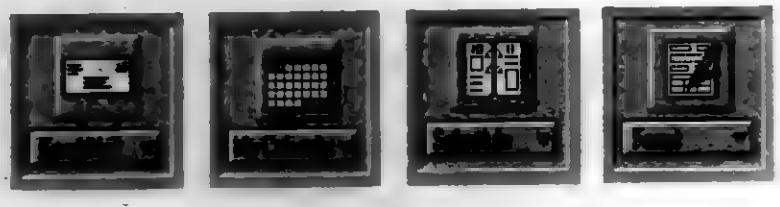

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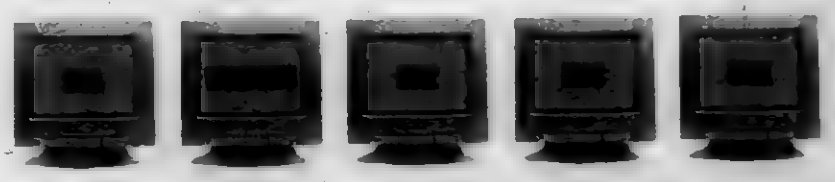

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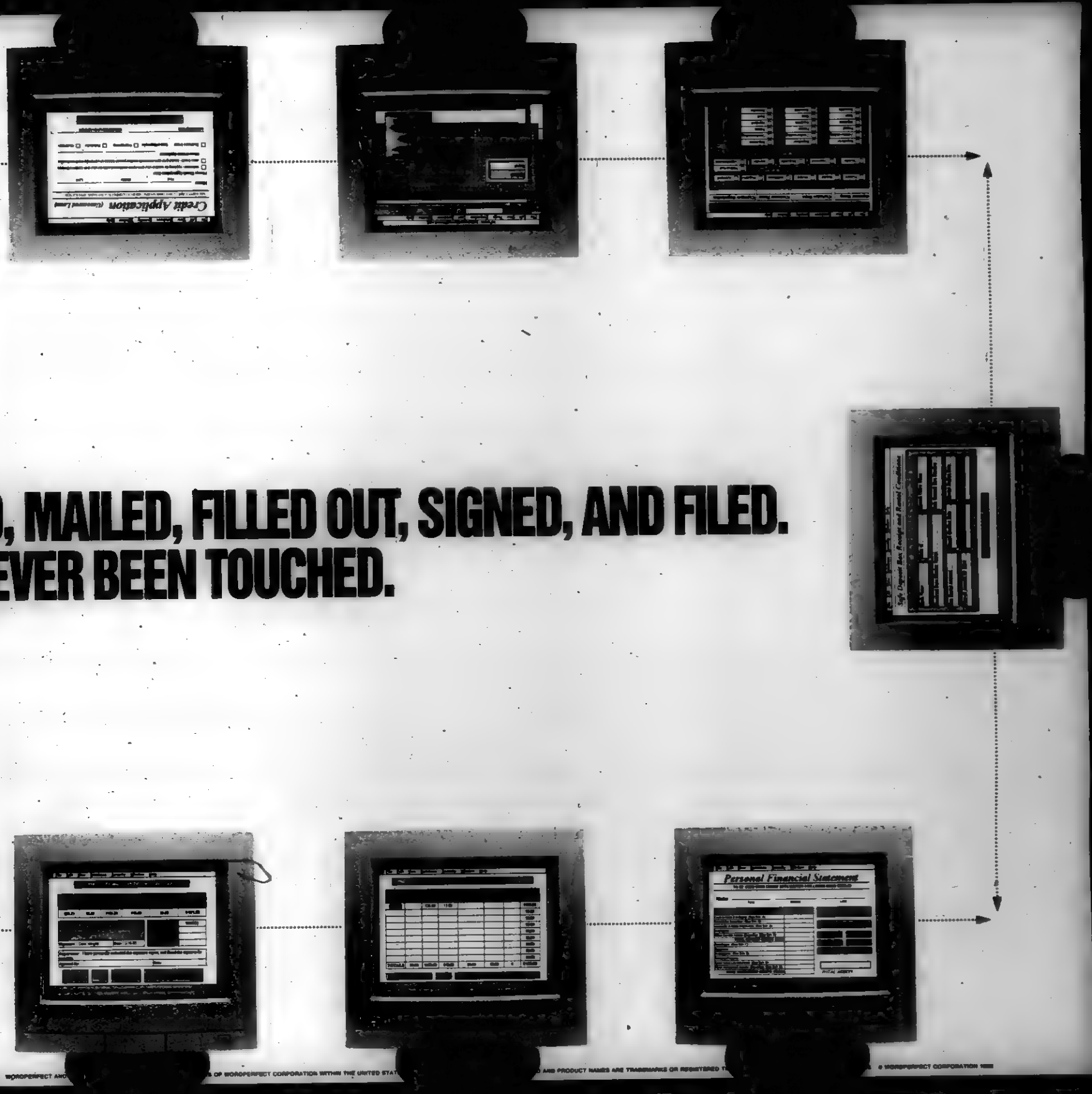

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[redacted]

Database management

Performance Technologies, Inc. has introduced Ace Timer, an end-user performance monitor designed to define performance levels in Oracle Corp.'s Oracle Forms environment.

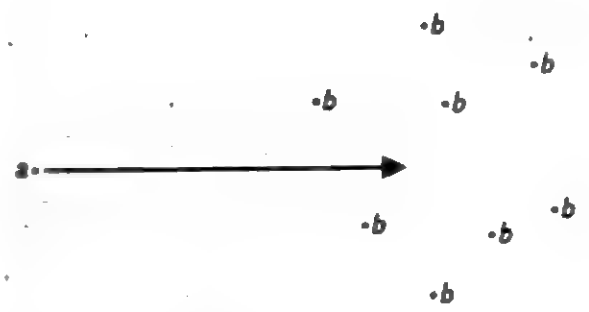
According to the company, the information that Ace Timer provides can be used in the build cycle to define acceptable levels of service.

The product also has the ability to compare performance between Version 6 and Oracle 7 applications.

Ace Timer is available on Digital Equipment Corp.'s VAX/VMS and most major Unix platforms.

Prices start at $4,000.

▶ *Performance Technologies*
70 Birmingham Pkwy.
Boston, Mass. 02135
(617) 787-1776



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JULY 25–AUGUST 6, 1993

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IQ Software Corp. has started shipping Intelligent Query (IQ) for Windows.

IQ for Windows offers Microsoft Corp.'s Windows-specific features such as context-sensitive hypertext Help, support for Dynamic Link Libraries and tool bars.

The product supports access to major relational databases including those from Digital Equipment Corp., The ASK Group, Inc.'s Ingres Products Division, Informix Corp., Oracle Corp. and Sybase, Inc., as well as 25 other third-generation language file systems such as Basic and Cobol.

IQ for Windows offers a data dictionary plus an interface designed to produce a variety of different types of output and functions.

IQ for Windows costs $500 per copy.

▶ *IQ Software*
Suite 550
3295 River Exchange Drive
Norcross, Ga. 30092
(404) 446-8880

Natural Language, Inc. has announced that its Natural Language for Microsoft Corp.'s Windows ad hoc query tool will support The ASK Group, Inc.'s new Ingres ODBC Database Driver and Informix Corp.'s relational database management system.

According to the company, Natural Language for Microsoft Windows is a desktop client/server version of Natural language that enables PC users to access relational database information on corporate servers by asking for it in conversational English.

A $595 client version of Natural Language for Microsoft Windows will be available during the second quarter of 1993 for Ingres and Informix RDBMSs.

▶ *Natural Language*
2910 Seventh St.
Berkeley, Calif. 94710
(510) 841-3500

Andyne Computing Ltd. has introduced Pablo, a desktop reporting tool.

According to the company, the product enables users to extract summary information from corporate databases. Pablo uses HyperCube, a technology that allows for multidimensional views of summary information.

To produce reports, Pablo can combine drawing capabilities, data navigation, report layout and flexible tables and charts.

Pablo also features a drill-down facility, automatic updating of information, access to local and remote information sources, charting features, power-sorting capabilities and dynamic linking to host databases.

Pablo will start shipping during the third quarter of this year and will cost $695 per user.

▶ *Andyne Computing*
2nd floor
552 Princess St.
Kingston, Ontario
Canada K7L 1C7
(613) 548-4355

Software application packages

Enable Software, Inc. has started shipping PowerLine, a Microsoft Corp. Windows-based communications package.

According to the company, PowerLine uses the drag-and-drop capabilities of Windows for dialing directories, working with the tool bar and setting up phone books.

The multimedia capabilities of Windows are used, providing audio and visual Help systems for PCs with sound boards. A communications environment called Powerlink is featured with PowerLine that permits the sending and receiving of files and messages between two PowerLine users.

The product costs $149.

▶ *Enable Software*
313 Ushers Road
Northway 10 Executive Park
Ballston Lake, N.Y. 12019
(518) 877-8600

Hayes Microcomputer Products, Inc. has introduced Smartcom for Windows communications software.

According to the company, the product offers the easy-to-use graphical user interface of a Microsoft Corp. Windows application and includes Dynamic Data Exchange support, Windows interface guidelines and Smartcom for Windows language support.

Smart Buttons are provided, making common commands and frequently used scripts available with the click of a button.

The Smartcom for Windows Scripting Language and the Smartcom for Windows Communications Editor are also included.

The product costs $149; however, through July, users can purchase the software for an introductory price of $49.

▶ *Hayes Microcomputer Products*
5835 Peachtree Corners East
Norcross, Ga. 30092
(404) 840-9200

Symantec Corp. has announced Version 3.0 of Q & A Write for Windows, a word processor designed for Microsoft Corp. Windows.

Features for the product include extensive mail merge capabilities with Q&A, dBase and Paradox files and transparent file conversions from WordPerfect Corp.'s WordPerfect and Microsoft's Word.

Q & A Write for Windows is communications-enabled, providing direct fax and electronic-mail support, the company said.

The product provides capabilities for file sharing over networks and supports Object Linking and Embedding and Dynamic Data Exchange with other applications. Requirements include an IBM PC AT or 100% compatible running with Windows 3.1 or higher.

Q & A Write for Windows Version 3.0 costs $89.95.

▶ *Symantec*
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 253-9600

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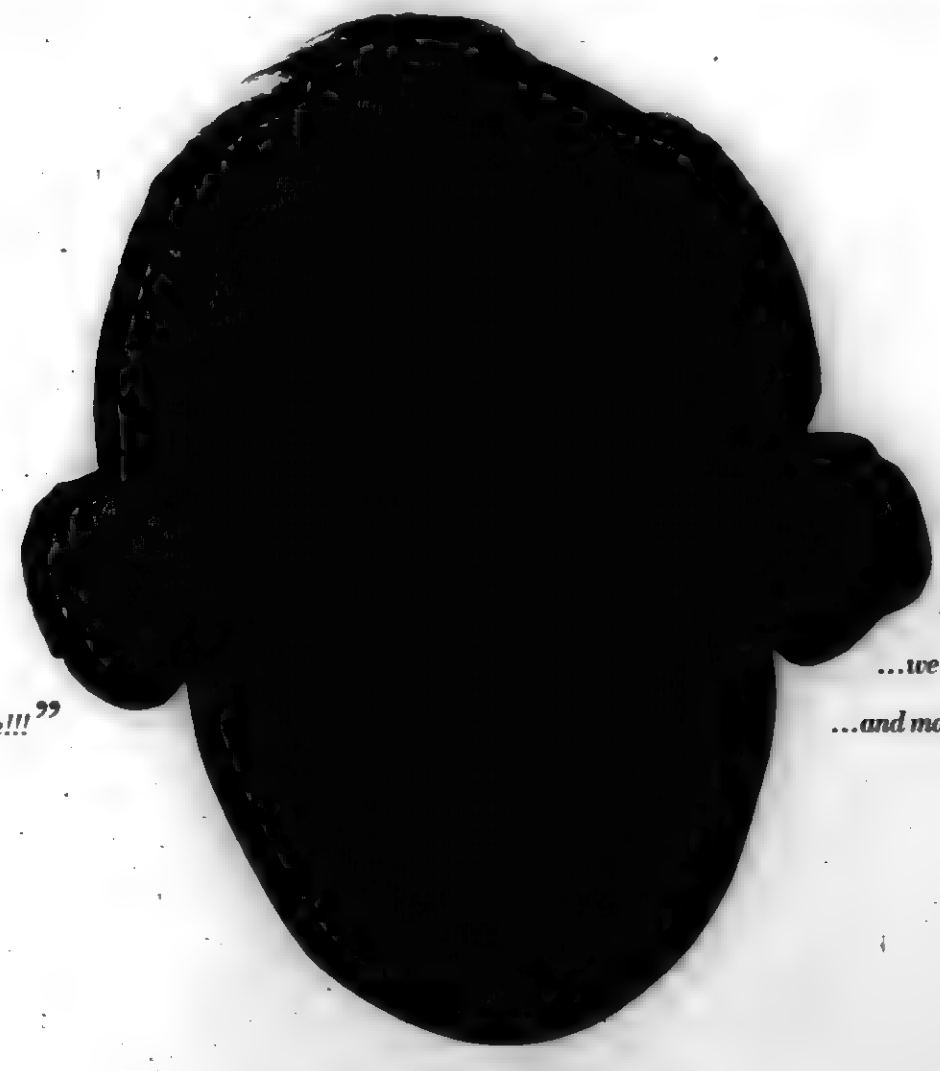

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Vendor releases NLM version of object database

By Kim S. Nash
BURLINGTON, MASS.

Object Design, Inc. recently unveiled a NetWare Loadable Module (NLM) version of its object-oriented database, claiming it is the first object-oriented database management system available for Novell, Inc.'s popular network operating system.

ObjectStore NLM Server was designed to store images, sound and other dense data generated by telephony and multimedia applications. Adding NLM compatibility means that information stored and manipulated as objects can be made available to users distributed across a Novell network.

Object technology provides users with faster access to complex data than a relational database, said Ian Schmidt, director of desktop and network products at Object Design.

Traditional relational database management system makers such as Oracle Corp. have announced NLM versions.

ObjectStore does not have to translate the very dense, complex data of which images and sounds are constructed into a traditional table or record, as a relational database must, he explained.

ObjectStore on NetWare gives Object Design access to a platform that can accommodate several hundred users, Schmidt said.

Early users include Granite Construction in San Jose, Calif., and third-party software maker Cadkey, Inc. in Windsor, Conn.

Running on Unix workstations and servers from Digital Equipment Corp., Hewlett-Packard Co., IBM and others, ObjectStore competes with object-oriented DBMSs and development tools from Servio Corp. in San Jose, for example. Both products are compatible with Transmission Control Protocol/Internet Protocol networks, but Servio has no plans for an NLM version of its GemStone database, a spokesman said.

ObjectStore NLM Server, due to ship by August for NetWare v3.11 and 4.0, will be priced at $2,250 for an end-user runtime license and $7,500 for a developer's license, a spokeswoman said.

Aside from the NLM deal, Object Design and Novell are further entangled. In January 1992, Object Design sold ObjectStore licenses to HyperDesk Corp. to build into Distributed Object Management System (DOMS). HyperDesk's DOMS is an administration and data management tool geared specifically to handle objects.

Then, in February of this year, Novell announced plans to integrate DOMS — which already contains ObjectStore — into NetWare to provide enterprisewide object management.

Will users ever move to Sun's Solaris?

Adoption of strategy may take more time, analysts say

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

It will take longer for Sun Microsystems, Inc.'s Solaris strategy to play out in user sites than to ship out on the new machines rolling off Sun's assembly lines.

Industry analysts projected that 800,000 copies of Solaris will be running on Sun platforms by the end of 1994, an amount equal to the current number of Sun operating system licenses worldwide. Much of that growth will be driven by Sun's shipment of Solaris 2.X on more than 250,000 Sun systems each year. The rest will come from Solaris 2.X running on Intel Corp. 1486 machines and through migration from SunOS 4.X, also known as Solaris 1.0.

However, users at some large Sun sites said modification of a large inventory of custom SunOS applications, often involving hundreds of systems, could slow their own porting process. That is because the differences between the commands used in SunOS 4.1.3 and in Solaris 2.X — which is compatible with Unix System V Release 4 — are considerable.

"Your files will need modification: The paths will be different, and the commands are based on [Unix] System V, so the shell scripts will need modification," explained John Griegga, an application design consultant at the Jet Propulsion Laboratories in Pasadena, Calif. The laboratory has more than 1,000 Sun machines, only a small fraction of which run Solaris 2.X, he said.

Even so, Sun executives said their 1992 release of Solaris 2.1 was made to support advanced features such as symmetrical multiprocessing and multithreading, along with the Unix System V standard.

"The message has been communicated very clearly, but sometimes there is a latency in the marketplace in moving to a new technology," said Michael Zadig, director of sales and developer engineering at Sun subsidiary SunSoft, Inc., which designs and sells Solaris. The pace should quicken as third-party software firms port their products to Solaris 2.0 this year, he said. Solaris 2.3 is due by year's end.

Own worst enemy

Sun's biggest problem in pushing Solaris into existing large user sites may well be its own success, analysts said. "Sun has the enviable problem of having a satisfied customer base," said David Card, director of systems research

Sun's Solaris, *page 67*

Many (long)? Industry analysts acknowledged the effort behind recompilation but said it may not be an overwhelming or slow undertaking. Some large sites have reported that it takes several months to port and debug applications. Others anticipate an effort of several months. Even if users cannot begin to migrate all their old applications, Michael Zadig, director of sales and developer engineering at SunSoft, suggested using aging SunOS machines as network nodes that can be accessed from Solaris 2.X machines.

Networking exotic peripherals still difficult

By Michele Dostert

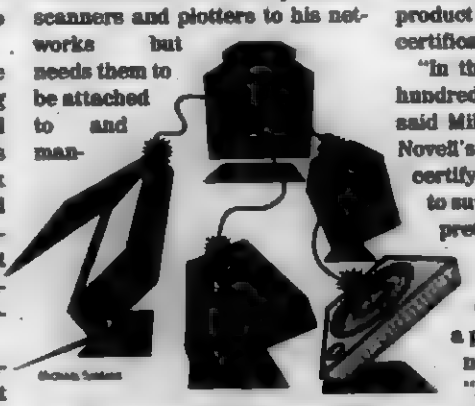
It's a brave new world in the PC peripherals market. CD-ROM players, image scanners, optical jukeboxes, plotters, fax servers and color printers are streaming into the marketplace.

Though these peripherals have become commonplace, connecting them to local-area networks is still a struggle, information systems managers said. They cited a lack of device drivers, unintentional conflicts with other network devices and programs and support runarounds as their biggest headaches when dealing with exotic peripherals.

David Eckert, an advanced technology and architecture analyst at Westinghouse Corp. in Aiken, S.C., has successfully added CD-ROM players and high-speed network printers to his LANs but said he is wary of other peripherals.

"We are starting to see user demand for things like scanners and plotters, but frankly, I've been disappointed in the support I've received from these device makers — most of them don't really understand networking — so we've been reluctant to add them," he said.

For example, Eckert said he would like to add color printers, scanners and plotters to his networks but needs them to be attached to and managed from centrally located servers. He said he also needs a mechanism whereby peripheral use could be tracked by and billed to the appropriate department.



LAN operating system vendors have different strategies for support of peripheral devices. Novell, Inc. relies on device makers to create the software drivers that enable their products to run on Novell's NetWare LANs. After a vendor submits its product and driver to Novell laboratories, Novell engineers test them. If they pass, the product and driver receive Novell certification.

"In the last year, we've tested hundreds of peripheral devices," said Mike Dahlgren, manager of Novell's testing center. "Before we certify it and commit ourselves to supporting it, we pound on it pretty thoroughly."

Users cautioned, however, that Novell certification is not a guarantee that a peripheral will snap into a network without problems. "Novell can't test for every possible configuration; it would take them years," said Dan Kohner, manager of network services at M. D. Anderson Cancer Center in Houston. Kohner has sophisticated medical imaging equipment, fax servers, CD-ROM players, optical jukeboxes and col-

Exotic peripherals, *page 70*

According to IDC Strategic Decisions, a Framingham, Mass., research firm, only 17% of companies in corporate environments have networked their peripherals. However, 43% of environmental respondents said they plan to network their scanners this year.

Pete Roberts

System fallacies

Of all the topics discussed in the IS press, none have been presented with more misconceptions and hogwash than the subject of "client/server."

As a result, many people use inappropriate criteria to determine if they should convert to a client/server system. They make decisions based on the organization of the hardware in a system instead of the organization of the system's software. Consequently, they buy new systems, toss out existing systems and disrupt their entire shop, guided by smoke and mirrors.

What's in a name, you say? Sometimes nothing. But in this case the wrong use of the term client/server leads to some strange ideas. In particular, people discuss "getting rid of their mainframes and going to a client/server system" and that "there is room for both mainframe systems and client/server systems." Or worse, writers complain that client/server systems are not appropriate solutions and that we still need powerful processing machines and terabyte central storage repositories. Of course we do, but what has that got to do with whether a system has a client/server design? The industry seems exercised over a nonissue, prompting inappropriate decisions.

A client/server design refers to organizing the software into independent modules that interact with one another using a command/response mechanism. It does not refer to the types of physical components in the system or whether they sit on a desktop or on the floor.

In fact, a true client/server system can be implemented entirely within one mainframe. Conversely, a tightly coupled homogeneous system can be designed for a topologically distributed system consisting of server-type computers and desktop computers.

It is true that certain computers are called servers because they hold large amounts of common data, execute centralized E-mail applications and so on. This name choice is unfortunate because the presence of a server in a distributed system does not ensure that the system has a client/server design.

Client/server design was developed for the same reason that structured programming and object-oriented techniques were introduced: encapsulation of functionality. This organization results in more robust systems that cost less to implement and maintain.

Some of the software modules in a client/server system are clients. Some are server modules. Some modules are both clients and servers. Each encapsulated module performs a well-defined task. Each may call on the services of other modules to perform subtasks, and each may, in turn, be called by other modules to perform a subtask. The modules may all execute in one computer, or the system may consist of many hardware platforms distributed over thousands of miles, linked by LANs and WANs.

The functionality of a client/server system is determined by the functionality of each of the software modules and the interactions of these modules, independent of where they execute. It is the performance requirements of a system that regulate, to a large extent, the locations of the physical components upon which the software modules execute.

Where are the users located and where does the data repose? What is the average and maximum response time required for transactions? What bandwidth is available on the various communication channels? What is the total amount of processing power required for the entire system? What are the costs? These and other issues determine the physical structure of a system — not whether a system is client/server.

Ignore the client/server assertions. They fail to address the real issues and will help you not one whit.

Roberts is a principle of Roberts Consulting in Corte Madera, Calif.

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Sun's Solaris

CONTINUED FROM PAGE 65

at International Data Corp. here. "It's a very stable, solid operating system that people like."

Card said he expects users to cross over from SunOS to Solaris 2.X sometime in early 1994. "That's slower than Sun would have it," he noted.

Some users said older applications at their sites may stay on SunOS for now because it is either too difficult or too costly to rewrite code with SunOS' Unix extensions from the University of California at Berkeley. Or they may stay indefinitely, provided the application is stable and does not need a hardware upgrade. But applications written for Sun's SPARCserver 1000 and SPARCcenter 2000, for example, will require Solaris 2.X, as will Sun-compatible software written for Intel 486 machines. To aid porting, Sun has shipped various migration tools to users.

Porting applications, though painful, is necessary to keep current with Sun technology, users said. "It's going to happen, and it's actually going to be better when it's done, but it's a difficult transition," said Randy Huntzinger, a computer specialist at the National Institutes of Health in Bethesda, Md. Programmers and system administrators will be harder hit than end users, as they must recompile existing applications to heed Solaris commands, he said.

Analysts said many users will move to Solaris 2.X simply to stay on Sun's technology curve. "The benefit of migrating to Solaris is avoiding the possibility of being painted into a corner," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "Otherwise, users have at best a patch strategy of maintaining SunOS and Solaris applications at the same time."

Still, many SunOS users await the wide availability of third-party software for Solaris. "Until everybody gets aboard with 2.X and customers say they're comfortable, many people will stay where they are," said Bill Niemi, director of distributed systems at Fidelity Investments in Boston, a large Sun site. "A lot of the software vendors are just about there, but it's still early in the game."

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Forms software vendors join forces

By Michael Vizard
TORONTO

As part of a bid to extend the reach of its electronic forms software beyond Windows and DOS platforms, Delrina Corp. has signed a development pact with Shana Corp., a maker of electronic forms software for Apple Computer, Inc.'s Macintosh based in Edmonton, Alberta.

Under the terms of the agreement, the two companies will work together to allow users to create forms using products from either company and then have those forms filled out by users of either the Delrina or Shana software.

"We're delighted," said Lynda Spencer, section supervisor for user services at Johns Hopkins Hospital in Baltimore. Spencer, who uses the Delrina software, said that with the integration, she will no longer have to moderate discussions between users of Microsoft Corp.'s Windows and the Macintosh over which platform has the better forms software.

The integration of the Delrina software, which consists of PerForm Pro Plus and FormFlow, and the Shana software, which consists of Informed Foundation, is scheduled to be completed next month.

In contrast, WordPerfect Corp. in Orem, Utah, will deliver its Informs for Windows package at the end of this month, followed by DOS and Macintosh implementations later this year.

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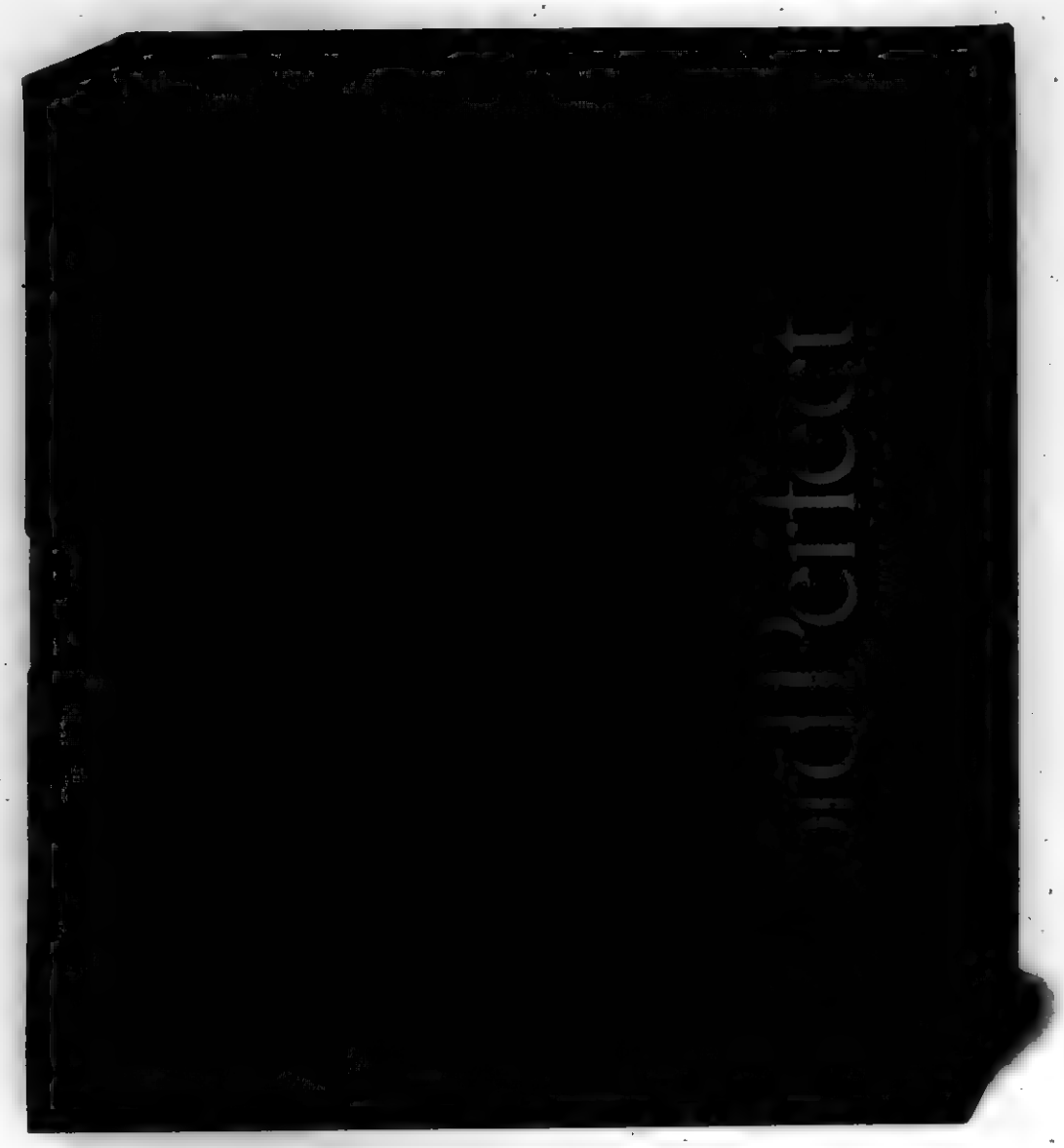

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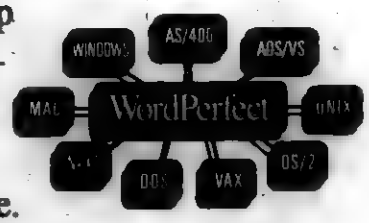

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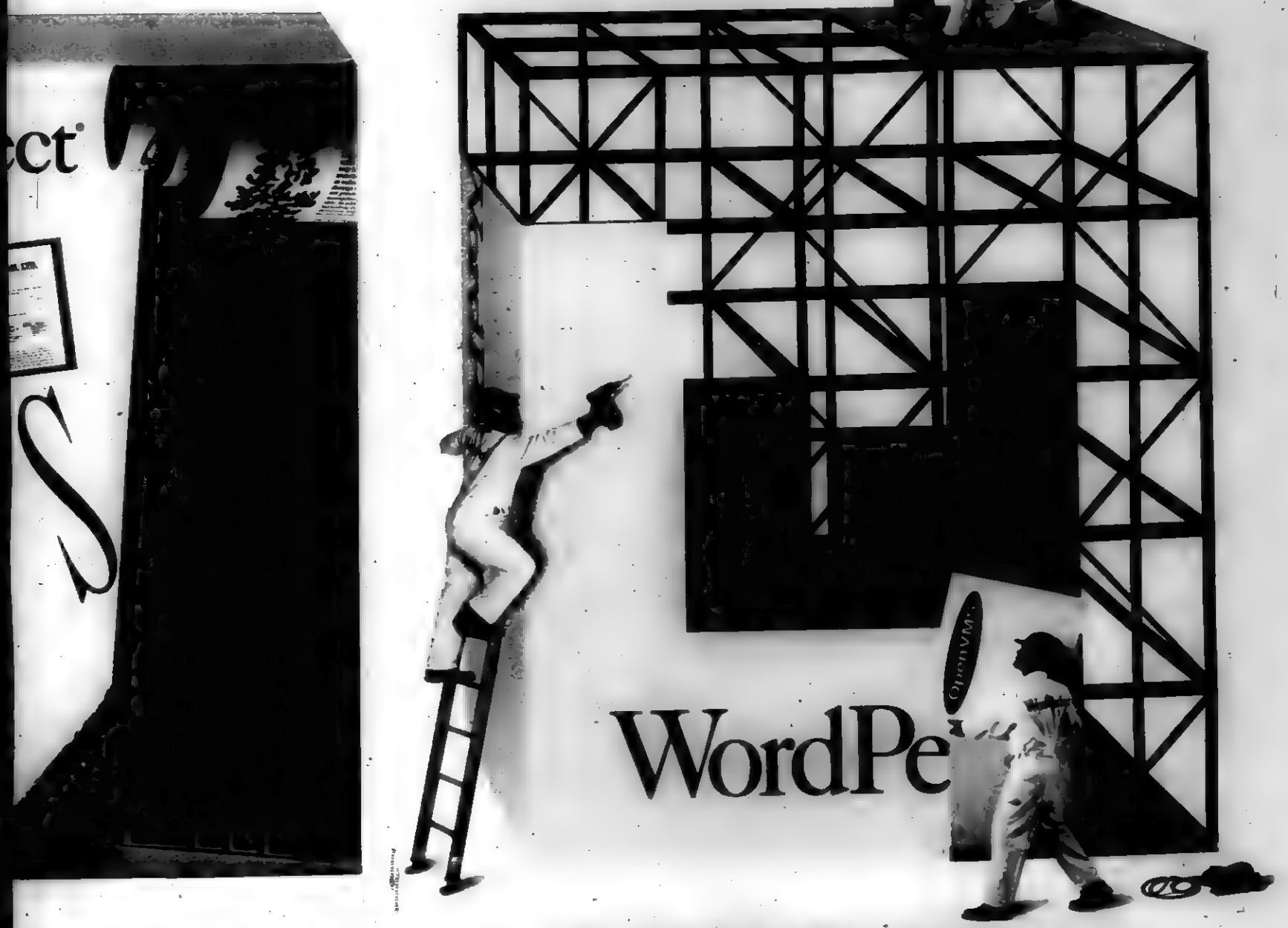

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Closing in on fast Ethernet standard

By Lynda Radosevich
WAKEFIELD, MASS.

Progress made last month toward development of a standard for 100M bit/sec. Ethernet included a new proposal for signaling techniques that allow Fast Ethernet to run over two pairs of Category 3 unshielded twisted-pair cabling. The move was intended to allow users to run the fast technology with existing two-pair cabling schemes.

Also, members of the IEEE 802.3 subcommittee for the fast Ethernet standard agreed that this month they will draft the project authorization request that precedes a formal draft standard.

The cabling issue is important because Category 3 cabling is still the most pervasive scheme, said Patricia Thaler, a principal engineer at Hewlett-Packard Co. and subcommittee chairwoman.

Original proposals for fast Ethernet discussed supporting two pairs of Category 5 unshielded twisted-pair cabling or four pairs of the lower grade Category 3 cabling, requirements that might be too steep for some users, Thaler said. Also, the committee is considering extending the standard to support fiber and other cabling schemes as well.

At the next meeting on July 12 in Denver, the subcommittee will tackle this and the even thornier issue of which media access control (MAC) method to pursue for the standard. The two methods most likely to be considered are Ethernet's CSMA/CD method or a new method proposed by HP and AT&T called demand priority, Thaler said.

Several subcommittee members said they expect two standards to emerge in July based on the separate MAC proposals. If so, the market could likely be confused by the similar options, they said.

Separately, 3Com Corp. showed its 100M bit/sec. Ethernet technology using two PCs with different Ethernet cards and a Novell, Inc. NetWare 4.0 server. The PC with a 100M bit/sec. Ethernet card ran a sample application roughly nine times faster than the PC with a 10M bit/sec. card.

Exotic peripherals

CONTINUED FROM PAGE 65

or printers connected to his network. "We've added some products that said they were NetWare-compatible and ended up writing our own drivers for them."

Banyan Systems, Inc. in Westboro, Mass., maker of the Vines LAN operating system, has traditionally insisted on building all software device drivers. But users have consistently complained about Banyan's slow release of drivers. In response, Banyan has opened a testing and certification service where third-party drivers can be Banyan-certified.

Microsoft Corp. also builds some of its drivers, such as the CD-ROM support in LAN Manager, and certifies devices from other vendors to work on LAN Manager networks. But Microsoft's testing suffers from the same limitations as Novell's.

"Microsoft may not have tested the product on your server or with your network cards or your applications, and there could be problems," said Claude King, network manager at the University of Florida's school of journalism in Gainesville, Fla.

Be careful what you add

Users warned that adding peripherals can have unintended — and disastrous — consequences.

"We've tested devices that suddenly caused problems in totally unrelated areas or suddenly swamped our network backbone," Kohner said. "If you have a complex, multivendor environment like ours, you must test everything yourselves before you add it to your network.

"Often, the best way to add peripherals is to hire the system integration services of whoever made your server and pay them whatever they ask to install and support the device. Otherwise, you'll end up spending weeks calling device vendors and coding custom software patches," he said.

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LAN hardware

Computone Corp. has introduced IntelliServer, a terminal server for local-area networks that connects directly to a Transmission Control Protocol/Internet Protocol Ethernet LAN using AUI or BNC connectors.

IntelliServer can connect modems, printers, high-speed serial X Window System terminals and PCs running X terminals to a LAN, according to the company. A menu-driven interface is provided for new users, and IntelliServer supports rlogin, remote-control printing protocols and industry-standard Telenet. The 16-port IntelliServer is expandable to 64 ports in 16-port increments.

The 16-port IntelliServer costs $2,995. Snap-on 16-port expansion modules are priced at $1,095.

▶ *Computone*
1100 Northmeadow Pkwy.
Roswell, Ga. 30076
(404) 475-2725

Alps Electric, Inc. has introduced RadioPort/Parallel Wireless LAN Adapter for peer-to-peer and client/server networks.

The adapter eliminates the need for cabling and can be used for file transfer, electronic mail and printer sharing. Without disrupting the rest of the network, users can set up, add, remove or relocate workstations, the company reported. The product includes an AC power adapter, user-friendly, menu-driven software and a keyboard power cable for laptop portability.

The RadioPort/Parallel Wireless LAN Adapter costs $599.

▶ *Alps Electric*
3553 N. First St.
San Jose, Calif. 95134
(408) 432-6000

LAN software

The Wollongong Group, Inc. has announced Release 2.0 of PathWay Client NFS for DOS/Windows, which provides enhanced support for CD-ROM disk drives, expanded network printing services, support for PCNFSD 2.0 and linked file systems support.

According to the company, the product's enhanced performance for network printing is 14 times faster than Version 5.0 of Sun Microsystems, Inc.'s PC-NFS. PathWay Client NFS supports DOS 6.0 and can automatically locate which NFS Servers are available on the network and display which file systems can be mounted by the NFS Client, the firm reported.

A single-user license of PathWay Client NFS 2.0 costs $265.

▶ *The Wollongong Group*
1129 San Antonio Road
Palo Alto, Calif. 94303
(415) 962-7100

Workgroup software applications

NetManage, Inc. has announced it will start porting its Network File System (NFS) client and server software to Microsoft Corp.'s Windows NT.

Windows NT users will be able to access files from any other computer on the network that has an NFS server, the company said. The NFS functionality will be available during the third quarter as part of ChameleonNFS32.

ChameleonNFS32 is an application package for Transmission Control Protocol/Internet Protocol communication on Windows NT.

The NFS functionality will cost $595.

▶ *NetManage*
20823 Stevens Creek Blvd.
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Envoy Systems Corp. has introduced the SalesMate Team Selling System, an integrated software system designed to extend workgroup concepts to mobile professionals and sales teams of 25 or more by coordinating team communications, linking remote users to corporate information systems and providing shared information access and entry.

The SalesMate Team Selling System uses both laptop-based software and the company's central-computer Sales Information Center software.

The SalesMate Team Selling System costs $1,925 per user.

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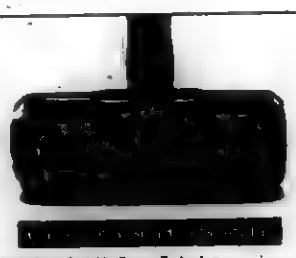

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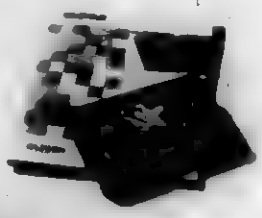

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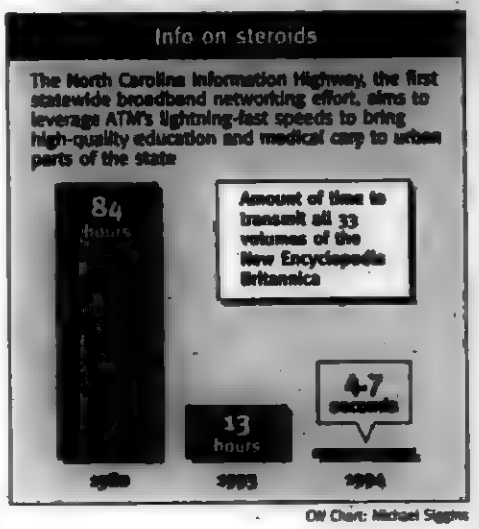
State paves way for 'highway'

By Joanie M. Wexler
RALEIGH, N.C.

A microcosm of the federal government's vision of an information superhighway is under construction in North Carolina.

Last month, the state committed to becoming a customer of Asynchronous Transfer Mode (ATM) services across a statewide Synchronous Optical Network (Sonet) infrastructure. About $4.4 million has been requested in the government's capital budget next year for bringing up the first 104 sites, and statewide service is expected by mid-1994.

State government officials will conduct their own business across the network in an effort to streamline their work and speed up the criminal justice system. However, a major government goal is to provide interactive communications to schools, hospitals, businesses and homes throughout North Carolina, according to the governor's office.



CW Chart: Michael Siggins

Demand is key

The state's large contractual commitment to these services is motivating the three local telephone companies in North Carolina to accelerate deployment of broadband networks. Assurance of customer demand is a key element in spurring new high-speed network services in general; for instance, the absence of perceived demand was a pitfall with the slow-to-ripen Integrated Services Digital Network (ISDN).

"We were going to build the infrastructures gradually anyway," said BellSouth Telecommunications spokesman Clifton Metcalf. "But having a guaranteed large customer such as the state" is stepping up progress.

BellSouth is installing ATM switches from Fujitsu Network Switching of America in its nine-state region; five switches will fall in North Carolina under the auspices of BellSouth's Southern Bell operating company. The other carriers involved in the project are GTE Telephone Operations and Carolina Telephone.

The government's major goal is to equalize opportunities throughout the 600-mile-wide state, which is largely rural, for educational and medical services, according to the governor's office.

"A young person in a rural coastal county will have the chance to learn calculus from a top teacher in the state, and an elderly resident in the mountains can get consultation with a top medical specialist in another part of the state," Gov. James B. Hunt said in a prepared statement.

Medical pilot

One pilot under way now, for example, is a link between North Carolina Memorial Hospital and MCNC, a Research Triangle Park computer center that houses a Cray Research, Inc. supercomputer. Physicians, for example, can speed medical images to the Cray, which then quickly feeds them results about potential treatment scenarios, a state spokesman explained.

Applications for ATM services tend to be image- and video-oriented, as ATM is optimized for the delay-sensitive nature of such traffic.

Sonet is a fiber-based standard for a networking infrastructure that can carry multiple high-speed telecommunications services such as ATM, frame relay and ISDN. The aggregate speed potential of Sonet today is in the 2G bit/sec. range, with no maximum theoretical limit.

Bringing broadband networking to North Carolina could also help the state's economy, a source at the governor's office said. He said that when companies are considering bringing industry to the state, the communications facilities in place statewide have a large impact on their decision-making.

Linking miles with ATM

[redacted] Telephone said late last month it will launch an ATM network this year—dubbed Xpect — aimed at the small- and medium-size business and government markets.

Xpect will link supercomputers and possibly mainframes at Cornell and Syracuse universities to Sandia Laboratory in Santa, N.M., and the Museum of Science and Technology in Syracuse later in the year, New York Telephone said.

Eventually, the phone company intends to allow private businesses and public institutions to tap into Xpect through the public-switched network.

For example, the network [redacted] wireless services a doctor looking to prescribe a treatment for health reasons concerning those employees in determining, within minutes, how much radiation the patient should receive and the most effective way to beam the radiation at the tumor.

Nynet will also use Sonet technology as part of its infrastructure.

—Joanie M. Wexler

Gary H. Anthes

All eyes on Clipper

If any conclusion can be drawn from the cacophony of conflicting views put forth at a recent public hearing on government-sponsored encryption technology, it is that the Clinton administration should slow down and take a closer look at Clipper.

Clipper is the government's attempt to give law enforcers the ability to unscramble coded messages from suspected criminals while guaranteeing constitutional safeguards to legitimate users. To do that, a secret algorithm embedded in a chip will use encryption/decryption keys maintained "in escrow" by two government-approved agencies and subject to use in wiretaps only via court order.

The first image brought to mind when presented with the key-escrow concept is that of a digital Big Brother, able to siphon off electronic secrets from anyone not in favor with the establishment. Stanford University Professor Martin E. Hellman says former Attorney General John Mitchell was in the habit of handing down blank but signed wiretap authorizations, 40 to 50 at a pop, rather than personally reviewing each request as required by law. "Two escrow authorities do little good if only one court order is required," Hellman contends.

Anthes, *page 74*

Software checks UPS pulse

By Elisabeth Horwitt

While many corporations have been working hard to set up centralized management of their remote network installations, users have only begun to address the need to centrally monitor the status of the electrical systems their computers and networks rely on. Uninterruptible power supply (UPS) vendors are beginning to address this need by providing software that allows a central console to monitor the status of a UPS and its battery backups.

A growing number of offerings also perform "managed shutdowns," which ensure that files are stored and I/O queues cleared before a workstation loses its power. Managed shutdowns are helpful to companies that turn off a building's power at night, and they help save files before a workstation runs out of battery power during a protracted blackout.

Another promising development is growing UPS industry support for the Simple Network Management Protocol (SNMP).

American Power Conversion, Inc., for example, offers a Microsoft Corp. Windows-based application that manages its UPSs via SNMP. The application provides features such as unattended data protection, central management, tracking of power data for diagnosis and the setting of scheduled tests.

Product announcements

More recently, Exide Electronics Group, Inc. in Raleigh, N.C., announced products for centrally managing its UPSs on remote sites:

- OnliNet 3.0 Basic Software reportedly enables a workstation to monitor its own UPS to track power conditions and performance. It also provides automatic CPU shutdown in the event of a power loss. Versions support Unix, Novell, Inc. and OS/2-based applications. It is priced at $189.
- OnliNet Basic Plus networking software allows a single workstation to monitor multiple UPSs across a Token Ring or Ethernet local-area network.
- OnliNet Network is Exide's proprietary application for monitoring multiple UPSs across a LAN or wide-area network. It allows the user to

UPS pulse, *page 78*

Anthes

CONTINUED FROM PAGE 73

The government has done little so far to put those fears to rest or to justify its own position. A parade of witnesses spoke out — mostly against Clipper — at the two-day hearing at the National Institute of Standards and Technology (NIST). No law enforcement officials showed up to say why we should entrust keys to our most sensitive communications to unknown parties.

The U.S. Department of Justice reports that out of 14 million arrests made in the U.S. in 1991, 3,000, or just .02%, resulted from 856 court-approved wiretaps. A conclusion drawn by some opposing Clipper is that wiretaps make a minuscule contribution to U.S. justice and are therefore not worth much sacrifice.

However, a summary of some of those wiretaps, provided by the Federal Bureau of Investigation, might cause even the most wary to warm up a little to Clipper:

- A wiretap led to the arrest and conviction of a "sexually deviant serial murderer" who had operated in New Jersey and New Mexico.
- Another wiretap enabled authorities to thwart Chicago's "El Rukns street gang" from a Libyan government-sponsored attempt to shoot down a U.S. commercial airliner with a military weapons system.
- The entire leadership of the Mafia's Colombo family was convicted with the help of wiretaps.

Power of persuasion

Federal law enforcement and intelligence officials have obviously convinced the president that Clipper is a good idea; they have been far less effective in convincing the public it should pay a price to guard against serial murderers, terrorists and drug dealers.

The government might well profit from a 12-month hiatus while it looks at some of the ideas that came up at the NIST hearing. For example:

- MIT Professor Silvio Micali outlined a key-escrow alternative to Clipper that he said meets all of Clipper's objectives with far fewer drawbacks.
- Sandra Lambert, vice president and information security manager at Citicorp, suggested that presumptively honest users such as banks be allowed to keep one of the escrowed keys while the government holds the other.
- A number of vendors and users are calling for a software implementation of Clipper, which would be cheaper, easier to interface with other systems and faster to swap out if a security compromise occurs. The feds say officially they do not know if that is possible, then admit they do not want a software implementation because the bad guys could close the back door by deleting a few lines of code.

Hellman has an ingenious idea that might appeal to those concerned about civil liberties. He would require not one but three judges to authorize a Clipper wiretap. A judge could answer the request with "Yes," "No" or "Oh, my God!" The latter means, "This looks like an attempted abuse of power, as in Watergate."

If a Clipper tap request got even one "Oh, my God!" decision, the target of the wiretap would be notified. Because that is the last thing the requester would want, it would serve as a powerful check on frivolous or improper requests.

Anthes is *Computerworld*'s Washington, D.C., senior correspondent.

Package automatically puts faxed data into host apps

By Lynda Radosevich
SUNNYVALE, CALIF.

■ Harvest Software, Inc., a small company that in the past has offered fax services, recently introduced software that automatically enters data from faxed forms into host transaction applications.

The Harvest software could fill a niche in the electronic data interchange market by giving large corporations a method for letting their smaller mom-and-pop trading partners send electronic forms using their fax machines, said David Taylor, vice president of electronic commerce strategies at Gartner Group, Inc., a market research firm in Stamford, Conn.

The Harvest software receives faxed forms and extracts data using character recognition techniques. The software then enters it directly into the host transaction application and faxes back a response with data from the host, if needed.

Because the forms are prefabricated and the recognition software knows what to expect, recognition accuracy is higher than in typical optical character recognition systems, Taylor said.

The software runs under IBM's OS/2 on Intel Corp. 1486-based servers and integrates the fax with transaction applications operating on IBM mainframes. The company said it also plans to support IBM Application System/400 applications this year.

The software comes in two modules. One is a set of graphical tools that allows users to build forms that map directly to data fields in IBM 3270 forms. Another includes features such as audit trails, report generators and rules for sending forms to a PC for human verification.

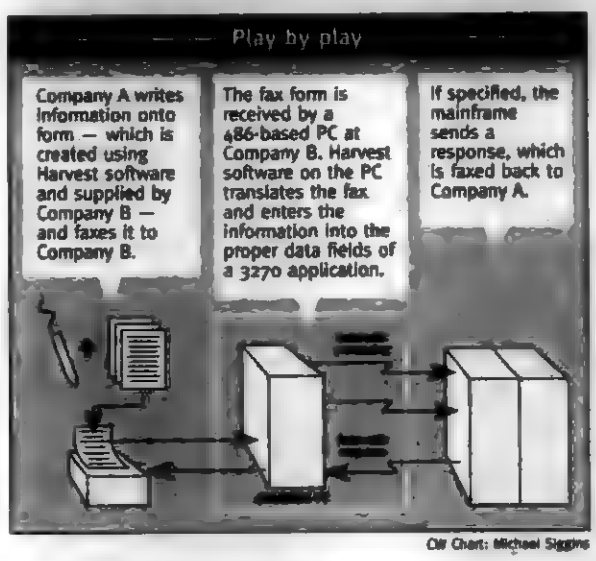
One major advantage of the software is that it reduces labor costs for data entry, said Pervez Qureshi, Harvest's vice president of marketing.

For example, Boise Cascade Office Products, a nationwide office supply distributor based in Itasca, Ill., found in a beta test that it could process 40 orders per hour using the Harvest software rather than the 16 per hour using manual methods.

"Before, we needed people to pull faxes off the machine, sort, distribute, enter, check. . . . With the software, we automated the entire 11-step process," said Pat Ware, director of technology services at Boise Cascade.

Ware estimated that 40% of the 20,000 orders the company receives each day arrive by fax. The company hopes to get 10% of its customers using the Harvest fax forms within a year, which would translate to roughly 200,000 forms being processed automatically per year. At that rate, Ware said, payback on the system would take less than six months.

The Harvest software is shipping now and costs $35,000 for both forms-building and operations modules.



QW Chart: Michael Siggins

E-mail integration

Wingra adds Notes/CC:Mail to E-mail switch

By Lynda Radosevich
ATLANTA

Wingra Technologies, Inc. will announce this week that it will add support for Lotus Development Corp.'s Notes messaging software to its electronic-mail integration software. The company will also announce a module that provides directory synchronization between Lotus' CC:Mail package and Digital Equipment Corp.'s directory service. Both additions will ship in the fourth quarter.

Faster than a speeding bullet...

E-mail is one of the fastest growing applications in the computer industry, with a growth rate of 36% from 1991-92, according to Wingra.

The new pieces fit into Wingra's Missive E-mail integration software for DEC's VAX minicomputer. Introduced in February, Missive acts as a switch, interconnecting mail from disparate local-area network or host-based systems. The switching alleviates the need to maintain multiple computers with point-to-point E-mail translation software, said Ronald Rassner, director of technology research at Wingra.

For example, Mantech International, Inc., a government contractor in Fairfax, Va., has been using the Missive software for roughly two months to link 600 people using CC:Mail on Novell, Inc. NetWare networks to 200 people using DEC's VAX/VMS Mail.

Additionally, the software will allow the company to integrate other mail systems, such as those based on Novell's messaging technology, said Steve Berlin, systems technical director.

However, administering the name and address directories is no piece of cake. Currently, Berlin said he must manually enter name and address information from VAX/VMS Mail into the CC:Mail directory, a "cumbersome process that I'd be very interested in automating." In that light, the new CC:Mail to DEC Distributed Directory Service module "looks very interesting," he said.

In addition to the new Notes and CC:Mail modules, Wingra offers Missive modules to Novell's Message Handling Service-compatible E-mail, WordPerfect Corp.'s Office, Unix Simple Mail Transport Protocol, Microsoft Corp.'s Mail, DEC's E-mail networks and IBM mainframe and midrange E-mail. Wingra said it will ship a link to Microsoft's Mail by the end of the year.

Mantech chose Missive over software from E-mail integration heavyweight Softswitch, Inc. because Missive "was simpler and more straightforward," Berlin said.

Pricing for Missive starts at $7,500 for the base software, plus $3,000 for messaging modules and $10,000 for the directory synchronization module.

RAIDION

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NetWare 3.11 and 4.0

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Take it from the industry's leading publications: when it comes to reliable, cost effective, fault-tolerant data storage, there isn't another disk array like RAIDION.

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LAN TIMES

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How to go client/nano

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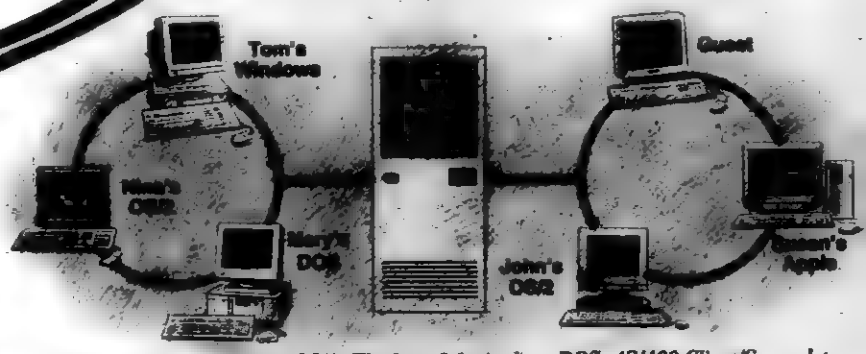

Whether you're working in OS/2, Windows 3.1, Apple or DOS, AS/400 Client/Server lets you get to data and applications anywhere in the network.

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For more details on the IBM AS/400 Client Series, call 1 800 IBM-CALL, ext. 102B.

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UPS pulse check

CONTINUED FROM PAGE 73

shut down any remote workstation running OnliNet network software. It can also manage Exide UPSs equipped with SNMP agents. The product costs $299.

•OnliNet SNMP collects information about Exide UPSs via SNMP and then passes the information to an SNMP-compatible network management platform such as Hewlett-Packard Co.'s OpenView. It is priced at $349.

•OnliNet Lite sits on a workstation that does not require power monitoring and communicates with OnliNet Network or OnliNet SNMP to provide automatic shutdown. It is priced at $129.

Preventive measures

Exide's ability to manage UPSs from a central location, using SNMP, had a lot to do with Walgreen Co.'s decision to implement the company's UPSs, according to Bill Greenhalgh, technical analyst at the Deerfield, Ill.-based retail chain. The company wanted a way to check the status of its UPSs and battery backups so it could catch a problem before a system lost its power, Greenhalgh said.

However, each store already has five telephone lines installed to monitor systems such as fire and burglar alarms, and Walgreen has more than five applications that can use those lines.

With Exide's OnliNet SNMP, Walgreen can monitor each store's UPS and battery backup from a central site over existing satellite lines that carry point-of-sale and other data. This eliminates the need to install another telephone line.

The SNMP support also enables Walgreen to integrate UPS monitoring with the SNMP network mangement system it plans to implement, according to Greenhalgh.

Unfortunately, a standardized SNMP management information base for UPSs is still some months down the road, an Exide spokesman said. As a result, one UPS vendor's SNMP-based system will not necessarily manage another vendor's UPSs.

Another recent announcement is Network Security Systems, Inc.'s LanSafe II for Unix, which is said to manage that company's UPSs on Unix workstations across heterogeneous network environments.

The product incorporates an X Window System and the Open Software Foundation's Motif graphical user interface, providing network administrators with the status of all power protection components on the network, and it identifies potential power problems, the San Diego, Calif., vendor said.

Pull-down menus provide the ability to change power settings, conduct networkwide tests, reboot or shut down nodes and view historical power event logs.

The system will also perform managed shutdown of the Unix network when a prolonged power outage occurs.

The product supports The Santa Cruz Operation, HP, NCR Corp., Sun Microsystems, Inc. and Digital Equipment Corp. Unix platforms. It is priced at $149 for the single-seat version.

Skirting disaster

UPS management systems avoid major power disasters in the following ways:

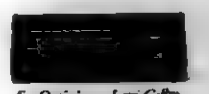
When a UPS battery wears down: The system identifies the problem before it becomes critical. It sends out a maintenance person or automatically drains and recharges the battery.

When there is scheduled power-off period: The system ensures that files are stored and I/O ports cleared before a workstation is turned off.

When an unscheduled, prolonged power outage occurs: The system notifies the network manager of why certain system failures are occurring, and the manager performs a managed shutdown of workstations with managed UPSs, saving files before their batteries run out of power.

SynOptics smoothly inte into your exist

An enterprise network is one of your business' strategic assets. And with the constant arrival of new network technologies, you need a partner to help you merge and manage both the old and the new. That partner is SynOptics.



SynOptics' new LattisCell™ product family enables you to build a complete ATM network, from corporate backbone to desktop connections.

Since the beginning of the intelligent hub revolution, SynOptics has smoothed the transition to new network technologies—from network management, to the first multi-protocol hubs integrating Ethernet, Token Ring and FDDI topologies.

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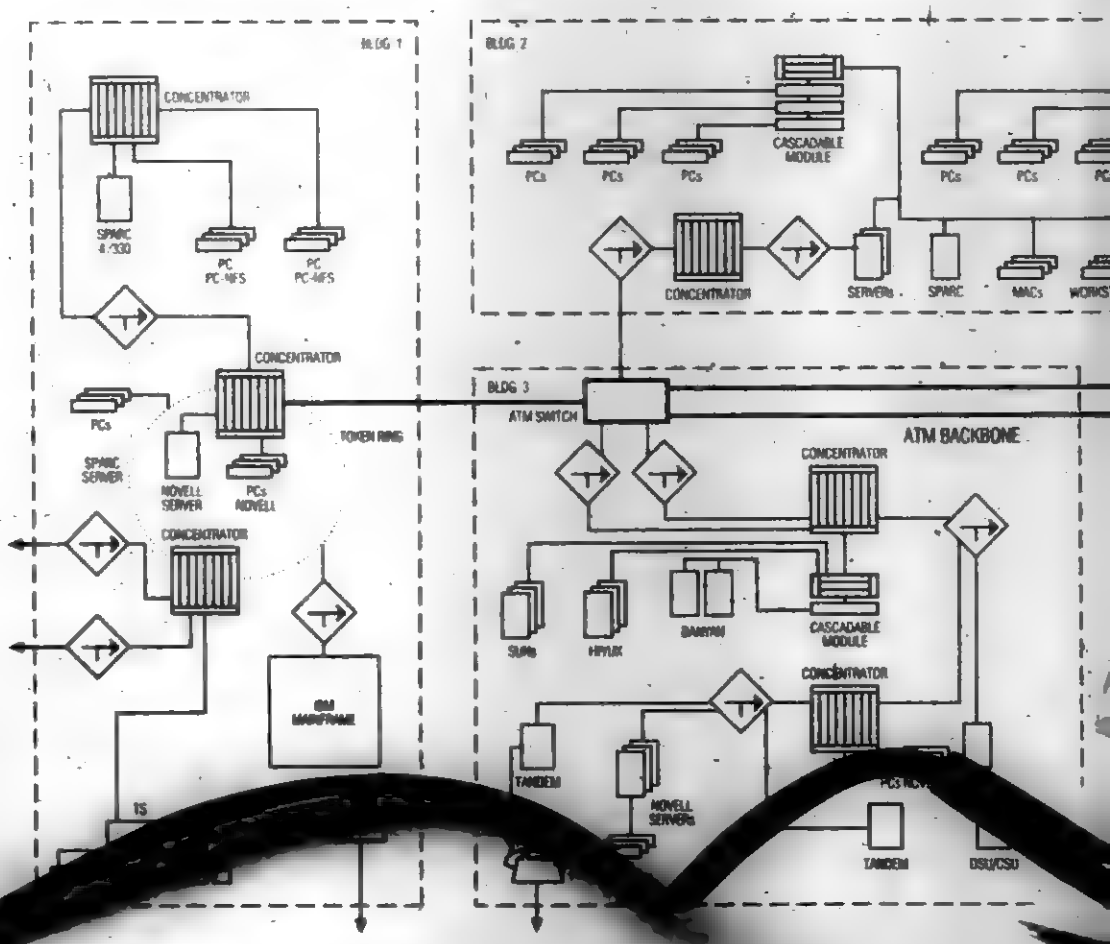

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[redacted]

Host-to-host

McData Corp. has announced the LinkMaster 9134 Serial/Parallel Converter.

The company said the product is the first non-IBM Escon converter.

The LinkMaster 9134 has the ability to translate between parallel signals carried over bus and tag cables and serial signals carried over fiber-optic cables.

Users can integrate their existing parallel I/O equipment into an Escon network environment, according to the company.

The LinkMaster 9134 costs $12,000 per unit.

▶ *McData*
310 Interlocken Pkwy.
Broomfield, Colo. 80021
(303) 460-9200

Network management

Tekelec has announced the Chameleon Open protocol analyzer for integrated, simultaneous testing of local-area network and broadband wide-area network interfaces and applications.

According to the company, the Chameleon Open is a protocol analyzer based on the Open Diagnostic Access Architecture. Application modules support both LAN and WAN interfaces and protocols, including Ethernet, Token Ring, Switched Multimegabit Data Services at T1 and T3 speeds and T1/E1 WANs such as Primary-Rate Interface, Integrated Services Digital Network, X.25 and frame relay.

Application modules can be used in any combination.

Prices for the Chameleon Open range from $22,000 to $45,000.

▶ *Tekelec*
26580 W. Agoura Road
Calabasas, Calif. 91302
(818) 880-5656

Gateways, bridges, routers

Proteon, Inc. has announced the DNX 300N Bridging Router, a "plug-and-play" product that was designed for Novell, Inc. users who need low-cost access to remote Ethernet local-area networks running the Internet Packet Exchange protocol.

Available in two configurations, the DNX 300N is a 386-based router that has flash memory and includes all the necessary software, hardware and cables, including bridging and routing software. The DNX 300N supports one LAN-to-LAN connection or connects two wide-area networks to one LAN.

The product offers a router configurator, an LED-based interface, flash-memory upgrades, a customizing configurator and a quick reference guide.

Prices range from $3,995 to $5,495.

▶ *Proteon*
9 Technology Drive
Westboro, Mass. 01581
(508) 898-2800

Computer Network Technology Corp. (CNT) has announced a new data tunneling capability for its channel networking systems.

According to the company, the capability enables users to send data from an assortment of communications devices, such as front-end processors, bridges and routers, over the CNT network with improved performance and a lower cost than existing connections.

Data goes into the CNT system from either V.35 ports with speeds of up to 4M bit/sec. or High Speed Serial Interface connections at speeds of up to 52M bit/sec., the company reported.

Prices for the product range from $5,000 to $20,000.

▶ *Computer Network Technology*
6500 Wedgewood Road
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(612) 550-8000

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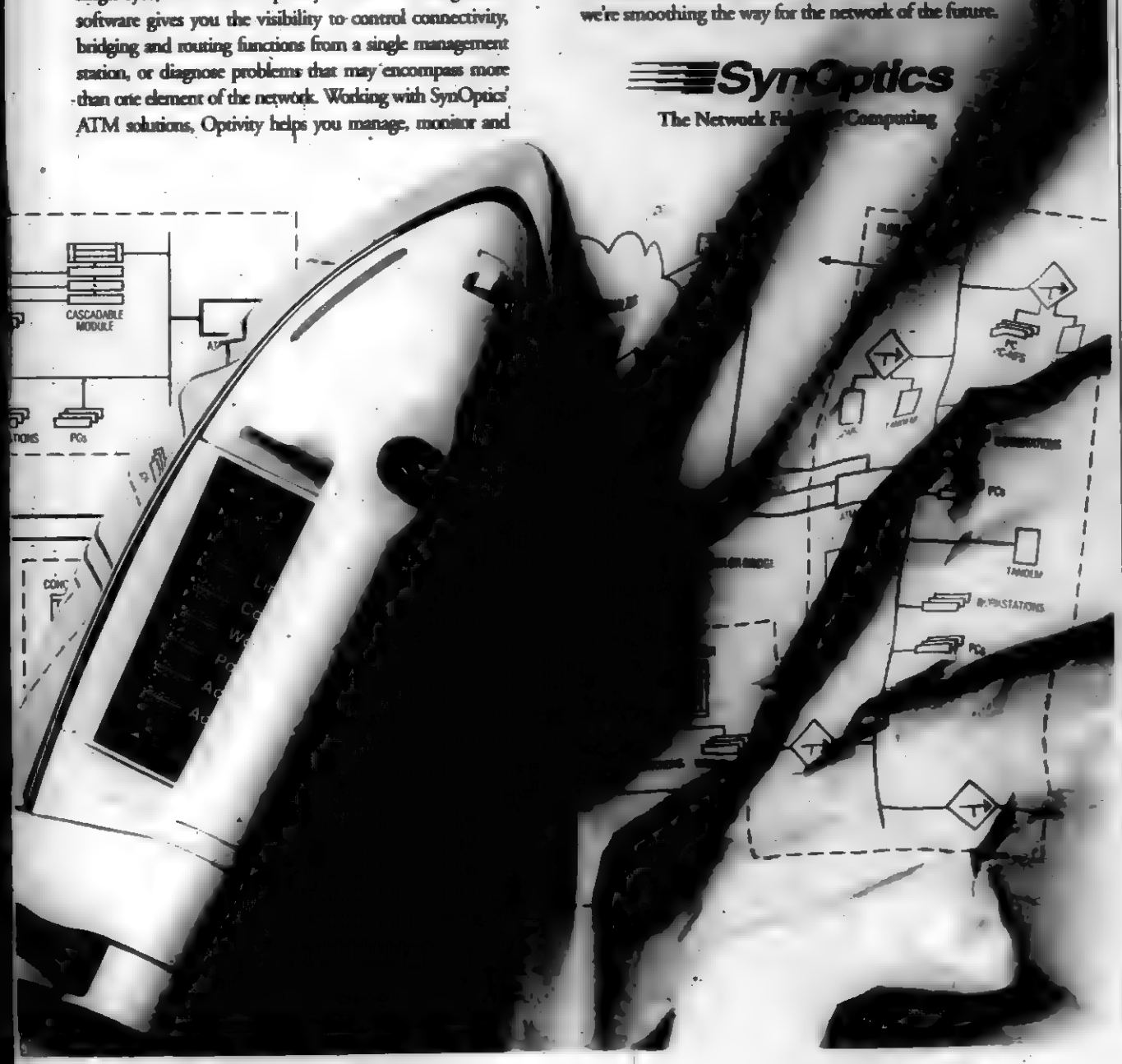
SynOptics
The Network Fabric for Computing



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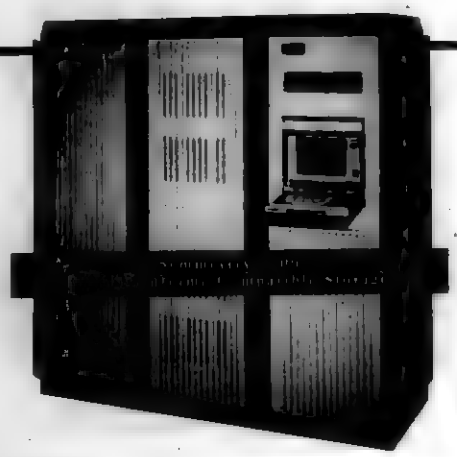
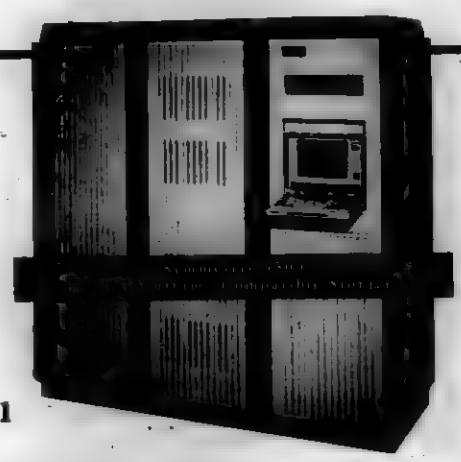
Life is full of tough choices: A performance car vs. a practical car. A job that satisfies your pocketbook vs. one that satisfies your mind. A disk storage solution that offers speed vs. one that offers complete data availability. Well, the last choice just got easier to make.

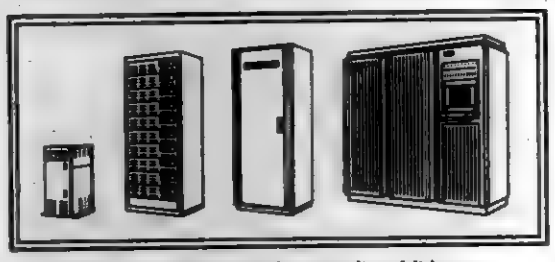
The disk storage system on the left is known for speed. The disk storage system on the right is known for continuous operation. Fortunately, they're one and the same.



Because, right now, there's the Symmetrix 5500 ICDA™ from EMC.



On one hand, the Symmetrix 5500 is fast. It's based on EMC's Integrated Cached Disk Arrays (ICDA™), which means it can access information on an IBM or compatible mainframe computer almost as fast as you can say "Where's my data?"



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

On the other hand, the Symmetrix 5500 offers continuous operation. Which means you'll have access to your data 24 hours a day, seven days a week, with no costly downtime.

But the benefits of the Symmetrix 5500 don't end there. It also offers high capacity per square foot, low power and cooling requirements and a two year warranty that all add up to a maximum return on your storage investment.

So if you can't choose between a disk storage solution that offers speed and one that offers continuous operation, don't. Get the Symmetrix 5500. To learn more, please call 1-800-424-EMC2, extension LM65C.

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IBM beefs up systems management line

By Johanna Ambrosio

IBM earlier this month announced software designed to play in the distributed systems management arena. One package allows customers to schedule jobs on non-IBM machines, including those that run Unix.

Another package, the brand-new Enterprise Performance Data Manager (EPDM), provides a way to collect information from various MVS components — including the operating system, RACF security package and CICS transaction processing manager. Customers can use this data to analyze historical information about resource use and to project trends.

Although EPDM runs only under MVS, it also accepts information about VM use.

Some differences

Kidder, Peabody & Co. in New York helped beta-test EPDM and has been using it for a couple of months, according to Tom Kopera, assistant vice president. He said Kidder is slowly phasing it in and primarily still uses EPDM's predecessor, Service Level Reporter (SLR). The primary difference is that EPDM stores data in a DB2 information base, whereas SLR uses VSAM. Also, EPDM sports a graphical user interface and SLR does not.

So far, Kopera said, EPDM is proving much easier to use. "With SLR, even the canned reports took me two months to set up. There was a lot of hair on the floor with that one."

With EPDM, on the other hand, "it's easy to generate reports if you know SQL." The most time-consuming portion is the conversion process needed to get the reports from the old SLR format to the new EPDM one, Kopera added.

Scheduling options

IBM's other major announcement was a new release of its Operations Planning and Control (OPC)/MVS package. With it, users can schedule jobs on computers including IBM mainframes, the Application System/400 and most Unix-based machines and computers from Tandem Computers, Inc. and Unisys Corp.

"It's the first step in addressing the distributed world," said Leif Engdahl, technical program manager at IBM's Nordic Laboratory in Lidingoe, Sweden. He said future releases of EPDM may come for Unix and the AS/400 environments.

Igor Stenmark, an analyst at Gartner Group, Inc. in Stamford, Conn., said the availability of OPC on non-IBM platforms "sounds interesting. If it's really able to manage those environments, it could be a serious player" in the market for distributed job-scheduling packages.

Another piece of the announcement was a new version of IBM's mainframe chargeback package, called Accounting Manager/MVS. IBM eliminated the need for customers to have Query Management Facility (QMF) as the reporting tool. "Now they can use whatever reporting tool they wish," Engdahl said. He added that the QMF prerequisite in other IBM systems management products will "likely" be eliminated in future releases of those products.

User choices

IBM's systems management announcements included the following:

- A new MVS package to collect historical systems management data and produce graphs and reports.
- A new release of Operations Planning and Control that lets users schedule jobs in Unix-, Tandem- and OS/2-based machines, among others.
- Automated Network Operations for VM.

NCR taps Pentium for mainframe-class servers

By Thomas Hoffman
DAYTON, OHIO

■ Improved hardware price/performance and the inclusion of fault-resilient software are the catalysts behind the arrival of 10 new high-powered NCR Corp. System 3000 servers, according to users of predecessor systems.

NCR's 3-year-old 3000 line includes a new uniprocessor — Model NCR 3410 — and the 16-way, Intel Corp. Pentium-based NCR 3575. Four new 1486-based machines fill gaps in NCR's scalable System 3000 product line, while the latest midrange Pentium-based servers push the line into the mainframe-class performance levels required to power high-volume, on-line transaction processing applications, analysts said.

"With the Pentium processor and added symmetric processing head room, NCR has clearly pushed its midrange performance target well into the mainframe class with the 3575," noted Peter Kastner, vice president at Aberdeen Group, a market research firm in Boston.

Speedy server

The NCR 3575 has been estimated to run at speeds approaching 1,500 million instructions per second (MIPS), based on reports given by Intel to NCR, according to Richard H. Arnold, an NCR assistant vice president of server marketing. The NCR 3550, an eight-way 486-based precursor to the NCR 3575, had been benchmarked to run at 400 MIPS, Arnold said.

The combination of Pentium processors — which are said to deliver up to twice the processing power of a 486 chip — along with the addition of NCR's LifeKeeper fault-resilient high-availability software, was well-received by System 3000 users at the information services department at the city of San Antonio.

Last year, the municipality tapped NCR for two System 3450 servers as part of a citywide computer-aided design (CAD) project being developed to speed the calls processed by the city's police, emergency medical services and 911 services operators.

Though the CAD application is being developed on an Amdahl Corp. 5860 mainframe, the city is planning to port the public safety system down to the NCR 3450s by the end of the year, according to Gary Miller, San Antonio's systems services manager.

Because the emergency system requires nonstop processing and quick response time, Miller said,

NCR, *page 84*

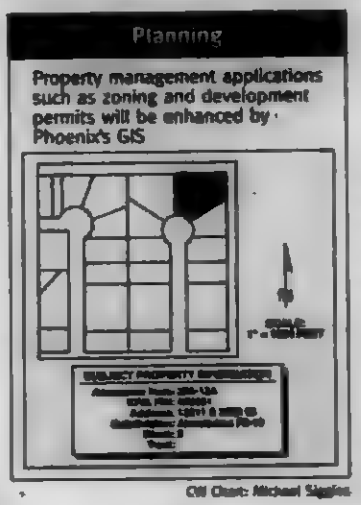
Geographic information systems

Phoenix maps out GIS plan

By Gary H. Anthes
PHOENIX

While the city of Phoenix improves its transportation, water and sewer systems, its information systems specialists are building an infrastructure of a different but related kind. It is a 5G-byte database of geographic information that will be able to pinpoint, display and describe every manhole, liquor store, one-way street, zone boundary and land parcel in a 400-sq-mile area.

The people building the geographic information system (GIS) infrastructure said more than 50 GIS applications have already been identified, and the end is nowhere in sight. "It's truly open ended. It is not an application like an accounting system," said William Bayham, GIS project manager. "This is more of a strategic information environment, or platform, to analyze and manipulate spatial data."



CW Chart: Michael Siggins

The city's GIS project got a jump start in 1988 with a $2 billion bond issue that earmarked $7.6 million for GIS over five years. Now the city is midway through a massive data-capture effort that involves digitizing paper maps that show water and sewer lines, land parcels, roads, zoning information and the like, all laid out in squares one quarter mile on each side.

In addition, the city is loading "attribute data," or text from map annotations and other sources that describes the spatial data.

The GIS applications are being built using GIS tools from Environmental Systems Research Institute, Inc. in Redlands, Calif. The company's Arc/Info combines cartographic and analysis capabilities with a database for input, management and display of spatial data. It also includes a specialized language in which to write GIS applications.

Some of the attribute data resides in Arc/Info's multimedia GIS database, and other information is stored in an Oracle Corp. database, which can be accessed by a SQL feature in Arc/Info.

The GIS applications are available to users on Token Ring local-area networks at various city locations, all connected by a fiber-optic backbone. The LANs support IBM RISC System/6000 and Sun Microsystems, Inc. Scalable Processor Architecture workstations and servers.

The backbone also connects to the city's IBM 3090 mainframe for access to systems and data there. For example, GIS users will be able to download crime data from police department systems to produce special maps highlighting crime trends and hot spots, Bayham said.

An application already running automates to a large degree the evaluation of liquor store license requests. Using census data, the GIS can

Phoenix, *page 84*

Maryfran Johnson
Senior Editor Workstations

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The Newspaper of IS

Amdahl users ask for conversion assistance

By Martin LaMonica
BARCELONA, SPAIN

Amdahl Corp.'s recent European user group meeting brought renewed pressure for client/server migration solutions from the mainframe vendor and intense soul searching over the changing role of mainframe shops, information systems departments and business organizations in general.

During a question-and-answer session with top Amdahl executives, users voiced concern over whether the company could accelerate its efforts to supply open systems software in volume and provide the necessary support.

Several Amdahl users said in interviews that the mainframe is not dead, but they noted that users are looking for solutions other than boxes as the mainframe becomes a data repository in a distributed environment.

"The mainframe is just another server —a commodity, really. It still has to be cost-effective," said Sandy Hulbert, general manager of information management operations at British Airways.

The airline continues to run nearly all its management applications, such as payroll, flight planning and inventory, on 900 million instructions per second of mainframe hardware, including two recently purchased Amdahl 6650s. Nearly all smaller platforms installed for the office environment are linked to its central sites.

Source: International Data Corp., Framingham, Mass.

Amdahl Chief Executive Officer E. Joseph Zemke outlined a plan to cut costs internally and shift strained personnel resources to open systems development, support and consulting.

Last year, services and outside maintenance represented 7% of Amdahl's $2.5 billion in revenue, a percentage the company expects to double this year on flat or slightly lower revenue, Zemke said.

In general, users said they were satisfied with Amdahl's open systems migration contracts and its UTS operating system, which allows its mainframes to run Unix.

Anton Ratnayake, group general manager of information at UK-based global transportation company P&O Containers Ltd., said his company's open systems transition with UTS was smooth and relatively inexpensive. He called Amdahl's support "stable."

Ratnayake said he uses UTS to interconnect Sequent Computer Systems, Inc. Unix-based systems, IBM RISC System/6000s, an Amdahl 5890/300E running UTS, an Amdahl 5990-700 running MVS/ESA and an IBM Enterprise System/9000 running VM/CMS.

Positive tales

Other users portrayed Amdahl as a straightforward, trustworthy partner. UK-based retailer Tesco Stores Ltd. has been pleased with an Amdahl software development contract for its logistics management system.

"We had Amdahl invest in half of the project to ensure their commitment," said computer services director Joe Galloway. The shop runs its Amdahl 6650 and 4550 mainframes at 25% processor capacity per hour and intends to stay with them for some time, according to Galloway.

Amdahl emphasized its dedication to open systems by announcing plans to develop a common application development environment with its 45% owner Fujitsu Ltd. and UK-based vendor ICL Ltd., which is 80% owned by Fujitsu.

The joint project, due to bear fruit at the end of the year, will allow applications developed under Unix System Laboratories, Inc.'s Unix System V on one vendor's platform to operate on another vendor's similarly equipped machine, according to Amdahl officials.

The company also emphasized partnerships, particularly in parallel multiprocessing. Amdahl will announce a "moderately parallel" machine that will integrate between 25 and 35 64-bit processors in a "reasonable time frame," according to top officials.

LaMonica is a reporter for the IDG News Service.

The many faces of Huron

Users showed great interest in Amdahl's Huron application development environment, which provides a single interface for development on MVS, TSO, CICS, IMS/DC, UTS, AIX for RS/6000s and The Santa Cruz Operation's SCO Unix for Intel Corp. 1486 platforms.

Physical data can remain in proprietary databases IMS, DB2, IDMS or Model 204 accessed through servers or can be held in Huron's own data stores, officials explained.

Several users said Huron has accelerated development processes. UK-based Coca-Cola Schweppes Ltd. has seen two- to sevenfold productivity gains and savings of $450,000 by switching to Huron for DB2 on MVS.

David Jephson, director of personnel, organization and systems, did report a few problems that he considered normal for a new product, notably the lack of an SQL interface. Also, Huron cannot control the priority at which a Huron batch job or on-line transaction accesses DB2 and cannot select the DB2 access mode from within a Huron transaction, he said.

"The thing I like about Huron is that it's totally integrated. There's just one workbench, which is easy to learn because there are only about 20 commands," unlike most fourth-generation development tools that have several hundred, said Joe Galloway, computer services director at Tesco Stores. —*Martin LaMonica*

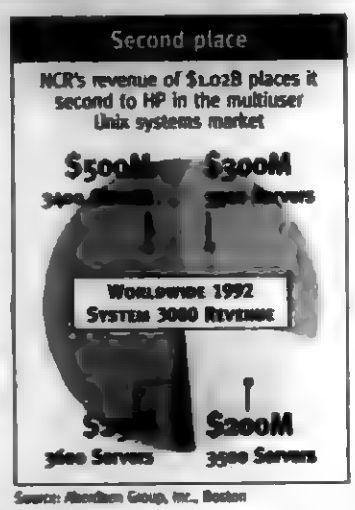
NCR taps Pentium for superservers

CONTINUED FROM PAGE 81

the city is extremely interested in both the Pentium systems and the LifeKeeper fault-resilient software. "As we move applications from our mainframe environment, or as new applications present themselves, we're interested in the fault-tolerant aspects due to the public service requirements that we have," Miller said.

Mainframe users have been steadily offloading mission-critical applications onto distributed platforms such as Unix. Analysts praised NCR's strategy to deliver fault-resilient software to protect those applications at a significantly lower price point than pricier Unix-based, fault-tolerant systems sold by Tandem Computers, Inc., Stratus Computer, Inc. and Sequoia Systems, Inc.

"We are seeing an increasing interest in the marketplace for high-availability systems for people who are not willing to pay the substantial price penalty for fault-tolerant systems," Kastner said, adding that IBM and HP also offer fault-resilient packages.



Source: Aberdeen Group, Inc., Boston

John Morrell, a research manager for Unix at International Data Corp., a Framingham, Mass., market research firm, placed NCR third in the Unix midrange systems market with 9% of the $9.3 billion pie, trailing IBM and Hewlett-Packard Co., respectively.

However, Morrell said the addition of the fault-resilient software with the Pentium processors will put NCR's System 3000 on par or ahead of its competitors from a price/performance and functionality standpoint, though he declined to forecast how the entries would affect NCR's market standing.

Phoenix GIS plan

CONTINUED FROM PAGE 81

quickly and accurately check for conformance to a host of rules that restrict the sale of alcohol near schools, churches and high-crime areas.

In another application, Bayham said GIS technology has reduced from five days to five minutes the time it takes to verify ownership and get other property data in order to respond to citizen complaints and questions about maintenance, zoning and environmental issues. The city used to have to pore through paper records at multiple sites in order to answer 22,000 such requests annually.

The city also uses the GIS environment to develop a system for routing garbage trucks, not an easy manual job when a truck has countless alternate routes overlaid by the constraints of one-way streets, rules against U-turns and the like. "We think we can automatically generate the optimum routes and print maps in an hour, eliminating person-months of effort and enabling the routes to be constantly fine-tuned," Bayham said.

Arc/Info includes a tool to aid route optimization, he said.

Other anticipated GIS applications include the following:

- Automatic notification of nearby property owners when someone applies for a zoning variance.
- Capacity planning and optimization based on modeling of water flows.
- Management of street maintenance.
- Processing and management of building permits.

City maps are now drawn independently by five departments: engineering, water, planning, city clerk and street transportation. They are then used by 14 departments for mission-critical functions.

Once the GIS architecture is in place, engineering will produce a baseline map, which is stored in the system once, Bayham said. Other views of the water system, for example, can be layered on top as specified by the user.

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Bull takes systems integrators by the horns

As proprietary sales fall, Bull focuses on distributed computing software

By Craig Stedman
BILLERICA, MASS.

Groupe Bull is putting together plans to market its distributed computing products to systems integrators, starting with the recently introduced first-production release of a Unix-based system management software package built around Hewlett-Packard Co.'s OpenView management technology with extensions developed by Bull.

Sales of Bull's proprietary computers are declining. Overall revenue dropped from $5.9 billion in 1991 to $5.7 billion last year. In response, the French company is looking for "a more aggressive way of pushing" the Integrated System Management (ISM) software and unspecified other products grouped under its Distributed Computing Model (DCM), said Maurice Gervais, vice president of North American/Pacific products and systems at the Bull HN Information Systems, Inc. subsidiary here.

"We feel there is a broader market [than the existing Bull customer base] and that our products are quite competitive," Gervais said.

Marketing to systems integrators is already starting in Europe, Gervais added, and an expansion into the U.S. should follow "within a few months at the most."

ISM, in particular, is being counted on "to be a flagship product," Gervais said. The OpenView-derived software is eventually supposed to enable all parts of a multivendor enterprise to be managed from a single Unix system using common management facilities, according to Bull.

Scheduled for general availability in August, Version 2 of ISM runs on the IBM RISC System/6000 systems that Bull resells as its DPX/20 line. This is a change from the first release, introduced a year ago, which supported 486-based desktop machines running The Santa Cruz Operation's SCO Unix.

Other Unix hosts are being qualified, Bull indicated, although it did not identify any specific platforms.

Version 2 also adds capabilities for monitoring Bull's mainframes running under the GCOS 8 operating system, as well as new monitoring and management support for internetworking devices and expanded tools for writing heterogeneous management applications.

The ability to monitor a variety of outside systems, including IBM and Unisys Corp. mainframes and HP and Digital Equipment Corp. hardware, is planned for future releases, Gervais said.

He added that Version 2 should be more dependable than ISM V1, which "was really a beta-test version" and has only been installed at a small number of user sites. Pricing for ISM Version 2 starts at $24,975, and Bull said it expects the software to compete with IBM's NetView family and OpenView.

Stephen Josselyn, an analyst at International Data Corp., a market research firm in Framingham, Mass., did not discount Bull's chances of getting outside business for its integration software.

"They've got some decent expertise there and a pretty good model" with DCM, he said. "It would obviously be in the running because it would save other people the time of having to go out there and develop it themselves."

However, Josselyn still is not convinced that integrating entire enterprises is feasible because of political issues at the user level. "All departments have to work together, and I'm not sure most organizations are capable of putting those things together," he noted. "Those barriers are much bigger than the technological barriers."

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Software application packages

Dynamic Information Systems Corp. has unveiled Omnidex, an indexing system designed to give instant access to Digital Equipment Corp.'s Record Management Services (RMS) through Microsoft Corp.'s Windows-based applications.

According to the company, Omnidex provides fast and flexible access to data, offering retrieval performance improved by as much as 1,000% over standard keyed RMS access. The product can be added to existing data structures and databases, and it can maintain on-line indexes.

For client/server applications, Omnidex can be implemented via Windows applications using Visual Basic to create the retrieval screens.

Prices range from $9,000 to $56,500.

▶ *Dynamic Information Systems*
5733 Central Ave.
Boulder, Colo. 80301
(303) 444-4000

System Software Associates, Inc. has announced that it will offer Microsoft Corp. Windows NT versions of three of its client/server applications that are now available for users running IBM's OS/2.

Planner's Assistant, Financial Analyst's Assistant and Formulation Assistant are client/server business applications that provide 32-bit cooperative processing between an IBM Application System/400 server and a workstation.

Each of the three client/server applications costs $7,500 per workstation.

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500 West Madison St.
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CES Business Systems has introduced the Aurora Phoenix, a line of management and accounting systems.

The Aurora Phoenix Financial System features include accounts payable, accounts receivable, general ledger and financial reporting and budgets. The Aurora Phoenix Property Management System comprises a series of modules that can be selectively implemented.

The Aurora Phoenix Construction System has modules that include subcontract payable, purchase order, home costing, work order/service billing and payroll, among others.

The fourth-generation language Aurora Phoenix application product line includes flexible, user-defined reporting, full-color graphics reporting, quick programming, smart windows and fully integrated financials and management information.

Prices start at $5,000.

▶ *CES Business Systems*
15037 Yonge St.
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(416) 350-3989

Utilities

Serena International has released Pdstools Version 3.1.1., a programmer's workbench that provides users with a complete environment created to manage partitioned data sets, extended partitioned data sets, VSAM and other files. Full-screen edit and browse facilities are included with Pdstools' ability to support VSAM for all data set types.

The product offers VSAM utilities that search and replace character strings, back up allocated VSAM data sets, provide on-line diagnosis of problems that could affect VSAM availability and detect logical errors.

Pdstools Version 3.1.1. prices range from $5,000 to $25,000.

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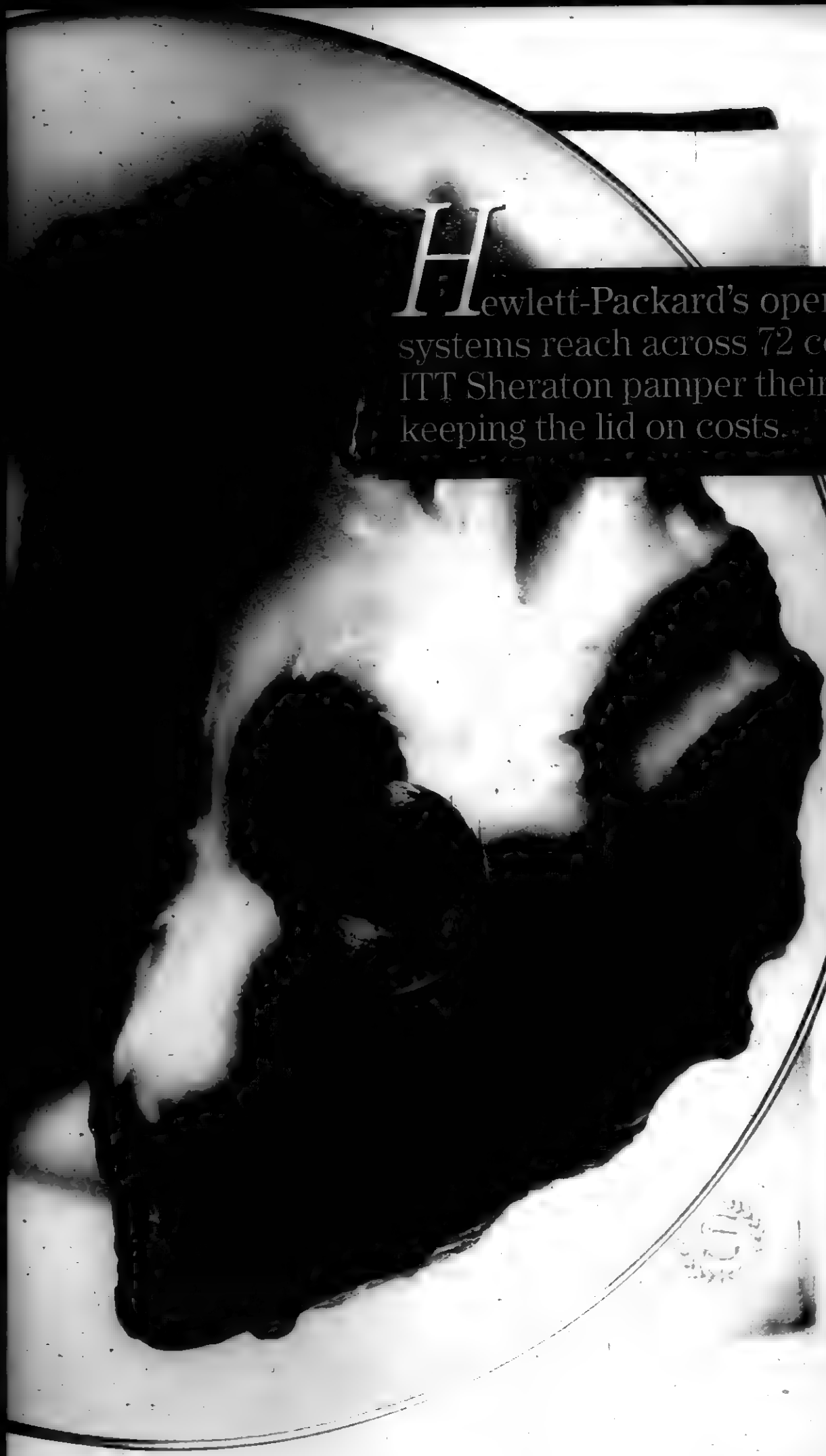

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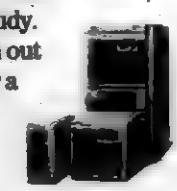

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Stephen M. Kuhn

Development doldrums

Throughout the business world, the issue of the day is productivity. While many users are reaping big productivity gains from this decade's phenomenal growth in computer power, application developers, strangely enough, have been left in the lurch.

Best estimates are that software development productivity is improving at a rate of 4% to 7% annually. But that's nothing compared with recent hardware performance gains.

By most accounts, hardware performance is doubling in speed and being halved in price every two years. That alone accounts for a large proportion of the increase in software productivity.

Frankly, the software development tools market is caught in a rut. The tools available today are essentially no different than those of 20 years ago. We are still developing code using a basically unimproved edit-compile-link-debug approach. If chip manufacturers were improving chips at the same rate as software developers are progressing, we would still be working with a 6-MHz 286.

Too complex

The culprit is complexity. Creating software is perhaps the most complex cognitive process in the world. Using current tools, programmers must be able to remember the what, how and why of every micro-detail in a project. This needlessly takes up a large portion of developers' mental energy and distracts them from their primary task: creating software.

It gets worse. The more sophisticated an application, the more complex the development

Kuhn, *page 97*

Client/server tools

Visual Basic stirs competition

By Melinda-Carol Ballou

■ An aggressively priced Visual Basic 3.0 is causing client/server tools vendors to reconsider their pricing, in some cases offering discounts, in an effort to protect their market share.

Given that Microsoft Corp.'s Visual Basic costs about 90% less than competing products, it could force a market shakeout, analysts said last week — but only if the firm can meet promises for improving the product, such as allowing users to perform broader, collaborative programming.

Already, client/server applications tools vendors such as Powersoft Corp., Gupta Corp. and KnowledgeWare, Inc. are waging a price battle as they seek to gain mindshare and compete with the low-balled pricing of Visual Basic.

While Microsoft's recently shipped Visual Basic Professional 3.0 carries a promotional price of $395 — which will increase to $495 — the other tools range in price from around $2,000 to $3,900.

KnowledgeWare led the others with a three-month discount from April to June 30 (see chart). Gupta brought its pricing down to a single-copy price of $199 until July 31. And Powersoft eliminated its runtime licensing fees — a per-server charge of $999. (Gupta is retaining its fees of $250 per client or $1,595 per database machine with unlimited clients.)

Powersoft will not offer comparable discount programs because it has not found them to be successful in the past, officials said.

But analysts said the tools vendors would be ill-advised to ignore the pricing impact of Visual Basic and other lower cost tools.

"The companies are experiencing pressure from development tools like Visual Basic, which are cutting substantially into their market share," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago consulting firm. "It's hard to justify the high cost of a PowerBuilder or SQL Windows. The costs are artificial — the products just aren't that much better" than Visual Basic.

Other analysts said Visual Basic does not yet have the functionality of the other tools, though they agreed that the pricing issue may force players to cut back.

"If you are a deep-pocket player, like Microsoft, then you can cut the oxygen off to the competition by starving them in terms of short-term sales so they can't afford to develop and go out and sell," said Aaron Zornes, analyst at Meta Group, Inc., a market research firm in Stamford, Conn.

"I see a winnowing out of products over time to around half a dozen that really work well with client/server applications," Finkelstein said.

Powersoft and Gupta users, on the other hand, spoke enthusiastically about the products and pricing changes.

"Gupta offered a pretty good discount, so we expedited" the move to Version 4.0 of SQL Windows, said Larry Will, software engineer at Vitro Corp., an engineering firm in Silver Spring, Md. "We don't consider Visual Basic to be in the same class as Gupta — [Gupta] makes it easier to develop complex applications because it abstracts everything and it's extensible."

"To us, the difference in price [between PowerBuilder and Visual Basic] could be made up in a week's worth of development time," said Stephenn Kaltenhauser, manager of IS at Unigas Corp. in Calgary, Alberta.

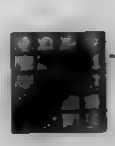
Tool time

Pricing wars have created hefty discounts for programming tools

Powersoft	PowerBuilder	$3,895	$3,595*
Gupta	SQLWindows	$1,995	$999
KnowledgeWare	ObjectView	$2,799	$999
Microsoft	Visual Basic	$495	$395

* Ongoing price change for OS/2 version

CW Chart: Janell Genovese



For Windows World Open, Computerworld's custom application contest, about two-thirds of the 144 applicants used Visual Basic in conjunction with other tools. Two of the three contestants who used only one tool used Visual Basic for their projects, which were smaller scale. Developers of larger applications generally use multiple development tools.

Bell Atlantic leads in manual design

By Mitch Betts

BELTSVILLE, MD.

Bell Atlantic Network Services, Inc., always trying to improve the quality of the internal information systems it builds, has written what is essentially an ultrapractical construction manual for use by its system builders.

The 10-part manual blends Bell Atlantic's development methodology with DesignPro, a collection of "best practices" for applications software engineering.

DesignPro, a guidebook produced by Arlington, Va.-based American Management Systems, Inc. (AMS), is part of AMS' Application Design Quality consulting service.

For Bell Atlantic, the six-month process of blending the two documents into one manual was challenging, educational and important, said Joyce Bailey, manager of the software engineering process group. To avoid overwhelming the staff with too many binders and methodologies, Bailey was adamant about creating a single, integrated volume of documentation.

"The marketplace just had bits and pieces. I wanted to put them all together and make a cohesive, coherent set of documentation that our practitioners can use conveniently," she said.

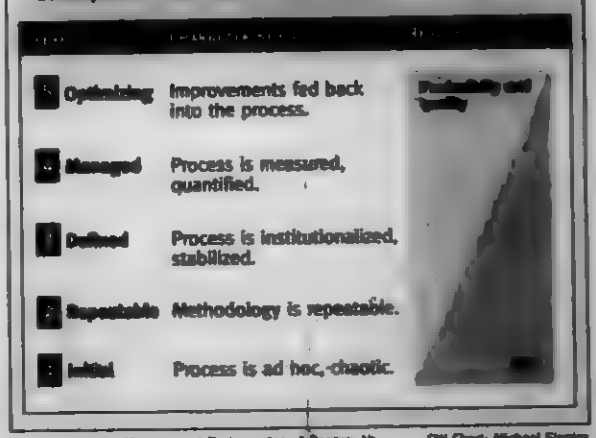
Bailey said she threw out the "high-level, conceptual" parts of DesignPro and transformed it into a practical, how-to manual tailored to Bell Atlantic's environment. The manual is broken down into 10 booklets on various software development topics, such as requirements, design, testing and documentation.

A key goal of the manual is to get Bell Atlantic's system developers to consider the elements of quality software at the outset, Bailey said, and then reinforce those quality

Bell Atlantic, *page 96*

Building maturity

The Software Engineering Institute's software process maturity model can be used to categorize the quality of a software development and maintenance operation



Source: American Management Systems, Inc., Arlington, Va. CW Chart: Michael Siggins

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More EDA/SQL gateways offered

By Melinda-Carol Ballou
BOSTON

Information Builders, Inc. is now shipping 13 EDA/SQL gateways to databases running on IBM mainframes, including VSAM, IMS, Oracle, Teradata, Supra and Adabas, company officials said. The introduction is scheduled for Client/Server World this week.

The gateways offer improved performance and access to mainframe data from third-generation language (3GL) and other applications, the officials added.

The EDA/SQL gateways can be accessed using front-end tools that support EDA/SQL, such as Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Access and Information Builders' own tools.

The gateways can also be accessed via an application programming interface to 3GL applications handling proprietary dialects and extensions to SQL, officials said.

In addition to supporting the appropriate EDA/SQL Data Drivers to read tables and support catalogs, the gateways also allow users to issue Remote Procedure Calls to incorporate customized 3GL procedures that read and update the databases.

The gateways will offer access to mainframe tables from 17 remote client environments, including DOS, Windows and OS/2, as well as Macintosh, Unix, MVS, VAX/VMS and MPE/IX.

Users with transaction-intensive applications have found the performance costs of EDA/SQL drivers prohibitive, according to Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

On the other hand, he said "TP lite" decision support applications have benefited from the products.

One such user is KFC Corp. in Louisville, Ky. Micki Thomas, applications development specialist at KFC, said the ability to give field employees access to mainframe data has been of enormous benefit to the company.

"They used to have to [review] the data from reports — now they can spend their time actually analyzing the data rather than re-keying it," Thomas said.

Bell Atlantic

CONTINUED FROM PAGE 93

principles throughout the development process. Otherwise, issues such as performance and security may become expensive afterthoughts.

"DesignPro is full of common sense, but very often those [issues] are the very things that are forgotten and bite you in the end," Bailey said.

Creating the manual is a small part of Bell Atlantic's effort to have "repeatable software processes" and move up the ladder of the Software Engineering Institute's software process maturity model. Bailey said that in the far-flung Bell Atlantic empire, some development units may rank at Level 2 or 3, while others are down at Level 1 (see chart page 93).

Bell Atlantic also wants to get to the point at which it can reuse software designs for generic business applications, such as on-line transactions and electronic data interchange. Then, the generic designs can be adapted to specific conditions, Bailey said.

DesignPro was designed to promote reusability and flexibility in applications software, according to Laurence J. Best, a principal at AMS and an expert on application software design.

For example, a dispatching system and a system for debt collection may look very different, but at their core they are work-flow applications that require the assignment of tasks to people, Best said.

DesignPro provides a standard template for building generic work-flow applications so designers do not have to do that part from scratch, he said.

Likewise, DesignPro describes the basic issues involved in building data interchange, inquiry, search and table-manipulation applications, as well as graphical user interfaces.

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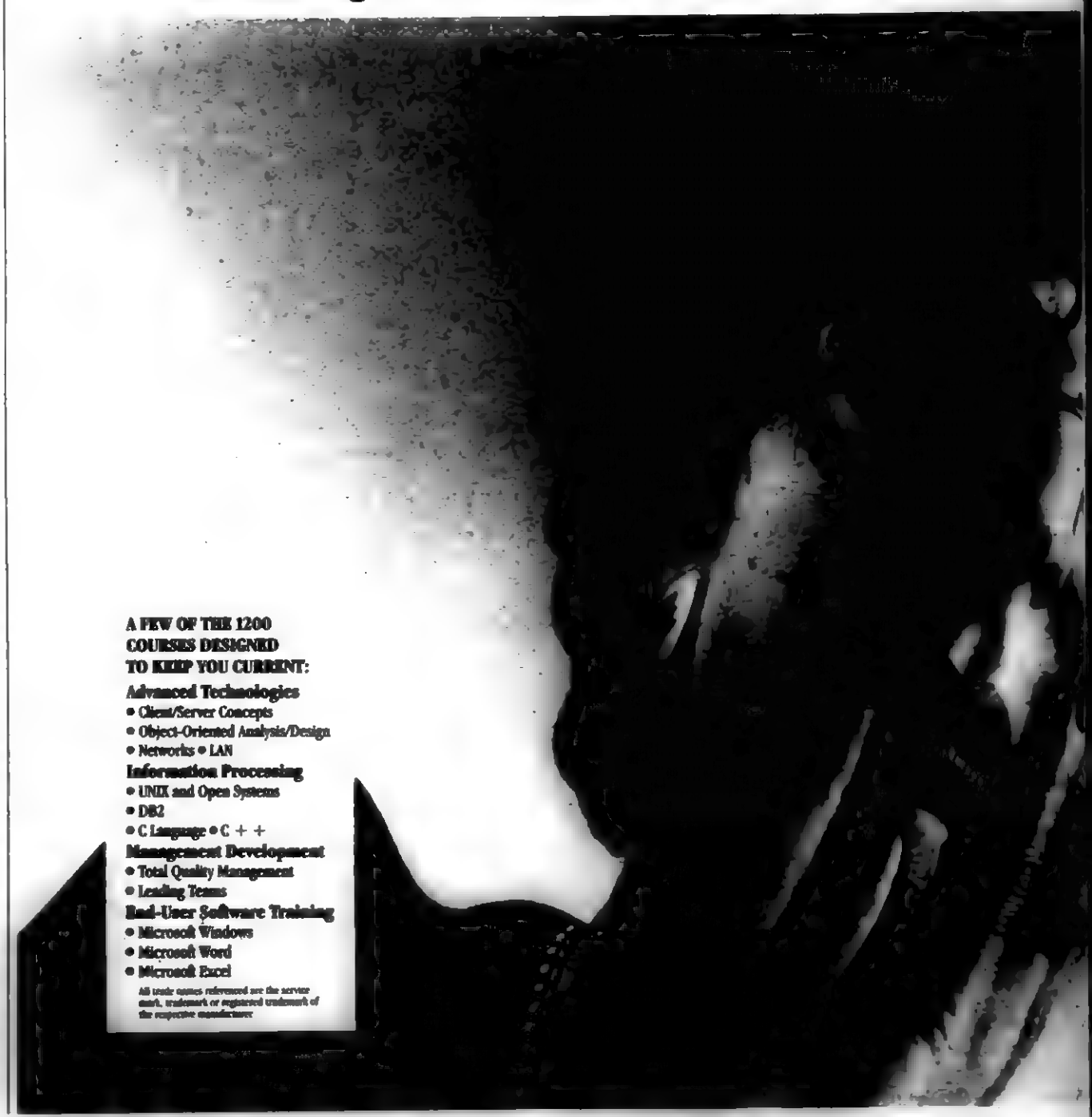

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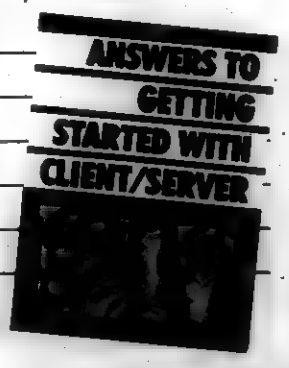

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Kuhn

CONTINUED FROM PAGE 93

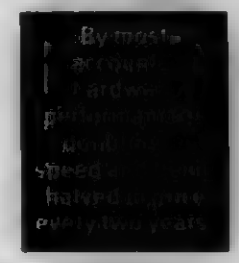
cycle. Multideveloper projects, the demands of the consumer market and the enormous increases in hardware performance have pressured programmers to create increasingly sophisticated products.

Too bad, then, that software development tools continue to be the greatest hindrance to building better quality products, rapid advancement of software technologies and shorter product cycles.

Some development tools focus on minimizing the edit-compile-link cycle. That's not enough because developers still spend the majority of their time editing and debugging. While those tools have evolved somewhat during the last two decades, they have not had a big effect on productivity.

What we need is a suite of tools that understand the process of software development. This is not just a big database with a browser on the front of it. That approach is just too passive, as you get only the information you ask for. If you always knew what to ask for, you would probably know what to do, and you wouldn't create buggy software, right?

What's really needed on the front end of this database is an adviser. Such a tool would understand what you are trying to do when you write software. The adviser would answer the questions you frequently ask: "Where is this variable declared?" "What method in this program takes two ints and returns a pointer to a gizmo structure?" "How many references are there to this function, and what is the effect of changing it?" Such questions are not easily answered with the existing tools.



The adviser would have three primary functions. First, it would tell you that you have created a potential bug as soon as you create it. This would ease the burden of complexity. Second, it would automate routine editing chores by reducing the mechanical grunt work a developer often performs, such as automatically declaring variables and functions.

Finally, it would act as a to-do manager, letting you know when a module needs editing or updating. This also reduces time wasted on unnecessary compiling, linking and debugging.

Real enhancements

Although these enhancements sound like the dreaded artificial intelligence, they really are made possible through the classic rules-based systems used in most of today's compilers. Adding these functions to software development tools would enhance productivity while allowing developers to use the same programming paradigms they use today.

Nor is this science fiction. In fact, a few companies have already begun to include such intelligence in their development tools.

Knowledge Systems in Cary, N.C., is promising 1993 delivery of a Smalltalk programming environment with some of these facilities. Component Software in Lexington, Mass., has added these and other enhancements to its C++ software development tool for the Apple Macintosh — and soon for Microsoft's Windows. Parametric Software in Waltham, Mass., is working on another C programming environment for delivery on Unix workstations.

All promise to address the needs of IS shops and Cobol programmers.

Kuhn is managing partner of Union Consulting, a Boston-based technology, business and marketing consultancy.

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If you're like most people who've started on a program of in-house client/server training you may be disappointed with the results. If you haven't started, it's because you've recognized the need for professional training.

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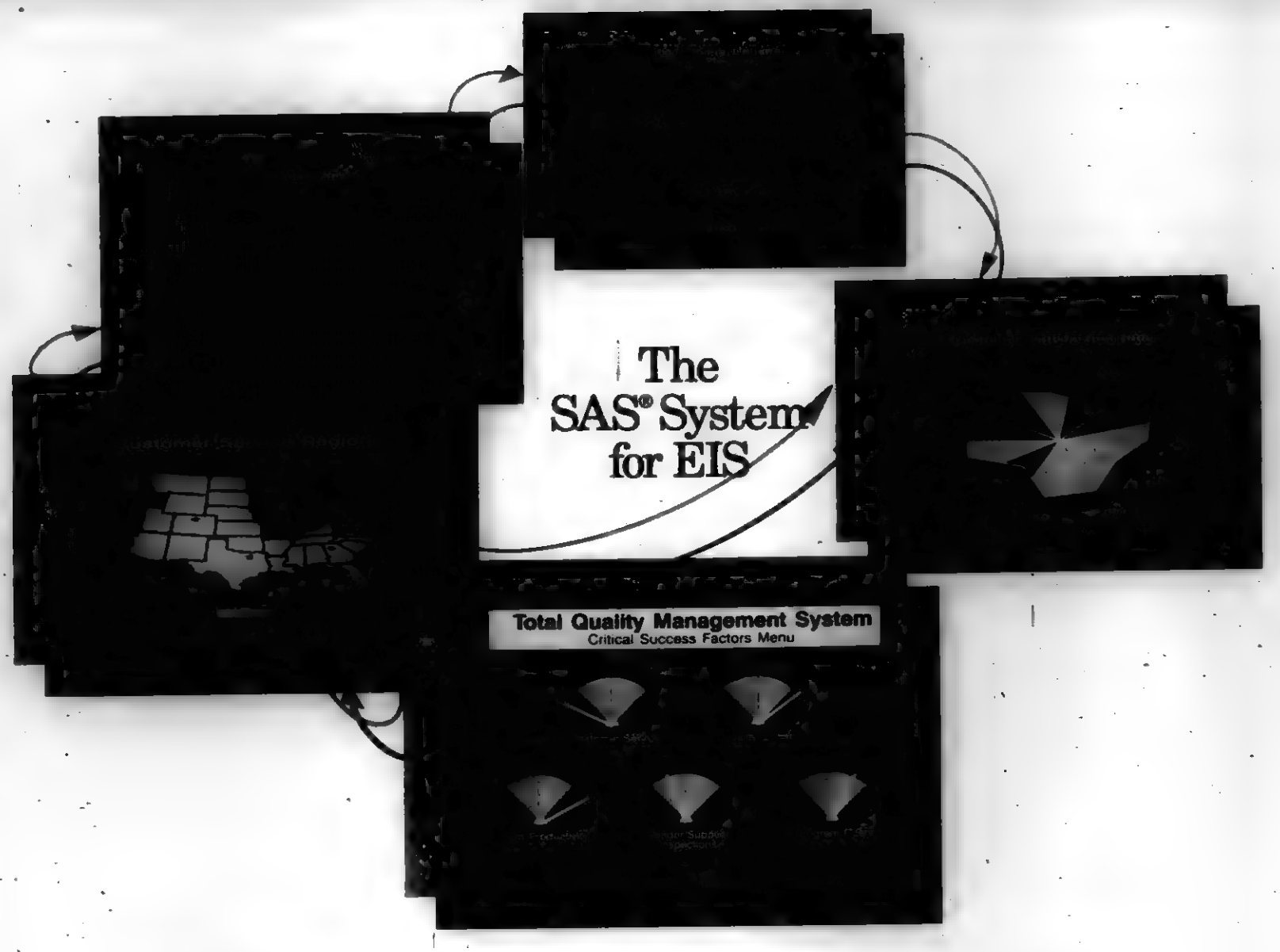

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JEAN GENIES

Four years ago, VF Corp. faced shrinking revenue and profits. Today, the multibillion-dollar maker of Lee and Wrangler jeans has its pockets filled with cash, thanks to new business processes and technology.

When the supply of Lee jeans gets low at a JC Penney Co. store, new pants will arrive within days to replenish the shelves, without a JC Penney buyer so much as touching a telephone to place an order.

Magic? Not exactly. Instead, it's an automatic inventory management system developed and managed by VF Corp., an apparel giant that makes the Lee brand of jeans along with more than a dozen other clothing lines, from Vanity Fair intimate apparel for women to Healthtex clothing for children.

While the inventory system makes life easier for JC Penney, it is even more meaningful to VF. The system is a central piece of a re-engineering strategy the company is now executing to stay competitive in the 1990s, according to Lawrence Pugh, chairman and chief executive officer.

Pugh says the strategy — which was officially launched in 1989, before he says VF had even heard the term "re-engineering" — was really a no-choice decision for the company, which was founded 90 years earlier as a maker of silk gloves.

As the 1980s came to a close, the company's revenue had leveled off in the $2.5 billion range. When Pugh looked to see what was wrong, he zeroed in on his Lee division, which VF had acquired in 1970, and he didn't like what he saw.

The jeans business was dabbling in fashion trends and not keeping up with the competition or delivering what its customers wanted, he says.

Pugh now says Lee was the primary cause for near-stagnant revenue.

"They had gotten big, sloppy and arrogant, and they weren't listening to the consumer," Pugh says of the jeans division. "At that time, I woke up and, looking out into the '90s, I recognized we had to do business differently than in the '80s."

Behind the times

When Pugh woke up, he realized that the problems with Lee were signaling a bigger issue, even though the other businesses showed no signs of trouble. Lee had lost track of what consumers wanted, in part because it didn't have effective tools to collect data on sales and buying trends. Furthermore, when it responded to changes, it was hung up by the traditional long production cycles the apparel industry had relied on for decades.

Pugh says VF needed to fundamentally change its business processes and devise a more aggressive information systems strategy to become a more responsive and competitive company.

"We've had to switch from just maintaining programs to finding ways to develop competitive advantage," adds H. Lynn Hazlett, vice president of business systems. Hazlett, who did a stint at rival Levi Strauss & Co. and then worked in retail IS, was recruited by Pugh as part of the turnaround strategy.

Led by the CEO but crafted from the input of hundreds of VF employees, the company established a corporate strategy in 1989 to redefine the core processes. It calls the mission the Market Response System (MRS), and it includes three new business processes, such as the inventory management system JC Penney now uses. The other two are continuous merchandising, with a goal of more frequent shipments to retailers, and flexible manufacturing, which would

Jean genies, *page 102*

▶VF's H. Lynn Hazlett: *Switching from maintenance to competitiveness*

Intelligence Files

RAD management

Does rapid application development (RAD), which compresses the systems development cycle, lessen the need for project management skills?

Not at all. RAD does shift some of the work to the end-user community, but the compressed time frame actually requires a greater emphasis on effective time and budget management.

Therefore, RAD and project management tools should be integrated so organizations can reap the benefits of RAD. Information systems departments should build a RAD/project management software tool kit — much like an expert system — and provide end users with it so they can drive the RAD process.

Source: Lecture by Guisseppi A. Forgionne of the University of Maryland-Baltimore County, given at the Baltimore Association for Systems Management Systems Conference, May 27, 1993.

Users as vendors

Some aggressive information systems departments have started selling internally developed software to outsiders. A survey of 51 IS directors found that a majority are dabbling in software sales to boost corporate profits.

However, many IS units are not well-organized for external sales, and there is some concern that the activity could divert the IS unit from its core functions.

The biggest challenges are providing adequate documentation and ongoing maintenance for the product, as well as creating a sales unit with an entrepreneurial attitude.

Source: "An exploratory study of software sales and purchases between IS departments" by Fritz H. Grupe, *Journal of Systems Management*, April 1993.

In-house patents

Finance and insurance firms continue to get patents for computer systems that underlie new financial products. The latest example is Signature Financial Group, Inc. in New York, which recently won a patent for the Hub and Spoke system of mutual funds management.

The complicated Hub and Spoke structure allows assets from diverse classes of investors (or spokes) to be pooled into a single investment fund (the hub) for more efficient management.

There is some debate about whether this structure is truly revolutionary, and it will likely be challenged in court.

Source: "Mutual fund patent granted" by Christine Philip, *Pensions & Investments* [trade newspaper], April 19, 1993.

Creative programming

There are two schools of thought about software development: Either it is a task full of routine procedures that could be easily automated, or it is one of the most complex and creative activities undertaken by humans.

A careful study of development tasks shows the latter is closer to the truth. The study discovered that human ingenuity outweighs routine action by a 4-to-1 margin during software development.

The research gives programmers some ammunition against notions that they can be automated out of existence or managed by nontechnicians. It also may explain why developers spend so much time staring into space.

Source: Pennsylvania State University news release, May 7, 1993.

Change blockers

Five major blocks can scuttle efforts to manage innovation and technological and cultural change, according to James Cash, chairman of the MBA program at the Harvard Business School.

Literacy blocks: Managers don't know how technology can be used to solve problems. *Culture blocks:* Some organizations insist that technology projects have clear efficiency payoffs and discourage executives from becoming associated with technology initiatives. *Vocabulary blocks:* Ideas are expressed in terms of technology, not business. *Value blocks:* Uncertainty about what should be used to measure a project's value. *Implementation blocks:* Lack of a champion who can take the idea up the organizational chart.

Solutions are complex, but Cash said designing new administrative systems can eliminate many of the blocks.

Source: "An interview with James Cash" by Neal Goldsmith, *Business Technology*, May 1993.

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Jean genies

CONTINUED FROM PAGE 99

enable VF to produce smaller but quicker production runs.

As it inched ahead into 1990, VF took its biggest hit: a huge drop in profits, from $176 million to $81 million in 1990. But today, MRS is showing results: VF can ship orders within five to seven days, down from an 80-day cycle.

The inventory management system — officially called flow replenishment — feeds point-of-sale data to VF, which can highlight a switch in buying patterns.

The company can now shift gears quickly and produce more or less of a given style.

The result? In 1992, the company reported $3.8 billion in sales, a 30% increase over 1991, and net income of $237 million, a 47% jump from the previous year.

Today, VF continues to shed its traditional approach to the apparel business, which relied on long production cycles and often crafted product strategies with little consumer input.

CEO Lawrence Pugh says more than 200 managers at Lee kicked in suggestions for the re-engineering effort.

A typical product cycle, from the birth of an idea to arrival on a store's shelves, could take 18 months to upward of two years. New designs can now be produced within several weeks.

Efficiency rules

The flexible manufacturing component is replacing the long cycles of high-volume production runs with new job scheduling and factory management that produces smaller, more frequent orders.

Meanwhile, continuous merchandising is ending the tradition of a small number of large shipments to retailers each year to more frequent but smaller deliveries. Flow replenishment transforms the retailer/supplier relationship into a partnership and helps both parties better manage inventories.

The three pieces are interdependent. Flow replenishment data makes continuous merchandising possible, and VF cannot easily perform continuous merchandising without a flexible manufacturing approach.

MRS is backed by an IS infrastructure dominated by IBM equipment. Host-based processing remains essential at VF, as it is crunching so much data and using it across systems. The company runs IBM mainframes and is a user of IBM's DB2 and Information Warehouse. Smaller divisions run Application System/400s and the front-end platform is OS/2.

VF can't be credited with total originality for its MRS strategy. Many well-known retailers have also been implementing some form of quick response strategy. But it does win points from industry analysts for its implementation skills.

"They are viewed as fairly progressive — not the leading edge but the cusp," says Claire Parker, a vice president and consultant at Cleveland Consulting Associates, a division of Computer Sciences Corp. "They see what works, and then they are quick at getting out a response."

Alan Millstein, publisher of the "Fashion Network Report" in New York, adds, "They have been proponents of quick response, and they're heavily invested in technology. But most of their major customers demanded it, too."

And MRS implementation has not been easy. It requires multiple changes to take place at once, but executives say that because VF staffers had a voice in what those changes would be, they are more willing to make the necessary changes.

So, as factory workers adjusted to dramatically new schedules and sizes of production runs, VF representatives were on the streets promoting flow replenishment to potential retail partners.

"We didn't tell people, 'Here are the changes,'" says Mackey McDonald, a VF group vice president in charge of the jeans business. He replaced the executive who managed Lee in the 1980s.

"Over 200 managers in the jeans business were involved. We asked what can we do in development, merchandising, trucking... and each of those groups came back with suggestions."

Pugh insists he is the "catalyst" for the re-engineering effort, and he personally sees to it that each of his divisions is following through on MRS.

"There aren't many conversations that I have with people today where this isn't part of the conversation," Pugh says.

Progress reports

Each division is responsible for providing Pugh with quarterly updates on its progress. Yet he is quick to point out that each group is also on its own schedule, and each is measured individually on progress.

"We did not put together a blueprint and hand it to them," he says. "We gave them the objectives."

Today, every business unit has implemented each of the three initiatives, and the progress varies by division, Pugh says. No division is operating from start to finish on the new plan yet.

Pugh says he's confident the company will keep coming back from the 1980s because VF understands its customers better than before.

"The consumer of the '90s isn't going to have the money they had in the '80s," Pugh says. "We can't pass price increases the way we did in the '80s. In order for us to reduce our costs, we had to fundamentally change the ways we manufacture our products." ■

Headquarters: Wyomissing, Pa.

Founded: 1899

1992 revenue: $3.8 billion

Major brands: Lee and Wrangler jeans, Vanity Fair intimate apparel, Jantzen casual wear, Healthtex children's wear

CEO: Lawrence Pugh

CIO: H. Lynn Hazlett

Number of employees: 57,000

Corporate strategy: Market Response System

1. Flow replenishment: Automatically maintains retailers' inventory based on previously agreed-upon amounts. In some cases, will also automatically restock for retailer.

2. Continuous merchandising: Point-of-sale data used to determine trends. Enables VF to respond to consumer demands within the same selling season.

3. Flexible manufacturing: Production based on smaller but more frequent jobs. Also allows VF to respond to market changes more frequently and reduce quality-control problems.

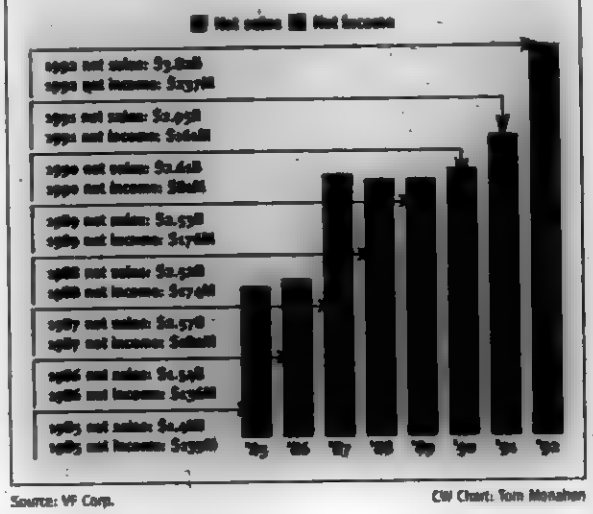
■ Information systems architecture

VF runs IBM ES/9000s at its data center hub in Greensboro, N.C. IBM DB2 and Information Warehouse are the centralized data management systems that support corporatewide use of the Market Response System. Corporatewide IBM SNA network links the corporation.

VF connects to retailers via electronic data interchange mechanisms and uses bar coding and point-of-sale computers to support its flow replenishment initiative.

FASHIONING A COMEBACK

VF's business re-engineering jump-started revenue by more than $1 billion over three years



Source: VF Corp. CW Chart: Tom Monahon

Go with the flow

While VF's corporate strategy is made up of three initiatives, the flow replenishment component stands out as its most significant overhaul and could have the biggest long-term impact.

Flow replenishment has turned VF's relationships with retailers into partnerships and has become a competitive tool for VF.

"The companies who are utilizing IS innovatively are the ones moving down this path of managing inventory for retailers," said Claire Parker, a partner at Cleveland Consulting Associates, a division of Computer Sciences Corp.

Flow replenishment is based on electronic data interchange — the linking of buyer and supplier — and is an extension of quick-response concepts used by retailers for years.

With flow replenishment, customers can place orders electronically with VF and manage their inventories with VF.

The key is to tap into point-of-sale (POS) data and analyze it continuously to track movement of product and see what is selling and what isn't.

"When we didn't have it, we could let small changes at the retail level build up," said Mackey McDonald, a VF group vice president. "Now, we see the changes occur on a smaller basis and we can adjust."

More recently, a few customers, including JC Penney, have allowed VF to manage the flow of stock. VF watches the retailer's POS data and automatically updates a particular item once the quantity falls to an agreed-upon point.

Dave Evans, vice president of IS at JC Penney, which works with about 4,000 suppliers, is currently connected electronically to about 2,700 of the suppliers. Of that group, only two — VF and Hallmark Cards, Inc. — have managed the retailer's inventory.

JC Penney prefers to manage its own inventory models, but VF "was anxious, and we said, 'Let's give it a try,' and we are very happy," Evans says.

H. Lynn Hazlett, vice president of business systems, says the firm is working with 300 retailers on the basic flow replenishment, and it has changed potentially antagonistic relationships into team-oriented relationships.

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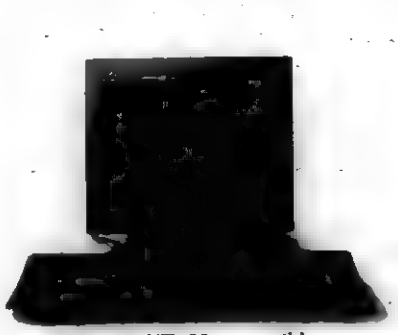

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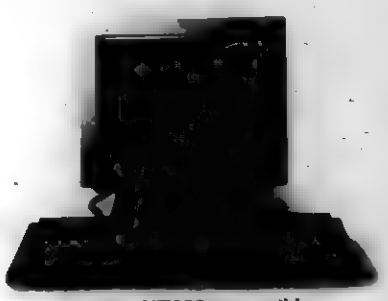

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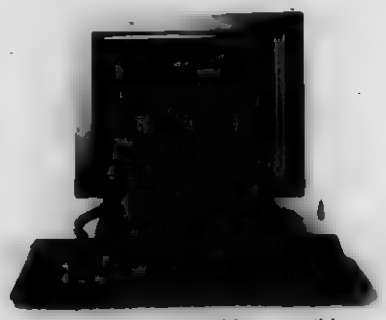

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State spurs process revamp

By Gary H. Anthes
OLYMPIA, WASH.

A Washington state agency is nearing the end of a pilot project in business process redesign (BPR), and observers here say its results are so promising it is spawning similar efforts elsewhere in city, county and state governments.

"The state is aggressively pursuing BPR at a real high level now," said Suzanne Miles, manager of information services planning at the Department of Labor and Industries, where the state cut its BPR teeth. "After watching us, they are interested in using BPR in a number of areas."

BPR-inspired improvements in systems and manual procedures have reduced the time it takes the department to procure desktop information systems technology from three months to less than nine days, and the cost of procuring non-IS supplies by 25% to 38%, according to Dan Fannin, who co-managed the BPR project.

The results were deemed so impressive that the Department of Labor and Industries' director declared that the department would undertake no new systems development efforts unless preceded by a BPR, Fannin said.

Changes needed to realize the procurement improvements ranged from the fairly sophisticated to "no-brainers," Fannin said. For example, the Department of Labor and Industries is in the process of implementing these changes to its procurement systems:

- Collapse of 11 procurement processes into two.
- Automatic assignment of purchase order number. Previously, a user would have to log on to the procurement system and then telephone another office for manual assignment of a number before the order could be placed and the computer session completed.
- Combination onto one screen (from two systems) of orders to be filled from the state's or the department's warehouse.
- "Prepositioning," or warehousing, of items such as PCs whose demand can reasonably be forecast.

"The group came up with some terrific ideas that didn't cost a lot of money," said Joe Dear, until recently director of the Department of Labor and Industries and the main sponsor of BPR. "They did not recommend a lot of expensive technology in terms of electronic data interchange."

Under coverage

The state of Washington's Department of Labor and Industries, which is leading the state into business process re-engineering, provides industrial insurance to 130,000 employers covering two-thirds of the state's work force of 1.3 million workers. The agency has 2,500 employees and 20 field offices. It paid out nearly $1 billion in worker's claims in 1991.

To help pinpoint the most promising areas for BPR, the department first ranked a number of business functions on a three-dimensional scale that assessed customer satisfaction with the services, the services' importance to the organization and the ability of the organization to improve those services.

"Procurement had the highest user noise level," said Curt Pederson, former Labor and Industries IS director. Three- to six-month delays in getting PCs were due to unbelievably cumbersome procurement procedures, a diagram of which "looked like how to build a nuclear reactor," he said.

Teams from all walks

The department put together teams that combined customers, service providers and IS people. "We kept our antennas up for people who seemed to color outside the lines," Fannin said. "We identified nine people — five customers and four service providers — who clearly demonstrated the ability to ask, 'Why are we doing this that way? Why are we doing this at all?' "

Fannin, one of two team leaders, was brought in from outside the department, and that gave him a valuable sense of detachment.

"You need that external person who is willing to call anybody's baby ugly because they don't care if they stay or not," he said.

The two teams were sent their separate ways with instructions to dream up the ideal procurement system without regard to cost, politics or anything else. "Then we came back together and guess what?" Fannin said. "The ideas were almost identical. Moreover, they matched what the state had spent the last God-knows-how-long trying to design the ultimate automated solutions."

Then the teams were sent off again and asked to come back with practical ideas that could be readily implemented while waiting for the state's long-term solution. "It was incredible what they came up with right out of the chute," Fannin said. "Some ideas were oriented to improving service, some to reducing cost, and some aimed at improving management awareness."

Low leader profile

Pederson, another key sponsor of the effort, said the project succeeded because its two project leaders downplayed their own visibility in favor of worker empowerment.

Pederson has since become acting director of central services for Thurston County, Wash., and he said he is eager to bring BPR to three county functions: auditing, property-value assessing and building permits.

Mapping out what to do was only 20% to 30% of the effort in the pilot BPR, Miles said. "But getting all the layers of approval, getting the involvement of stakeholders and getting commitment — that's what is taking the most time."

Miles said cultural barriers to the changes resulting from BPR are likely to be formidable in any organization, but in government, scrutiny and oversight from labor unions, legislatures and other regulatory bodies make change difficult.

But asked if BPR can make a substantial improvement in government, Miles said, "I'm tremendously optimistic because there is so much inefficiency in government in the first place. I think it's the only chance of getting any kind of control back into government services."

Executive Track

Allen Cournyer, senior vice president at **Texas Commerce Bancshares**, has been promoted to general manager at the bank's Consumer Credit Operations Center in Hedwig, Texas.

During the past several years, former data center manager Cournyer has presided over the successful rollout of the imaging-enabled commercial loan business.

Robert M. Rubin, information systems vice president at Elf Atochem North America, Inc. in Philadelphia, will assume the president's mantle at the **Society for Information Management (SIM)** on July 1.

Rubin takes the helm at SIM after years of service to the Chicago-based professional organization, including stints as a member of SIM's executive, finance and strategic planning committees and as chairman of the Philadelphia chapter.

In addition to Rubin, SIM's recently announced slate of directors for 1993-94 includes President-elect **Warren L. Harkness**, IS director at Framingham, Mass.-based Bose Corp., who will succeed Rubin as president in July 1994.

James R. Kinney, vice president of customer service systems at Kraft General Foods, is SIM's new vice president of finance.

William E. Eager, president and chief executive officer at First Bancorp of Ohio, will serve as vice president of chapter relations.

The new board also includes Communications Vice President **Harvey R. Shrednick**, senior vice president of IS at Corning, Inc.; International Relations Vice President **Donald A. Marchand**, who is dean at the School of Information Studies at Syracuse University; and Programs and Products Vice President **Edgar M. Frandle**, IS vice president at DataCard Corp.

Calendar

JUNE 20-JUNE 26

Mobile Computing Forum. Dallas, June 21-23 — Contact: Daniel J. Edelman, Inc., Mountain View, Calif. (415) 968-4033.

Network Security in the Open Environment. Washington, D.C., June 21-23 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2310.

Advanced Program-to-Program Communication and Advanced Peer-to-Peer Networking (APPC/APPN) Platform Developers. Research Triangle Park, N.C., June 21-24 — Contact: Kay Sintal, APPC Market Enablement, Research Triangle Park, N.C. (919) 254-4460.

James Martin World Seminar. Atlanta, June 21-25 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

M Technology Association Conference. Washington, D.C., June 21-25 — Contact: M Technology Association, Silver Spring, Md. (301) 431-4070.

The Road to ATM Conference. Washington, D.C., June 22-23 — Contact: Telecommunications Reports, Conference Department, Washington, D.C. (202) 842-3022.

Fourth Annual Worldwide Personal Communications ComForum. Alexandria, Va., June 22-24 — Contact: ComForum, Chicago, Ill. (312) 938-3500.

Winning Strategies for Upgrading AS/400 Systems and Storage Conference. White Plains, N.Y., June 24-25 — Contact: Reliability Ratings, Needham, Mass. (617) 444-5755.

JUNE 27-JULY 3

The Disaster and Recovery Symposium. New York, June 29-30 — Contact: Association for Information Technologies, Kings Park, N.Y. (718) 482-8484, ext. 206.

PC Expo. New York, June 29-July 1 — Contact: All Conference Travel, Fort Lee, N.J. (201) 346-0300.

The 11th Annual Conference on European Fiber-optic Communications and Networks. The Hague, Netherlands, June 30-July 2 — Contact: Information Gatekeepers, Inc., Boston, Mass. (617) 232-3111.

JULY 4-JULY 10

Client/Server and Distributed Database Management Systems. Troy, N.Y., July 8-9 — Contact: Office of Continuing Education, Rensselaer Polytechnic Institute, Troy, N.Y. (518) 276-8351.

JULY 11-JULY 17

1993 Banyan Technical Conference. Cambridge, Mass., July 11-13 — Contact: Banyan Systems, Inc., Westboro, Mass. (508) 898-1000.

11th National Conference on Artificial Intelligence. Convention Center, Washington, D.C., July 11-15 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

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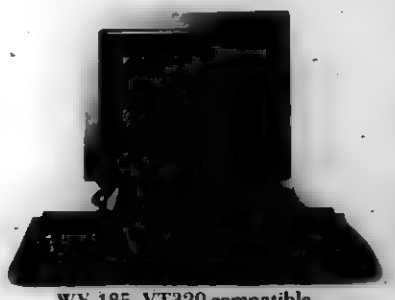

WY-185. VT320 compatible.

WY-370. Color VT320 compatible.

WY-325. Color VT220 compatible.

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PC Week - May 10, 1993

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Not quite ready for prime time

Prime concerns

We asked 161 Buyers' Scorecard respondents to answer a series of questions about OOP. Here are some of the results:

Code reuse

73% of respondents found that only half their OOP code was reusable in more than one application.

Legacy systems

54% of respondents considered it a "very" or "somewhat" important issue to integrate legacy systems with their OOP-developed applications.

Training

94% of respondents considered it a "very" or "somewhat" important issue to train staff in object-oriented languages and concepts.

By Alan Radding

You'd think the entire industry was dropping Cobol. At some point, every publication crowding your mailbox has likely touted the promise of object-oriented programming (OOP). Even the general business press has joined the admiring throng, notably so in *BusinessWeek*'s September 1991 six-page cover story, "Software made simple."

OOP shows lots of promise, but tool and training hurdles remain. Best advice: Start small and wait for more business-oriented class libraries before you invest heavily.

Little wonder. OOP promises are many: reusable components, fast delivery times, high success rates for new applications and flexible programs.

But while OOP success stories — and there are many of them — are the main course on the computer industry luncheon circuit, information systems executives are not ready to swallow another magic pill for their software development woes. "I'm see-

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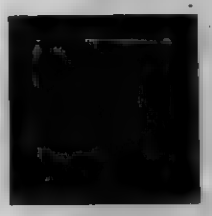
inside

Our "Object primer" sheds light on OOP page 111

NextStep users lend new Intel version page 121

Smalltalk and C++ tools face off page 118



It's curious what passes for interoperable computer systems these days.

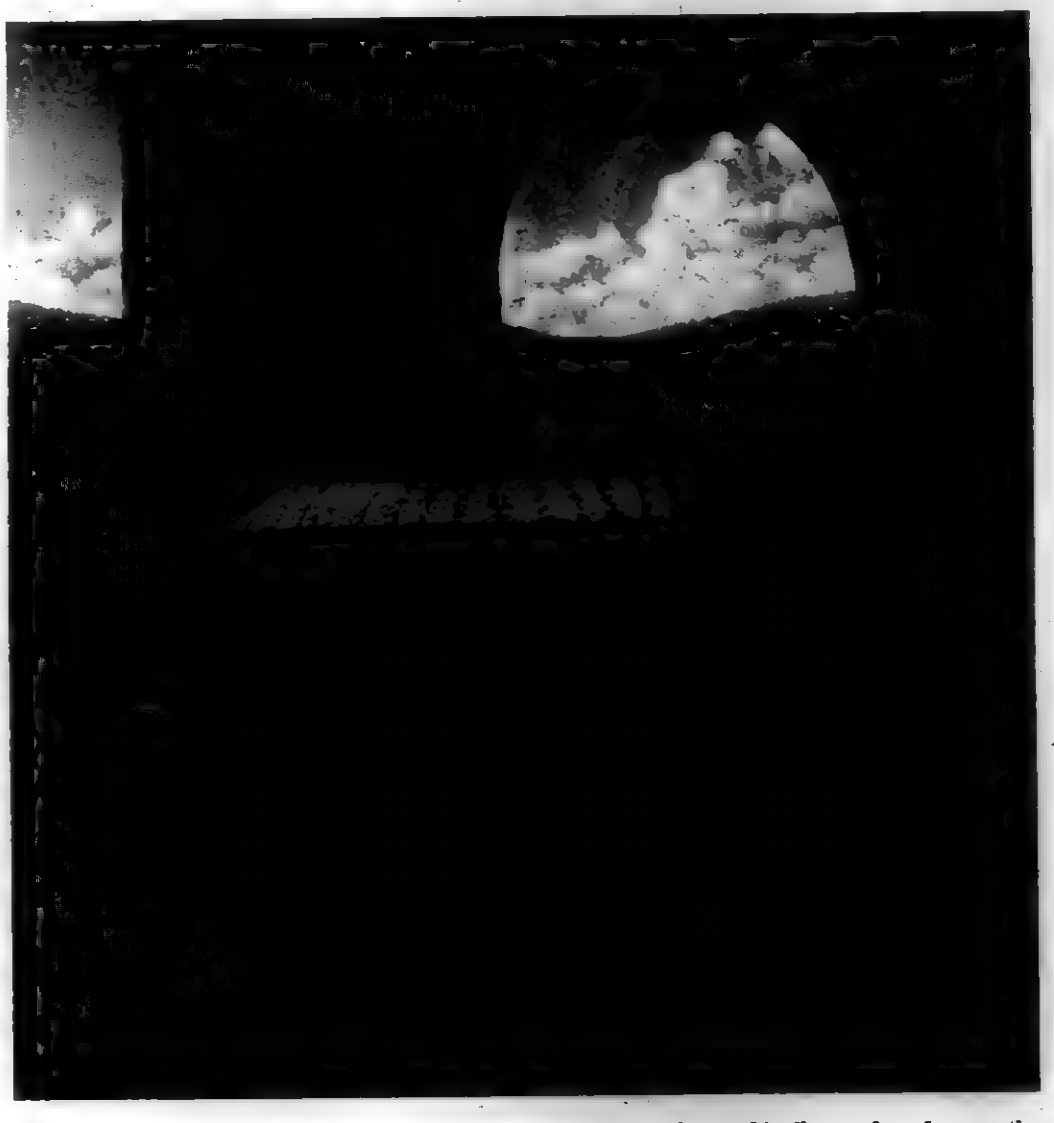
Lately, many computer makers are claiming, "Our systems are open." But their customers are asking, "Open to what? *Your* computer environment? Or ours?"

The point is well taken. Because computers should work with systems already in place, the customer's existing investment. And with systems yet to come, the customer's future investment. It's a big assignment—*interoperability*, enabling information to move freely across different computer environments.

Permit us to suggest a simple test. Ask your computer providers if their commitment to interoperability extends to a few of their offerings—or all of them. Ask if their commitment ends with UNIX® and PC operating systems—or anchors their systems architecture and corporate strategy. Total interoperability does not yet exist. But a total commitment to interoperability puts Unisys at the head of the industry—and gives our customers a head up on the competition.

Perhaps you hadn't realized that Unisys is a pioneer at delivering information solutions over open information networks. And among the first to appreciate that open systems are only one stop on the drive to interoperability.

"No supplier is doing more to respond to its customers' requirements for interoperability across an entire product line than Unisys," reports the Aberdeen Group. We've brought the benefits of interoperability to customers such as The Limited, the State of Ohio, Banque Bruxelles Lambert, and more. It's all part of our focus on the customer. And a prime reason 60,000 Unisys customers in 100 countries rely on us for solutions to fit their needs. Not merely our own.



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Prime time

CONTINUED FROM PAGE 107

ing the same things I used to see at the CASE conferences, even [the same people], citing the same 10-times increases in productivity," says Olin Redmon, manager of development technologies at Glaxo, Inc. "There's a lot of hype."

More exploration than production

That doesn't mean the worldwide pharmaceutical company isn't doing its share of exploration. Isolated uses of OOP are scattered throughout Glaxo, and Redmon's group plans to pilot some projects in the near future.

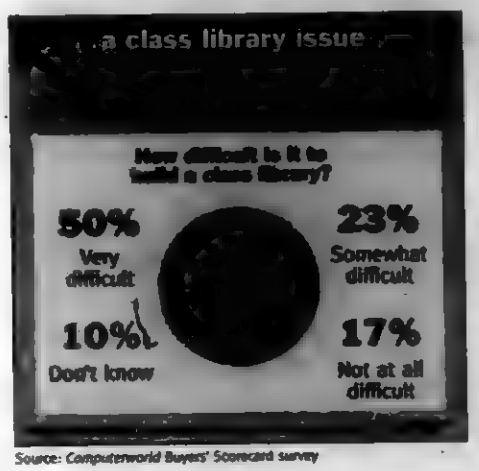
But at this point, there is more tire kicking than OOP production. In a recent study conducted by Index Summit, a research and advisory service of CSC Index, Inc. in Cambridge, Mass., 42% of North American respondents were researching OOP, compared with only 6% in production development. Of those moving forward with OOP, the majority are independent software developers and consultants.

Still, the benefits of reuse and the promise of programmer productivity are too great for corporate developers to pass up. In a recent *Computerworld* survey of 161 OOP users, 64% said programmer productivity increased by up to 50% through the use of OOP methods.

The Enterprise Information Systems Group at Hughes Aircraft in Long Beach, Calif., has built five systems for the Air Force using tools from ParcPlace Systems, Inc. The applications — primarily accounting and human resources programs — have progressed so well, says J. L. Godwin, senior consultant for IS, that the group was given the go-ahead to prebuild common business objects from which new applications will subsequently be assembled without the need to write much new code at all.

See In Depth, starting on page 127

This and other experiences demonstrate why smart companies shouldn't ignore OOP, but they also suggest why it's important to balance promise with reality. "There are a bunch of hurdles," says Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. The largest of these is not technology but the cultural leap from traditional procedural programming to OOP and the resulting retraining and investment it requires.



Source: Computerworld Buyers' Scorecard survey

Plenty of products

The tools themselves are pouring onto the market. "We're seeing the tools coming together," says Jerrold Grochow, chief technology officer at American Management Systems, Inc. in Fairfax, Va. Numerous vendors provide basic integrated development environments for C++ and Smalltalk. These environments comprise editors for revising code, debuggers for tracing and correcting errors and browsers for analyzing the structure of the code and the relationships of the objects. They also include basic "class libraries," which contain low-level objects.

Microsoft Corp.'s Visual C++ and ParcPlace Systems' VisualWorks are typical of the OOP environments available to users. Other products, such as Inference Corp.'s ArtEnterprise, bring some artificial intelligence capabilities to OOP, allowing developers to create, in effect, intelligent objects that have some of the reasoning capabilities of expert systems.

On the whole, however, OOP tools are far from mature. For one thing, you can mix and match class libraries, browsers and debuggers only with great care and effort. What's more, a key product category — off-the-shelf, business-oriented class libraries — is severely lacking.

A need for more class libraries

Class libraries eliminate a lot of the preliminary work that goes into building an object. Essentially, they are collections of predefined categories that developers can immediately start populating with objects. As more class libraries become available, corporate developers can spend more time assembling applications from prebuilt classes and less time writing, testing and debugging new classes of objects.

There are class libraries available today that provide low-level components. Sometimes referred to as interface classes, these products provide basic program components such as graphical user interface (GUI) buttons or the rectangles and circles used to create GUI components. There is also a number of control-class libraries that perform middleware functions, such as generating a SQL query.

While these classes are useful, they do not free the developer from having to design and build the business functionality almost from scratch. That won't occur until developers have access to high-level (domain) class libraries consisting of business domain objects, such as a "bond" or "equity." Then the developer can assemble the application by connecting predefined classes and filling them with the objects.

"When we get off-the-shelf [domain] class libraries, that will turbocharge everything," says Nick Vitalari, vice president/director at Index Summit.

Low-level libraries available

"There are good [lower level] class libraries available for things like string classes or collection classes," says Philip Meese, director of technical services at Mercury Technologies, Inc., a New York-based consultancy specializing in financial applications. Meese uses Centerline Software, Inc.'s Object Center development environment for Unix with lower level class libraries from Rogue Wave Software, Inc., but he builds his own financial domain classes for things such as bonds and futures.

The high-level class libraries that do exist may also be difficult to incorporate into your

Prime time, *page 116*

Quiz

Object-oriented databases: Are they for you?

By David Baum

Object-oriented databases are excellent for some types of applications, but they're not for everyone. With relational technology's maturity, wide availability and support, object databases have some catching up to do before they are the technology of choice.

Take the following quiz to see which database technology is for you. When you're finished, turn to page 116 to tally your score.

David Baum is a Santa Barbara, Calif.-based writer who specializes in application development.

1 Are you going to store video clips or other structured multimedia information in your database?
yes no

2 Do you need to store design information from CAD, CAM or CIM applications?
yes no

3 Do your applications primarily access simple tabular data for things such as personnel records, general ledgers and tax tables?
yes no

4 Does your application make use of richly structured, deeply nested information, such as a bill of materials with 300,000 components?
yes no

5 Do you have extremely large amounts of data, in the multigigabyte range?
yes no

6 Are the database applications you create going to be used by many (more than 50) concurrent users?
yes no

7 Do your needs call for unstructured, on-the-fly, ad hoc queries?
yes no

8 Is a standard data access language important to you?
yes no

9 Are you developing mission-critical OLTP applications that will bring the business to a standstill if the application fails?
yes no

10 Are you using object-oriented application development tools?
yes no

11 Do you need a platform other than UNIX?
yes no

Scoring, page 116

Developing client/server applications doesn't have to be a nightmare.

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Object primer

Two important things to know about objects

"I'm alive."

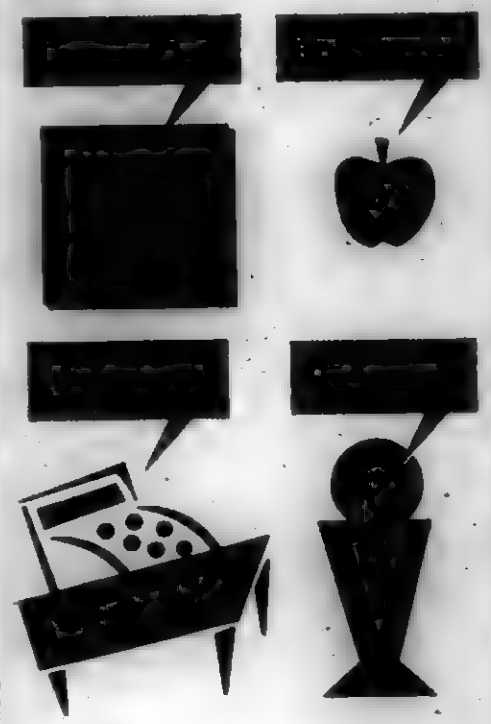
You can understand objects better by thinking and talking about them in the first person: "I know my own. . . ." and "I can . . . myself."

"I'd rather do it to myself."

You can work with objects more effectively when an object acts upon itself.

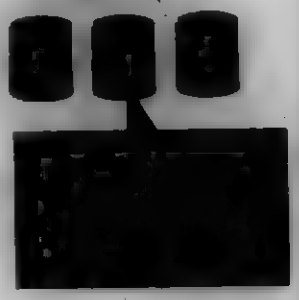
what is an object?

An object is a person, place or thing. When brought to life, it knows things (called attributes) and does things (called services).



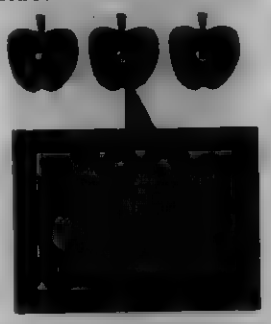
A group of like objects make up a "class."

Class: Item



Classes can be "specialized."

Class: Perishable Item



three key concepts

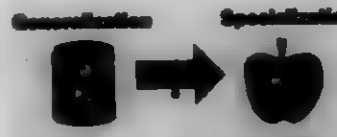
Encapsulation

The principle that an object should hide things from other objects, limiting visibility about what "I know and do."

("Data hiding")

Inheritance

The principle that a class can extend from another previously defined class. The guiding principle is to organize the classes according to generalization/specialization.

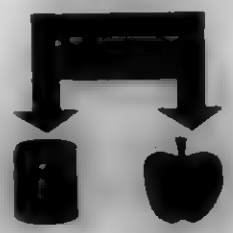


Class: Item "I'm an item."

Class: Perishable Item "I'm a perishable item."

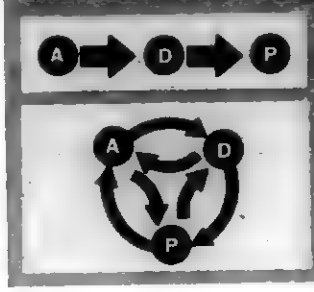
Polymorphism

The principle that objects in different classes may understand the same message yet respond in different ways.



"I do it my way." "I do it my way."

how objects make programming more effective



Structured development
Analysis, design and coding take place in the traditional "waterfall" way. Each step is isolated from the other. Working results can take two or more years to see.

Object-oriented development
One multifaceted model is used from concept to code. Because one underlying model is used, teams apply analysis, design and programming concurrently.

Source: Peter Coad, Object International, Inc, Austin, Texas
For a free objects poster, call (800) 662-2667 or fax (512) 795-0332 ($4 shipping and handling).

Where 4GLs fit in

Fourth-generation languages (4GL) are often grouped in the same category as object-oriented programming (OOP) tools. But while these products are likely built using OOP techniques, and while they produce applications with object-oriented characteristics, such as GUIs, they are essentially procedural tools.

Still, some 4GLs may provide an effective transition to OOP. Powersoft Corp.'s "PowerBuilder has some object flavor to it," says Olin Redmon, manager of development technologies at Glaxo, Inc., a worldwide pharmaceutical firm. "It might make it easier for us to begin OOP than learning C++."

Other 4GL vendors are adding object capabilities to their tools. Gupta Corp.'s SQL Windows 4.0, for example, provides multilevel inheritance, polymorphism and encapsulation. The company is even shipping a basic class library with the product.

4GLs can be useful in the right circumstances. "4GLs represent a progression beyond procedural programming. We're seeing a refining of 4GLs to comply with OOP requirements," says Dick Dionne-Keay, an industry analyst at Summit Strategies, a market research firm in Boston. "The important thing," he continues, "is not that the tool be object-oriented per se but that it give MIS shops the benefits of OOP."

ENTERPRISE MANAGEMENT

Managing Change and Complexity

Two opposing forces in modern business are on a collision course: the need for specialized, localized hardware and software solutions, and the need to cost-effectively unite these information resources into a manageable business asset.

As IT managers respond to this challenge, they must cope with explosive growth in the number and diversity of devices and systems. Enterprise systems are becoming profoundly more complex.

Organizations today have a mixture of older, centralized systems and new, distributed systems—a wide variety of technologies provided by an even larger number of vendors.

The challenge is managing this diverse collection of resources. The nature of the problem requires a "best-of-breed" multi-vendor solution.

That's why the leaders in information technology listed here are committed to creating and providing Enterprise Management solutions.

What Is Enterprise Management?

Enterprise management is a strategy for integrated monitoring, measurement and control of multi-vendor networks and computer systems to serve enterprise business needs. It is a technological framework into which multiple management tools, applications and displays can fit, providing end-to-end management of network elements and resources.

Enterprise management requires an organizational commitment to, and consensus on, a common open management platform and a set of open management standards for use throughout the enterprise.

The Benefits

Implementing an enterprise management strategy provides considerable benefits:

- Continuously high levels of reliable and responsive service.
- Smooth incorporation of new client-server solutions with existing mainframe approaches. Your investment in existing mission-critical applications is preserved and augmented.
- Change and increasing complexity can be accommodated more quickly, without jeopardizing system and network availability.
- Greater optimization of network and system resources ensures high quality service is maintained at the lowest possible cost.
- Automation of management processes allows systems administration and operational costs to reduce steadily as your enterprise grows.
- Network and data security is enhanced.

What You Can Do Today

To achieve the benefits of enterprise management, take these steps:

- Develop organizational consensus on a strategy and on a management platform:
  - working with your key vendors and carriers, develop a strategy for implementing this enterprise management architecture within your organization.
  - establish purchasing guidelines that all parts of your organization can follow so that their evolving information systems can fit into the enterprise management approach.
- Select a common open management platform for use across your enterprise that:
  - enables management of products and services from multiple vendors.
  - is standards-based.
  - enables integration of management tools and applications from multiple vendors.
- Review existing management tools and interfaces and prioritize upgrades that move the organization toward enterprise management in the most cost-effective and rapid manner possible.
- Favor distributed and object-oriented management solutions.
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what's HOT

Operating systems: The true promise of objects is the construction of extremely flexible systems. To realize that promise, an environment should use objects from the lowest level system services all the way to the user interface. Today, Next, Inc.'s NextStep offers many of these features in an integrated package. The technology with the most promise is the Pink project at Taligent, Inc.

Distributed objects: The Corba standard from the Object Management Group simplifies the problem of distributing objects within and between platforms. It will be adopted by all serious vendors of object technology and facilitate the development of client/server applications. Today, Distributed Smalltalk from Hewlett-Packard Co. meets all Corba criteria.

Object-oriented modeling and methods: The most natural way to construct an object-oriented system is to first model the requirements and architecture using an object method. The key to maximum reuse is to model key objects at the enterprise level.

Crossover products and methods from AI: Two of the best application development environments are ProKappa from Intellicorp and ArtEnterprise from Inference Corp., two AI vendors.

Visual programming environments: Tools such as Digitalk, Inc.'s Parts, ParcPlace Systems, Inc.'s VisualWorks and Microsoft Corp.'s Visual C++ speed application development by providing a more abstract interface that requires less knowledge about the underlying technology.

Object-enhanced productivity tools: Powersoft's PowerBuilder 3.0 is a prime example of a product that has benefited from an overhaul to incorporate the spirit of objects. It features encapsulation and inheritance to let users develop client/server applications with reusable parts.

what's NOT

By Adrian Bowles

It's easier to put objects "on" the box than it is to put them "in" the box. And because no one wants to be left out of the current object mania, we're now inundated with products that are decidedly not object-oriented but still bear object labels. These products are frequently offered by vendors attempting to add an object appearance to aging technology, which is a poor use of objects with limited long-term utility.

On the bright side, there are several arenas in which object technology has made a significant impact (or promises to in the next few years). The best of these products come from three intersecting camps:

- New vendors that, with no significant legacy systems, are free to use the latest technology.
- The artificial intelligence community, which is now learning to commercially market the OOP application development tools it has been developing for years.
- Unix tool vendors, which turned to objects early on to meet the high expectations of Unix developers.

Object CASE: No vendor today offers a complete integrated computer-aided software engineering (CASE) product with the power of a tool like Information Engineering Facility from Texas Instruments, Inc. Most of the products are repackaged conventional tools with a new set of icons. Their developers do not use the object methods they claim to automate, and their tools offer functionality comparable to early-1980s CASE. Notable exceptions that actually support methods and were developed using object technology include Objectory from Objective Systems, Rose from Rational Systems, Inc. and Teamwork from Cadre Technologies, Inc.

Hybrids: Hybrids, such as Object-Oriented Information Engineering and object-Cobol, promise to preserve legacy investments. While this makes sense in situations where the legacy is an asset, sometimes it pays to move on to the newer technology without the drag of the old. Leading information engineering innovators are objectifying that technology, but most users are years behind those vendors. For its part, object-Cobol will ultimately fail to deliver significantly better systems because programmers will continue writing procedural code in object-Cobol.

Objects at the glass only: Any product whose only claim to object status is the use of a GUI has missed the point. Although GUIs make life more pleasant for the user, they do not make products more flexible.

Object wrapping: Encapsulating a conventional component so that it may be treated as an object is seen by some as a way to handle ailing legacy systems. In reality, though, wrapping poor code is a lot like wrapping fish: It won't take long to discover the truth about the contents.

The only time that code-wrapping makes sense is when you have high-quality, stable components to integrate or when the component is so important but brittle that a rewrite is not feasible and your new system will be object-oriented.

To methodology or not to methodology?

Many people hear the word "methodology" and groan. After all, it was the Achilles' heel of computer-aided software engineering. "Following the methodology" became an end in itself, and organizations lost sight of the real goal: to get an effective system out the door.

Now methodologies are popping up for object-oriented programming (OOP), and it's enough to make an information systems manager hesitate. Although OOP methodologies are supposed to be more flexible, whether to use one is still one of the more controversial topics among OOP developers. In a *Computerworld* survey of 161 OOP users, respondents were divided equally as to whether they used a methodology.

"Methodologies lead you into quicksand," says Cliff High, application systems development supervisor for the state of Washington's Department of Health. "We once spent three years following a methodology and ended up with a diagram that we couldn't code," something he's determined not to repeat with OOP, High says.

Nick Vitalari, vice president/director at Index Summit, a research and advisory service of CSC Index, Inc. in Cambridge, Mass., also rejects conventional methodologies in favor of "rapid prototyping that lets you fail fast and get into experiential learning."

Others, such as Jerrold Grochow, chief technology officer at American Management Systems, Inc. in Fairfax, Va., say, "You can do without a methodology for small-scale projects, but it's another thing to try to rearchitect a firm's systems using dozens or hundreds of developers. You need a structure to organize around."

Peter Coad, a methodology author, takes the middle ground. He rejects conventional methodologies as too heavy-handed for OOP. Still, "you want enough notation to communicate and a strategy that lets people be innovative," he says.

Different methodologies are considered better for different types of problems:

- Object Modeling Technique (Rumbaugh) is regarded as flexible and best suited for fast, iterative development.
- OOD (Shlaer Mellor) provides formal, rigid control of very large, complex projects.
- ObjectOry (Ivar Jacobsen) comprehensively supports analysis through maintenance, with well-defined mapping between the analysis and design models, according to Adrian Bowles, managing director at Atelier Research in Westport, Conn.
- Object-Oriented Design (Booch), Bowles says, supports both conventional and object-oriented languages and is suited for real-time environments and the defense industries.

OOP tool vendors align their tools with methodologies in one of two ways, Bowles explains. The first, which is less formal, is "notation support," where the tool recognizes the symbols and signs used in the design. The second, which is more rigid, is "notation and step support," in which the tool enforces compliance with the methodology.

When a product provides tight support for a methodology, consultants advise against substituting another method. "It would be a waste of effort to try to use Rational Rose without Booch," Bowles says. For tools that support notations but not methods, you can cherry-pick among multiple methods.

—*Alan Radding*

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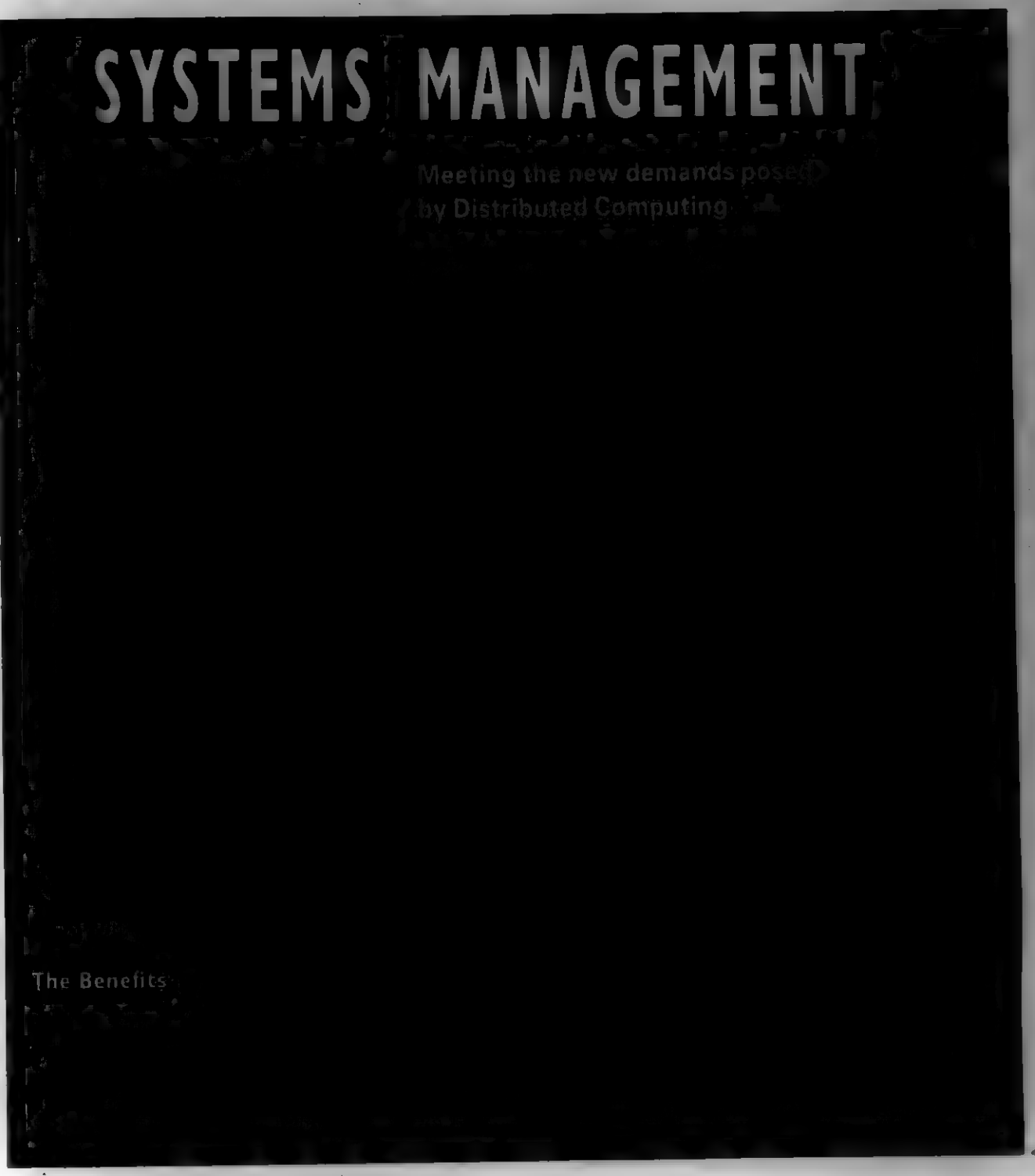
Meeting the new demands posed by Distributed Computing



Distributed systems demand the same level of management and availability that IS has historically provided in a mainframe environment. Yet the technical approach to distributed systems management is fundamentally different from that applied to centralized systems.

Hardware and software resources to be managed tend to be more numerous, widely-dispersed and provided by a wide variety of vendors. Put simply, old approaches to systems management cannot be incrementally extended to manage these new distributed systems. A new approach is required.

Why A New Approach Is Necessary

When compared to the centralized mainframe environment, tracking and intervention tools for distributed systems management still appear somewhat primitive - even as the number and variety of systems IS professionals must manage is increasing. At the same time, IS professionals are expected to provide backup and recovery services, fault isolation and repair capabilities, and updating procedures that provide levels of service similar to those users have come to expect from centralized systems. These demands all threaten to increase administrative and support expenses. And if these systems are poorly managed, there's a real chance such expenses may actually erase the cost reductions achieved through downsizing.

Effective distributed systems management addresses these issues. It provides the considerable business benefits of distributed computing within a context that allows for effective management of IT resources and costs.

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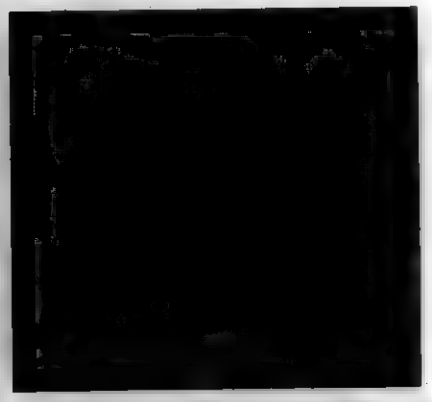

▶ Develop organizational consensus on an enterprise-wide open management platform that can interface with your legacy systems and newer distributed systems.

▶ Acquire management tools and applications for distributed systems that integrate with the open management platform you choose.

▶ Favor object-oriented management solutions.

▶ Place open management agents on systems, clients and servers throughout the enterprise that will communicate with your management platform.

▶ Take an application-oriented view towards the utilization of system resources. This allows you to target your management focus on areas likely to provide the biggest and quickest return to end users.

▶ Create automated responses to system problems - responses that automatically alert system managers when problems occur, or which resolve problems at the same speed they occur.

▶ In the switch from centralized to distributed processing, leverage the expertise, skills and methodologies of existing MIS personnel. And remember that legacy systems are likely to play a key role in mission-critical applications for many years to come.

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Prime time

CONTINUED FROM PAGE 100

application. Because they tend to be compiler-specific, you can't assume a Smalltalk class library from ParcPlace will work with a Digitalk, Inc. compiler, for instance.

Rick Price, systems analyst at Cap Gemini America, Inc. in Atlanta, succeeded in mixing class libraries by sticking with compiler-specific classes when he could and avoiding compiler-specific code every place else, proving it can be done with effort.

Source: Computerworld Buyers' Scorecard survey

Browsers and repositories

Even with class libraries, you can't take advantage of reusable code if you're not able to locate useful classes when you need them. That's where browsers and repository tools come in. But even here, the tools could be more mature. The few repository tools that are available offer only limited platform support and rudimentary features.

Browsers, which generally are integrated with the OOP environment, show you the classes in a given application. For example, they will show graphically how certain objects relate to other objects and display the inheritance. In other cases, you can simply list the classes used in the application.

Separate repository tools maintain the classes in a central location, making it easier for multiple development teams to share them. They also store semantic information about the classes, such as where, when and how they should be used.

While it's not absolutely necessary to have a repository, it's helpful when the number of classes and developers grows. Repositories are sold separately from OOP environments.

Southern California Edison in Rosemond, Calif., uses the Envy repository from Object Technology International, Inc. in Ottawa for its Smalltalk class libraries, which were developed with VisualWorks. The firm uses OOP to create applications that watch the flow of work across people's desks and alert them to things they should be doing. Harvey Kramer, manager of applied technology, likes the product because it "stores the classes in a database on the LAN and allows Smalltalk to grow beyond the single-user mentality."

Difficult integration

Finally, developers face the problem of getting tools from different vendors to work together easily. Developers also report difficulty combining class libraries from different sources. You can do it, but only with great care. "These tools are really just in their infancy. At the next stage, the tools will speak to each other," Meese predicts. The eventual solution must take the form of a repository of object information that any tool can call upon, adds Steve McClure, manager of object-oriented technology at International Data Corp.

Standards will resolve some of the difficulty in combining tools and class libraries, but standards, as usual, are lagging. "We're going to have to live with a lack of standards for the next two to three years," Grochow notes.

The Object Management Group (OMG) made headway with its Object Request Broker and Common Object Request Broker Architecture (Corba), but Corba doesn't address how tools and libraries speak with each other. It defines how objects interact across the network and the mechanism by which users can tap objects elsewhere on the network.

Although developers are making progress with OOP, corporate IS has been slow to follow. That's likely because while you can find tools that let you build industrial-strength applications, they are far from easy to use. To use them, firms face a massive investment in training and outside help on top of the investment in the tools just to get to the point where they can begin to be productive. Having been burned by big investments in computer-aided software engineering that didn't pay off, people are finding it pays to be more cautious this time around. ■

Radding is a free-lance writer based in Newton, Mass.

Reuse not guaranteed

You can build the perfectly functional OOP application — but that doesn't guarantee you'll achieve the dream of software reuse. In that dream, application developers snap together complex applications using off-the-shelf, proven objects the way children build structures snapping together Lego pieces.

In a *Computerworld* survey of 161 OOP users, 73% said they were able to reuse only half of their OOP code in more than one application. And Brad Clements, president of Murkworks, Inc. in Potsdam, N.Y., a small software developer, built a number of DOS utilities in Borland International, Inc.'s C++ using OOP techniques. While the application works fine, "my concept of reusability was not correct," he says.

Because he was working in DOS rather than Windows, Clements was unable to take advantage of the class browser built into the Borland environment, which he says made life difficult. "When you can't see the inheritance laid out in a graphical way, you can't see if you made a mistake in the overall scheme," he says.

But the real problem was his lack of a methodology (see story page 114). A methodology, Clements suspects, would have helped him design his classes to optimize reuse.

The trick to reuse, according to Peter Coad, chairman of the OOP training and consulting firm Object International, Inc. in Austin, Texas, is to consider it from the very start and not make your initial domain classes too specific. For instance, a "buy" object should be built for applications ranging from investments to retail.

Chicago-based Andersen Consulting, for example, gets as much as 95% reuse in its OOP efforts, reports Steven Rothman, managing director for solution delivery programs, because "we start with the intent of making the objects reusable."

—Alan Radding

Quiz scores

Scoring for the object quiz, page 109

1. If yes, 5 points for object-oriented.

2. If yes, 5 points for object-oriented.
In any application dealing with complex data or data derived from real-world entities, an object-oriented database will win hands-down because of its superior modeling capabilities.

3. If yes, 3 points for relational.
The tabular, set-oriented representation of data in the relational model lends itself naturally to much of the information that floods the business world.

4. If yes, 3 points for object-oriented.
In an object-oriented database, information is tightly linked through object identifiers. Navigation among complex data sets — such as selecting a subset of 283,000 components for a particular engine — is efficiently handled with high-speed messages or pointers.

A relational database must use inter-table joins to accomplish the same results. This is cumbersome and can quickly bog down even the stoutest of processors.

5. If yes, 3 points for relational.
Relational is a better choice for simple data structures without a lot of complex join operations. Data is indexed for fast access.

6. If yes, 3 points for relational.
Object-oriented databases tend to freeze up with lots of concurrent access — typically more than 50 or 100 users, depending on the product.

7. If yes, 3 points for relational.
Relational DBMSs are very good at pulling up new relationships among the data. They are optimized for unanticipated queries. With an object-oriented database, data associations generally must be hard-wired through the database's pointers. You can do ad hoc queries with some object-oriented databases, but the technology is less mature.

8. If yes, 5 points for relational.
Object-oriented database interfaces tend to be language-specific. For the most part, each one declares its own interface protocol. Most are C++, which can be awkward if you are in any other development environment. In short, there is no equivalent to SQL in the object-oriented world, although standards efforts are afoot to remedy this situation.

9. If yes, 5 points for relational.
This is the forte of relational databases. They are optimized for short, accurate transactions through mature rollback and recovery features. If the network goes down in the middle of your transaction, your data remains intact. Object-oriented databases lack the integrity features and support for large numbers of concurrent users that relational database vendors have had a decade to perfect in the commercial business world.

10. If yes, 5 points for object-oriented.
If you are moving toward object-oriented tools, ultimately you will want an object-oriented database to more easily access and store information in an object-oriented format. For example, if you have programs in Smalltalk or C++, you will have to go through a translation and mapping process to let data structures be stored in a relational database. You'll take a performance hit whenever you retrieve that data, and it's a lot more work to make it fit.

With an object-oriented database, inheritance of attributes and methods from one class of object to the next can be stored with the data itself and modified on the fly.

11. If yes, 3 points for relational.
The current crop of object-oriented databases runs mostly on Unix workstations and minicomputers. If you are using mainframes or PCs, better stick with relational. You will likely have to invest in some new hardware for your object-oriented database management system.

NETWORK MANAGEMENT

Ensuring flexibility, consistency and reliability

Even if your network copes with your enterprise needs now, is it prepared to handle the way your organization will move and use information tomorrow? Your network will need to support applications far more complex and powerful than those you're using today. And it will need to do this flexibly and reliably, across organizational and geographic boundaries.

Without an integrated, open approach to network management, building and managing a network that will evolve successfully to meet these demands is impractical. Without effective network management, cost control is impossible.

The Benefits

Networks have become a crucial determinant of enterprise efficiency and competitiveness, which is why effective network management is now more essential than ever to the health and success of your organization.

Network availability, for example, is essential to mission-critical applications such as customer service, inventory management, EDI and product development. Network management enables consistent, reliable network service that organizations can depend on. An integrated network management approach will enable your enterprise to quickly respond to requests for new services to meet evolving business needs. This is especially crucial in a period when use of network-based applications is growing rapidly.

Integrated network management provides a foundation for higher levels of automation of administrative and operational tasks. It also improves responsiveness to user needs while substantially lowering support costs. Integrating your network management solution into a broader enterprise management strategy is far more cost-effective than investing in closed, vendor-specific solutions on an ad hoc basis. And it provides your IS department with the information necessary to track costs and optimize network resources while maintaining desired service levels.

What Is Open Network Management?

What You Can Do Today

- Address network management from a strategic perspective. Ad hoc solutions and their incompatibilities will ultimately cripple your network.
- Choose an open platform for managing your enterprise network that is compatible with other enterprise management choices. Gradually, eliminate proprietary management interfaces, instead choosing new equipment based on open standards such as SNMP and CMIP.
- Place standards-based management agents on existing network devices.
- Make the use of open management protocols a requirement for new network purchases.
- Acquire management tools and applications for networks that integrate with the open management platform you choose.
- Favor object-oriented network management solutions.

Contact the leading vendors listed here for more information. They are committed to helping you implement an integrated management approach to building and managing open, interoperable, multi-vendor networks.

SOURCES OF NETWORK MANAGEMENT SOLUTIONS

CABLETRON SYSTEMS

SPECTRUM is Cabletron Systems' protocol-independent management system for proactive monitoring and control of multivendor, enterprise-wide networks. 1-603-332-9400

CiscoWorks

CiscoWorks — a comprehensive series of SNMP-based router management applications — enables users to easily manage, monitor and administer Cisco internetworks. 1-800-553-NETS

digital

POLYCENTER solutions provide integrated multivendor network management. Digital supports SNMP, OSI CMIP, NetWare, SNA, and many other network components. 1-800-332-INFO ext. POLY

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SunConnect

SunNet Manager and the largest number of third party management applications available, provide system managers with distributed management solutions for complex heterogeneous networks. 1-800-241-CONX

WOLLONGONG

PathWay Management Station is a TCP/IP network management product that supports SNMP with a unique, client-server, distributed architecture. 1-800-872-8649

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Contact these leading vendors today to learn more about their Network Management products and services. A coupon to request information from these vendors is included with the Enterprise Management advertisement earlier in this issue.

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Buyers' Scorecard: ParcPlace's Objectworks tops user satisfaction ratings

By Derek Slater

ParcPlace Systems, Inc.'s Smalltalk compiler received the highest satisfaction ratings from its users in the Buyers' Scorecard survey of leading object-oriented programming (OOP) languages Smalltalk and C++.

ParcPlace's Objectworks Smalltalk earned an overall score of 77, followed by Borland International, Inc.'s C++ 3.1 at 73, Microsoft Corp.'s C/C++ 7.0 at 71 and Digitalk, Inc.'s Smalltalk/V with a 70.

Each language has strengths. Smalltalk scored higher user satisfaction in reusability of code and support for inheritance. C++ earned higher scores in training time required and speed of developed applications.

Fully 65% of the respondents said their OOP products have delivered the expected cost savings or increase in productivity. But users also said there is a steep learning curve, which is reflected in the low satisfaction scores received in the area of training time required. The C++ products scored better than the Smalltalk products in that area.

COMPUTERWORLD BUYERS' SCORECARD

Smalltalk

ParcPlace's Objectworks Smalltalk garnered the highest ratings in a number of key categories, including ease of maintenance. Portability of applications is also a hallmark of the product, which supports a variety of PC and workstation operating systems.

Smalltalk has also been incorporated into a full application development environment, VisualWorks, introduced last October. VisualWorks adds a graphical user interface (GUI) builder.

Potential ParcPlace users must consider the price of the product: The full VisualWorks environment with Objectworks Smalltalk costs $2,995 for Windows and OS/2 and $4,995 for Unix. Without VisualWorks, Objectworks Smalltalk costs $2,495 for Windows.

Digitalk's Smalltalk/V users gave the product lower satisfaction scores than the ParcPlace product. Smalltalk/V did garner the highest rating of any product in inheritance support. It lagged in responsiveness of vendor service.

But Digitalk's implementation of Smalltalk costs $500 for Windows, $995 for OS/2 and only $125 for DOS. Like ParcPlace, Digitalk has also released new products that integrate with its compiler. The Parts Workbench ($1,995 for OS/2) lets users combine program components written in Smalltalk, Cobol and C. The $1,495 Team/V extension supports group development.

C++

Borland's C++ edged out its rival for the top C++ satisfaction rating, scoring higher in ease of maintaining applications and debugging features. The product also took higher marks in integration of tools and functions in the application development environment.

The two C++ products finished in a dead heat in responsiveness and quality of vendor service and support, while Microsoft's C/C++ users were more satisfied with its handling of inheritance.

Microsoft will give Borland a run for its money as its Visual C++, the successor to C/C++, picks up steam. It includes a GUI-building component. The product runs under Windows and costs $499 for the professional edition. Borland's C++ compiler costs $495. ■

METHODOLOGY

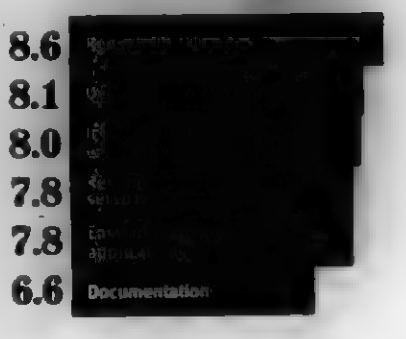
User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 50 users each for Borland's C++ and Microsoft's C/C++, 38 users for Digitalk's Smalltalk/V and 23 users for ParcPlace's Objectworks Smalltalk.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: Byron Hale, Effective Information; *Computerworld* Database Division.

ParcPlace's Objectworks Smalltalk

OVERALL SCORE: 77



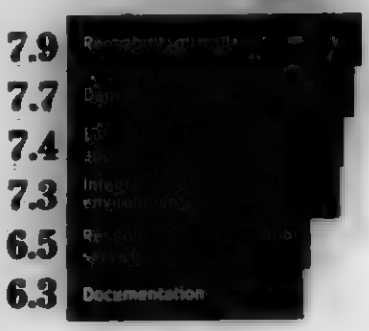
RESPONSE BASE: 23 USERS

Would you buy the product again?

LIKELY
REASON: Meets our expectations
UNLIKELY
REASON: Cost
DON'T KNOW

Digitalk's Smalltalk/V

OVERALL SCORE: 70



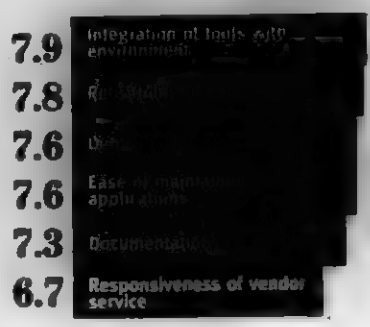
RESPONSE BASE: 38 USERS

Would you buy the product again?

LIKELY
REASON: Meets our needs
UNLIKELY
REASON: Better products available

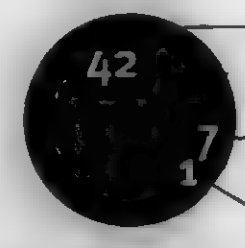
Borland's C++ 3.1

OVERALL SCORE: 73



RESPONSE BASE: 50 USERS

Would you buy the product again?



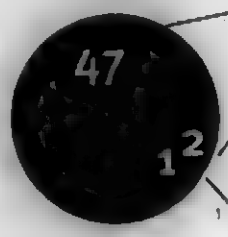
LIKELY
REASON: Meets our needs
UNLIKELY
REASON: Don't like environment
DON'T KNOW

Microsoft's C/C++ 7.0

OVERALL SCORE: 71

RESPONSE BASE: 50 USERS

Would you buy the product again?



LIKELY
REASON: Good, familiar product
UNLIKELY
REASON: Don't like environment/ interface
DON'T KNOW

DME

Distributed Management Environment

A consensus-based solution to the creation of universal management standards.

With the emergence of distributed, multi-vendor computing environments, the creation of a standards framework to facilitate their effective management became a top priority. As a result, leading vendors, working through the Open Software Foundation (OSF), have developed a set of open, vendor-neutral standards known as Distributed Management Environment (DME).

DME was conceived to get the most out of today's advanced distributed computing technologies, open standards, interoperability and object-oriented technologies. Its standardized framework represents an industry consensus on application program interfaces (APIs) and protocols for open management. DME is a 'living' standard, evolving as technologies evolve, enhancing the latest industry developments.

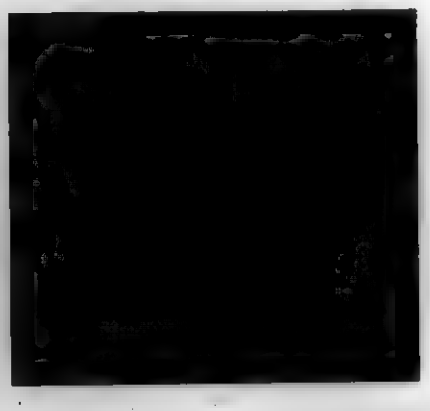
Why DME Works

DME builds on existing standards. It is not an alternative to other standards. Rather, it represents a complementary approach that encompasses existing SNMP and CMIP standards and endorses interfaces devised by the Network Management Forum, X/Open and others.

DME is the product of a multi-vendor, consensus-based process. As a result, DME maps to your computing environment and manages growth in multi-vendor systems and networks. And because DME is the product of industry consensus, it accelerates the process of reaching consensus within your organization.

DME is based on a comprehensive set of requirements developed through an open, industry process to meet specific objectives and address real needs.

DME is vendor neutral. It enhances competition in the management market. This will result in lower costs and better solutions for users.



The Benefits

DME's wide-ranging benefits include:

- A scalable, distributed architecture that can accommodate growth in multi-vendor networks and distributed systems.
- Better management, interoperability and integration through the implementation of common management services and standardized protocol and object definitions.
- Reductions in time and costs for system administration and training.
- Tightly integrated solutions utilizing object-oriented design, for easier and more flexible integration of scalable, distributed, multi-vendor architectures.
- Greater longevity of systems resulting from standards-based, backwards compatibility.

What You Can Do Today

No matter where you are in the development of your network, we suggest evaluating DME as you build your enterprise management strategy. Versions of the DME will be available during 1993 from a number of vendors. Complete implementations of DME will begin appearing in 1994.

Contact the Open Software Foundation for more information on DME and how it can provide you with a framework for managing growth in a multi-vendor systems and networks. Or, contact these leading vendors who have committed to supporting DME.

DME SUPPORTERS

Cabletron Systems

SPECTRUM is Cabletron Systems' protocol-independent management system for proactive monitoring and control of multivendor, enterprise-wide networks. 1-603-332-9400

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POLYCENTER products deliver DME vision today, and provide the quickest path to full DME compliance. They provide open integrated systems and network management. 1-800-322-INFO ext. POLY

IBM

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HEWLETT PACKARD

HP OpenView technologies provide key components of the DME. As the fast path to DME, HP OpenView is the right choice for solving your network and systems management problems today. 1-800-637-7740

NetLabs

NetLabs is the leading independent supplier of standards-based network management solutions providing management platforms, development environments, and integrated applications. 1-800-447-9300

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To learn more about these DME supporters contact them today. A coupon to request information from these vendors is included with the Enterprise Management advertisement earlier in this issue.

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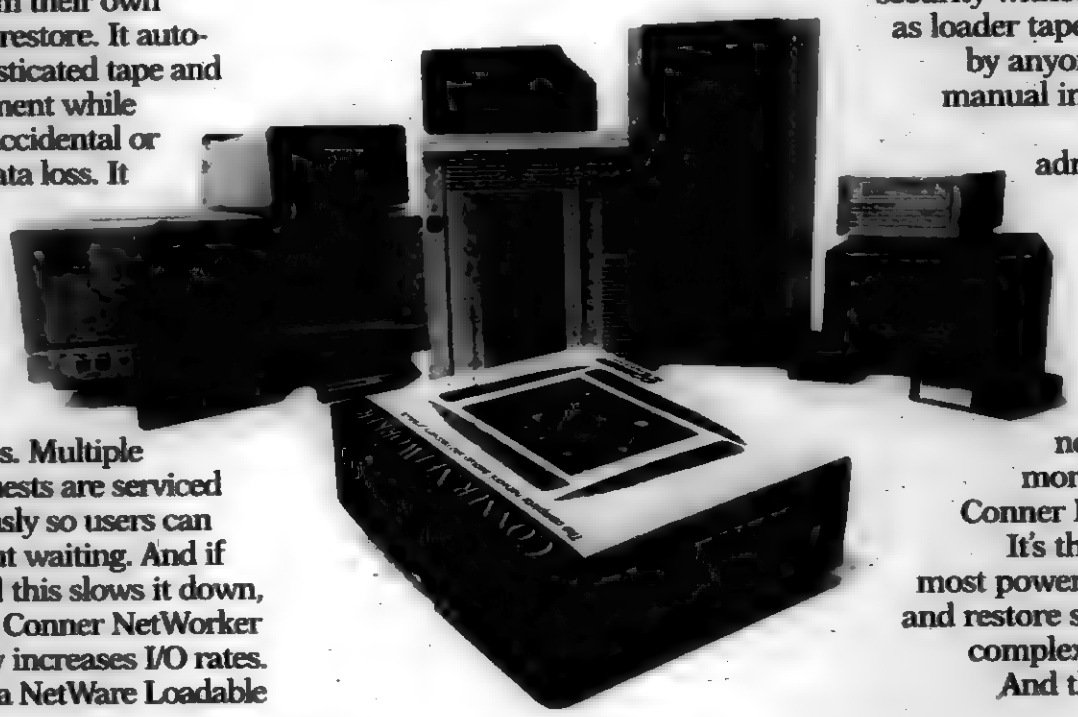
Fact:

The more complex your network grows, the simpler backup and restore becomes.

To some it's blasphemy. To others it violates a natural law. The fact is, backup and restore on complex networks can be dramatically simplified. But only with Conner NetWorker™ software. It frees the network administrator because end users perform their own backup and restore. It automates sophisticated tape and file management while preventing accidental or deliberate data loss. It manages and controls all backups from any workstation... even remotes. Multiple backup requests are serviced simultaneously so users can work without waiting. And if you think all this slows it down, think again. Conner NetWorker dramatically increases I/O rates. Running as a NetWare Loadable Module, Conner NetWorker supports up to 250 clients on 26 servers with minimal performance impact and includes automatic fault recovery. It's perfect for networks with ever increasing storage demands. It's perfect for mixed NetWare environments with UNIX, DOS and Macintosh systems. It drives today's most reliable, highest capacity backup devices and loaders from Conner, including Digital Linear Tape (DLT), 8mm and DAT. And now you have security without sacrifice as loader tapes are used by anyone without manual intervention while the administrator controls access to each individually. The larger your network, the more you need Conner NetWorker. It's the simplest, most powerful backup and restore solution for complex networks. And that's a fact.



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The most powerful data management software for complex networks.

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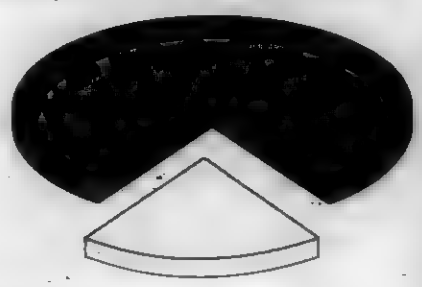

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- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
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- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 80. Educator, Journalists, Librarians, Students
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- d. Software
- e. Peripherals

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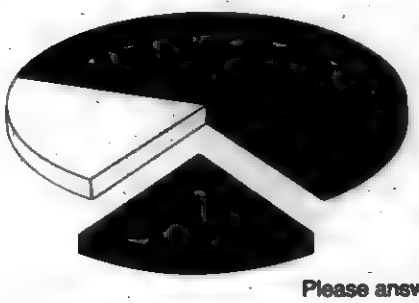

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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
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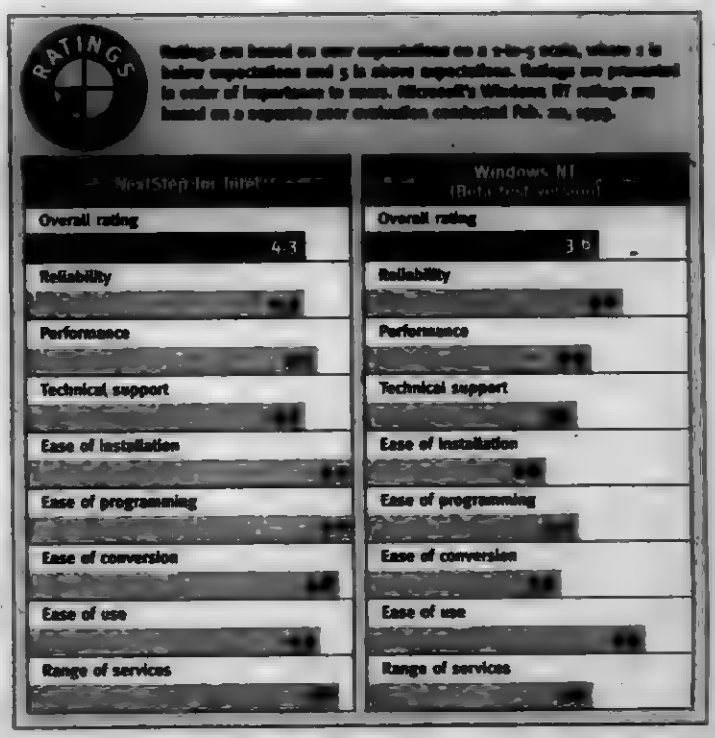
NextStep 3.1 for Intel:
Users say it sizzles on 486 machines and is the best OOP platform

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in five application environments.

Next, Inc.'s NextStep for Intel

- **Evaluators said Next, Inc.'s NextStep for Intel is a robust implementation of the operating system and development environment. They were surprised that performance on the Intel platform exceeded that of Next's proprietary hardware.**
- **The relative shortfall of commercial applications for NextStep is of continuing concern. But the evaluators claimed the NextStep development environment outweighs this issue.**



It was more than three years ago that Apple Computer, Inc. cofounder Steve Jobs started his second Silicon Valley venture.

But the company, Next, in Redwood City, Calif., has not approached the raging success of Apple. After burning through an estimated $200 million in venture capital, the company's proprietary-hardware and operating environment had achieved little more than niche status at most user sites.

That may have changed last month. With a blizzard of announcements, Next said it has abandoned its proprietary hardware to become a software-only company.

The first fruit of that realignment is NextStep 3.1 for Intel, a version of the Unix operating system and NextStep designed to run on Intel Corp.'s I486 and Pentium processors. Like its predecessor, NextStep for Intel includes the multithreaded, multitasking Mach operating system kernel and (in the developer version of the environment) a variety of object-oriented programming tools, such as the NextStep Interface Builder, for rapid application development.

SITE PROFILES

Using beta-test version since	November 1992	November 1992	December 1992	December 1992
Hardware platforms	Dell DGX, Epson Progress, HP Vectra	Compaq, Goldstar	DEC, Intel, Compaq, Dell	Compaq, Dell
Number of NextStep programmers	6	2	60	40
Intend to deploy	Now	Now	Now	Sometime in 1993

The evaluators participating in this survey were all beta-test users of NextStep for Intel. They also used NextStep on Next's proprietary hardware, some since the Next "Cube" first became available in 1990.

Despite their enthusiasm for NextStep for Intel, the evaluators were concerned about Next's longevity. They cited the relative shortage of commercial applications for NextStep — an estimated 600 vs. more than 50,000 for Microsoft Corp.'s Windows environment. They were also concerned that Next would be unable to make NextStep a commercially viable alternative to upcoming operating systems from Microsoft and other vendors.

Reliability

Based on a variant of the Unix operating system called Mach, NextStep is a stable and reliable platform, the evaluators said.

The telecommunications firm, which is developing customer service applications demanding high-speed transaction processing, experienced some programming difficulties. The evaluators also said NextStep provides a file recovery mechanism at least equal in capability to other Unix implementations.

Telecom firm: "I've never experienced a failure on NextStep, mostly because it's a Unix operating system."

Integrator: "We're doing things with NextStep that it doesn't normally support by extending the development environment."

Performance

If nothing else, NextStep for Intel revealed the performance deficiencies of Next's now-defunct hardware. Using a variety of name-brand and clone PCs, the evaluators said NextStep ran considerably faster on the 486 machines than on the NextStation. None of the evaluators had yet tested NextStep on Intel's Pentium processor.

Developer: "I was shocked to see how fast it ran, especially on cheap hardware."

Telecom firm: "We gave it a rigorous performance evaluation. . . . We got a 67% performance increase compared to the NextStation."

Technical support

Next's technical support was diffi-

Users, *page 122*

Users were concerned about Next's longevity but gave NextStep for Intel high ratings

CONTINUED FROM PAGE 121

cult to measure, given that the evaluators had very little need to contact the company. In the few cases where technical support was required, the evaluators were dealing with arcane programming issues that had yet to be resolved in the beta-test version of the operating system.

Documentation was viewed by the evaluators as merely "adequate."

Ease of installation

Information systems managers and users know that operating system upgrades and installations can be arduous. Many companies, such as Microsoft with Windows NT and IBM with OS/2 2.1, have now begun to deliver their operating systems on CD-ROM, a method pioneered by Next more than three years ago.

Once the physical installation has been completed, NextStep includes a wealth of utilities for networking and hardware configuration that vastly reduce installation time. Utilities to connect to Novell, Inc.'s NetWare and Apple's Appleshare can be operated by novice users, evaluators said.

Developer: "I was surprised at how seamlessly everything came together."

Telecom firm: "It's plug and play. You load it and it goes."

Integrator: "We were able to turn out a new [NextStep-ready] system in an hour."

Ease of programming

Despite fourth-generation languages, end-user programming tools and the object-oriented revolution, NextStep still holds sway with these evaluators.

With a wealth of programming tools, browsers and an integrated development environment, NextStep has always garnered rave reviews from developers.

The evaluators said the same of NextStep for Intel. They unanimously agreed that the object-oriented NextStep development environment reduced programming efforts by anywhere from three to 100 times those of other platforms and languages.

NextStep 3.1 for Intel features

- Runs on Intel i486 or Pentium platforms with a minimum of 8MB bytes of RAM and a 120MB-byte hard disk.
- Available in $795 user version or $1,995 developer version.
- Supports Ethernet and Token Ring network adapters; PostScript printers; Microsoft and Logitech mice; and VGA video as 2-bit gray scale.

Developer: "NextStep is giving us a 100-to-1 magnification over conventional programming environments."

Telecom firm: It is "the best environment known to mankind for object-oriented software development. It's not worth talking about because no one will believe you."

Ease of conversion

The evaluators had all ported applications from NextStep 3.0 (for Next's proprietary hardware) to NextStep for Intel. All agreed that the porting effort requires no more work than a simple recompilation.

The developer said he lengthened his porting effort by making unnecessary changes to his application code. When he ported the code a second time without changing any code, the conversion to NextStep for Intel went flawlessly, he said.

Developer: "It was better than [Next] told me it would be. It was a dream."

Integrator: "It was fun to watch developers saying, 'I don't believe it. I [ported an application] in two hours.'"

Ease of use

The evaluators generally compared the NextStep user interface to the Apple Macintosh, and they agreed that the Macintosh has a slight edge in usability. They

10:00 AM 2:00 PM

also said operations such as transferring data among NextStep applications were far easier than in Macintosh or Windows applications.

Developer: "Compared to the Macintosh, there are some things that I miss."

Telecom firm: "For end users, it's on par with the Apple Macintosh."

Integrator: "I've put it on the desks of executives who refuse to touch a DOS or Macintosh system."

Range of services

From a developer perspective, the evaluators said NextStep for Intel has no peer.

Starting with the complement of development tools such as Interface Builder and extending to the enhanced and simplified Unix utility programs, NextStep has few rivals as an operating environment, the evaluators said.

Developer: "Everything a person could think of is in Unix, and Next has packaged those [Unix] commands into good user interface objects."

Written and compiled by research manager Michael L. Sullivan-Trainor.

Next responds

The following are Next's responses to issues raised in this evaluation.

•**Availability of commercial software:** Next has more productivity and business applications to serve its customers than any other Unix or workstation vendor. With SoftPC from Insignia Solutions, Inc., NextStep will support DOS and Windows applications, providing our customers with access to that application base. NextStep for Intel will significantly expand the market for commercial software developers, resulting in many new NextStep applications during the next few months.

•**NextStep and industry standards:** Next was the first Unix vendor to integrate NetWare client software. We have announced that we will support the Open Software Foundation's (OSF) Distributed Management Environment, the Object Management Group's Common Object Request Broker Architecture and the OSF's Distributed Computing Environment standards. Our philosophy is to work with customers and strategic partners to adopt and seamlessly integrate industry standards that promote interoperability.

•**Challenges:** The greatest challenge is getting the word out about NextStep as broadly as possible and letting customers know how many customers are re-engineering and automating business processes using NextStep. A first step is having developers experience the benefits of NextStep. We are offering that through our $299 evaluation kit.

•**Viability in enterprise computing:** Our primary market is the corporate desktop. We offer a combination of strengths that no other operating system vendor has, including the ability to build client/server applications five to 10 times faster than traditional methods; the ability to deploy extremely robust, enterprisewide applications; and the ability to make enterprise computing as easy for the user as stand-alone computing is today.

•**Third-party tools:** NextStep is open to support tools and languages from third parties. We currently have third-party support for Fortran, Cobol, Smalltalk, LISP and a variety of fourth-generation languages.

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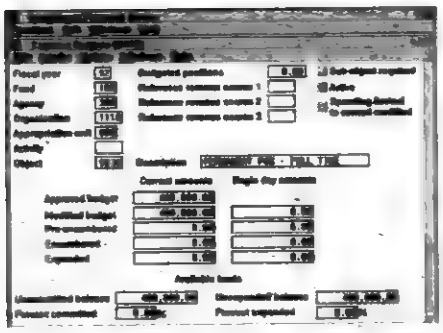
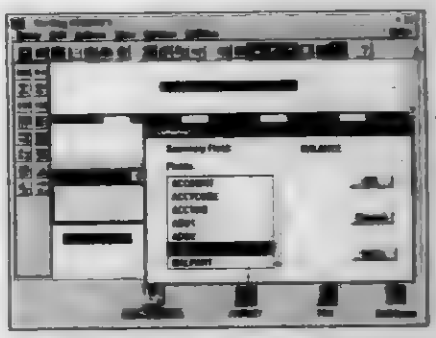


*For **American Management Systems** (AMS), Open Interface enabled the simultaneous deployment of a client/server application on five platforms.*

***Computron**, using Open Interface, ported their GUI for financial and workflow applications to customers' platforms in just hours.*



***Sterling Software** created a Query and Reporting tool with mainframe access by utilizing Open Interface's unique combination of power and portability.*

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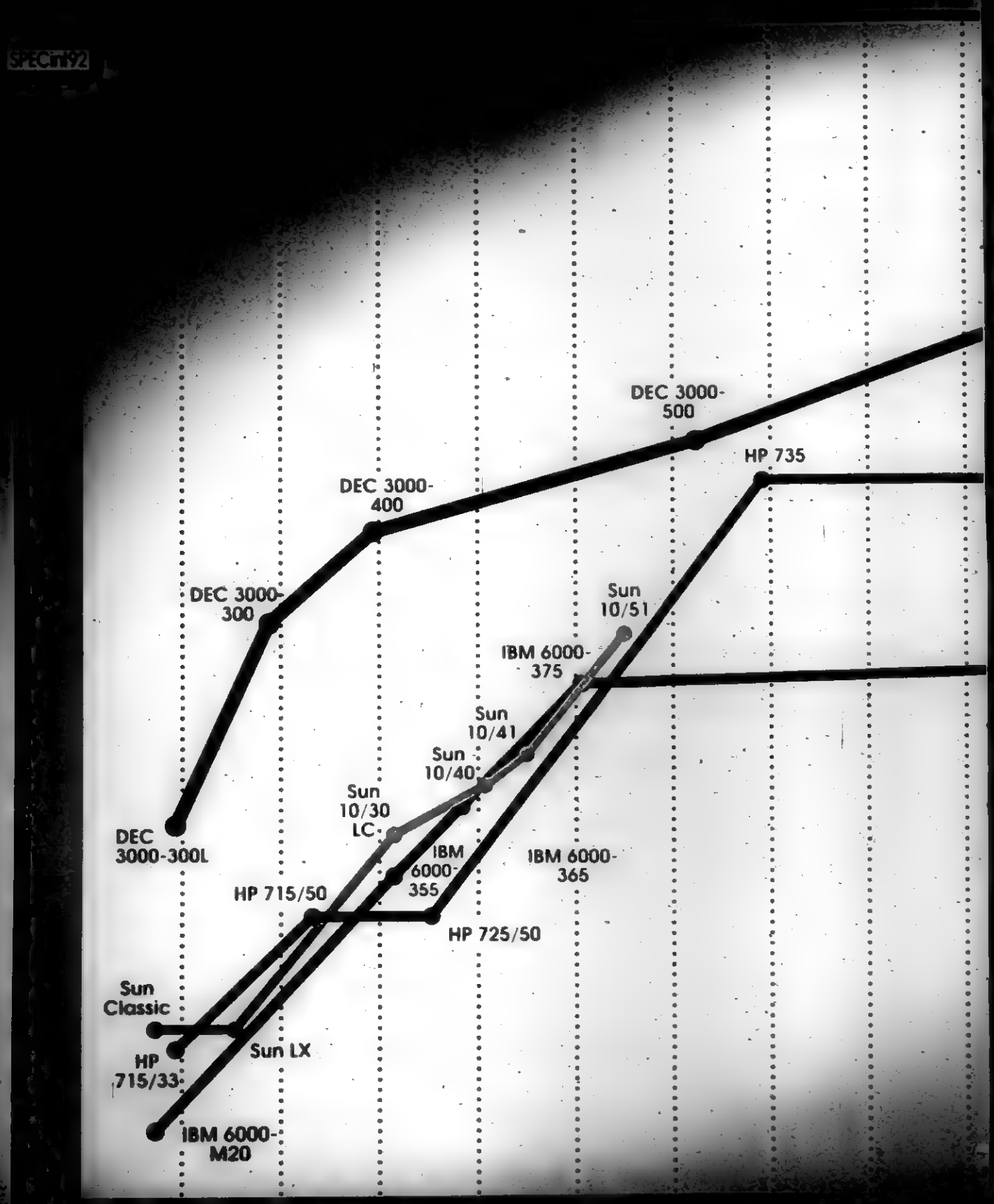

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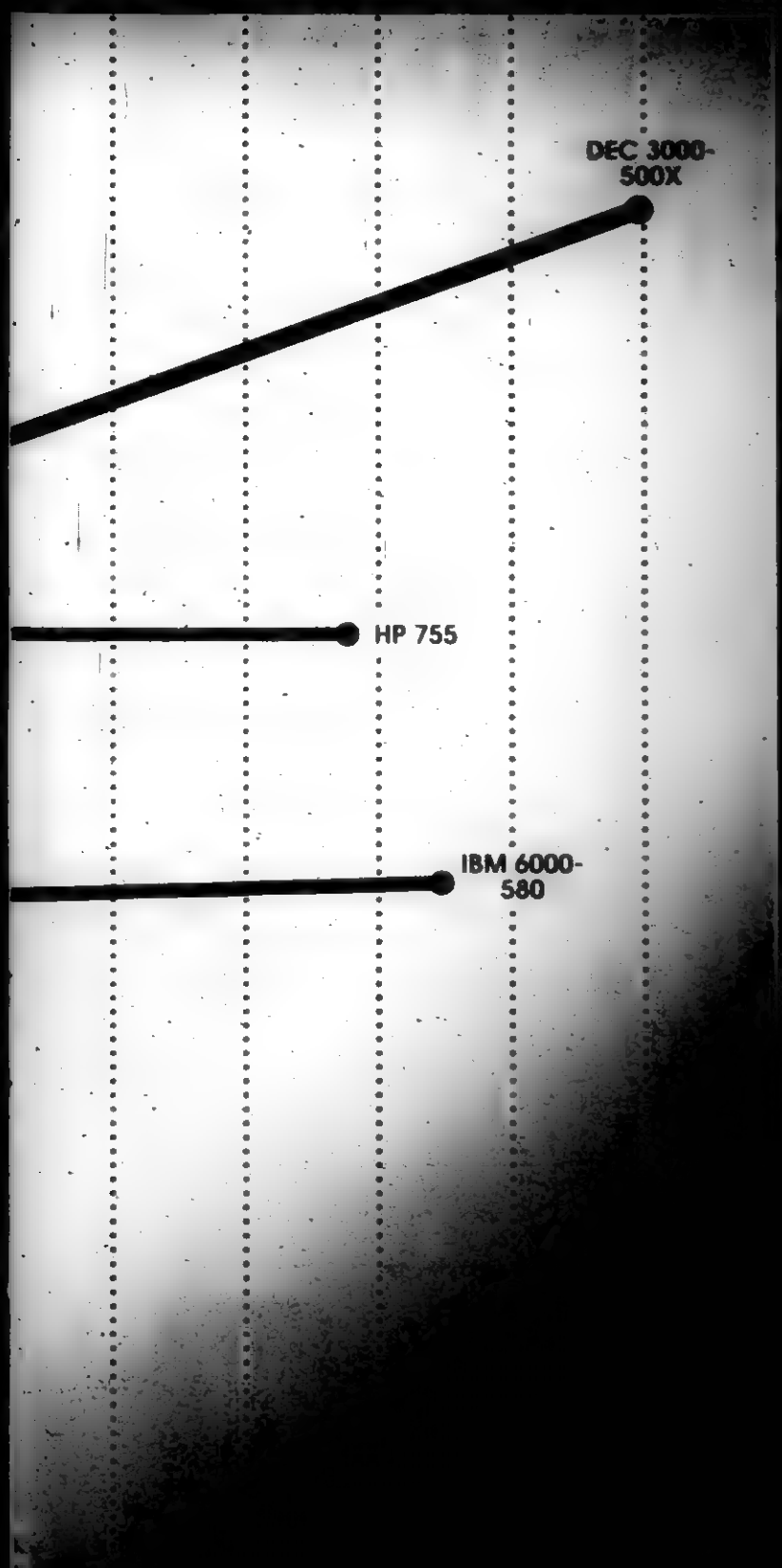

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Objection!

There is no truth in claims that object DBMSs are superior to relational DBMSs. In fact, object DBMSs are much like the hierarchical network databases of old — inflexible and in need of manual methods to maximize application performance.

By Fabian Pascal

OBJECT MANIA HAS taken over the industry, and proponents of object orientation are heralding object databases and object database management systems as a cure for the purported weaknesses of relational technology.

Poppycock.

We're told that the relational data structure — the table — is too simplistic to represent the complexity of real-world information. Object database technology, on the other hand, is praised as a more "realistic" database option because it can handle unstructured information, such as graphics, binary code and compound documents — information that database designers can't readily capture in tables.

This argument is specious. Object DBMSs do not deal with unstructured data any better than any other DBMS (which is to say, not well).

The concepts underlying object orientation are useful at the front-end (application) level, and that's where software designers should focus their efforts. Here these concepts act as well-known principles of good software development. Applying object orientation directly and indiscriminately at the database level reintroduces problems that have haunted the database practice for years and that took the relational approach two decades to get rid of. Database technology is, in fact, regressing.

Practically all claims that object DBMSs are superior to RDBMSs are flawed, as I'd like to prove with the following:

For our report on object oriented programming, see page 107

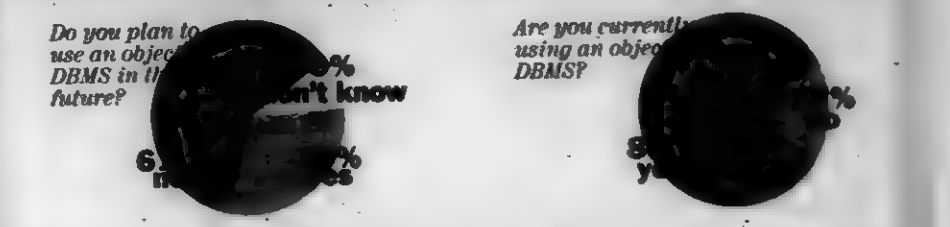
Pascal is a Palo Alto, Calif., independent consultant, teacher and writer specializing in database management. His forthcoming book, *Understanding Relational Databases* (John Wiley and Sons), will contain a detailed treatment of the arguments in this piece.

Background

RDBMSs do have a mechanism for dealing with unstructured data — basic large objects (Blob). Blobs contain unstructured data and can be associated with structured data. Blobs can be defined over domains, which are equivalent to user-defined data types in programming languages and akin to object types in object-oriented terminology. Had SQL RDBMSs supported relational domains, Blobs could have inherited the user-defined operations from the domains, achieving the same objective as object DBMSs.

FIRE & ICE

Users like the idea of object DBMSs . . . but aren't sold on today's technology



Total respondents: 161 object-oriented tool users

Source: Buyers' Scorecard survey

Claim

Object DBMSs offer more realistic representations of the world because they don't have to be relational tables but can be "anything"; particularly, they can represent unstructured data.

Reality

RDBMSs can accommodate unstructured data as well as object DBMSs can.

Claim

RDBMSs complicate the handling of certain kinds of information in areas such as scientific experiments, financial portfolio management and trading, insurance policy maintenance,

Objection! *page 128*

Objection!

CONTINUED FROM PAGE 127

manufacturing and computer-aided software engineering, as well as computer-aided design, manufacturing and engineering. The data in applications such as these works well in a tabular format, but the relational database design principles (known as normalization) generate lots of deep or sparse tables involving operations such as multitable joins — and do not represent hierarchies or multidimensionality well. This complicates access and adversely affects DBMS performance.

Reality

These complexity problems stem from SQL and its commercial implementations, not relational technology per se. Although SQL has, unfortunately, become synonymous with relational technology, almost all SQL products violate, ignore or poorly implement many relational features. Basing RDBMSs on a better SQL standard (or better relational language altogether) would eliminate most difficulties and would be a better solution than object DBMSs.

Background

In the absence of a general, well-defined, theory-based data model equivalent to the relational model, object DBMSs borrow data structures from programming languages (such as C++ or Smalltalk). These structures are language-specific, do not have the useful properties of relational tables and complicate data manipulation without adding power. Therefore, they suffer from some of the same problems the prerelational world had.

Relational databases, on the other hand, can and do represent more complex structures without those problems. Containment hierarchies, for example, are represented relationally by means of explicit values in tables, a much simpler and more flexible approach than physically hard-wiring them into the database with pointers, as object DBMSs and hierarchical databases do.

What is really needed is a set of data

Objection! *page 130*

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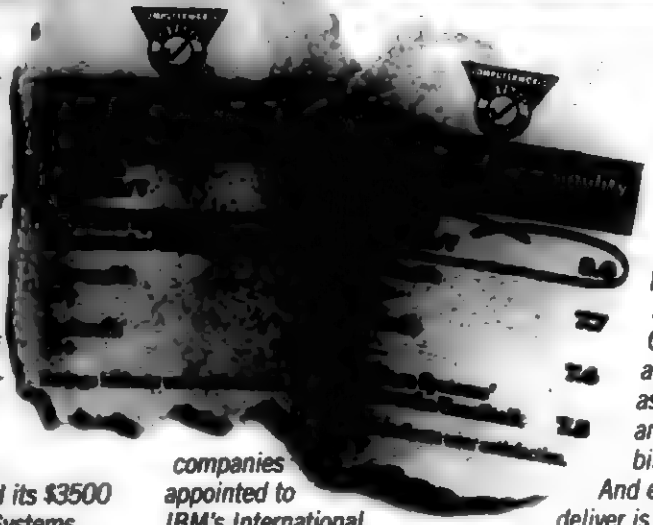

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Prenuptial advice

Without a fully effective relational technology and with object orientation not the miracle cure, what can IS managers expect?

The idea of the two DBMS approaches converging is one possibility. If RDBMSs become more object-oriented and object-oriented DBMSs incorporate more relational features, the need to choose between the two technologies may become moot. The following is what is supposed to happen, according to the Committee for Advanced DBMS Function at the University of California at Berkeley:

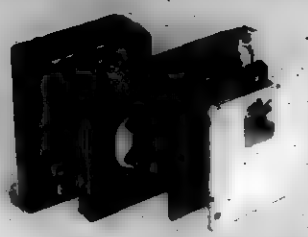
•Besides traditional data management services, third-generation DBMSs will provide support for richer object structures and rules.

•Third-generation DBMSs will incorporate second-generation DBMSs.

•Third-generation DBMSs must be open to other subsystems.

Whether or not such a merger becomes real, my advice to users is to represent in relational tables as much data as they can and have an RDBMS manage that data. They should do so even if they can store unstructured data in the same database. For example, extracting data from contracts into tables and storing both the tables and the contracts as a text or graphic image in Blobs is more useful than storing the contracts by themselves. That's because the relational database structure and DBMS features give users more intelligent manipulation and DBMS control.

As to the specific RDBMSs to use, users should opt for one based on the correct combination of relational DBMS facilities and object-oriented tools and applications. Unless users make it known they want such combinations, good DBMSs will become increasingly hard to find. —*Fabian Pascal*



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Reliability

What IS really needs for database management is as follows:

- **WE NEED products that better adhere to the relational model. We have to correct SQL's deficiencies and extend the language to support, among other things, true domains, nested relations, additional relational operations, stored procedures, Blobs and user-defined functions. Otherwise, we need a better relational data language.**
- **WE NEED extensions to the relational model.**
- **WE NEED physical implementation improvements and better exploitation of hardware advances.**

Objection!

CONTINUED FROM PAGE 128

operations that exploit these values. C. J. Date and E. F. Codd proposed using hierarchy explosion operations, which are useful for bill-of-material and organizational chart applications.

The reason RDBMS products are cumbersome for queries such as "What are the top X rows?" is the failure of SQL to support a relational partition operation — splitting one table in two.

There are also promising avenues no one has pursued for extending the relational model. Nested relations, for instance, enable relational tables to be values in other tables, which can improve the representation of more complex relationships without losing the theoretical properties of the relational structure.

Claim

Object-oriented encapsulation provides greater data independence because it releases users from having to know the structure, methods and integrity constraints applicable to objects.

Reality

Object-oriented encapsulation can actually result in loss of data independence. Without theoretical guidelines such as normalization, object database design is arbitrary, complex and inflexible.

Background

Because objects can inherit properties and behavior from other object types, changes in one object type can have database-wide repercussions and put maintenance burdens on database administrators and application developers.

Moreover, when a relationship exists between objects of different types, who knows in which object class developers should encapsulate the relationship? The same question comes up for methods that manipulate multiple objects.

Object database encapsulation is supposed to capture more meaning within the database and simplify matters for users, but it actually causes complications. For example, it requires database designers to encapsulate data relationships, integrity constraints and manipulation in object classes at the database design stage. However, it is impossible to know at database design time all the data relationships and manipulation needs of current and future applications.

The fact that object DBMS vendors are now scrambling to add ad hoc querying facilities to their products — in effect, a violation of object-orientation principles — is telling.

Application developers can avoid some of these problems in relational environments by using stored procedures with the DBMS security mechanism for encapsulation.

Claim

Object DBMSs offer simpler database access than RDBMSs because navigation eliminates complex and slow operations such as multitable joins. Navigation also does away with the impedance mismatch between set-oriented relational database processing and record-oriented programming languages. (For example, SQL embedded in programming languages and the use of cumbersome cursors.)

There is no longer a need (as with SQL) for separate languages for database access and application development; there is only one computationally complete language.

Reality

With pointer-based structures, object databases end up like the old hierarchical and network databases: biased toward certain applications and against others. They are also inflexible. For example, when data relationships or the patterns of access to data change, it affects many object types, which developers must modify or reoptimize.

Chasing pointers across networks is not conducive to data distribution, either.

Object DBMS native languages are navigational and procedural; that is, they are third-generation languages. The impedance mismatch is "resolved" by lowering the DBMS to the record level. This is the opposite of what the solution ought to be: making languages more powerful by raising them to the set level.

Claim

Object DBMSs provide higher performance than RDBMSs. Pointer navigation is faster than multitable operations (particularly joins) and does not require relational performance optimization.

Reality

Without the benefit of relational theory, there is no such thing as system optimization in object DBMSs. Developers have to use manual methods to maximize and reoptimize applications performance.

Background

DBMS designers enhance object DBMS performance by caching complex object structures in application memory, guaranteeing no more than one I/O per object instance, using optimistic concurrency mechanisms (such as versioning) and exploiting certain hardware or operating system capabilities.

But these are physical tuning strategies that have absolutely nothing to do with the object orientation of object DBMSs. Not only are they possible with any RDBMS, but using an RDBMS puts less of a burden on users because of relational data independence.

Sticking closer to the relational model and improving physical implementation capabilities are more effective ways to improve performance and are better for users than object technology. ■

C. J. Date

A fruitful union

Where is database technology headed? Some pundits have predicted the imminent demise of relational databases. They claim today's relational systems are just too simplistic for the complex databases we need in the 1990s and have jumped with both feet onto the object-oriented bandwagon.

"The world is much too complex to be represented in flat relational tables" is a typical claim heard from this camp. On the other hand, relational advocates have been defending their position stoutly, arguing the importance of relational's solid theoretical foundation and pointing out that in certain respects, object-oriented technology represents a giant step backward.

Well, I have some good news: We can have our cake and eat it, too! The point is to marry the two technologies instead of throwing mud at each other.

When I talk of marrying the technologies, I mean we should try to extend relational systems to incorporate the good features of object orientation and shun the bad. Let me stress that I am talking about a marriage of technologies, not of products. I am not pretending a clean integration between object-oriented product X and relational product Y is a simple matter — or even achievable or a good thing.

So how are we to meet this desirable goal? By looking for what the two have in common.

The fundamental construct in object-oriented systems is the object class, which is (in general) a user-defined, encapsulated data type of arbitrary internal complexity. (Note: I use the term data type here in the sense in which the term is understood in modern programming languages. In particular, it means only certain operators, whose definitions are provided by the users, can manipulate instances of the data type in question. I am not referring just to primitive, system-defined, built-in data types such as Integer and Char.)

In relational systems, the fundamental construct is the domain, which for the most part is not implemented in today's relational products. In general, a domain is a user-defined, encapsulated data type of arbitrary internal complexity — i.e., a domain and an object class are the same.

In my opinion, therefore, domains are the key to achieving our "desirable goal." A relational system that implements domains properly would be able to do all the things that object-oriented advocates claim object-oriented systems can do and relational systems cannot. Thus, criticisms of relational from object-oriented advocates may well be accurate if they are taken as criticisms of today's products; however, they are not accurate if they are taken as criticisms of the potential of the technology.

Relational vendors should do everything in their power to extend their systems to include proper domain support. Indeed, you can make an argument that the whole reason we are getting into this debate on the relative merits of object-oriented and relational is precisely because the relational vendors have failed so far to support the relational model adequately. But this fact shouldn't be an argument for abandoning relational entirely. It would be a great shame to walk away from the experience gained from more than 20 years of solid relational research and development.

Date is an independent author, lecturer and consultant specializing in relational database systems. He is author of the book *An Introduction to Database Systems: Volume I*.

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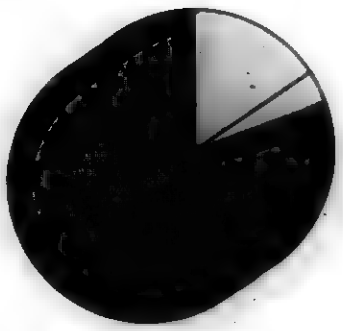

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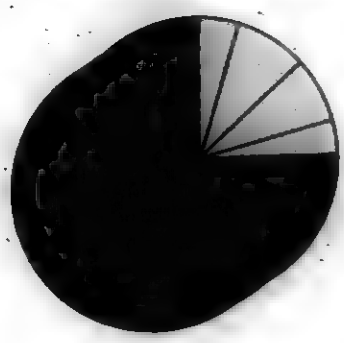

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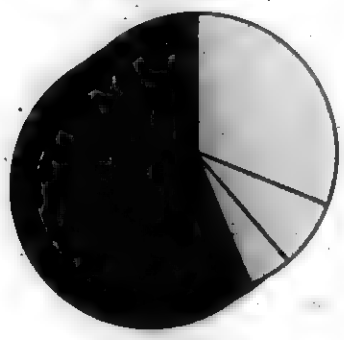

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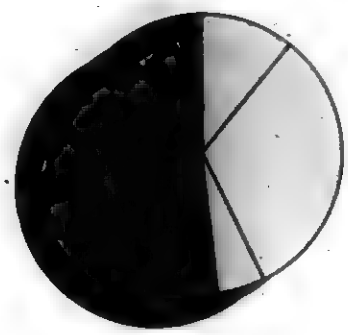

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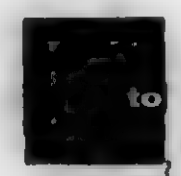

By David Baum

INDUSTRY EXPERTS agree that a handful of emerging technologies will make or break programming careers in the years ahead. While areas such as event-driven programming and object-oriented development may sound like old news to some, experts say the average programmer lacks the necessary know-how in these areas.

Even less common on a programmer's skill list is the ability to create visual representations of functionality — not a crucial skill but one that separates leading programmers from the crowd.

If you haven't added these skills yet, all is not lost. Experts recommend that you learn the following to keep in step with the industry:

•Event-driven programming

Mainframe programmers must make two primary shifts to move to client/server. The first is understanding the differences between character-based programming and event-driven or graphical user interface (GUI) programming. The second is the shift from information systems-driven systems development, involving rigorous analysis and design, to the more spontaneous, user-driven, rapid prototyping of PC systems.

Programming for a GUI environment is more complex than programming for character-based applications. It's not a simple extension of Cobol or Fortran programming; it is event-driven. The user controls the events, not the programmer.

"It's easy to slap up a GUI screen, to prototype a window with some basic programming behind it," says Kent Failing, president of Computer Design Professionals, a consulting firm in Atlanta. "But event-driven means the user can jump anywhere on that screen and access a feature or combination of features that you hadn't anticipated." Failing adds, "You must be very good at testing and debugging and be rigorous about not leaving any places where the user can leave data hanging or only partially update a record."

To build systems, programmers should also become comfortable with rapid prototyping and constant user interaction. "If client/server is going to be done by the MIS group, they need to become familiar with a rapid, more iterative approach to systems development," Failing says. At the enterprise level, applications require code that is oriented to both the client and the server, with more emphasis on the server. This makes skills in relational databases extremely important.

"Nearly every job that comes down for development in a client/server environment requires expertise in either Oracle or Sybase. In my experience, managers would rather take someone who has the database skills and train them in the client/server development tools than the other way around," Failing says.

•Object-oriented development

Hand in hand with the industry's grand waltz to client/server is its embrace of object-oriented technology. But how do traditional programmers get their feet wet?

"Object orientation involves a whole new learning curve," says Nathan Lane, a developer at Trico Title Co. in Santa Barbara, Calif. "An application isn't one monolithic block of code; it's hundreds of discrete objects." Rather than a simple display screen of 80 by 120 characters, an object-oriented application works with pixels. Groups of pixels become objects that perform predefined operations.

How do you become accustomed to this type of programming? Dive in and try it, suggests Victor Janulaitis of Positive Support Review, a recruiting firm in Santa Monica, Calif. "Get hold of an inexpensive tool such as Microsoft Corp.'s Visual Basic or Borland International, Inc.'s ObjectVision to see how graphical applications are pulled together."

•Programming with pictures

Graphic arts skills have never been a part of the programmer's curriculum, but the usability of today's applications is becoming dependent on the visual syntax. The need for a visual representation of how the functions make sense has led to a near-universal demand for a new type of developer, says Joe Carter, a partner at Andersen Consulting in Chicago. "We need people who can combine the technical skills of a programmer with the visual talents of an artist."

There aren't a lot of people who are good at creating visual representations of functionality, Carter says, but an understanding of typography, visual layout and design sets today's leading-edge programmers apart. "These skills might some day become a standard part of the programmer's job. Those who learn them now will be ahead of the game."

•Peer-to-peer networks

These emerging technologies imply additional changes at the network level. Developing for client/server can involve programming low-level communications code to distribute processing logic among client and server nodes. Therefore, understanding the rudiments of peer-to-peer networking is important for most projects. Keith Therrien, a software architect at Arkwright Insurance in Waltham, Mass., suggests getting familiar with the industry standards that pertain to your expertise and learning how application programming interfaces work.

Baum is a free-lance writer based in Santa Barbara, Calif.

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Career advice for the '90s

Off-site contracting not common

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chuck Muller, a principle at Andersen, Jones & Muller Associates, a Southfield, Mich., executive search firm that specializes in placing computer professionals.

Q. Contracting seems to be all the rage, but I never hear anything about long-distance moonlighting at the programmer/analyst level. Is this common, and how can I find these opportunities?

A. Hiring contractors or outsourcing specific projects is a common method of cost control, but hiring independent contractors to work off-site is not. Usually the exception is when a company is looking for expertise in specialized or hard to find skill sets.

These off-site positions are also generally awarded to employees who have already worked for a company and proven themselves to be valuable commodities.

Your best bet is to get in-depth knowledge of a very specific area — even one that may not be hot right now. For instance, one of the off-site programming positions I'm familiar with involves working with Computer Associates International, Inc.'s IDMS — an older relational database product.

Q. I am a computer training and support specialist with nine years of experience. I'd like to get into a new technology area and am willing to learn almost anything. However, I want to make sure the area I choose is not overrun with experienced applicants. What skills are in short supply right now?

A. One area that has increased in demand but has a shortage of experienced professionals is client/server application development. In the past six months, we have had four requests in this area.

Our clients are typically looking for one to two years of solid coding experience in languages such as C++ and Microsoft Corp.'s Visual Basic. Hiring companies are usually new to client/server and want people capable of training their internal staff as well.

Q. I have a bachelor of science degree in computer science and a teaching certificate. I have been teaching high school computer science for five years but would like to get into the information systems field.

What position can I realistically hope for?

A. If you went directly into the job market right now, you would most likely be faced with two job prospects. One is an entry-level systems development position where you would compete with recent graduates for a limited number of jobs.

A better bet is to leverage your existing teaching and people skills for a training position at a computer support services company. If you get an MBA in finance from a top school, it might help you further, especially if you're interested in a consulting position with one of the big accounting firms.

Keeping up

Do you have questions about learning to work in a multiplatform environment? If you do, send your questions to Jodie Haze by calling (800) 343-6474 ext. 727 or faxing them to (508) 875-8931. Answers to individual questions will be solicited from experts in this area. If we use your question, we'll send you a gift.

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Dan Taylor, director of systems services
North American Van Lines, Inc., Fort Wayne, Ind.

TIPS FROM THE TIMES

■ **Spend time with them. We assign specific business areas to each IS staff member. For instance, one of our applications people works closely with people in the budget and general-ledger departments, and over time they get to know what people need.**

David Deckard, supervisor of technical support
Memphis Light Gas and Water, Memphis

■ **We attend user staff meetings. This enables us to improve our sensitivity to their needs, to get a better perspective of their jobs and an appreciation for how they perform their duties. They attend our meetings so they can see how we go about meeting their requirements. It gives them a chance to guide us better.**

Jim Stirling, manager of systems programming
Mortgage Guaranty Insurance Corp., Milwaukee

■ **Every six months we visit our divisions around the country to meet with users. Many times we find that some users are not using the systems correctly, or they may need to be properly trained on the system.**

Tom Hankins, manager of data processing
Tuthill Corp., Hinsdale, Ill.

Compiled by Stefanie McCann, assistant researcher.

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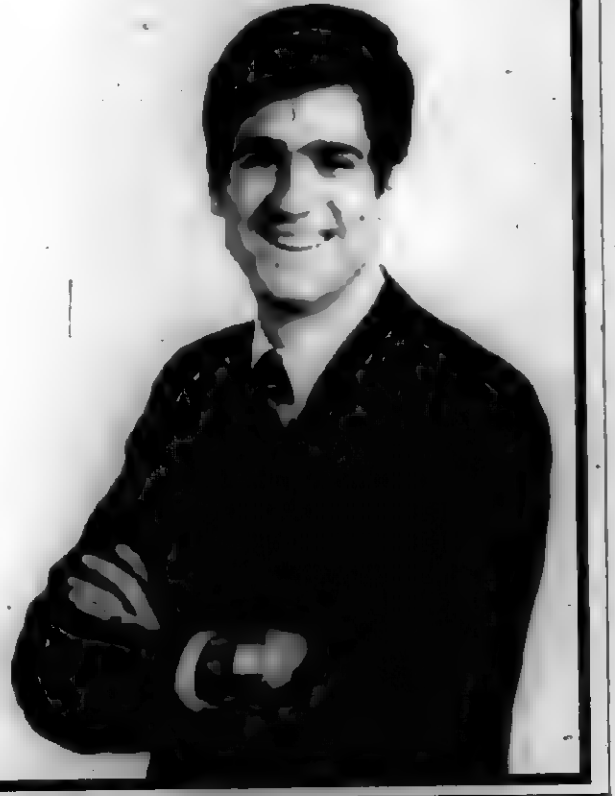

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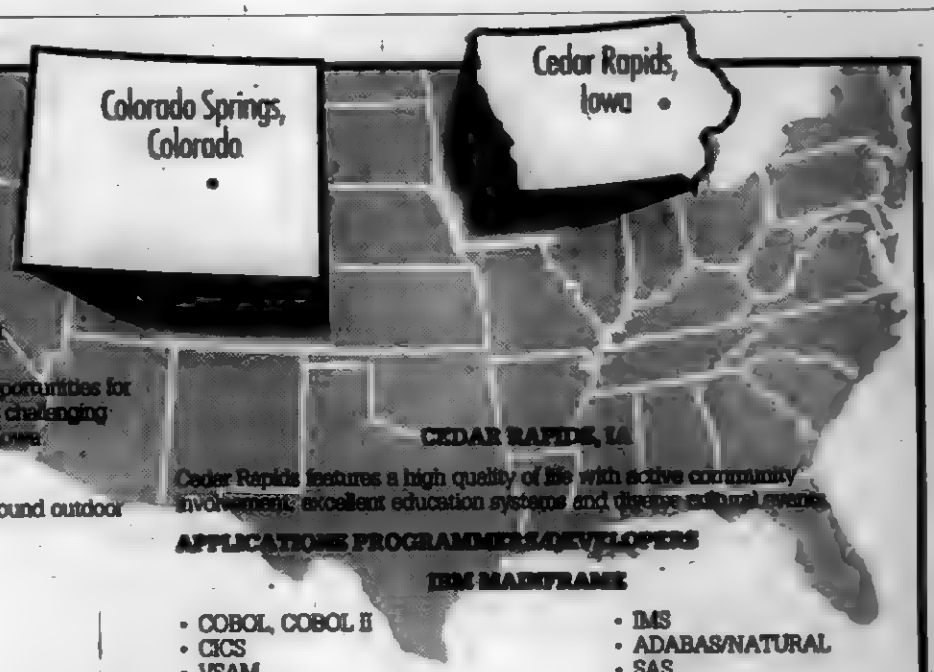

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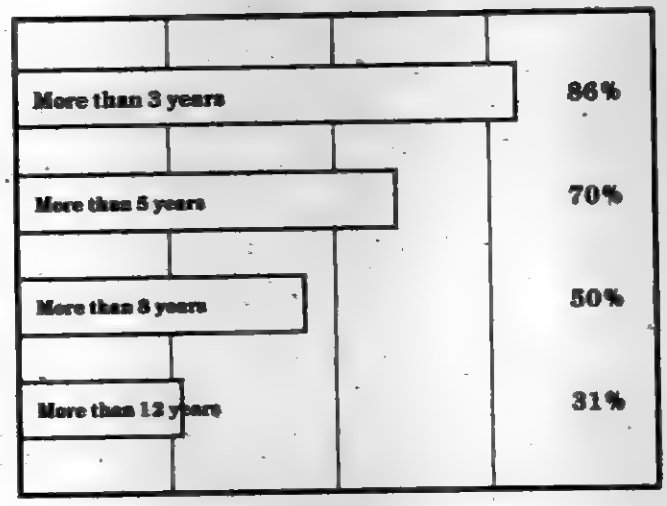

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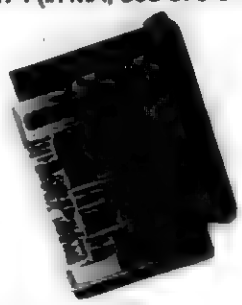

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Switching standards? It pays to do the math

By Linda Musthaler

If you're thinking of switching to a new personal productivity software standard — such as migrating from DOS to a graphical user interface environment — consider this: Don't shop price alone. There are many hidden costs to factor into this type of move.

The following guidelines and worksheet will help you determine those hidden costs. If you don't have a clear idea of your company's labor costs, use an average (salary plus benefits) of $40,000 per year for an information systems professional or end user.

1. Training: Training must be replaced when you move to a new software standard. Assume that all users will need at least one course in how to use the new product. In fact, training is a large expense for new products, particularly if you do most of it in-house. For example, it could easily cost $25,000 or more to train 100 employees on the basics of a new product.

2. Technical support: Demand for technical support may increase, at least temporarily. Experienced help desk managers place the typical increase at 15% to 50% above normal support demands. Factor the cost of increased demand for the duration of the new product implementation into the cost of normal support requirements.

Musthaler is an industry analyst at Currid & Co. in Houston.

Use the following guidelines to determine the change factor: 15% for a product upgrade on the same platform, 30% for a product upgrade that includes a platform change, 30% for a product switch on the same platform, 50% for a product switch that includes a platform change.

3. Product testing: Your staff will spend time evaluating and testing the new product before and after you make the decision to change your standard.

4. Administrative activities: These tasks represent a truly hidden cost, but they should be factored into the overall cost. Even though some of these activities are performed for upgrades as well as for wholesale product exchanges, the time and costs are more extensive for software switches.

Activities include researching purchase details, advertising the change to users and installing the new software.

5. File conversions: You will need to convert your work files from one product's format to another. Some conversions are smoother than others, and some are nearly impossible.

6. Custom development: Some products require custom development to optimize performance. For instance, you may want to create custom output drivers or macros to perform specific tasks.

7. Lost employee productivity: You're bound to lose productivity when switching the software tools that people use.

To quantify lost productivity costs, use the following guidelines: Allocate five hours per user for an upgrade on the same platform, 10 hours per user for an upgrade on a new platform, 10 hours per user for a product switch on the same platform and 15 hours per user for a product switch involving a new platform.

Cost analysis worksheet

Use this worksheet and text to determine the hidden costs of switching software standards

1	
Cost to develop and reproduce course materials (plus)	
Cost of lost employee productivity time while employees are in class (plus)	+
Cost of trainer's time (plus)	+
Cost of outside training (including tuition and travel)	+
Total	

2	
Cost of normal support (multiplied by)	
Change factor (see text)	x
Total	

3	
Cost of personnel for the number of hours spent testing	
Total	

4	
Cost of personnel for the number of hours spent on administrative tasks	
Total	

5	
Number of files to convert (multiplied by)	
Conversion time per file (multiplied by)	x
Cost of personnel	x
Total	

6	
Cost of the developer's time	
Total	

7	
Number of users (multiplied by)	
Number of hours in the change factor (see text) (multiplied by)	x
Cost of employee time	x
Total	

Total	
Add the totals of 1 through 7 to get the full implementation cost of switching software standards	

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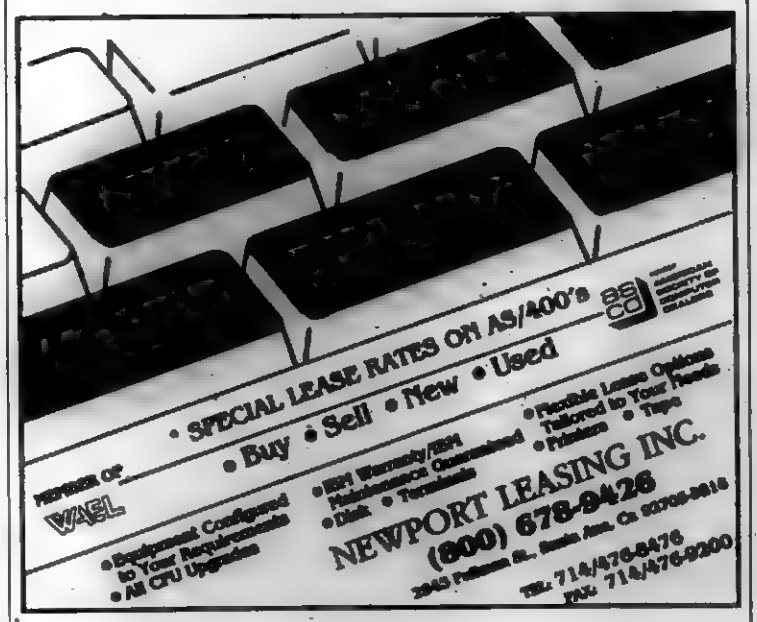

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Inquiries regarding the RFP should be addressed to:

Mr. Stan Johnson
Director
Management Information Systems
Port of Los Angeles
P.O. Box 151
425 So. Palos Verdes Street
San Pedro, CA 90733-0151
Telephone: 310-732-3700
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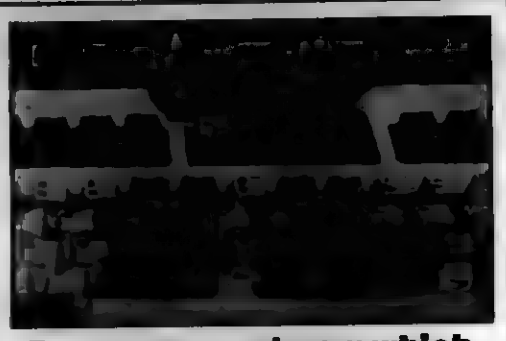

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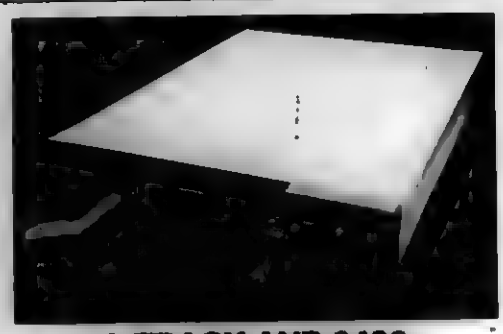

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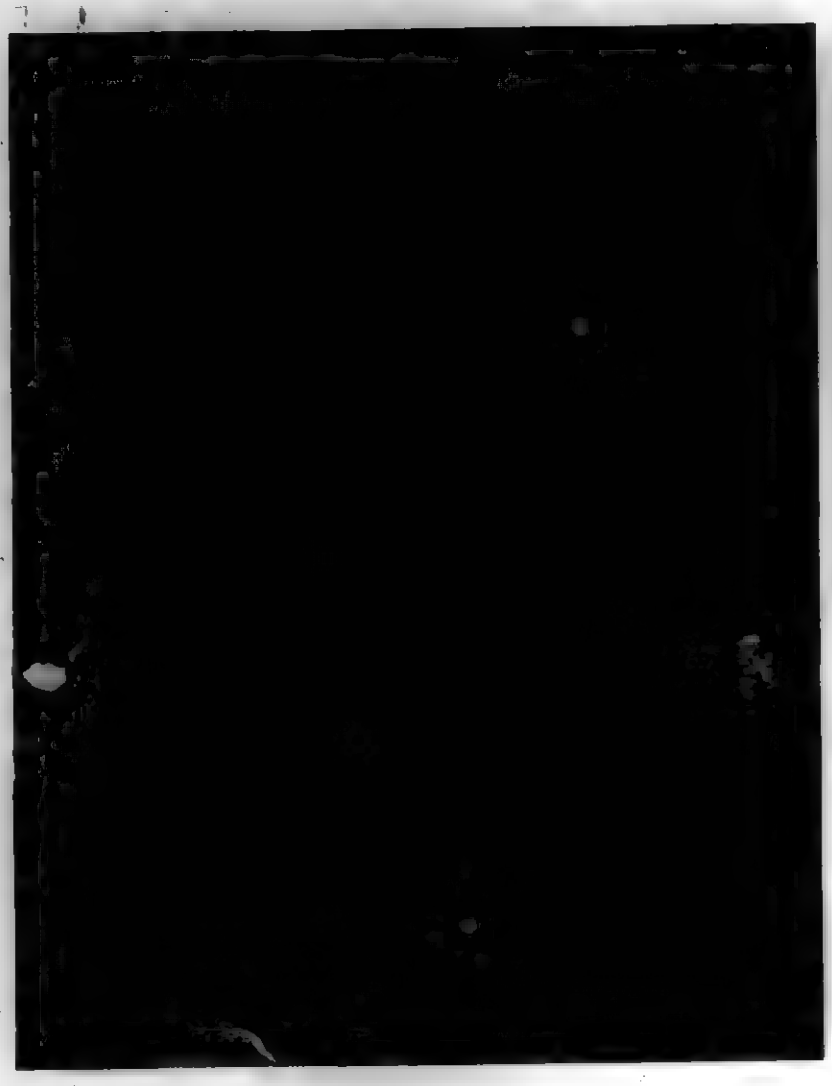

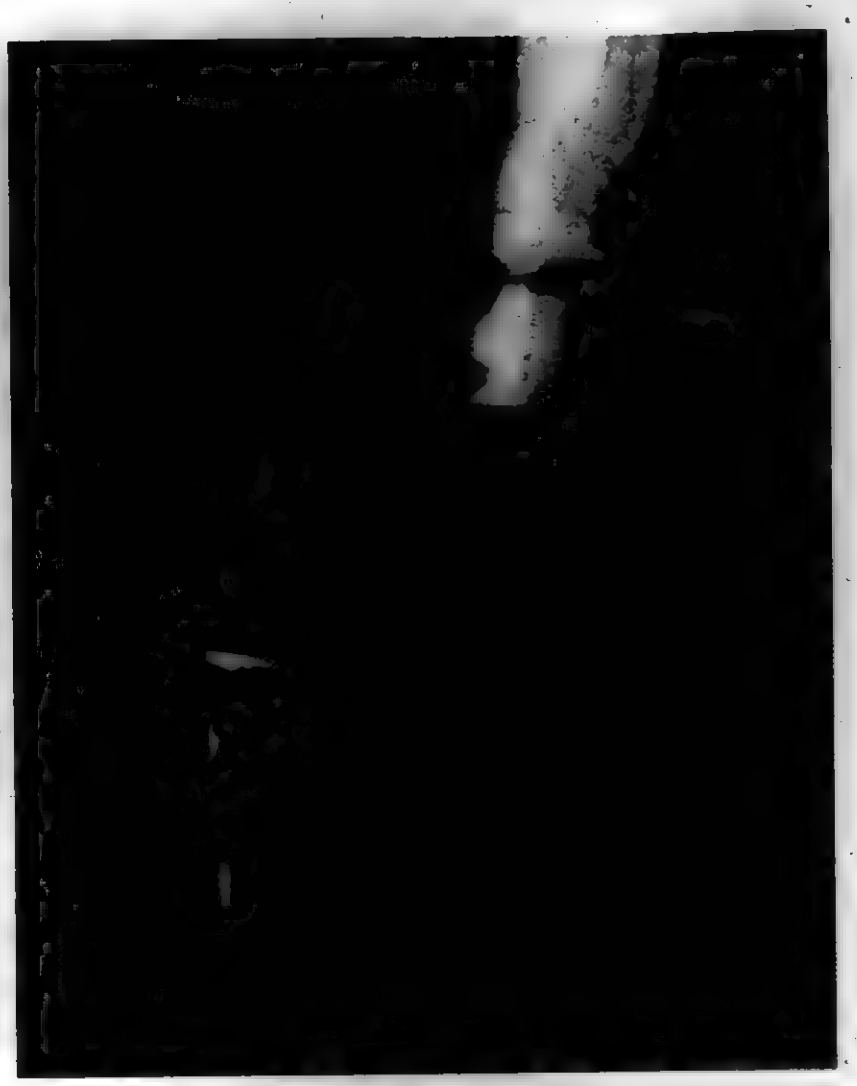

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Percent

Bolt, Beranek & Newman	37.8
Group 1 Software	28.0
Applied Communication Corp.	16.7
Intelligent Info. Systems	14.3
Inacom Corp.	14.2
Walker Interactive Systems	13.3
Phoenix Technologies	12.5
Cognitronics Corp.	12.1

Dollar

Networked Measures Corp.	5.38
Symplex Communications	3.38
Intelligent Info. Systems	3.00
Inacom Corp.	2.75
Arcnet Systems Inc.	2.63
Inacom Corp.	1.63
Rainbow Technologies Inc. (N)	2.50
American Info Techs Corp.	2.50

Losers

Percent

Advanced Micro Devices	-24.9
Apple Computer Inc.	-19.5
Gupta	-18.0
Software Toolworks Inc.	-15.7
Computervision Corp.	-15.4
MathSoft (L)	-14.5
Picturetel Corp.	-14.4
Protein Inc.	-14.3

Dollar

Apple Computer Inc.	-10.75
3M Corp.	-7.38
Advanced Micro Devices	-7.00
Compaq Computer Corp.	-5.63
Microsoft Corp.	-4.38
Creative Technologies Inc.	-3.75
Gupta	-3.63
Picturetel Corp.	-3.25

Legal jitters ease

Sometimes the best way to handle a threat is to ignore it. That wisdom comes from Wall Street equities analysts looking at Intel Corp. (INTC) and Advanced Micro Devices, Inc. (AMD).

Patent decisions can alter a high-tech company's future abruptly — with the potential for a corresponding drop in stock valuation. In AMD's case, a losing final decision in its legal tiff with Intel could cost the smaller firm its piece of the PC processor market and a boatload of cash (see story opposite page).

But the market's reaction to last week's appellate court decision was relatively muted, and several analysts continued to recommend the purchase of both Intel and AMD issues.

Analysts said investors are getting used to the legal tug-of-war and are basing their investment decisions more on company fundamentals. To handle the vicissitudes of investing in firms that are involved in lawsuits, "you need a Maalox and an aspirin, and that's it," said S. G. Warburg & Co. analyst David Wu. "These lawsuits will go on as long as we live, and there's no way to predict a winner."

Several other analysts agreed that a final verdict, in the case of Intel and AMD, is years away. "People are starting to realize that these issues are very gray, and if they don't see an imminent decision, they are likely to revert to looking at earnings estimates," said Lawrence Borgman, senior vice president at Josephthal Lyon & Ross.

The bitterly contested case is a fairly extreme example of computer industry litigation, analysts agreed. Other cases have been somewhat more predictable. "If the company filing suit has a history of settling out of court, you can work with that" to help guide investment decisions, said Stuart Johnson, vice president of research at Wertheim Schroder & Co. —*Derek Slater*

Nearly unanimous

MANY WALL STREET ANALYSTS SAY BOTH INTEL AND AMD MERIT PURCHASE

Dull & Phelps	Buy	Buy
Josephthal, Lyon & Ross	Buy	Hold
Pershing & Co.	Buy	Buy
S. G. Warburg & Co.	Buy	Buy
Wertheim Schroder & Co.	Neutral	Neutral

Exch	52-Week High	52-Week Low		June 11 5 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT						
OTC	40.00	9.63	3 COM Corp.	25.88	-0.63	-2.4
NYS	80.25	62.63	American Info Techs Corp.	76.00	2.50	3.4
NYS	62.75	40.63	AT&T (H)	62.00	0.50	0.8
OTC	3.56	0.75	Aetel Communication Corp.	3.06	0.44	16.7
OTC	24.50	10.25	Banyan Systems Inc.	15.38	0.13	0.8
NYS	56.75	43.88	Bell Atlantic Corp.	56.50	1.50	2.7
NYS	97.50	66.75	BellSouth Corp.	53.13	0.13	0.2
NYS	7.75	3.63	Bolt, Beranek & Newman	7.75	2.13	37.8
OTC	18.50	9.50	Brooktrout Technology	12.25	0.25	2.1
NYS	107.00	65.75	Cabletron Systems	99.88	0.88	0.9
OTC	22.75	3.75	Centigram Communications	20.25	-0.75	-3.6
OTC	43.50	19.00	Chipcom Corp.	39.13	2.50	6.8
OTC	56.25	21.38	Cisco Systems Inc.	53.00	1.25	2.4
OTC	16.38	5.50	Compression Labs Inc.	11.63	-1.38	-10.6
OTC	36.00	11.00	CrossComm	30.25	0.25	0.8
OTC	4.63	1.00	Data Switch Corp.	2.75	0.00	0.0
NYS	20.25	12.38	Digital Comm. Assoc.	12.75	-0.13	-1.0
OTC	12.75	4.50	Digital Systems Int'l Inc.	5.25	0.00	0.0
OTC	44.00	4.25	DSC Communications	43.13	-0.63	-1.4
OTC	9.50	4.75	Fibronics Int'l Inc.	6.50	0.50	8.3
OTC	24.75	8.75	Fibronics Corp.	12.25	0.00	0.0
OTC	4.38	1.50	Gandalf Technologies Inc.	3.13	0.13	4.2
OTC	2.06	0.69	Gateway Communications	1.06	-0.06	-5.5
NYS	15.75	2.88	General Datacomm Inds. (H)	14.38	-1.25	-8.0
ASE	3.75	2.00	Go Video	2.94	0.31	11.9
NYS	37.75	30.63	GTE Corp.	35.13	0.13	0.4
NYS	85.13	62.50	ITT Corp.	81.25	-2.25	-2.7
OTC	57.13	30.75	MCI Communications Corp.	54.50	-0.88	-1.6
OTC	9.75	2.25	Microcom Inc.	4.00	0.00	0.0
OTC	24.25	4.75	Netrix Corp.	5.25	0.25	5.0
OTC	19.00	8.75	Network Computing Devices	9.75	0.00	0.0
NYS	15.00	5.38	Network Equipment Tech.	8.88	-0.33	-1.4
OTC	21.00	8.00	Network General	9.25	-0.25	-2.6
OTC	15.75	8.38	Network Systems Corp. (L)	9.13	0.13	1.4
OTC	65.63	15.00	Newbridge Networks Corp.	81.00	5.50	7.3
NYS	46.00	30.50	Northern Telecom Ltd.	36.38	0.63	1.7
OTC	35.25	27.50	Novell Inc.	28.25	0.25	0.9
NYS	92.50	76.00	Nynex Corp.	87.75	2.75	3.2
OTC	30.00	14.50	Octel Communications Corp.	21.25	-1.00	-4.5
OTC	6.13	3.38	Perinet Data Comm Networks	4.38	0.13	2.9
OTC	30.50	10.25	Picturetel Corp.	19.25	-3.25	-14.4
OTC	15.25	4.63	Proteon Inc.	5.25	-0.88	-14.3
NYS	35.00	14.25	Scientific Atlanta Inc.	32.75	-1.00	-3.0
NYS	40.75	29.69	Southwestern Bell Corp.	39.00	0.50	1.3
NYS	33.25	21.00	Sprint Corp.	30.75	-0.13	-0.4
OTC	27.00	10.50	Standard Microsystems Corp	17.38	0.88	5.3
OTC	18.50	6.88	Stratacom Inc.	14.25	0.00	0.0
OTC	128.25	27.75	Synoptics Communications	109.88	3.38	3.2
OTC	7.00	3.88	Telebit Corp. (L)	4.75	0.13	3.0
OTC	9.38	2.13	Telematics Int'l Inc.	7.00	0.38	5.7
OTC	25.50	13.38	US Robotics	21.25	-0.25	-1.2
NYS	45.00	34.88	U S West Inc.	44.25	0.13	0.3
OTC	55.50	12.00	Wellfleet Communications	47.50	2.25	5.0
OTC	14.75	7.00	Xircom (H)	14.00	0.00	0.0
COMPUTERS AND WORKSTATIONS						
OTC	6.00	2.50	Advanced Logic Research	3.75	-0.44	-10.5
OTC	65.25	41.50	Apple Computer Inc.	44.25	-10.75	-19.5
OTC	24.25	11.25	AST Research Inc.	14.50	-1.00	-6.5
NYS	11.38	2.63	Commodore Int'l	3.00	0.13	4.3
NYS	61.75	23.13	Compaq Computer Corp.	54.13	-5.63	-9.4
OTC	49.88	15.00	Dell Computer Corp	20.25	-2.13	-9.5
NYS	88.88	50.25	Hewlett Packard Co.	86.13	-0.50	-0.6
NYS	38.50	16.13	Silicon Graphics	34.63	-1.63	-4.5
OTC	41.00	22.50	Sun Microsystems Inc.	30.63	-1.38	-4.3
NYS	32.38	22.25	Tandy Corp.	29.88	-1.00	-3.2
OTC	8.75	2.75	Zeos International Ltd.	4.13	0.00	0.0
DISK DRIVES						
ASE	18.38	4.63	Amdahl Corp.	5.50	0.00	0.0
NYS	8.75	4.25	Conner Computer	5.88	-0.50	-7.8
OTC	6.13	1.88	Cray Computer	3.38	0.00	0.0
NYS	32.50	19.00	Cray Research Inc.	27.50	-0.75	-2.7
NYS	13.88	7.13	Data General Corp.	10.00	-0.75	-7.0
NYS	49.25	30.38	Digital Equipment Corp.	42.50	-0.88	-2.0
NYS	38.63	26.75	Harris Corp.	37.63	0.38	1.0
NYS	100.38	45.88	IBM	52.50	-1.25	-2.3
OTC	22.00	5.50	Kendall Square Research	16.63	-0.38	-2.2
NYS	127.50	83.00	Matsushita Electronics	122.00	-2.00	-1.6
OTC	23.75	8.25	Netframe	16.13	0.25	1.6
OTC	15.50	9.25	Parallan Computer	13.00	-1.00	-7.1
OTC	19.00	6.00	Pyramid Technology	18.00	-0.25	-1.4
OTC	24.00	13.50	Sequent Computer Sys.	18.88	-0.63	-3.2
OTC	12.13	1.38	Sequoia Systems Inc.	1.94	-0.06	-3.1
NYS	48.38	29.50	Stratus Computer Inc.	30.75	-0.88	-2.8
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.00	0.0
NYS	19.00	10.63	TriCord Systems	17.25	-0.88	-4.8
NYS	19.88	7.75	Unisys Corp.	11.38	-0.50	-4.2
SOFTWARE						
OTC	71.50	25.25	Adobe Systems Inc.	68.00	2.63	4.0
OTC	20.75	10.25	Aldus Corp.	15.75	-0.38	-2.3
OTC	14.25	5.50	American Software Inc.	8.00	0.38	4.9
OTC	28.13	9.75	Ask Computer Systems	11.00	-1.25	-10.2
OTC	56.50	32.75	Autodesk Inc.	52.00	2.13	4.3
OTC	13.00	2.50	Bachman Info. Systems	3.13	0.00	0.0
OTC	43.00	32.00	BGS Systems Inc.	33.75	0.75	2.3
OTC	84.13	37.25	BMC Software Inc.	50.25	-0.88	-1.7
OTC	28.25	17.00	Boole & Babbage	24.00	0.50	2.1
OTC	49.00	17.50	Borland Int'l Inc.	22.88	-1.13	-4.7
OTC	5.63	3.00	CE Software	3.31	-0.31	-8.6
ASE	30.25	6.25	Cheyenne Software Inc.	27.13	0.00	0.0
OTC	19.50	8.25	ChipSoft	10.25	-0.50	-4.7
OTC	9.25	5.63	Cognos Inc.	6.50	-0.13	-1.9
NYS	31.38	10.88	Computer Associates	27.50	0.25	0.9
NYS	12.38	2.75	Computervision Corp.	4.13	-0.75	-15.4
OTC	34.25	19.25	Compuware Corp.	23.25	1.00	4.5
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OTC	17.25	10.75	Corel Corp.	15.75	0.13	0.8
OTC	27.00	5.25	Easel Corp.	6.38	0.38	6.3
OTC	25.25	12.00	4th Dimension	17.75	-2.25	-11.3
OTC	19.50	5.75	Frame Technology (L)	6.00	-0.63	-9.4
OTC	20.75	10.00	Group 1 Software	12.00	2.00	20.0
OTC	35.25	15.63	Gupta	15.63	-3.63	-18.8
OTC	8.75	3.50	Hogan Systems Inc.	7.75	-0.13	-1.6
OTC	25.75	11.25	HNRS	18.75	0.50	2.7
OTC	36.00	18.50	Information Resources	35.50	1.25	3.6
OTC	49.75	12.13	Informix Corp.	44.50	0.75	1.7
OTC	16.75	8.88	Interleaf Corp. (L)	9.88	0.50	5.3
OTC	13.63	6.88	Interleaf Inc.	8.38	-0.25	-2.9
OTC	18.00	6.50	Intersolv Inc.	7.00	0.38	5.7
OTC	16.00	7.25	Knowledgeware Inc.	10.00	0.25	2.6
OTC	54.75	26.00	Legent Corp.	30.63	2.38	8.4
OTC	36.75	14.75	Lotus Development	33.50	-0.63	-1.8
OTC	23.00	6.50	MathSoft (L)	6.63	-1.13	-14.6
OTC	23.25	5.25	McAfee Associates	7.00	0.75	12.0
OTC	11.63	1.88	Meca Software	10.63	-0.25	-2.3
OTC	13.25	5.25	Mentor Graphics	10.75	0.38	3.6
OTC	46.00	27.25	Micro Focus	34.00	0.00	0.0
OTC	17.25	4.38	Micrografx Inc.	5.63	-0.13	-2.2
OTC	98.00	65.50	Microsoft Corp.	89.63	-4.38	-4.7
OTC	45.63	14.00	Oracle Corp.	42.38	-2.00	-4.5
OTC	34.25	15.38	Parametric Technology	29.00	-1.63	-5.3
OTC	40.50	22.50	Peoplesoft	31.75	-1.25	-3.8
OTC	7.13	3.50	Phoenix Technologies	5.63	0.63	12.5
OTC	40.00	24.75	Powersoft (L)	26.00	1.13	4.5
OTC	61.50	17.00	Platinum Software	25.50	0.50	2.0
OTC	25.00	11.25	Platinum Technology	13.75	0.13	0.9
OTC	61.50	29.00	Progress Software Corp.	34.00	-2.50	-6.8
OTC	13.25	2.56	Quarterdeck Office Sys.	3.19	-0.13	-3.8
OTC	26.25	11.75	Rainbow Technologies Inc. (H)	26.25	2.50	10.5
OTC	13.00	4.00	Rasterops	8.75	-0.88	-9.1
OTC	15.25	3.63	Ross Systems	12.00	-0.88	-6.8
OTC	27.25	8.50	Saphers Intl. Corp. N.V.	23.25	0.38	1.6
OTC	14.50	6.75	Software Publishing Corp.	7.75	-0.38	-4.6
OTC	12.00	2.00	Software Toolworks Inc.	9.38	-1.75	-15.7
OTC	4.13	0.75	Spinnaker Software	1.38	0.00	0.0
OTC	12.75	3.25	State of the Art	10.25	0.00	0.0
NYS	24.63	13.75	Sterling Software Inc.	19.50	0.75	4.0
OTC	21.50	8.00	Struct. Dynamics Research	18.75	-0.25	-1.4
OTC	72.75	21.00	Sybase Inc.	69.13	0.88	1.3
OTC	42.75	5.88	Symantec Corp.	15.75	-1.88	-10.6
NYS	12.50	5.25	Systems Center Inc.	10.25	0.13	1.2
OTC	25.50	10.00	System Software Assoc.	19.25	0.00	0.0
OTC	6.50	2.50	Teknic Corp.	3.25	-0.38	-10.9
OTC	22.75	9.13	ViewLogic Systems	18.13	-0.38	-2.0
OTC	23.50	6.75	Walker Interactive Systems	8.50	1.00	13.3
OTC	3.19	1.38	Wordstar	1.63	0.06	4.0
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices	21.13	-7.00	-24.9
NYS	21.38	9.00	Analog Devices Inc.	18.75	-0.63	-3.2
OTC	24.38	7.63	Atmel Corp.	24.13	0.25	1.0
OTC	7.75	2.75	Chips and Technologies	3.88	-0.50	-11.4
OTC	39.75	13.00	Cirrus Logic	18.88	-1.50	-7.4
NYS	14.38	7.38	Cypress Semiconductor Corp	13.38	-0.50	-3.6
NYS	16.13	8.00	Dallas Semiconductor	14.13	-1.00	-6.6
OTC	60.63	23.88	Intel Corp.	56.50	0.31	0.6
NYS	14.50	4.88	LSI Logic Corp. (H)	13.63	-0.13	-0.9
OTC	33.25	13.75	Lattice Semiconductor	29.13	0.13	0.4
NYS	33.13	13.13	Micron Technology (H)	31.75	0.63	2.0
NYS	88.00	37.13	Motorola Inc.	84.00	-2.25	-2.6
NYS	15.88	8.50	National Semiconductor (H)	14.75	-0.88	-5.6
OTC	16.50	6.50	Sierra Semiconductor	8.00	0.25	3.2
OTC	43.25	22.25	SynOptics	39.00	-1.25	-3.1
NYS	69.00	32.25	Texas Instruments	66.38	-2.25	-3.3
OTC	8.88	6.00	VLSI Technology	8.00	0.00	0.0
OTC	9.88	7.13	Weitek	9.88	0.75	8.2
ASE	9.63	4.13	Western Digital Corp.	4.63	0.25	5.1
OTC	38.50	14.50	Xilinx	33.75	-2.25	-6.3
OTC	32.38	12.66	Zilog Inc.	32.38	0.88	2.8
PERIPHERALS AND SUBSYSTEMS						
OTC	39.25	11.75	American Power Conversion	37.00	-0.50	-1.3
OTC	20.16	13.84	Banctec Inc.	18.25	-0.75	-3.9
OTC	18.00	6.25	Cambex Corp.	2.00	-0.38	-5.1
ASE	18.38	6.50	Cognitronics Corp.	8.13	0.88	12.1
NYS	25.50	10.38	Conner Peripherals (L)	10.50	-1.00	-8.7
OTC	38.50	10.75	Creative Technologies Inc.	28.75	-1.75	-11.5
OTC	30.75	14.25	Data Race Inc.	19.75	-2.25	-10.2
ASE	17.00	4.75	Databasm Corp.	9.50	-1.00	-9.5
NYS	18.63	5.06	EMC Corp.	17.38	-0.56	-3.1
OTC	10.50	5.38	Emulex Corp.	7.13	-0.13	-1.7
OTC	19.00	13.25	Evans & Sutherland	16.50	-0.38	-2.2
OTC	33.00	10.88	Exabyte (L)	10.88	-1.63	-13.0
OTC	26.00	7.09	Intelligent Info. Systems	24.00	3.00	14.3
OTC	8.88	3.88	Iomega Corp.	4.19	-0.06	-1.5
OTC	21.25	5.75	IPL Systems Inc.	8.00	0.75	10.3
OTC	24.00	10.75	Komag Inc.	20.25	0.25	1.3
OTC	19.63	5.88	Maxtor Corp.	6.50	-0.38	-5.5
OTC	11.25	5.75	Micropolis Corp.	7.25	0.00	0.0
NYS	117.00	94.75	3M Corp.	108.00	-7.38	-6.4
OTC	7.75	4.00	Printronix Inc.	6.50	-0.25	-3.7
NYS	17.25	6.88	QMS Inc.	8.88	-0.75	-7.8
OTC	17.88	11.63	Quantum Corp.	11.88	-0.50	-4.0
OTC	12.75	3.25	Radius Inc. (L)	3.50	0.06	1.8
NYS	16.50	7.50	Recognition Equipment	14.50	-1.00	-6.5
OTC	13.88	4.50	Reton Inc.	5.13	0.25	5.1
OTC	22.38	12.00	Seagate Technology	14.88	-0.88	-5.6
NYS	45.00	18.00	Storage Technology	36.88	-2.50	-6.3
NYS	27.88	16.88	Tektronix Inc.	23.13	-0.25	-1.1
NYS	88.88	66.75	Xerox Corp.	75.13	0.00	0.0
SERVICES						
OTC	21.75	14.25	American Mgmt. Systems	17.50	0.88	4.8
NYS	4.75	2.75	Amacomp Inc.	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	26.25	-0.75	-2.8
NYS	56.13	38.75	Auto Data Processing	49.38	0.13	0.3
NYS	17.25	11.22	Ceridian Corp.	14.50	0.13	0.9
NYS	17.38	13.13	Comdisco Inc.	14.50	0.25	1.8
OTC	8.25	4.50	Computer Horizons	7.75	0.50	6.9
NYS	80.50	57.00	Computer Sciences	75.38	0.13	0.2
NYS	9.25	6.50	Computer Task Group	7.00	0.00	0.0
NYS	60.50	22.00	CompuUSA Inc.	33.50	0.50	1.5
OTC	14.25	6.00	Corporate Software	12.00	0.25	2.1
OTC	19.75	7.38	Egghead Discount Software	8.63	0.25	3.0
NYS	35.88	25.25	General Motors E (EDS)	30.13	-1.00	-3.2
OTC	25.50	9.25	Inacom Corp.	21.13	2.63	14.2
OTC	15.38	6.25	Intelligent Electronics	12.38	-0.75	-5.7
OTC	13.00	6.63	Merisel	12.38	-0.25	-2.0
OTC	16.25	5.75	Micrografx Inc.	15.25	0.00	0.0
OTC	43.00	21.75	Paychex	39.00	-2.25	-5.5
NYS	87.25	32.88	Policy Management Sys.	38.38	0.63	1.7
NYS	38.50	16.81	Reynolds and Reynolds	37.75	0.00	0.0
OTC	33.00	22.00	SEI Corp.	31.00	-1.25	-3.9
OTC	24.38	16.88	Shared Medical Systems	22.13	-0.13	-0.6
OTC	12.63	5.75	SHL Systemhouse	10.63	-0.75	-6.6
OTC	29.25	18.25	Software Spectrum Inc.	27.25	0.50	1.9
OTC	33.75	22.50	Sungard Data Systems	30.50	-0.50	-1.6
NYS	4.38	1.13	Ultimate Corp.	3.38	-0.50	-12.9

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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In Brief

Frame restructures

Citing declining revenue and an anticipated second-quarter loss, Frame Technology Corp. is cutting its head count by 20% and will take a $15 million restructuring charge in the period. Frame has also hired George Klaus — president and chief executive officer of Integral — effective July 1. He replaces Paul Robichaux, who remains chairman of the San Jose, Calif., developer of document publishing software. Integral co-founder Kathleen Urbelis was named interim president.

Tandy line sold

Norand Corp. in Cedar Rapids, Iowa, has purchased Tandy Corp.'s Micronic/Parconin line of handheld computers, which are sold primarily in Europe. Norand will also acquire procurement rights and some short-term liabilities associated with the line. An undisclosed number of employees have been offered jobs with Norand. The deal comes just weeks after Tandy agreed to sell the bulk of its PC operations to AST Research, Inc.

SHORT TAKES The International Trade Commission agreed to investigate Intel Corp.'s patent claims against Twinhead International, Inc.... PenUltimate, Inc., an Irvine, Calif., developer of pen and mobile computing software, has agreed to sell $5 million worth of its stock in a public offering.... Random Access, Inc. in Denver has signed a letter of intent with a brokerage to underwrite a public offering next month of approximately 2 million shares of common stock.... Irvine, Calif.-based Wonderware Corp. last week filed a proposal for a planned initial public offering of 2.25 million shares of common stock expected to sell for between $10 and $12 a share.

Novell buys to build developer's framework

By Michele Doetert
PROVO, UTAH

■ Novell, Inc. expects to announce a new application development architecture later this month that will use its recently acquired object-oriented technology to simplify the development of distributed applications on the NetWare operating system.

More acquisitions are rumored to be imminent. Novell is reportedly negotiating to purchase Fluent, Inc., a Natick, Mass., company specializing in multimedia application tools. Novell and Fluent officials declined to comment on the matter.

However, Darrel Miller, Novell's executive vice president, said the company intends to make more acquisitions and partnerships during the next year. "Novell is always in the market for best-of-breed, multiplatform technology," he said.

During the next two years, according to Miller, Novell will be targeting what it thinks will be the hottest niche in the networking market: dedicated application servers. But in this arena, NetWare must compete with Microsoft Corp.'s Windows NT and IBM's OS/2, which is why Novell has been aggressively acquiring application development technology.

Novell has a three-pronged plan of attack for this application server market. First, it is beefing up NetWare's object-oriented application development support using technologies acquired from Hyperdesk Corp. in Westboro, Mass., Software Transformation, Inc. in Cupertino, Calif., and Serius Corp. in Salt Lake City (see chart).

Novell's upcoming application development architecture, called FrameWare, will provide developers with a template to more easily build object-oriented, cross-platform networked applications.

Buying spree

Company acquired	Price paid	Novell gains
Hyperdesk	NA*	Object-management interface
Software Transformation	$25.8M	Cross-platform development APIs
Serius	$17.25M	Cross-platform application development language
Unix System Laboratories	$100M	Control of Unix System V source code

*Not available

"All of this object-oriented technology Novell has acquired is aimed at strengthening NetWare against NT and OS/2 in application development," said Stan Schatt, a local-area network analyst at Computer Intelligence/Infocorp in Santa Clara, Calif.

Secondly, Novell is touting its System V Release 4-based UnixWare as a platform for developing both Unix and NetWare-based applications. "There are hundreds of existing Unix applications that can be easily ported to UnixWare and then sold to all those NetWare users, which makes UnixWare very attractive to developers," said Jamie Lewis, an analyst at The Burton Group in Salt Lake City.

Third, it has defined and expanded a set of System Application Services that NetWare can provide to application developers, including imaging engines, multimedia application programming interfaces and messaging and directory services.

A fourth prong may be to look beyond current technological hot spots when considering future acquisitions, company officials said. "Novell's strategy is to anticipate today which technologies will be in high demand three to five years from now and acquire companies that are working in that area," Miller said.

Novell thinks that five years down the road the most in-demand technology will be connectivity products that move users from the current, many-to-one client/server model to a many-to-many web of information sources — available worldwide via intelligently programmed devices, according to Miller.

"We'll need a whole set of new tools to automate the distribution of applications and information because it will just be too complicated for a human to do. We hope to have all of the technology in hand when this market appears," Miller said.

For example, Novell officials are looking to build or acquire "smarter software" that can route, store and forward messages to users anywhere in the world automatically, Miller said.

Intel winner of 386 suit, for now

By Michael Fitzgerald

Followers of the court battles between Intel Corp. and Advanced Micro Devices, Inc. (AMD) could easily name Yogi Berra as their patron saint, as "deja vu all over again" has happened yet again.

Late on June 4, the California Sixth District Court of Appeals overturned an arbitrator's 1992 decision giving AMD the right to manufacture its clones of Intel's 80386 chip.

AMD's stock price fell more than 15% in the wake of the announcement.

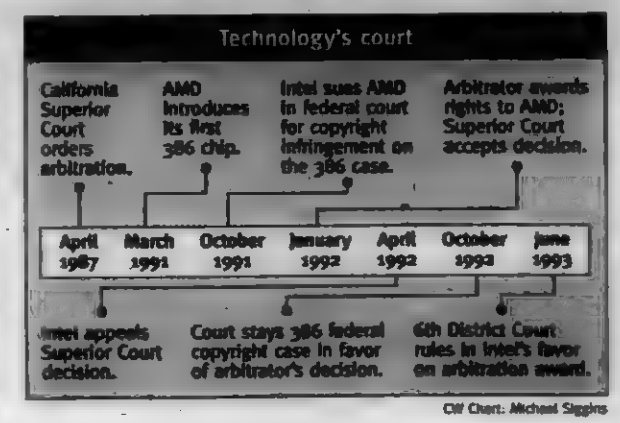
While AMD will ask the panel to reconsider its decision, the company said it will likely have to ask the California Supreme Court to hear its appeal.

Regardless, users will probably see little impact, as "neither company's product shipments will be affected during the next year or two," predicted Ken Lowe, an analyst at Dataquest, Inc. in San Jose, Calif.

The panel's decision applies only to the 386 arbitration ruling, at a time when the market is shifting to the 486. But Intel will probably use the decision to revive a separate case alleging that AMD violated copyright laws by producing the 386. That had been stayed in a federal court in October 1992 in favor of the arbitrator's decision.

Intel had requested damages of $800 million when it filed the federal copyright case in October 1991. But some observers said Intel may up the ante to $1 billion to reflect lost sales.

Technology's court



CW Chart: Michael Siggins

Chip shots

Dean McCarron, an analyst at Micro Design Resources, Inc. in Scottsdale, Ariz., estimated that AMD had between 55% and 60% of the total 386 market in 1992. McCarron estimated that Intel and AMD produced 14 million 386SX and DX chips between them last year, representing approximately $600 million in revenue. He said he expects AMD to gain share this year, as Intel focuses on the 486 and Pentium, though the total 386 market is shrinking.

Wysiwyg

We all have some cute and some not-so-cute nicknames for our users. Here are some handles our readers use to refer to their users:

Name Game

Bunkie: An inept user who is the bane of the IS staff's existence.

Wire-haired Geeks: Very knowledgeable but still irritating users.

BMU: Stands for "Brain-Missing Users." Speaks for itself.

Unclean Masses: Users you don't want to go near because they just mean trouble.

WORD PLAY

The IS department at Acme Manufacturing Corp. was meeting with the support staff about the newly implemented client/server system when the help desk phone rang. It was a **Bunkie** asking why he had to move to the new version of Windows when he had just mastered the old version. No sooner had the user hung up when the phone rang again, with a **Wire-haired Geek** on the line wondering why the company wasn't on the beta-test list for Windows NT. Just then, Fran came into the room, apologizing for her tardiness. She had just spent a half-hour with a **BMU** teaching him how to power up his PC. She had left him still trying to master the double-click on his mouse. Just then, the IS staff heard a great rumbling noise and looked down the hall to see the entire accounting department striding toward them. It appeared that the **Unclean Masses** were on their way to discuss the new accounts receivable package. It was going to be a long day for IS.

Illustrations by Stephanie Faucher

The 5th Wave *by* Rich Tennant

Inside Lines

Packing down the betas

Reports on "Snowball," the code name for Microsoft's next generation of Windows for Workgroups, indicate that the round beta-test version contains the beginnings of TCP/IP support as well as ODI and Remote Access services. These features, among other things, could make the next Windows for Workgroups a better client for Windows NT. Meanwhile, sources said Microsoft is intended making Chicago — its next version of Windows — fit in a minimum of 4M bytes of memory. Microsoft reportedly is willing to sacrifice some features to make sure it runs well in 8M bytes of memory.

Getting sifmodi

Microsoft has delayed the ship date of its Delta versioning tool for software development until the fall, according to industry sources. The product, dubbed Sourcesode Line Management, or "Slime" internally, is scarcely being used in-house due to performance and other problems. It is now going through a second beta test, the sources said. It was originally scheduled to ship in March.

Playing it safe . . . for now

Before it makes its major systems launch this fall (see story page 1), Compaq will introduce a two-processor version of its SystemPro/XL, according to Virgil Hornstein, director of systems marketing. Hornstein said this would cap out the XL line — a surprise, because Compaq had said the XL would support four processors when the company introduced it. The four-processor version was expected by this summer. The fall announcement will include support for four processors and software to run on them.

Power-full

The second-generation EV5 version of DEC's Alpha AXP microprocessor, due out in the second half of next year, will likely exceed a 30W maximum power consumption goal that DEC has set for the RISC technology. DEC was already too far into the product definition stage on EV5, which it will market as the DECchip 21164, when it decided that 30W was the appropriate upper power limit for future devices. The company hopes to keep the third-generation EV6 microprocessor that is scheduled for introduction in 1996 under 30W but is having to devote a lot of engineering time to come up with a way to do so.

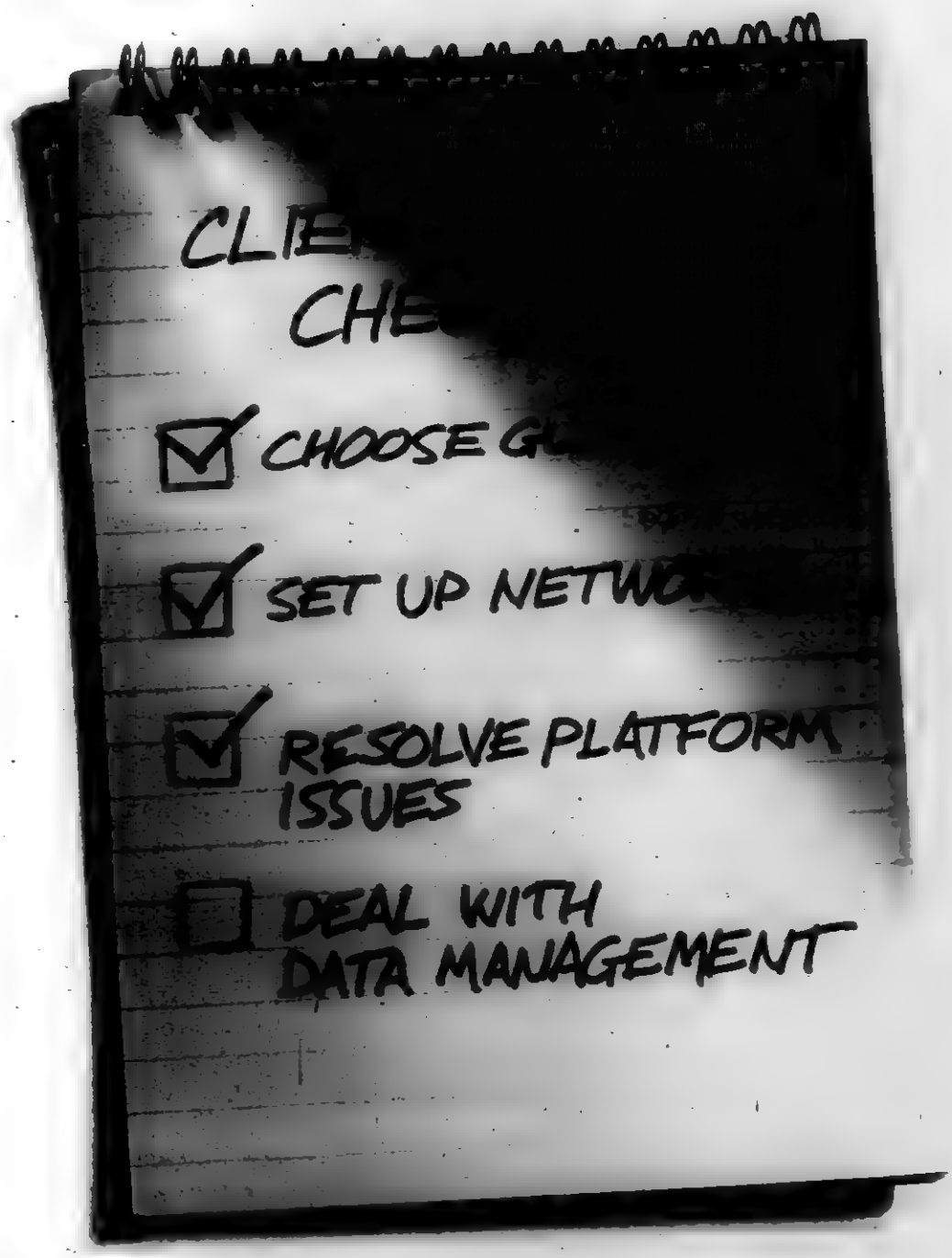
DOE, a dear

After two years of gestation, Sun Microsystems' SunSoft business unit is about to give birth to Distributed Objects Everywhere (also known as Project DOE). Sun hinted at DOE during last summer's Object World in San Francisco, but it is making a formal announcement at this week's reprise of the same object-oriented event. A DOE developer's tool kit will be delivered to selected SunSoft users and developers via CD-ROM by next month, Sun sources said.

Integration netting

CMIP, the much-maligned "official" network management protocol, was an unexpected participant at InterLab's New SNA conference last week. IBM networking director Rick McGee confirmed again that IBM plans to integrate SNMP and Common Management Information Protocol for managing current and future versions of its APPN internetworking architecture. Cabletron hinted that its Spectrum platform would do the same thing as a way for managing SNA LAN internetworking.

Just as the movie Jurassic Park hits the theaters, the computer makers who worked behind the scenes are starting to take their bows. The images of giant dinosaurs that amble and run throughout the flick were generated on Silicon Graphics workstations at Industrial Light & Magic in California. Meanwhile, rival Sun Microsystems noted that Jack Horner, the Montana scientist who consulted on the film, used a Sun SPARCstation to analyze CAT scans of dinosaur fossils. Rivalry, it seems, has not evolved much since the Jurassic Age. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (800) 839-6555.



The One You Haven't Done Could Be Your Undoing.

As you move to client/server computing, you'll undoubtedly spend countless hours evaluating GUI tools, sorting through network solutions and resolving platform issues. But past experience will tell you that managing your data is just as important. In fact, it's key to delivering information to your users when and where they need it–and making sure it's the right information.

To help you address the issue of data management in a distributed environment, we've developed a useful guide that's yours free. For your personal copy, return this coupon or phone us at **1-800-BACHMAN. In Canada, call 1-800-445-0854.**

Successfully implementing client/server computing isn't easy. But if data management is high on your list, you'll be well on your way to getting the job done.

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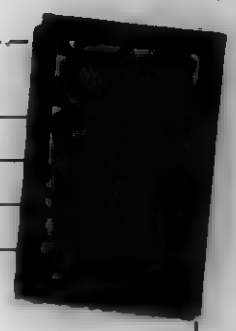

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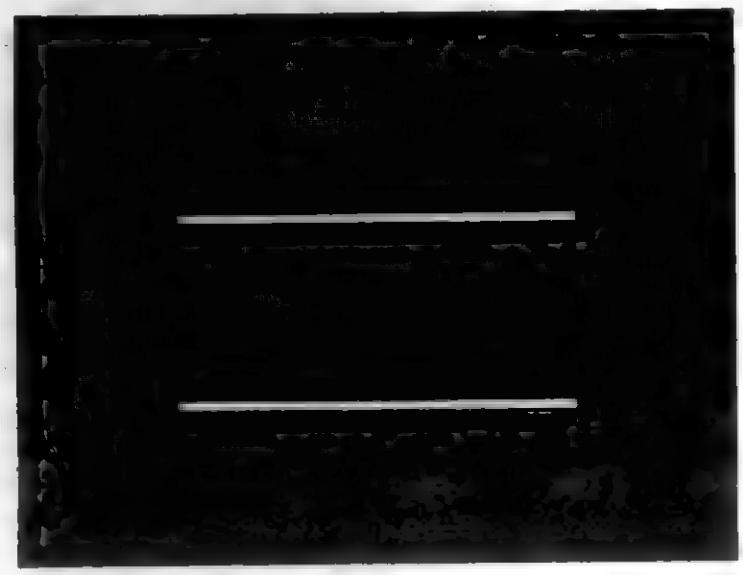

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COMPUTERWORLD

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OS WARS
Windows NT isn't shipping, but that hasn't stopped early users. **The Education Resources Institute** is building an NT-based global student loan system. Meanwhile, **IBM** gets some free advice on how to pump up OS/2 sales. *Page 4*

LEGACY DATA
Desktop access to prerelational mainframe data gets easier as more connectivity options bridge the gap between the two. *Page 10.* **Adobe** plans to tackle the legacy of paper documents using OCR technology. *Page 56*

INTERNETS
While SNA managers struggle with internetworking (*page 61*), **Hewlett-Packard** attacks the low end of the market with two aggressively priced routers. *Page 62*

PC HARDWARE
"Green PCs" see the light of day at White House rollout. *Page 24.* Phenomenal growth causes **Compaq** to pause and catch its breath as it sets its sights on IBM. *Page 123*

Users tie 'partners' to profits

Bottom line key for outsourcing pacts

By Mark Halper
SAN FRANCISCO

■Navistar International Corp. is once again evaluating whether to outsource its data centers. Only this time the company wants to structure a deal in which the price it pays the vendor will tie directly into how much product rolls off its assembly lines.

The $3.8 billion Chicago-based truck and engine company's tack is indicative of a sentiment taking hold among information systems chiefs: If outsourcing vendors are indeed business partners, then why shouldn't they link their compensation to their customers' business performance?

"We're trying to craft an arrangement that establishes a correlation between the intensity of the information utility and the amount of products we produce," said E. O. Stout, Navistar information organization vice president, who is investigating farming out operation of four data centers.

His idea was well-received by several of his IS counterparts who gathered at a Digital Consulting, Inc. outsourcing conference held here last week to glean insights for

'Partners,' *page 16*

Wireless nets gaining ground

Interoperable services, airborne E-mail pushing tech envelope

By Lynda Radosevich
ATLANTA

Airborne, interactive electronic mail edged closer to becoming a widespread corporate reality last week at the Electronic Mail Association conference.

Among the wireless milestones achieved were the first interoperability effort among radio-based networks, wireless versions of popular local-area network-based mail applications and cabled-to-wireless network links. These efforts pushed the technology ever closer to widespread use, although obstacles remain.

While many firms said they now have high hopes for wireless E-mail's potential, they confessed that the technology far from meets their large-scale needs because of such glaring barriers as insufficient network reach.

"Looking at the coverage maps, [wireless messaging] is not relevant for us yet," said Phillip Widing, computing technology analyst at Alcan Aluminum Corp., a Montreal manufacturer.

However, an industry interoperability turning point reached by start-up RadioMail Corp. in San Mateo, Calif., should ease this concern. The company demonstrated a gateway service, slated to be generally available in August, that lets users exchange messages across RAM Mobile Data and Ardis wireless packet data networks.

Such linkups would allow users to gain the cumulative geographic coverage of the interconnected networks. What would further enhance the benefit to users would be linking RAM Mobile Data and Ardis gateways into McCaw Cellular Corp.'s far-reaching cellular network, which is in its infancy in supporting data applications.

However, no announcements have yet been made in that area.

Filling in another piece of the wireless puzzle was Ericsson GE

Wireless, *page 14*

Enterprising insurers

Mobile pen computing greases way to faster, cheaper repairs

By Joanie M. Wexler
SAN RAMON, CALIF.

A graphical, database-oriented system in a suitcase from a unit of Automatic Data Processing, Inc. is saving many of today's fiercely competitive insurance carriers about $100 per automobile repair estimate.

This has translated into a 15% productivity gain for The Travelers Corp. in Hartford, Conn., said Paul Ramsey, PC claims director. Travelers has also realized a 50% service boost by chopping the entire estimating turnaround time from 96 hours to 48, he said.

Mobile computing, *page 10*

ADP's Gerhard Blandstrup *expects 2,500 Audapoint systems to be in use within 12 months*

Software upgrade costs rising

By Michael Vizard

Now that many corporate sites are well along in their transition from DOS to Windows, information systems directors have begun to notice that the price of PC software upgrades is edging higher as the cost of new product software falls.

With the average selling price of packaged applications falling about 15% a year, developers are looking to make up some of that lost revenue on upgrades. As a result, upgrade pricing has risen about 20% during the past two years, said Susan Borden, managing editor of the "SoftJetter" newsletter in Watertown, Mass.

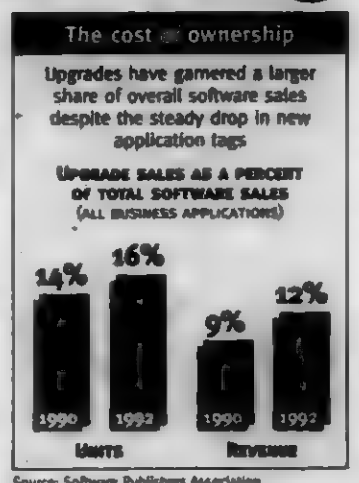
"The software vendors have finally gotten smart and figured out that most of their sales are going to come from upgrades," noted Ron Kasper, senior vice president of finance and administration at Loral Aeronutronic, a unit of Loral Corp. based in Newport Beach, Calif.

"The price of the software upgrades is really an annuity for the software vendors," said Priscilla Tate, executive director of the Microcomputer Managers Association in New York.

But while software vendors will make more money from upgrades, IS shops said they are less inclined to buy every upgrade because installation and administration are the most expensive parts of upgrading.

"It's not a big deal if upgrade prices rise so long as vendors don't

Upgrades, *page 20*



Source: Software Publishers Association, Washington, D.C.

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KATHERINE LAMBERT

CLIENT/SERVER

HP will announce today plans to ship two key elements of its distributed computing strategy. *Page 16.* The **Tennessee Valley Authority** halts its project pending an investigation into personnel and technical problems with a PeopleSoft application. *Page 6*

PC SOFTWARE

Columnist Esther Dyson says the question of who will win the operating system war is a stupid one — but she offers some good answers anyway. *Page 37.* Users must cope with a rising tide of upgrade costs. *Cover 1.* Vendors, meanwhile, are rolling out new versions of their software. The arrival of **Lotus'** 1-2-3 Release 4 elicits promises from rival vendors; **Microsoft** will preview Word 6.0 at PC Expo; and **WordPerfect** plans OS/2 launch. *Page 2*

OBJECT TECHNOLOGY

At Object World last week, object-oriented vendors fearing competition from Microsoft united to support standards; DEC offered distributed capabilities for Microsoft's OLE and connection to OMG standards; and just weeks before **IBM** and **DEC** plan to ship their distributed object tool kits, **SunSoft** said it has shipped the developers' version of its long-awaited Project Distributed Objects Everywhere tool kit. *Page 12*

IN DEPTH

IS has many competitors for its application development services, including outsourcers and savvy end users. To stay valuable, IS should concentrate on its unique strengths, including enterprisewide integration and soup-to-nuts implementation skills. IS chief Trav Waltrip at Travelers adds central oversight to that list. *Page 101*

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Borland eyes low-end Paradox

DBMS sans programming language is on its way

By Michael Vizard
SCOTTS VALLEY, CALIF.

■ Borland International, Inc. is working on a stripped-down version of the Paradox for Windows database that is aimed squarely at end users, Borland Chief Executive Officer Philippe Kahn revealed last week.

To make it easier for end users to adopt Paradox, Kahn said, Borland intends to deliver a version of Paradox for Windows that does not include a programming language.

This offering is widely seen as an effort to counter Lotus Development Corp.'s recent acquisition of Approach Software Corp., which makes an end-user relational database that does not include a programming language.

However, some Paradox users suggested that Borland is overestimating the impact of low-end, language-free databases.

Borland's Philippe Kahn *has high hopes for a low-end Paradox*

"I think Borland's making a mistake with a lower end version of Paradox," said Jerry Lazarus, computer technology research specialist at Southern California Gas Co. in Los Angeles.

Buying a database, he said, is similar to buying shoes for kids. "You want to make sure you get them a pair that doesn't exactly fit so they'll grow into it," Lazarus said.

He also noted that because Paradox for Windows is already priced at $139, a low-end version is not likely to be priced low enough to make buying the $139 version unattractive.

Meanwhile, Microsoft Corp. executives said they have no intention of countering the Lotus and Borland moves with a low-end implementation of Access.

"Our focus will be on making Access easier to use, but we don't see how having two versions of a product would be successful," said Mary Engstrom, group product marketing manager for Access.

Although Kahn declined to say when Borland would deliver a stripped-down database, he said the effort would be a relatively simple endeavor. Unlike Approach, however, the end-user version of Paradox for Windows will provide an upgrade path for sites that may need an application development tool in the future, Kahn said.

Options weighed

Lazarus said that before opting for Paradox, he evaluated both Approach and Access.

"Approach is easy to use so long as you stay within its cookbook model for accessing data. But if you deviate from that, you have to jump through hoops, and there's no documentation," Lazarus said.

"Access is a fine product, but it has problems with its table lookup and documentation. Since we have mostly Microsoft applications, I thought we would go with Access. But Paradox has more usable power and was easier to learn," he added.

Corrections

- The June 14 Firing Line evaluation of NextStep 3.1 for Intel included three ratings that did not appear in the accompanying chart: emulation, 2.3; price, 3.5; and compatibility, 3.5. The overall rating of 4.3 included these numbers.
- Intel Corp. Chairman Gordon Moore was incorrectly identified in a photo caption in the June 14 issue.
- Because of a reporting error, a chart in the June 14 issue incorrectly cited the purchase price of Unix System Laboratories, Inc. from Novell, Inc. That price is $320 million in stock.

Serving clients

The planned version of Paradox for Windows aimed at end users is part of Borland's client/server strategy, which calls for Paradox and dBase IV databases to be used as front-end tools to access SQL database repositories from vendors such as Oracle Corp. and Sybase, Inc.

The cornerstone of Borland's client/server technology is the navigational SQL interface that Borland has built as part of its Integrated Database Application Programming Interface (IDAPI) initiative. That project allows applications to make calls to navigational databases such as dBase and SQL databases such as Oracle and Sybase.

"Our goal is to be totally promiscuous in terms of getting data," said Borland CEO Philippe Kahn.

The navigational SQL interface is a particularly important IDAPI component because it will allow users to browse SQL databases for the first time. "Today, if you browse using SQL, you'll lock the entire database [from other users]," Kahn said.

He claimed that while IDAPI supports joins across different data types, Microsoft's Open Database Connectivity (ODBC) SQL interface supports joins only within a single database.

Borland's client/server effort will begin in earnest in September, when it is expected to deliver SQL interfaces for Paradox for Windows.

"We have people using SQL in Paradox for DOS, so we're waiting on the SQL and IDAPI drivers in Paradox for Windows," said Jerry Lazarus, computer technology research specialist at Southern California Gas Co. in Los Angeles.

Microsoft recently delivered ODBC drivers for its Access for Windows database [CW, June 7], but it has not yet endorsed Borland's IDAPI initiative.

—Michael Vizard

Microsoft set to demo Word 6.0 at PC Expo show

By Michael Vizard
REDMOND, WASH.

■ Looking to give its already best-selling word processor for Windows additional momentum, Microsoft Corp. plans to demonstrate Word 6.0 at PC Expo in New York next week — even though the product has not yet gone into beta testing.

According to Microsoft, for the first time Word will incorporate a set of Wizards, or canned macros that automate specific tasks. These Wizards include creating memo, newsletter, agenda or resume formats; tabbed dialogs that put documents in a file folder format on a Windows screen; an enhanced version of WordArt; and support for the Object Linking and Embedding (OLE) 2.0 protocol.

Word 6.0 will also include a WordPerfect Corp. WordPerfect Help facility that provides keystroke compatibility between the two word processors, and a file conversion utility that translates WordPerfect files into Word files.

The new release is also expected to share a common macro language, tool bars and menus with other Microsoft applications.

Eye on integration

Industry analysts said improvements to Word 6.0 primarily focus on improving integration with other Microsoft applications and providing a migration path for WordPerfect users.

"In 1992, Word became the No. 1 word processor, passing WordPerfect. With this release they are clearly after WordPerfect," said Krystyna Filistowicz, an industry analyst at Dataquest, Inc.

Filistowicz attributed Microsoft's success to Microsoft Office, a suite of Microsoft applications the company said will account for more than half the Word and Excel spreadsheet units it sells by the end of this year.

"WordPerfect doesn't have a suite, and the relationship with Borland isn't going to provide the level of integration required [in suite sales] in the near term. People just aren't buying stand-alone packages anymore," Filistowicz said.

Microsoft said 90% of Windows word processor users own a spreadsheet, 87% own a presentation graphics package, and 51% include spreadsheet data in their documents.

To address this issue, Borland International, Inc. and WordPerfect teamed up to offer Borland Office earlier this year [CW, April 26].

In the meantime, executives at Lotus Development Corp. are counting on a revamped 1-2-3 for Windows spreadsheet — Release 4 (see story above) — to boost SmartSuite sales, which in turn will boost sales of Lotus' Ami Pro word processor.

"From a technical point of view, Ami Pro is the one to beat," Filistowicz said. Still, it only has a 10% market share.

In addition, Bill Jones, director of product management for Ami Pro, said users can expect to see support for OLE 2.0 and LotusScript, a common macro language for Lotus applications, in the next release of Ami Pro.

1-2-3 R4 spurs rival promises

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. last week made good on its promise to deliver 1-2-3 Release 4 for Windows, which immediately triggered decisions by Microsoft Corp. and Borland International, Inc. to preview major features that will make up the next releases of their respective spreadsheets.

1-2-3 Release 4 is expected to boost Lotus' fortunes in the spreadsheet market, which have suffered greatly under stiff competition from Microsoft's Excel and Borland's Quattro Pro Windows spreadsheets [CW, May 10].

"We had already decided to adopt Excel until I saw a beta copy of Release 4 of 1-2-3. It has the classic 1-2-3 menu and is easier to use. And we just adopted Lotus' Notes, so we want to become an all-Lotus shop for the application integration," said Bob Berry, a vice president at Geneva Business Research Corp., a mergers and acquisition firm in Irvine, Calif.

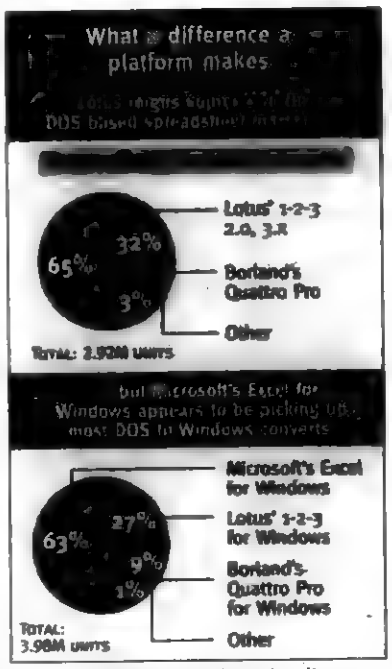
New features for Excel

However, while Lotus is gearing up to deliver 1-2-3 Release 4, Microsoft officials last week began outlining some of the broader capabilities that will be in the new release of Excel, which is expected to arrive by year's end.

New features in the next Excel release will include support for Microsoft's Object Linking and Embedding (OLE) 2.0, Open Database Connectivity (ODBC) drivers to link Excel to a variety of SQL databases, the first implementation of a common macro language for all Microsoft applications, support for multidimensional and document modeling, improved import/export capabilities and a hands-on charting model.

In addition, Excel 5.0 will be based on a common code shared by other Microsoft applications and will share a common set of menu commands and tool bars. These capabilities will form the nucleus of Microsoft's overall emphasis on more tightly integrating its applications, said Kathleen Schoenfelder, Microsoft group product marketing manager for Excel.

Meanwhile, Borland plans to extend the intelligence of the object technology it incorporates in Quattro Pro. The next release of Quattro Pro for Windows will include an Object Exchange Facility that will link multiple Quattro Pro users into workgroups, according to Borland Chief Executive Officer Philippe Kahn. The first iteration of Object Exchange Facility will be a Subscribe and Publish utility that will allow users to share spreadsheet data.



Source: International Data Corp., Framingham, Mass.

Kahn added that Borland will use its Object Exchange Facility technology to integrate its applications with WordPerfect Corp.'s namesake word processing software, which is included in the Borland Office suite. It is also negotiating with other firms that might support Object Exchange Facility.

Borland does not believe workgroup computing should require services found in operating systems or middleware products such as those found in the Notes offering, Kahn said. In addition, he promised that Quattro Pro for Windows Release 5 will include an intelligent facility that would automatically generate the appropriate chart for any range of selected data.

Lotus said it already provides a common menu structure across its applications and has made significant strides on integrating its applications under Release 2.0 of SmartSuite, which began shipping last week.

Lotus will add support for ODBC, and in the next major release of 1-2-3, the company will also deliver support for OLE 2.0 and a common macro language called LotusScript. It will incorporate the Bento object format from Apple Computer, Inc. as the underlying technology for linking its applications across platforms, said Paul Stroube, 1-2-3 for Windows product manager.

"OLE only works on Windows platforms," Stroube noted.

But whether all this jockeying for position among the spreadsheet vendors will result in any substantial shifts in market share remains to be seen.

"Users are getting apathetic about features. They all know that if they wait six months to a year, they'll get the same or better features from their vendors. They're more concerned about longevity, support and integration, so the competition is heating up on the high end and [is] focused on IS issues," said Daniel Gasteiger, editor of "The Spreadsheet Consultant" newsletter in Cambridge, Mass.

Word processing

16-bit WordPerfect for OS/2 2.1 launch slated for next month

By Michael Vizard
OREM, UTAH

With the help of three former OS/2 engineers recruited from IBM, WordPerfect Corp. announced last week that it will deliver a 16-bit implementation of its word processing software for OS/2 2.1 by no later than the first week of next month.

A full 32-bit implementation of WordPerfect on OS/2 is due in 1994, said Richard Running, WordPerfect's director of marketing for OS/2.

Although the 16-bit implementation is essentially only a port of WordPerfect's existing 5.2 release for Windows, some users said they are pleased that a major word processing package will soon be available for OS/2.

Excitement brewing

"A lot of people who are going to OS/2 are going to be excited about this," said Susan Littlepage, senior information resource center consultant at Huntington National Bank, a unit of Bancshares, Inc. in Columbus, Ohio. "We've been in correspondence with WordPerfect about it for the past year."

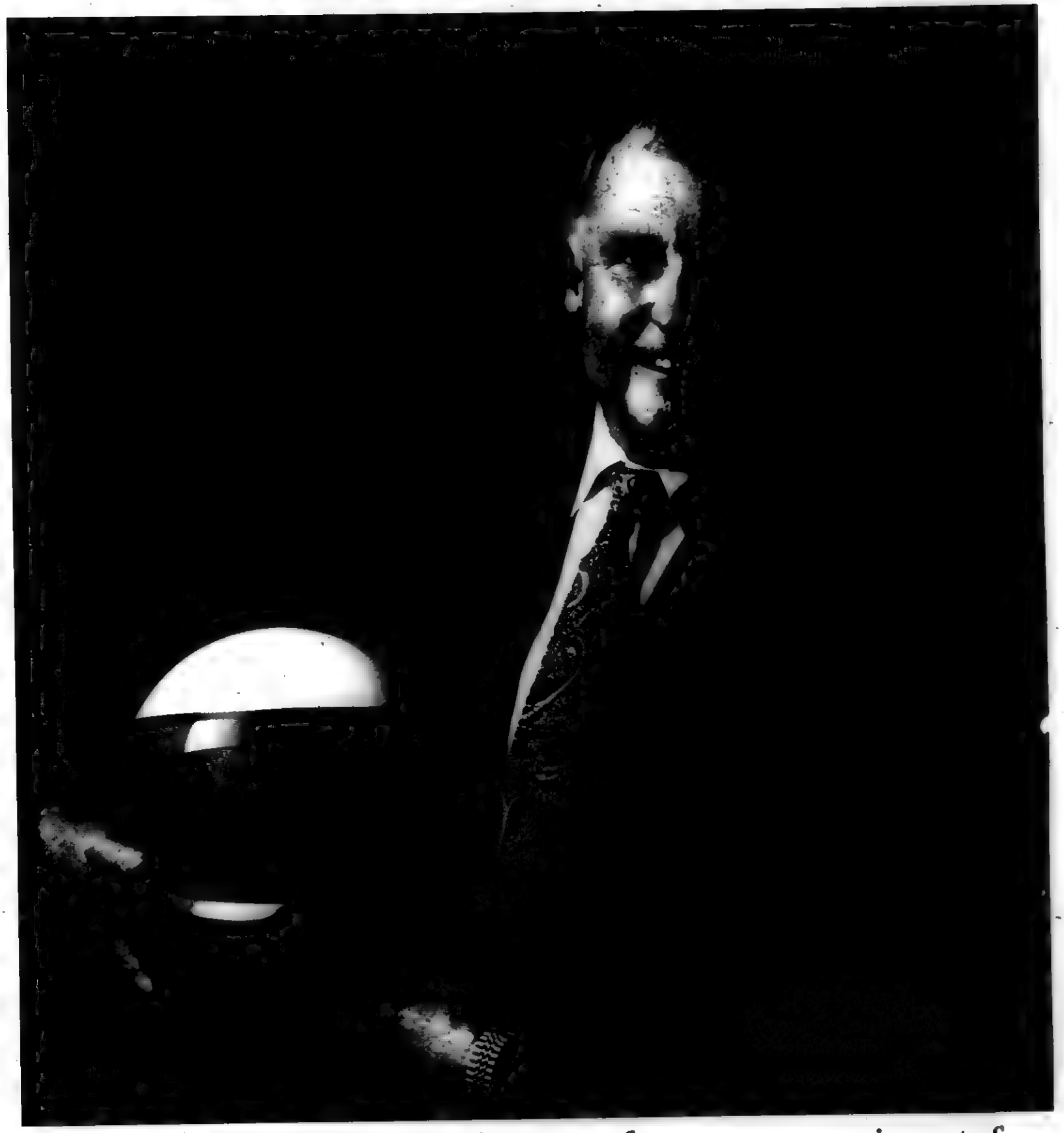
WordPerfect on OS/2 is important because the bank already uses WordPerfect under Windows and DOS, which means being able to transparently exchange files across multiple desktops is critical, Littlepage said.

WordPerfect extensions that take advantage of OS/2 include support for 32-bit multithreading and the ability to use IBM's WorkPlace Shell Utility to manage documents.

"Multithreading gives you the perception of speed because you can do a print job in the background while giving the user control over their screen," Running said.

In addition, WordPerfect has taken advantage of the drag-and-drop capabilities of the WorkPlace Shell to allow users to print documents or insert documents into other files without having to launch WordPerfect.

WordPerfect's major rival in the OS/2 arena is Describe, Inc. in Sacramento, Calif., which claims to market the only word processor specifically designed for OS/2.



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As OS/2 2.1 ships, questions remain

By Christopher Lindquist

"Opportunity only knocks once" is a phrase IBM hopes to prove wrong with Version 2.1 of OS/2, which officially shipped last week. But analysts, users and software vendors said IBM has some work to do to maintain the momentum that enabled it to ship some 2 million copies of OS/2 2.0.

Despite the positive technical reviews OS/2 2.0 received, some independent software vendors, resellers and users said IBM needs to update its strategy if it is going to sell OS/2 2.1 to non-OS/2 users.

In particular, a number of vendors recently complained that their OS/2 applications are not selling well. Indeed, Corel Systems Corp. and Micrografx, Inc. both said they are re-evaluating their commitment to OS/2 in light of less-than-stellar sales.

On the user side, sources close to OS/2 customer Ashland Oil in Lexington, Ky., said the Fortune 50 company is beginning to make a shift from OS/2 to Windows. Lithonia Lighting Corp. in Conyers, Ga., is converting some users back to older OS/2 versions after experiencing system hang-ups [CW, May 31].

Among the changes in IBM strategy suggested by members of the OS/2 community were improved and more visible marketing, more big-name applications and better service and support.

"IBM's strategy is different than Microsoft's," said Rich Running, director of marketing for WordPerfect Corp.'s WordPerfect for OS/2. "Right now, Microsoft is winning."

Not enough

Running said that while IBM's efforts have improved — technical support for independent software vendors is better, and there are more on-site technical representatives — more could be done.

Specifically, he said, IBM should refocus its campaign for OS/2 away from the "it runs Windows 3.1 applications" theme and toward the benefits of OS/2-specific features, such as the WorkPlace Shell. It is "difficult for [customers] to cost-justify [OS/2] to run Windows applications," Running said, because they "have to train users on both the Windows and OS/2 interfaces." IBM touts its WorkPlace Shell as being easier to use than Windows because it eliminates menu structures and focuses on an object-oriented approach.

Customers had their own short list of strategy suggestions (see story page 45). A user at a large chemical company said he had investigated OS/2 for a project but decided against it when he found development tool costs to be several times higher than they are for Windows. In addition, IBM support people proved to be difficult to reach. The same user noted that IBM's inability to get OS/2 applications on the market also hurt its chances.

But users and analysts generally agreed that if OS/2 has a weakness, it is in marketing — not technology. If OS/2 fails, sources said, it could likely be from a lack of exposure.

Play up exposure

Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa., said IBM needs to put a spotlight on OS/2 and OS/2 applications.

"You can't find OS/2 software in the stores to save your soul," she said. "Windows software occupies every available inch of space." And that lack, she said, is something IBM could remedy by working more closely with resellers.

Meanwhile, others have said IBM should continue to concentrate on selling OS/2 close to home. "I think IBM can push millions of copies of anything within its installed base," said Rikki Kirzner, principal analyst at Dataquest, Inc. in San Jose, Calif. "There's enough of a market within IBM that [independent software vendors] can sell to it and still recover their costs."

But what it all boils down to is that IBM must create sales for OS/2 applications outside of its installed base if it wants to succeed. Pragmatism rules in the computer industry.

"We're fond of IBM and fond of OS/2," said Peter McLaughlin, director of corporate communications at Micrografx, an early OS/2 developer and an IBM OS/2 development partner. "All that goodwill and faith and pleasantries aside, if the sales aren't there, there's not much anyone can do about it."

IBM's answers

Walter Casey, IBM's director of marketing, responds to suggestions about how to win users over to OS/2 2.1

Suggestion	Response
Present a more coherent message to customers regarding OS/2's future.	
Improve initial support and service to help prospective users "get over the hump" while evaluating OS/2.	
Create incentives for independent software vendors to produce OS/2 applications and price them competitively with Windows products.	

IBM reveals LAN Server plans

By Michele Doctert

AUSTIN, TEXAS

No believer is more fervent than a recent convert, and at a press briefing here last week, IBM local-area networking development executives trumpeted their new open systems religion. They touted detailed plans for future multivendor support in LAN Server as proof of their sincerity.

The latest release of LAN Server, Version 3.0, lacks the global distributed directory found in competing operating systems such as Novell, Inc.'s NetWare 4.0 and Banyan Systems, Inc.'s Vines. IBM will rectify that in the next major release of LAN Server by adding directory, file and security services, as well as the remote procedure technology that forms the Open Software Foundation's Distributed Computing Environment.

IBM plans to add native support for protocols other than NetBIOS. In the next major release, users can install LAN Server on top of a new transport package, called the Multiprotocol Transport Network (MPTN), which can then run Novell's IPX/SPX, Transmission Control Protocol/Internet Protocol, NetBIOS, LU6.2 or Systems Network Architecture.

"We know that many users in multivendor environments want to use just one protocol on their wire, which MPTN will let them do," said Charles Brown, the lead technical developer in IBM's LAN systems group.

Although IBM officials would not give dates for upcoming releases, they said planned LAN Server enhancements will appear "shortly after" those capabilities are added to OS/2.

Analysts applauded IBM's new openness but they said it may have come too late for IBM. "You have to give IBM credit. They have a good plan, and the DCE stuff will be great, although difficult to do," said Jaimie Lewis, a LAN analyst at Burton Group in Salt Lake City.

Windows NT passes test for colleges' financial aid

By Christopher Lindquist

BOSTON

When it came time to decide on a new student loan administration system, developers at The Education Resources Institute decided to bypass mainframes and minicomputers and go right to file servers.

And as if that would not cause most developers to blanch, they jumped a yard farther and decided to build the new system around an operating system that has yet to be released: Microsoft Corp.'s Windows NT.

The system, called ASAP, was the brainchild of four Boston companies — The Education Resources Institute, American Student Assistance Corp., New England Loan Marketing Corp. and Education Loan Services, Inc. It will provide financial aid for college students around the country.

The idea was to create a "traffic cop" that would direct inquiries about financial aid from educational institutions to any of 10 systems that reside on an IBM Enterprise System/9000, an IBM Application System/400 and a Digital Equipment Corp. VAX. The advantages over the old manual method are expected to be enormous, according to Ernest T. Freeman, president of The Education Resources Institute.

"One or two systems might have been available on-line, but if you made a change, it only affected that system," he said. "And one system might require a piece of paper to change, while the other might have a terminal."

Help on campus

Barbera Tornow, director of financial assistance at Boston University, said the school is very excited about the new system, which it has alpha tested and is about to start beta-testing.

She said the university processes some 20,000 loan applications per year that account for some $100 million in revenue for the school. And "when you cost $24,000 per year, people want answers; they want help," she said.

Tornow said there will be several benefits to ASAP. One of the most important will be getting information to students and families when they need it, not just when outside loan offices are open.

Many companies are building client/server systems on top of available operating systems, so moving to Windows NT was a risk. Freeman said the decision to go with Windows NT was based on several factors.

First, the companies involved felt they had the luxury to experiment with a new system because Microsoft guaranteed them a fallback position to Windows 3.1. They also believed working with Windows NT would position them well for the future of 32-bit operating environments, including using new 32-bit applications and scaling the system to other processors.

Currently there are seven schools beta-testing the system, but that number could jump to the thousands after the system becomes fully operational in the fall. The number of students affected could be in the millions, Freeman said.

Working with a beta-test operating system is not without its problems, however. For example, the original beta-test code did not meet performance promises Microsoft had made, and performance is vital to a system that may eventually handle millions of transactions.

ANNOUNCING A MAJOR STEP FORWARD IN ENTERPRISE-WIDE COMPUTING.

THE RIGHTSIZING CHALLENGE

In theory exploiting the economies of networked PC's while continuing to extract value from older larger systems is relatively straightforward.
In practice it is not. For a start, no single vendor can provide the optimal integrated software solution for managing information from the mainframe to the desktop. While distributed computing makes data readily accessible, it also accelerates the movement of data around the enterprise magnifying the level of complexity. And when a problem arises, figuring out which vendor to call can be a nightmare.

MAKING IT EASIER TODAY

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News Shorts

Apple names Spindler CEO, cuts tags

Apple Computer, Inc. last week promoted President Michael Spindler to chief executive officer. He succeeds John Sculley, who remains chairman and will focus on emerging business opportunities. The firm also cut prices on many Macintosh models by as much as 12%. The largest cut was a $410 reduction on two models of the PowerBook 180. Apple also cut prices by as much as 26% on peripherals such as CD-ROM drives and laser printers and instituted a three-month rebate program on some hardware for dealers.

Turner IS exec switches niches

Construction giant **Turner Corp.** confirmed last week that Richard A. Schell, its director of information systems for the past 10 years, will move to **Capital Cities/ABC, Inc.** Schell led IS at Turner when it went through a major move in the 1980s from a host-based computer to a client/server setup. Schell refused to comment on his possible assignment at ABC. He moves over on June 28. An ABC spokeswoman, meanwhile, would confirm only that the network was "in negotiations" with Schell.

Open systems management moves

Last week was chock-full of Unix systems management news. A user group called **Moses** (Massive Open Systems Environment Standard) said it has published a document, available through CompuServe and other means, that identifies the requirements for managing a large data center of Unix machines. Also, **Hewlett-Packard Co.** has tapped **EcoSystems Software, Inc.** in Cupertino, Calif., to provide EcoTools client/server systems management software to HP/UX customers. HP already has a similar agreement with **Computer Associates International, Inc.**

Newspaper tries downsizing

Philadelphia Newspapers, Inc., which publishes the *Philadelphia Inquirer* and the *Philadelphia Daily News*, last week said it will abandon its IBM 3090-based **Dun & Bradstreet Software** financial programs in favor of a **Collier Jackson** application running on a Hewlett-Packard HP 3000 minicomputer.

JC Penney to get high-speed network

JC Penney Co. has tapped **AT&T** to construct a multimillion-dollar, high-speed digital network to link the retailer's 1,300 stores with three data centers. The network is the first phase of a five-year plan to implement a client/server and bridge-router architecture corporatewide, a spokesman said. AT&T Digital Access Cross-Connect switches support a 45M-bit/sec. backbone between three primary data centers around the country and deliver 56K bit/sec. digital links to all 1,300 retail outlets. The network replaces AT&T 9.6K bit/sec. multidrop analog lines. The network project is scheduled for completion by October.

IBM boosts AD/Cycle

To pump new life into its sagging AD/Cycle software development program, **IBM Programming Systems** announced plans to incorporate **Seer Technologies, Inc.**'s communications connectivity code in future computer-aided software engineering products, including LAN-based packages that IBM will ship by mid-1994. IBM has a 40% stake in Seer in Cary, N.C.

SHORT TAKES **Fujitsu Ltd.** and **Siemens AG** will jointly develop a family of mainframes that will be less expensive than today's versions; the wares should be ready in 1996.... **Novell, Inc.** has completed its acquisition of **Unix System Laboratories, Inc.**

News shorts, page 16

Investigation stalls TVA project

By Kim S. Nash
KNOXVILLE, TENN.

Officials at the Tennessee Valley Authority (TVA) acknowledged last week that the organization has halted a client/server migration to PeopleSoft, Inc. payroll applications, pending the outcome of an investigation by the TVA Inspector General's Office.

At issue is the validity of the software procurement process and how well PS/Payroll works with IBM DB2 data and applications. TVA's difficulties with PS/Payroll appear to be an exception: Of eight other PeopleSoft users interviewed, none reported problems serious enough to stop work.

George Prosser, assistant inspector general, confirmed that his office is investigating problems with PS/Payroll but declined to elaborate. Other sources at and close to TVA said it is in the heat of a formal investigation of allegations of wrongdoing on the part of a TVA employee in procuring PeopleSoft software. Prosser gave no time frame for completion of the investigation.

Technologically, the payroll initiative has seen troubles, too. There have been difficulties in getting PeopleSoft programs to work as promised with TVA's existing mainframe-based payroll system, sources said.

TVA Chief Information Officer Bob Yates said he could not give specifics per an agreement with PeopleSoft, but he did confirm that the payroll project is on hold.

Meanwhile, TVA brought in several client/server applications in March from Oracle Corp., including payroll.

Yates noted that TVA is a longtime Oracle customer, having signed a five-year contract with the vendor in 1990 that gives TVA "rights to license Oracle's entire product line," he said. He declined to say whether Oracle will replace PeopleSoft at TVA.

PeopleSoft executives declined to be interviewed but submitted a prepared statement to *Computerworld* that conceded "difficulties" with the TVA payroll project: "To the extent that PeopleSoft customers have experienced any implementation difficulties in connection with either the installation of or conversion to client/server technology, PeopleSoft has sought to work cooperatively with them to work through and resolve these difficulties. This commitment applies to all of PeopleSoft's customers, including TVA's Payroll implementation team," wrote Peggy Taylor, vice president of customer services.

TVA was among early client/server enthusiasts in 1990 when it shelled out — up front — more than $1 million for a suite of PeopleSoft applications. The organization planned to downsize an IBM mainframe-based employee payroll and benefits application to a client/server system. That means the PeopleSoft applications had to accommodate large, on-line transaction processing using DB2 as a host.

The problems appear to be confined to payroll. For example, a PeopleSoft human resources project "came off well," said Ray Pack, information systems program manager for human resources. Human resources went live in November 1992 with a distributed system for 250 employees in several TVA offices in four states.

Pack led the two-year effort, which involved converting 1.1 million records on a flat-file database to DB2 connected to 40 local- and wide-area networks of mainly IBM Personal System/2 PCs.

Oracle, Novell team up to offer suite alternatives

By Kim S. Nash
SAN FRANCISCO

Oracle Corp. and Novell, Inc. last week unveiled OracleWare, a line of repackaged products from both vendors, the first of which is due out by September.

OracleWare — to be sold by Novell resellers but supported by Oracle — consists of the Oracle 7 database, either the NetWare or UnixWare operating system and Oracle Office, a suite of electronic-mail and scheduling tools for building distributed office applications. OracleWare users need only call Oracle for support, regardless of whether problems lie in the database or operating system.

The two companies stressed that their alliance is aimed at serving entire enterprises, but users and analysts said they see it more as a parry to a workgroup-level thrust from Microsoft Corp. and Sybase, Inc.

Observers said they were more interested in one-stop support than in OracleWare, especially because the package will not be priced at much of a discount vs. buying the pieces separately.

"The biggest benefit for users is no finger-pointing on support anymore," said Rob Tholemeier, an analyst at Meta Group, Inc. in Burlingame, Calif.

Officials at Oracle and Novell declined to specify pricing but said it will be user-based, starting with small workgroup scenarios and ranging to enterprise-level packages.

The database market will undergo a price restructuring as distributed computing takes hold, said Wayne Kernochan, an analyst at Aberdeen Group in Boston.

Users are likely to see dual offerings with different prices and features from each vendor: a lower end workgroup level and a larger, enterprise-class package, he predicted.

The partnership is nonexclusive, but Novell Chief Executive Officer Ray Noorda said his firm will devote "serious" time and resources to making the deal work, precluding similar agreements with other database makers for now. "This will take time.... We will not go out carte blanche and look at other vendors," he said.

Oracle on UnixWare piqued the curiosity of a few Oracle users, including Mike Oelkers, a computer scientist at University of California Lawrence Livermore National Laboratory in Livermore, Calif. He is planning a mass consolidation to Oracle databases running on Unix systems.

Running UnixWare on the 350 PCs in one of the departments he oversees would make that conversion a lot easier.

"We'd be able to use the existing PC hardware, which is inexpensive compared to putting everyone on Unix workstations," Oelkers said.

As for Oracle Office, observers said they were skeptical of a mass conversion to the product. Most NetWare users already run "more graphical" administrative packages from Microsoft and Lotus Development Corp., Tholemeier noted.

OracleWare-abouts

A calendar of scheduled ship dates

SEPTEMBER 1993
- Oracle 7 NLM for NetWare 3.X
- Oracle 7 for UnixWare

FIRST-QUARTER 1994
- Oracle 7 NLM for NetWare 4.0

MID-1994
- Oracle 7 for UnixWare symmetric multiprocessing systems

Sun division to play up integration

By Elisabeth Horwitt
CHELMSFORD, MASS.

Sun Microsystems, Inc. is expected this week to launch a new division mandated to help customers integrate their Sun systems into multivendor, enterprise-wide computing environments, a source close to the company said.

Based here, the new organization will consist of teams of Sun engineers who specialize in network design and implementation and will target customers around the world, the source said.

This should have a strong appeal for Sun customers who want to build global enterprise networks, said Todd Dagres, a senior analyst at The Yankee Group. Indeed, such a unit would fill a long-standing gap in Sun's support organization. "Sun has always been one to say to a customer, 'You have to be smart or buy from an integrator,'" Dagres said.

"Sun runs a very lean, mean and clean" support organization, agreed Roy Camblin, a senior vice president at Wells Fargo & Co.

Indeed, Sun will probably be handing fewer network integration customers to its partners, Electronic Data Systems Corp. and Andersen Consulting, said Walter Johnson, director of advanced network computing services at New Science Associates, Inc., a consulting company based in Westport, Conn.

Growth spurt

The worldwide network integration and management services market is expected to grow 32% per year through 1996, from $14.5 billion in 1993, according to G2 Research, Inc. in Mountain View, Calif.

"I guess Sun wants to keep some of those integration profits for itself," Johnson said.

The question is whether Sun can compete with its former partners for customers who "want their hands held through the process of moving from the mainframe down to distributed computing," Johnson said. "At the technical level, I'm sure Sun could convince engineers that it knows how to string boxes together. The question is whether Sun can convince IS managers [who] want a partner who understands their business."

Wells Fargo, for example, could use some help integrating two divisions of the bank. One uses Intel Corp. workstations and Novell, Inc. networks, and the other uses Sun and Oracle Corp. technology, Camblin said.

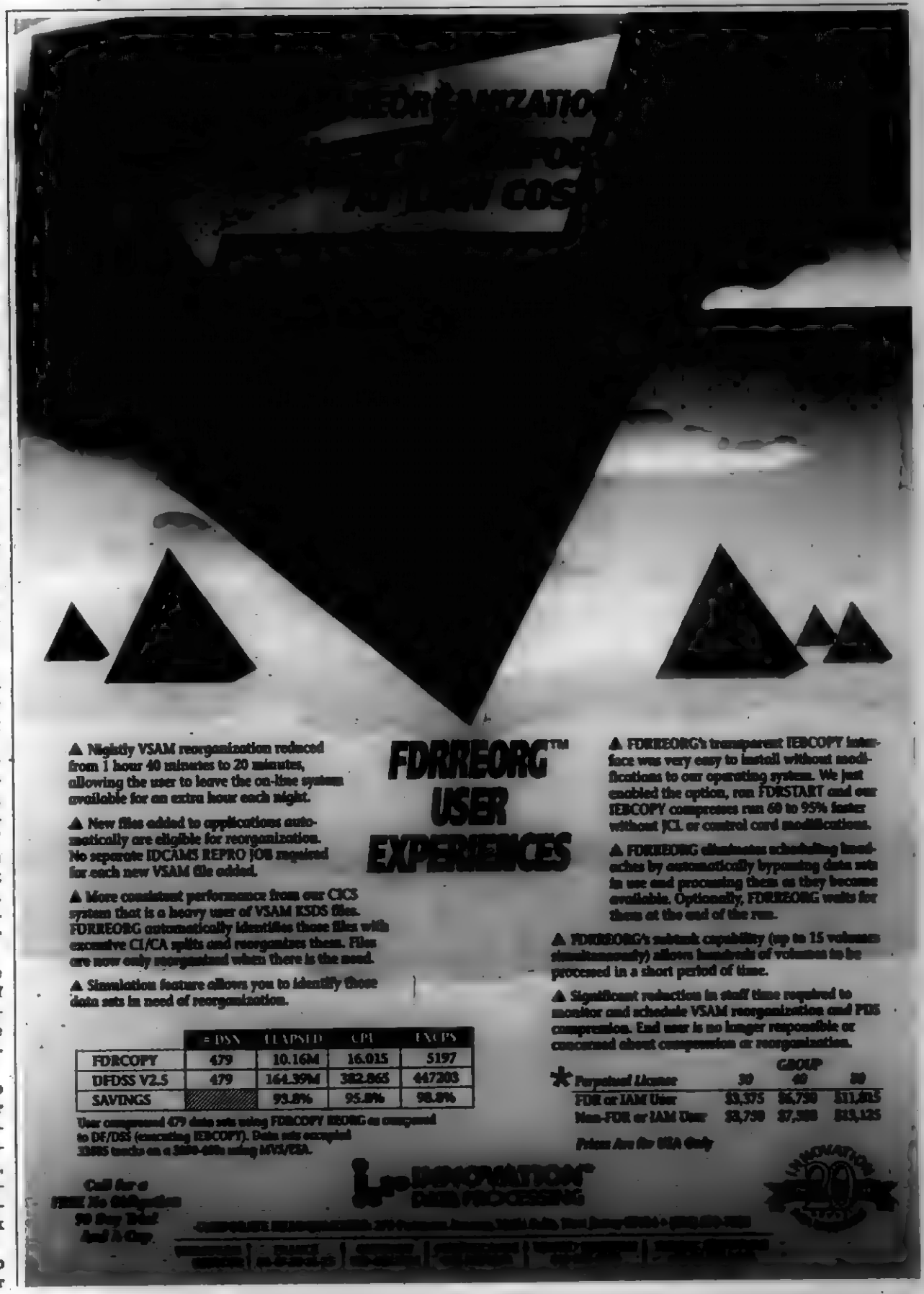
However, the bank is more likely to look for integration help from "a major consultancy specializing in linking different platforms, such as Oracle's consulting group or SHL Systemhouse Ltd., Camblin said. "I almost don't want to depend on my hardware vendor for integration because then you don't get to pick and choose the best and the cheapest."

On the other hand, users cannot help but benefit from Sun's allying with other vendors for integration purposes, Camblin said. He cited as an example the recent Common Open Systems Environment, a Unix consortium that Sun has joined.

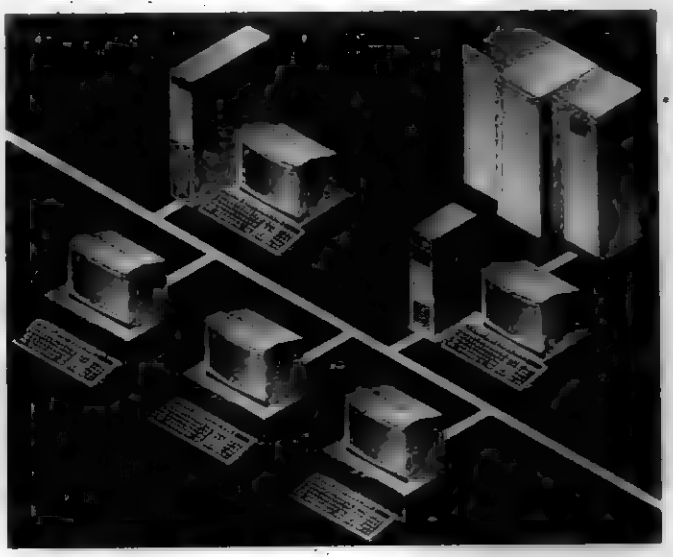
Sun will be following in the footsteps of IBM, Digital Equipment Corp. and Hewlett-Packard Co., whose systems integration consulting organizations have made billions, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consulting firm.

Sun's new organization is expected to make use of existing network integration products and services that other Sun divisions now provide. In particular, its staff is expected to work closely with SunSelect, a Sun division also based in Chelmsford. SunSelect provides services and products to integrate Sun and other types of Unix systems with a variety of PC clients and local-area networks.

Sun is also expected to expand its network integration offerings through alliances with other vendors, which will be announced at a future date. Further details about the new division's offerings should come out in the fall, according to the company.



There's a lot of serious rethinking going on in the area of information management. Because companies need to take advantage of new technology while keeping the best of their existing systems. They need to go to client-server computing. Without moving out of the mainstream.



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Above: Windows NT delivers power, reliability and open architecture for client-server computing.

Right: This versatile operating system platform includes versions for both clients and servers.

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Mainframe data access getting easier

New tools, packages open up legacy systems

By Johanna Ambrosio
BOSTON

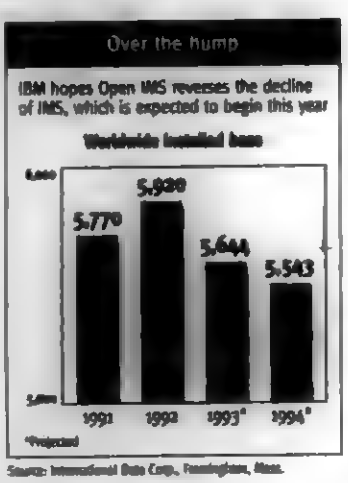
Until recently, users have had neither key nor keyhole into most nonrelational mainframe data. But accessing legacy data is becoming easier, thanks in part to new tools and packages announced last week by vendors.

The announcements, which took place at the Database World trade show, included the following:

- Trinzic Corp. in Waltham, Mass., and Micro Decisionware, Inc. in Boulder, Colo., said they will jointly market each other's software to provide workstations with access to relational and nonrelational mainframe data.

The vendors will pitch Micro Decisionware's Database Gateway as the transport mechanism and Trinzic's InfoHub as the way to access mainframe data from VSAM files, IBM's IMS databases and Computer Associates International, Inc.'s Datacom and CA-IDMS data.

- Information Builders, Inc. in New York announced 13 gateways to provide point-to-point bridges to VSAM, IMS, CA-IDMS, Cincom Systems, Inc.'s Total and others.
- In addition, IBM managers said they will unveil during the next few months a strategy dubbed "Open IMS." This will comprise a family of packages that will let end users access IMS data from PCs and workstations running Windows, flavors of Unix and other environments.



By some estimates, 70% to 90% of mainframe data resides in flat files or nonrelational databases. "There's still pre-1985 stuff out there, chugging along happily," said Ken Orr, a database consultant and principal at the Ken Orr Institute in Topeka, Kan.

The idea of opening up flat files and other data created before the advent of relational databases comes at a time when end users are pounding on information systems shops for data access.

"Access is getting hotter all the time," said Chris Levan, IS vice president at Blue Cross/Blue Shield of Tennessee in Chattanooga.

"Legacy data is a very big problem," said Donnette Bruno, an information resource management specialist at Barnett Bank in Jacksonville, Fla. "You're trying to apply new technology to old stuff, and that just doesn't work too well."

Although IS shops have made the switch to relational for their new applications, the majority of production systems still run on the older databases. Most IS shops cannot afford to convert the old applications to another format.

Thus, IMS and its ilk will probably be around another 10 years or more, said Shaku Atre, president of consulting firm Atre Associates, Inc. in Rye, N.Y.

There have, however, been few tools available to automate the providing of old data to end users because the access tools on the market are almost entirely geared to relational databases. And even some of what has been available allows for retrieval but not updates or deletions to the vintage systems.

Mostly, IS shops have had to adopt one of three techniques: write their own programs to provide the data, duplicate the data or a subset of it in relational databases or not provide the data at all.

Also, some mainframe database vendors, including IBM, Cincom and Software AG of North America, Inc., have programs to move data from hierarchical databases to relational ones.

IMS not forgotten

IBM's IMS hierarchical database may be forgotten, but it is far from dead in IBM's development ranks. In the next several months, IBM will roll out packages that will allow PC users to access IMS.

"We'll be providing multiple bridges to access IMS data," said Patt Cronin, IBM's IMS product manager. Version 4.1 "set the stage for client/server," she said. IMS Client Server/2 [CS/2], available Friday, allows OS/2 users to access IMS.

IBM will build up this CS/2 family to run under other platforms, including Windows and Unix.

Shaku Atre, president of Atre Associates, said, "IBM has seen that IMS still has life left, and they want to jump on the client/server bandwagon along with everyone else."

Customers applauded the move. "We want to tie legacy data together with information from non-IBM platforms," said Steve Clanton, an applications support analyst at Caterpillar, Inc. in East Peoria, Ill.

IBM is working with third-party providers to provide IMS access, Cronin said.

— Johanna Ambrosio

Mobile computing

CONTINUED FROM COVER 1

ADP's Audapoint system, which is now rolling out at a rate of about 50 systems per week and will soon glean benefits from pen technology, is a "smart" estimating machine. Using detailed text and graphical database information, it calculates vehicle repair costs in moments.

The system is fostering a truce between insurance companies and auto repair shops, which, to the detriment of customers, have historically haggled for days over labor costs, explained Gerhard Blendstrup, senior vice president of strategic services at ADP's Automotive Claims Service office.

Fraud fighter
Continually refreshed data on the mainframe is fending off insurance fraud by giving adjusters real-time information on stolen or damaged cars when an owner is trying to milk multiple insurance firms for a single claim.

A portable version of a 1G-byte graphical database for adjusters and a desktop version for repair shops gives both sides of the claims equation the same information on labor and part costs for every vehicle on the road. This promotes trust between once-adversarial players and accelerates service, Blendstrup said.

Claims adjusters tote their systems around in suitcases that house the static portions of the detailed database and two CD-ROMs in a portable PC. A modem in the case allows adjusters to access mainframes in Ann Arbor, Mich., and to gather dynamic data. A miniprinter spits out repair estimates on-site.

Because many insurers refer to the ADP database "as the estimating Bible," quotes from repair shops and adjusters created through ADP are more widely accepted by each side, said Shon Kim, general manager of Obrist & Cunningham Body and Paint Specialists in Portland, Ore., a repair shop that uses the desktop Audapoint version, called Shoplink, for its estimating. "We're making more money because we're getting paid for actual work" instead of spending time negotiating, he said.

When an insurer trusts a shop's estimate and waives an on-site inspection, "we can save three days on a 10-day job," added Erick Bickett, director of information technology at Caliber Collision Centers, a nationwide repair shop chain based in Fountain Valley, Calif.

The estimates are accurate because the system will deduct labor time and associated costs for overlapping functions, such as a common piece of work to be done if both the hood and fender are to be refinished, Kim explained. Or it will add time and costs to an estimate if "you need to replace a fender but have to pull the bumper off to get to it," he said.

The goal behind adding a pen-based version, now in prototype, is to let claims adjusters from ADP insurance company clients point to a damaged car part on their screen and immediately get the breadth of parts and labor information they need to turn around an estimate on the spot.

Another touch of the penpoint allows users to drill down, layer by layer, into the innards of today's complex motor vehicles; as they do, the system dynamically adjusts prices as it judges relationships among damaged parts.

Pen technology is applicable to the process, said Joe Pych, information systems team leader at Travelers, because the highest form of technology many appraisers have used is a calculator. The pen interface is more like the pencil and paper they are used to, Pych said.

But "wireless technology is the one thing stalling progress" with Audapoint, Blendstrup said. Some adjusters use the Ardis radio data network to communicate with the host, but wireless "just isn't there yet," he said (see story below).

Travelers tested Audapoint over Ardis during its pilot, Pych said, "and we were very disappointed with the range" of service and decided not to include it in its production system.

Static information, such as car design, OEM part numbers and prices, are refreshed on each user's mobile system monthly. Fluctuating information, such as the changing inventory of salvage yards, remains on the mainframe.

Wireless-less

Wireless links from portable PCs to ADP's home database system would be handy for Audapoint users crawling under cars and not in the mood to find a phone jack. Yet wireless technology is the biggest roadblock with Audapoint, said Gerhard Blendstrup at ADP's Automotive Claims Service.

The reasons are as follows:

- No wireless network service today has 100% coverage, which limits use.
- Some Audapoint users employing the Ardis wireless network are finding response times slow because real-time data is "not store-and-forward-oriented," as are wireless services.

Emerging competitive wireless offerings are causing a holdup while ADP evaluates them. "We'll probably end up gluing some cross-section of them together into a common backbone," Blendstrup said.

Industry progress with this began last week. RadioMail Corp. announced a gateway between the Ardis and RAM Mobile Data networks at the Electronic Mail Association show in Atlanta (see story cover 1).

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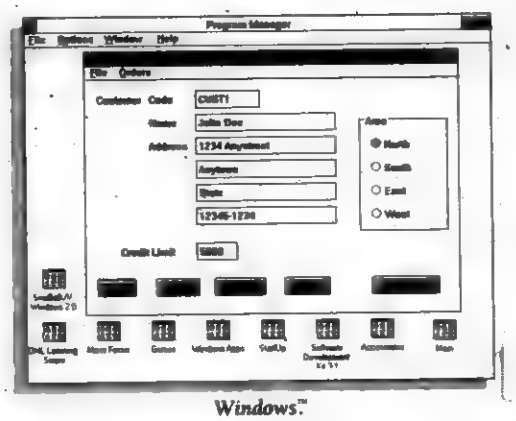

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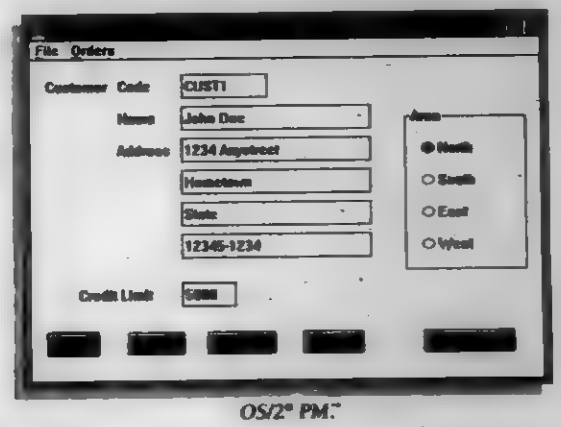

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GSA Contract Number GS00K90AGS5251-PS02.

Winners and finalists at Computerworld's second annual object-oriented application awards competition gathered with master of ceremonies Steve Jobs and Computerworld Publisher Gary Beach last week to celebrate. Pictured (top) Al Christians, Jim Burton, Will Thornton-Reid, James R. Greenwood, Craig L. Patterson, Ken Matusow; (middle) unidentified, Werner Staringer, unidentified, Amarjeet S. Garewal, C. Douglas Colonel, Barbara Harper, Gregory H. Anderson; (front) Robert Seliger, Howard Sumner, Gary Beach, Steve Jobs, Christopher Stone, Bernadette Reiter, Rich Holmes and Leo Savage.

Allies abound at Object World

Object-oriented cooperation the theme for many vendors

By Melinda-Carol Ballou
SAN FRANCISCO

Alliances were all the rage at the Object World object-oriented conference last week, amid the usual flurry of new product announcements, user testimonials and industry hype.

A wedding cake served by Interactive Data Environments Corp. and Martin Marietta's Advanced Concepts Center to symbolize their collaboration on new object management products seemed an apt image for many vendors in attendance. These included large systems manufacturers such as IBM, Hewlett-Packard Co. and Digital Equipment Corp. and software companies such as Borland International, Inc. and Lucid, Inc.

Brokering key agreements was the Object Management Group (OMG), which is coordinating the establishment of object-oriented standards. The organization also helped sponsor the conference.

Presence felt

Conspicuously absent from the festivities were the folks from Redmond, Wash.-based Microsoft Corp., which did not have a booth at the show. But the company was present implicitly — its competitive threat offered the incentive to overcome disagreements and unite.

As expected, IBM and HP, together with SunSoft, Inc., the software subsidiary of Sun Microsystems, Inc., announced that they would offer common interfaces to the OMG's Common Object Request Broker Architecture (Corba) standard (see story at right). HP and IBM further declared their intent to share technology and interoperate across their technologies.

Borland and Digitalk, Inc. also announced support for IBM's Systems Object Management technology. Following its recent agreement with HP [CW, May 31], Next, Inc. gave DEC the go-ahead to resell the NextStep operating system and tools on selected PC platforms.

Seventeen vendors displayed products related to the OMG's Corba, such as developers' kits, implementations of the Corba specification and related interfaces. Object Design, Inc. and Objectivity, Inc., for instance, demonstrated their object databases with support for Corba. Objectivity is working with SunSoft to build an extension that will enable Corba's Object Request Broker to pass object requests directly to the database.

"Corba provides an infrastructure for interoperability in much the same way that the telephone system does," said Jeffrey Fleisher, senior scientist at the National Photographic Interpretation Center, a McLean, Va.-based federal research agency that has been using the OMG standard for development. "Ultimately, I expect that these services will be pushed down into the operating system."

Address immediate needs first

While users said standards such as the OMG's and others will ultimately help them, most at the show focused their attention on their direct development needs.

Standards "will make the job easier in the long run, but I can't get hung up in all of it," said Bill Wallace, manager of technology planning at Florida Power and Light in Miami. He added that his organization partners with strategic vendors as a cushion against the vagaries of the standards process. Standard interoperability across Corba will not be available until next year, for instance.

According to Cliff Reeves, manager of object technology products at IBM's Personal Software Products Division, the new alliances and standards bode well.

"Breaking the application development logjam with object-oriented technologies has been a dream for many years. ... But even ANSI-compliant C++ compilers haven't been able to work together," Reeves said. "Corba provides a nervous system for objects."

DEC offers multiplatform distribution link for OLE

By Melinda-Carol Ballou
SAN FRANCISCO

Digital Equipment Corp. will provide a key link for Microsoft Corp.'s Object Linking and Embedding (OLE) protocol later this year when it ships technology said to enable users to distribute OLE applications across a range of platforms.

OLE so far has been limited to Windows, and there is also some doubt about Microsoft's willingness to support emerging object-oriented interoperability standards from the Object Management Group (OMG) [CW, June 14].

DEC's upcoming technology, which will likely ship to beta-test users with a developer's tool kit and a new version of DEC's Application Control Architecture (ACA) services in September, addresses both of those issues. It will allow OLE applications to use the OMG's Common Object Request Broker Architecture (Corba) as a transport mechanism to communicate with non-OLE and OLE-compliant applications running on a range of platforms.

Industry analysts and OMG officials lauded the technology.

"This is important because it adds distribution [capabilities] to OLE, which won't be available from Microsoft until Cairo ships, and who knows when that will be?" said John Rymer, an analyst at the Patricia Seybold Office Computing Group, a consulting firm located in Boston.

Tool translator

DEC's Software Developer's Kit, created jointly with Open Environment Corp., a Cambridge, Mass., developer, will offer Corba translation capabilities for OLE, Dynamic Data Exchange and Microsoft's Visual Basic programming tools.

The software developer's kit will ship to software developers next month. It will go into general beta testing in the fall and will be generally available before the end of the year, DEC officials said.

Current pricing for ACA offers a "good guideline" for the projected cost of the ACA software developer's kit, officials said. An average developer's license on a "good-size server" costs $5,000, and a runtime license on a PC is priced at $130.

SunSoft's objects tool kit enters beta-testing phase

By Jean S. Bozman
SAN FRANCISCO

■ Only weeks before IBM and Digital Equipment Corp. plan to ship their distributed object tool kits, Sun Microsystems, Inc. subsidiary SunSoft, Inc. jumped on the interoperability bandwagon at last week's Object World show. SunSoft announced plans to ship a developer's version of its long-awaited Project DOE (Distributed Objects Everywhere) tool kit.

Sun is unlikely to beat either of its rivals out the door, however. A beta test lasting several months is planned, according to Sun executives, who noted that general availability might not come until 1994.

Project DOE is to be a launching point for a new generation of client/server networked applications running under Sun's Solaris operating environment. DOE was also designed to address aging mainframe applications. That can be done by "wrapping" old Cobol code in a new layer of objects that can be handled by a re-engineered set of corporate applications, said Bud Tribble, SunSoft's vice president of object products.

SunSoft also revealed an agreement with IBM and Hewlett-Packard Co. last week to ensure interoperability among Project DOE, IBM's System Object Model and HP's Distributed Object Management Facility [CW, June 14]. Without this interoperability, based on a set of common object interfaces, distributed object applications would not work in mixed-vendor networks.

Based on Corba

DOE is based on Sun's advanced research project and the Object Management Group's Common Object Request Broker Architecture standard, which was built on HP's object-oriented technology. DOE also contains a set of built-in object services for global naming, event notification and the assembly of compound objects into applications, said Jim Green, director of Project DOE.

The Project DOE developer's kit is being shipped to a small group of large Sun sites and consulting firms, Tribble said. Industry analysts said the number may be extremely small — about a dozen selected sites.

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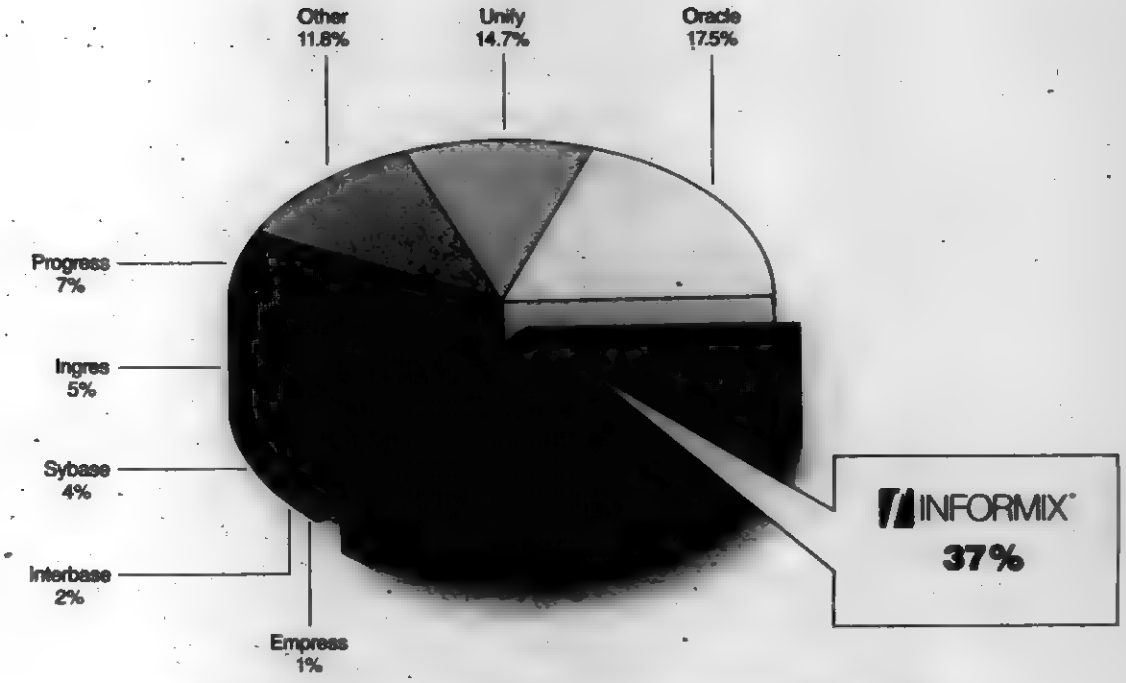

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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Reporter's Notebook

The resounding theme at last week's Electronic Mail Association conference in Atlanta was how implementing LAN electronic mail will require companies to invest heavily in infrastructure. The cost of E-mail software is just the tip of the iceberg, conference speakers warned again and again.

To illustrate the complexity of implementing large-scale LAN E-mail, Darwin Sharp, E-mail adviser at Exxon, said the company expects to finish migrating 65,000 users from host to LAN mail during the next "15 to 20 years" but didn't stick a price tag on the mammoth project.

Lotus, meanwhile, announced CC:Mail for Windows 2.0, which adds features that will help users automate sorting, searching and storing E-mail messages. For instance, by picking from a list of commands, users can build rules to direct the handling of incoming mail. Other new features include a spell checker that uses a 190,000-word Houghton Mifflin Co. dictionary and an updated interface.

Banyan, Isocor and gateway vendor **Boston Software Works** will ship products in early 1994 to link X.400 and Simple Mail Transfer Protocol (SMTP) messaging with Banyan Vines message transport and StreetTalk directory services.

Reach Software will bundle imaging software from **Watermark Software** into its recently released work-flow software, which means the Reach software can now route faxes. Watermark announced a similar arrangement with Beyond this week as well. Meanwhile, **CE Software** said it will use Reach technology to run its Quickmail clients natively over Novell's Message Handling Service.

The U.S. House of Representatives is connecting internal departments' E-mail — opening itself to E-mail from the Internet public and other organizations — using software and hardware from **Soft-Switch** in Wayne, Pa., to link the disparate networks.

SHORT TAKES X.400 software showcased at the conference included several additions to **Hewlett-Packard's** OpenMail X.400 messaging line, including support for CC:Mail, Microsoft Mail, Macintosh and Sun clients and integration with HP's OpenView network management package. . . . **DEC** unveiled X.500-based directory integration software and announced that its X.400-based mail-integration suite runs on the VMS/VAX Version 1.0 platform. . . . **Microsoft** released an updated gateway from Microsoft Mail to X.400 that will work on Ethernet LANs via an OSI protocol. . . . **Control Data** in Arden Hills, Minn., demonstrated an E-mail switch and directory integration software. The software converts incoming mail from most major platforms to and from the SMTP X.400 and ties into directory services based on the X.500 standard. . . . **Apple** announced its latest version of its X.400 server software gateways that work over TCP/IP and OSI networks.

Wireless gaining ground

CONTINUED FROM COVER 1

Mobile Communications, Inc. with an announcement of a wireless modem that implements the "AT" (attention) command set interface developed by Hayes Microcomputer Products, Inc. and used in most wired modems.

The first commercial developers to use the modem are Lotus Development Corp. and AT&T, which demonstrated their respective CC:Mail LAN application and EasyLink wired messaging service over RAM Mobile Data's network (see story below).

In addition, Intel Corp. said it plans to release in September an end-to-end wireless service package that includes the Ericsson modem, the CC:Mail application and a RAM-to-Easylink connection.

Getting the hang of it

The fact that widely used CC:Mail is going wireless is important to familiarize users with wireless mail, and the new modems will make application development easier, said Roberta Wiggins, associate director of wireless and mobile communications at The Yankee Group in Boston. But many users said that even so, wireless technology is too immature to make firmwide implementations yet.

For example, Dawn Simon, manager of global messaging at Salomon Technology Services in New York, said she will not invest in wireless until she sees better network and data security.

"Currently, sending a wireless message is about as secure as sending one by paper airplane," she said.

The security fear exists, in part, because the messages are stored at the service provider's site, she said, leaving them only as protected as the carrier is able to make them.

Hard to carry around

For Christopher Lynberg, a computer specialist at the Centers for Disease Control and Prevention here, another roadblock is portability. With many vendors' systems, users must carry a separate, bulky wireless modem along with their laptop and other traveling paraphernalia.

"I'm looking for one device that includes paging, two-way messaging and a cellular phone," Lynberg said.

That scenario is not viable for the near future; however, at least one vendor is addressing the portability problem. Motorola, Inc. demonstrated its wireless version of the latest laptop craze: a Personal Computer Memory Card International Association-standard modem.

The device should make wireless computing less cumbersome by integrating the credit-card-size interface into the PC. However, Motorola said it does not expect to deliver the product until 1994.

Source: RAM Mobile Data — CW Chart: Michael Siggins

Wireless messaging works both ways

The wireless world of two-way messaging forged ahead last week with the following developments:

- Support of the Hayes AT command set in Ericsson GE Mobile Communications' $775 radio modem, available now, allows software developers to write to a common interface for both wired and wireless applications and to adapt existing applications to wireless media.
- RAM Mobile Data announced gateway software that lets customers using the AT-compatible device connect to X.25 packet networks.
- Also on the interoperability front, RAM Mobile Data is beta-testing BellSouth Corp. software that provides wireless access to Digital Equipment Corp.'s All-In-1 mail. The software is available to companies for other pilot projects.
- RadioMail said that starting this week, users of Apple Computer, Inc.'s PowerBook and PowerBook Duo notebooks equipped with an Ericsson or Motorola wireless modem can exchange messages using RadioMail's wireless service.
- RadioMail also announced a wireless "breaking news" service free to its subscribers who use PowerBooks. Users can download headlines, news summaries and Dow Jones information that is downloaded from 16 newswires.

—Lynda Radosevich

Informix shipping gateway for host

By Kim S. Nash

MENLO PARK, CALIF.

Informix Software, Inc. is due to ship today a gateway between its database and IBM mainframes but will not fully support Application System/400 minicomputers, as was originally planned.

Informix-Gateway with DRDA was designed to let applications built with Informix tools access and change data stored on machines under IBM's Distributed Relational Database Architecture (DRDA).

DRDA is a set of standards said to let relational databases on IBM mainframes and AS/400s understand the SQL spoken by remote non-IBM systems.

However, Informix's internal tests showed that the "AS/400 didn't fully conform to DRDA in some instances," according to Mike Sun, product marketing manager for connectivity products.

IBM said it has fixed the problems, but Informix wants to run "a more robust battery of tests, just for our own peace of mind," Sun said.

Cause of bottlenecks

The problems were minor, but they nonetheless stymied the gateway in specific situations, Sun explained. For example, the gateway cannot map certain data formats between Informix's SE database and the AS/400's built-in relational database because the AS/400 operating system misinterprets some DRDA specifications, he said.

"The AS/400 completely complies with DRDA," said John Fulton, chief software engineer for the AS/400 database.

The as-yet unpriced gateway allows some conversation between AS/400 and Informix-built applications, but not as much as Informix would like. Sun said more testing is necessary before Informix can ship an AS/400 gateway, but he expects to announce one by the fourth quarter of 1993.

Meanwhile, a DB2 version is on its way out the door for Informix users running IBM RISC System/6000 and Sun Microsystems, Inc. Scalable Processor Architecture-based machines.

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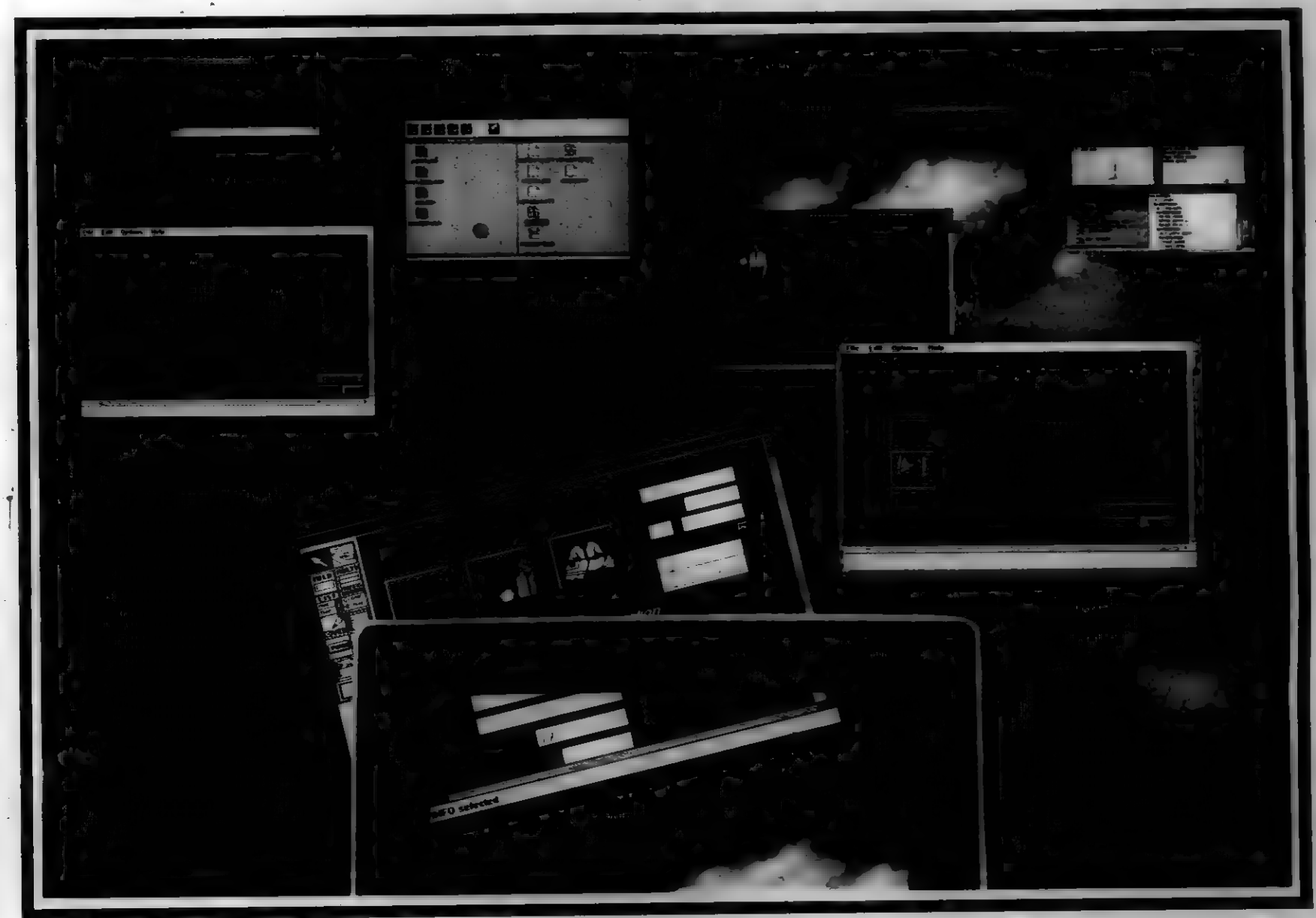

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News Shorts

GE to buy DEC leasing unit

Digital Equipment Corp. has agreed to sell its U.S. leasing business to GE Capital's Vendor Financial Services unit, which will run the 40-employee operation as DECfinancial Services in Westboro, Mass. DEC would not comment on the size of the leasing business, but Sanford C. Bernstein & Co. analyst Barry Willman said leasing "wasn't something the firm had ever emphasized." DEC's leasing customers will not likely see any short-term changes and will not have to renegotiate their leases, said John Buckley, DEC manager of customer administration.

Dell beefs up processes, adds execs

Michael Dell, chairman of **Dell Computer Corp.**, told shareholders last week that Dell is in the process of constructing better systems and processes to be prepared for the future. Dell said the company looks on track to reach $3 billion in sales in 1993. To meet that goal, Dell has hired a number of high-level executives in the last few months, including two more last week: Eric Harslem left **Apple Computer, Inc.** to become senior vice president of Dell's Product Group, replacing G. Glenn Henry, who was named Dell's chief technical officer, and Stephen C. Martson was named vice president of worldwide procurement.

Dow Jones builds client/server software

Dow Jones Telerate, a wholly owned subsidiary of Dow Jones & Co., is building a new generation of financial-information delivery systems based on a client/server architecture. The firm signed a four-year contract with **Hewlett-Packard Co.** to provide Unix workstations to be used as servers for tens of thousands of Intel Corp.-based client machines at customer sites. Future plans call for building a companion Windows "client" to replace aging PCs at many sites, the New York company said.

Marcam announces open strategy

Marcam Corp., a supplier of Application System/400 manufacturing and financial software, introduced its Maples Unix-based product line, its first non-IBM software ever. It said it would introduce other products for Unix systems from HP, DEC and others. To help fulfill that promise, Marcam also announced its intention to acquire **The Varnet Group**, a $12.9 million supplier of open systems software in Montreal. Marcam will acquire Varnet for about 900,000 Marcam shares.

IBM to push CICS competitor's monitor

IBM is starting to tout the transaction monitor that works with the IMS database management system as a high-performance alternative to CICS. IBM has unbundled what was known as IMS/Transaction Monitor and will provide it on alternative platforms, just as the CICS group is doing.

SHORT TAKES **Madge Networks, Inc.** and **Willemijn Holding BV** have settled patent litigation surrounding their networking products. . . . **Joseph J. Agro**, executive vice president and second in command at **Software AG of North America, Inc.**, resigned last week after 4½ years with the firm. No replacement was named. . . . **Amdahl Corp.** last week responded to IBM's May introduction of the IBM 3390 triple-density disk drive. A string of two Amdahl drives will contain 272G bytes, near the 270G bytes stored within an IBM 3390 Model 9 unit or a Hitachi Data Systems Corp. 7699, which is expected to ship in 1994. . . . A jury in California found George Hwang, founder and president of **ULSI Systems, Inc.**, not guilty of charges alleging use of proprietary **Intel** documents in developing his company's advanced processor chip.

HP to unveil distributed components

By Jean S. Bozman
CUPERTINO, CALIF.

Hewlett-Packard Co. will try to get out ahead of its open systems competitors today by announcing shipment of two key elements of its distributed computing strategy. The two products, HP Encina/9000 and HP DCE/9000, support Transarc Corp.'s Encina transaction processing monitor and the Open Software Foundation's Distributed Computing Environment (DCE), respectively.

Unix versions of the products for HP 9000 machines running HP/UX will ship right away; MPE/IX versions for HP 3000 users are expected to ship sometime next year, HP said.

The HP Encina/9000 product, based on technology from Pittsburgh-based Transarc, is said to ensure data integrity by supporting two-phase commits, DCE remote procedure calls and a variety of update and recovery functions.

HP may be one of the first vendors to get its DCE tools to market [CW, May 31], but industry analysts said they do not expect them to be widely used until next year.

"That will take another year to 18 months," said Steve Wendler, an analyst at Gartner Group, Inc. in Stamford, Conn. "Except for leading-edge clients who are willing to learn DCE and Encina, the meal is cooking but it's not ready to eat yet."

Widespread adoption of HP's Encina and DCE products may depend on the readiness of information systems sites to move to a distributed computing architecture, analysts said. Until recently, leading-edge users had to custom-code to implement DCE's remote procedure calls, for example.

"The big issue with DCE is that nobody really wants to use DCE code by itself," said John Morrell, a Unix analyst at International Data Corp. in Framingham, Mass. "What they want to do is use tools on top of DCE."

HP said it will ship DCE/9000 Version 1.1, an enhancement to software first shipped in December 1992. It has data-replication and file-naming management.

HP Encina/9000 server prices will start at $3,600; client licenses will start at $150. Prices for the HP Encina/9000 monitor license will start at $5,500. The DCE core services carry a onetime $1,500 charge, while DCE cell director and security services are priced at $3,100 each. HP's DCE application development tools carry an additional $2,000 charge. A five-user DCE cell package will be priced at $10,000, HP said.

'Partners'

CONTINUED FROM COVER 1

their own outsourcing evaluations.

"If that kind of innovation can be interjected, it's got to enliven the field. I like the notion of it," said Harold Hickman, director of data center operations at Northrop Corp., a $6 billion Los Angeles-based defense contractor in the early stages of an outsourcing evaluation.

Those thoughts were echoed by Cecil Labhart, vice president at Providence, R.I.-based Textron, a $9 billion conglomerate that is also weighing an outsourcing decision. "How can you have a partnership if you don't have something like a joint profit and loss to measure it?" Labhart asked.

While users said they would like to see bottom line-based deals (see chart), they acknowledged the difficulty of deriving a formula that accurately measures the effect of an outsourcer's efforts on the client's business performance.

That is not to suggest that more traditional cost/price models are simple. Outsourcing contract negotiations often drag on for months — or outright collapse — under the weight of sorting out payment agreements based on formulas that attempt to gauge functions, including computing volume and how IS operators and developers spend their time.

And as the conventional models build mass, it will take several business results-based contracts to shift the inertia, IS practitioners observed.

In some of the few known instances of such contracts, the outsourcer processes transactions that clearly generate revenue for the client. For example, Electronic Data Systems Corp. draws a cut from the traffic violation payments it processes and collects for the city of Chicago. And Unisys Corp. earlier this year signed an outsourcing deal that gives it a share in each sale it processes for a customer that sells to retailers, according to Harvey Cohen, director of commercial operations for Unisys' system support operations.

Bottom line

Companies that outsource IS operations are working with vendors to develop better ways to guarantee that they obtain the most for their outsourcing dollar

OLD MEASURES/GOALS
- Transaction volume
- Computer efficiency
- Development activity

NEW MEASURES/GOALS
- Link prices to number of goods produced (Navistar is pursuing)
- Revenue sharing (EDS and Unisys)
- Sliding scales (Energy company ties price to industry)

There was some chatter at last week's conference about a few contracts that have been set up on a sliding-scale basis in which payments vary with fluctuations in a customer's fortunes.

For the most part, outsourcers are still wrestling with the issue. "It's complicated. The shared risk in outsourcing is difficult to measure," said Dale Kutnick, president of Meta Group, Inc., a research firm in Westport, Conn.

Outsourcing discussions at Navistar bear out that observation. "The vendors are having a hell of a time with it," Stout said in a telephone interview.

Late last week, Stout, who is talking with two outsourcers, said an outsourcing deal was starting to look unlikely because vendors' preliminary prices are too high.

Ron Johanson, manager of systems technology at IBM's Integrated Systems Solutions Corp. (ISSC), noted that "we've had [the results contract] conversation with several customers, but it's difficult to establish something that protects both parties."

Vendors and IS shops agreed that there are times when one or both parties would not be interested in establishing bottom line-based deals. For instance, although Harvest Foods in Little Rock, Ark., suggested such a setup to ISSC during outsourcing negotiations, the IBM subsidiary did not go for it, according to Harvest Chief Financial Officer Robert Rough. During that time, Harvest was struggling through a recovery period following a leveraged buyout from its former owner, Safeway, Inc.

ISSC said "a lot of your business success is dependent on factors outside of ISSC's control," Rough recalled.

Rudy Hirscheim, a University of Houston business professor and outsourcing consultant, pointed out that sometimes the customer's short-term needs take priority over long-term bottom-line results. "Maybe a cash infusion up front is more important," he said.

Nonetheless, many analysts said they believe bottom-line, or revenue-linked, contracts will catch on. "If there's shared risk, there's shared reward. It's part of the increased business orientation of IS," Kutnick said.

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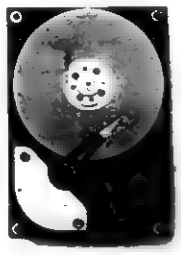

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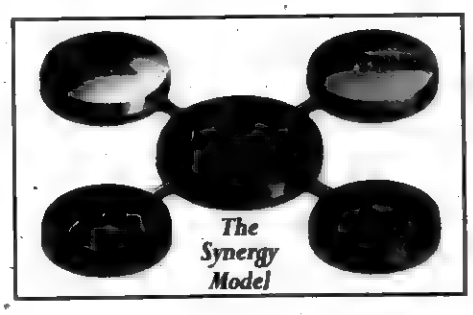

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Software upgrade costs rising

CONTINUED FROM COVER 1

say that if you skip one, you're out," Kasper noted.

In fact, the actual cost of the software is "minor" compared with the installation costs, said Ky Wilson, information resources manager at Stone Container Corp. in Chicago.

"An upgrade is going to have to offer about a 60% improvement in terms of features over the existing package before it's worth upgrading faster than once or twice a year," Tate said.

For IS managers, the move to Windows exacerbates the complexities of upgrades because Windows tends to entice users into deploying more applications than they did on DOS. As a result, managers are often faced with the prospect of having to upgrade several applications a year on each user's desktop.

Without a concerted plan, an upgrade of a single application across 100 users' desktops can take anywhere from 17 to 32 weeks, according to the MMA.

To offset some of the headaches associated with upgrades, IS directors have been relying on network servers, volume purchases and maintenance agreements as a hedge against the difficulties of keeping up with upgrades. For example, consolidating licenses to a network server eliminates the need to physically upgrade software on every machine.

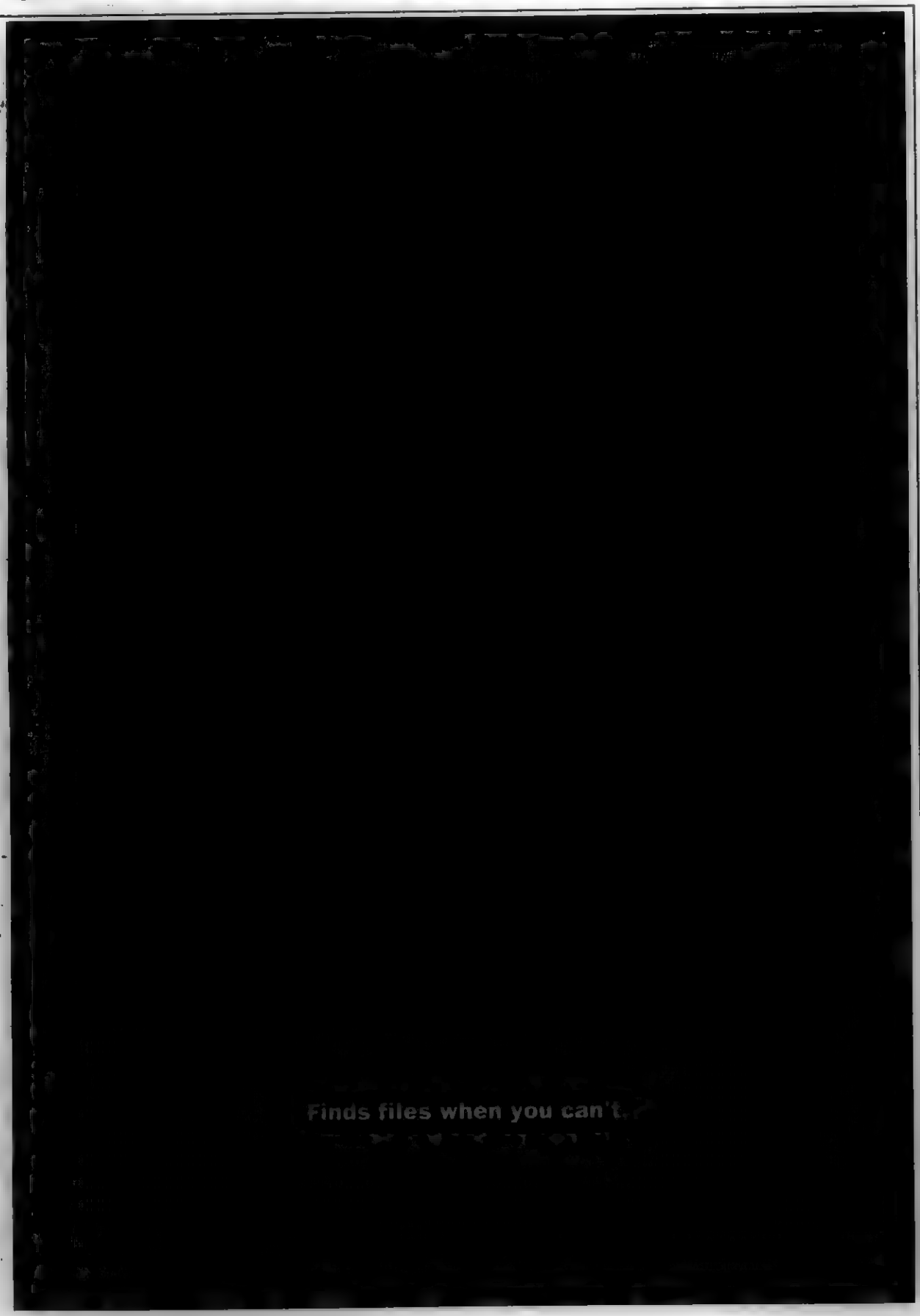
In addition, Kasper said his organization is looking at moving toward maintenance contracts that bill for software on a monthly basis and that also cover upgrade costs.

"We just bought a three-year maintenance license for CC:Mail, but that was easy because we were starting a new system from scratch," Kasper said.

Meanwhile, on the horizon are automated software license managers that will make it easier to track who has what software and hardware configurations across a network.

But this technology is still in its infancy, so most IS managers can expect the upgrade process to remain a labor-intensive task [CW, June 7].

"Right now we handle all the installation. To simplify this, we're going to put our applications up on servers rather than on each user's desktop," Wilson said. "We've looked at the automatic distribution software, but right now it's pretty rudimentary. They basically just copy a file. They're not aware of configurations."



Numbers game

Software upgrades accounted for just 16% of the total software units shipped in 1992, according to the Software Publishers Association (SPA) in Washington, D.C.

However, some analysts said the SPA's numbers do not accurately reflect the influence of upgrades because they do not include users who move from DOS to Windows. Analysts maintained that this is actually a manifestation of the upgrade business rather than the adoption of a new environment.

"If you view Windows as an upgrade to DOS, then the impact of upgrades is significantly higher. The 1990s is the decade of upgrades," said David Coursey, editor of "P.C. Letter" in San Mateo, Calif.

And this activity is expected to increase dramatically this year as another generation of Windows applications rolls out.

Lotus Development Corp. last week delivered Release 4 of 1-2-3 for Windows, and WordPerfect Corp. recently delivered an enhanced version of its word processor for Windows and has plans to deliver a major upgrade later this year. Microsoft Corp. is expected to deliver major upgrades of its Excel spreadsheet and Word word processing software in the second half of this year.

— Michael Vizard

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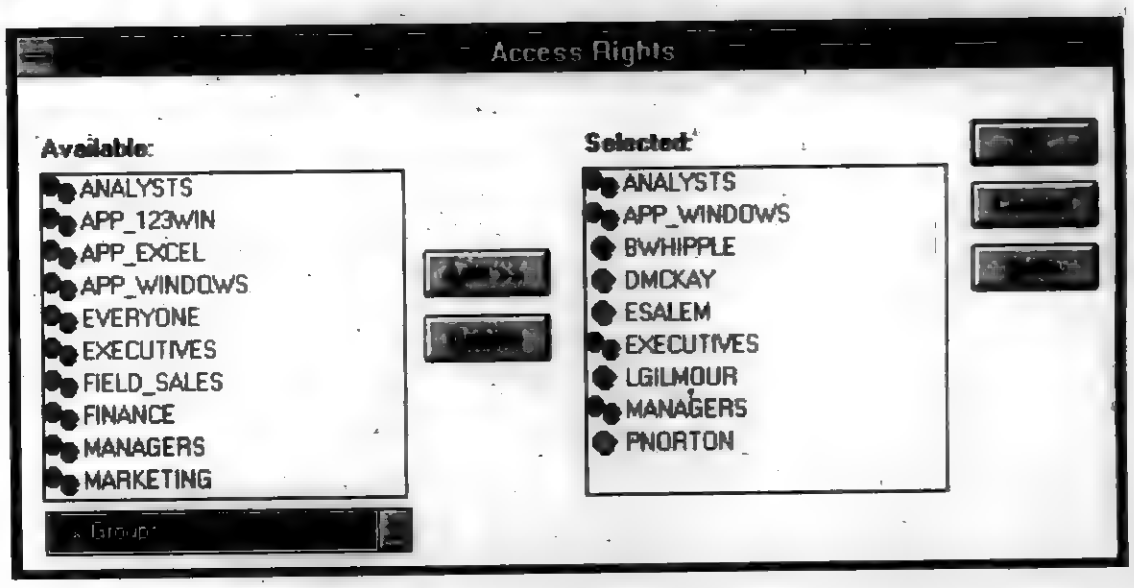

Peter Norton, the leader in Windows utility software.

It seems Windows was designed to make everyone's life easier. Everyone, that is, save for today's network manager.

Saving that manager is exactly what Peter Norton has in mind. With Norton Desktop's Network Menuing Admin Pack 2.2 (NMAP for short), you now have the power to take complete control over access to network* applications.

Peter recognized that there may be hundreds of Windows users with varying skills, needs and preferences. And then there is you, expected to maintain corporate desktop standards, control the free flow of information and handle the stream of panicky requests from your users.

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NOVELL. The Past, Present, and Future of Network Computing.

EPA plants seeds for 'green PC' project

By Michael Fitzgerald
WASHINGTON, D.C.

Last week's official unveiling of the Environmental Protection Agency's Energy Star initiative drew widespread support from the computer industry. The initiative looks likely to become a common part of PC design in the future.

Vendors ranging from the IBM PC Co. to Intel Corp. announced products that will help meet the government-mandated Energy Star specifications, which were designed to curtail PCs' electricity use. Energy Star PCs must run at less than 30W, compared with the 200W most run at today.

Most of these products will showcase power management features, such as sleep modes, that have typically been found on notebook computers.

Analysts said "green PC" initiatives, such as system components that run at 3.3V and low-emission monitors, will gain momentum in the marketplace and should become standard systems parts.

"In the next eight to 12 months, these features will be just rolled into the product lines," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

The government mandate (see story below) should guarantee healthy sales for energy-efficient devices. Still, even users at governmental agencies said they would not rush right out to replace all their systems with green PCs.

"We're definitely pleased by this, but we'll probably phase in this sort of technology over time," said Richard Jungbluth, an air-quality engineer at the South Coast Air Quality Management District in Diamond Bar, Calif.

IBM PC Co., which introduced a radically different green PC, the Personal System/2 E, last week, said its design was more important than energy conservation.

"The energy conservation side is a bonus," said James G. Turner, general manager of premium systems at IBM.

The PS/2 E measures 12- by 12- by 2¾-inches and weighs less than 11 pounds. It can be hung from a wall. The system can be purchased with either a 14-in., low-power monitor or a 10.4-in., low-power flat-panel, active-matrix color display.

Turner said street pricing would fall near $2,200 for a PS/2 E with the 14-in. CRT or in the mid-$4,000 range with the flat-panel monitor.

Vendors such as Hewlett-Packard Co. have released conventional PCs that meet the EPA requirements.

Intel also chose last week to announce its new SL Enhanced Intel486 chips. These ranged from a 25-MHz 486SX to a 33/66-MHz DX2 processor.

Other vendors with products or support for the Energy Star program include Apple Computer, Inc., Compaq Computer Corp., AST Research, Inc., Gateway 2000, Inc., Advanced Logic Research, Inc., Acer America Group, NEC Technologies, Inc. and Zenith Data Systems.

Saving energy

It's not every day that computers literally take center stage — at a White House briefing.

"Let's see what we have here," said Vice President Gore, pulling away a white sheet that covered new energy-efficient PCs and printers, recipients of the EPA's Energy Star certification.

Flanked by 22 beaming executives from computer companies such as Acer America and Zenith Data, Gore saluted EPA analyst Brian Johnson, who in just a year dreamed up and headed EPA sponsorship of industry development of computer gear with drastically reduced power requirements.

The vice president said computers account for 8% of all power used by commercial activities, noting that use will rise to 10% by the year 2000 if no action is taken.

— Gary H. Anthes

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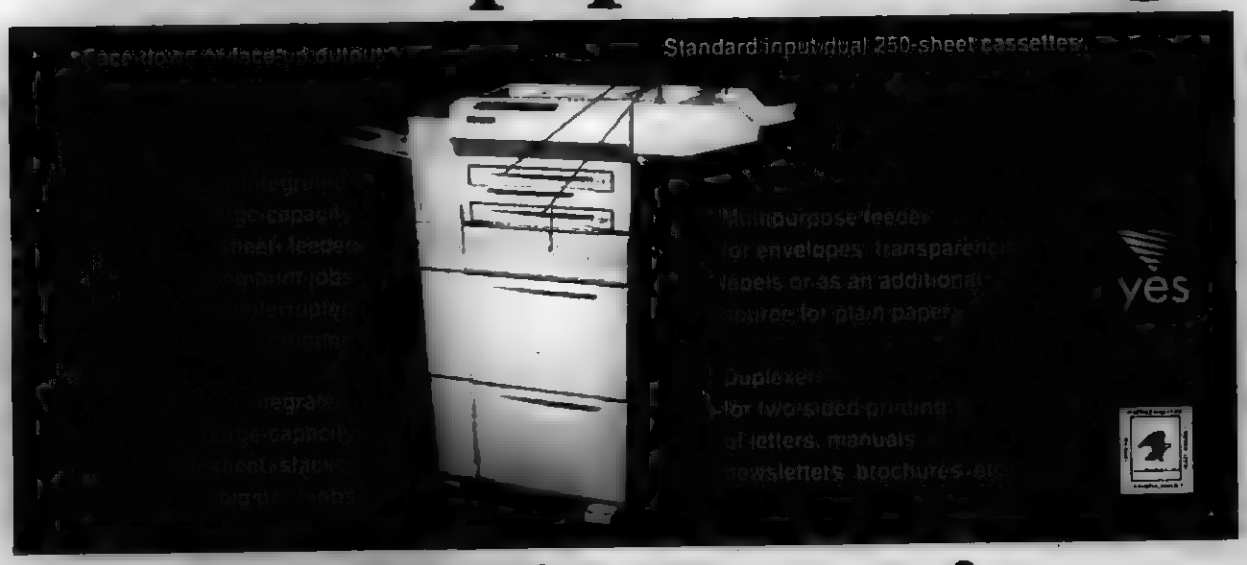

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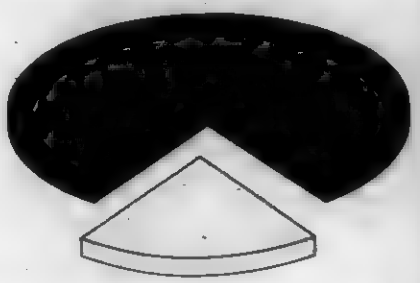

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- 31. Programming Management, Software Developers
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- 80. Sys. Integrators/VARs/Consulting Mgt.

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- 12. Vice President, Asst. VP
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DEPARTMENTAL MANAGEMENT
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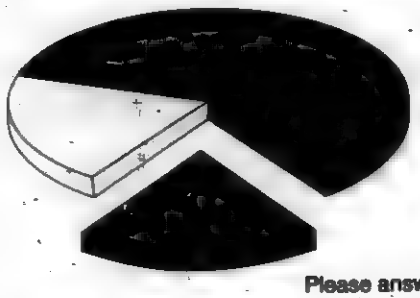

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- 65. Communications Systems/Public Utilities/ Transportation
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The new OS/2 2.1 lets you run the latest Windows 3.1 applications, in addition to the DOS, Windows and OS/2 applications you can already run. We've also added TrueType fonts, select Windows applets, File Manager and support for Windows 3.1 printer and display drivers, including 32-bit seamless SVGA support. And now you can start DOS and OS/2 applications from a WIN-OS/2 session, too.

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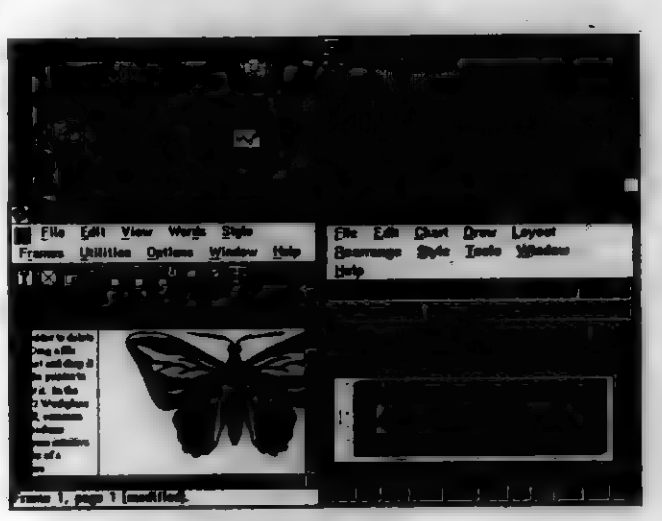

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IBM boosts power, connectivity of 3172

Offers 45% higher throughput for TCP/IP connections and twice the output for SNA-based links

By Elisabeth Horwitt
WHITE PLAINS, N.Y.

IBM introduced a far more powerful version of its 3172 Interconnect Controller Model 3 last week, positioning it as a router/gateway that can interconnect local-area network users to up to 16 IBM mainframes on an Escon network.

Until now, the 3172 has provided host-channel connections for Token Ring and Ethernet LANs running Transmission Control Protocol/Internet Protocol (TCP/IP) or Systems Network Architecture (SNA).

However, the cluster controller has been losing market share to multiprotocol router backbones that can flexibly connect LANs to one another, as well as to multiple hosts, according to Todd Dagres, a senior analyst at The Yankee Group, a research firm in Boston.

Last week's announcement represents IBM's attempt to extend the 3172's life span, he added.

With a faster processor, more memory and more hard disk storage, the enhanced Model 3 boasts a 45% higher throughput for TCP/IP connections and about twice the throughput for SNA-based links, an IBM spokesman said.

In addition, the controller supports Escon, IBM's channel extension software, which enables it to route LAN transmissions among 16 IBM hosts, compared with the two hosts supported by the original model's channel connection, IBM said.

Escon also supports high-speed links between the LAN and multiple hosts, which can be extended as far as 37 miles, the IBM spokesman said. In contrast, a basic channel-based link is limited to 400 feet.

LAN software packages

IBM also announced 3172-based versions of its LAN Resource Extension and Services (LANres) and LAN File Services software packages.

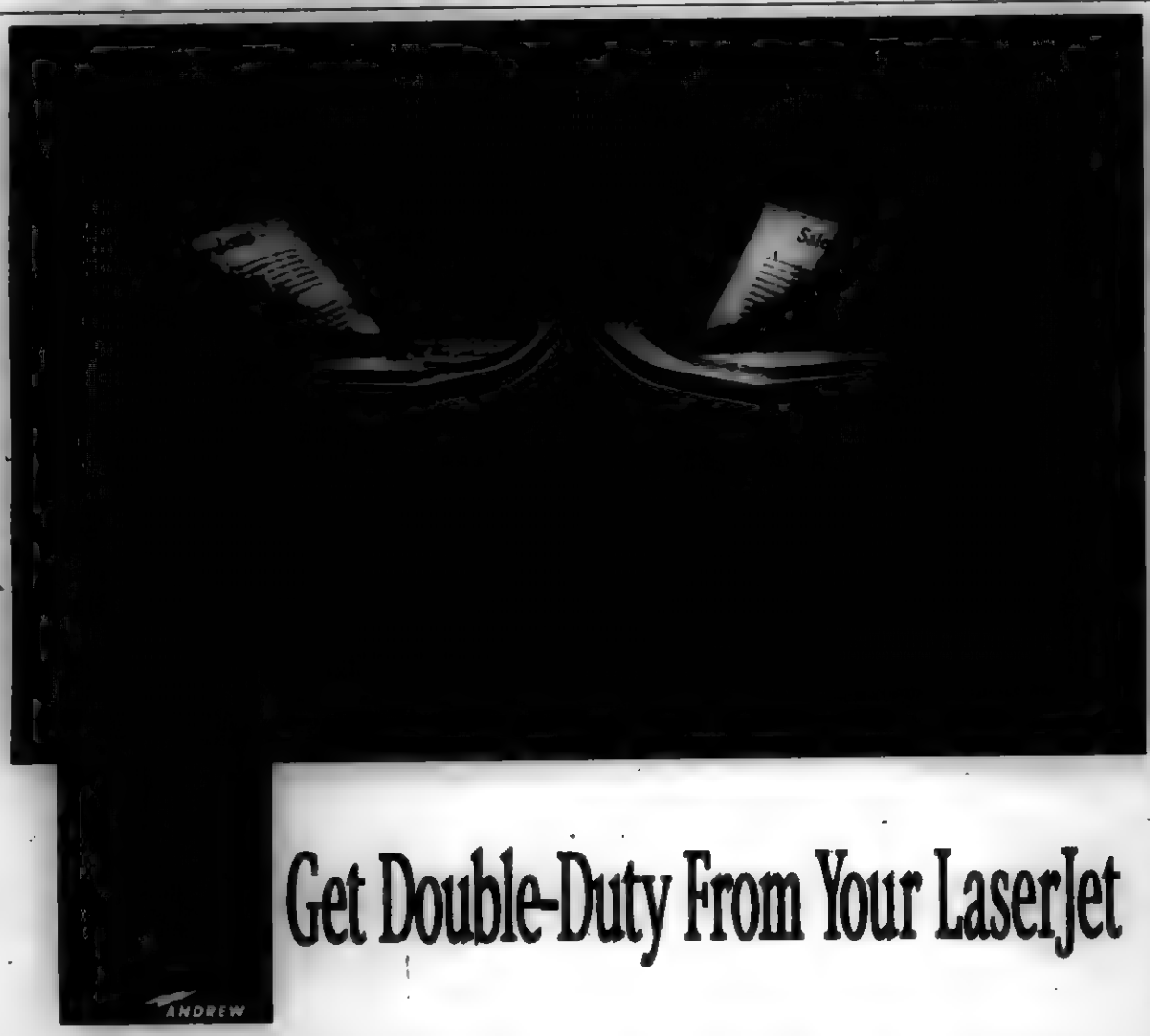
LANres enables an IBM mainframe to provide file and print services, data distribution and LAN administration for Novell, Inc. NetWare installations. LAN File Services provides similar services for OS/2 LAN Server and Sun Microsystems, Inc. Network File System clients.

New versions of the above LAN software packages now include Escon support, and they can link LAN clients up to MVS/ESA hosts, IBM said. The original products linked up only to VM/ESA hosts.

The enhanced 3172 model can also support TCP/IP and SNA transmissions over the same LAN port, IBM said. Previously, each LAN protocol needed its own port.

This enhancement allows a 3172 for the first time to support both types of traffic between a mainframe and a Fiber Distributed Data Interface (FDDI) network because 3172 Model 3 has only one FDDI port.

The enhanced Model 3 is available now, priced from $16,029 to $53,935, depending on configuration.



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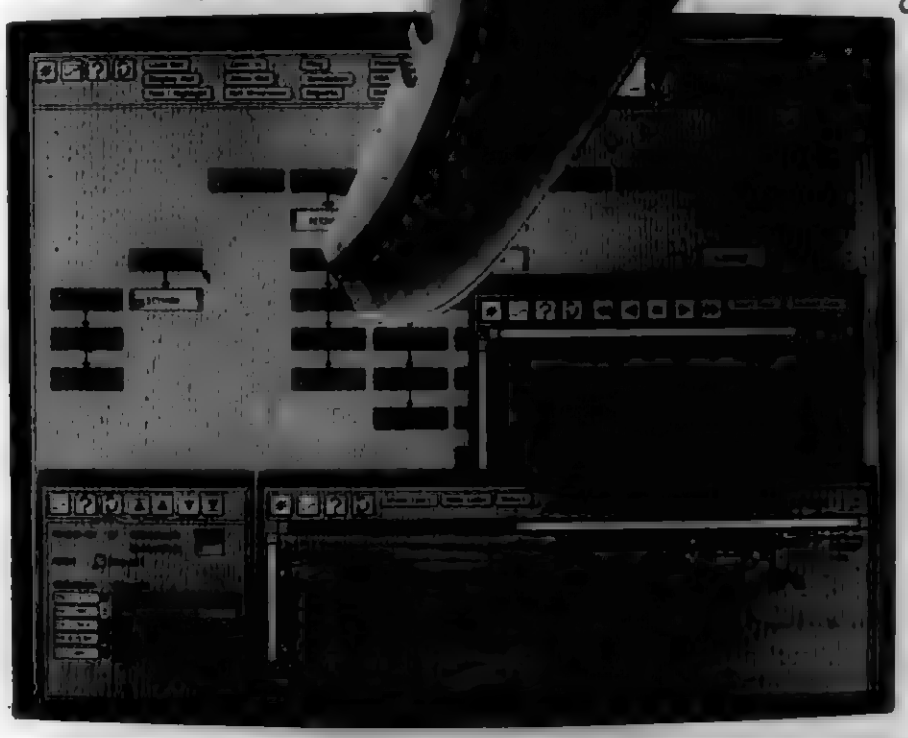

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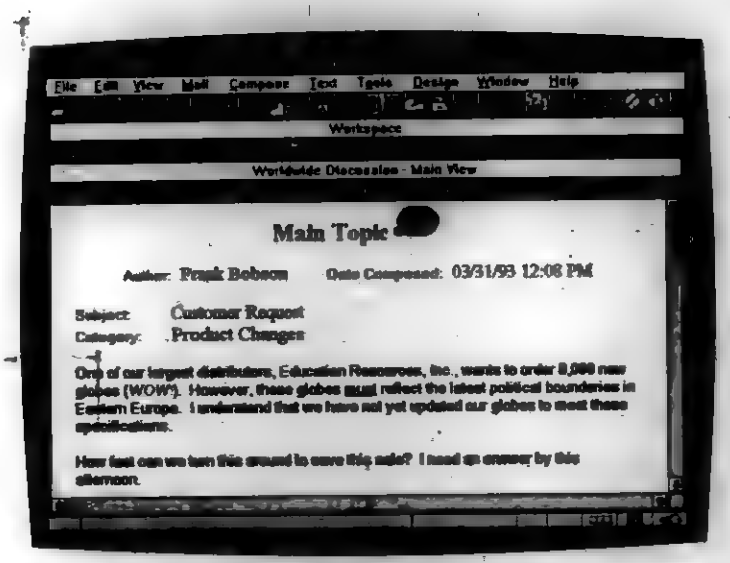
TRIBA

1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems worldwide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.

5. Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.

6. After lunch he opens a document from Ellen in product development who has responded with the necessary changes and scheduling information. The new art was scanned directly through Lotus Notes: Document Imaging from the art department. James approves the art for manufacturing.

How Lotus Notes Relea

Thousands of companies already know how Lotus Notes® helps them respond more quickly and effectively to the demands of everyday business. Now Release 3 extends that power to new dimensions.

Just watch how James Carlton, a new district manager at Global Publishing, uses Notes Release 3 to solve a major global problem in short order. See how he uses information from on-site and remote locations. From both inside the company and external sources. Across a

variety of platforms. How he uses applications such as Account Tracking, Newswire, and Engineering Change Orders to get a new product developed fast. And how he creates an informal team spanning a range of departments to do it.

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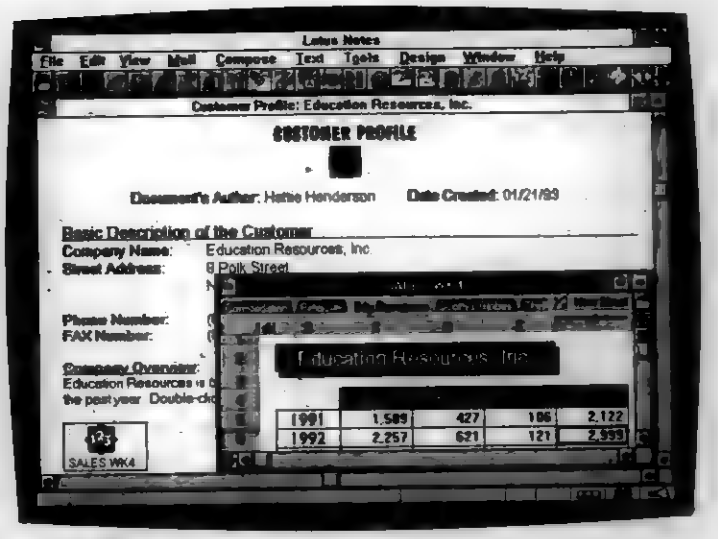
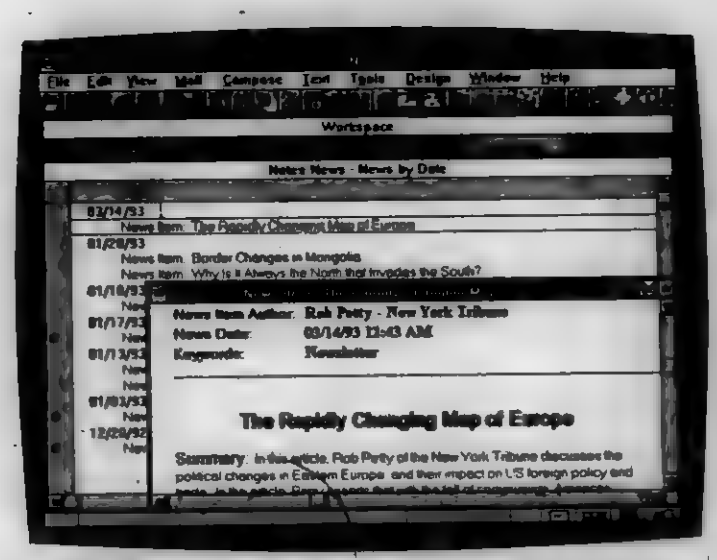
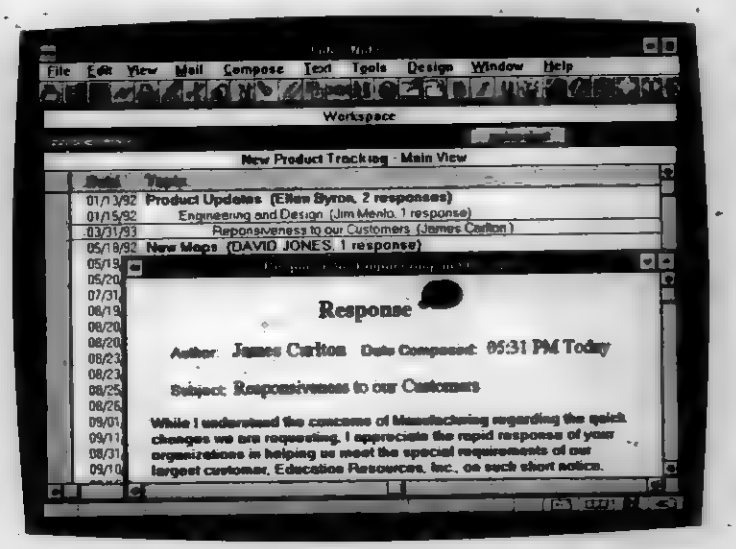
*UNIX Server and Client available by year end 1993. In Canada, call 1-800-GO-LOTUS. ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes and 1-2-3 are registered



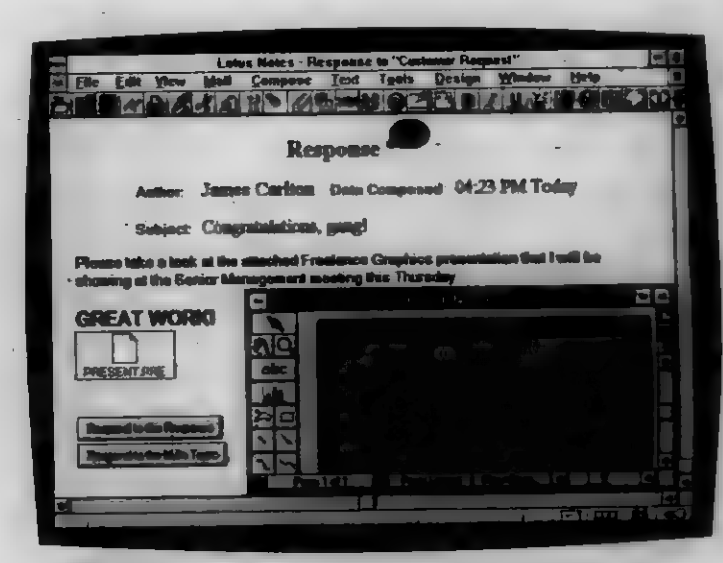
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database so everyone can see how the team rearranged the world to save a big account.

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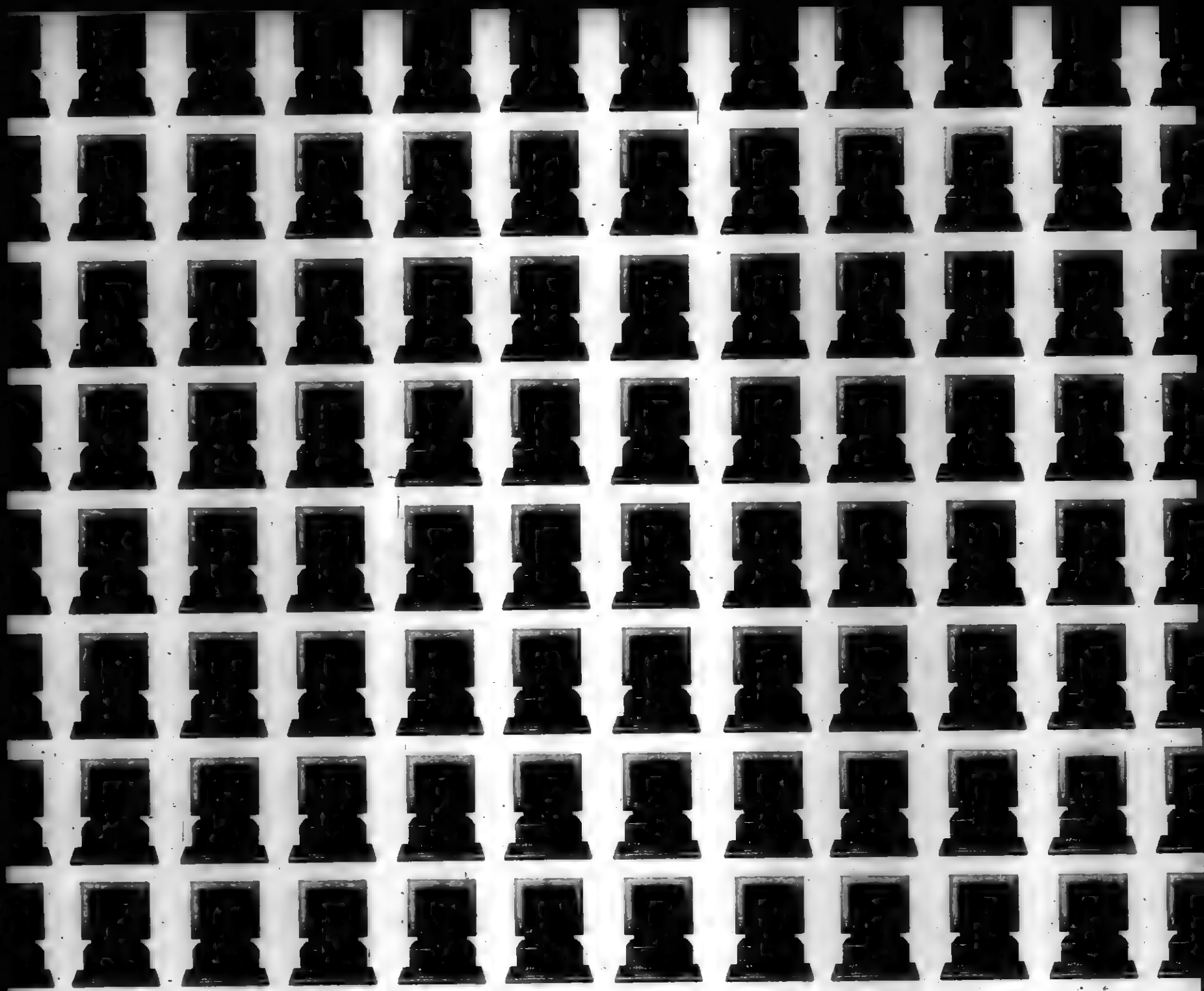

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More than just a game

Next-generation CD-ROM players might have other not so obvious uses

By Ellis Booker

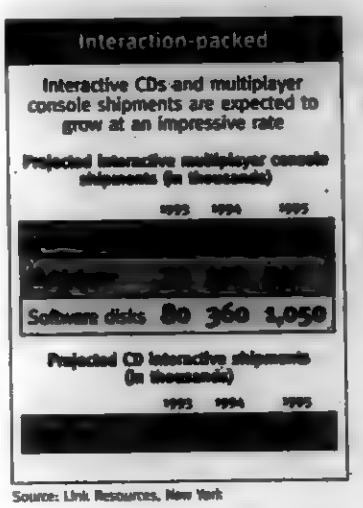
Now that Universal Pictures' *Jurassic Park* is out, makers of the interactive CD-ROM video game of the same name can finally show *their* dinosaurs in public.

Earlier this month at the Consumer Electronics Show in Chicago, eager game afficionados were disappointed to learn that the demonstration version of The 3DO Co.'s Jurassic Park Interactive did not include dinosaurs. The company had agreed not to show that part until the movie was released.

At the moment, San Mateo, Calif.-based 3DO is the most closely watched player in the multibillion-dollar video game industry. It has garnered $48 million from its initial public offering.

The buzz about 3DO, a coalition of consumer electronics, communications, entertainment and software companies, has to do with a hardware/software standard it developed called the Interactive Multiplayer. The multiplayer is an interactive, multifunctional CD-ROM player that is compatible with music CDs and Eastman Kodak Co.'s Photo CD standard (see box for more details).

To date, 3DO has licensed the technology to some 302 software companies. Three hardware vendors have also licensed the technology. In the fall, Matsushita Electric Industrial Co. will ship the first 3DO player, a $700 system to be sold under the Panasonic label. AT&T and Sanyo Electric Co. also plan to bring out 3DO platforms.



Source: Link Resources, New York

However, the first 3DO player will not hit the market until fall, and it will have only 10 or so software titles available upon release.

Meanwhile, not everyone is thrilled with the 3DO technology.

"It's too expensive to be a video game and too limited in its user interface and access to be useful as a computer," said Bart Mallio, division manager at Venture Development Corp. in Natick, Mass.

Besides, Mallio added, software, not hardware, has always been the key to the market. "Nintendo's success has been due to a strong, intuitive sense of what's *fun* in the game market," Mallio said.

Leaving aside the games platform, how will interactive CD-ROMs develop?

"There's education, there's information delivery ... there's point-of-purchase displays and kiosks," suggested Walter Miao, vice president of technology at market research and consulting firm Link Resources Corp. in New York.

Miao said few developers are pursuing such markets; they are banking on games for now.

Another strategy, Miao said, is to use the platform for video — an application being emphasized by 3DO competitor Philips Consumer Electronics Co. At the Consumer Electronics Show, Philips introduced a $249 software adapter that provides digital, full-screen, full-motion video to its Compact Disc-Interactive (CD-I) players. Philips also announced agreements with Paramount Pictures and Capital Cities/ABC Video Productions, Inc., both of which plan to release video content for CD-I.

Meanwhile, the interactive CD-ROM winner in the games market could indirectly influence the future direction of desktop multimedia, given that developers will be encouraged to write for the platform standard with the most widely installed base of machines.

For instance, video games giant Sega sold 180,000 of its proprietary CD-based system in the fourth quarter of 1992 and, according to Miao, may sell as many as 700,000 more this year.

"Toys do matter if we're having an installed base war over CDs," he said, noting that the installed base of CD-ROM drives is 3 million or 4 million today.

CD-ROM technology: Now and future

3DO TODAY:

- In its initial incarnation, the 3DO Interactive Multiplayer is a peripheral to a television, not a PC.
- Its graphics animation performance, claimed to be 50 times that of current PCs or video games, is accomplished via a pair of specialized graphics engines. These engines are able to display or move up to 64 million pixels per second, greater than the 1 million pixels of 16-bit or 3 million pixels of 32-bit systems.

FUTURE PRODUCTS:

- An array of user devices, from controllers and 3-D glasses to memory-card storage for saving games in progress or other information.
- Cable TV hookups (AT&T is investigating such networked applications).
- PC interfaces (using as-yet-unannounced expansion cards).
- MPEG Video (the interactive Multiplayer features a cartridge port designed specifically for future video compression hardware).

Users starting to talk up voice recognition

By Michael Fitzgerald

People talk to their computers more than they would probably admit, generally to express their feelings about some little idiosyncracy, like a system crash. They don't really expect a response, though an apology might help.

But a growing class of users talk to their computers with the express intent of getting a response, and voice recognition may become a hot button for users. Compaq Computer Corp., in conjunction with Microsoft Corp. and Analog Devices, Inc., already offers a product called Business Audio that lets users give commands to their PC systems.

Recently, IBM introduced a version of its Continuous Speech Series (ICSS) for the PC, which offers 1,000-word recognition from a 20,000-word vocabulary for as little as $299.

While most people think of speech recognition as something largely for people who cannot use their hands, users are developing numerous ways to do things.

For instance, two Las Vegas casinos use Blackjack Survey Voice from Casino Software Services, Inc. to track blackjack player skill levels and catch card-counters. A casino employee, using game tapes, tells a computer database what cards to enter. The information is then analyzed so the casino can see how well players are doing. The product also tracks how much money is spent per hour, how much the table takes in or pays out and so-called complimentary players — people who receive free rooms and sometimes free flights in exchange for promising to spend a certain amount of time at high-stakes tables.

Derk Boss, director of surveillance at The Tropicana casino, said that the software, which has been in place for three months, has "saved us a tremendous amount of time."

Some folks are taking an opposite tack, trying to use speech recognition for the benefit of others. Lake Charles Memorial Hospital in Lake Charles, La., is developing an early prototype of a recognition application based around ICSS.

"We have 1,000 people here involved in health care, doing activities with their hands and their eyes, so we're looking for some way to increase the amount of paperwork they can do without taking people away from their primary duties," said Stephen Veazie, vice president of information and technology at the hospital.

"It's much different than typical systems development because using speech as the basis of the application is highly unusual," Veazie said.

He said the project would give nurses and physical therapists the ability to move around and talk and not have to enter data.

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No panacea

To hear some industry executives talk, you'd think object-oriented programming (OOP) is going to cure cancer, put Americans on Mars and have us all working 30-hour weeks.

Yes, object orientation is an important productivity concept that will enable developers to create more stable software. But there's a faint hint of snake oil here and a reminder of past promises gone astray.

Users are under the gun to adopt OOP languages such as C++, build from class libraries and employ inheritance and encapsulation in all they do. But a very fine line exists between the old concept of a subroutine library and a class library. The benefit of object technology is that programmers can share code and reuse objects. But programmers have been reusing code for years. They just called it something else.

The concepts underlying OOP are indeed important. The most critical idea is that it brings some element of structure to what in most programming shops is still a pretty unstructured task. How many of you have Cobol programs in production that lack sufficient documentation? I thought so. Wouldn't it be nice to have an organized, well-documented library of code objects that you could pull out and drop into programs as needed? Of course. Will OOP get you there? Maybe or maybe not.

The fact that something is object-oriented does not make it well-structured, well-documented or efficiently coded. That's still a job for humans. Nor does object orientation necessarily make programmers more productive. On the contrary, having technical people encapsulate and document every chunk of program code is only going to slow them down. Look at how drawn out the development cycles have become on Windows products. Even the most object-oriented of software developers have admitted that they get little or no productivity gains from OOP on the front end.

The big benefits come in easier maintenance, speedier enhancement and improved software reliability. That is where OOP shines. Code that is well-documented and organized into reusable libraries is going to be easier to maintain and simpler to improve. There's nothing object-oriented about that. In fact, the embattled field of CASE always promised much bigger payoffs in the maintenance cycle because it forced programmers and analysts to organize their work clearly before coding. Before that, structured methodologies took a shot at making software better by forcing developers to follow rules and document what they did. Same idea, different approach.

Perhaps the art of software development just doesn't lend itself to regimentation. In that case, OOP may serve an important purpose by giving developers a set of standard class libraries to use. The endorsement of major industry icons like Microsoft and Borland helps legitimize the concept. But even the best OOP products won't help a development group have its own house in order.

Paul Gillin, *Executive editor*

Windows NT a winner

It is hard for me to understand how David Coursey's column "NT isn't worth the wait" [CW, June 14] has a place in your fine periodical, except as one of those things that gets printed for the purpose of generating a reaction. Well, here's some reaction.

Windows NT is a Windows 3.1 power user's dream. The potential of 32-bit independently multitasked applications, as demonstrated by the NT applets, is tremendous. This is a significant benefit that allows formatting and copying of files to floppy disks, as well as loading large programs and databases, while critical high-speed communications operations are in progress.

NT delivers reliability, security and audibility that was previously unheard of on the desktop. It stands up to the best mainframe system in these key areas. NT logs support GUI utilities that let support people examine objective evidence of user-reported problems. The NT performance monitor enables diagnosis of performance problems with resolution that compares favorably with the best mainframe tools.

Is the NT cup partially full or partially empty? Coursey focuses on his belief that "NT is often slower than Windows 3.1." It is also often faster. NT's 32-bit graphics engine is like plugging in an accelerator card. NT's appetite for 24M to 32M bytes of memory is no more perplexing or costly than Windows 3.0's desire for 4M to 8M bytes when it first came out.

Coursey's lack of clarity "as to exactly what NT does that OS/2 or Unix doesn't already do as well or better" has to come from lack of experience with all of the above. What NT does better than Unix is run the huge library of Windows 3.1 applications with superior hardware efficiency and an easy-to-install system with a familiar user interface.

NT was designed to serve as the basis for the solution to the computing problems of the year 2000. By then we will be looking at near-gigabyte memory and multigigabyte hard drives just as we look at 8M-byte memory and 200M-byte hard drives today. Our applications will no doubt need them.

While NT looks a little overbuilt today, it will let us grow on a smoothly evolving system software base until the year 2000 and beyond. Not only is NT worth the wait, it will be worthy of the future.

Arnold B. Krueger
Grosse Pointe Woods, Mich.

Morph mistake

Gary L. Dunne's article "Get ready to 'morph' yourself" [CW, June 7] claims the motion picture industry invented a new word — transmogrification. Calvin and Hobbs have been transmogrifying for years.

The *American Heritage Dictionary* defines transmogrify as "to change into a different shape or form, especially one that is fantastic or bizarre." The only thing the motion picture industry did was misspell it.

L. Joseph Dunn
Burbank, Calif.

Learn to manage

Elaine Bond's premise in "Have tools, lack talent" [CW, May 24] is widely accepted, but the article allows the audience to quickly confirm their opinion that it's the programmer's fault! This obscures the real source of the problem — senior management.

This is the message that must be acknowledged before significant change and gain will become apparent.

Evidence that this message is not being received fills the employment pages of every newspaper as companies continue to advertise for technology specialists in lieu of technology managers.

Software managers must be conversant in current technology and technology trends, but to deliver software profitably, they must be skilled managers first.

Let's face it, most developers are generally performing a function according to the requirements of their employer and are remarkably nonresistant to change in process or procedure. The writer, from her position of influence, would do well to focus similar articles, and her attention, where it will generate the most benefit — senior management.

David W. Carey
Chelmsford, Mass.

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According to my computer, you don't exist. Next!

Joseph Maglitta

The airline's computer terminal was so dumb I wanted to reach over and slap some smarts into it — especially since my flight had already started boarding.

"I'm sorry, sir," the counter attendant said. (Why didn't I believe her?) "I can't give you frequent-flier credits unless you have your number. My computer doesn't have those numbers."

"But," I explained, "I can't find my card, so I don't know my number." I could feel my eyelid start to twitch.

"I'm sorry, sir." (Again!) "But if you fill out this form and mail it to the address on the back, along with your boarding pass, you'll receive full frequent-flier credit for the flight."

"BUT THAT'S THE PROBLEM!" I said more loudly, face reddening. "I DON'T KNOW MY NUMBER!"

"I'm sorry, sir." (Again!) "This computer doesn't have those numbers."

Jack Nicholson, trying desperately to order wheat toast in *Five Easy Pieces*, flashed through my mind. So did Michael Douglas in *Falling Down*. I grabbed my stupid form and huffed onto the plane.

Driving home, I decided to stop into my local megachain pharmacy. "I'm sorry, sir," the pharmacist said. "That prescription was originally called into one of our other stores. I can't fill it for you. We don't share computers."

By the time I visited my local video chain, I knew the words by heart. "I'm sorry, sir," the counter clerk said. "That film was rented in our Cambridge store. It has to be returned there because each store has its own computer system."

It all blew later that week in the supermarket checkout line, when I discovered I'd forgotten my courtesy card.

"Can't you look in a file?" I asked, catching myself too late. In a flash the assistant store manager had lugged over a 2-foot-thick book of computer printouts and began searching for my name. "That's N-A-G...?"

Minutes passed. "I'm sorry," she finally announced. "But we have no record of your card. Did you sign up at this store or another one of our branches?"

I snapped. "LOOK," I yelled, swinging a bunch of organic carrots. "Do you realize that it's easier to use Tootie to order a $299 glazed porcelain bunny on the Home Shopping Channel than it is to buy a loaf of bread at this market? Take my money! TAKE MY MONEY!"

As a scared-looking boy bagged my groceries, the checkout girl swiped a bag of coffee four times across the scanner. Finally, it bleeped into the system.

"I hate computihs," she confided. "They make everything wicked hahd."

I know that linking systems and networks is far easier said than done. But if the customer is always right, why are we still so often wronged by computers? I have sworn to patronize as little as possible any business that causes me computer-related headaches.

I bet I have lots of company.

Maglitta is *Computerworld*'s senior editor, management. He likes computers enough to be tough on them and their keepers.

Which operating system will win?

OPEN MIND *by* Esther Dyson

Pardon me, but that's a stupid question.

The philosophical answer is that none has ever won before, and none ever will. The game is never over, and all a particular operating system can achieve is dominance of a particular market for a certain stretch of time.

So what's a user to do? The more practical answer is that if you choose one of the standards, you'll probably be OK. Basically, you want enough variety to have a choice but not so much that you risk making a mistake. Although if you make a big enough mistake (say, Wang), you'll probably have enough company to attract suppliers of tools, bridges and other coping facilities. The applications and other value you build won't go to waste.

Unix, Windows NT and OS/2 are likely to coexist on the server; Windows and Macintosh live on the clients and other players have bit parts. No single operating system will drive out all the others. The recent obsession with standards and "openness" has caused the ridiculous notion that a single operating system can work in all environments, for all applications.

Microsoft, more than anyone, has muddied the waters with Windows everywhere. In fact, Windows is just a brand name that will be attached to a range of operating systems, from DOS (for single-user PCs) to Cairo (for interconnected servers) to Chicago (for high-end, single-user, multitasking workstations). Then there's Windows At Work (for fax machines and the like) and, I have it on good authority, Windows For Toasters. What they have in common is not so much the operating system as common APIs so that, if a function exists in an environment, you can get to it the same way.

What does all of this mean for you? Right now, you're being wooed with a huge variety of operating systems and lures such as running Windows on Unix machines and running Unix on PCs.

Clearly, the value must lie in those applications that people want to run everywhere, not in the platforms they run on. As a manager of systems, your job is to manage the corporate applications and data, not to fuss with which operating system has the best memory-management tuning this week.

As a user, then, your most difficult choice is which applications or development tools to use. The good ones will end up on all the standard platforms anyway.

At that point, the battle may be between companies such as Taligent and Andersen Consulting, with their task- and industry-specific application frameworks. The trick is to know at which level to make your decision. Andersen's systems will be available on a variety of operating system/hardware platforms, as will Taligent's, ultimately.

The pitch is: "Come with us! We can save you from the horrors of operating system dependence if you choose our environment."

Does this mean that all your problems will be solved? Of course not. The hidden message is that you may be independent of the operating system vendors, but you will be dependent on Taligent or Andersen or whomever.

But that's part of being a grown-up. You have to make risky choices if you want to be ahead of the pack.

By the time the answer is obvious, there will be no percentage in making the bet, just as now there's no real percentage in choosing between Windows NT and Unix. Either is fairly safe for server applications, but neither is going to give you much benefit.

If you really want to take a risk and gain competitive advantage, you should already be looking at Taligent. Or you could have been looking at Next.

Dyson is editor of "Release 1.0" and Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.

Charles Babcock

Alpha imperatives

"Is it worth doing business any longer with Digital Equipment Corp.?" you ask yourself. Your business manager was skeptical of your last purchase order with DEC's name on it. You're troubled by the lack of a clear message coming out of the company and wonder if DEC hasn't been permanently bypassed by the downsizing trend.

DEC is trying desperately to regain its footing with Alpha. But this will be a tricky maneuver. In watching DEC, one still gets an unnerving sense of a lack of focus, which sells short some of the company's hidden strengths.

Alpha is an elegant design and one of only two real 64-bit systems available, but its initial sales have been slow. It is estimated that any modern chip producer must invest $1 billion a year to sustain microprocessor design, new fabrication lines and chip sales. In order to give Alpha the two to three years it may need to become self-sustaining, Robert Palmer, the new DEC president, will have to curtail spending elsewhere.

It seems to me DEC must concentrate on giving Alpha a chance to compete. The core of DEC's culture lies in hardware engineering and manufacturing, and it is one of the few firms with a shot at staying competitive there. But to sell Alpha chips, it will have to get the price below Intel's Pentium, which will delay any profits on DEC's massive investment.

At the same time, DEC must demonstrate that it is capable of rapidly pushing the Alpha line forward, much as Intel encourages confidence in its ability to upgrade the 8086 line. In fact, DEC has second- and third-generation Alphas on the drawing boards that push the clock speed above 200 MHz.

To create the breathing space Alpha will need, other parts of the firm will have to be cut back. If they aren't, doubts will arise about DEC's ability to survive, which will overshadow Alpha's merits.

Such a thing is difficult to do at a company like this. DEC was organized around the principle that it would solve computing needs from top to bottom—hence the broad scalability of the VAX, the wide range of software and its strength in networking.

This expertise is expensive to maintain, particularly when newcomers have begun specializing in one piece of the mosaic. If DEC is to sustain Alpha, it will have to choose where it wants to remain in system software and networking.

The VMS operating system still has life in it, thanks to the 200,000-plus VAXs that run it, but development resources must flow into either VMS or a credible form of Unix. DEC has put its money where its mouth is with OSF/1. Now it must tell the world whether this is an ongoing investment or if it finds some other form of Unix a less expensive alternative.

DEC must consider cutting expenses on any proprietary product that is not profitable and a market leader. Rdb is a good database system, but under the circumstances it is unlikely to command the ongoing development resources of Oracle, Ingres, Informix or Sybase.

DEC is trying hard to sell PCs but probably makes little or no money when it does so. Nevertheless, PC sales give it the opportunity to follow up with integration services, like Pathworks.

In his Comdex address, Palmer made it clear he considers Windows NT an integrating force and that he intends to capitalize on the opportunity to sell Alpha servers running NT. This may prove to be a large step in a new direction, but DEC must follow through with a line of integrating services that begin to scale Alpha and NT further up in the company.

Microsoft clearly hopes DEC and Alpha will help it do this, and for DEC, beginning again, closer to the end user, is one of its few clear shots at a future role.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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DOS 6.0 utilities disappoint some

By James Daly

■ Early upgraders to Microsoft Corp.'s DOS 6.0 may be thrilled to discover a passel of new utility features on the refreshed operating system.

But don't get your hopes up. And whatever you do, don't get rid of your existing third-party utility applications.

Early users urge caution in placing any great reliance on the utility features, which they described as rudimentary.

The dark side of the equation, however, is that Microsoft's March entrance into the competitive utilities field may eventually force producers of better products out of the market.

Fifth Generation Systems, Inc. President Barry L. Bellue, whose company produces a line of utilities software, said news of the DOS 6.0 utility additions caused a 35% drop in sales of utility applications among all manufacturers in a recent quarter. Bellue, who claimed to be in close contact with his competitors on this subject, said many are worried about the utilities-laden DOS 6.0.

Stac Electronics, Inc. — which produces a highly regarded compression utility called Stacker that competes directly with DOS 6.0's DoubleSpace — is having some financial problems and has laid off nearly 20% of its 200-member work force. Stac is also suing Microsoft, claiming that Microsoft uses patented Stacker technology in DoubleSpace.

That is a sad prospect for longtime users. "Stacker is a much better tool, but I'm going to have to get rid of it because everyone using DOS 6.0 is going to have DoubleSpace preinstalled, and I'm going to have to support it," said John Nichols, a research analyst at Mayflower Transit, Inc. in Indianapolis.

Stac recently introduced Stacker 3.1, which converts DoubleSpace files to Stacker.

Meanwhile, users face more than the potential loss of more in-depth utilities. Microsoft's entrance into the utilities market may ultimately result in more costly support for users. Fifth Generation Systems, for instance, provides 24-hour, toll-free customer support for one year. DOS 6.0 users only receive 90 days of free support, after which they must dial a 900 number at the rate of $2 a minute or opt for a single $25-a-call charge.

Despite the pressure of Microsoft's market might, some users are sticking to their guns, saying they will not give up the more meaty products of third-party vendors.

"DOS 6.0 will give us a quick and easy way to get better backup, data compression and virus protection to the average Joe, but there's no way it's going to satisfy our power users," said Rich Pickett, who has installed more than 300 copies of DOS 6.0 as director of computing services at the Oregon Institute of Technology in Klamath Falls, Ore.

Others will jealously guard their own third-

DOS utilities, *page 45*

Portable computers

ThinkPad plan reaps kudos

By Michael Fitzgerald
SOMERS, N.Y.

IBM has had trouble being in the right place at the right time in the PC market, but it seems to have reversed that trend in the notebook market with the ThinkPad.

As evidence of its turnaround in the notebook arena, IBM announced two new ThinkPad models last week: the 350 notebook, which includes a passive-matrix color and monochrome model; and the 500 subnotebook, which may accelerate the company's newfound success in the portable market. These products continue IBM's aggressive feature and price combination in the portable market.

"Those look like they're going to be hot products," said Andrew M. Seybold, editor in chief of the "Outlook on Mobile Computing," a newsletter in Brookdale, Calif.

Thanks to its aggressiveness, IBM has vaulted from Nowheresville to near the top of the notebook market and, in the process, has won back customers who had forgotten how to spell IBM.

"We hadn't used IBM in seven years, and [ThinkPad] was the product that got them back in here," said William I. Lodge, project leader at Turner Corp., a multinational construction company based in New York. "The ThinkPad is clearly the notebook of choice here."

At New York Life Insurance Co., IBM PC products were completely off its agency systems group's recommended buy list before the ThinkPad 700C came along. Richard E. Nelson Jr., vice president of agency systems, cited the big screen and aggressive pricing as the reasons for IBM's return.

IBM PC Co.'s new notebooks

ThinkPad 350/350C: Both systems have a 25-MHz Intel Corp. 1486SL chip and PI local bus graphics. They display 256 colors and include a PCMCIA slot. They offer a minimum two-hour battery life on the color (up to seven hours) and 2½ hours on the monochrome version (up to nine hours). The 350C has a 9.2-in. passive-matrix color display and weighs 5.8 pounds, while the 350 has a 9½-in. monochrome display and weighs 5.2 pounds. Estimated street pricing, with a 120M-byte hard drive, is $1,950 ($2,475 for the color model). A 240M-byte hard drive will be available next month.

ThinkPad 500: The 10.1- by 7½-in. subnotebook weighs 3.8 pounds, uses the 25/50-MHz IBM 486SLC2 and supports PCMCIA. It has a three-hour minimum battery life and a special "self-charging" battery. With an 85M-byte hard drive, it costs $2,999 on the street. A 170M-byte hard drive will be available in August.

User participation

Users have also had unprecedented input into product development at IBM. The ThinkPad brand team has put together several user and analyst advisory councils and appears to have taken users' comments to heart.

For instance, when IBM designed a 240M-byte hard drive for the ThinkPad 720 that did not fit in the ThinkPad 700,

ThinkPad, *page 49*

Horse breeder bets on Mathcad to win

By Michael Vizard
LAWRENCEBURG, KY.

The sport of kings, a longtime staple of the Kentucky bluegrass region, may be going the way of the automobile and consumer electronics industries. Japanese investors have purchased the horses that sired some of 1993's leading racehorses — and an American breeder is fighting back with high technology.

High technology *is being used to help breed champions such as Sea Hero, winner of this year's Kentucky Derby*

To cut the odds on horses such as the sires of Sea Hero, winner of this year's Kentucky Derby, and Dancing Brave, winner of the English Derby in the UK, from breeding a champion, one Kentucky breeder of thoroughbred racehorses is turning to high technology. Both sires were recently purchased by Japanese organizations.

Using the Mathcad software package from MathSoft, Inc. in Cambridge, Mass., Foye Equine Genetic, Inc. is sorting through the massive amounts of genetic information required to create a thoroughbred that will hopefully one day wear the roses at the Kentucky Derby.

"Pedigree information on thoroughbreds goes back to the mid-17th century across 23 generations. The complexities of breeding are enormous," said company President David Foye.

Combating Japanese, Arab threat

According to Foye, who was responsible for breeding 1991 Kentucky Derby winner Strike the Gold and 1990 winner Turf Male Itsallgreektome, the increased interest of Japanese and Arab investors in thoroughbred racing is a threat that will require the racing industry to adopt better analysis tools.

"The Japanese in particular have a reputation for quality control. Today, most of the data on thoroughbreds is on-line, but it's underutilized or crudely used by U.S. breeders," Foye said.

Using Mathcad, Foye said he gets an easy-to-use statistical analysis tool that includes modeling and forecasting tools that allow him to forecast the effects of combining different gene pools.

But Foye said that while he is impressed with Mathcad, he will not know how effective it is until two or three years from now. "When I use it, I'm just flabbergasted. But it takes about three years to get a horse up and running," he said.

In the meantime, Foye said he does not expect computers to replace common horse sense anytime soon.

"You have to remember that an idiot with a computer is still an idiot; he can just do more damage," Foye said.

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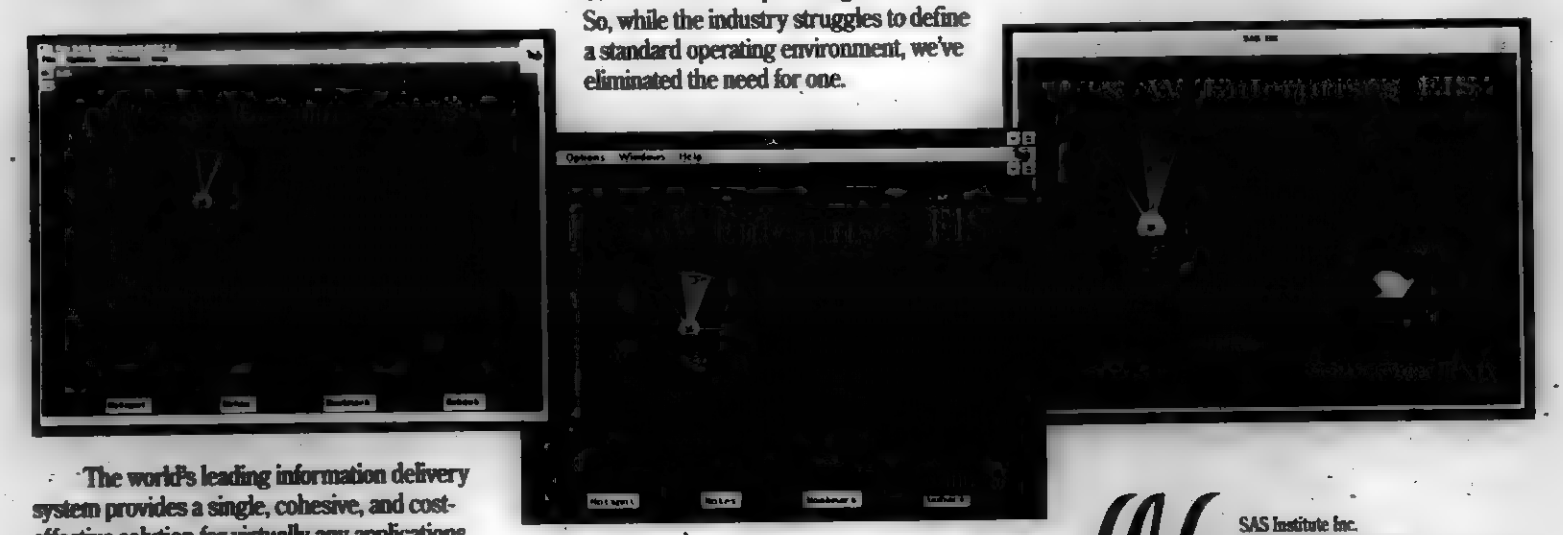

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Controlling remote software on Windows

By Christopher Lindquist

While remote-control packages for PCs have been around for years, the Windows versions have been something less than spectacular. Now Symantec Corp. has upped the ante with Norton PC Anywhere for Windows, an easy-to-use package that provides reliable remote control, file transfer and general communications functions under Windows.

PRODUCT test DRIVE

If your life, like mine, revolves around the PC you have at work, then there probably have been times when you needed a piece of information — a phone number, an address, a report — that was on the work PC. The only problem was that you were at home. Retrieving the information required getting into the car and driving to work.

Remote-control packages solved that problem for many people, allowing them to dial in and work on the remote machine as if it were on their local desktop. Such packages worked fine under DOS, but the Windows implementations were often unstable and slow.

PC Anywhere for Windows attempts to resolve the stability issue by functioning as a dedicated Windows package (instead of as an addition to the DOS version as it was previously).

The speed issue needs to be resolved in hardware. While PC Anywhere for Windows supports 2.4K bit/sec. modems, you will find yourself growing old waiting for the screen to repaint. The faster your modems, the better — with connection over a network being best of all.

Just like being there

The package allows remote users to run the host machine as if they were physically sitting at it. Everything is available to remote users, including the ability to blank the host screen and lock the host keyboard to prevent anyone else from using the machine while it is in session. Network users get the added benefit of a gateway that allows modem sharing on the host PC.

A Chat Window that allows users on both ends of a session to communicate could be a boon to support personnel. If a user is having a problem, the support technician could start a PC Anywhere session over the network or dial-up lines and walk the user through the problem without having to be there in person.

Security is handled via passwords for host system access as well as the ability to do call backs to the user's system. PC Anywhere for Windows can also be configured to disconnect users after a certain period of inactivity, reboot the system after a session or after a connection is lost or record the session for later playback. Sessions can also be logged to track use of the host system, including start/stop times and file transfers.

Easy retrieval

One of the biggest benefits of remote-control software addresses our first concern: getting at remote data. Moving files is extremely easy. PC Anywhere for Windows comes with a file manager that supports drag-and-drop file transfers between systems as well as the ability to delete files and create directories.

User beware

Some things to be careful about in PC Anywhere for Windows, as learned from a frustrating experience:

If you plan to exit Windows on the "host" system, be sure you have installed the resident DOS program that will allow you to retain control of the system. And if you set PCAnywhere to reboot the host after a session or lost connection, make sure Windows and PCAnywhere are configured to execute upon start-up. Failure to obey these rules can result in a trip to the office.

PC Anywhere for Windows also works as a quite functional communications program, allowing connections to electronic bulletin boards and other remote systems, file transfers using multiple protocols and support for a variety of terminal emulations.

The package comes on two disks with a pair of manuals: one is a user's manual and the other is dedicated to the extensive scripting language that allows entire sessions to be automated. Unfortunately, no form of script recording is included, so all scripts have to be entered manually, reducing the usefulness of the script language somewhat.

PC Anywhere for Windows is available now for a list price of $199 for a single-user license. Five-license LAN Complete Paks list for $599, and five-license LAN Host Paks, which allow only incoming calls, retail for $199.

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DOS utilities

CONTINUED FROM PAGE 41

party product. "DOS 6.0 utilities are OK for most people, but there's no way in the world they're going to get me to replace my own personal utilities," said Charlie Russell, system administrator for computer-integrated monitoring at New United Motors Manufacturing, Inc. in Fremont, Calif.

- DOS 6.0's antivirus features — an implementation of an antivirus package from Central Point Software, Inc. — are also coming under heavy fire. In the recently released "Inside MS-DOS 6.0," the authors put the operating system's antivirus features through its paces. The result: In a scan of 1,590 viruses, Microsoft's antivirus scanner detected only 1,009 — or about 63%. Of the 1,009 it detected, it could not remove 978.

"I think you can say that it's not the sort of hit rate most places would find adequate," said David Stang, director of research at Washington, D.C.-based International Computer Security Association and co-conductor of the virus study.

A scan of several on-line forums showed users lambasting the scanner for being too slow and for having a clumsy interface. To make matters worse, Microsoft promises upgrades via its electronic bulletin board, but it does not promise they will be free.

DOS 6.0 utilities provide basic functions to people who may have had none in the past, one user said. "At least it gives people a little virus protection and a little backup," said Paul Ligeski, a programmer at Ann Arbor, Mich.-based Medstat Systems, which organizes the medical benefits programs of Fortune 200 companies.

Microsoft officials said they do not expect DOS 6.0 utility features to be all things to all people. "They are not designed to blow third-party products out of the water," said Brad Chase, general manager of MS-DOS. "They are there to give utilities to users who perhaps never owned utilities before."

Chase acknowledged that many third-party backup and antivirus products "have feature sets much stronger than DOS 6.0." He would say the same, however, for DOS 6.0's DoubleSpace compression feature, which he said is an integral part of the operating system.

How can IBM's OS/2 counter NT?

■ In a recent Computerworld phone poll, we asked readers to comment on what they feel IBM should do with OS/2 to counter interest in Microsoft Corp.'s Windows NT. Here's what they advised:

▶ IBM's OS/2 is suffering from a lack of interest because of its lack of accessibility.

"IBM should give away OS/2 in much the same way Microsoft gave Windows away," said Mark Chauvin at Tulane University Medical Center.

"IBM needs to flood the market, get it preinstalled on every system that can take it," added Steve Mathesius at Kaiser Implement.

▶ Callers also commented on OS/2's pricing structure.

"IBM needs to lower the price across the board. $249 is not reasonable for a first-time computer buyer, and a $99 upgrade will not attract many DOS and Windows users," Mathesius said.

▶ Because IBM does not provide evaluation copies to non-IBM resellers, Steve Aikens at PC Solutions in Clovis, N.M., said he will not recommend any operating systems to his clients that he has not fully tested himself. He also refuses to pay even dealer wholesale prices.

▶ Some OS/2 loyalists said IBM needs to educate users on the advantages of OS/2 over Windows NT.

"OS/2 is a workstation environment, and NT is too bloated to even be considered one," said George Norby at Mercury Blueprint and Supply, Inc. in Las Vegas.

Another caller added that IBM should point out that OS/2 needs only 6M to 8M bytes of random-access memory and 20M bytes of disk space compared with NT's minimum of 12M bytes of RAM and 70M bytes of disk space.

▶ Susan Ackerman, president of Strategic Marketing and Research in Philadelphia, said IBM has to get more developers to write application software for OS/2.

▶ "Push very inexpensive programming languages to increase developer interest," added self-employed programmer Bob Kottas.

"Make sure all third-party developers are advertising," said Dan Marshall at New Century Associates.

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Alpha Software makes play for DOS users

By Michael Vizard
BOSTON

Looking to spark interest in database application development under DOS, executives at Alpha Software Corp. in Burlington, Mass., last week unwrapped Alpha Four 3.0 and called for a more realistic outlook concerning PC database platforms.

"There's no question that Windows is the future. But the real world still lives in DOS," said Selwyn Rabins, Alpha Software co-chairman.

Alpha Software, which claims to have a half-million users of its database, is making a commitment to DOS at a time when rival vendors are heavily touting their Windows offerings. Lotus Development Corp. has acquired Approach Software Corp. in Redwood City, Calif., while Microsoft Corp. and Borland International, Inc. have been pushing their respective Windows database products for the past year.

Rabins said that while his company has a Windows database project under way, most sites are not yet ready to absorb the incremental hardware costs needed to run Windows.

He claimed that it takes an Intel Corp. 1486-based PC with 8M bytes of memory to effectively run a Windows database. Yet most customers are just beginning to install 486 systems, with the majority of their systems being 386-class PCs.

As a result, Rabins said, programmers are discovering that while they can create applications on a 486, those applications cannot run on the existing installed base of PCs.

Richard Rosen, president of Rosebud Consulting, Inc. in Saugerties, N.Y., said his firm adopted Alpha Four because most of his customers do not want Windows systems yet and do not have the PC hardware to run Windows applications.

Rosen said his latest project consists of an order-entry application for a chain of liquor stores in New Jersey.

"I originally wrote the application in Microsoft's Access, but they didn't like the mouse. They wanted something that looked like what they were used to seeing on paper," Rosen said. The latest version of Alpha's relational database was introduced at the Database World exposition held here.

It features the ability to enter data in multiple database files from a single screen, real-time posting of data to external database files, automatic referential integrity, cascading and conditional look-up tables and the ability to design screens with scrolling windows that display data from linked databases. Priced at $495, Alpha Four is now shipping.

Source: Forrester Research, Inc., Cambridge, Mass.

Briefs

Simple expands memory cards

Simple Technologies, Inc., a memory card maker in Santa Ana, Calif., expanded its line of memory upgrade cards, coming out with 4M-, 8M- and 16M-byte cards for the Versa notebook from NEC Technologies, Inc. Pricing is $295 for the 4M-byte card, $495 for the 8M-byte card and $1,395 for the 16M-byte card.

VideoLogic unveils graphics products

VideoLogic, Inc. in Cambridge, Mass., recently announced several graphics products. It introduced Captivator, a video capture card for PCs. Captivator will ship at the end of this month and will be bundled with Microsoft Corp.'s Video for Windows and Macromedia, Inc.'s Action. Suggested retail price is $399 with the software, $349 without it. VideoLogic also introduced Mediator LC, which lets users transfer PC graphics to VCRs or TVs. Mediator LC was codeveloped with IBM and will have both companies' logos. Shipping now, it costs $599.

New Epson subnotebook

Epson America, Inc. introduced its ActionNote 4000 subnotebook, a 3.85-pound box based on the 486SLC/33 chip from Cyrix Corp. The subnotebook comes with an 80M- or 120M-byte hard drive and will ship in July at a price to be determined.

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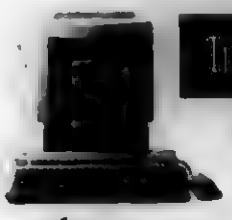

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ThinkPad plan

CONTINUED FROM PAGE 41

the advisory council panned the idea. IBM went back and is now redesigning the part, which is due out in the third quarter. The advisory council "has made a huge difference," said Bruce Claflin, general manager of mobile computing at IBM.

IBM's ability to react to suggestions has earned it the No. 5 spot in the notebook market for 1992, according to International Data Corp. numbers, and the company has a 7% share of the notebook market worldwide.

The current ThinkPad line consists of the new notebooks plus the 720 and 700 (monochrome and color versions of each) and the ThinkPad 710T pen tablet. The 300 notebook, manufactured by Zenith Data Systems, has been withdrawn. The line, particularly the 700C and the 720C, represents the new IBM PC Co. at its best, building products with innovative technology that come to market in a timely fashion.

The ThinkPad 700C, for instance, offered the biggest display of any active-matrix color notebook and hit the market just as users began to buy color notebooks in droves. IBM followed sixth months later with the 720, which included a faster processor and support for Personal Computer Memory Card International Association (PCMCIA) cards. Of the new products, the subnotebook market has barely begun developing, and IBM added local bus video to the 350 notebook, something most vendors have yet to do.

Turning heads

All this product activity has analysts raising eyebrows.

"We're not five years into the market yet; what is IBM doing coming out with a product? They're so much more aggressive with the ThinkPads," said Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

IBM officials conceded their tardiness.

"We were very late in portables, and we want to get ahead of the curve," Claflin said. He said this was why IBM came out with the subnotebook before the market solidified and put PCMCIA, still an emerging standard, into its products.

Backlog problems

But ThinkPad also shows the IBM PC Co. at its worst: waterlogged with demand. IBM PC Co.'s supply problems are not limited to ThinkPad — users said the low-priced ValuePoint PCs are harder to get — but at one point this year IBM had a $1 billion backlog on the product. While users such as Nelson said "things have opened up a bit, especially with the ThinkPads," the backlog remains.

Seybold said he thinks the 350 may ease IBM's back-order slate for its current ThinkPads by "spreading buyers among several different products."

While the market has reacted in frenzied fashion to the ThinkPad products, analysts said IBM still has a lot of room for improvement.

They point out that the ThinkPad 700 and 720 are bulky products that weigh more than many notebook-type devices. IBM said it is addressing these issues in part with the new 350 and 500 and that it will continue to expand the ThinkPad family.

"We want to be the undisputed leader in the mobile market," Claflin said. "Our first ThinkPads were focused on the high end, and these new products are to compete in the volume end of the market."

Claflin said that while IBM was late to market, "this area of the market is still wide open. We do not yet sleep soundly at night, but we are beginning to feel pretty good [about our position]."

[redacted]

Product shorts

Great Plains Software has released Version 7.0 of Great Plains Accounting, offering 91 accounting features and 106 features that affect all 16 core modules. Cost: $295 to $1,295. Great Plains Software, Fargo, N.D. (701) 281-0550.... **PenMetrics, Inc.** has released FieldNotes, a geographic information system for pen, laptop and notebook computers that use Windows Pen Computing. An enhanced geocoding capability comes with the product. Cost: $895. PenMetrics, Corvallis, Ore. (503) 757-3076.

Microsoft Corp. has announced Microsoft Mouse Version 2.0 with hardware and software enhancements and a new design geared for both right- and left-handed users. Cost: $109 for the Serial Mouse and Mouse Port versions. Microsoft, Redmond, Wash. (206) 882-8080.... **Clarion Software Corp.** is shipping the Clarion Database Developer Version 3.0, an upgrade to the Clarion Professional Developer 2.1, its database and application development tool for MS-DOS microcomputers. Cost: $995. Clarion Software, Pompano Beach, Fla. (305) 785-4555.

User Solutions has announced the Spreadsheet Scheduler, a set of template programs that are compatible with all popular spreadsheets. Cost: $199. User Solutions, South Lyon, Mich. (313) 498-1934.

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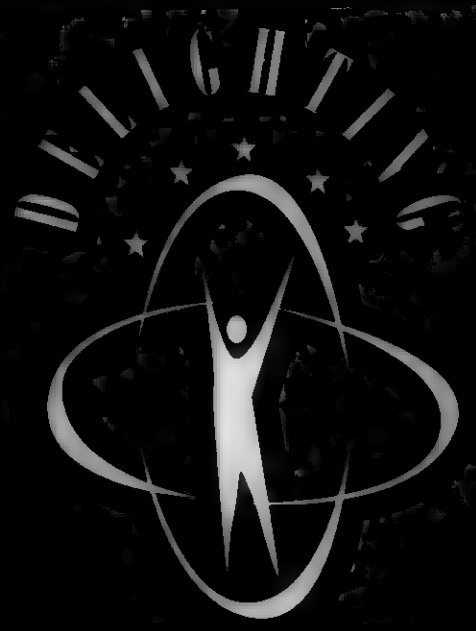

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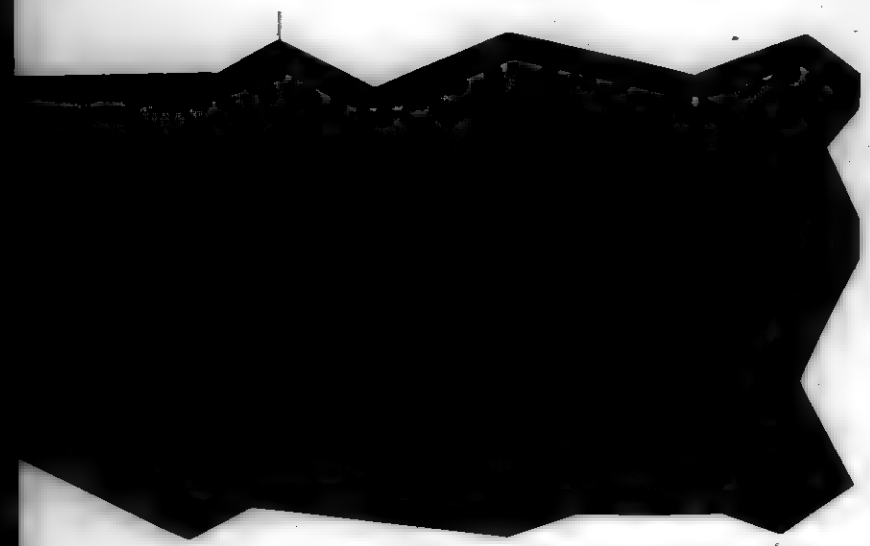

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GA-1304

Mac/Unix marriage takes off

By Jean S. Bozman

For the last several years, Macintoshes and Unix workstations have sat side by side on engineers' desks. In many cases, their use was driven by application alone: People used the Macintoshes for word processing and spreadsheets and the Unix workstations for designs in two and three dimensions.

Now, this separate but cordial coexistence seems about to change. By early 1994, both IBM and Apple Computer, Inc. will have shipped the PowerPC, a powerful reduced instruction set computing (RISC) architecture capable of running both the Macintosh operating system and Unix operating systems such as IBM's AIX. More immediately, new software interfaces that allow Unix workstations to host selected Macintosh applications under a Unix interface are starting to ship from Quorum Software Systems, Inc. in Menlo Park, Calif., and Sun Microsystems, Inc.

These technologies will soon allow users to run Macintosh and Unix applications on one machine — not two. And as the lines between Unix and the Macintosh become blurred, the prices of Macintosh and Unix workstations are expected to dip as powerful PCs challenge $5,000-plus Unix workstations.

As a result, users may get to dictate terms on their desktop machines. "I think what's happening is that people won't make a distinction if it's a Mac box or a Unix box or a PC box," said James Yip, a manager of technical services at Ernst & Young Canada in Toronto. "All they'll really care is that it runs the application they're used to."

Several ways to run Macintosh applications on Unix platforms

- Buy Macintosh interface software for your Unix workstation.
- Use Macintosh emulators on your Unix machine. This may slow performance.
- Wait for the Apple/IBM PowerPC to arrive in early 1994. The PowerPC will be able to host Macintosh applications on a RISC machine under the Macintosh operating system.
- Buy Apple's own A/UX version of the Unix operating system.

Yip said many of the 3,000 Macintoshes in his organization may turn into PowerPCs, starting next year.

In addition to running the Macintosh operating system, the Apple/IBM/Motorola, Inc. PowerPC will be able to run Macintosh binary code on a Unix/RISC platform, said Nina Lytton, president of Open Systems Advisors, Inc. in Boston. That will give it an innate performance edge over emulation technology that runs Macintosh code on top of a Unix operating system.

Lytton said that is important because some elements of the Macintosh interface simply will not appear when Macintosh applications run under a Unix software interface. Among them: the Macintosh finder, the trash can for deleting files and Macintosh-specific multimedia applications. Those will have to be ported to the PowerPC, Lytton said.

Mac-compatible

Earlier this month, Quorum Software Systems said it was shipping a Macintosh-compatible layer of middleware that hosts Macintosh applications on Sun and Silicon Graphics, Inc. workstations. And Sun announced this spring that it would market another Macintosh-compatible solution.

By July, Echo Logic, Inc. in Holmdel, N.J., will sell its FlashPort binary-to-binary translator to independent software vendors porting their Macintosh programs to PowerPC, she said. Apple has said it will port its Macintosh toolbox to Unix.

Meanwhile, some users at large Macintosh and Unix sites said they can wait for the PowerPC.

"Apple will be selling their operating system, and the hardware is becoming a commodity," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. At Lockheed, many Unix users turn to Macintoshes to access corporate electronic mail or to create documents shared with other departments.

Neither interfaces nor emulators will have the same impact as the PowerPC, Bailey said. Its shipment will trigger a wave of Macintosh-on-Unix ports, he predicted.

FEMA disaster recovery system goes high-tech

By Michele Dostert

In the aftermath of Hurricane Andrew, federal management agencies were roundly criticized for responding too slowly to the crisis. Emergency workers reported spending five hours traveling to and from a site, then having their reports delayed another five hours by overloaded fax machines in Washington, D.C. On top of that, agencies found their computers and applications could not talk to one another, causing a huge backlog of unprocessed data.

The Army Corps of Engineers Emergency Management Division hopes to do better next time. Early this month, the Federal Emergency Management Agency (FEMA) sponsored its annual week-long simulated disaster drill, predicated on an imaginary earthquake of 7.5 on the Richter scale hitting a city at 7:30 Monday morning. During the drill, the Army Corps of Engineers tested a new disaster management information system using notebook computers, Notes-based applications and microwave/satellite data hookups to provide instant communication between relief workers and support offices.

"To expedite damage assessment and relief supplies and personnel, we have to have immediate two-way communications between field workers and support personnel even though the communications infrastructure is gone," said Mark Verke, chief of the Army Corps' Emergency Management Division.

Well-equipped

The first line of response in the new system is disaster workers equipped with notebook computers and digitized video and still cameras. In the simulated disaster, pictures, voice and data were sent via cable or wireless link to recreational vehicles (RV) equipped with power generators, PCs and videoconferencing systems from PictureTel Corp. in Danvers, Mass.

The voice, data and pictures were compressed and sent, via two-way AirLink wireless modems from CyLink Corp. in Sunnyvale, Calif., to a mountaintop earth station set up by CyLink. The data then traveled to local offices and, via satellite, to remote offices nationwide.

"We were trying for a wireless radius of 30 miles, but with the relay station boosting the signal, we got video from miles away," said Tom Ruff, government services manager at PictureTel.

As the RVs traveled from collapsing dam to crumbling highway overpass to flattened airport, emergency officials saw real-time pictures of the structures and could communicate with camera operators. "All of the microwave radio and satellite links worked perfectly," Verke said, "which was a good thing because the cellular modems we had planned to use for backups wouldn't work at all."

Disaster relief workers *take part in a simulated earthquake*

The Army Corps of Engineers also tested new disaster applications and computer networks. All of the notebook and desktop PCs in the RVs were equipped with tailor-made Notes applications with customized icons for things such as power, telephone, fires, water and collapsed buildings. Data was sent first to a local PC server running OS/2 and then mirrored to servers in Sacramento, Calif., and Washington, D.C., providing redundant information storage.

"Via our servers, we could instantly access detailed maps stored on government computers in Hanover, N.H., [and] use the [Windows] paint box to annotate them with locations of fires, relief hospitals and the like and then store them on our server. Whoever next called them up would have accurate, up-to-date information immediately," Verke said.

Participants in the drill, while not committing themselves to the Army Corps of Engineers' new system, were impressed by it. "If everyone had been on this system during [Hurricane] Andrew, we could have provided relief 20 times faster, better and cheaper," said one FEMA official who asked not to be identified.

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Cardiac monitors speed data delivery, diagnosis

By Nell Margolis
OMAHA

Putting a whole new spin on the term "Heartland," an ultrasound cardiography system is just now sprinting beyond beta-test status at the University of Nebraska Medical Center. It gives doctors at the center's cardiology unit a real-time look at what is going on in the heart of a remotely located patient, said cardiology engineering project manager Alan Michels.

The recently launched cardiography system, the latest in a barrage of information systems-enabled health care from the university, weds Hewlett-Packard Co.-engineered diagnostic scanner technology to an analysis workstation tailored to the health care field. The workstation was designed by Freeland Systems, Inc. in Broomfield, Calif.

Digital data is transported instantaneously across US West's Switchnet 56 lines, allowing physicians at the university to transmit data at 56K bit/sec., Michels said. What is more, he said, the doctors use a dial-up service provided by US West rather than leased lines — a per-use rather than package deal that keeps costs down for the medical center's rural hospital affiliates.

For patients who need to see a cardiologist, this is no small step, Michels said.

"Many of the rural hospitals or health centers have scanners," he noted, but "few have the specialty expertise" to interpret the data and quickly act in the patient's best interest.

Through the ultrasound system — a wholly noninvasive device that is simply stuck onto the patient's chest — a cardiologist can get an on-line look at "what's beating in the heart and what's not," according to Michels.

Even more important, specialists can spot in seconds signs of a heart attack in progress. Moreover, the consulting specialist's advice, relayed in seconds to the remote location across the medical center's network, can stop the heart attack before it hits.

This critical capacity joins a long list of IS-enabled health care initiatives afoot at the university medical center, all of which were among the most hotly talked about items at the 2nd Annual National Medical Information Networking Conference held here earlier this month.

Others include the following:

- Launched in 1991 to serve regional physicians, the Synapse health information network connects and offers a broad range of health data access to some 400 doctors, nurses, medical students and pharmacists at 150 sites in 60 cities across Nebraska and Iowa, according to Synapse coordinator Robin Meter.
- The Synapse electronic-mail system taps into a statewide system, giving its users access to some 4,000 individuals in all levels of state government. Last week marked the successful end of an approximately two-month-long project to convert Synapse E-mail from IBM's Professional Office System to OfficeVision.
- An aggressive telecommunications initiative also kicked off in 1991 has resulted in a spate of applications, including the ultrasound addition, a bedside monitoring system and a digital recorder that monitors heart waves of patients while they are at home going about their normal activities.

The crux of the center

Meter said the center relies on a frame-relay network that encircles Nebraska. The network, Meter said, is the fruit of the labors of a state-facilitated consortium of both state and private health providers designed to wire Nebraska.

Such a network makes sense in the sprawling state, where "it makes sense to start thinking in terms of transporting information rather than patients," Michels said.

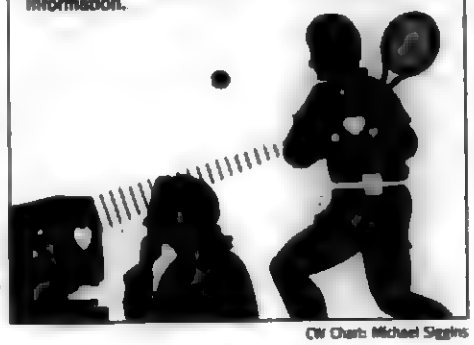
But the medical center is also prodded by the as-yet unknown mandates of the Clinton administration's federal health care plan, the first pass of which is due out within the next several weeks. For instance, the center is negotiating with Seattle-based Phamis Corp. to co-develop an electronic medical record system, said Jim Bahansky, associate director of computing services at the center.

The center's criteria for the new system, Bahansky said, include "tying both in-patient and out-patient records into the same database and creating flexible tools that will let us introduce new technology as it emerges."

The center also wants the system to provide an engine for building rules-based expert systems that could pitch in on matters such as managed care accounting, quality assurance on the clinical and pharmaceutical side and teaching, Bahansky said.

Heart-to-heart monitor

The University of Nebraska Medical Center's digital Holter recorder monitors heart waves of patients as they pursue activities. The patients wear electrodes on their chests and a belt-based recorder. A remotely located cardiac specialist (often hundreds of miles away) catches the waves in real time, 24 hours a day; previously, it took doctors two to six days to receive and process the information.



CW Chart: Michael Siggins

Monthly savings

Cardiac monitors tied into the University of Nebraska Medical Center's cardiac monitoring station can monitor up to 64 beds simultaneously, said engineering project manager Alan Michels. This lets the center's specialists be at its 108 monitored bedsides with the aid of two monitors and one PC. In prestation days, he said, it would have taken 25 monitors and five technicians to do the job. Net savings to the hospital: 80% of the equipment cost and 80% of the technician cost.

Franco Vitaliano

Why not NOS?

To NOS-or nosh? Do you take one quick trip to the centralized systems supermarket or meander through scattered files and services? Like an individual's appetite, the answer is a matter of organizational taste and user lifestyle.

Network operating system-based systems such as Novell's NetWare, which grew up in the limited world of MS-DOS PCs, served valuable roles. They provided fast PC file services and imposed minimal MS-DOS memory requirements for running NetWare client drivers.

In addition to centralized file/print services, the network operating system can take responsibility for handling communications between diverse clients such as Macintoshes, MS-DOS and Unix.

In contrast to PC users, folks growing up in the distributed Unix workstation world always had megabytes of memory to play with, 32-bit operating systems, built-in TCP/IP and the rest of the network goodies, such as Network File System (NFS).

NFS allows users across heterogeneous systems to access a file anywhere on a LAN without having to know on which machine that file may reside. NFS is now licensed and marketed by almost 300 vendors. NFS implementations exist for MS-DOS, multiple Unix flavors and DEC's VMS.

But the NFS drivers and their associated TCP/IP stack will cost your PC between 150K and 200K bytes of RAM. Memory managers can squirrel away this stuff, and many of the PC NFS vendors are smart enough to automatically load their drivers into high or expanded memory, but there is no free lunch in the PC world.

If you want the flexibility for every machine to act as either server or client, need full distributed connectivity and desire a flattened organizational structure, then TCP/IP and NFS are right for you. But if your shop has mostly PCs, has a very hierarchical world view and serves users who require only occasional access to Unix (and vice versa), then NFS running on NetWare 3.X or 4.0 or NetWare for Unix makes more sense.

Static equation

Of course, the advent of a more robust Windows, Windows NT, OS/2, Novell UnixWare, cheap processors and gobs of RAM will shortly rework the entire PC equation. NFS and TCP/IP can easily play in these new environments.

Moreover, the notion of loading up a single centralized server with everything is about to be rendered obsolete by the advent of distributed objects. With distributed objects, you should be able to easily plug in and snap out specialized network services such as fast file systems. Vendors will then be able to concentrate on producing the fastest and most efficient servers.

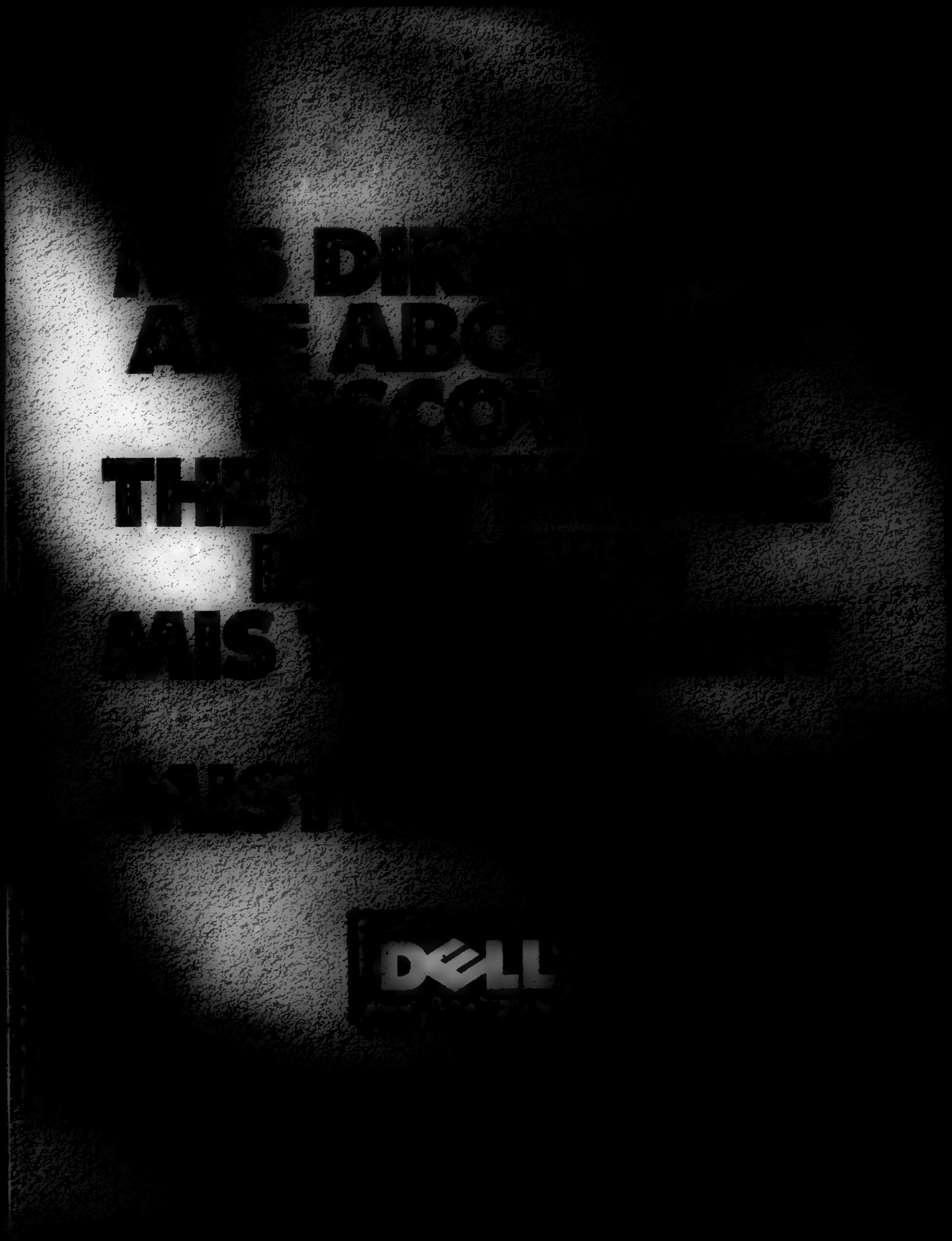
And organizations will be able to seek out the best cost/performance distributed object module in any particular service category.

New systems such as Santa Clara, Calif.-based Network Appliance Corp.'s FAServer for NFS clearly mark this upcoming network sea change. The 486 FAServer strips out much of the Unix operating system overhead, and its lean code does speedy reads and writes out to its several gigabyte RAID subsystem. This box delivers the goods for approximately $20,000.

It is a short conceptual jump to envision a network object wrapper being placed around the FAServer. You could then plug and unplug it from various types of networks at will. With more specialized "appliances" like this and distributed object services, these new systems will soon mitigate against buying a centralized, overburdened network operating system.

Bottom line: In about two years, NetWare and its ilk will reach a historical crossroads. The big, overburdened network operating system server may go the way of the mainframe.

Vitaliano is a Boston-based writer specializing in distributed computing issues. He can be reached by MCI Mail at VITALIANO.


DELL

Pathworks to get license management

By Craig Stedman
ATLANTA

Digital Equipment Corp. is building mandatory software license management capabilities into new versions of its Pathworks local-area network software but has not yet figured out a method for migrating users who are unsure about the extent of their existing licenses.

Earlier Pathworks versions did not include any license-checking features, making it difficult for both DEC and its customers to keep track of how many licenses were being used within networks. Pinpointing PCs that hold valid licenses has also been unwieldy, according to DEC and users alike.

DEC is adding its License Management Facility (LMF) to Pathworks in part to ensure that it gets paid appropriately for licenses, a common concern among software vendors.

Users were somewhat sympathetic but reacted warily to word that they would have to implement the license management capabilities.

Unknown quantity

"At this point, we have no idea how many Pathworks licenses we own," said Maurice Daniels, network administrator at the Manitoba division of Inco Ltd., a Sudbury, Ontario, nickel mining and smelting company. "We asked DEC, and they don't know. It's a very annoying thing."

"Even if they came in here and audited me, how are they going to know?" asked another Pathworks user, who requested anonymity.

Finding a way to move users to the upcoming Pathworks releases with DEC's LMF "is a fun question that's been consuming a lot of our time the last few months," said John Gorczyca, product manager of the version of Pathworks based on Novell, Inc.'s NetWare.

"I don't have anything specific to tell you today, but I can tell you there will be a solution," he said at the Digital Equipment Computer Users Society spring conference here.

LMF will be included in the NetWare-based Pathworks, which Gorczyca said should finally ship this summer, and Pathworks 5.0, a version built around Microsoft Corp.'s LAN Manager technology that is being promised for shipment by year's end.

"I'm not thrilled because license management is a pain," said Steve Ruger, MIS manager at Smith Industries Ltd.'s aerospace operation in Malvern, Pa. "It's more time shuffling papers and keeping track of numbers, and it doesn't add to the functionality of our system. It's just there mainly for DEC's convenience."

For the first time with the new Pathworks releases, DEC also plans to offer concurrent-use server licenses similar to the NetWare licensing model. However, PCs licensed through a server would have access only to basic file and print services and could not use any other Pathworks client applications.

Continuing with individual client licenses would also be more cost-effective for PCs that need to access multiple servers, said Laura Spear, Pathworks 5.0's marketing manager. The server version could be accessed by up to 256 PCs at a time, with no limit on the number that could be supported altogether.

Adobe plans Acrobat OCR font technology

By Michael Vizard
NEW YORK

Adobe Systems, Inc. in Mountain View, Calif., last week said it intends to deliver within the next year optical character recognition technology that will allow users to scan documents into an electronic format that is compatible with the Portable Document Format (PDF) in its Acrobat font technology.

Unveiled here last week, Acrobat was designed to allow users to read and annotate documents created using Postscript files regardless of whether the document was originally created on a Windows, Macintosh, Unix or DOS platform [CW, June 14].

To take that metaphor one step further, Adobe Chief Executive Officer John Warnock said his company's next mission will be to bring all the legacy documents currently stored on paper into electronic document systems. That effort will be based on technology Adobe acquired last year when it purchased OCR Systems, Inc.

In addition, he said, Adobe will shortly add support for device-independent color to PDF, and it plans to give users of its Illustrator software the ability to edit PDF files directly.

"The lack of device-independent color is a short-term phenomenon," Warnock said.

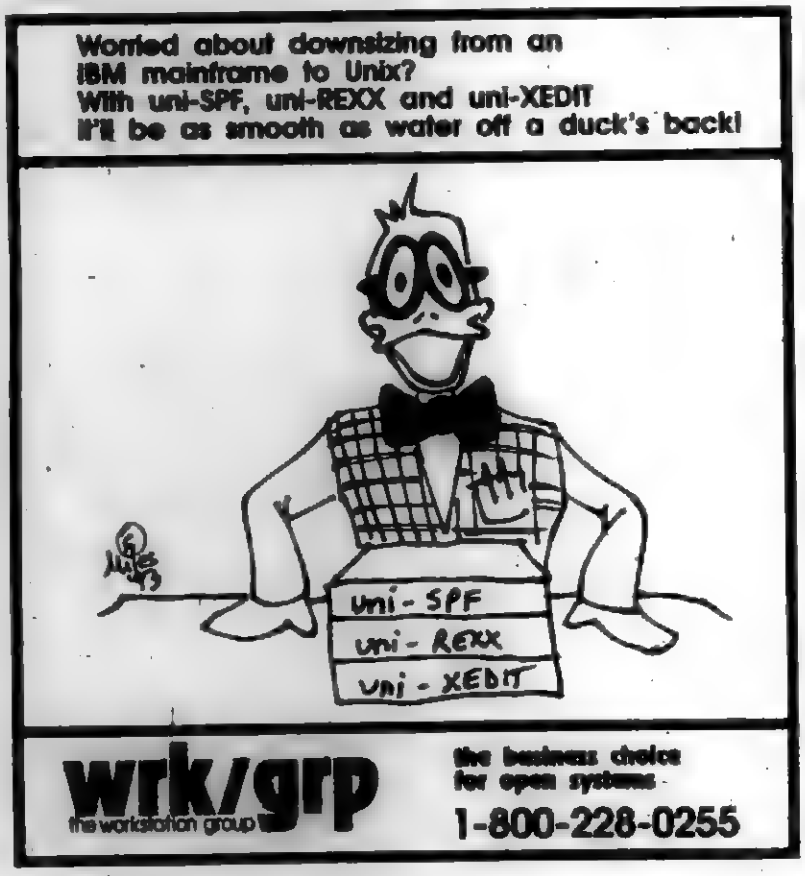
Pricing for Acrobat Reader, which allows users to read a PDF document, is $40 per copy in 100-pack units. Pricing for Acrobat Exchange, which allows users to read and annotate documents, is $146 per copy for 100-pack units. Acrobat Distiller, which converts a Postscript file to PDF, is $695.

Acrobat, which has been beta-tested at more than 400 sites, is currently available on Windows and Macintosh platforms. Support for DOS and Unix is scheduled for later this year.

In the same time frame, Adobe also plans to deliver full-text search capabilities. A translation utility for linking PDF files to documents created using the Standardized General Markup Language is planned for the first half of 1994.

Supporting cast

Vendors endorsing Acrobat include AlphaGraphics, Inc., Business Link, Datawave Technologies, Elixir Technologies, Knight-Ridder/Trans-Link, Eastman Kodak Co., Lotus Development Corp., Multex Systems, R. R. Donnelley & Sons Co., Tech Data Corp. and Ventura Software, Inc.



In Brief

Netpower debuts

Former **Mips Technologies, Inc.** Chairman Robert Miller's start-up company became official last month when **Netpower, Inc.** held its "coming out" above the din at Comdex/Spring '93. As expected, the workstation company said it will start shipping Mips-based boxes running **Microsoft Corp.**'s Windows NT in the fall [CW, May 17].

RAID for PC LANs

Hewlett-Packard Co. has announced its first fault-tolerant redundant arrays of inexpensive disks (RAID) product for the PC-based local-area network market. The array features an Extended Industry Standard Architecture-based interface, 4M bytes of on-board cache, Small Computer Systems Interface-2 performance and variable RAID support. Pricing starts at $8,849. The HP Disk Array supports servers from multiple vendors, including Compaq Computer Corp., AST Research, Inc. and Dell Computer Corp., and it is compatible with Novell, Inc.'s NetWare, The Santa Cruz Operation's SCO Unix, OS/2 and MS-DOS. Support for Windows NT is planned.

Informix ports to Apple

Informix Software, Inc. said it will port Informix-OnLine, Informix-SE, Informix-4GL and other relational database tools to **Apple Computer, Inc.**'s Workgroup Server 95 system. Informix products running on Apple's A/UX Unix operating system are due out late this year, an Informix spokesman said.

Lotus ups training

Lotus Development Corp. has launched Lotus Authorized Education Centers, a network of third-party companies that will provide Notes and CC:Mail training.

Embarc adds MCI Mail

In the latest in a series of interconnection agreements, **Motorola, Inc.**'s Embarc has been connected to MCI Mail, **MCI** and Motorola announced last week. With the connection, Embarc subscribers can receive MCI Mail messages in some 220 U.S. and Canadian cities. In late May, Embarc signed a similar pact with **WorldLinx Telecommunications, Inc.**, the provider of Canada's largest public electronic-mail service.

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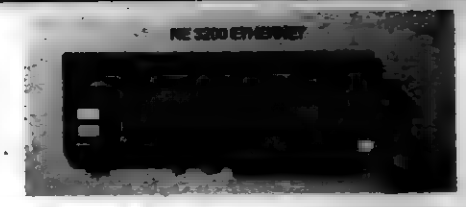

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LAN software

Object Design, Inc. has released the Object Design NetWare Loadable Module (NLM) Server, an object-oriented database for Novell, Inc. NetWare networks.

According to the company, the product was designed to simplify the development of new classes of distributed applications. NetWare users can develop applications that distribute and manage data, providing access to advanced services for imaging, multimedia, document management and groupware.

The ObjectStore NLM Server is accessible through an assortment of networking protocols, including native IPX/SPX and Transmission Control Protocol/Internet Protocol.

A developer license costs $7,500, and an end-user runtime license costs $2,250.

▶ *Object Design*
1 New England Executive Park
Burlington, Mass. 01803
(617) 270-9797

The Enterprise Systems Division of Apple Computer, Inc. has announced full support of Transmission Control Protocol/Internet Protocol (TCP/IP) for its Data Access Language (DAL) server software products.

According to the company, TCP/IP users can now access data on any Apple DAL-supported server from a DOS/Windows client or a Macintosh.

The DAL Server for MVS TCP/IP was also announced. Through TCP/IP, this software product enables Windows and Macintosh PCs with DAL client software access to IBM's DB2 relational database manager.

Prices for the DAL Server for MVS TCP/IP range from $35,000 to $50,000, $6,000 to $12,000 for the DAL Server for VAX/VMS and $4,250 to $20,000 for the DAL Server for Application System/400.

▶ *Apple Computer*
20525 Mariani Ave.
Cupertino, Calif. 95014
(408) 996-1010

Cheyenne Software, Inc. has released Arcserve 5.0 for NetWare-Windows Edition.

Arcserve 5.0 is client/server backup and recovery software for single-server or large multiserver Novell, Inc. NetWare enterprises.

Enhancements include a "point and click" Windows interface plus an improved one-step backup command called Quick Start. Tape cascading, parallel streaming and stacker and changer support are other features incorporated into the product.

Pricing begins at $395.

▶ *Cheyenne Software*
3 Expressway Plaza
Roslyn Heights, N.Y. 11577
(516) 484-5110

Workgroup software applications

NCR Corp. has introduced ProcessIt, a set of process management software.

ProcessIt was created to assist users to design, implement, execute and manage mission-critical business processes, the company reported. To manage work flow throughout the enterprise, ProcessIt provides a suite of Windows-based tools.

An advanced database-oriented workflow engine is employed to automatically route work based on a company's policies and procedures. ProcessIt uses graphical user interface-based tools to implement, measure and alter processes without affecting work in progress of existing applications, the company said.

A typical 30-user configuration of ProcessIt costs about $1,245 per user.

▶ *NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
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*Manufacturer's suggested retail price is $425.

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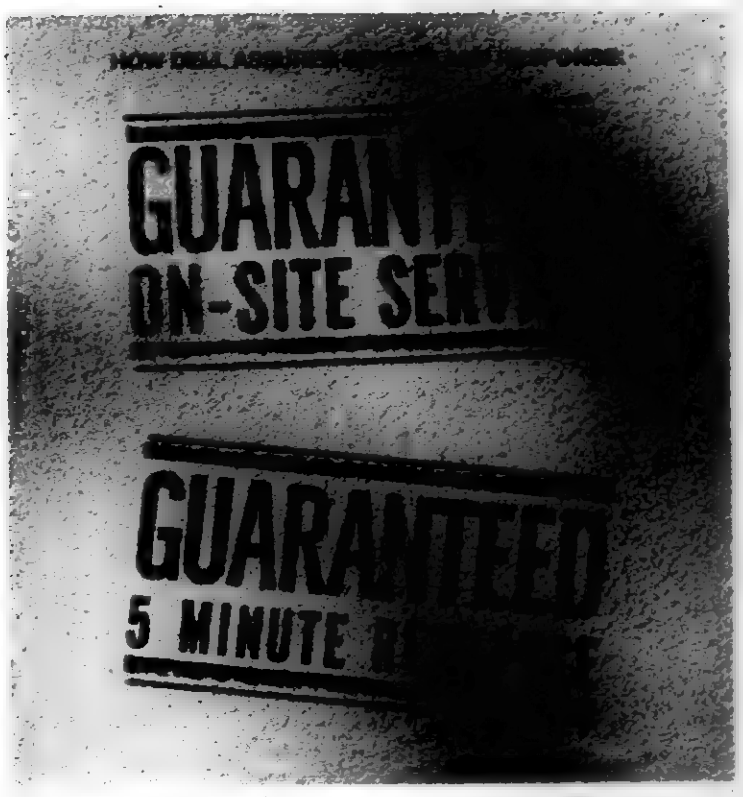

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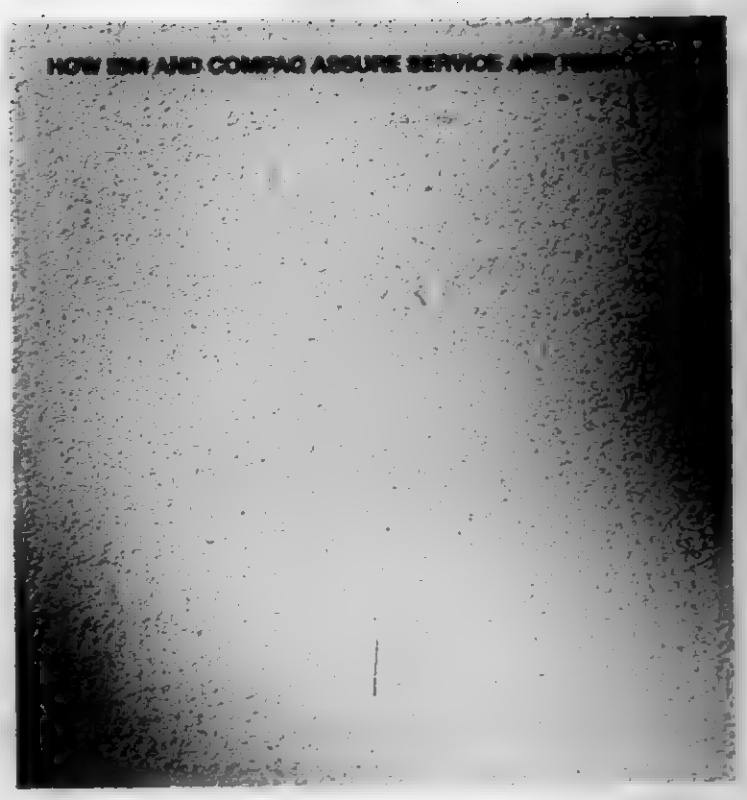

As any MIS Director will attest to, it's not hard to get "assurances" from a computer company. But what's to keep those assurances from vanishing into thin air?

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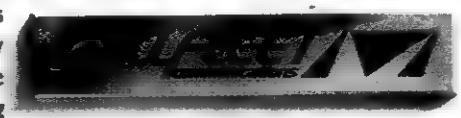

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Elisabeth Horwitt

Middleware needs PR

What do you do if you think you've got a really nifty product — something that will solve a lot of the stubborn, sticky problems associated with multivendor distributed computing — but you can't explain to your potential customers what's so great about it?

That's the problem facing the message-oriented middleware (MOM) consortium, a seven-vendor body that includes feisty little companies such as PeerLogic, Horizon Strategies and Covia, as well as the more august IBM and DEC.

What it is

Middleware can be loosely defined as software that helps distributed applications communicate across dissimilar computing and networking environments. Many such products consist of gateway software that translates between, say, SNA and TCP/IP or OS/2 and Unix, plus underlying housekeeping services such as error correction, acknowledgments and transaction logging. Running over all these are APIs that ideally enable developers to write one set of applications that work across many environments.

MOM, unlike its remote procedure call (RPC)-based cousins, installs a message queue at each system. This means that system A can go ahead and send a request for data or the results of a job to system B without setting up a session first. If system B is otherwise occupied, the message waits in B's queue until B is ready. If system B or the network happens to be down, the message waits in A's queue until it can be sent.

As a result, analysts say, MOM is great for interconnecting across the enterprise multiple systems that need to communicate once in a while over telecom links that may occasionally go down. RPC-based middleware works well

Horwitt, *page 64*

Users leery of SNA internet

By Elisabeth Horwitt
NEW YORK

Information systems managers who went to a "New SNA" conference recently in search of tips, strategies and products to help them migrate to local-area network internetwork backbones came away frustrated by vendors' conflicting, proprietary product strategies.

Randall Murphy, an IS manager at the Lake County government offices in Waukegan, Ill., spoke for many when he called the decision process for Systems Network Architecture/LAN internetworking a mine field.

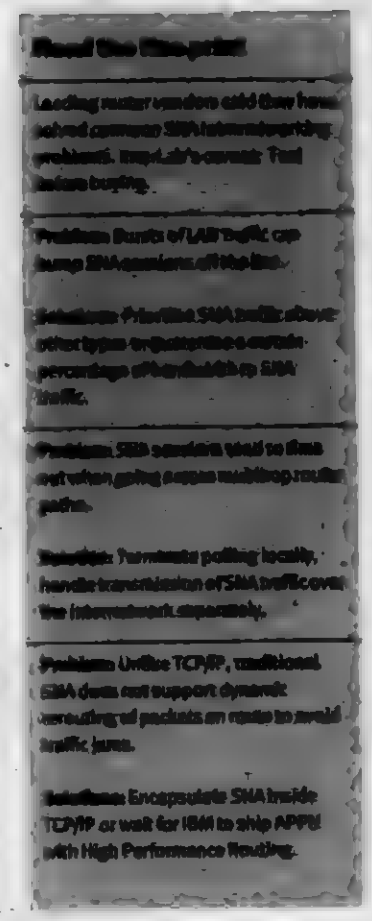
"The idea that everything is open and easy to interconnect is a myth. Users are getting locked into proprietary products, and now that is backlashing at the vendors," Murphy said.

Now users are saying, "We won't play until you prove to us" that a given SNA internetworking feature works as advertised, according to Murphy.

"I come from a mainframe perspective, and I'm not comfortable doing SNA over [Transmission Control Protocol/Internet Protocol] until [TCP/IP internetworking] has the consistent, predictive service levels my customers are used to," said John Gagnon, a technical adviser at Fidelity Investment and Network Service.

Even with the right products, the nature of internetworks precludes IS managers from having total control over their SNA links, which makes many managers nervous.

"I was interested in Proteon's product, which is supposed to guarantee 30% availability to SNA traffic, but if TCP/IP users are screaming for bandwidth, my 30% may go anyway," Gagnon said. "Before, I had 100% [of the bandwidth] for SNA. Now it's a matter of trust."



More than a stack

At least router vendors are no longer treating SNA as "just one more protocol stack" to be routed, as they did at last year's conference, said Kevin Tolly, president of InterLab, a Sea Girt, N.J., consulting and network testing company.

In the past year, the major internetworking vendors have announced products to address the more prominent SNA internetworking issues.

However, "there's no way of knowing whether a vendor spent months or years developing a feature," or whether it has any glitches, without thoroughly testing it, Tolly said (see box).

For example, InterLab recently tested a prioritization feature that is said to guarantee SNA the bandwidth it needs to avoid session time-outs. InterLab discovered that Cisco Systems, Inc. and Wellfleet Communications, Inc. routers treat all bridged traffic as one protocol, which means that NetBIOS and SNA can occasionally end up fighting for the same bandwidth.

One "bright light in a dark environment" is growing support by prominent router vendors for IBM's Data Link Switching (DLS) protocol

SNA internetworking, *page 62*

Network to help veterans fight war on home front

Linking shelter computers will coordinate services, keep track of veterans' histories and movements

By Stephen P. Klett Jr.
BOSTON

With help from Racal-Datacom, Inc., The New England Shelter for Homeless Veterans recently embarked on a pilot project to establish a state-of-the-art nationwide network aimed at integrating the country's more than 200,000 homeless veterans back into society.

The shelter, which hopes to have a national network in place by year's end, expects to go live with its own local network this month.

The first step toward establishing this national network is connecting the shelter's mishmash of donated computer equipment.

Racal-Datacom donated two INX 5000 intelligent hubs and designed for the shelter a network topology that it will help implement. The network infrastructure is based on a fiber-optic backbone, and the INX hubs provide Ethernet connectivity to allow communications with local social service agencies.

The shelter has a "vision, and we are providing the basic infrastructure and network engineering to get this vision up on its feet and running," said Jim Norman, president of Racal-Datacom.

Sister company Racal-Interlan has donated 60 network interface cards to connect the shelter's PCs to the Ethernet-based local-area network. The INX hubs and interface cards are valued at approximately $33,000.

The 10-story, nonprofit shelter uses its computers to help coordinate medical and social services with local agencies, list job and housing opportunities and maintain a client database.

The shelter's list of equipment includes 286 and 8086 PCs from AT&T and IBM, two file servers from Banyan Systems, Inc. running the Vines network operating system, an Aster 360 minicomputer from NEC Corp. and two laser printers from Hewlett-Packard Co.

The PCs are used mainly for data entry and processing and for the shelter's Automated Accounting Job Training program, which includes classes in accounting, Lotus Development Corp.'s 1-2-3, word processing, resume writing and general computer skills.

The shelter's computer systems currently suffer from isolation. For example, the computers in the training room on the first floor are not connected with the computers on the ninth floor, and there is no direct link to outside services such as Veterans Administration hospitals.

According to Ken Smith, executive director of the shelter and a Vietnam veteran, this makes it extremely hard to track veterans from shelter to shelter. For instance, Smith said, traffic at the shelter is already up 20% from the winter. He said the uptick is caused by homeless clients migrating from southern locales to New England for

Veterans, *page 62*

HP to enable low-cost Ethernet-only routing

By Joanie M. Wexler
PALO ALTO, CALIF.

■ Hewlett-Packard Co. recently outlined plans to fill an internetworking niche with two low-priced local routers designed to help companies economically segment Ethernet local-area networks for better performance.

Segmentation — creating more LANs with fewer users on each — is a common tactic for quickly relieving network bottlenecks as users consume increasing amounts of bandwidth. However, with each new segment comes the need for another internetworking device.

HP said it will ship next month a four-port, $7,500 Ethernet-only router, as well as a $12,500 version that includes a Fiber Distributed Data Interface (FDDI) link. The FDDI option targets companies looking to speed up throughput of internetworked, 10M bit/sec. Ethernet traffic by aggregating it on a 100M bit/sec. FDDI backbone "highway."

The aggressive prices mean that Michael McEwen, manager of information systems at Ahlstrom Pyropower, Inc., an engineering and construction company in San Diego, can probably afford to bullet-proof his campuswide Ethernet by installing redundant routers at each internetworking juncture.

"Reliability is much more important than price," McEwen said, explaining that he has a corporate mandate for his network to experience no more than one outage for no longer than two hours each year. "I'd be willing to pay twice as much [as $7,500] for a router I can count on, so I'll probably buy two for hot backup," he said.

Performance increases

McEwen runs centralized, redundant Wellfleet Communications, Inc. routers as a collapsed backbone for linking his internetwork's population of mixed Ethernets and Token Rings. He said he ran his own internal performance benchmarks on the new HP devices and that they yielded a 30% to 40% performance improvement over comparable Wellfleet models for supporting dumps of Ethernet traffic.

This is despite the fact that HP router platforms all run Wellfleet routing software.

McEwen added that he will likely look at HP's FDDI version because the company will soon have to segment its 100 Unix nodes from its 200 PC desktops. However, the company is not running FDDI today, he said.

HP drew price comparisons between its routers and similar models from Cisco Systems, Inc., 3Com Corp., Proteon, Inc. and Wellfleet, positioning HP's products at prices up to 60% less expensive. However, the competing devices all included some number of wide-area network ports, while the HP routers have LAN-only connections, acknowledged John Vega, HP product marketing manager for routers.

In addition to introducing two routers, HP slashed prices on several of its existing bridges and routers by 16% to 24%.

The HP local routers support five common protocols: TCP/IP; Novell, Inc.'s IPX; Apple Computer, Inc.'s AppleTalk II; Digital Equipment Corp.'s DECnet IV; and Xerox Corp.'s XNS.

Also, most of those products, including the Cisco 4000, Wellfleet Link Node, Proteon CNX 500 and 3Com NetBuilder II, are based on modular designs, meaning that users buy a generic chassis and then outfit it with the LAN or WAN interfaces that their network designs require.

This jacks up their price for giving users more flexibility in customizing their equipment.

Fixed configurations, such as HP's, indicate that "you're competing at the low end, and I can see the niche where this will fit," said Fred McClimans, director of local area communications research at Gartner Group, Inc., a consulting and research firm in Stamford, Conn.

McClimans explained that he views the inexpensive Ethernet routers as a move to fend off competition from the LAN switching vendors, such as Kalpana, Inc., in low-end Ethernet products.

HP's internetworking divisional general manager Carolyn M. Ticknor, however, said the company is attempting to allow users to buy only what they need, rather than supplying "products that are all things to all people."

Veterans

CONTINUED FROM PAGE 81

the summer.

A national network connecting LANs located at more than 50 homeless veterans' shelters across the country would make it possible to track veterans' movements, Smith said. This would give the shelter access to each client's history to determine exactly what kind of help was needed, such as counseling or treatment for substance abuse or post-tranmatic stress disorder.

But the biggest benefit the network will provide, Smith said, is to help restore veterans' identities.

"Information management is the key to homelessness. . . . The homeless do not have an identity," Smith said. "Information management helps restore their identity by helping restore things they've lost, such as their driver's license."

The shelter is on course to have its administration/accounting departments on the ninth floor connected via Ethernet with its training rooms on the first floor by the end of this month, according to Bob Herlihy, business manager at the shelter. Herlihy said the shelter plans to connect to shelters in other states before year's end.

Once a national network is established, Herlihy said, veterans' shelters will give homeless veterans a bar-coded identification card to present each time they enter one of the shelters on the network. The card will allow security officials at each shelter to immediately direct the individual to whatever services may be needed.

SNA internetworking

CONTINUED FROM PAGE 81

as a de facto standard, Tolly said. DLS handles all of the issues around mixing SNA and LAN traffic, such as prioritization, congestion and flow control.

A group of vendors is now working with IBM on an enhanced DLS that will then be proposed to the Internet Engineering Task Force standards body.

In the meantime, however, many large SNA shops are struggling to hammer out a viable SNA internetworking strategy from the proprietary hodgepodge of products now available.

The Chase Manhattan Bank NA "faces the same issues as everyone else: We have a multiprotocol environment that we're trying to scale to two or three" protocols on the internetwork, said John Jobity, a senior engineer at the bank.

Chase is considering tunneling or encapsulating SNA inside TCP/IP as a way of cutting down on total internetworking protocols, Jobity said. The company is also evaluating Advanced Peer-to-Peer Internetworking, a protocol originally proposed by Cisco that would allow SNA devices to communicate over a TCP/IP backbone.

In contrast, First Security Information Technology, Inc. is leaning toward IBM's Advanced Peer-to-Peer Networking (APPN). It chose 3Com Corp. over Cisco, partly because 3Com had a better relationship with IBM, said technical analyst Ken Moerman.

"I came to this conference partly to see if we should buy Sync Research, Inc. boxes to convert SDLC to LLC, or wait and do APPN or do encapsulation," Moerman said.

3Com offers a class-of-service option that "they say can handle reliability and prioritization of SNA, which is a big concern with us," Moerman said.

Gateway manages SynOptics hubs

By Elisabeth Horwitt
SANTA CLARA, CALIF.

SynOptics Communications, Inc. has announced a gateway said to enable Simple Network Management Protocol (SNMP)-based systems to manage SynOptics hubs over an IBM Systems Network Architecture (SNA) backbone.

The product addresses companies that want to manage hub installations at sites not yet equipped with Transmission Control Protocol/Internet Protocol (TCP/IP) links, the vendor said. TCP/IP is the protocol by which SNMP management systems communicate with managed devices.

SynOptics' SNMP Transport Gateway is OS/2-based software that takes SNMP management data from SynOptics' intelligent hubs and encapsulates it into IBM Advanced Program-to-Program Communications packets. The packets can then be sent over an existing SNA backbone to a system running SynOptics' Optivity network management software.

Priced at $2,495, the product is scheduled to ship in October.

The product represents the first fruit of SynOptics' alliance with Eicon Technology Corp. Also in the works are SNA features for SynOptics hubs, including the ability to convert IBM Synchronous Data Link Control traffic into Logical Link Control packets that can run over local-area networks. SynOptics' rival in the hub and network management arenas, Cabletron Systems, Inc., is providing similar capabilities through an alliance with Sync Research, Inc.

Still in question, however, is how and when SynOptics and Cabletron plan to provide SNMP management of their hubs' SNA components.

Cabletron announced earlier this year its BlueVision strategy, which enables its SNMP-based management system, Spectrum, to manage SNA devices through a bidirectional link with IBM's NetView. However, Cabletron does not see an immediate user need for direct SNMP management of SNA devices, a company spokesman said. A SynOptics spokesman made a similar statement.

Despite this, the two vendors are participating in a vendor consortium to develop SNMP management information bases that would enable SNMP systems to manage SNA gateways and SDLC to LLC converters.

First grads

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CLONE.

IBM PC Co. follows Dell's lead with new support options

By Neal Boudette

Two months after Dell Computer Corp. introduced a menu of user-support options, IBM Personal Computer Co. has followed suit.

IBM's new Customer Protec-

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In Brief

Netmaker adds library

Make Systems, Inc.'s Netmaker can now perform simulations and what-if scenarios for internetwork installations that include Wellfleet Communications, Inc. routers. Netmaker simulation software enables users to assess the impact of network traffic loads, determine the impact of different routing protocols on throughput and determine how routers will respond to link failures, Make said. The Wellfleet device library costs $17,000 for a 50-router network, the company said.

Hitachi licenses OpenView

Hitachi Ltd. has licensed Hewlett-Packard Co.'s OpenView for Unix for use as the basis of its own network management family, NetMConnet. Hitachi's software family, due out in December, will provide monitoring, fault-, configuration- and performance-management of distributed Transmission Control Protocol/Internet Protocol (TCP/IP) networks. It will run on Hitachi 3050RX and 3500 systems.

NetWare adventures

How to Keep your Novell Network Alive, by James Nadler and Don Guarnieri, is a self-described "Underground Guide to Novell Networks" that takes a humorous and illustration-intensive slant to the rigors of setting up and administering Novell, Inc. NetWare local-area networks. Topics covered include network design, internetworking, server, workstations and storage systems, cabling, backup and archiving, printing and communications. The book costs $26.95 and is published by Bantam Books.

OS/2 LAN tool delivered

IBM recently began shipping LAN Management Utilities/2, an OS/2-based LAN management tool that operates in Ethernet and Token Ring environments. It reportedly automates management of OS/2 clients and servers, DOS clients and Novell NetWare servers in four management areas: assets, operations, faults and performance. It costs $795 per license. Customer-requested enhancements include remote execution of a forced system shutdown and the ability of one LAN administrator to manage multiple LMU/2 systems from one workstation. It also measures the percentage of Token Ring bandwidth being used and issues alerts if a preset threshold is crossed.

IBM ships MPTN products

IBM began shipping the first products of its Multiprotocol Transport Networking (MPTN) architecture two months early, in late April, under the new name, AnyNet/MVS. The product is said to allow TCP/IP Sockets applications to run over a Systems Network Architecture network, and allows IBM Advanced Program-to-Program Communications applications to run over TCP/IP. It is available as a feature on VTAM Version 3 Release 4.2 and runs on both MVS hosts and OS/2 workstations. Monthly charges for mainframe CPUs range from $254 to $2,350. A one-time charge for workstations is $150.

3Com, NetManage team

3Com Corp. and NetManage, Inc. have signed an agreement under which NetManage will license 3Com's TCP/IP software for DOS systems, and the two companies jointly work on TCP/IP products for the DOS and Windows environments.

IP as native protocol

Network Systems Corp. has announced Greenline-IP, which is said to be the first host channel networking product to use the Internet Protocol as a native transport protocol. This lets customers connect TCP/IP networks to the Minneapolis firm's channel-based networks without the expense of a router or encapsulation overhead, according to Network Systems.

Apple updates two MacX.400 E-mail servers

By James Daly
CUPERTINO, CALIF.

With the words "open systems" on the lips of many client/server system designers, Apple Computer, Inc. continued its move into this potentially lucrative environment last week with the introduction of two new versions of its MacX.400 electronic-mail server.

The MacX.400 v1.1 was designed for enterprise networks, while the MacX.400 SD (Single Domain) is optimized for small organizations and workgroups that need to communicate with only one X.400 server. Both will be available later this summer, Apple officials said.

Both will provide users with the ability to send messages from Macintoshes to other platforms over the Internet and to recipients on other platforms connected to X.400 networks, said Apple senior director John Nauman.

E-mail has grown in importance in recent years largely because of its close ties with such things as databases and electronic data interchange.

Some analysts have even predicted that messaging with E-mail will become the major communications pipeline for desktop applications in the current decade.

Apple's new E-mail server products also include support for Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI). For instance, users can run X.400 messaging applications over the Internet using their existing TCP/IP infrastructure.

Apple's OSI transport, OSI Connection for Macintosh v1.1, will include support for the ISO Transport protocol that provides end-to-end connection in multivendor environments. It will be included in MacX.400 v1.1 and will also be available as a stand-alone product.

The MacX.400 SD has a suggested retail price of $2,950, while the MacX.400 server v1.1 is priced at $4,950. The stand-alone version of the OSI connection package costs $199.

Horwitt

CONTINUED FROM PAGE 61

when two or three systems need to cooperate closely on jobs, preferably over a LAN. You can see why message-oriented middleware does not fit nicely into a catchy slogan or TV ad.

To make things harder for message-oriented middleware, many IS managers are understandably leery about entrusting critical distributed computing strategies to 2-year-old companies with 30 or 40 employees.

So what can the MOM consortium do to persuade corporate America to take their products seriously? Everyone agreed at the first meeting that they need to educate the public. They intend to sit down and hammer out a set of common terms, plus some consistent descriptions for what MOM is and why it's useful.

Apples and oranges

The problem is that even within the MOM sector of middleware, apples and oranges abound. For example, IBM and Systems Strategies specialize in interconnecting Unix and IBM, TCP/IP and SNA systems; PeerLogic is hitting the LAN environments; and Horizon Strategies is addressing a variety of fronts.

One big user suggested standardized APIs that would ideally allow corporations to migrate to another MOM vendor, should one fold. However, the diversity of the MOM sector could make this extremely problematic, analysts and vendors say.

I suspect the smaller MOM firms will ally themselves with bigger software players, either by getting themselves acquired or through OEM agreements. PeerLogic is already cutting such deals with companies like TI and Legent. Let's hope these guys can get into the mainstream without losing their entrepreneurial spirit — they really seem to have taken a good swipe at some longstanding barriers to distributed computing.

Horwitt is a *Computerworld* senior editor, networking.

CUSTOMER FOCUS.

Oct. 1993	*First Place* tie, *PC Week* Poll of Corporate Satisfaction (System 333)	USA
Oct. 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 333/16)	USA
1993	*Best Sales and Support*, *Practical Computing*	UK
Apr. 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 200)	USA
Apr. 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 316)	USA
Sep. 1992	*Most Dependable Since Sinclair*, *Micro Decision*	UK
Feb. 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 316)	USA
Feb. 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 325)	USA
May 1993	*Most Company for Customer Satisfaction*, *McKinsey Report*	GER
July 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 316LE)	USA
July 1993	*First Place*, *PC Week* Poll of Corporate Satisfaction (System 310)	USA
Nov. 1993	*Tops in the (Almost) Customer Satisfaction Survey*, *Computer Weekly*	UK
Oct. 1991	*World Class Support Award*, Service and Support, *PC World*	USA
Nov. 1991	*Extraordinary Services*, *Computer Live* (System 320SX)	GER
Sep. 1992	*Rated #1* in an Independent Customer Satisfaction survey conducted by Reliability Ratings™†	USA
Nov. 1992	*First Place*, Datapro Customer Satisfaction Survey, *Computer Weekly*	UK
Nov. 1992	*Most Recommended Personal Computer Manufacturer*, *Decision Micro*	FRA
Nov. 1992	*Top-Ranked PC Company* in the 1992 Datapro® Customer Satisfaction Survey*	USA

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† Survey was independently conducted by Reliability Ratings, Needham, MA. The data is quoted from a 40-page report available for purchase through Reliability Ratings (617)444-5755. Reliability Ratings, the research company, is not affiliated with Dell Computer Corporation and does not endorse its products. *Source: Datapro, Nov. 1992. Dell disclaims proprietary interest in the marks and names of others. ©1993 Dell Computer Corporation. All rights reserved.

HOCUS POCUS.

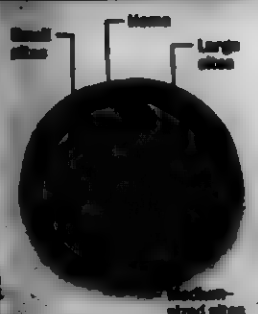
IBM, Compaq direct-response efforts are lacking, users say

By Robert L. Scheier

While corporate customers are more willing than ever to buy PCs direct, they say IBM and Compaq Computer Corp. haven't done much to woo them from established direct-response players such as Dell Computer Corp. and Gateway 2000 Inc.

IBM and Compaq, which are still learning the mechanics of the direct-response business, are primarily offering a limited set of low-end products that lack the features and power required by corporate customers, users said.

Who buys direct?



Source: IBM Strategic Database

For example, Compaq's ProLinea 4/25s, which are targeted at small businesses, are configured with only 4M bytes of memory and a 120M-byte hard drive and a Super VGA monitor for $1,549, available through IBM Direct. A similarly configured Dell local-bus system costs $1,599. In comparison, Compaq's non-local-bus 25MHz 486SX-based ProLinea costs $1,449 through DirectPlus.

"What we've seen is that there's not enough power in [Compaq] machines," said Roy Wilsker, manager of end-user services for The Kendall Co., a Mansfield, Mass., manufacturer of health care and other products that is currently buying Dell PCs. Wilsker, a former IBM PS/2 customer, is currently buying direct from Dell and has no plans to switch.

IBM's and Compaq's direct-response programs have also been impeded by their efforts to avoid alienating traditional resellers, which still sell the bulk of the companies' products.

Compaq has targeted its DirectPlus program at the small-business market rather than at its corporate customers, who will continue to buy mostly from resellers, said Barbara Krumland, Compaq's vice president for DirectPlus, in Houston. To ease dealers' fears, Compaq is only selling products through DirectPlus that are in good supply, she said.

However, some dealers were

Reprinted from April 12th issue of *PC Week*, ©1993 Ziff Communications Company

[redacted]

Electronic data interchange

Sterling Software's Systems Software Marketing Division has announced Sterling Hypertrace, a generation of electronic data transfer products for enterprisewide data communications that run independent of communications protocols, platforms and applications.

According to the company, Hypertrace was designed to communicate through IBM's LU6.2 architecture to deliver peer-to-peer communications. An electronic mailbox is provided that serves as a voice-mail system for data files.

The mailbox gives applications independent data communications, allowing data to be forwarded, retrieved and stored within the network without having an impact on the application.

Pricing begins at $25,000.

▶ *Sterling Software*
11050 White Rock Road, #100
Rancho Cordova, Calif. 95670
(916) 635-5535

Network management

Infonet Services Corp. has introduced PerspeXion, a family of services designed to provide real-time, graphically displayed network management information.

According to the company, PerspeXion Vision was designed for users who require the services of Infonet's international networks, the Public Data Network (PDN) or Virtual Private Data Network (VPDN), or its high-speed Infolan communications services.

Real-time graphic, trouble ticket and alarm information is sent to the PerspeXion Vision monitor on the client's site from Infonet's Network Control Center.

From a single monitor, Infonet users can see their public and private networks with PerspeXion Manage. Daily, weekly and monthly network performance reports are delivered to Infonet's PDN, VPDN and Infolan service clients via PerspeXion Link.

The PerspeXion Vision service for a typical client costs about $1,000 a month.

The PerspeXion Manage service will be available during the fourth quarter of 1993, with prices varying depending on users' requirements.

PerspeXion Link typically costs $300 a month.

▶ *Infonet Services*
2100 E. Grand Ave.
El Segundo, Calif. 90245
(310) 335-2600

Gateways, bridges, routers

Fibermux Corp. has introduced the CC6672ZZ and the CC6673ZZ, two SmartBridge Ethernet local-area network modules.

According to the company, the products were designed for segmenting user traffic on the firm's Crossbow intelligent wiring hubs.

The modules offer either fiber-optic or thick-net front-panel connectors that give them the ability to bridge between external networks and Crossbow-based networks.

Forwarding rates of 13,000 packet/sec. are achieved, and extensive packet filtering functionality is provided. The modules can also work with LightWatch, Crossbow's Simple Network Management Protocol-based network management system.

The CC6672ZZ has two attachment unit interface (AUI) thick-net connectors and costs $3,495. The CC6673ZZ has one AUI connector and two fiber-optic inter repeater link connectors; it costs $3,895.

▶ *Fibermux*
9310 Topanga Canyon Blvd.
Chatsworth, Calif. 91311
(818) 709-6000

Ungermann-Bass, Inc. has announced four power-supply products designed to provide a more flexible and global power solution for Access/One users.

The products — ASE7000AUTO, ASE7000FTSYS1, ASE7000FTSYS2 and ASE7000FTPS — offer options for both fault-tolerant and non-fault-tolerant power systems. They fit into the 11 slots of the company's Access/One enterprise hub.

Fault management and disaster recovery support is provided for mission-critical networks composed of high-speed desktop network devices, bridges and routers.

Pricing for the products range from $1,500 to $3,995.

▶ *Ungermann-Bass*
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 496-0111

Microcom, Inc. has introduced MBR 7.0, enhanced bridging and routing software.

MBR 7.0 was designed for Microcom's Bridge/Router models MBR/6000 and MBR/6500.

The WANmiser Advantage, a set of features that helps users minimize internetworking costs such as downtime, monthly telecommunications services and wide-area network support, is incorporated in MBR 7.0.

Working in conjunction with the WANmiser features, MBR 7.0 reduces costs such as automatic bandwidth on demand, automatic dial backup and IPX autodial. The MBR/6000 and the MBR/6500 can be managed from within Hewlett-Packard Co.'s OpenView with the MBR Manager for HP OpenView, an optional feature.

Starter kit prices for the MBR/6000 and MBR/6500 begin at $4,299 for a two-port Ethernet remote bridge/router and $4,799 for a two-port Token Ring remote bridge/router.

▶ *Microcom*
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

3Com Corp. has introduced a high-speed Ethernet Switching Module (ESM) for the company's LinkBuilder 3GH internetworking hub.

According to the firm, ESM offers new levels of internetworking functionality in large high-density networks and bandwidth-intensive distributed computing environments.

Improved throughput performance, additional network media support and two enhanced modes of operation-bridging mode or switching mode deliver the functionality.

ESM is powered by a reduced instruction set computing-based processor and has the ability to switch and bridge data at 50,000 packet/sec. ESM offers three media interface options.

The eight-port 10Base-T and four-port attachment unit interface modules cost $12,500. The eight-port fiber-optic 10Base-F module costs $14,000.

▶ *3Com*
5400 Bayfront Plaza
Santa Clara, Calif. 95052
(408) 764-5000

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Mainframe utilities defy hardware trend

By Thomas Hoffman

If the mainframe is dead, why are the industry's leading independent software vendors racking up record revenues?

One of the chief reasons, analysts said, is the dramatic rise in the use of data center utilities. Currently, many mainframe shops are putting off hardware upgrades while they await a more mature client/server market. To prolong the life cycles of their big iron, they are socking capital into automated software.

Information systems budget allocations for mainframes dropped nearly 29% between 1991 and 1992, according to Computer Economics, Inc., a Carlsbad, Calif., market research firm. The rising use of data center utilities "explains why you have hardware revenues declining while software revenues are still on the rise," noted Charles E. Phillips, a financial analyst at Kidder, Peabody & Co. in New York.

For example, in a May 17 report he compiled on the IBM DB2 database market, Phillips projected that the DB2 utilities market "is healthier than other mainframe software segments and is likely to grow at a 25% to 30% annualized rate over the next 18 months."

Some observers said the shift back to mainframe utilities reflects a cyclical trend. "There was robust demand for systems utilities when the economy went soft in the early 1980s, and it's happened again," noted Terence Quinn, a managing director at Furman-Selz, Inc., a New York brokerage. For example, Quinn said the continued economic malaise in Europe has helped fill the coffers of leading utilities vendors such as Computer Associates International, Inc., Legent Corp. and BMC Software, Inc.

Playing it smart

Of course, prudent IS management stateside has also helped contribute to the resurgence of the utilities market. Take Dr Pepper/The Seven-Up Co. The Dallas beverage distributor has been planning to replace its aging IBM 3084 machine for more than a year. But after comparing the licensing and maintenance costs of the 3084 with potential IBM 3090 successors, the firm realized that making do with the same machine would save it $4,000 to $8,000 per month, according to John Stevenson, vice president of MIS.

"Over the past few years, we found that if we judiciously target utilities to do a couple of things for us — like manage the throughput or examine the heartbeat of a system and determine where we have stress or strain — we can work around doing hardware upgrades for our critical needs," Stevenson said.

So last year, Dr Pepper/Seven-Up launched a project — aptly named "Save the Whale" — targeted at delaying the 3084's demise. The "whale" is used to run the firm's financial operations, while a Digital Equipment Corp. VAXcluster handles its sales and marketing applications. When I/O bottlenecks clog the IBM 3084, Dr Pepper/Seven-Up relies on performance-monitoring tools rather than upgrading the hardware to alleviate system constraints.

The soft drinks company has given the 3084 a stay of execution until at least Labor Day. Still, Stevenson acknowledged it is becoming increasingly difficult to keep the whale alive from a cost-justification standpoint. "As the cost of iron falls, it gets tougher to determine whether to spend $60,000 on a software upgrade when the hardware costs are getting closer to that," he said.

Others are not so sure. "Software is a smaller investment," chimed in M. Lewis Temares, chief information officer at the University of Miami. Temares said utilities make it easier to modify existing hardware than to scrap it. The smart thing to do, he said, is to "make use of what you have but find a way to do it better at a lower cost."

The school is doing just that. Earlier this year, the university installed Candle Corp.'s Omegamon performance monitor, according to Freddie Robinson, senior manager of technical operations. Omegamon is helping the university prolong the life of its IBM Enterprise System/9000 Model 580 by conducting performance tuning and capacity planning on-line in real time, Robinson said.

Temares said the use of automated software will allow the university to keep the mainframe for at least five more years, during which time it will enable the machine to function as a large corporate server.

Creativity led one IS shop to integrate the best features of its utilities. Last year, United Parcel Service, Inc. created an interface between its Computer Associates CA-7 scheduling package and Legent's AutoMate operations utility. By doing so, manual intervention for data center tasks such as job scheduling has been eliminated, according to Ed Zolcinski, a UPS computer operations manager. Now, the package carrier's Mahwah and Paramus, N.J., data centers can be managed from a single console, freeing up operators to help out with other data center chores.

For UPS and most companies, the single largest IS expenditure is not equipment but people. Zolcinski estimated that the integration of the two utilities has helped UPS reduce the number of console operators between the two data centers from eight per shift to five.

It does not hurt to strike a good deal with a vendor, either. Jim Hammon, a lead systems engineer at The Travelers Corp. in Hartford, Conn., said The Travelers recently replaced IBM's Resource Management Facility (RMF) with Boole & Babbage, Inc.'s CMF Monitor Version 4.3, primarily because Boole & Babbage offered to throw in a direct-access storage device manager, called DASD Advisor, for free.

Besides, Hammon said, CMF Monitor offered perks that IBM's RMF did not, such as the ability to monitor The Travelers' 11 operating systems from a single terminal.

Coming soon

Here are some of the new products and upgrades that are on the way from the major data center utility vendors:

•Legent: A Microsoft Corp. Windows NT version of DAR (DYSCOUT Archival and Retrieval) is slated for beta testing by mid-1994. DAR is an automated output management package that currently provides on-line viewing of computer output for IBM MVS environments.

Legent is also developing a Windows NT version of AutoMate/XC, a workstation-based automated systems operations package that can externally manage multiple IBM and non-IBM systems, including Digital Equipment Corp. and Tandem Computers, Inc. machines. Currently available on the OS/2 platform, AutoMate/XC should also reach beta testing by mid-1994.

•Boole & Babbage: MainView Baseline, an OSF workstation-based product that was designed to roll-back mainframe activity onto OSF workstations, is currently in alpha testing and slated for general availability this fall.

•Computer Associates: The next releases of CA-7 and CA-Scheduler will include an option for a rules-based recovery mechanism. CA-7 3.1 should begin shipping by October, while CA-Scheduler 7.2 is due out by the end of this year.

— Thomas Hoffman

Unix gusher

The Home Oil Co. may well strike it rich if it can successfully follow through on plans to migrate its costly IBM MVS environment to Unix. According to Gary Graham, coordinator of data management at the firm, the shift from MVS to Unix is expected to help the company cut its monthly MVS licensing and maintenance costs by $10,000. Home Oil is relying on Computer Associates' CA-Unicenter for Unix systems management package as the linchpin for the conversion.

By the end of this month, Home Oil plans to begin beta-testing CA's IDMS for Unix database on a Hewlett-Packard Co. HP/9000 Model 827 machine. The fuel distributor has been running some of its geological and oil exploration applications on IBM RISC System/6000 Unix workstations, Graham said. But the ultimate goal is to move all of its MVS financial and other engineering applications over to Unix within the next three years.

Home Oil's IBM MVS-based data center is almost fully automated, with the exception of its tape mounts, which are done manually. Graham is hoping Home Oil can carry over its "lights out" approach to the planned Unix data center.

But finding adequate Unix-based utilities has not come easy, Graham said. While some packages such as CA-Unicenter offer help by providing systems management and security administration, he said, there is still a dearth of Unix tape management and performance tools on the market.

"Some of the things we miss are equivalents to Omegamon on MVS," Graham said, referring to Candle's performance monitor, which was designed to help optimize CPU use and storage on IBM's MVS, VTAM, DB2 and CICS environments.

While Home Oil continues its search for Unix utilities, Graham said, the simplicity of CA-Unicenter is helping to make Unix converts of the company's six data center staffers. "One of the reasons we went to Unicenter was so that our data center staff doesn't have to be trained to know more than base-level Unix commands," Graham said.

— *Thomas Hoffman*

Wang lowers prices, adds choices on VS line

By Craig Stedman
LOWELL, MASS.

Wang Laboratories, Inc. has introduced new versions of its high-end and mid-range VS systems with much lower prices than the models they replace, continuing an attempt started in the past few months to become more aggressive in its marketing and sales.

"Our policy is we're not going to get beat as much in the marketplace, and we've given our people the authority" to discount more heavily, said David Goulden, Wang vice president of marketing. "We're paying much more attention to what's out there in terms of competition."

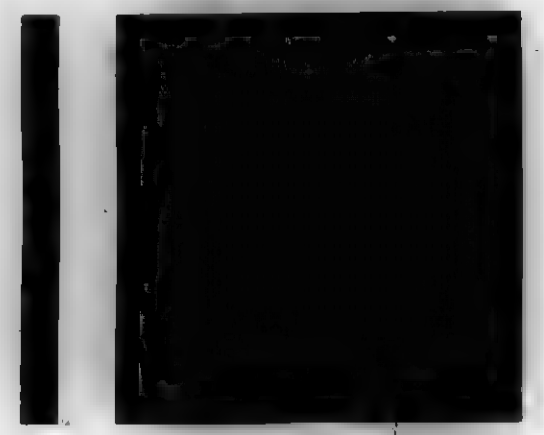
Goulden added that the more aggressive posture applies both to the proprietary VS line, which is facing sharp declines in demand, and Wang's open systems products based around RISC System/6000 hardware supplied by IBM. It also covers sales of used equipment by the company.

The new high-end VS 12000 Model 650 starts at $535,000 with 64M bytes of memory, compared with a $910,000 base price on an earlier Model 550 with 32M bytes of memory. The same processor is used in each system, but Goulden said the Model 650 performs about 10% faster mainly because of a new memory architecture.

The new architecture includes an integrated memory control unit and increases VS memory capacity from 256M to 2G bytes, Goulden said. A new release of the VS operating system was added to support the memory increase; Release 7.50 is the last major one planned, although enhancements will continue, he noted.

Wang, which also uses a smaller cabinet with the 12000 Model 650, has now streamlined the VS family from 20 systems a year ago to six machines. It also is simplifying its software licensing policies, making pricing for new and used operating system licenses identical and cutting the number of pricing tiers for its applications from seven to four, Goulden said.

"Workflow technology now provides a platform for the critical business process of organizations all over the world."



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"We are teaming up with Computerworld and IMC this year for an upcoming White Paper on 'Workflow Technologies in the 1990s' to be published June 14, 1993. This paper presents a detailed examination of the imaging applications and buyer's requirements for workflow technologies as well as projected market growth forecasts for the coming years. This will be the first published paper to examine this market in both the U.S. and Europe."

"AIIM's mission is to educate IS management on the ever-changing world of electronic imaging and micrographics. This Computerworld White Paper will help us reach the most influential IS decision-makers."

Sue Wolk
Executive Director
Association for Information and Image Management

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In Brief

Anchor Bank works on image

The Anchor Bank will install image technologies from NCR Corp. and Document Solutions, Inc. to automate the storage processing and retrieval of checks for its South Carolina offices. The imaging system, slated for implementation in the fourth quarter, will include NCR's 3350 departmental server, the NCR 7780 Image Transport and other peripherals.

SHORT TAKES IBM Programming Systems has cut prices almost in half for its OfficeVision mainframe- and minicomputer-based software.... Zeos International Ltd. said some of its Intel Corp.-based PCs have been approved for the NASDAQ Workstation II program.... Mainframe systems software maker Compuware Corp. said it plans to acquire EcoSystems Software, Inc., a maker of client/server systems management tools.... Fairfield University in Fairfield, Conn., has signed a seven-year, $17 million contract with Systems & Computer Technology Corp., a Malvern, Pa., outsourcing firm, for administrative software and outsourcing services.

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What's So GREAT About 64-BIT COMPUTING?

The competitive advantage — It's what every business continually strives for. And that's exactly what Digital's 64-bit Alpha AXP architecture gives you. The power of Alpha AXP systems will assist you in meeting your business requirements today and tomorrow.

Today, Alpha AXP systems — from desktop to server — can dramatically enhance your existing applications. In terms of your business future, Alpha AXP systems open the door to new ways of approaching your business problems, without constraints and on your choice of platforms.

Plus, Digital's 64-bit computing architecture offers an unprecedented 25-year growth path — assuring you that today's investment will be protected well into the 21st century.

Supercomputers Introduce Power of 64 Bits

The unbounded power and precision offered by 64-bit computing was first introduced by costly supercomputers and has been garnering dramatic benefits for a handful of specific industries.

With 64 bits, engineers designing computer simulations are given finer granularity, increased accuracy, and greater interactivity. Thus, what once took months or years to design now takes days or weeks — with animated visualization that borders on reality.

For example, a major U.S. automobile manufacturer that once used real automobile prototypes for crash experiments saved months of time and millions of dollars by implementing electronic crash simulations to collect critical information.

Along the same lines, the unbounded performance of 64-bit computing helped a leading U.S. chemical company create a synthetic catalyst in weeks instead of years — saving the company millions in experimental chemistry costs.

Alpha AXP Makes Supercomputer Power Affordable on the Desktop

Today, Digital's Alpha AXP architecture puts supercomputer power on the desktop for less. In fact, our 64-bit technology has the best performance and price/performance ratio in the computing arena. Now, virtually every industry can access the power of 64 bits to address their business problems.

Technologies that benefit from the power provided by Alpha AXP systems include:

- **Graphical representation**

Used in applications including CAD/CAM, molecular modeling, and computational fluid dynamics, this technology will gain significant design time advantages — resulting in greater productivity and cost savings for industries.

- **Information handling and retrieval plus recognition/interpretation**

Applications using technologies such as unstructured data (document image), EDM, voice, text-image search by content, and knowledge bases will dramatically benefit from the processing power of the Alpha AXP architecture. For instance, the paper mountains of insurance companies can be scanned into EDM servers to reduce search times from days to seconds.

- **Scheduling and multivariable problems**

Utilizing Alpha AXP systems, applications such as inventory and replenishment/logistics, chain management, and crew and maintenance scheduling can be treated in increasing detail in the retail industry and many others in order to garner higher returns.

- **Mathematical computations**

Applying 64 bits to risk analysis, realtime computation, and complex event prediction will allow banking and finance industries to solve larger problems faster, and with greater detail and accuracy.

Organizations Select Alpha AXP Systems as Computing Technology of Choice

Most often, you're not concerned about how technology works, but only that it works to provide business benefits. Many organizations worldwide have selected Digital's Alpha AXP systems for the compute power they offer — power that ultimately enhances business productivity and profit.

Boston Edison Plugs into the Power of Alpha AXP Systems

Boston Edison has recently selected two Alpha AXP systems (the DEC 3000-500 system and the DEC 3000-400 system) to run its primary application, EMS/SCADA. In its search for an open system that offered a distributed workstation-based solution, the company chose an Alpha AXP system over the IBM RS6000 because of the system's price and price/performance advantage. Digital's 64-bit technology will see Boston Edison into the 21st century.

Why not stop working around your current technology, and start letting technology work for you? Don't waste countless hours maneuvering around the limits of your current computing system.

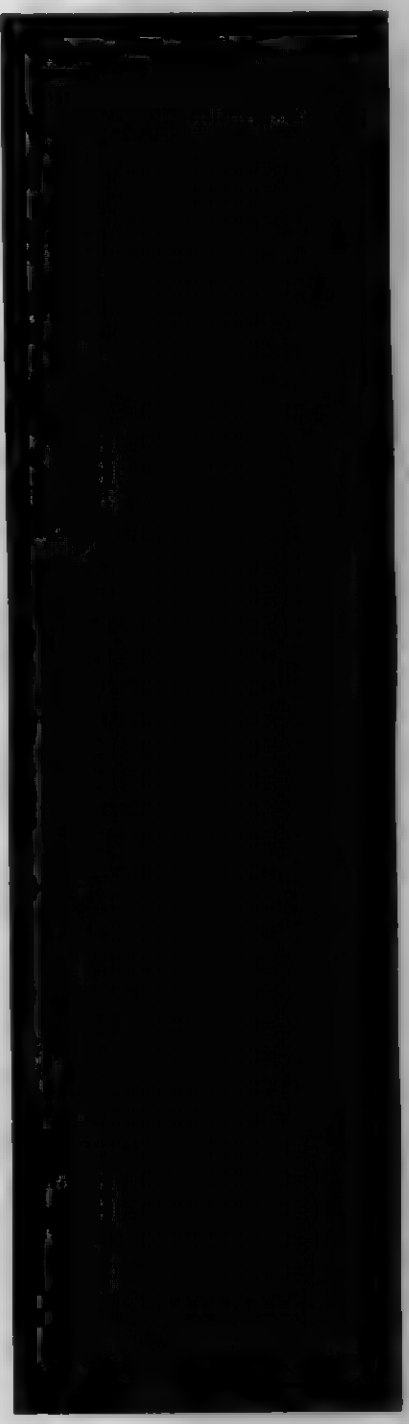
Instead, use Digital's Alpha AXP 64-bit RISC architecture to implement new, more cost-effective ways of solving your business problems now and in the future.

Tampere University Replaces Supercomputer with Alpha AXP Systems

Finland's Tampere University of Technology needed to add more compute power to its engineering computing lab. It found the solution in the 64-bit arithmetics provided by Alpha AXP systems. Sixty-four bits will give the university a new dimension for its technical computing — enabling users to solve more complex problems at a much faster rate. The Alpha AXP systems will be utilized in various physics, electronics, and signal processing simulations, and for structural analysis tasks.

Take Advantage of the Power and Affordability of Alpha AXP Technology

Alpha AXP technology can help companies across a broad range of industries improve cash flow, increase profitability, enhance productivity, and gain a competitive edge. With the best price/performance ratio in the industry, it makes good business sense to utilize 64-bit technology today in order to maintain your competitive edge tomorrow. ■



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"Every Sun user is faced with a significant transition as they move from SunOS to Solaris. The move to Alpha AXP offers a smoother path with more growth potential than any other option — including moving to newer models in the SPARC family."

JOHN O'KEEFE, VICE PRESIDENT, UNIX MARKETING
DIGITAL EQUIPMENT CORPORATION

Today, Digital's workstation upgrade program makes your path to Alpha AXP systems even smoother. Our upgrade program allows users of Sun workstations — based on the SPARC architecture — to move to Digital's Alpha AXP workstation family. The major benefits? A dramatic increase in application performance at half the cost.

Covering all SPARCstation workstations from the SPARCstation ELC through the SPARCstation 10 models, Digital's limited-time upgrade program lets Sun users trade up to Alpha AXP systems including the new DEC 3000 Model 300 AXP or the DEC 3000 Model 500x AXP system, the world's fastest workstation.

Available program credits range from $2,000 to $10,000 toward any system model you select for your SPARCstation trade. You can choose the DEC 3000 Model 300 or Model 400 AXP workstation — with 16-inch color monitor — or select the DEC 3000 Model 500 AXP system or the DEC 3000 Model 500X AXP system. Plus, any configuration of the Alpha AXP workstation can be ordered through the trade-in program.

In addition, Digital offers you a complete range of migration services including planning, support, tools, and full project management. You can continue to use your Sun systems for up to 60 days during the transition period — with complete assurance that current projects will continue to run without interruption.

As a leading supplier of multivendor maintenance service for both Sun hardware and software, Digital carries a basic inventory of spare parts — components from traded Sun systems — that support a large base of existing and future large maintenance agreements.

For information on Digital's limited-time Workstation Upgrade Program for Sun users, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 76N. ■

Over 1,200 Alpha AXP Applications Shipping Today

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If you've been looking for the right application to run on your Alpha AXP system, your search is over.

Since announcing the first Alpha AXP systems in 1992, Digital and its software partners have ported more than 2,800 applications to the OSF/1 and OpenVMS Alpha AXP operating systems. More than 1,200 of these applications are shipping right now. You'll find the most popular software products in every category, including office systems, databases, software development tools, and engineering applications.

And now it's easier than ever to find out exactly what's available. You are one phone call away from receiving Digital's "Alpha AXP Software and Applications Catalog" — a free publication that provides you with address, contact, and shipping information on Alpha AXP application software.

Here's a sampling of some of the industry-leading applications shipping today. But this is just a small portion of what's available. In fact, applications are being added at a rate of 300 per month.

To get your FREE "Alpha AXP Software and Applications Catalog" (part number EC-J2294-10), call 800-332-4636, and reference ext. 20. ■

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Apple Inc.	Aster*isk	Office
ARK Computer Systems Inc.	[illegible]	Manufacturing
Dicom Systems Inc.	Supra Server Mantis	Database (DB2 compliant) Development tools
Data Software	Code-VS	Accounting
Cognos Corporation	PowerHouse	4GL and tools
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Software AG	Adabas Natural	DBMS Software development
Systems & Information Resources, Inc.	Financial Modules	Healthcare
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Wang, Inc.	Wang OIS Server Libraries Suite	Database Software tools
Wind/U, Inc.	Multiple Products	Analysis
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Yurbion	MetSensation	Science/research

Imagine the best solutions for your business needs.

STEP UP to Digital

The economy has taken its toll on computer suppliers. However, there is a "light at the end of the tunnel" for those suppliers that have the ability to expand quickly to customer business needs. Digital is one such organization — finding new opportunities to help companies respond to today's business challenges.

But, where does this leave you? Or, more important, where does this leave your current computing investment?

A glance at today's headlines shows some computer companies consolidating and redefining their products and services to better meet your needs. Digital has been listening carefully to your concerns and is prepared to help.

How? By offering you a long-term, stable computing environment, a 25-year architecture with Alpha AXP, database and graphics capabilities, and a clearly defined path to get there. Together with recognized software vendors, Digital will provide the hardware products and software conversion tools you need to migrate to VAX VMS, Alpha AXP running OSF/1 or OpenVMS, ULTRIX on DECsystems, or SCO UNIX on Intel.

In short, we can provide you with a complete set of migration solution services.

Good News for Prime Customers

To remain competitive in today's market, businesses must anticipate their computing needs. Companies currently dependent on Prime technology are facing several challenges, including when and how to:

- Upgrade current technology without losing the entire investment in their Prime-based solution
- Move their business applications to a computing architecture that meets their open systems requirements
- Plan the migration to a new platform within a timeframe that makes good business sense and is easy to implement
- Implement a client/server strategy
- Contain or minimize operation costs.

In spite of these challenges, there is good news. Through its investment protection program called Digital Solutions for Prime, Digital offers Prime customers a clear growth path to 21st century computing.

Simple, Practical Solutions

Whether your business goal is migration, coexistence, technology upgrading, or containment of operation costs, Digital has the consulting experience and tools you need, today. In fact, our Solutions Integration Unit — along with our Independent Software Vendor — were on hand at the National Prime Users Group Conference recently to demonstrate Digital Solutions for Prime on the Alpha AXP platform.

Companies previously dependent on Prime have [illegible] Digital platforms because of all we have to offer, including:

- Prime migration/conversion consulting expertise and services
- A choice of operating system environments such as PICK, OSF/1, OpenVMS, ULTRIX, and SCO UNIX
- An unparalleled selection of software applications for each of these operating system environments
- Multivendor systems and network service.

What's more, Digital offers solutions and support for a full range of systems, from the desktop to the data center. For companies considering Digital for the first time, we will compare Prime maintenance costs *significantly*.

For information on Digital Solutions for Prime, call 508-467-6908. To schedule a professional vendor service assessment, call 800-222-6636 and request a Digital representative for your area. ■

Digital offers you a way to protect your investment in Prime computers. Through your comprehensive set of migration solutions, you can make a technology transition that's right for your company.

For SUPER PERFORMANCE, SUPERCHARGE Your VAX or Alpha AXP Systems with SuperCache from EEC Systems, Inc.

How do you measure computer system performance?

Not by CPU speed alone. In the last five years, CPU performance has increased phenomenally, while performance improvements in disk I/O have lagged behind. Depending on how often your application reads or writes data, you could end up with a serious I/O bottleneck.

> **"Now that SuperCache is available for Alpha AXP systems, customers will be able to take complete advantage of the impressive speed and expanded memory capacity of this advanced architecture."**
> ERIC DICKMAN, CEO, EEC SYSTEMS

Now there's an easy way to realize the full potential of your OpenVMS VAX, OpenVMS Cluster, or Alpha AXP system. SuperCache software from EEC Systems, Inc., feeds data to your application at memory speed rather than disk speed — enabling you to cut application processing time dramatically or to add 50 percent more active users to your current application without any decrease in performance.

"Using SuperCache, customers can expect to increase performance 2 to 15 times," says Eric Dickman, EEC's chief executive officer. "In addition to that, SuperCache works transparently, so you don't have to change your application to make use of it. And now that SuperCache is available for Alpha AXP systems, customers will be able to take complete advantage of the impressive speed and expanded memory capacity of this advanced architecture."

SuperCache works by using main memory — not the disk — to store the most recently used data in three dynamically sized caches. This means that frequently accessed data is read directly from memory. Because the interconnects between memory and the CPU are very fast, your I/O is significantly accelerated, and the overall efficiency of your VAX, OpenVMS Cluster, or Alpha AXP system improves significantly.

For complete protection of your data, SuperCache writes to the disk at the same time that it writes to memory. In addition, SuperCache software is multithreaded to support full parallel processing on multiprocessor systems.

"The end result is efficiency as well as speed," explains Dickman. "Because customers can run existing applications faster, they're able to put more applications or more users on the systems they've got. Resources — both capital and human — are used with maximum cost effectiveness."

EEC and Digital Deliver Customer Satisfaction

A division of EDS, EDS Personal Communications of Waltham, Massachusetts, provides services such as billing and fraud protection to cellular communication companies. In doing so, the company uses almost 500 VAX Units of Performance (VUPs) and more than 400 gigabytes of on-line storage, spread across 30 standalone and clustered VAX systems. In addition, it recently acquired its first DEC 4000 AXP system.

SuperCache enables you to increase the number of users you can support — without buying a new system.

"We're excited about the speed, additional memory capacity, and memory management features of Alpha AXP," says Chris Yetman, principal consulting engineer at EDS. "As a cellular communications service company, we depend on quick turnaround for a competitive edge. With SuperCache running on OpenVMS today, we can double the throughput of many jobs — without having to reengineer our applications."

EDS Personal Communications also makes use of SuperCache monitoring features that help determine which disks will get the maximum benefit from caching. And, with SuperCache, you're able to cache specific disks or your entire I/O subsystem.

"When we first installed SuperCache, improvements in performance were so dramatic that when customers called to get the status of their jobs, we were able to tell them that they had already been processed," Yetman continues. "When we start moving over to Alpha AXP, we expect to see even bigger performance improvements."

Available for OpenVMS VAX systems, OpenVMS Clusters, and Alpha AXP systems, SuperCache software can be purchased directly from EEC Systems. In addition to supplying this software-only product, EEC can supply TurboWare, a package that bundles SuperCache software with Alpha AXP or VAX memory — at prices lower than each product sold separately.

For information and a FREE SuperCache demo, call EEC Systems at 508-443-5306. ■

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The Answer Is YES

ONE UNIFIED NETWORK PRINTING STRATEGY IS HERE

AND DIGITAL HAS IT

Is there any company around today that doesn't work in a multivendor computing environment? Today, countless multivendor environments — including your own — prove that computing has changed dramatically. And with this change comes the need for a network printing solution that works for your mix of HP-UX, IBM AIX, SCO UNIX, SPARC, BSD UNIX, and NetWare systems — or a combination thereof.

Meet and exceed your printing requirements with Digital's unified network printing strategy — a solution based on our PrintServer family of printers and PrintServer software for each supported platform.

Digital's variety of PrintServer printers range in performance from 17 to 32 pages per minute, and display powerful features and options including:

• Remote Management Utility
Whether your PrintServer printer is down the hall or in another country, you can monitor and manage it right from your chair — saving time and enhancing productivity.

• Access Control
This feature allows system managers to define access to the printer. Once set, the printer itself mediates the access control.

• Accounting
Easily keep track of accounting information about usage to a system of your choice. Also included is an accounting reporting package that will generate reports based on costs and other criteria. Plus, if cross-charging is essential for your business, take advantage of a unique feature called Reliable Accounting — enabling your printer to print only when accounting data can be written. If the accounting host is shut off, or taken off the network, the printer will refuse connections — guaranteeing that all jobs are accounted for.

If you think that no single printing solution could possibly work for your mixed bag of IBM AIX, SCO, HP-UX, NetWare, SunOS, OpenVMS, ULTRIX, OSF/1, and BSD UNIX systems — think again. Digital has the complete solution — both printing software and printer hardware — that's right for your multivendor environment.

• Soft Loading or Booting
The PrintServer printer is a bootable device, meaning that printer upgrades may be done entirely with software. On platforms including SPARC, IBM AIX, HP-UX, SCO UNIX, BSD UNIX, SunOS, OpenVMS, ULTRIX, and OSF/1, booting is accomplished with the industry-standard bootp and ftp protocols. The software includes a bootp daemon if your system has none. OpenVMS systems load PrintServer printers using Digital's Maintenance Operations Protocol (MOP).

• Resource Loading
With Resource Loading, PostScript resources may be defined to load at PrintServer printer boot time — guaranteeing that certain custom fonts or other files such as logos, forms, or letterheads are always resident on the printer.

Digital Printing Software: Easy to Install, Packed with Features

Printer hardware is only half the story. The real key to providing a total printing solution for your multivendor environment lies with available printing software.

Digital's printing software was designed and built to integrate seamlessly with each operating system's printing environment. Plus, our software comes complete with a host of features, including the ability to print job banner pages and the ability to customize the layout of the banner page.

For SPARC/SunOS, other BSD systems, HP-UX, IBM AIX, and SCO UNIX systems, installations are driven by a user-friendly script. The menu dialogue is foolproof and allows for multiple installations or large networks. All files, including installation scripts and documentation, are bundled into a "tar" file format, and shipped on the media that's right for your needs.

For all platforms, installations can be customized to suit your directory structure and preference. What's more, reinstallation over older highly customized versions is made easy via "PrintServer Object Database" — acting as a roadmap to all the choices made when installing the software.

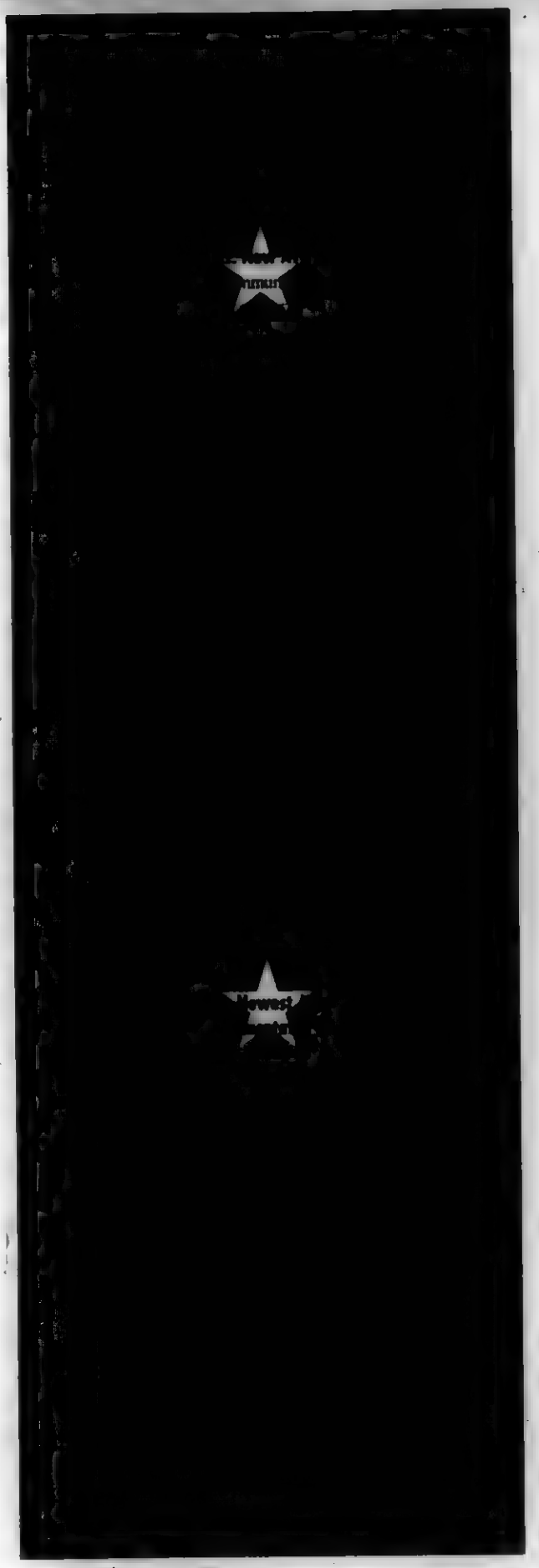
Digital's software kits also include full documentation and detailed "man" pages — providing you with complete printing information. Plus, you and your users are supplied with user reference cards that maximize the ease and productivity of the printing process by listing the most commonly used print commands from all supported platforms.

Client Software for NetWare Systems

In addition to UNIX offerings, Digital provides solutions for your NetWare environment. These solutions allow NetWare users to share the same Digital PrintServer printers as users on HP-UX, IBM AIX, SCO UNIX, SPARC, BSD UNIX, OpenVMS, ULTRIX, and OSF/1 systems.

Digital's "NetWare Print Client" fits seamlessly into the standard NetWare client/server architecture — offering users a range of features from the ability to do job-separator banner pages to multi-page "number up" printing.

For information on Digital's network printing solutions, call Abe Litman, PrintServer Marketing, at 508-635-8425. ■



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PUTTING IMAGINATION TO WORK

imagine the possibilities for your multivendor environment.

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DEC aims fault tolerance at high end

DECUS attendees told little need for additional fault-tolerant machines

By Craig Stedman
ATLANTA

Digital Equipment Corp. expects to finally ship its delayed VAXft 810 high-end, fault-tolerant computer in late July, but the company is still not committing to developing any additional fault-tolerant machines based on its Alpha AXP reduced instruction set computing (RISC) architecture.

"We don't have a firm plan to do that yet," said William Demmer, vice president of DEC's Computer Systems Group, at the recent spring conference of the Digital Equipment Computer Users Society (DECUS) here.

Demmer said he wants to resolve the Alpha question this month so funding for a project could be included in the engineering budget for fiscal 1994, which starts late this month. However, he said a final decision may slip into July because DEC's new industry business units are involved in the discussions.

> "I think they're meeting some of the needs out in the marketplace that they seemed to miss the boat on before."
>
> —*Randy Bowser*
> *Computer specialist*
> *U.S. Defense*
> *Logistics Agency*

Last fall, DEC disbanded what had been a separate fault-tolerant research and development group and folded that activity into its central engineering organization. The firm does not expect to put much emphasis on hardware-based fault tolerance even if it does go forward with an Alpha system, Demmer added.

"I don't look at it as a major industry segment anymore," he said. "I think the [fault-tolerant] market is going to shrink over time, as high availability becomes more available in general systems. So we don't plan to be a dominant vendor in that market."

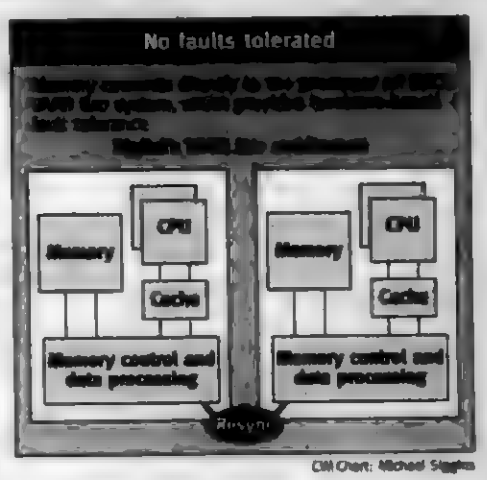
The relatively low level of sales for the VAXft line makes that almost a self-fulfilling prophecy, analysts noted. International Data Corp. (IDC) estimated 1992 VAXft sales totaled just $20 million to $25 million, down from about $60 million in 1991.

"Looking at [DEC's] numbers, you can see that it really lost focus over there," said Stephen Josselyn, a senior analyst at IDC.

Peter Kastner, vice president of the Boston consulting firm Aberdeen Group, added that DEC originally expected VAXft to be "a several hundred million dollar business" per year by now.

DEC is hoping the VAXft 810 will allow it to compete for some high-end business against market leaders Tandem Computers, Inc. and Stratus Computer, Inc., something it admittedly has not been able to do with existing VAXft machines, which top out at 25 transaction/sec.

"We weren't hitting the high end of performance with the earlier machines," said Vincent Mollomo, DEC's fault-tolerant systems marketing manager. He said he expects the single-processor 810 to be capable of reaching between 60 and 90 trans./sec., although performance testing has not been completed yet.



CW Chart: Michael Siggins

Coming in July

The 810, which had been scheduled for introduction last fall but was delayed because of software problems, is now expected to ship "probably around the end of July," Mollomo said. Pricing will start at $175,000 for a diskless, single-cabinet system with 32M bytes of memory and a single I/O module.

The machine will use a 45-MHz VAX processor and support up to 256M bytes of memory and 56G bytes of storage, Mollomo said. Changes from existing machines include the direct attachment of memory to the CPU and a switch of the uninterruptible power supply from a standard feature to an option, he added.

Users at the DECUS conference had kind words for the 810, opinions based on details released by Mollomo during a fault-tolerant session. "I think they're meeting some of the needs out in the marketplace that they seemed to miss the boat on before," said Randy Bowser, a computer specialist at the U.S. Defense Logistics Agency.

George Ramsey, an employee in the engine test department of Ford Motor Co., also had a favorable impression and was not scared away by DEC's indecisiveness about an Alpha-based system. Attendance at the fault-tolerant session was scant, however; only seven users came.

DECUS attendees find software issues remain

REPORTER'S notebook

With the fiscal 1994 budget still not finalized, DEC continues to hold off on deciding which of the 230-odd products in its layered software portfolio will stay in central engineering and which will be farmed out to overseas research and development units, sold to third parties or "retired."

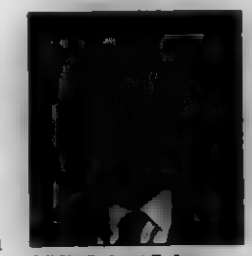
Budgeting should be finished shortly because the new fiscal year starts late this month, and engineering executives also expect to complete discussions this month on what sort of software framework they want to keep internally.

Decisions on specific products are expected to start coming down in July and August, but the process will extend over "many months," said Dick Mahoney, group manager for software business development, at the Digital Equipment Users Society (DECUS) conference in Atlanta.

"It's not like July 1 we know how many of the 230 are coming and how many are going," Mahoney said.

The uncertainty over the software portfolio is part of the reason why it is taking longer than planned to get a full commercial suite of layered products out for the DEC OSF/1 operating system, according to William Demmer, vice president of the company's Computer Systems Group.

Meanwhile, Demmer said symmetric multiprocessing is "the most needed functional enhancement to OSF/1" and is getting the highest priority in R&D, "but it isn't going to happen much faster than the schedule calls for," which is currently the first half of 1994.


DEC's Robert Palmer *promised DEC 'will get more aggressive'*

Funding for exploratory work on putting OpenVMS on the promised microkernel version of OSF/1 and building OpenVMS application programming interfaces into Windows NT so OpenVMS software could run in that environment is expected to be included in the fiscal 1994 OpenVMS engineering budget. Both are potential alternatives during the next couple of years, Demmer said. Donald Harbert, OpenVMS engineering vice president, said the OSF/1 and Windows NT ideas "are really in the category of thought experiments" for now, but his unit plans to look at those options in fiscal 1994.

Demmer said capturing 20% to 30% of the NT market with Alpha AXP would be "a nice entree for Digital to get into the desktop market," assuming that NT accounts for about 10% of the overall market. He added later that he was not setting a specific goal: "I was trying to make the point that we don't need a large percentage" of the desktop business to get off to a successful start in the NT market.

Multiuser VAXstation licenses had been expected by some to surface at the DECUS conference, but DEC officials said they will not likely become available until July at a price of $300 for each additional license. Some corners of DEC are reportedly miffed about the early leak because of concerns over its potential impact on revenue in the current fourth quarter, when the company hopes to make it back into the black. Ironically, though, the news got out at least in part through a customer letter signed by Demmer that was posted recently on the DECUServe bulletin board.

DEC CEO Robert Palmer got a laugh during his DECUS talk with a tale of how a wag had described DEC's too-honest sales technique: "People say you've got a great suit. I say, 'Yeah, but I've got this hole in my sock.'" Going forward, he promised, DEC will "get more aggressive" and maybe only "mention the hole in passing."

Among the multitude of multicolored ribbons handed out at DECUS to denote different types of attendees was a purple one signifying that the wearer was "best of breed." The organization's National Local User Group Council was the perpetrator of the dog show parody as a friendly spoof on the sheer quantity of real ribbons in the DECUS catalog.

Also in a satirical mood was the DECUS Security Special Interest Group, which gave out passes entitling the bearer "to wander the halls aimlessly." That is not such a hard thing to do in the cavernous confines of the Georgia World Congress Center.

Compiled by Craig Stedman, Computerworld senior editor, midrange systems.

[redacted]

Utilities

Millennium Information Systems, Inc. has introduced the Personal Computer File (PCF)-Toolkit, an IBM Application System/400-based utility.

According to the company, the PCF-Toolkit allows RPG III programs to process Lotus Development Corp.'s 1-2-3 spreadsheets stored on the AS/400.

The product comprises proprietary objects and model source code that permits RPG III programs to read, write, delete and update information in 1-2-3 spreadsheets, the company said.

PCF-Toolkit costs $1,295.

▶ *Millennium Information Systems*
15 Eastern Pkwy.
West Caldwell, N.J. 07006
(201) 882-8244

Software application packages

QCC, Inc. has announced the Credit, Receivables and Deduction (CREDT) Management System.

CREDT can be used as a front-end application solution that can be interfaced with accounts receivable packages from leading vendors. Users can track, control and monitor earned and unearned deductions. CREDT operates on IBM Application System/400s.

Prices range from $7,500 to $35,000 per client license.

▶ *QCC*
886 Washington St.
Dedham, Mass. 02026
(617) 329-7626

American Software has unveiled Amsoft Deaktop, a Windows-based graphical version of its mainframe applications.

Dialog boxes, icons, scroll bars and radio buttons are some of the Windows features provided. Information from the mainframe can be shared with other applications from the PC environment.

Prices start at $4,000 for 10 users.

▶ *American Software*
470 East Paces Ferry Road
Atlanta, Ga. 30305
(404) 261-4381

Cyborg Systems, Inc. has released DB2, Rdb and Oracle versions of The Solution Series, Cyborg Systems' client/server-based human resource management system, payroll, benefits and time and attendance software.

ANSI SQL is incorporated, and full support for the functionality of each vendor's relational database management system is provided.

Users can take advantage of native SQL offered by database vendors, or they can use third-party SQL-based tools for analysis, data retrieval, manipulation and presentation.

Prices for The Solution Series range from $50,000 to $360,000.

▶ *Cyborg Systems*
12th Floor
2 North Riverside Plaza
Chicago, Ill. 60606
(312) 454-1865

Data storage

Candle Corp. has announced Omegamon II for SMS, a product designed to monitor, manage and control System Managed Storage (SMS) and non-SMS mainframe environments.

The product provides analysis of a real-time and historical perspective of all storage management issues. Features include complete cache analysis, the storage status adviser, hierarchical storage manager alerts, real-time analysis and an application view of storage.

License prices for Omegamon II for SMS range from $17,000 to $70,000.

▶ *Candle*
2425 Olympic Blvd.
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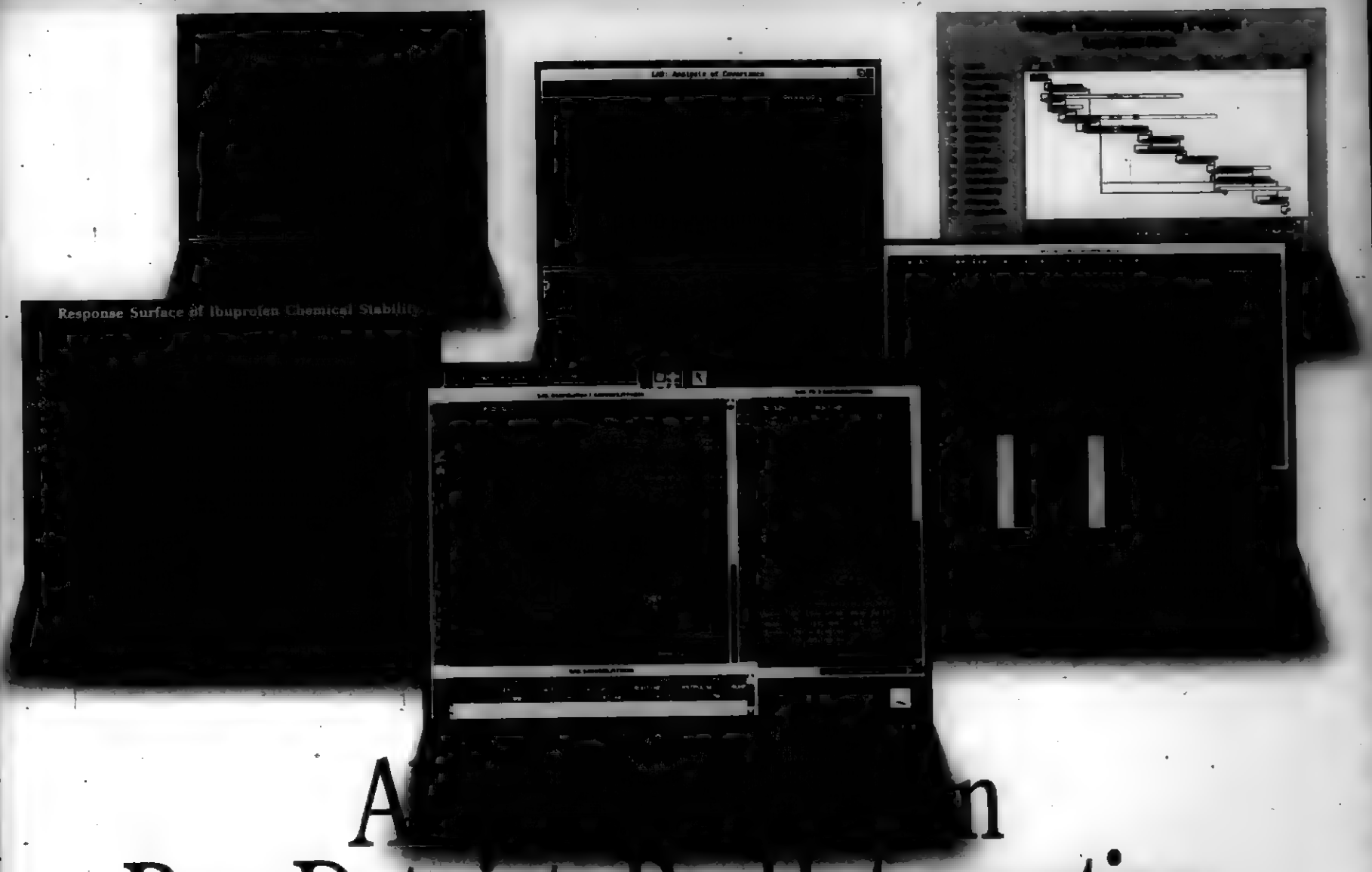

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I found the solution I had been 4ever

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Visual Basic gets boost from add-on

By Melinda-Carol Ballou
REDMOND, WASH.

Sheridan Software Systems, Inc. has begun shipping VBAssist 3.0, an enhanced version of the company's add-on tool for Microsoft Corp.'s Visual Basic programming environment.

VBAssist is a Windows-based program that can be an integral part of Visual Basic, both visually and functionally, by attaching a button bar of tools to the main Visual Basic window.

New with VBAssist 3.0 are features for designing forms for database applications that include drag-and-drop capabilities for linking table columns. Instead of having to update each individual control's data source and data field in the properties window, VBAssist's Data Assistant opens a window showing all fields in the database associated with the data control. The developer clicks on the appropriate one with a mouse.

Using a Form Wizard, this version of VBAssist will automatically generate a database form. Developers can also create and modify table structures and view or modify data for any table. The data access tools in VBAssist work with all databases compatible with Visual Basic's Data Access Engine.

VBAssist 3.0 costs $179.

Garbage in, info out

Waste management firm tracks trash with Progress 4GL

By Melinda-Carol Ballou

Do you know where your garbage goes once the clanging outside your window subsides in the early morning? More importantly, does your waste management company know where it puts your trash?

Poor access to such information has a range of negative consequences, including higher costs to consumers when landfills are run inefficiently.

Enter John Sexton Contractors Co., a waste management company in Hillside, Ill., that used Progress Software, Inc.'s Progress fourth-generation language (4GL) to develop a Waste Management Information System that the company will bring on-line later this month.

The 62-year-old company, which has 18 sites in four states, needed an efficient way to organize data across a range of geographically dispersed systems. The information systems department opted for Progress as a development tool because of its flexibility, portability and ability to run across multiple platforms.

"We acquire other [landfill] companies on a regular basis and must integrate a tremendous number of systems," said Jeff Thompson, manager of IS at John Sexton.

"Progress runs on just about any platform, and the code is easily portable," he added.

ON SITE

John Sexton Contractors Co.
Hillside, Ill.

Challenge: To coordinate data across heterogeneous platforms at multiple landfill sites, medical waste plants, recycling, hauling and transfer station facilities and main corporate offices using only two developers.

Technology: Progress Software's Progress 4GL and RDBMSs running on HP 9000 servers and across PC LANs, initially.

Goal: To cut costs by running the business more efficiently and to address changing federal Environmental Protection Agency legislation.

The waste management software will allow John Sexton to coordinate data across many regional offices. Developed on a Hewlett-Packard Co. HP 9000, the software will allow regional offices to access data that is pooled from local offices using PC local-area networks. The LANs are connected to Unix servers and the Progress relational database management system at the regional offices via Transmission Control Protocol/Internet Protocol. Other server platforms will be supported eventually.

Weighing data

The data is registered at the local landfill, for instance, when a garbage truck arrives at a weigh station. The weigh station operator identifies the owner of the truck and those being charged for the bill as well as the specific waste type.

The operator then presses a button, the truck is weighed, and the operator registers where the waste will be dumped in the landfill. This process requires approximately four keystrokes for standard waste deliveries, Thompson said.

"The idea was to keep it efficient," he said. "There is a whole lot of work happening behind the scenes. Credit agreements may limit particular customers to certain types and volumes of waste, for instance. The parameters of the system may then issue a warning to the operator. Each site is able to customize those parameters."

Progress' flexibility is also important for the company to help it adapt to changing environmental regulations.

Using the waste management software, landfill operators also know where certain wastes are dumped in a landfill. This is important because if those wastes later become categorized as hazardous and require treatment, they can be located.

Access to the landfill also enables managers to charge more effectively for services and analyze compaction ratios by using data such as how much space is taken up by particular types of waste and how rapidly it decomposes.

Access to this data is also helpful for making the most of recycling programs. Managers are able to analyze how much they are paid for a particular commodity, such as aluminum. A medical waste facility run by John Sexton recycles 89% of the paper and plastic wastes brought in, for instance.

The company also refines the methane gas that results from the decomposition process at its landfills and then resells it to utility companies.

"We're able to figure how much we're pumping off. While other landfills burn it off, we use it as a small source of revenue," Thompson said.

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Sid Adelman

Budgets in unreal time

The setting is an off-site planning session for information services. The CIO has been severely pressured by his clients, the division managers, to deliver major new systems and to do so within the next year. The CIO, in turn, pressures his application development managers to commit to unrealistic budgets and unrealistic time schedules.

The application development managers have always had some problems with estimating and have usually been over budget. Now they are being asked to agree to budgets and schedules they know are far too optimistic. They are being told that if they cannot get the job done, someone else will.

Let's assume the application development manager did a diligent job estimating the project. Let's further assume that the manager is experienced and competent at estimating projects and that he did not inflate his numbers with the expectation that lower estimates would be forced on him.

Accepting the forced lower estimates is a lose-lose decision. If he did a good job of estimating, there is little chance that the deflated estimates will be realized. Even if the project is brought in on time and within budget, it will be thought this manager failed. If he agrees to the lower estimates, he is admitting that the original estimates were padded. His ethics are now in question. He is not only a bad estimator but also dishonest.

It is critical to have cost and time budgeted for unexpected contingencies, for the introduction of new technology and for anything that differs from the way the organization has been developing and implementing systems.

While there is no room for change in budget estimates and schedules, there is room for change in deliverables. It may be acceptable to break the implementation into multiple phases. This requires knowing and understanding the following:

1. The dependencies of functions upon each other.
2. Which functions are most important for the end users.
3. External influences such as political factors or a reorganization in a related department.

One response to a request for a lower cost or shorter delivery time might be, "The estimates were based on my understanding of your requirements. Could we prioritize the requirements and determine which should be deferred to later phases?"

A surefire disaster is giving the user some "bells and whistles" without providing the capabilities that are critical to running the business.

CASE tools will probably not lower your up-front costs. CASE tools are not magic. No application manager should expect these tools to improve schedules or budgets, especially on projects for which these tools are being used for the first time. Agreeing to estimates of higher productivity should happen only if the organization has measured and documented productivity improvements.

Additional resources, usually people from within the organization or outside contractors, can impact the schedule but will not reduce the overall cost. Putting more resources on a project usually increases the overall budget.

If estimates are generated with the help and support of the user divisions, there will be less disagreement. The users should also be active participants in setting priorities.

Does this approach mean that the person with the "can do" attitude has no place in this environment? No, but be realistic. The data processing battlefield is strewn with the hulks of failed projects and the bodies of the application development managers who were responsible for those projects.

We should not confuse a positive attitude with a lack of realism that will surely result in a failed project.

Adelman is an independent consultant in Sherman Oaks, Calif. He specializes in application development and data architecture.

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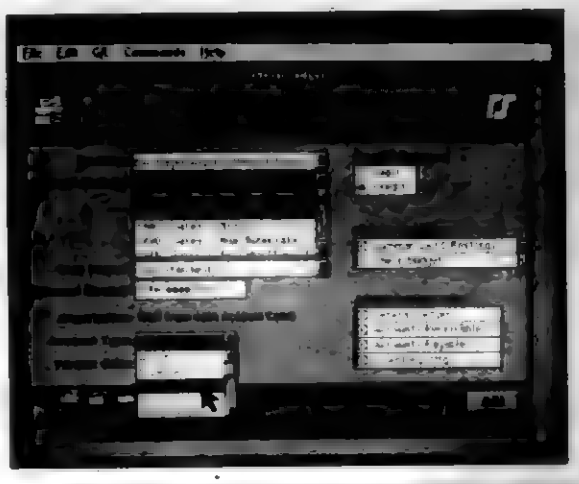

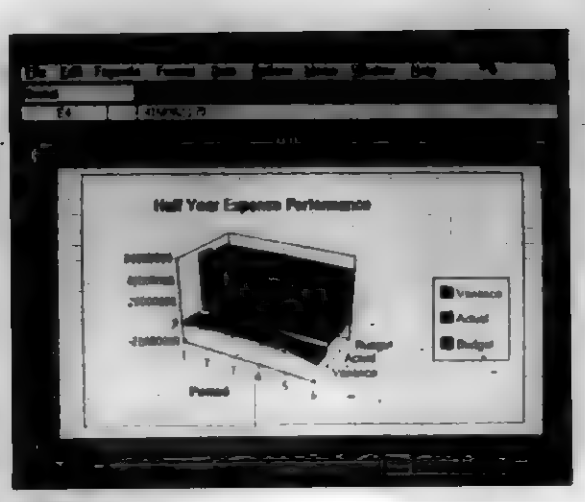

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Red Brick keys in on decision support

Updated Warehouse relational database focuses on large data sets

By Kim S. Nash
LOS GATOS, CALIF.

Red Brick Systems recently announced Version 2.0 of its flagship Warehouse relational database, aimed at firms that frequently analyze large amounts of fast-changing data, such as retailers and banks.

While Oracle Corp., Sybase, Inc. and other relational database makers say their products can handle both decision support and on-line transaction processing (OLTP) activities equally well, 7-year-old Red Brick focuses only on decision support.

Relational databases set up for heavy-duty OLTP cannot shunt that much data around as efficiently as a database designed specifically for that task, said Wayne Kernochan, an analyst at Aberdeen Group, a consulting firm in Boston.

"If a database is optimized for OLTP, then the speed and efficiency of queries for data analysis suffer, and vice versa," agreed Sandra Tucker, MIS supervisor for sales and marketing systems at Playtex Apparel, a division of Sara Lee Corp.

Playtex is about to go live with the first phase of a three- to five-year project to move all its data from an IBM IMS hierarchical database to various relational storehouses. The company decided to downsize from an IBM 3090 mainframe to a string of Unix-based Hewlett-Packard Co. 9000 servers. That meant converting data to a relational structure.

Tucker said she doubted that Oracle could handle the 5G bytes and three fiscal years' worth of sales and marketing data that will run on the finished system. "The things we were hearing [about Oracle] just weren't what we wanted for decision support," she said, referring to a recent internal Sara Lee information systems conference where technicians from all over the conglomerate gathered to discuss computing.

Another division had used Red Brick for more than a year with impressive results, so Tucker decided to follow suit. Oracle databases will be used for distribution and other corporate data, in a separate conversion project, she explained.

Ideally, Red Brick wants to co-exist peacefully with Oracle and Sybase, leaving OLTP to them. "We're meant to do different things," said Christopher Erickson, Red Brick's president and chief executive officer.

But Erickson acknowledged he is having a hard time fighting the marketing machines of larger relational DBMS makers that want to be all things to all users. To help differentiate Warehouse 2.0 from rivals, the following features were added:

- Incremental backup and restore functions to manipulate very large amounts of data quickly. Tests of a 75G-byte database showed that Warehouse 2.0 was able to process 1G byte of data per hour.
- Extensions to Red Brick's query language, called RISQL, and a report writer to rank and compare sales data, for example, year-to-year.
- Customizable stored queries to let users save the formulas for frequently used questions so they do not have to be rewritten every time.

Also available with Warehouse 2.0 are consulting services to teach users how to use the product as well as how to design databases honed for specific departments or types of queries.

The product is installed at about a dozen sites, with eight users in production, Erickson said. The average Red Brick database in production contains 10G bytes of data, he said, adding that some customers range up to 100G bytes.

The product has been in beta testing since March and is slated for general availability at the end of this month.

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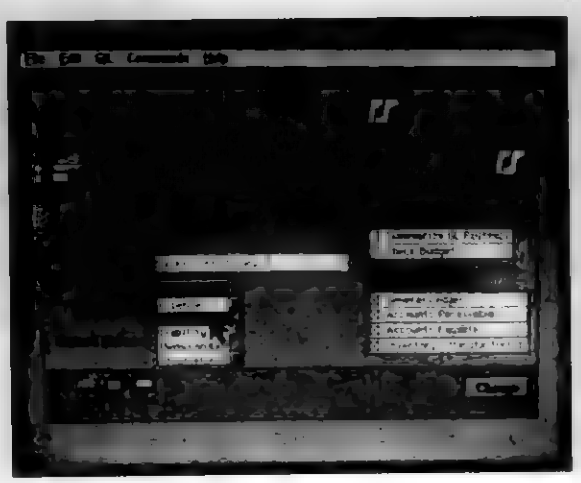

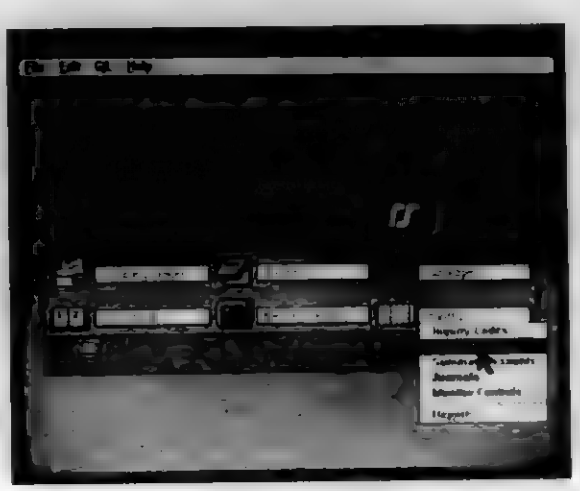

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Reverse-engineering

Interactive releases products for Ada

By Melinda-Carol Ballou

Interactive Development Environments, Inc. earlier this month released Design Generator for Ada and the latest releases of complementary products, Object-Oriented Structured Design/Ada (OOSD/Ada) and the Code Generator for Ada.

With these products, developers will be able to take existing Ada software and automatically reverse-engineer it into reusable designs and federally compliant 2167A documents, company officials said.

The Design Generator for Ada reverse-engineers existing Ada source code into the Ada Development Environment, creating both design diagrams for OOSD/Ada and notation for Ada and Data Structure diagrams. The generator is integrated with a reuse library and catalog that lets users create their own corporate reuse libraries from existing systems. It is also integrated with a document preparation system, which offers templates to provide documentation that is compliant with the U.S. Department of Defense's DOD-STD-2167A standard.

OOSD/Ada Release 1.3 includes accelerator keys, and the enhanced Code Generator for Ada offers performance increase of at least 10%, according to company officials.

The products currently run on Sun Microsystems, Inc. SPARCstations. The typical cost for a 10-user system, which includes eight floating licenses for OOSD/Ada, two licenses of the Code Generator for Ada and one license for the Design Generator for Ada, is $7,300.

Tools ease OOP use

Ilog offers problem solver, libraries of objects and rules

By Melinda-Carol Ballou

Ilog, Inc., a newly established U.S. subsidiary of Paris-based Ilog, announced a series of C++ tools that facilitate the use of object-oriented programming (OOP).

Ilog Views is a library of reusable and extensible graphics objects that augment traditional graphical user interface builders, allowing the display and manipulation of complex data. Ilog Views separates visual aspects of the object from its behavior to offer class reusability.

Ilog Views offers drawing primitives, graphics objects, view managers and advanced object modules.

It also provides a single application programming interface across standard windowing environments such as Windows, the Open Software Foundation's Motif and Sun Microsystems, Inc.'s OpenLook.

Ilog Solver is an object-oriented, constraint reasoning tool for solving complex reasoning problems such as scheduling, configuration and management. It searches for the most economical solution among a very large number of possibilities and dynamically adapts the solution as changes occur to data, officials said.

Problems addressed by Ilog Solver deal with finding the best allocation of resources, such as people and machines, subject to a set of constraints, such as time and availability.

These sorts of problems have traditionally been solved by generating all possible branches of a search tree, officials said.

Features of Ilog Solver include an object-oriented architecture for expressive modeling and implementation; the propagation engine; complete separation between modeling and solving strategies; reusability and extensibility of models, constraints and solving algorithms.

Ilog Rules is a library for embedding business rules into standard applications. With Ilog Rules, developers can automatically generate C or C++ code from an existing rules knowledge base. Ilog Rules' inference engine is a 90K-byte library that processes objects of the target application at a rate of 10,000 rules/sec.

Features of Ilog Rules include inferencing on native application objects without changing or duplicating existing code; customizable rule engine; and automatic C or C++ generation.

Ilog products are shipping now on Unix workstations and are priced at $5,000 for Ilog Views, $20,000 per license for Ilog Solver and $10,000 for Ilog Rules. The products will ship shortly on PCs.

[redacted]

Application development tools

Cortex Corp. has announced CoreVision 5.1, an application development tool that automatically generates full-scale commercial production applications to run in a client/server environment.

CoreVision is an application generator for Digital Equipment Corp.'s VAX/VMS environment.

This version enables users to develop applications from DEC's OpenVMS VAX servers and from Version 3.0 or higher of Windows clients, automatically generating source code for both platforms, the company said.

From the same design specification, CoreVision 5.1 can produce terminal/host and client/server applications.

Pricing begins at $30,000.

▶ *Cortex*
100 Fifth Ave.
Waltham, Mass. 02254
(617) 622-1900

IntelligenceWare, Inc. has started shipping Version 1.1 of Iconic Query.

According to the company, Iconic Query is a What-You-See-Is-What-You-Ask query approach. Instead of using a query language, users can point to and click on visual scenes.

Several new functions have been introduced including the use of icons, hypertext and three-dimensional data graphics for database access.

Iconic Query 1.1 has a report writer feature that acts like a word processor, enabling form-based reports and labels to be produced from within the program, the company said.

An executive information system feature, SQL union operations and parameterized queries are also featured.

Iconic Query 1.1 is available on IBM PCs and compatibles for $290, which includes Borland International, Inc.'s Paradox and dBase drivers.

▶ *IntelligenceWare*
5933 W. Century Blvd.
Los Angeles, Calif. 90045
(310) 216-6177

Computer-aided software engineering

Unisys Corp. has announced Linc Development Assistant III (LDA III) software, an integrated computer-aided software engineering product for the rapid development of software solutions.

According to the company, the software integrates graphical analysis and design with development and testing tools on desktop solutions, providing the entire development life cycle with automated support.

From a single set of high-level specifications, the product can produce complete software solutions such as business logic, transaction manager, database and network and user interfaces.

LDA III costs $12,000 per license on a single-user basis. Site licenses costs $154,000.

▶ *Unisys*
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Code libraries

EMS Professional Shareware has started shipping the fifth edition of VBasic Library on CD-ROM or 10 1.44M-byte disks.

The collection offers 371 Microsoft Corp. Visual Basic programs, utilities and various file collections selected for Visual Basic users.

A directory database is provided. The directory can be searched by product name, vendor, type, full text search and release date. Several types of products are listed within the directory, such as data access, database, disk utility, graphics, icon utility, file compression, program utility and more.

The library costs $59.50 on CD-ROM or disk.

▶ *EMS Professional Shareware*
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

Compilers

Irvine Compiler Corp. has announced the ICC Ada/i960MX, a complete Ada software development environment for Intel Corp.'s i960MX microprocessor.

The product incorporates the standard features of a complete Ada compilation system with a code generator, code optimizer, an Ada compiler and an archiver.

According to the company, the ICC Ada/i960MX features a Profiler, an Ada Software Simulator and a Symbolic Debugger that offer a full system debug environment for the target hardware and for the host system.

Prices for the ICC Ada/i960MX Ada software environment start at $36,000.

▶ *Irvine Compiler*
Suite 270
34 Executive Park
Irvine, Calif. 92714
(714) 250-1366

Product shorts

Speech Systems, Inc. has released SPOT/VBX, a custom control facility designed to simplify the addition of speech recognition features to software applications developed using Microsoft Corp.'s Visual C++ development system for Windows or the Visual Basic programming system. The product is available with the Speech Systems PE400 System Development Kit (SDK), software tools that build speech recognition applications. Cost: $1,495 for The Speech Systems PE400 SDK. Speech Systems, Boulder, Colo., (303) 449-0481.

Integrated Computer Solutions, Inc. has introduced Builder Xcessory Version 3.0, a graphical user interface builder. The product provides full Open Software Foundation Motif 1.2 and internalization support and fully integrates C++ object-oriented programming with Open Software Foundation/Motif application development. The product is available on Silicon Graphics, Inc. platforms and SunSoft, Inc.'s Solaris platforms. Cost: $3,200. Integrated Computer Solutions, Cambridge, Mass., (617) 621-0060.

Virtual Technologies, Inc. has released Version 1.4 of the Sentinel debugging environment for Unix C, C++ and X Windows users. This version offers additional reports, detects more types of errors and debugs programs faster, the firm said. Cost: $395 to $995. Virtual Technologies, Dulles, Va., (703) 430-9247.

RECENTLY, SOME HAVE REFERRED TO LOTUS 1-2-3 AS SOMETHING OF A SLEEPING GIANT.

LOTUS INTRODUCES 1-2-3 RELEASE 4 FOR WINDOWS.

THIS IS CLEARLY A TIME OF CHANGE FOR AMERICAN BUSINESSES.

To keep up with these changes, and the new ways of working they demand, business people need new and better-suited tools. Lotus® has responded by rethinking and re-creating the spreadsheet as a tool for individuals and for workgroups. 1-2-3 Release 4 incorporates over 4,000 spreadsheet user suggestions. It's dramatically easier to learn and use than any spreadsheet in history. It's much more powerful and productive. And it's the first spreadsheet that's actually designed to help people work together in impressive new ways.

THE FIRST CONTEXT-SENSITIVE USER INTERFACE.

Release 4 actually anticipates what tools and functions you'll need. Depending on what you're doing, 1-2-3 presents only the menu choices and **SmartIcon**™ palettes appropriate to the operation at hand.

Since the features you need are always easy to find and remember, you won't spend time clicking through menus looking for them. They're where you want them when you need them.

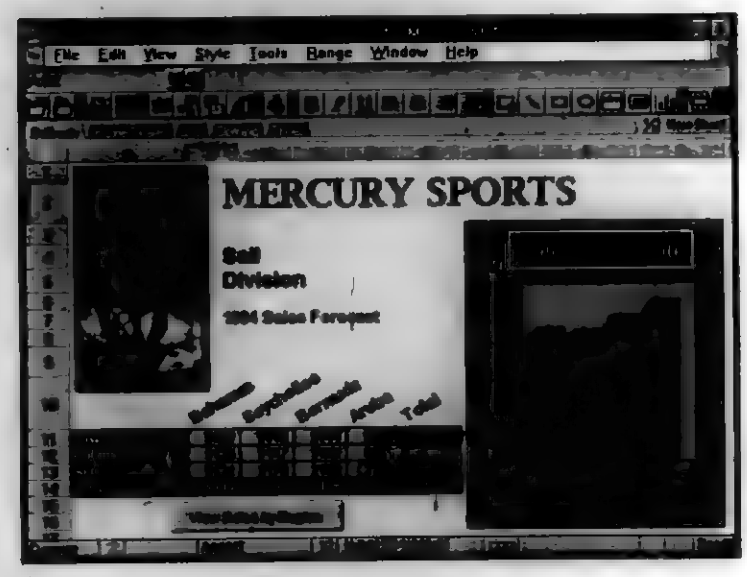
FEE. FI. F

IT'S MORE POWERFUL BUT VERY SIMPLE.

While adding dozens of major new features, hundreds of macros and hundreds of tools and @ functions, Lotus has actually simplified the way you work in a spreadsheet.

The open-handed mouse pointer closes when you grab the cell.

For example, Release 4 features an @ function pull-down menu to help you build spreadsheets faster. Cell copying is now a simple drag-and-drop operation, with meaningful visual feedback. And changing text and font attributes is done in one dialog box. (Excel often requires three.) So 1-2-3® is not only a lot friendlier and easier to use than any other spreadsheet, it's a significant advance over Microsoft® Excel in usability.



"The SmartIcons in 1-2-3 for Windows are smarter, and Lotus' approach to swapping different toolbars in and out beats Excel's and Quattro Pro's."
–PC Computing 6/93

IMMEDIATE ON-SCREEN MANIPULATION.

A **Live Status Bar** on screen shows the attributes of any highlighted element.

To make a change (like font, size or decimal points) you just click on the appropriate section of the status bar. Then scroll up to your chosen attribute and click again.

And unlike Excel, 1-2-3 R 4 includes

In-Cell™ Editing, so you can literally work *in* your spreadsheet. There's no need to go to the control panel. You can enter and edit any information right in the cell.

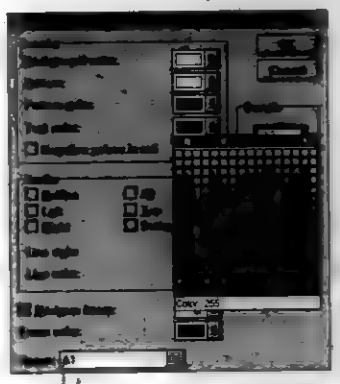
And you can go directly to any named range on any page simply by clicking on

> *Lotus 1-2-3's in-cell editing feature... is such an obvious and natural way of working...*
> *–PC Week 5/3*

the name in the exclusive **Navigator** menu.

ONE-STEP CHARTING.

With **One-Step Charting**, you can pick up all titles, data, legends and axis labels right from the worksheet to create a great looking chart the first time, automatically. No need to launch into some five step, semi-connected charting wizardry with its own set of commands just to edit a simple chart. And you can edit the chart right in your worksheet because all elements can easily be selected and manipulated directly. And you can even choose from 256 colors.



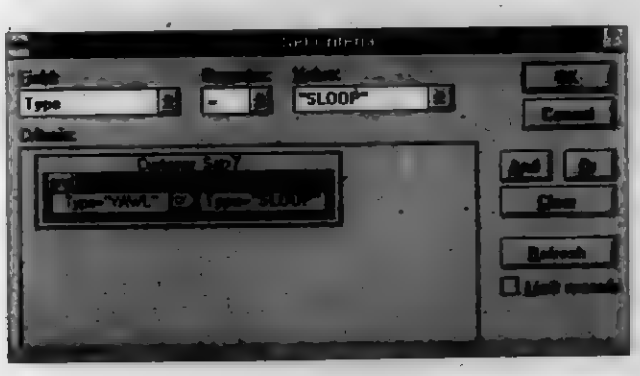
NAVIGATE THROUGH 3 DIMENSIONS.

Anyone who works on multiple worksheets will appreciate the new 1-2-3 **Worksheet Tabs** which can be labeled with real words. So you can go directly to any sheet simply by clicking on the appropriate tab.

And Worksheet Tab names are then incorporated into formulas. All of which helps to keep 1-2-3's unique 3D technology simple and easy to use.

DATABASE FUNCTIONS MADE EASY.

The 1-2-3 database now has a new, completely graphical interface that makes using it significantly easier. Plus 1-2-3 provides a range of built-in tools that are powerful without being perplexing.



For example, to modify or create a query, you don't generate criteria and output ranges with cryptic commands. Just bring up the Query Dialog Box and select the fields and records by name. Changing your query is as simple as drag-and-drop.

> *1-2-3 for Windows has always had more powerful database features than Excel or Quattro Pro, and now these features are also easier to use.*
> *–BYTE 6/93*

With DataLens® drivers for dBase IV,® SQL Server, Informix, OS/2® Data Manager, Paradox® and more (including ODBC support), 1-2-3 is the first spreadsheet that provides a completely integrated model for directly querying both on-sheet and external databases.

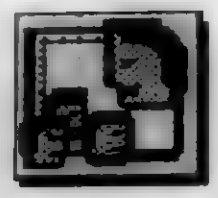
THE SMOOTHEST PATH FROM DOS TO WINDOWS.

If you're ready to make the move from DOS to Windows,™ 1-2-3 Release 4 is the way. It includes the traditional 1-2-3 ("/") **Classic® Menu** as well as complete file, style and macro compatibility with your DOS version.

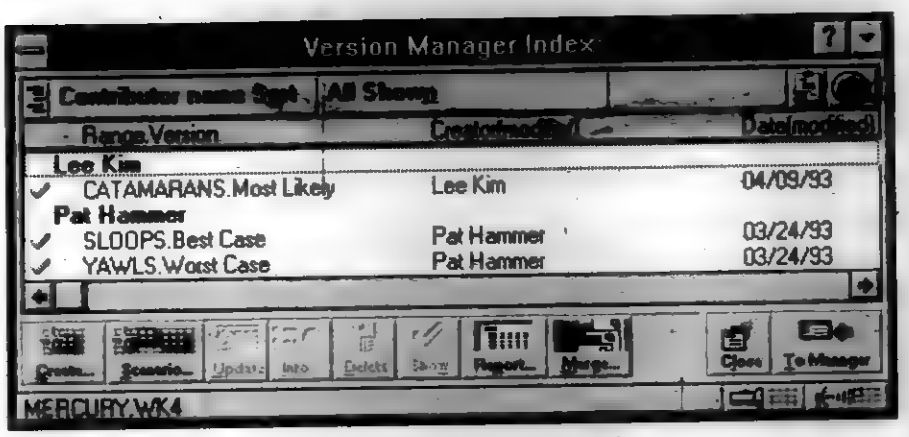
And if you're networked, just turn the page and you'll see why the best spreadsheet for you is the only spreadsheet for your workgroup.

O. FUM.

THE FIRST SPREADSHEET FOR WORKGROUPS.



With 1-2-3 Release 4, Lotus transforms the spreadsheet into the powerful workgroup tool people have needed.



you integrate it into your work?

You use our innovative **Version Manager,** that's how. Version Manager tells you who did what when, and why they did it. It lets you save, label, track, mix, match, merge and comment on ranges, worksheets or entire files in ways that make sense to you. And it does it all without overwriting existing data.

In fact, whenever a new version is created, 1-2-3 automatically "stamps" the version with the user's name and the date and time it was created.

IT'S NOT JUST A NEW VER

Combining the analytical power of 1-2-3 with workgroup features, users can now share spreadsheet insights and information and collaborate in ways never before possible.

VERSION MANAGER MAKES WORKGROUPS MAKE SENSE.

Ever forgotten why you used a particular number? Or wanted to track more than one value in a cell or range?

> *"Version Manager is a natural way to extend single-user what-if tasks of traditional spreadsheets to the workgroup. It also makes Microsoft Corp.'s Scenario Manager in Excel 4.0 look like a toy by comparison."*
> *–PC Week 5/3*

Or suppose you've sent a spreadsheet to a co-worker who develops a whole new version and sends it back. How do you integrate it into your work?

You use our innovative **Version Manager,** that's how. Version Manager tells you who did what when, and why they did it. It lets you save, label, track, mix, match, merge and comment on ranges, worksheets or entire files in ways that make sense to you. And it does it all without overwriting existing data.

In fact, whenever a new version is created, 1-2-3 automatically "stamps" the version with the user's name and the date and time it was created.

1-2-3 MEETS LOTUS NOTES. TOGETHER, THEY CHANGE EVERYTHING.

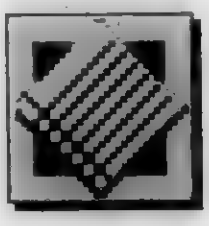
This is the way people ultimately want to work. Not just together. Concurrently.

If you have Lotus Notes,® the workgroup benefits of the new 1-2-3 take on even greater proportions. Besides utilizing the impressive workgroup power of Notes, there are specific Release 4 features that synergize to offer significant business advantages. Here are just a few.

Now different users can access and work on the same spreadsheet at the same time. Notes maintains file integrity and notifies you of changes made by others. So you know you're using the right numbers.

Notes also features replication. This means that even if you're disconnected from the network while you travel, you can stay up-to-date and still participate fully in the spreadsheet sharing process when you reconnect.

To maintain security and integrity, users can create access lists and grant varying privilege levels on a per-user basis.



And all this comes standard as part of the new 1-2-3 Release 4. No add ons, customizations or new application development is necessary.

WORKING TOGETHER IN SUPPORT OF INDUSTRY STANDARDS.

1-2-3 R 4 supports object-linking and embedding technology for both clients and servers. This enables users to display data from a 1-2-3 spreadsheet into any OLE client application such as a word processor or presentation software. 1-2-3 also complies with VIM and MAPI standards so it works with cc:Mail,™ Lotus Notes or any other VIM- or MAPI-compliant mail system installed on your computer. So you can send a worksheet, a range or an entire file as an e-mail message to another user.

All without ever having to leave 1-2-3.

> *The new release is fantastic. There's really nice integration using the (Object Linking and Embedding) functions with other applications.*
> *–Stacy Myers in Computerworld 5/10/93*

THIS IS THE BIG ONE.

> *1-2-3 leapfrogs Excel and Quattro...*
> *–PC World 6/93*

Lotus 1-2-3 Release 4 is here. Now. And because it's network ready, one box is all it takes to upgrade all your users, whether they're working off a server or their own PC.

A FEW OF THE SPREADSHEET ENHANCEMENTS REQUESTED BY OUR USERS.

120 new @ functions (engineering, statistical, financial, calendar, informational, mathematical)
16 Designer Frames
256 color choices
64 fill pattern choices
250 new macro commands
Animated tutorial
AutoSave option
Center text over a range
Charting of 23 data points
Clean screen elements
Column, row and worksheet selection
Cross Tab
Customizable data fill
Define column aliases for database queries
Discontiguous range selection and charting
Displays up to five most recently opened files
Easier computed columns and rows
Enhanced Help system
Enhanced macro transcript
Escape from Help
External connections stored with query
Fill down, fill right
Floating, wrapping text boxes on sheet
Gradient fills
Group draw items
Help icon in dialog boxes
Icons in page setup
Interactive print preview
Justify labels and values left, right, center
Keyboard shortcuts
Long prompt text feedback in title bar
Lotus shared dialog box editor
Macro buttons on sheet
Named SmartIcon sets
New chart types
Numeric format WYSBYGI dialog box
Numeric up/down "clicker" on number fields
Partial insert/delete of rows and columns
Post selection from all range controls
Pre-built dialog boxes for application development
Print range stored in print settings
Print to fit columns
Print to fit rows
Print to fit page
Print to fit chart
Print charts directly
QuickMenus (context-sensitive right mouse-button menus)
Reads XLS spreadsheet files
Rotate cell contents up to 90 degrees
(Send-SQL) macro command
Shared dictionaries (across Lotus apps.)
Shows file links in dialog box
SmartIcon bitmap editor
Spell checker
Style gallery containing predefined style templates
Text wrap in edit line
True on-sheet draw layer
Vertically centers text within a cell
Windows-common dialog boxes
Wraps multiline text in a cell
"+" or "=" sign to start a formula automatically converts to "@" formula
@ function arguments supplied
(A more detailed list available on request.)

SION. IT'S A NEW VISION.

Call 1-800-TRADE UP, ext. 8858; for a free demo disk or to order your upgrade for just $119 direct from Lotus. Or visit your Lotus Authorized Reseller.

Lotus 1-2-3 Release 4
SPREADSHEET FOR WINDOWS

*Upgrade to 1-2-3 Release 4 for just $119 direct from Lotus.**

1-2-3 IS BACK. AND IT'S NOT ALONE.

Lotus 1-2-3 Release 4 is joined by a full complement of the most powerful, easiest-to-use business applications ever available to Windows users. That's not our claim, or an opinion. It's a statement borne out by users, reviewers and publishers every day.

Lotus Ami Pro® is consistently rated the best word processor for Windows. Well ahead of both Word and WordPerfect.®

For the last two years, Lotus Freelance Graphics® has dominated both Harvard Graphics® and PowerPoint® for power as well as ease of use.

Lotus cc:Mail is the acknowledged world standard for electronic mail. Which explains why cc:Mail is used by 3 million people worldwide.

Lotus Organizer™ is rated best in the PIM category.

And Lotus Notes is the talk of the industry, redefining workgroup computing in practical ways that upgrade vital business processes.

All these Lotus Windows applications look, feel and work together like they were made for each other. Because they were. With only one user interface to learn. Common SmartIcons that work across applications. Seamless transport of data and charts between applications. And one spell-check dictionary that works across these applications.

RUN FOR IT.

Working Together™ is now a reality. And it comes in a box called Lotus SmartSuite.™

Packaged together with Ami Pro, Freelance Graphics, cc:Mail, and Lotus Organizer, 1-2-3 Release 4 completes a suite of advanced Windows applications that's years ahead of any competition.

For a limited time you can upgrade to SmartSuite 2.0 from any Lotus or competitive product** and receive a $50 rebate direct from Lotus. And remember you can upgrade to 1-2-3 Release 4 for just $119, direct from Lotus. Just call **1-800-TRADE UP, ext. 8858.*** Or run to your Lotus Authorized Reseller.

*Get all five award-winning Lotus Windows Applications plus a $50 rebate.** direct from Lotus.*

Lotus 1-2-3 Release 4
SPREADSHEET FOR WINDOWS

*In Canada call 1-800-GO-LOTUS. Please have your credit card and product package ready when you call. **Offer expires 8/31/93. Qualifying competitive products are: Microsoft Excel, Borland Quattro Pro (not including SE), Microsoft Word, WordPerfect, WordStar, Displaywrite, Microsoft PowerPoint, Harvard Graphics, Corel Draw, WordPerfect Presentation, Aldus Persuasion. Qualifying Lotus products include: 1-2-3 (excluding 1-2-3 for Home) Symphony, Ami Pro, Freelance Graphics, Graphwriter and ccMail.*

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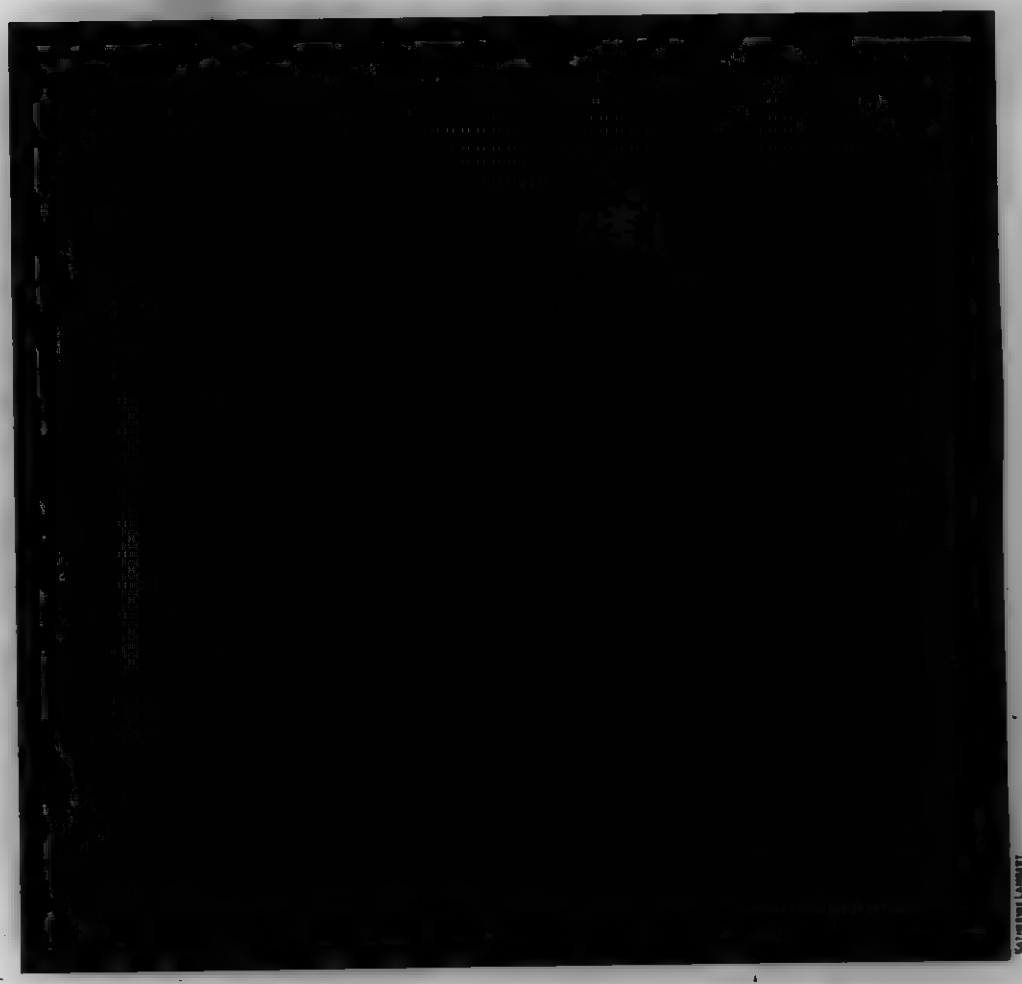
Insecurity complex

CORPORATE LAYOFFS BRING THE FEAR OF EX-STAFFERS USING COMPUTERS FOR REVENGE. HERE'S HOW TO PROTECT YOUR COMPANY.



BY JAMES DALY

Sabotage isn't new. Only the motivations change.

With many financially strapped organizations in the throes of staff reductions, information systems managers and security professionals have a new beast on their hands.

"When jobs are eliminated, computer systems are frequently seen as a great place to take out your revenge," says Charles Cresson Wood, an independent security consultant in Sausalito, Calif.

Security experts say IS managers should take preventive measures to keep disgruntled employees from seeking revenge on the source code.

"Prevention and preparation will save you every time," says Sid Diamond, an independent security consultant in Stevenson, Md., who served as vice president of worldwide information services at Black & Decker Corp. during several staff reductions.

Experts say people are a company's greatest resource, but they can also be its greatest risk. If computer security is lacking during a major staff downsizing effort, the consequences for IS security personnel can be both embarrassing and damaging.

Wood recounts the case of a computer systems manager who was released from a Florida newspaper and later took a position at a competitor. Shortly thereafter, the management at his original newspaper couldn't understand why its competitor kept beating it with stories on which they expected to have an exclusive.

An examination of computer logs revealed that the account of the de-

Insecurity complex, *page 94*

ENTERPRISE MANAGEMENT

Managing Change and Complexity

Two opposing forces in modern business are on a collision course: the need for specialized, localized hardware and software solutions, and the need to cost-effectively unite those information resources into a manageable business asset.

As IT managers respond to this challenge, they must cope with explosive growth in the number and diversity of devices and systems. Enterprise systems are becoming profoundly more complex.

Organizations today have a mixture of older, centralized systems and new, distributed systems—a wide variety of technologies provided by an even larger number of vendors.

The challenge is managing this diverse collection of resources. The nature of the problem requires a "best-of-breed" multi-vendor solution.

That's why the leaders in information technology listed here are committed to creating and providing Enterprise Management solutions.

What Is Enterprise Management?

Enterprise management is a strategy for integrated monitoring, measurement and control of multi-vendor networks and computer systems to serve enterprise business needs. It is a technological framework into which multiple management tools, applications and displays can fit, providing end-to-end management of network elements and resources.

Enterprise management requires an organizational commitment to, and consensus on, a common open management platform and a set of open management standards for use throughout the enterprise.

The Benefits

Implementing an enterprise management strategy provides considerable benefits:

▶ Continuously high levels of reliable and responsive service.

▶ Smooth incorporation of new client-server solutions with existing mainframe approaches. Your investment in existing mission-critical applications is preserved and augmented.

▶ Change and increasing complexity can be accommodated more quickly, without jeopardizing system and network availability.

▶ Greater optimization of network and system resources ensures high quality service is maintained at the lowest possible cost.

▶ Automation of management processes allows systems administration and operational costs to reduce steadily as your enterprise grows.

▶ Network and data security is enhanced.

What You Can Do Today

To achieve the benefits of enterprise management, take these steps:

▶ Develop organizational consensus on a strategy and on a management platform:

- working with your key vendors and carriers, develop a strategy for implementing this enterprise management architecture within your organization.
- establish purchasing guidelines that all parts of your organization can follow so that their evolving information systems can fit into the enterprise management approach.

▶ Select a common open management platform for use across your enterprise that:

- enables management of products and services from multiple vendors.
- is standards-based.
- enables integration of management tools and applications from multiple vendors.

▶ Review existing management tools and interfaces and prioritize upgrades that move the organization toward enterprise management in the most cost-effective and rapid manner possible.

▶ Favor distributed and object-oriented management solutions.

▶ Use management solutions that incorporate open management standards such as the Simple Network Management Protocol (SNMP), the Common Management Information Protocol (CMIP) and the OSF's Distributed Management Environment (DME).

▶ Automation is a key element in effective enterprise management. Move toward "self-managed" systems.

▶ Require the use of open management protocols in new information system purchases and deploy open management protocols in existing network elements, distributed systems and vendor-specific management systems.

Contact the leading vendors listed here. They can provide you with additional information on the enterprise management strategy that's right for your organization, and the products and services you need to implement it.

SOURCES OF ENTERPRISE MANAGEMENT SOLUTIONS

These industry leaders have come together to promote the business benefits of an Enterprise Management Strategy. They can be contacted directly or by using the reply card below.

The Partnership Legend illustrates relationships that have formed to provide these complex, multi-vendor solutions.

The Management Solutions Legend denotes some of the types of products and services each of these vendors contributes to a complete solution.

CiscoWorks — a comprehensive series of SNMP-based router management applications — enables users to easily manage, monitor and administer Cisco internetworks. 1-800-553-NETS

IBM and the International Alliance Members lead the way in solving customers' management problems today, delivering SystemView conforming products, offerings and services. Call us at 1-800-IBM-6676 (x685)

OpenVision products and services overcome the barriers to deploying production applications in distributed environments by addressing operations, performance, storage and security. 1-510-426-6400

Technically Elite Concepts offers fully integrated LAN & WAN monitoring hardware and software applications with RMON based Ethernet and Token Ring solutions. 1-800-659-6975

COMDISCO SYSTEMS, INC

BONeS® family of graphical simulation software tools to design, analyze, and predict the integration and expansion of Enterprise Networks. 1-415-574-5800.

InterConnections

Leverage for NetWare integrates NetWare LANs and VAX/VMS systems, providing File Sharing Services, Network Print Services, and Terminal Emulation Services (TES). 1-800-950-5773

PLATINUM TECHNOLOGY

PLATINUM technology offers a complete set of software tools and utilities for DB2, CMF, and other IBM databases, as well as innovative client/server tools. 1-800-442-6861

Ungermann-Bass

Ungermann-Bass, the leading global enterprise network innovator, is the dominant supplier of network management software and high-end intelligent hubs. 1-800-777-4LAN

American Power Conversion

APC is the leader in power protection for networks. APC solutions include: UPS systems, automatic shutdown and monitoring software, and remote management via SNMP. 1-800-800-4APC

Data General

Providing the tools to build your enterprise management foundation. For information, call your local Data General sales office or 1-800-DATA GEN.

JBL's X-Server, developed to manage and monitor ChatterBox systems in a Novell network, can be accessed from any SNMP management station. 1-818-709-1778

SNMP Research

Produces a family of network management products based on SNMP, SNMP Version 2, and other protocols including agent and network management station source code. 1-615-573-1434

UNISOL Site Management Utilities perform system and network management, security auditing, backup and restore, performance monitoring and resource accounting charge back. 1-310-542-0068

ACD

ACD provides UNIX software platforms to deliver integrated applications for the 5 Specialized Management Functional Areas: Fault, Configuration, Performance, Security and Accounting. 1-812-232-6051

DEMAX SOFTWARE

With SecureMan and System Detective, DEMAX Software is the market leader in providing centralized security management solutions for networked UNIX and VMS environments. 1-800-283-3629

LANDMARK

The leader in enterprise performance management for IBM mainframe and multi-platform UNIX environments. Our products are integrated through a unique client/server architecture.1-800-488-1111

SSDS

The DESC, SSDS' enterprise-wide system management architecture, integrates heterogeneous net management platforms /software/applications, providing truly distributed systems management. 1-800-NET-DESC

UNIX

Distributed Manager™ solves the problem of managing users, software, printing, data backup and the myriad of administrative tasks across distributed systems. 1-800-828-UNIX

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ascom Timeplex

Unified architecture, intuitive management, and global support for robust enterprise networks that are simple to install and easy to operate. 1-800-669-2298

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digital

POLYCENTER solutions provide open multi-vendor system and network management. From UNIX to Windows NT, NetWare to OSI, Digital delivers integrated management. 1-800-332-INFO ext. POLY

NetLabs

NetLabs is the leading independent supplier of standards-based network management solutions providing management platforms, development environments, and integrated applications. 1-800-447-9300

SunConnect

SunNet Manager and the largest number of third party management applications available, provide system managers with distributed management solutions for complex heterogeneous networks. 1-800-241-CONX

WOLLONGONG

Wollongong's PathWay networkin, products give users of desktop computers access to computing resources over any departmental LAN or corporate network. 1-800-872-8649

Cabletron Systems

SPECTRUM is Cabletron Systems' protocol independent management system for proactive monitoring and control of multi-vendor, enterprise-wide networks. 603-332-9400

EcoSystems Software, Inc.

EcoSystems provides integrated systems management software for client-server computing. Manage relational databases, UNIX computers, and networks from a central console. 1-800-368-4ECO

NETWORX

The critical first step in Enterprise Management is problem control Paradigm automates your workflow process, providing an effective resolution strategy. 1-206-646-1898

Sun

As part of the COSE specification, Federated Services integrates enterprise-wide naming, filing, security services and networking in heterogeneous environments. 1-415-336-6755

Technical Consulting Resources, Inc.

Developing enterprise wide network and system strategies and architecture to help users and vendors create dynamic competitive advantage. 1-617-570-0780

COMPUTERWORLD

The weekly newspaper for Information Systems, delivering news, application information and product reviews for IS professionals responsible for implementing new technologies in their organization. For subscriptions call 1-800-669-1002

Candle

Making systems perform with OMEGACENTER open enterprise management with OMEGAMON® analysis, OMEGAVIEW® status displays, and Automated Facilities™. 1-800-332-3235

Fibronics

Fibronics provides InterView NMS for enterprise network management; PowerMill development toolkit for integrating third party SNMP devices, and intelligent hubs and FDDI solutions. 1-800-327-9526

NOVELL

NetWare Management System for multi-vendor networks provides an integrated, scalable, system using Novell and third party developed management applications. 1-800-554-4446

SynOptics

SynOptics provides customers with powerful distributed solutions for managing intelligent hub-based enterprise networks running Ethernet, Token-Ring, FDDI or ATM. 1-800-PRO-NTWK

NM Forum, a consortium, sponsors OMNIPoint, a multi-technology, multi-domain blueprint for end-to-end service management of LAN/WAN Networked Information Systems. 1-908-766-1544

The Open Software Foundation is a non-profit software research and development organization working to further open systems development and adoption. Call OSF Direct Channels, 1-617-621-7300.

CHIPCOM

Our fault-tolerant intelligent switching hubs and other networking products are specifically designed for facility networks — building or campus wide — without failure or downtime. 1-508-460-8900

HEWLETT PACKARD

HP and HP OpenView Solutions Partners deliver 180 integrated management solutions that give you management control of the networked systems in your enterprise. 1-800-637-7740

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Insecurity complex

CONTINUED FROM PAGE 91

parted systems manager had never been turned off. He had repeatedly accessed the original employer's computer to get information about the stories in progress.

As the economy continues to batter corporate America, security managers say, such cases will happen more often.

Dan Poulin, director of operations technologies at Bedford, Mass.-based Millipore Corp., says as job security grows thin, so does company loyalty. "There is no such thing as a guaranteed lifetime job anymore," Poulin says. Millipore underwent a three-year effort to consolidate three data centers. "Economics no longer afford that guarantee," he says.

IS managers and security consultants who have gone through the wrenching exercise of downsizing say the following tips can save face — and data.

PREPARE EARLY

Security chiefs also advise looking out for troublemakers early on. Virginia Hockett, information technology manager at 3M Co.'s Memory Technology Group, says security personnel must keep a sharp eye and ear out for early signs of trouble.

"As soon as you get a whiff that there may be staff cuts, get to the bottom of the rumors," says Brian Redler, director of security and operations at National Securities Clearing Corp., a financial services firm in New York. "If it's true, you're going to be faced with a very chaotic situation, and the last thing you want is to be unprepared for chaos."

Computer viruses, for instance, can enter any system unintentionally. But if you start getting them by the boatload, look out. Hockett says, "If computer viruses are cropping up at your business, shouldn't you be asking employees how they feel about their job?"

Unfortunately, these early warning flags are often the exception rather than the rule. Such was the case at The Coca-Cola Co.

"The security people were the last ones to come into the loop," says Cheryl Currid, president of consultancy Currid & Co. in Houston and director of information technology at Coca-Cola for eight years.

The omission — or late addition — of the security team in the downsizing equation can have damaging consequences, especially when workers feel they have not been treated fairly and are facing the prospect of unemployment.

The result is that the hours following the announcement of a reduction in staff are confused and disorderly — a situation that security professionals say can be easily avoided.

TREAT DEPARTING WORKERS WITH RESPECT

"Make sure the workers know the terminations are due to economic difficulties and are beyond management control," says Fritz Wagner, manager of corporate electronic information security at Du Pont Co., which has undergone major staff reductions the past several years.

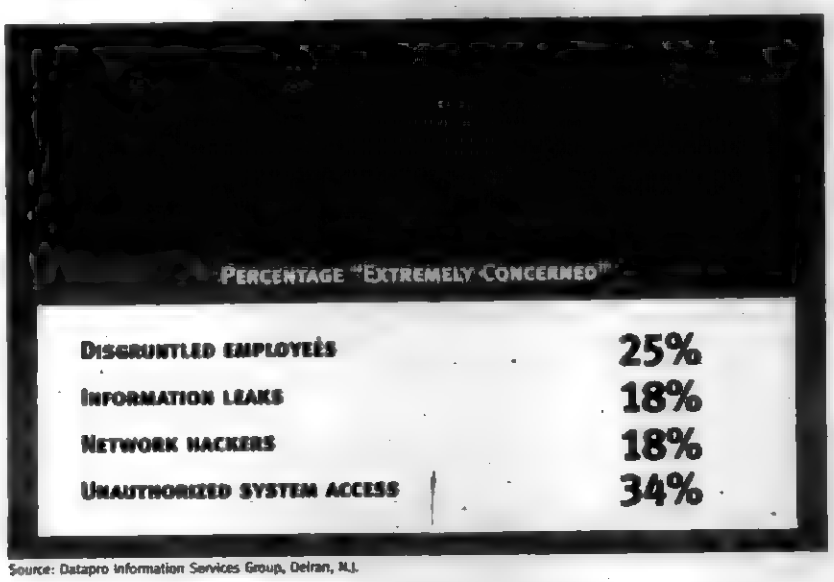
Experienced security managers know that their job is that of both technologist and psychologist.

Large-scale layoffs can be tough because in most cases, the workers are being let go because of unfavorable business conditions rather than any personal incompetence.

If management can foster solidarity in an organization, it's possible to prevent discontent from spreading, experts say. Security is best served when dissatisfaction and resentment are deflected away from the organization.

"There is never a sense that we have to lock the gates," Poulin says. "The general feeling is that people who are let go during downsizing activity are respected before, and they will be respected after."

That's not to say you should let your guard down. Wood emphasizes respect for departing workers — but cautious respect. At the time of an employee's departure, he says, user IDs and passwords for both computers and network access should be revoked. "It may sound elementary, but it's surprising how many organizations do a poor job of this, if they do it at all," Wood says.



Source: Datapro Information Services Group, Delran, N.J.

When IS people are asked to shoulder the duties of departed staffers, they often let security slip through the cracks.

Departing employees should also be reminded of any confidentiality agreements, and proprietary information in their possession should be collected.

"Even though a person may have developed an application, they need to remember that it belongs to the company, not that individual," Wagner says.

Staffers in sensitive positions who are not laid off but who could have loyalties to departed friends should be transferred to less sensitive posts, Wood says.

TEAM HUMAN RESOURCES

"Security personnel suspecting a wide-ranging loss of jobs should sit down with the human resources people and make sure that they understand that there will be very real security concerns," says Patricia Fisher, president of Janus Associates, an information security consulting firm in Stamford, Conn.

She says one West Coast manufacturer even has a system in place that automatically transfers personnel change-of-status information in a DB2 database into a RACF security-related computer privilege database. The program automatically revokes the privileges of users who leave the company.

In a former position, Redler developed a similar system that used a combination of electronic and paper links. In it was a checklist for company material that should be retrieved.

Redler says bank credit cards, long-distance telephone credit cards and building access control badges should all be canceled. Metal building keys, library books, computer system documentation and other property should be collected.

While many firms have checklists of such items, interconnected systems such as Redler's are rare.

HELP DEPARTING EMPLOYEES FIND NEW JOBS

Diamond also suggests putting job-finding programs in place to smooth departing employees' move to a new company and position.

"You have to help your workers switch from a negative mode to a positive mode," Diamond says. Typical on-site services include career counseling and resume preparation services, he says.

Wagner says he also tries to minimize the number of younger workers laid off by offering early retirement incentive packages to older employees. "Encourage the attrition end of the equation," he says. "We'll do everything in our power not to lay people off."

It's important to help employees realize that, however depressing the days following the layoff notices may be, they have a future, and there is hope.

"One thing I've always told my employees," Diamond says, "is that there is life beyond their job." ■

SYSTEMS MANAGEMENT

Meeting the new demands posed by Distributed Computing

The Benefits

Distributed systems demand the same level of management and availability that IS has historically provided in a mainframe environment. Yet the technical approach to distributed systems management is fundamentally different from that applied to centralized systems.

Hardware and software resources to be managed tend to be more numerous, widely-dispersed and provided by a wide variety of vendors. Put simply, old approaches to systems management cannot be incrementally extended to manage these new distributed systems. A new approach is required.

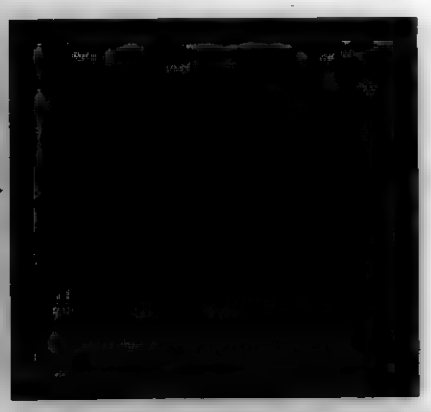
Why A New Approach Is Necessary

When compared to the centralized mainframe environment, tracking and intervention tools for distributed systems management still appear somewhat primitive - even as the number and variety of systems IS professionals must manage is increasing. At the same time, IS professionals are expected to provide backup and recovery services, fault isolation and repair capabilities, and updating procedures that provide levels of service similar to those users have come to expect from centralized systems. These demands all threaten to increase administrative and support expenses. And if these systems are poorly managed, there's a real chance such expenses may actually erase the cost reductions achieved through downsizing.

Effective distributed systems management addresses these issues. It provides the considerable business benefits of distributed computing within a context that allows for effective management of IT resources and costs.

What You Can Do Today

- Implement remote management solutions that bring the problem to the troubleshooter, not the other way around.



- Develop organizational consensus on an enterprise-wide open management platform that can interface with your legacy systems and newer distributed systems.
- Acquire management tools and applications for distributed systems that integrate with the open management platform you choose.
- Favor object-oriented management solutions.
- Place open management agents on systems, clients and servers throughout the enterprise that will communicate with your management platform.
- Take an application-oriented view towards the utilization of system resources. This allows you to target your management focus on areas likely to provide the biggest and quickest return to end users.
- Create automated responses to system problems - responses that automatically alert system managers when problems occur, or which resolve problems at the same speed they occur.
- In the switch from centralized to distributed processing, leverage the expertise, skills and methodologies of existing MIS personnel. And remember that legacy systems are likely to play a key role in mission-critical applications for many years to come.

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Benchmarking etiquette

By Mitch Betts
ARLINGTON, VA.

"Benchmarking" with competitors to compare information systems and other business processes is in vogue these days, but it gives corporate lawyers the heebie-jeebies.

After all, the goal of quality benchmarking is for two companies to cooperate in the process of stealing each other's best ideas [CW, Nov. 30, 1992]. Talk like that gives lawyers nightmarish visions of lawsuits involving antitrust or theft-of-secrets charges, according to Kent M. Johnson, corporate counsel at Texas Instruments, Inc. in Dallas.

At a conference here last month, Johnson urged benchmarkers to adhere to high ethical standards, to avoid misunderstandings with partners and to steer clear of legal entanglements. The event was sponsored by the American Productivity & Quality Center in Houston and its International Benchmarking Clearinghouse.

In the IS field, benchmarking is all the rage in certain circles, including the Society for Information Management and regional groups such as the Chicago Research & Planning Group and the Omicron consortium in Mountain Lakes, N.J.

Benchmarking is based on trust, openness and honorable intentions. But Johnson warned that the freedom with which benchmarking is now conducted could be eroded by newcomers with ulterior motives. "If a number of companies start abusing benchmarking with an attitude that they'll take advantage of the chumps, then we'll have increased skepticism, government intervention and lawsuits," Johnson said.

There have been no reported lawsuits that mention benchmarking, but Johnson said lawsuits are likely to ignore the benchmarking buzzword.

The best-known legal problem in the benchmarking world is antitrust law. Benchmarkers that are competitors must avoid discussing anything that could be construed as price fixing or collusion to limit competition, he said.

Lesser-known legal issues include protecting rights to intellectual property, such as copyrights, patents and trade secrets. Recipients of information should "find out if there are any strings attached to the ideas they get," Johnson said.

Benchmarkers trading "war stories" should refrain from criticizing companies by name, he added. Otherwise, they could face charges of "disparagement or trade libel."

Sources: International Benchmarking Clearinghouse; The Benchmark Partners, Inc., Oak Brook, Ill.

Moving into the realm of ethics, Johnson stressed that benchmarking partners should come to an agreement at the outset on the confidentiality of sensitive benchmarking data. He suggested benchmarkers ask themselves a few ethics questions: What processes ensure that the information will not be used for unexpected purposes? Would your source provide the information to you if he knew what you intended to do with it?

Even with precautions, it may take a while for corporate attorneys to become comfortable with cooperative benchmarking. "For the legal profession, this is a profound change in the way we look at the world," Johnson said. "Benchmarking is a phenomenon that doesn't make a lot of sense to lawyers." ■

N. Dean Meyer

Theory X lives on

In 1960, Douglas McGregor differentiated Theory X and Theory Y management — X being top-down and autocratic, while Y has *faith* in people and bets on their empowerment. After generations of MBAs trained in Theory Y have permeated the workplace, you'd think Theory X would be put to rest by now. But with each generation, it finds new ways to demean people and sabotage organizational effectiveness.

In the spirit of progressiveness, a large research and manufacturing firm made a companywide commitment to business process re-engineering. It appointed "process owners" at the senior management level and made process thinking the core of its cultural objectives and strategic business planning method.

Neat *stuff*, eh? But something's rotten in the *state* of process-land.

You see, in this company, operating managers in each country are still expected to produce their "numbers," and their objectives are all measured within a one-year time frame. How in the world can upper management get them to invest in process re-engineering?

And why would operating managers risk their autonomy to join with others in a cross-functional project? In the past, they've been known to invent the same computer system 50 times over — rather than band together and altruistically sacrifice control over their business for the sake of their shareholders!

And here's the real trouble: These line managers have control over all the IS resources. They aren't going to spend their money on projects that reduce their control and may or may not be in the interests of their local stakeholders.

Recipe for trouble

So how will the process owners bring truth and beauty to the heathen in such a hostile environment?

How about if top management shifts resources away from country managers and reallocates it into the hands of process owners? Then corporate process owners could fund the right IS projects that are cross-functional rather than country-specific.

Makes sense, right? In fact, this is the typical executive response.

Let's say it another way: How about if we give the process owners money so they won't have to sell their ideas to the guys who run the business, so they won't have to think of country managers as their "customers," so they can shove new processes down country managers' throats without regard to local needs, so they can hire IS to do their dirty work?

Dr. McGregor, does this sound at all familiar?

You can guess what the results will be. Those new processes will never quite work. Let's not call it sabotage. Let's just say the guys who know how to run the country operating units told us so.

Perhaps this is too dire. Perhaps the disempowered country managers will do as they're told: They'll simply take their hands off the wheel and let corporate drive their businesses. The results will be equally disastrous.

This disempowering approach unravels everything we have tried to build with the Total Quality Management movement.

Do we have a choice?

So what's the alternative?

How about if instead we change the metrics so that country managers have some incentive to improve their processes and leave the money with the guys who make it in the first place. Then process "consultants" (not "owners") can help operating managers win by facilitating the formation of consortia to buy process re-engineering and shared information systems.

Then country managers will share what should be shared and go their own way when it makes business sense to do so.

In other words, decisions will be left to the people on the front line. But at the same time, there is a reason to pursue shared process redesign.

True, the process consultants will have to work a little harder. They'll have to sell their ideas and convince line managers of the local benefits of process re-engineering. And management will have to think carefully about metrics and incentives to be sure that what's good for the company is good for line managers. But since when did good old-fashioned critical thinking hurt business?

OK, a systemic approach might seem much slower. It will take many years for process re-engineering to succeed instead of just a few years for it to fail.

Remember, in the trouble scenario, we gave process "owners" money to spend on IS to impose their ideas on others. A change as subtle as the allocation of IS resources can make the difference between X and Y. This is an example of the impact that the "internal economy" can have on corporate culture.

Centrally planned economies don't work. They make staff agents of central planners instead of a "business within a business," serving internal customers.

Staff should serve — not control — line management. This is ensured when both IS and process re-engineering staffs (who spend money) have to earn their keep from those on the front lines (who make money). In the long run, market economies work much better than top-down central planning. ■

Meyer is president of NDMA, Inc., an IS consultancy in Ridgefield, Conn.

NETWORK MANAGEMENT

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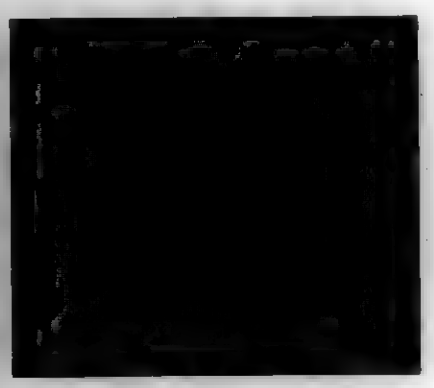
Without an integrated, open approach to network management, building and managing a network that will evolve successfully to meet these demands is impractical. Without effective network management, cost control is impossible.

The Benefits

Networks have become a crucial determinant of enterprise efficiency and competitiveness, which is why effective network management is now more essential than ever to the health and success of your organization.

Network availability, for example, is essential to mission-critical applications such as customer service, inventory management, EDI and product development. Network management enables consistent, reliable network service that organizations can depend on. An integrated network management approach will enable your enterprise to quickly respond to requests for new services to meet evolving business needs. This is especially crucial in a period when use of network-based applications is growing rapidly.

Integrated network management provides a foundation for higher levels of automation of administrative and operational tasks. It also improves responsiveness to user needs while substantially lowering support costs. Integrating your network management solution into a broader enterprise management strategy is far more cost-effective than investing in closed, vendor-specific solutions on an ad hoc basis. And it provides your IS department with the information necessary to track costs and optimize network resources while maintaining desired service levels.



What You Can Do Today

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Executive Tracker

In Rancho Cordova, Calif., Ira J. Rothman has been named vice president of information technology at Foundation Health Corp. Rothman formerly served as president of HCIS Consulting in Solon, Ohio.

Tom Lewis, a two-decade veteran of the manufacturing systems industry, recently joined The Strifler Group as a senior consultant specializing in manufacturing systems.

In his new position at the Dallas consultancy, Lewis, who most recently served as manufacturing systems specialist at Hewlett-Packard Co., will head a team charged with analyzing and defining software needs, evaluating and implementing systems and providing strategic and tactical business consulting.

Al Rodriguez, who has spent the past 10 years overseeing the development and implementation of an information systems operation at Graham-Windham, a New York-based family services agency, recently became director of the agency's Residential Treatment Center in Hastings-on-Hudson, N.Y.

In announcing his promotion, Graham-Windham President and Chief Executive Officer Joyce Lapenn noted that Rodriguez "is a terrific choice because he already knows the facility and the workings of the agency."

Mattel, Inc., an El Segundo, Calif.-based toy maker, has named John Phippen senior vice president and chief information officer for corporate systems worldwide. Phippen joined Mattel in 1985 as operations division vice president/controller. Most recently, he served as the company's IS senior vice president.

E. Bradford Ridley is the new assistant director of information resources at Boston-based Massachusetts General Hospital. Ridley comes to Mass General from Atlanta-based HealthQuest.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact senior editor Neil Margolis at (800) 343-6474 to pass along the news.

Calendar

JULY 4-JULY 10

Client/Server and Distributed Database Management Systems. Troy, N.Y., July 8-9 — Contact: Office of Continuing Education, Rensselaer Polytechnic Institute, Troy, N.Y. (518) 276-8351.

JULY 11-JULY 17

1993 Banyan Technical Conference. Cambridge, Mass., July 11-13 — Contact: Banyan Systems, Inc., Westboro, Mass. (508) 898-1000.

11th National Conference on Artificial Intelligence. Washington, D.C., July 11-15 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

A Time to Restructure: The Annual Industry Future Conference. New York, July 12-13 — Contact: Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

Client/Server Computing: Strategic Directions and Tactical Solutions. New York, July 12-13 — Contact: Ashlet Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6774.

Image World Dallas. Dallas, July 12-16 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Object Expo Europe '93. London, July 12-16 — Contact: SIGS Conference Office, New York, N.Y. (212) 274-0640.

Camdex/Canada. Toronto, July 13-15 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Windows World. Frankfurt, July 16-19 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JULY 18-JULY 24

Guide '93 Conference. Montreal, July 18-23 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

Windows World. Mexico City, July 20-22 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6709.

Equipment Resources Planning Institute. Albuquerque, N.M., July 22-23 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2907.

JULY 25-JULY 31

All about IBM '93. Aspen, Colo., July 26-28 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Tools USA 1993. Santa Barbara, Calif., Aug. 2-5 — Contact: Tools Conferences, Santa Barbara, Calif. (805) 685-1006.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Intelligence Files

In its own image

The mid-1980s saw an explosion of interest in imaging technology as several big companies in fields such as insurance and health care undertook pioneering engineering efforts.

However, the recession of the early 1990s shook up the electronic imaging market, as the industry was beset with financial difficulties and uncertainties surrounding platform migration.

The easing of the recession and major organizational changes among the computer vendor giants have opened new directions for electronic imaging. The continued interest in business process re-engineering is one driving factor in renewed interest in imaging, for example.

Source: "Implementing Image Technology for the 1990s," Computer Technology Research Corp., (803) 853-6460.

CIOs R.I.P.

Conflict with a chief executive officer is a sure-fire way to end a chief information officer's career. CIO turnover is already nearly twice that of other business professionals. But disagreement between technology and business heads over the best ways to make organizational and operational changes is making the situation worse.

The biggest disagreement is this: far greater acceptance of re-engineering among CEOs than CIOs. Other big problems for CIO longevity (now averaging two to three years) include unprecedented change, unaligned strategies, unclear objectives and uncertain timing.

Source: Gateway Management Consulting, (212) 880-9300.

Shopworn

At best, information systems functions do an average to below-average job on the shop floor, according to a new survey sponsored by the American Production and Inventory Control Society.

Nearly half of 117 electronic industry respondents felt the role of IS was insignificant in automating the shop floor, controlling the manufacturing process, implementing quality control, establishing a computer-integrated manufacturing environment or implementing concurrent engineering.

Half of the respondents said they felt that IS had little or no "manufacturing orientation." Two-thirds said IS was protective of its turf. On the plus side, nearly three-fourths said they believe IS has good relationships with manufacturing.

Source: Survey by Uma Gupta for the University of Central Florida, (407) 823-2679.

Telecommuter tips

As the use of telecommuting grows, particularly among small companies, following a few guidelines can make working from home even more attractive.

First, choose your telecommuters carefully and train them in the office beforehand. Second, communicate constantly. Electronic mail is a big plus here, and mandatory attendance at a weekly meeting also helps.

Lastly, keep an eye on regulations governing the use of telecommuters. For example, getting workers' compensation insurance for telecommuting employees can sometimes be a problem.

Source: *Inc.* magazine, June 1993.

Ground for real estate

One of the best vertical markets to tap the potential of geographical information systems (GIS) is the real estate industry. Service providers such as appraisers and brokers can use the technology as a competitive arm to bring in more business. Other corporations with significant real estate holdings can use a GIS to more profitably manage their property. Currently, few of the players in the real estate industry are tapping GIS' potential.

Source: *Business Geographics*, May/June 1993.

Multimedia manuals

Electronic books could be a big money saver. A new, confidential study of more than 250 major corporations found that converting paper manuals to an electronic multimedia format can slash distribution and updating costs. One company reported annual savings of $87,500 from putting a 200-page manual on-line, according to Positive Support Review, a Santa Monica, Ca., consulting company.

Source: Positive Support Review, (310) 453-6100.

Stuck on STICIs

Contrary to current press reports, graphical user interfaces will not forever rule the world. STICIs, or Self-Teaching and Interpretive Communicating Interfaces, are the next wave in computer interfaces.

A STICI (pronounced sticky) uses intelligent agents to track how users actually use a software program, then adapts the program to that user.

While agents have been a feature in some proprietary mainframe systems, these features are coming down to the PC level and are even being designed into future versions of products such as Microsoft Corp.'s Word for Windows word processor.

Ultimately, agents will be used to change PC use from a "do what I say" model to a "do what I need" one, making the computer interface truly user-friendly.

Source: "PC Market Update," a newsletter published by DIS Strategic Decisions, Norwell, Mass., (617) 982-9500. Jeffrey Henning, editor.

DME

Distributed Management Environment

A consensus-based solution to the c
of universal management standards

With the emergence of distributed, multi-vendor computing environments, the creation of a standards framework to facilitate their effective management became a top priority. As a result, leading vendors, working through the Open Software Foundation (OSF), have developed a set of open, vendor-neutral standards known as Distributed Management Environment (DME).

DME was conceived to get the most out of today's advanced distributed computing technologies, open standards, interoperability and object-oriented technologies. Its standardized framework represents an industry consensus on application program interfaces (APIs) and protocols for open management. DME is a 'living' standard, evolving as technologies evolve, enhancing the latest industry developments.

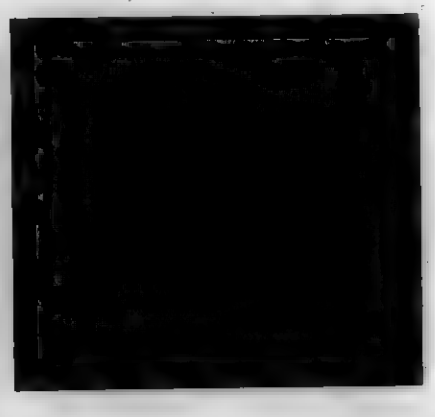
Why DME Works

DME builds on existing standards. It is not an alternative to other standards. Rather, it represents a complementary approach that encompasses existing SNMP and CMIP standards and endorses interfaces devised by the Network Management Forum, X/Open and others.

DME is the product of a multi-vendor, consensus-based process. As a result, DME maps to your computing environment and manages growth in multi-vendor systems and networks. And because DME is the product of industry consensus, it accelerates the process of reaching consensus within your organization.

DME is based on a comprehensive set of requirements developed through an open, industry process to meet specific objectives and address real needs.

DME is vendor neutral. It enhances competition in the management market. This will result in lower costs and better solutions for users.



The Benefits

DME's wide-ranging benefits include:

- A scalable, distributed architecture that can accommodate growth in multi-vendor networks and distributed systems.
- Better management, interoperability and integration through the implementation of common management services and standardized protocol and object definitions.
- Reductions in time and costs for system administration and training.
- Tightly integrated solutions utilizing object-oriented design, for easier and more flexible integration of scalable, distributed, multi-vendor architectures.
- Greater longevity of systems resulting from standards-based, backwards compatibility.

What You Can Do Today

No matter where you are in the development of your network, we suggest evaluating DME as you build your enterprise management strategy. Portions of the DME will be available during 1993 from a number of vendors. Complete implementations of DME will begin appearing in 1994.

Contact the Open Software Foundation for more information on DME and how it can provide you with a framework for managing growth in a multi-vendor systems and networks. Or, contact these leading vendors who have committed to supporting DME.

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SPECTRUM is Cabletron Systems' protocol-independent management system for proactive monitoring and control of multivendor, enterprise-wide networks. 1-603-332-9400

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IBM products designed to use the DME standards through the SystemView framework provide effective management solutions that adapt to your evolving, multivendor distributed computing environments. Call us at 1-800-IBM-6676 (x685)

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ACT NOW!

To learn more about these DME supporters contact them today. A coupon to request information from these vendors is included with the Enterprise Management advertisement earlier in this issue.

For an additional copy of that coupon please call Access Media at 310-450-7941.

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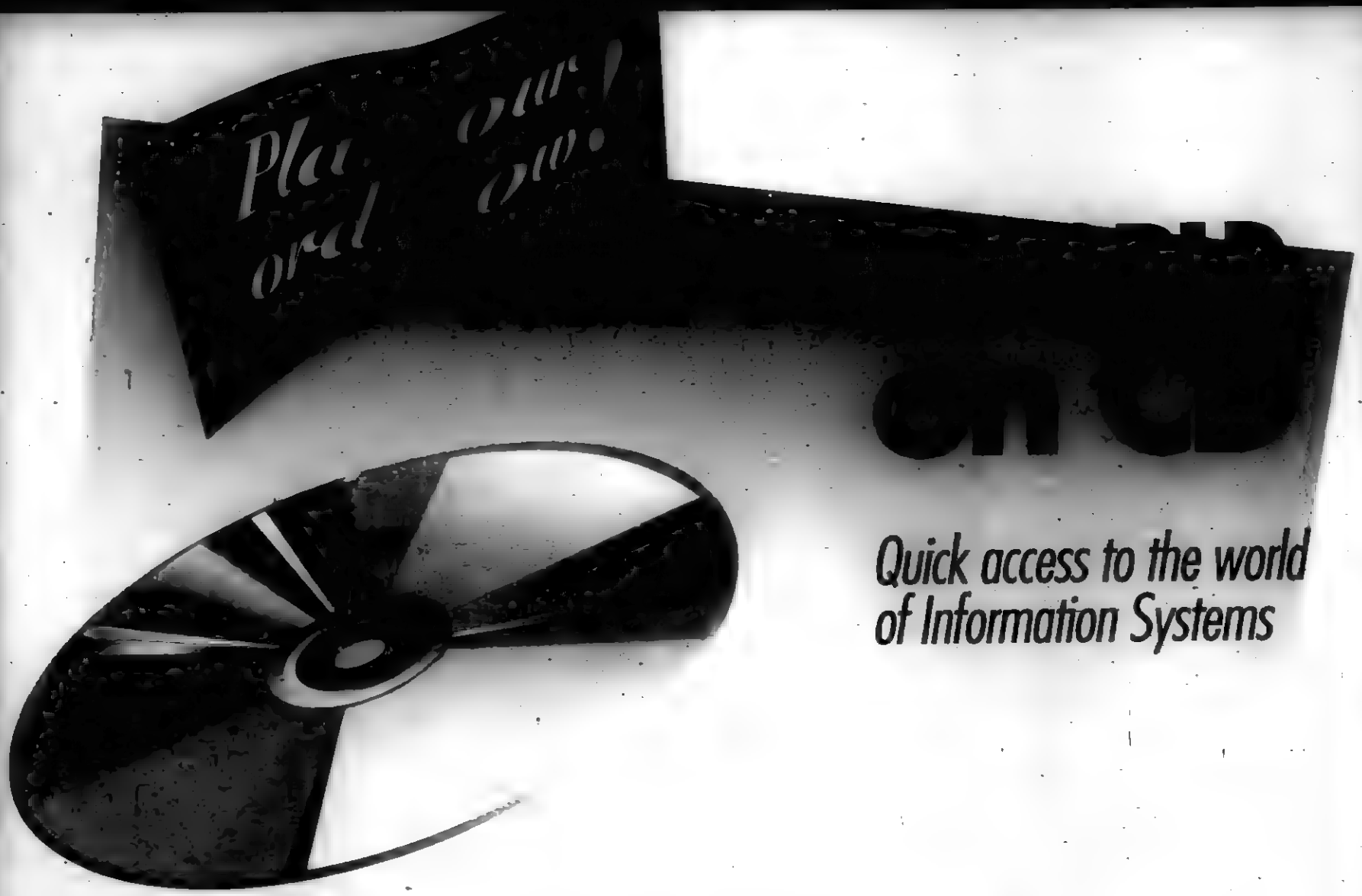

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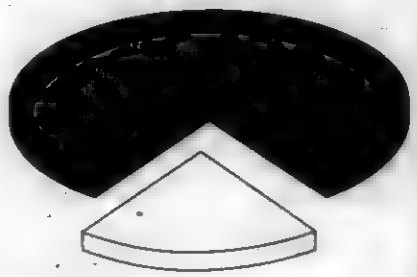

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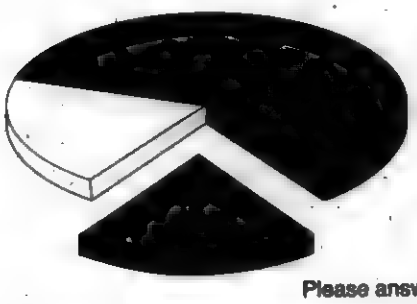

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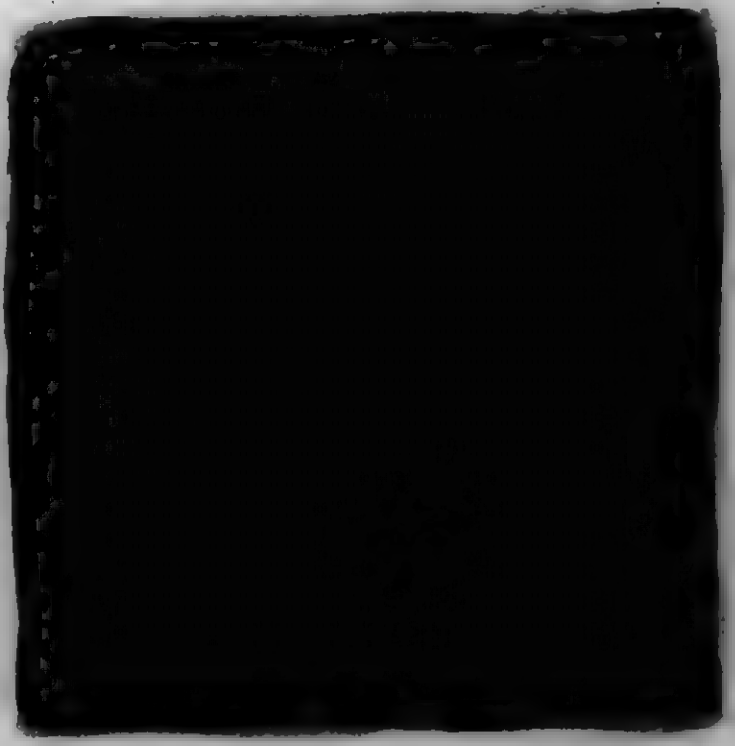
TOGETHER

By Tom O'Connor



You have to face the fact that you've got a lot of competition. Everyone is claiming he can handle what were once the sole activities of the information systems department — application system design and development, maintenance and so on. The competitive threat is coming from outsourcers and even your own users, who have gained power and technical experience through departmental computing.

In a worst case, these rivals can diminish your role in a company, as evidenced by shrinking budgets and IS reorganizations. For instance, at a time when information is one of an enterprise's most valuable assets, IS budget numbers are not growing significantly. Cambridge, Mass.-based CSC Index, Inc. says the average IS budget will grow 2.5% this year, while oil and energy industry budgets are down 5.3%. IS departments are having a harder time justifying application system upgrades than business departments are having justifying PCs, PC software, local-area networks and departmental servers.

You need to strengthen your prowess in areas in which no one else can be as valuable. It's time to re-engineer for the future.

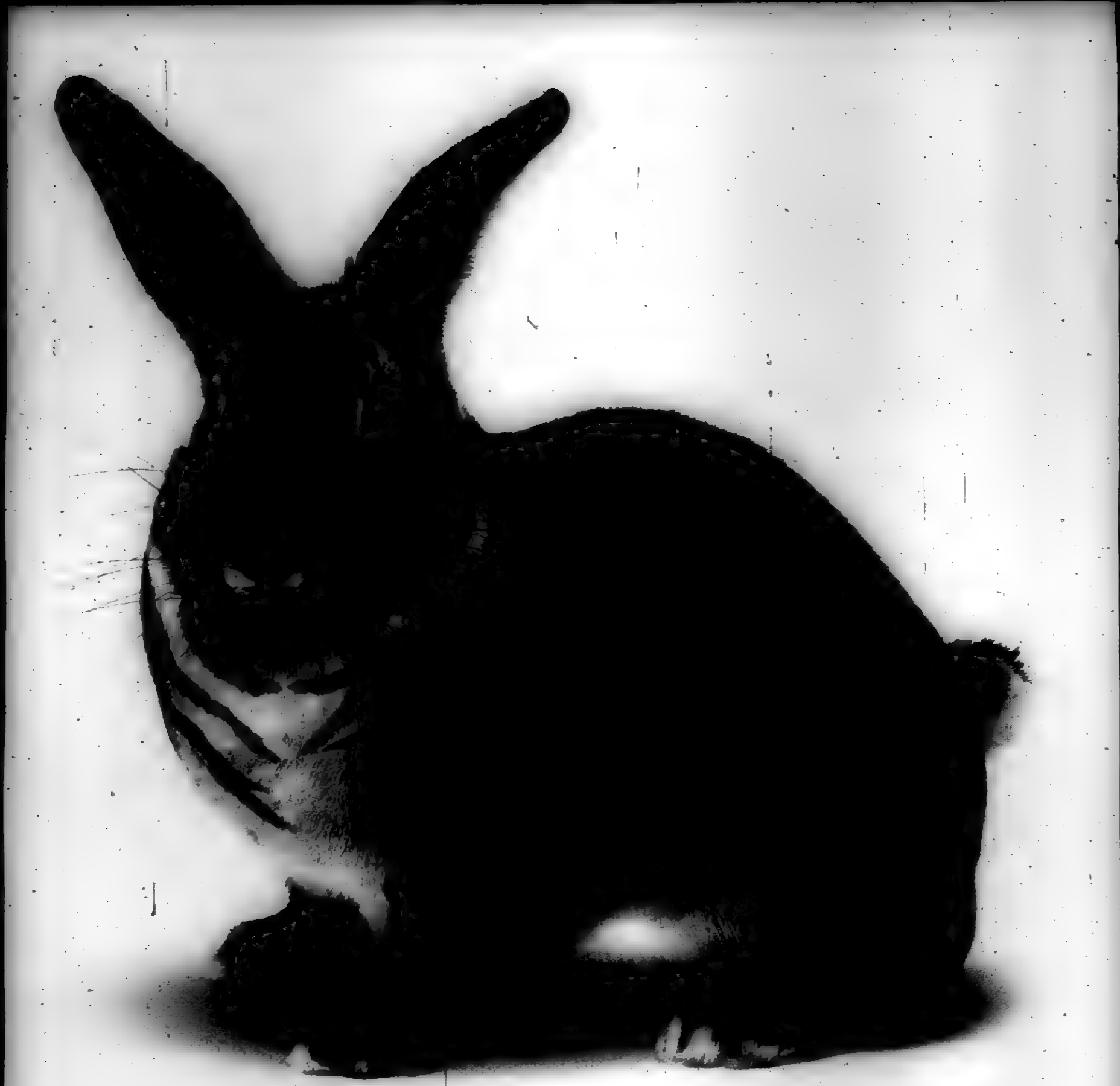
Start fresh. Look at needs to see if there are chances for you to contribute in new ways.

•The stovepipe syndrome. Business depart-

IS stronghold, *page 103*

A 23-year veteran of the computer industry, O'Connor is currently manager at KPMG ExIS, an information systems consulting unit of Peat Marwick Main & Co. in Palo Alto, Calif. He has also held system development and technical management positions at Electronic Data Systems Corp.

Outsourcers, end users and other competitors are grabbing some of your traditional duties, such as application development. Only by concentrating on your UNIQUE strengths — integration and implementation — can you stay valuable.



Just don't expect it to roar.

These days, organizations are seeking to become swifter and more ferocious.

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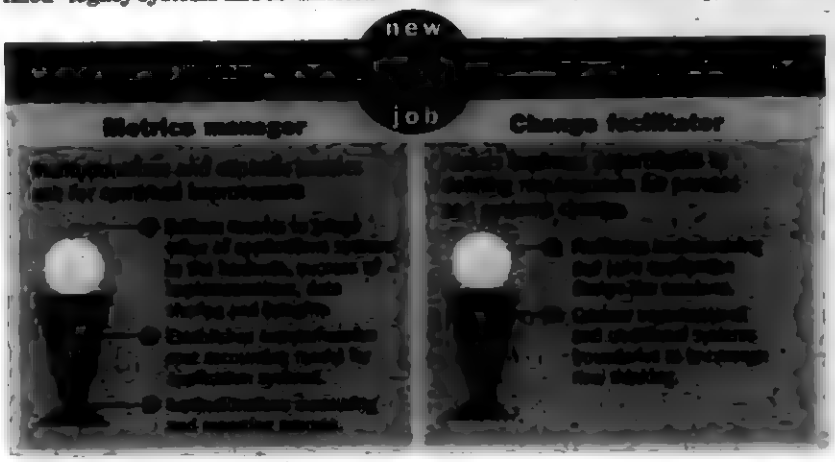
IS stronghold

CONTINUED FROM PAGE 101

ments have a very narrow field of vision. Because they focus so closely on their specific domain and responsibilities, they don't know how the department next door operates or even whether they can rely on each other. This isolationist attitude can create big trouble in the enterprise as a whole.

Unfortunately, the IS department itself may be the root of the problem. "Wart-filled" legacy systems and IS' insistence on limits to what it can or will provide to business departments have forced end users to find their own way.



For instance, a manufacturing firm's finance department, after years of poor IS response to maintenance requests for a billing system, took matters into its own hands.

While the unit now has its own list of customer billing addresses, however, the company as a whole suffers from multiple views of customer data.

Another finance department, this one in a casualty insurance company, set up its own system for tracking dividends, in essence making the information departmental data, not corporate data. It did not reconcile the information with other perspectives and views of dividend-related information. The company ended up with inconsistent information that has affected decision-making.

I worked with one insurance company where two of four independent departments reversed the standard definitions for policy "buy out" and "close out." Needless to say, this undermined corporate policy.

I have seen too many companies where departments have their own customer lists, product lists, vendor lists, personnel lists, budgets, revenue and expense models and other redundant (if they are lucky) or inconsistent (if they are unlucky) data not to think the problem is epidemic. How many lists of customers or vendors does your company have in its various departments?

It's a wonder companies can function at all, let alone be successful.

•The ripple effect. Part of the problem with all this scattered information is that there is no pervasive vision for how things *should* be. While business departments are buying, building and implementing their own systems, very few appreciate the scope and implications of an implementation, even a small departmental one. Implementations require a systems approach but aren't getting that.

Departments suffer setbacks because logistics and complex project management are rarely, if ever, part of a business staff's job description.

System implementations are complex logistics projects. Tested software, hardware capacity, telecommunications, backup and recovery procedures, system administration, training, security authorizations, clerical procedures, business management processes and help desk support all need to be in place at the right time.

So it's not enough to put in a customer service system; its effectiveness is directly tied to ensuring managers know what to do with it.

Pick a pony

So here we are. As former President Reagan might have asked, "Welllll, where's the pony?"

I see a pony. I see some real needs that require just the skills and experiences IS departments should and could have. I see a need for a broad, corporatewide view of systems to counter the narrow view of individual departments. I also see a need for implementation expertise to anticipate and avoid new system sinkholes.

I suggest that the IS department change its name to the Integration and Implementation Department to fulfill a vital role within corporate enterprises.

The integration portion builds on your broad, comprehensive view of the entire enterprise. You're the ones who know all the uses of customer data, product data and so on. You understand the value of data integration across applications and departments for the good of the enterprise. You appreciate the business value of sharing data across departments.

You can be the ones to prevent corporate officers from meeting to discuss bookings, only to realize they each have their own sets of numbers that don't agree. You can be the catalyst, for instance, to getting a single, precise definition of what a "booking" is. You can network departmental computers seamlessly.

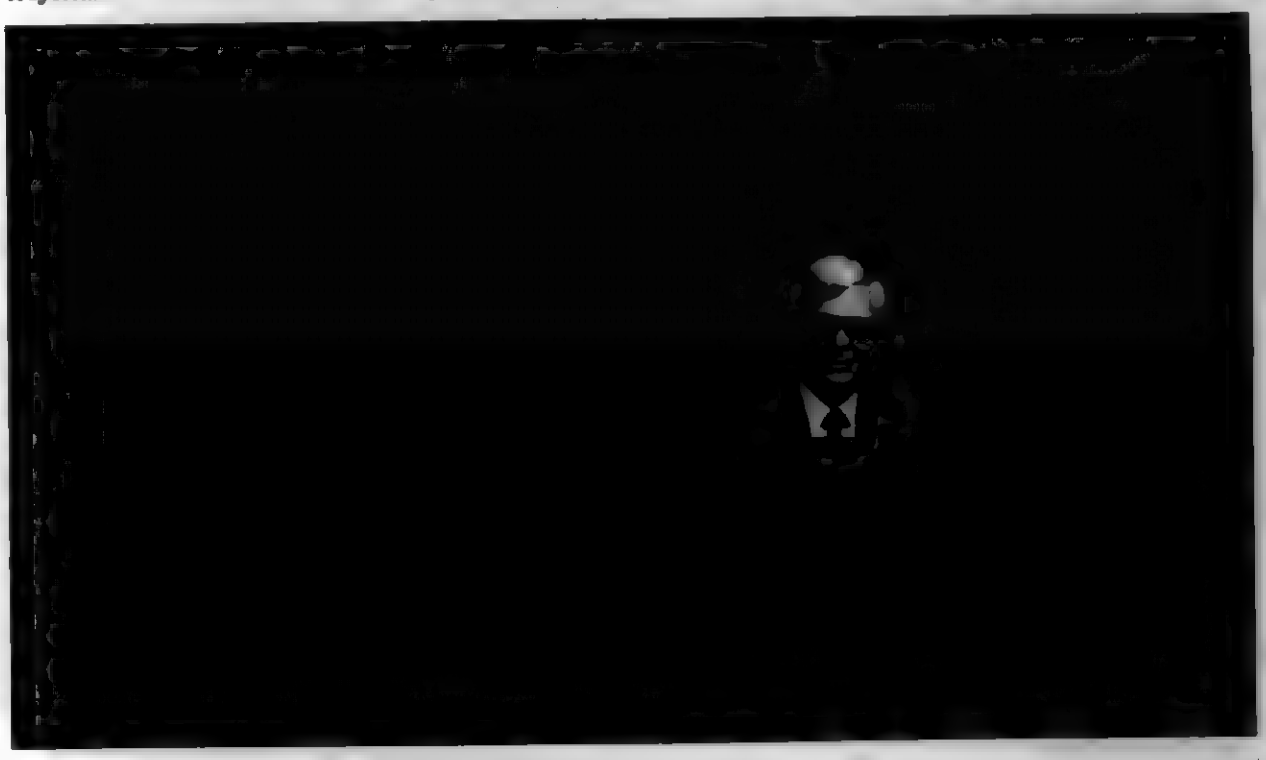
The key to integration is perspective. The tools of integration are data administration and networks. Why not put your emphasis in these valuable areas?

Expertise required

Implementation needs your trained eye as well. You understand that it takes a lot of components (technology, procedures, management, administration, training, support) to get to a business system. You know what has to be scheduled, sequenced and completed to get something running. This is a complex discipline.

You're the ones who understand that technology is not the entire system but rather a core surrounded by other manual and management systems; leave out one part, and the project goes bust. You have the systems approach that is vital to every implementation. You should attach a high priority to providing this valuable contribution to your enterprise.

Integration and implementation can form the foundation for a rejuvenation of your value to the enterprise. ■



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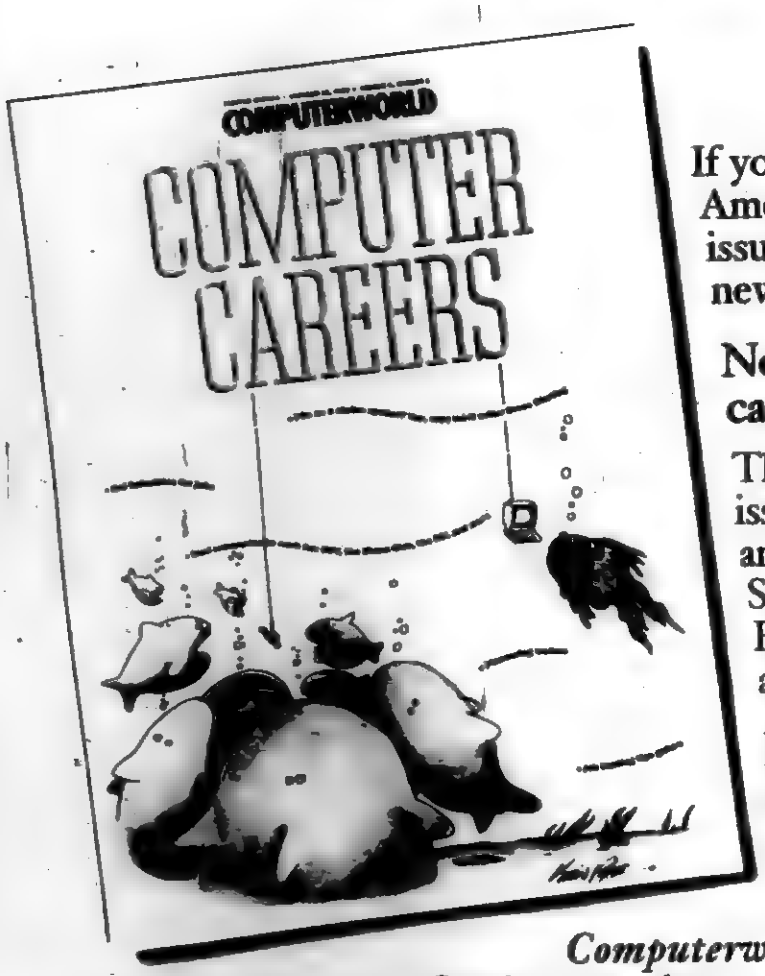

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(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

AS/400 no longer on its own

skills block AS/400

By Mary Brandel

NO ONE IS EXEMPT from the client/server imperative — not even Application System/400 specialists. It may just be a glimmer in the information systems director's eye, but client/server will eventually catch up with you, especially with IBM's initiatives to make the system more server-like.

"I expect [our programmers] to grow and understand that the AS/400 is not the center of the world," says Crystal Kennedy, director of IS at White Plains, N.Y.-based Dannon, Inc., which is developing client/server applications with its IBM AS/400 as the back-end processor.

Not every AS/400 site will take the client/server route, of course. And even where the shift does occur, not every programmer and analyst will be involved. But if you want to get ahead, you've got to have your head up.

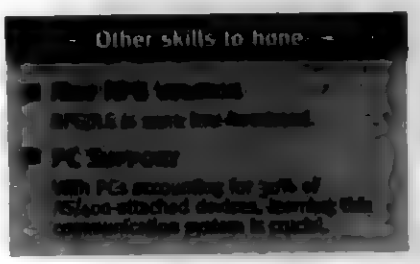
"Within any given organization, a group of AS/400 programmers will need to be retrained," says Joseph Gottlieb, vice president and service director of open computing and server strategies at Meta Group, Inc. in Westport, Conn.

What should you be doing to make that cut? Keep up with the changes now on the drawing board for the AS/400, the most important of which include the following:

•Learn a new environment

One of the biggest and most imminent is the Integrated Language Environment (ILE). With ILE, IBM essentially rebuilt the underlying process model of the AS/400 to allow client/server and object-oriented programming.

"ILE will allow subroutines to be written once and used time and time again, independent of the language," says Steven Salk, project manager of application strategy at IBM.



So far, not many portions of the operating system use ILE, and only a C compiler is shipping, although RPG and Cobol compilers are due in the future.

But now is the time to start navigating the new environment. "People need to get familiar with ILE compilers because they're going to be necessary for client/server applications," says Teresa Elms, president of Elms Information Services Group in San Diego.

•Turn in your RPG tools

Learning new languages will also be important. "Currently, less than 1% [of AS/400] code is in C, but as client/server applications become important in this environment, programmers will need familiarity with C and to start writing at least some code in C," Elms says.

•Get to know your front end

Familiarity with graphical user interfaces and front ends is possibly the largest requirement that will be made of programmers, Salk says. "Programmers will need an understanding of Presentation Manager and Windows interfaces as well as the connectivity between the host and the workstation," he says.

Kennedy says, "What we'd like to do is put application front ends out on the network and access data on the 400 through gateways rather than replicating it on the network."

•Database intricacies

Other changes may lie ahead, but right now "the big challenge is to continue to integrate the AS/400 with other database environments," Gottlieb says.

At Dannon, that means understanding gateways. The plan is to enable users to access data transparently on any one of the networked databases, which include facilities in Ohio, Texas and New York.

To achieve this, Kennedy says she plans to use Progress Software Corp.'s fourth-generation language, Progress 4GL, which recently incorporated an AS/400 gateway as well as a gateway to Sybase, Inc.'s database, which Dannon recently implemented. "We're looking at our programmers to understand what gateways are and how they work so that they understand the impact of things like multiuser updates," Kennedy says.

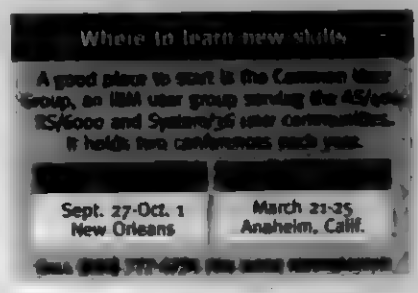
•Network necessity

As the AS/400 is pulled into collaborative relationships with other database platforms, networking becomes a major issue.

Programmers will need to learn networking details of the non-AS/400 world, Elms says, including Transmission Control Protocol/Internet Protocol, which is much more primitive than Systems Network Architecture; Network File System, which is the Unix standard for file transfer and remote file management; and Simple Network Management Protocol for Unix network management.

And these are just the near-term concerns. Look out three to five years, and you'll see the Open Software Foundation's Distributed Computing Environment coming to the AS/400 as well as true object orientation, which is an IBM statement of direction.

Object orientation is "a ways off," Salk says, "but the point is that our programmers will have to understand [object orientation] and [obect-oriented] techniques for providing good client/server graphical applications."



Brandel is a *Computerworld* senior editor, features.

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In pursuit of troubleshooters

By Michelle Louzoun

If you're a local-area network troubleshooter who's kept up with LAN and wide-area network communications, there's a market for your talents. "Troubleshooters are in demand," says Kim Knowles, vice president of TTS Personnel Services, Inc. in New York. "It's one of the few information systems positions where demand has remained steady."

There isn't just one position that is dedicated solely to troubleshooting, however. Instead, the responsibility is shared by network operations staff, help desk consultants, LAN administrators, LAN engineers and network planners.

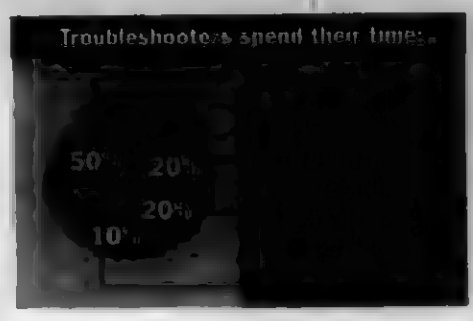
Only 10 years old, this area has dramatically changed. "When I started working as a troubleshooter, the job was more physical, and problem determination was easier," says Joe Montalto, a telecommunications specialist at Bankers Trust Co. in New York. "You could usually solve a problem by resetting the power or replacing a cable. Now you have to dig deeper."

Montalto experienced a situation where 12 users were unable to read their electronic mail. After determining it was a Token Ring problem, he checked the router connection and the configuration program. The router was functioning from a physical point of view, but "there was a software filter that prohibited users from gaining access to the E-mail," Montalto says. "I reprogrammed the router to remove the filter."

Know the basics

Troubleshooters say that the most important technical requirement is understanding PC and LAN operating systems — specifically, how the system's memory works and how to set up programs. Familiarity with the common transport protocols is also a plus. From a hardware standpoint, this means knowing about wiring schemes for Ethernet or Token Ring and being able to set up and monitor hubs and concentrators.

Knowledge of network diagnostic tools is also mandatory. The more popular products include LANalyzer from Network Communications Corp. in Bloomington, Minn., and the Sniffer from Network General Corp. in Menlo Park, Calif.



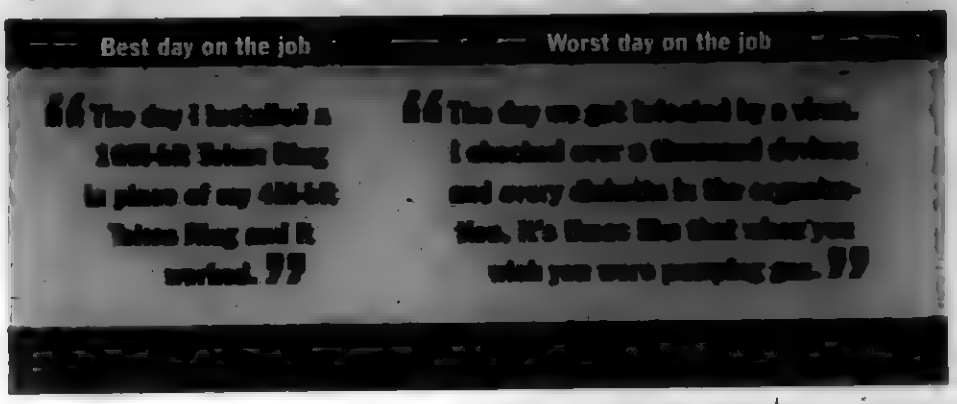
If you'd like to increase your salary, learn about LAN-to-WAN communications — specifically, setup and maintenance of routers, bridges and gateways. A troubleshooter who understands this can earn up to 75% more than a troubleshooter who doesn't, Knowles says.

Technical knowledge alone won't make someone a good troubleshooter, however. "You can learn the technology on the job," says Michael Sugden, network manager at Sid Peterson Memorial Hospital in Kerrville, Texas. "But the one thing that can't be taught is general logic or horse sense."

"You need a systematic approach to problem solving so that you don't overlook the obvious," concurs David Paparello, network manager at ADD, Inc., an architectural firm in Cambridge, Mass. "I've seen people redesign the system when all they needed was to plug in a power cord."

If you're ambitious, LAN troubleshooting is a good position to be in. "This is not a niche role," says Mark Theoharous, a manager for the network solutions practice at Andersen Consulting in Chicago. "You are exposed to an array of systems, applications and business areas. There's no reason why a LAN troubleshooter couldn't go up to the executive level."

Louzoun is a free-lance writer based in Great Neck, N.Y.



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Chicago: 'My kind of town' for mainframers

By Jill Vitiello

The popular song claims Chicago is "my kind of town," and information systems professionals who live and work in the Windy City may feel a strong affinity to it. With its diverse and recession-resistant economic base, Chicago has fared somewhat better than big cities on the East and West coasts. That doesn't mean things have been easy for Chicago IS professionals, however. Downsizing and hiring freezes have taken their toll.

The city is host to many kinds of companies that employ sizable numbers of IS professionals. For the most part, mainframes dominate, but more and more Midwestern firms are moving toward the PC local-area network environment.

This shift, which is proceeding at a cautious pace compared with other regions of the country, is a mixed blessing for Chicago's IS workers. It has opened opportunities for business systems analysts with PC and networking experience at some of the most prestigious companies in the U.S.

Many companies, including First National Bank of Chicago, American National Bank and Trust, and Chicago and Northwestern Transportation, Inc., have recently hired or are still searching for experts in these areas.

However, Chicago's gradual migration to PCs has put many of those with mainframe talents in a stagnant unemployment pool as companies downsize IS departments. "It used to be that if you could spell 'Cobol,' there was a job for you," says Doug Baniqued, president of CompuPro, an IS recruitment firm in Chicago. "Today I'm receiving calls from senior-level, double-degree, excellent people, and I can't help them because they don't have the hands-on skills employers want now."

Mainframe loyalty

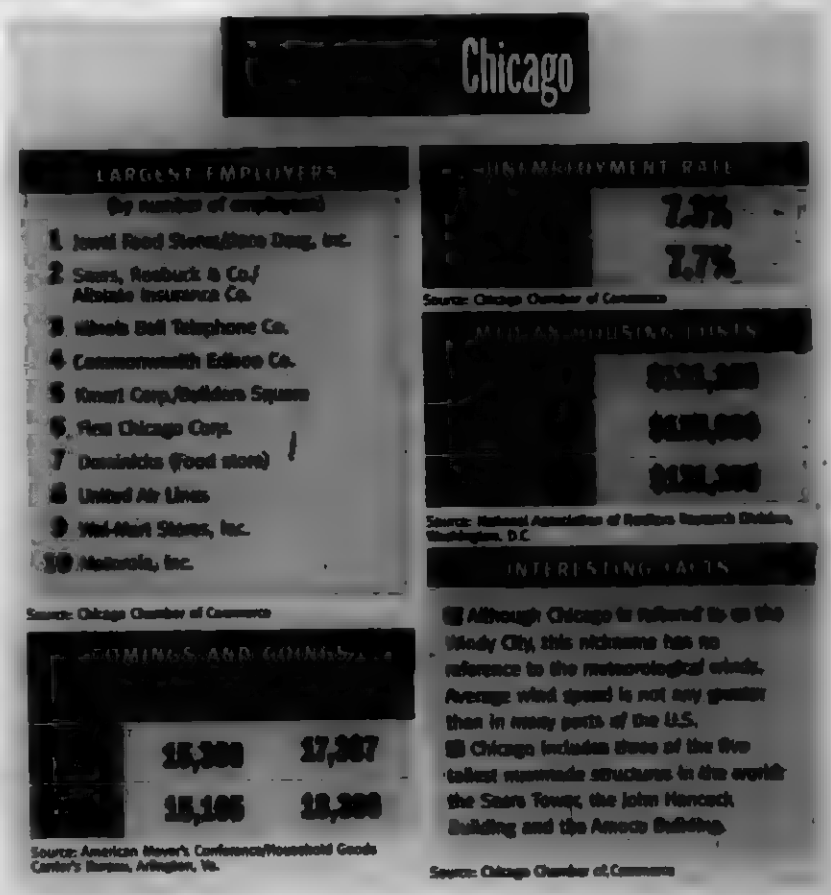
Mainframers who have held onto their jobs are not leaving them. Of course, the job market is inhospitable to them now, but that's not the only reason they stay. Many Chicago firms express a staunch commitment to mainframe technology.

"The client/server environment doesn't make sense for us," says Edith DeBoard, manager of IS at Bacon's Information, Inc., a media data bank. "Our bread and butter is our media bank, and everybody has to get at the same files."

DeBoard's skepticism of the client/server route is common in Chicago. "We have no interest in working up a plan to convert all our mainframe applications to the PC," says John Hermann, vice president of management information systems at Hart Schaffner & Marx Corp., a manufacturer of men's clothing.

To hold the line on expenses, Hermann plans to keep his department at 20 people and won't budget for future additions. Not all mainframe shops are restricting growth, however. First National Bank of Chicago, which is largely mainframe-dependent, has been hiring Cobol programmers and many other IS professionals during the recession, says Sheila Hamilton, human resources officer and senior recruiter.

Hamilton looks for traditional mainframe and PC LAN experts who combine excellent technical skills with interpersonal aplomb and business acumen. "We are not hiring people who want to stay in a back room and code," she says. "All positions in IS require user interaction, so we search for people with a professional flair."



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But what about those for whom loyalty is not an option? IS professionals who've lost their jobs in Chicago have been resourceful, says Michael Martell, placement manager at the IS division of Robert Half International. Many become independent contractors, find temporary employment or return to school.

Vitiello is a free-lance writer in East Brunswick, N.J.

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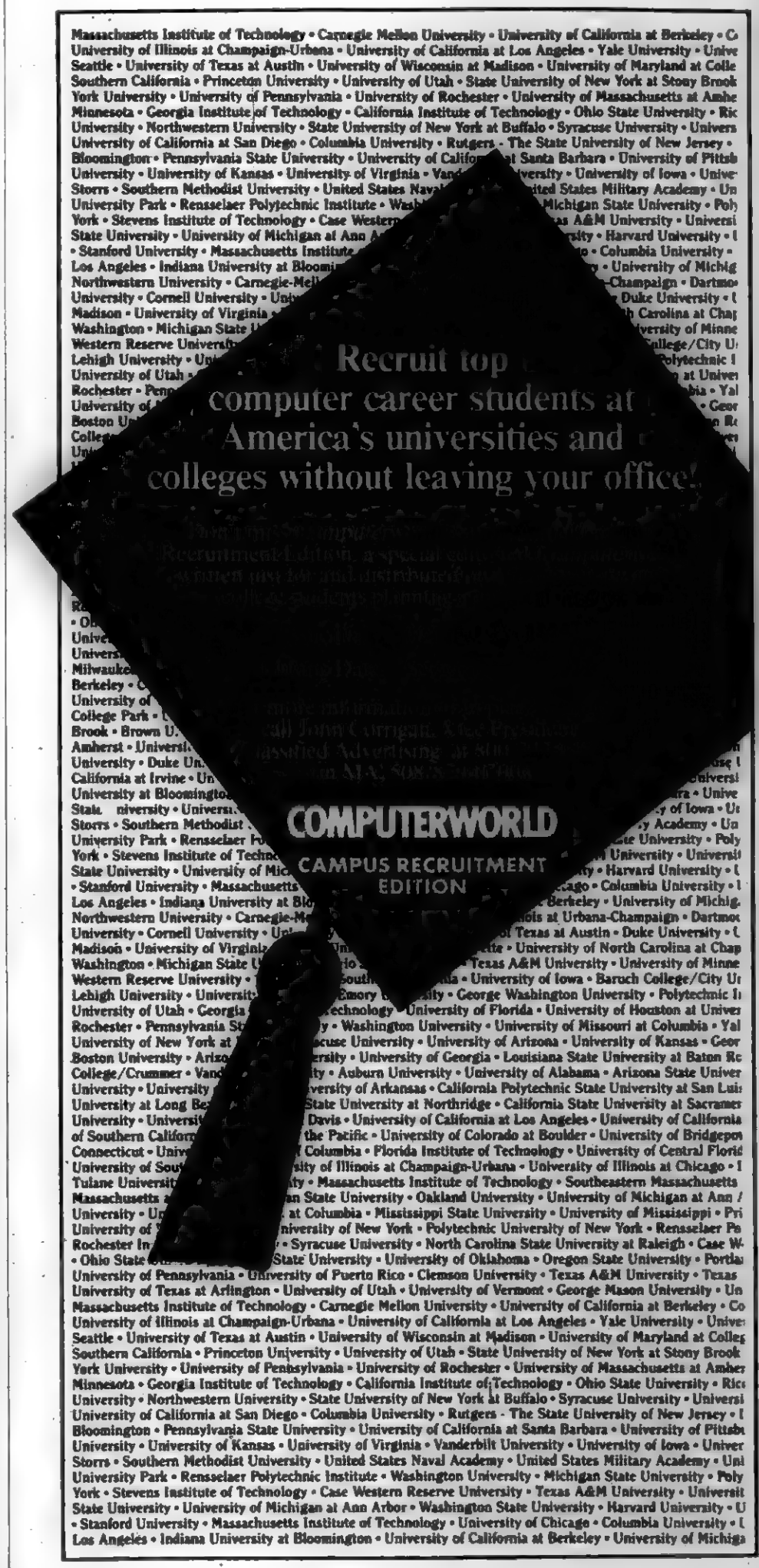

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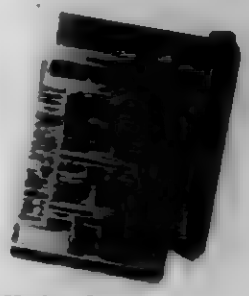

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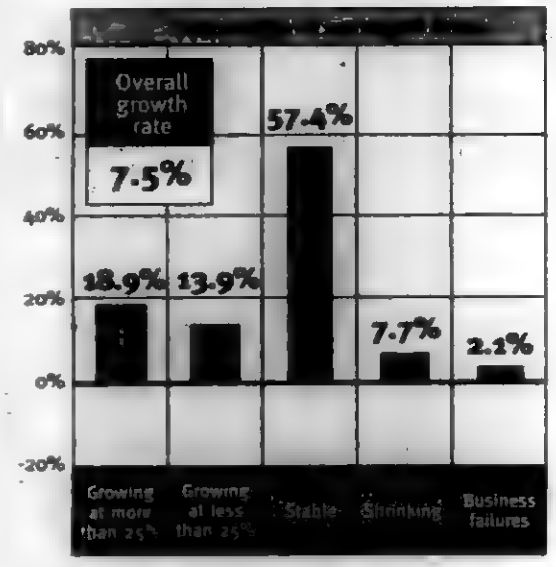

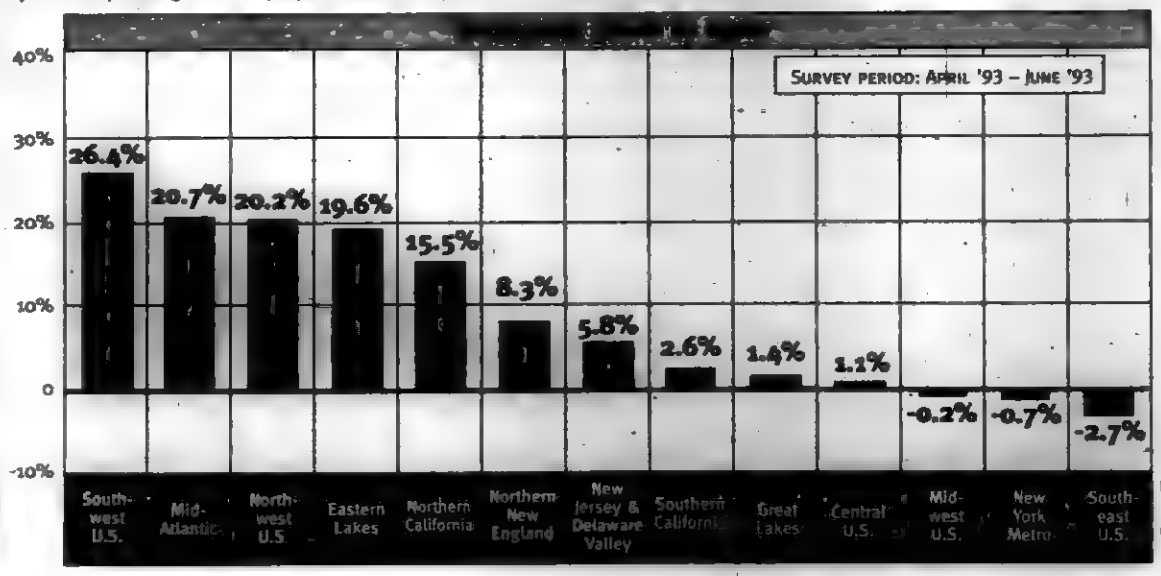

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Leasing and the upgrade time bomb

shopper alert!

By Timothy E. Duncan

Unplanned upgrades are to leasing what soft drinks and french fries are to the fast-food industry: the primary source of profits. Many companies spend 25% to 50% more than necessary on leasing because managers don't properly prepare for the inevitable need to upgrade.

Equipment that is functional today probably won't be in two years without significant enhancements to the system. Leasing companies know this. In fact, lessors have found that 70% to 80% of the leased equipment in their portfolios will be upgraded within 36 months of the lease's inception. Users who don't plan for these upgrades will come up short.

The basic problem with financing an upgrade is that the lessor is usually your only financing source. Of course, your company can always buy the upgrade and forego financing, but if you haven't protected yourself up front, this could be costly. A better alternative is to improve your lease management by heeding these 10 recommendations.

1. Acknowledge the problem

Virtually all types of equipment, from PCs to mainframes, are upgradable, and much of the equipment that you lease will probably be upgraded before the lease runs out. Your company will likely spend more money on upgrading equipment than buying it in the first place.

2. Plan ahead

Speak with users and determine when upgrades might occur during the lease and what the range of costs might be. Also, get an idea of how upgrades will extend the equipment's life, and compare this life expectancy with the term of the lease you expect to sign.

3. Use competition to your advantage

Lessors will be extremely aggressive in going after the initial lease. Use this competitive environment to your advantage by having lessors include rates for possible upgrades in initial bids. Rates for upgrades are normally expressed as a percentage of the cost of the upgrade that the lease rate will pay back, based on interest rates in effect at the time the upgrade is installed.

4. Incorporate into the lease the right to upgrade

You should have the unrestricted right to upgrade equipment as long as you don't materially diminish the value of the equipment and you agree to return the equipment to its original condition when the lease expires.

5. Reserve the right to return identical equipment

Lower cost items of leased equipment such as PCs and workstations will often be upgraded indiscriminately by users who pay for the upgrades out of their own budgets. In many cases, it is impractical and costly to remove these upgrades, and the best alternative is to return identical equipment to the lessor and leave the upgraded equipment in place.

6. Reserve the right to purchase the equipment at the end of the lease

Lessors generally do not bid on upgrading another lessor's equipment unless the user can purchase the equipment from the original lessor at the end of the lease. When they are providing initial lease rates, ask lessors to provide a purchase quote for the equipment at the end of the proposed lease. The lease should state that you have a right to purchase the equipment at this purchase price or fair market value, whichever is lower, at the end of the lease's initial term.

7. Incorporate into the lease the right to purchase the equipment at certain points during the lease

In most cases, your only option will be to purchase the upgrade yourself if your lessor refuses to provide you with competitive upgrade pricing or is no longer able to provide additional financing. As a result, insist on the right to buy out the lessor at certain points during the lease (quarterly or semiannually) at specified prices. You can always buy the equipment back from the lessor, order the upgrade and obtain financing for both the buy-back and the upgrade if the original lessor cannot meet your needs.

8. Reserve the right to extend the lease

Upgrades can significantly extend the life of the original equipment because they often occur in the lease's later stages. Insist on a provision to extend the lease beyond its initial term.

Obtain extension rate pricing from all lessors bidding on the original lease, and consider it an important factor in awarding the transaction. Ask for the right to extend the term at the lower of the extension rates or the fair market rental value for the desired extension period.

9. Focus on more than budget numbers

Many users pay attention only to the monthly payment and not the length of the term, especially when an upgrade and a lease extension occur at the same time. By stretching the length of the lease to lower monthly rental payments, users increase the likelihood that the equipment will need another upgrade before the end of the lease. A higher lease rate and shorter lease term may sometimes be a better option.

10. Maximize leasing expertise

Sophisticated lessees save millions of dollars in overall costs by devoting sufficient resources to manage the process. It is important to be well-grounded in advanced financial concepts and have adequate external and internal resources to develop long-term strategies.

Duncan is an attorney and president of Duncan Resources Group, a Boston advisory firm that assists companies with purchasing, leasing and financing high-tech equipment.

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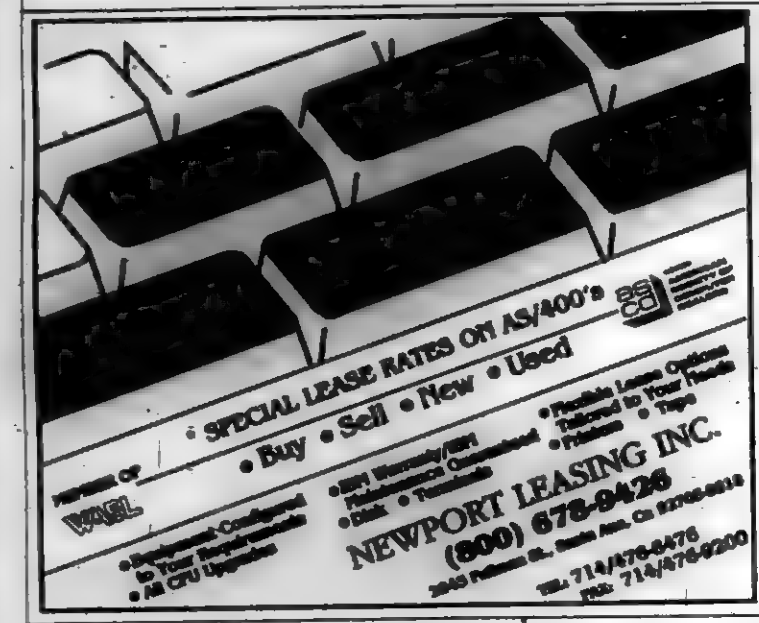
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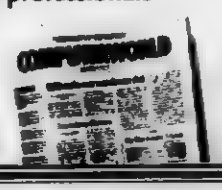

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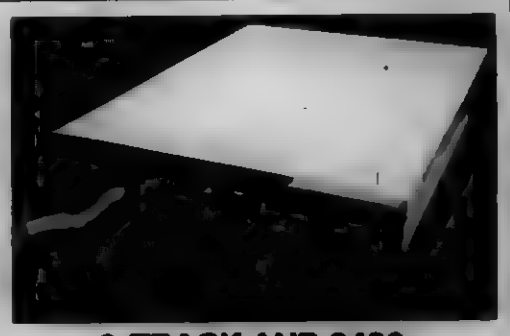

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Percent

[illegible]	20.6
[illegible]	16.7
[illegible]	15.4
[illegible]	14.3
[illegible]	13.6
[illegible]	13.2
[illegible]	11.8
[illegible]	11.8

Dollar

[illegible]	5.38
[illegible]	3.88
[illegible]	3.88
[illegible]	3.25
[illegible]	3.13
[illegible]	3.00
[illegible]	2.88
[illegible]	2.75
[illegible]	2.75

Losers

Percent

Zeos Inc.	-18.9
Group I Software	-16.7
Stratacom Inc.	-14.8
Western Digital Corp.	-13.9
Synoptics Communications	-13.6
3 COM Corp.	-12.6
Microdyne Inc.	-12.5
Bell Computer Corp.	-12.5

Dollar

Zeos Inc.	-4.13
Hewlett Packard Co. (H)	-3.38
Watertown Electronics	-4.63
Synoptics Communications	-4.63
Apple Computer Inc.	-3.50
BMC Software Inc.	-3.50
3 COM Corp.	-3.25
IBM	-3.13

[illegible]

Greatest misses

Wall Street analysts answer the question: What is the worst investment recommendation you've ever made?

"I once owned Wang, so that was the worst *personal* investment.

"Then I picked Computer Associates at 7, watched it go up to 19 and then back down to 4. Of course, people didn't remember the 7 bit, only the 19. I see it's back up now, though."

— Vice president of institutional research

"With 20 years' experience, I can't remember which one was worst. A recent one was Borland — it's been cut in half. I was recommending it in the 40s, and now it's in the 20s. Subsequently, I quit following the stock."

— Technology analyst

"The worst was a Buy on IBM when it was around 80.

"Another mistake was not taking a Buy rating off when I planned to. That was DEC in 1987. It was about 199 when I left for vacation, and I didn't take the Buy rating off. It was 150 when I got back."

— Analyst

"I was recommending AMD back when they went into what I call their period of agony — the mid- to late 1980s. I wrote them down quite a bit before I threw in the towel.

"The only good thing was, I didn't quit at the very bottom. It kept going down after I gave up on it.

"Often the worst decision for analysts is one we didn't recommend that we should have. I was recommending Intel until late December, then I went Neutral. I should have waited another month and a half. I missed about the last 20 points."

— Vice president of research

"Mine was Wang Labs at about 15 bucks. It was about three years before disaster struck, but we tend to have clients with long memories."

— Analyst

"It was probably Perception Technology in the voice response business. The story was they were working on a bunch of big deals with resellers, and it didn't happen.

"I think it was probably 12 or 14, and it went to 2 or 3. You try to forget these things."

— Partner

Compiled by Derek Slater.

Exch	52-Week Range			June 18 Vol	Net Change	Vol Pct Change
[illegible]						
OTC	40.00	9.63	3 COM Corp.	22.63	-3.25	-12.6
NYS	80.25	62.63	American Info Techs Corp.	78.75	2.75	3.6
NYS	63.88	40.63	AT&T (H)	61.63	-0.38	-0.6
OTC	3.94	0.75	Artel Communication Corp. (H)	3.94	0.88	28.6
OTC	24.50	10.25	Banyan Systems Inc.	15.00	-0.38	-2.4
NYS	56.75	44.25	Bell Atlantic Corp.	56.75	0.25	0.4
NYS	57.50	46.75	Bellsouth Corp.	53.63	0.50	0.9
NYS	8.00	3.63	Bolt, Beranek & Newman (H)	7.25	-0.50	-6.5
OTC	18.50	9.50	Brooktrout Technology	10.88	-1.38	-11.2
NYS	108.38	46.00	Cabletron Systems (H)	101.50	1.63	1.6
OTC	27.75	3.75	Centigram Communications	20.00	-0.25	-1.2
OTC	43.50	19.00	Chipcom Corp.	38.75	-0.38	-1.0
OTC	56.25	21.38	Cisco Systems Inc.	51.25	-1.75	-3.3
OTC	16.38	5.50	Compression Labs Inc.	12.63	1.00	8.6
OTC	36.00	11.25	CrossComm	29.25	-1.00	-3.3
OTC	4.63	1.00	Data Switch Corp.	2.88	0.13	4.5
NYS	19.88	12.38	Digital Comm. Assoc.	12.50	-0.25	-2.0
OTC	12.75	4.50	Digital Systems Int'l Inc.	5.25	0.00	0.0
OTC	48.13	4.25	DSC Communications	48.13	5.00	11.6
OTC	9.50	4.75	Fibronix Int'l Inc.	6.63	0.13	1.9
OTC	24.75	8.75	Filenet Corp.	11.25	-1.00	-8.2
OTC	4.38	1.50	Gandalf Technologies Inc.	2.88	-0.25	-8.0
OTC	2.06	0.69	Gateway Communications	1.06	0.00	0.0
NYS	15.75	2.88	General Datacomm Inds.	14.25	-0.13	-0.9
ASE	3.75	2.00	Go Video	2.94	0.00	0.0
NYS	37.75	31.13	GTE Corp.	35.38	0.25	0.7
NYS	85.13	62.50	ITT Corp.	85.13	3.88	4.8
OTC	57.13	30.75	MCI Communications Corp.	55.50	1.00	1.8
OTC	8.50	2.25	Microcom Inc.	3.50	-0.50	-12.5
OTC	24.25	4.75	Netrix Corp.	5.25	0.00	0.0
OTC	19.00	8.75	Network Computing Devices	9.25	-0.50	-5.1
NYS	15.00	5.38	Network Equipment Tech.	7.88	-1.00	-11.3
OTC	20.13	8.00	Network General	9.13	-0.13	-1.4
OTC	15.75	8.38	Network Systems Corp.	9.00	-0.13	-1.4
OTC	44.25	7.50	Newbridge Networks Corp. (H)	43.25	2.75	6.8
NYS	46.00	30.50	Northern Telecom Ltd.	38.25	1.88	5.2
OTC	35.25	22.50	Novell Inc.	26.50	-1.75	-6.2
NYS	92.50	76.00	Nynex Corp.	88.50	0.75	0.9
OTC	30.00	14.50	Octel Communications Corp.	20.75	-0.50	-2.4
OTC	6.13	3.38	Pairgain Data Comm Networks	4.00	-0.38	-8.6
OTC	30.50	10.25	Picturetel Corp.	20.50	1.25	6.5
OTC	15.25	4.63	Proteon Inc.	5.13	-0.13	-2.4
NYS	35.00	14.25	Scientific Atlanta Inc.	30.75	-2.00	-6.1
NYS	40.75	29.69	Southwestern Bell Corp.	37.88	-1.13	-2.9
NYS	33.25	21.00	Sprint Corp.	31.75	1.00	3.3
OTC	27.00	10.50	Standard Microsystems Corp	16.88	-0.50	-2.9
OTC	18.50	6.88	Stratacom Inc.	12.25	-2.00	-14.0
OTC	42.75	9.25	Synoptics Communications	32.00	-4.63	-12.6
OTC	7.00	3.88	Telebit Corp.	4.00	-0.25	-5.9
OTC	9.38	2.13	Telematics Int'l Inc.	6.63	-0.38	-5.4
OTC	25.50	13.38	US Robotics	21.75	0.50	2.4
NYS	45.00	35.25	US West Inc.	44.00	-0.25	-0.6
OTC	55.50	12.00	Wellfleet Communications	46.75	-0.75	-1.6
OTC	14.75	7.00	Xircom	14.25	0.25	1.8
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OTC	5.75	2.50	Advanced Logic Research	3.75	0.00	0.0
OTC	66.25	40.75	Apple Computer Inc.	40.75	-3.50	-7.9
OTC	24.25	11.25	AST Research Inc.	15.00	0.50	3.4
NYS	10.63	2.63	Commodore Int'l	2.88	-0.13	-4.2
NYS	61.75	23.25	Compaq Computer Corp.	53.38	-0.75	-1.4
OTC	49.88	15.13	Dell Computer Corp.	17.75	-2.50	-12.3
NYS	89.25	50.25	Hewlett Packard Co. (H)	80.75	-5.38	-6.2
NYS	38.50	16.13	Silicon Graphics	34.75	0.13	0.4
OTC	41.00	22.50	Sun Microsystems Inc.	28.25	-2.38	-7.8
NYS	32.38	22.25	Tandy Corp.	30.13	0.25	0.8
OTC	7.00	2.75	Zeos International Ltd.	3.88	-0.25	-6.1
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ASE	18.38	4.63	Amdahl Corp.	5.38	-0.13	-2.3
NYS	8.75	4.25	Convex Computer	5.63	-0.25	-4.3
OTC	6.13	1.88	Cray Computer	3.13	-0.25	-7.4
NYS	30.88	19.00	Cray Research Inc.	27.50	0.00	0.0
NYS	13.88	7.13	Data General Corp.	9.50	-0.50	-5.0
NYS	49.25	30.38	Digital Equipment Corp.	40.75	-1.75	-4.1
NYS	38.63	26.75	Harris Corp.	37.88	0.25	0.7
NYS	100.38	45.88	IBM	49.38	-3.13	-6.0
OTC	22.00	5.50	Kendall Square Research	17.25	0.63	3.8
NYS	127.50	83.00	Matsushita Electronics	117.38	-4.63	-3.8
OTC	23.75	8.25	NetFrame	16.00	-0.13	-0.8
OTC	16.50	9.25	Parallan Computer	13.25	0.25	1.9
OTC	19.00	6.00	Pyramid Technology	17.75	-0.25	-1.4
OTC	24.00	13.75	Sequent Computer Sys.	18.38	-0.50	-2.6
OTC	10.75	1.38	Sequoia Systems Inc.	2.25	0.31	16.1
NYS	48.38	29.50	Sybatus Computer Inc.	31.00	0.25	0.8
NYS	16.88	9.88	Tandem Computers Inc.	12.00	-0.88	-6.8
OTC	19.00	10.63	TeleCode Systems	18.25	1.00	5.8
NYS	13.88	7.75	Unisys Corp.	11.13	-0.25	-2.2
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OTC	74.00	25.25	Adobe Systems Inc. (H)	67.63	-0.38	-0.6
OTC	20.75	10.25	Aldus Corp.	17.63	1.88	11.9
OTC	14.25	5.50	American Software Inc.	7.88	-0.13	-1.6
OTC	28.13	9.75	Asa Computer Systems	11.13	0.13	1.1
OTC	56.50	32.75	Autodesk Inc	53.25	1.25	2.4
OTC	13.00	2.50	Bachman Info. Systems	3.00	-0.13	-4.0
OTC	43.00	32.00	BGS Systems Inc.	32.00	-1.75	-5.2
OTC	84.13	37.25	BMC Software Inc.	46.75	-3.50	-7.0
OTC	28.25	17.00	Boole & Babbage	24.25	0.25	1.0
OTC	49.00	17.50	Borland Int'l Inc.	24.50	1.63	7.1
OTC	5.38	3.00	CE Software	3.75	0.44	13.7
ASE	38.25	6.25	Cheyenne Software Inc.	29.13	2.00	7.4
OTC	19.50	8.25	ChipSoft	10.50	0.25	2.4
OTC	9.25	5.63	Cognos Inc.	6.63	0.13	1.9
NYS	31.38	10.88	Computer Associates	27.63	0.13	0.5
NYS	12.38	2.75	Computervision Corp.	3.88	-0.25	-6.1
OTC	34.25	19.25	Computware Corp.	26.38	3.13	13.4
OTC	14.75	5.75	Corsmare Inc.	7.25	-0.50	-6.5
OTC	17.25	10.75	Corel Corp.	16.75	1.00	6.3
OTC	23.00	5.25	Easel Corp.	5.75	-0.63	-9.8
OTC	25.25	12.00	4th Dimension	18.13	0.38	2.1
OTC	19.50	5.38	Frame Technology (L)	5.88	-0.13	-2.1
OTC	20.75	10.00	Group I Software	10.00	-2.00	-16.7
OTC	35.25	16.00	Gupta	16.00	0.38	2.4
OTC	8.75	3.50	Hogan Systems Inc.	7.50	-0.25	-3.2
OTC	25.75	11.25	IMRS	18.25	-0.50	-2.7
OTC	36.00	18.50	Information Resources	35.75	0.25	0.7
OTC	24.88	6.06	Informix Corp.	23.25	0.99	4.4
OTC	16.75	8.88	Intergraph Corp.	9.88	0.00	0.0

Exch	52-Week Range			June 18 Vol	Net Change	Vol Pct Change
OTC	13.63	6.88	Interlan Inc.	8.63	0.25	3.0
OTC	18.00	6.25	Intersolv Inc. (L)	6.25	-0.75	-10.7
OTC	16.00	7.75	Knowledgeware Inc.	9.38	-0.63	-6.3
OTC	54.75	26.00	Legent Corp.	33.50	2.88	9.4
OTC	36.75	14.75	Lotus Development	34.50	1.00	3.0
OTC	23.00	6.50	MathSoft	6.75	0.13	1.9
OTC	23.25	5.25	McAfee Associates	6.75	-0.25	-3.6
OTC	11.63	1.88	Meca Software	10.25	-0.38	-3.5
OTC	12.00	5.25	Mentor Graphics	10.63	-0.13	-1.2
OTC	46.00	27.25	Micro Focus	33.38	-0.63	-1.8
OTC	17.25	4.38	Microsmarts Inc.	5.50	-0.13	-2.2
OTC	98.00	65.50	Microsoft Corp.	89.25	-0.38	-0.4
OTC	45.63	14.00	Oracle Corp.	43.25	0.88	2.1
OTC	34.25	15.38	Parametric Technology	30.25	1.25	4.3
OTC	40.50	22.50	Peoplesoft	29.00	-2.75	-8.7
OTC	7.13	3.50	Phoenix Technologies	5.63	0.00	0.0
OTC	40.00	22.00	Powersoft (L)	27.75	1.75	6.7
OTC	41.50	17.00	Platinum Software	25.00	-0.50	-2.0
OTC	25.00	11.25	Platinum Technology	13.38	-0.38	-2.7
OTC	61.90	29.00	Progress Software Corp.	39.25	5.25	15.4
OTC	13.25	2.56	Quarterdeck Office Sys.	3.31	0.13	3.9
OTC	27.75	11.75	Rainbow Technologies Inc. (H)	27.00	0.75	2.9
OTC	12.25	4.00	Rasterops	9.50	0.75	8.6
OTC	15.25	3.63	Boss Systems	12.75	0.75	6.3
OTC	27.25	9.13	Sapiens Intl. Corp. N.V.	25.50	2.25	9.7
OTC	14.50	6.75	Software Publishing Corp.	7.50	-0.25	-3.2
OTC	12.00	2.00	Software Toolworks Inc.	9.38	0.00	0.0
OTC	3.50	0.75	Spinnaker Software	1.25	-0.13	-9.1
OTC	12.75	3.25	State of the Art	9.50	-0.75	-7.3
NYS	24.63	14.25	Sterling Software Inc.	19.50	0.00	0.0
OTC	21.50	8.00	Struct. Dynamics Research	17.50	-0.75	-4.1
OTC	72.75	21.88	Sybase Inc.	69.88	0.75	1.1
OTC	41.00	5.88	Symantec Corp.	15.88	0.13	0.8
NYS	12.50	5.25	Systems Center Inc.	10.38	0.13	1.2
OTC	25.50	10.00	System Software Assoc.	20.00	0.75	3.9
OTC	6.38	2.50	Telmic Corp.	3.38	0.13	3.8
OTC	22.75	9.13	ViewLogic Systems	17.50	-0.63	-3.4
OTC	23.50	6.75	Walker Interactive Systems	7.50	-1.00	-11.8
OTC	3.19	1.38	Wordstar	1.63	0.00	0.0
[illegible]						
NYS	32.88	7.38	Advanced Micro Devices	20.75	-0.38	-1.8
NYS	21.38	9.00	Analog Devices Inc.	19.25	0.50	2.7
OTC	25.13	7.63	Atmel Corp. (H)	25.13	1.00	4.1
OTC	7.75	2.75	Chips and Technologies	3.63	-0.25	-6.5
OTC	39.75	13.00	Cirrus Logic	19.63	0.75	4.0
NYS	14.38	7.38	Cypress Semiconductor Corp	13.63	0.25	1.9
NYS	16.13	8.00	Dallas Semiconductor	14.75	0.63	4.4
OTC	60.63	25.75	Intel Corp.	55.50	-1.00	-1.8
NYS	14.63	6.88	LSI Logic Corp.	14.63	1.00	7.3
OTC	33.25	13.75	Lattice Semiconductor	27.25	-1.88	-6.4
NYS	35.00	13.13	Micron Technology (H)	34.25	3.50	7.9
NYS	88.00	37.13	Motorola Inc.	81.38	-2.63	-3.1
NYS	16.00	8.50	National Semiconductor (H)	15.75	1.00	6.8
OTC	16.50	6.50	Sierra Semiconductor	7.50	-0.50	-6.3
OTC	63.25	22.25	SynOptys	60.25	1.25	2.1
NYS	69.63	32.25	Texas Instruments	69.63	3.25	4.9
OTC	8.88	6.00	VLSI Technology	7.63	-0.38	-4.7
OTC	10.38	2.19	Weitek (H)	9.13	-0.75	-7.6
ASE	9.63	4.00	Western Digital Corp.	6.00	-0.63	-13.5
OTC	38.50	14.50	Xilinx	34.38	0.63	1.9
OTC	33.00	13.00	Zilog Inc.	26.25	-6.13	-18.9
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OTC	39.25	11.75	American Power Conversion	34.00	-1.00	-2.1
OTC	20.16	13.84	Banctec Inc.	17.75	-0.50	-2.7
OTC	18.00	6.25	Cambex Corp.	6.50	-0.50	-7.1
ASE	18.38	6.50	Cognitronics Corp.	7.75	-0.38	-4.6
NYS	25.50	9.88	Conner Peripherals (L)	9.88	-0.69	-6.0
OTC	38.50	10.75	Creative Technologies Inc.	27.63	1.13	3.9
OTC	30.75	14.25	Data Race Inc.	19.25	-0.50	-2.5
ASE	17.00	4.75	Databank Corp.	8.88	-0.63	-6.6
NYS	18.75	5.06	EMC Corp. (H)	18.75	1.38	7.9
OTC	10.50	5.38	Emulex Corp.	7.00	-0.13	-1.8
OTC	19.00	13.25	Evans & Sutherland	16.00	-0.50	-3.0
OTC	33.00	10.00	Exabyte (L)	10.00	-0.88	-8.0
OTC	26.00	7.09	Intelligent Info. Systems	25.00	1.00	4.2
OTC	8.88	3.75	Iomega Corp. (L)	4.00	-0.19	-4.5
OTC	21.25	5.75	IPL Systems Inc.	7.75	-0.25	-3.1
OTC	24.00	10.75	Komag Inc.	18.50	-1.75	-8.6
OTC	19.63	5.88	Maxtor Corp.	6.50	0.00	0.0
OTC	11.25	5.75	Micropolis Corp.	7.00	-0.25	-3.4
NYS	117.00	94.75	3M Corp	108.38	0.38	0.3
OTC	7.75	4.00	Printronix Inc.	6.75	0.25	3.8
NYS	17.25	6.88	QMS Inc.	8.88	0.00	0.0
OTC	17.88	10.63	Quantum Corp. (L)	10.63	-1.25	-10.5
OTC	12.75	3.13	Radius Inc.	4.00	0.50	14.3
NYS	16.50	7.50	Recognition Equipment	13.88	-0.63	-4.3
OTC	13.88	4.50	Rexon Inc.	4.63	-0.50	-9.8
OTC	22.38	12.80	Seagate Technology	15.63	0.75	5.0
NYS	45.00	18.00	Storage Technology	36.50	-0.38	-1.0
NYS	27.88	16.88	Tertronix Inc.	24.00	0.88	3.8
NYS	88.88	66.75	Xerox Corp.	77.38	2.25	3.0
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OTC	23.75	14.25	American Mgmt. Systems	16.50	-1.00	-5.7
NYS	4.75	2.75	Arrocomp Inc.	3.00	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	27.25	1.00	3.8
NYS	56.13	38.75	Auto Data Processing	47.25	-2.13	-4.3
NYS	17.25	11.22	Ceridian Corp.	14.50	0.00	0.0
NYS	17.38	13.13	Comdisco Inc.	14.50	0.00	0.0
OTC	8.25	4.50	Computer Horizons	7.38	-0.38	-4.8
NYS	80.50	57.00	Computer Sciences	77.75	2.38	3.2
NYS	9.25	6.50	Computer Task Group	7.25	0.25	3.6
NYS	40.50	22.00	CompUSA Inc.	31.88	-1.63	-4.9
OTC	14.25	6.00	Corporate Software	12.00	0.00	0.0
OTC	19.75	7.38	Egghead Discount Software	8.25	-0.38	-4.3
NYS	35.88	25.25	General Motors E (EDS)	30.13	0.00	0.0
OTC	25.50	9.50	Inacom Corp.	20.50	-0.63	-3.0
OTC	15.38	6.25	Intelligent Electronics	12.88	0.50	4.0
OTC	13.00	6.63	Merisel	11.50	-0.88	-7.1
OTC	16.25	5.75	Microage Inc.	15.75	0.50	3.3
OTC	43.00	21.75	Paychex	39.00	0.00	0.0
NYS	87.25	32.88	Policy Management Sys.	36.00	-2.38	-6.2
NYS	38.50	16.81	Reynolds and Reynolds	35.88	-1.88	-5.0
OTC	33.00	22.00	SEI Corp.	30.88	-0.13	-0.4
OTC	24.38	16.88	Shared Medical Systems	23.00	0.88	4.0
OTC	12.63	5.75	Shl Systemhouse	10.88	0.25	2.4
OTC	29.25	18.75	Software Spectrum Inc.	28.75	1.50	5.5
OTC	33.75	22.50	Sungard Data Systems	30.25	-0.25	-0.8
NYS	4.38	1.13	Ultimate Corp.	3.50	0.13	3.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Cabletron results rise
Showing growth across its product line, Cabletron Systems, Inc. last week posted first-quarter profits of $26.7 million, an increase of 49% from the like period one year ago. Revenue also rose 49%, to $131 million, the Rochester, N.H., networking products vendor said.

Adobe growth off
Adobe Systems, Inc. last week reported second-quarter earnings of $14.4 million, off 2% from the year-earlier period. Revenue in the period was $79.6 million, up 14% from the comparable period last year, the Mountain View, Calif., developer said.

Chapter 11 for Cygnet
Cygnet Systems, Inc., a San Jose, Calif., maker of optical storage jukeboxes, filed for Chapter 11 bankruptcy protection after it was unable to resolve a long-standing dispute with Eastman Kodak Co., which had filed suit against it in 1992 seeking repayment of a loan made in 1986. The two companies reached an agreement earlier this year in which Cygnet was given time to either recapitalize or be acquired.

SHORT TAKES Client/server tools developer Blyth Holdings, Inc. in Foster City, Calif., posted fourth-quarter profits of $253,766 on revenue of $2.8 million. . . . Central Point Software, Inc. in Beaverton, Ore., has agreed to acquire Maxa Corp., a Glendale, Calif., developer of Macintosh diagnostic products. . . . ECCS, Inc., a Tinton, N.J., systems integrator, has filed an initial public offering (IPO) of 1.7 million shares at a price of $6 a share. . . . Madge NV, a San Jose, Calif., Token Ring adapter supplier, has filed an IPO of 6 million shares, which are expected to sell for $10 to $12 a share.

Compaq struggles with success

By Michael Fitzgerald
HOUSTON

A year after firing the salvo that began the PC price war, Compaq Computer Corp. is slowing expansion plans as it struggles to keep pace with demand.

Last year's June 15 announcement of its aggressively priced ProLinea, DeskPro/I and Contura lines sent shock waves through the PC industry. The resulting consumer response allowed Compaq to more than double its U.S. market share, from 4% to 10% (see chart).

But with growth has come some pain. Outside of its well-publicized supply problems, prominent issues include a restructuring of its field sales force, which involved shifting much of the operation to Houston, rather than leaving the sales force out in the field; and a temporary retreat from plans to produce a new low-end product line aimed at retail channels, such as Wal-Mart Stores, Inc., in which Compaq currently does not have a presence.

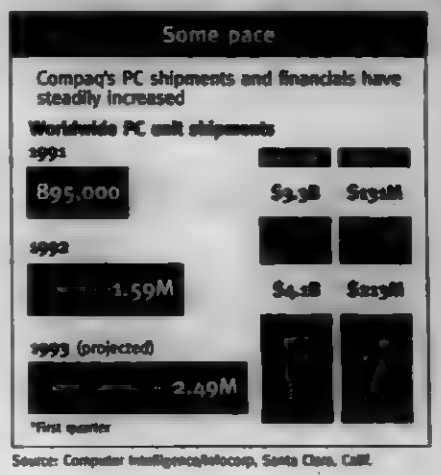
Ross A. Cooley, Compaq North America's senior vice president of sales, agreed "absolutely" that Compaq has had to pause as it tries "to digest" its growth, which rose 247% from the first quarter last year to the first quarter this year.

Besides slowing expansion efforts, Compaq has shifted extra lines to a new vertically integrated manufacturing process to help meet demand.

Compaq expected to have the new product line and channel expansion in place by now, but Cooley said these moves will not happen until the late third quarter. Compaq's Direct Plus direct-marketing effort has also been slower to develop than the firm expected, ironically because the unit has the same backlog problems that Compaq's reseller channel has.

Barbara Krumland, who runs Direct Plus, said the unit should earn 8% to 10% of Compaq's sales by the fourth quarter.

The traditional reseller channel, which Cooley affirmed will continue to be by far Compaq's largest distribution channel, has loudly questioned the wisdom of Compaq's expanding its channels at a time when dealers cannot get all the products they need. The fallout from Compaq's combination of rapid channel expansion and backlogs remains unclear; although Compaq has not experienced a mass revolt from its resellers, several said privately that they now discourage salespeople from even mentioning the company's name.



Source: Computer Intelligence/Infocorp, Santa Clara, Calif.

Analysts said, however, that by getting the Compaq name in front of buyers it used to concede to other companies, Compaq's channel expansion so far has been a fundamental part of the firm's comeback from the financial difficulties that caused the ouster of founder Joseph R. "Rod" Canion in November 1991.

Compaq's backlog situation is improving, and it may be largely caught up with demand by the end of the third quarter, according to company officials.

Where Compaq was once known for technological excellence, it now is less focused on being first to market with technology. Rather, "Compaq's innovation has been in pricing and channel and re-engineering the company, and that's probably more profound," said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass.

Among the changes instituted at Compaq in the last year were the following:

- Major strategic shifts in its server business aimed at giving it leadership in the downsizing arena [CW, June 14].
- Vastly expanded distribution channels, including direct sales.
- Obsessive cost-analysis for every piece of every product.
- Revamped back-office systems to handle higher order levels.

While analysts said Compaq's product strategies show that it is listening to its customers, users have noted over the last year that they have less contact with the company. Most stopped short of saying less contact is bad, however.

"They're not being as proactive as in the past," said Douglas Murphy, director of information systems at Comcast Corp.'s data center. Murphy said his firm accepts this as Compaq becomes "leaner and meaner."

Though Compaq leads IBM in several European markets and sells more servers in the U.S. than IBM sells, analysts were largely skeptical that Compaq can meet its stated goal of catching IBM by 1996.

Project Ruby: Gem of a plan

A key factor in Compaq's turnaround was an idea known internally as Project Ruby.

Launched in November 1991, Project Ruby set out to determine how Compaq could compete with low-priced PC vendors. The group, established as an independent business unit, laid the groundwork for the ProLinea family, whose base model was a 386SX desktop priced at less than $900.

However, Project Ruby has had a much more far-reaching impact for Compaq, particularly in cost-cutting.

While ProLinea came in at as much as 55% below DeskPro/M pricing in June 1992, one of the most important things Project Ruby did was show Compaq that it could produce low-priced systems and that it did not need Asian manufacturers for that purpose. That changed Compaq's entire design philosophy.

"There wasn't a person at Compaq who believed that we could cut even 30% off our costs before Ruby," said Richard Swingle, who ran Ruby and is now Compaq's vice president of desktop marketing for the PC division.

Swingle's team ripped apart desktop systems from all sorts of PC vendors to figure out how much the parts cost. It also attacked hallowed Compaq standards, which went so far as to mandate inspection of rubber bands.

Swingle held weekly cost-cutting sessions that initially humiliated the engineers, who were used to putting in the best technology they could find, regardless of cost. Now engineers have learned to justify every part that costs more than one used by a low-priced competitor.

For instance, Compaq uses a 145W power supply in its five-slot ProLinea instead of the cheaper 90W power supply used by a mass-market competitor. Swingle said Compaq's engineers found that a 90W power supply could not support the box if all five slots were used.

Ruby's precepts also guided the server division into faster, more cost-conscious product development cycles. Engineers who once said they needed more time to develop servers because of their complexity now race to meet Ruby and get products out as fast as their PC brethren.

Compaq also applied the Ruby concept to the creation of Direct Plus, its direct marketing effort. The company said it intends to use Ruby-like independent business units sparingly.

—Michael Fitzgerald

Wysiwyg

Ever play a prank on your users?

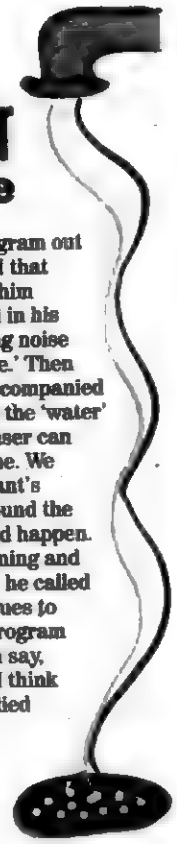
Here's what two of your colleagues have done...

Dating game

"I was working in a shop that had a sign-on security system for data entry clerks. I was interested in meeting one of the clerks in particular, so I rigged her system so that she had to answer a bunch of difficult questions before she could get logged on. Her supervisor, who was in on the prank, took me over to help her out with her 'trouble.' I spent time with her, helping her answer the tough questions. Today, that woman is my wife."

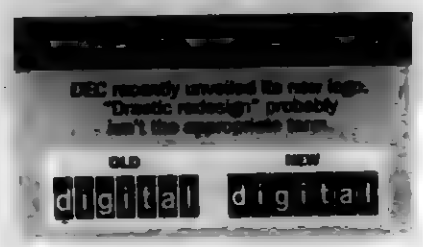
Jim MacFarland
System engineer
CBIS
Cincinnati

Water, water everywhere



"There's a joke program out there called DRAIN.COM that beeps at the user to tell him water has been detected in his drive. It makes a gurgling noise and says, 'Draining drive.' Then it says 'Drying drive,' accompanied by a drying sound. After the 'water' has been removed, the user can press any key to continue. We put this on one accountant's machine and waited around the corner to see what would happen. When the gurgling, draining and beeping sounds started, he called over some of his colleagues to check it out. After the program was done, we heard him say, 'Wow, those guys at IBM think of everything.' We just died laughing."

Paul Stagnoli
Programmer/analyst
Sebastiani Vineyards
Sonoma Valley, Calif.



Got any anecdotes about your users, your boss or your job? Call Lory Zottola Dix at (800) 343-6474, ext. 236. If we use your idea, we'll send you a gift.

The 5th Wave *by* Rich Tennant

Inside Lines

Consortia lover

A group of 88 vendors is expected to disclose a plan this week to develop a common Unix data management interface for such functions as data backup, file migration, compression, security and storage. Reportedly called the Data Management Interface Group, it was described by industry sources as "very similar in scope" to the Common Open Systems Environment (COSE) coalition set up earlier in the year to focus on a unified Unix look and feel. One definite similarity to COSE, at least in its original incarnation: Sun, Hewlett-Packard and IBM are all said to have signed on with the data management group, while DEC was not on the list as of last week.

Check the fine print

Microsoft, apparently swamped with support calls for DOS 6.0, is sending at least some users who procured the operating system bundled with their PC back to the hardware vendor that installed the software. Systems OEMs say Microsoft is merely enforcing a long-standing policy that says the manufacturer is responsible for support if it ships its system with software installed — including application software. Typically, manuals distributed by the hardware [illegible]

Changing [illegible]

Microsoft has reportedly named Dick Tong director of marketing for Windows NT and networking products. He takes the place of Dwayne Walker. Tong was formerly a senior product manager for Windows 3.1. Walker has taken a position as director of the solutions providers group.

Another false start?

Earlier this month, smart hub giant SynOptics Communications told *Computerworld* it would finally ship its Ethernet switching module — originally slated for release in the first quarter and based on Kalpana's LAN switch — this week. However, last week SynOptics once again reneged. The company did say that the module will incorporate Kalpana's new two-way Ethernet technology, which doubles LAN bandwidth [CW, May 25]. SynOptics attributed the many delays to having to build in an SNMP Management Information Base, which Kalpana did not have in its original design.

Dodging delays

After experiencing development problems, The Dodge Group is back on schedule with its Open Series of client/server financial applications and plans to ship a general-ledger component by the end of the year. The Waltham, Mass., firm, founded two years ago by Frank Dodge, has been beta-testing the general-ledger component at an undisclosed site since April. Dodge said the software is initially targeted at IBM's RS/6000 and Sun's Solaris server platforms. Open Series will be priced using an algorithm for concurrent use, with typical configurations listing for about $225,000, Dodge said.

Minnesota Software Systems Development certainly called attention to itself last week. Things got rolling when the company answered a challenge from Computer Associates by offering to give away 2 million copies of its financial software. That action was followed with a news release denying rumors that Microsoft was buying the company. Next came a statement that the company was indeed being acquired and "moving to the West Coast," though no purchaser was named. Then a release came out quoting the company's president saying Microsoft was indeed going to purchase the company. Phew! Finally, the news was out — maybe. The real news happened when a news wire appeared advising editors to ignore the whole thing. Two days of trying to reach Minnesota Software met with an unanswered phone. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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JANUARY 29, 1990

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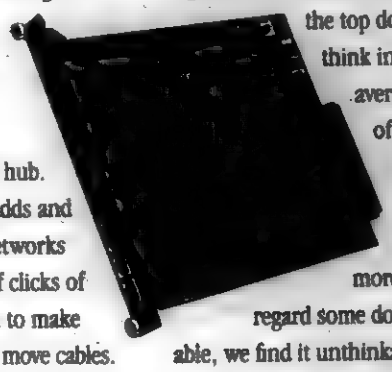

APRIL 29, 1991

We were the first to put Port Switching into an intelligent hub. With it, you can do moves, adds and changes, within or across networks or segments with a couple of clicks of a mouse. Without it, you get to make trips to the wiring closet and move cables. A lot of trips.

MAY 13, 1991

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Or what the heck, ask for all three.

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—*PC Magazine*, May 11, 1993

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COMPUTERWORLD

Confused developers try to untangle Win32 web

By Michael Vizard
REDMOND, WASH.

As corporate and independent developers begin planning their application development strategies for 1994 and beyond, many said they are becoming lost in a maze of conflicting Windows road maps. They cited the proliferation of Microsoft Corp. Win32 developer's kits.

Microsoft has left many developers concerned about picking the wrong development environment, which could have serious consequences for their future business plans.

"There isn't really a good channel for plugging into where Microsoft is going. We're kind of surprised to find out how hard it is to find out where the next shoe is going to drop," said Bill Niffin, a developer at Varitec Corp. in Birmingham, Mich., which specializes in creating applications for the health care industry.

According to Microsoft, about 75% of the applications being built today for its 32-bit Windows NT operating system are being constructed using the Win32s kit. That kit is a subset of the full Win32 kit that allows Windows applications to run on both the 32-bit Windows NT and 16-bit Windows 3.1 platforms.

The Win32s kit does not support some of the more complicated programming constructs, such as multithreading on reduced instruction set computing platforms

Win32 web, *page 10*

Development dilemma

Model	Function	Application deployment*
Win32s	Allows applications to run on Windows 3.1 and NT by not supporting multithreading, security and SMP.	1993
Win32	Supports all Windows NT platforms.	1994

*Expected

IS to gain app control

Microsoft adds macro language to integrate its packages

By Michael Vizard
NEW YORK

Microsoft Corp. will preview a common macro language this week that was designed to help information systems shops regain a modicum of control over the thousands of PC applications dispersed throughout their organizations.

While IS managers are happy to see progress in the area of application integration, there is some concern that Microsoft's offering is unavailable to third parties to incorporate into their own applications. But Microsoft's common macro language will link to third-party applications through its Object Linking and Embedding facility, which includes an OLE Automation utility that allows one application to take control of another.

The arrival of the common macro language, which Microsoft Chairman Bill Gates will showcase running on forthcoming versions of his company's Excel spreadsheet and Project project management software at PC Expo, heralds the beginning of a Microsoft push to tightly integrate its application software [CW, May 31].

Based on the company's Visual Basic programming language, Microsoft's common macro language is called Visual Basic programming systems, Applications Edition, and is intended to give IS managers a tool for building mac-

IS, *page 14*

PC EXPO

WordPerfect demos Amber; PC-DOS 6.1 to debut; wireless LAN proliferate. See stories pages 14 and 15.

Sun boosts net management

By Elisabeth Horwitt
MOUNTAINVIEW, CALIF.

Sun Microsystems, Inc. is preparing to fight off IBM and Hewlett-Packard Co. encroachments on its network management turf. Sun will go on the offensive with a salvo of help features aimed at the less SNMP-savvy user, a company spokesman confirmed last week.

In the works are a user interface based on the Open Software Foundation's Motif, as well as more functional utilities for managing different applications and views of the enterprise network, according to Steve Borcich, product development manager at Sun.

The late summer announcements, Sun hopes, will satisfy some long-term user rumblings and help extend the company's reach beyond the OEM market and its workstation base into end users' multivendor networks.

The enhancements will come none too soon if SunNet Manager is to compete effectively with HP's OpenView and IBM's NetView/6000 for a place on the short list for corporations now shopping for enterprise network manage-

Sun, *page 8*

Spindler likely to prune Apple orchard

By James Daly
CUPERTINO, CALIF.

■ The ascension of Michael H. Spindler to chief executive officer at Apple Computer, Inc. is expected to have serious repercussions on the Macintosh line and could sound the death knell for products yet to be released.

Spindler, a workmanlike leader, replaced the more visionary John Sculley as CEO 10 days ago [CW, June 21]. He is expected to sharply pare some of the expansive research and development programs that have cut into Apple's overhead and expense structure, analysts said last week. Apple insiders said as much as $150 million of the firm's $600 million R&D budget may be chopped.

In addition, analysts predicted that anywhere from 1,000 to 2,000 people in Apple's 14,000-member work force may lose their jobs in layoffs during the coming weeks. Apple officials declined to comment on the report.

Sculley's shift "is

Spindler, *page 20*

CW Report: Portable computing

Invisible staffs and other mobile mysteries

With more people working off site, you may soon find yourself in the empty corridors of "the virtual corporation," where employees are located wherever they're most productive. How do you manage people you never see? Experienced users offer advice in our Management section.

Mass mobility also creates technology challenges. In the CW Guide, we familiarize you with some new miniature technologies, make sense of the new gadgetry and explain two techniques for linking remote users to the local-area network. You'll also want to read about the security and networking issues that arise. Finally, users rate top color notebooks and applaud the latest Apple PowerBook.

See stories pages 97-146.

Pacific Stock Exchange's David Elizabeth is embarking on a 'virtual office' project

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■ A lack of consensus hurts the chances that a **PCMCIA** standard will be reached this year. *Page 4*

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■ An on-line prototype system in England, which will use navigational satellites, will give passengers access to fares and bus locations as they wait for their bus to arrive. *Page 28*

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KENT MANSON

In Depth: Re-engineering aftermath at Connecticut Mutual: IS Chief Jan Scites (left) said that at first people were afraid; for end user Kathleen Pogg, change has meant empowerment. *Page 149*

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CW GUIDE TO MOBILE COMPUTING

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Executive Briefing

Some developers are getting lost in conflicting directions from Microsoft about how to develop for future versions of Windows. About three quarters are using the less-functional Win32s tool kit, which doesn't provide advanced Windows NT features. *Page 1.* **Microsoft this week will preview a common macro language for its applications, but other commercial developers apparently won't have an easy way to use it in their products.** *Page 1.* **Its phone lines jammed, Microsoft pushes more of its support load onto hardware vendors.** *Page 6*

Re-engineering processes and systems can be a gut-wrenching experience for IS and users alike. A look at projects taking place at Connecticut Mutual, Agway and Kodak reveals how re-engineering altered the lives and jobs of not only IS but managers and end users as well. *Page 149*

New software pricing options are giving users flexibility but also complexity. Diversity has spawned more paperwork and decision-making, and some users are less certain that they are getting the best deals. *Page 16*

Sun and Novell will connect their network management systems, using SunNet Manager to provide administrators with an overview of the network, while Novell NMS concentrates on specific NetWare issues. *Page 8.* Sun is also readying a salvo of help features aimed at the less SNMP-savvy users. *Page 1*

It's crunch time at Apple as Michael Spindler takes over as CEO. Analysts expect Spindler to cut R&D and lay off up to 2,000 employees. The next year should be rocky because innovative technologies like the Newton personal digital assistant and PowerPC Macintosh won't contribute revenue. *Pages 1, 20*

Mobile computing is prompting managers to learn new ways to communicate with far-flung employees. The CW Buyers' Guide offers purchasing tips for tiny technology. *Page 107.* Compaq garners high user-satisfaction ratings among top color notebook models, while Apple PowerBook users rave about that machine. *Pages 141, 145*

Performance trade-offs associated with Microsoft's ODBC database standard will push many developers into working with faster, existing proprietary interfaces for accessing SQL databases.

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AS/400 retooled for NetWare service

By Craig Stedman
ROCHESTER, MINN.

IBM is expected in September to add client/server functionality to its low-end Application System/400 computers in an attempt to position them more competitively as local-area network servers against Intel Corp. 1486- and Pentium-based machines.

The rollout, which follows earlier IBM promises, is expected to include a move to make the central processors now used in the high-end 9406 models available as options on the lower end 9402 and 9404 series for use in file server applications.

IBM is also said to be planning to move some file processing functionality from the AS/400's CPU to its I/O processors to increase file uploading and downloading performance. In addition, streamlining is anticipated in the number of instructions in the OS/400 operating system related to moving files, according to David Andrews, managing partner at ADM Consulting in Cheshire, Conn.

Andrews said IBM may also make Novell, Inc.'s NetWare network operating system directly available on the AS/400 as part of the client/server strategy.

An IBM spokesman would not confirm or deny the reports, but he said it is "no secret that client/server is our direction" for the AS/400.

Steady but slow

While the AS/400 already functions as a solid database server, Andrews said, it currently is "significantly slower" at uploading and downloading files than 486-based systems equipped with NetWare. "It will do that job. It just won't do it very fast," he noted.

The moves IBM plans should make the AS/400 "a viable hybrid server which offers great performance" and lessens the need for users to put a separate 486 or Pentium box alongside it to handle file serving, Andrews said.

Rich Kolbe, director of MIS at Harley-Davidson, Inc. in Milwaukee, said he was pleased by the reports. "The idea of having something a little bit better to take advantage of PC networks, and of using the AS/400 as a file server in a more fluid manner, is something that appeals to me," he said.

Teresa Elms, president of the Elms Information Services Group consultancy in San Diego and an AS/400 customer, said her surveys show one-third of all terminals attached to AS/400s are PCs. The reported plans "would be consistent with IBM's strategy," she said. "They finally got the religion."

But Andrews said he does not expect IBM to compete on price with 486-based servers. He is looking for the AS/400 to be positioned as a higher end system that does both file and database serving while providing robust systems management.

Source: Computerworld Database Division, Framingham Mass.

Offering the higher end CPUs on the low-end AS/400s would likely make sense in PC LAN server applications where the work load would probably be high enough to keep the faster processors busy, Andrews said.

PCMCIA standard not in the bag

Competitive systems manufacturers holding up process

By Christopher Lindquist and Michael Fitzgerald
LOS ANGELES

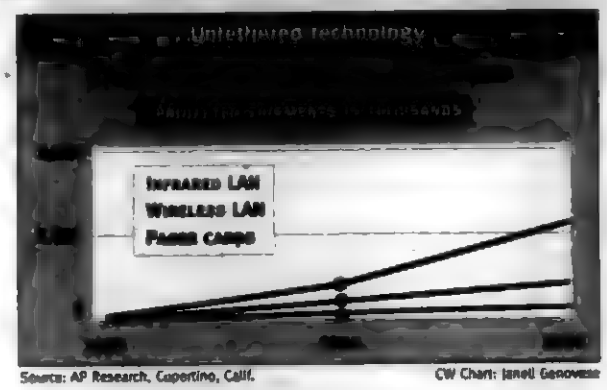
While the Personal Computer Memory Card International Association (PCMCIA) appears to be marching inexorably toward a common, interoperable standard for PC cards, the group may encounter difficulties trying to keep its members from fracturing the standard.

If the PCMCIA cannot enforce its standards, PC cards will not become as interoperable as floppy disks, which will hurt their acceptance in the market.

The PCMCIA recently appeared headed toward delivering a solid, stable standard for all PCs as early as the end of this year [CW, May 31]. However, speakers on a PCMCIA panel at the Lap and Palmtop Show here said it is more likely that a consensus will not be reached until mid-1994.

The PCMCIA standard should also let users exchange cards among diverse systems, such as Intel Corp.-based notebooks and Apple Computer, Inc.'s Newton, but this may be years away from reality.

"Unfortunately, the marketplace is promoting these things as being generic," said Sam Walker, vice president of sales at Apex Data, Inc., a Dublin, Calif., maker of notebook peripherals. "We're far, far from that."



Source: AP Research, Cupertino, Calif. CW Chart: Janell Genovese

Striving to be unique

Walker said the problem lies with systems manufacturers that are trying to maintain some level of differentiation in a competitive market.

Most systems vendors, even in the Intel world, require card vendors such as Apex to write drivers specific to systems, although IBM and Grid Systems Corp. have systems that come bundled with PCMCIA socket services specification 2.01, the latest version of the standard.

IBM sees this as enough of a problem that it introduced ThinkPad Proven, a program that certifies PC cards for use in its systems.

"The risk we're running into now is this stuff is going to start appearing in the stores, and there could be a consumer backlash," said Andrew Prophet, president of AP Research in Cupertino, Calif., a market research firm specializing in the PCMCIA and semiconductor industries.

Various schemes are under consideration, including a means of marking cards and systems in such a way that users would be able to select working combinations, much as they can with automated teller machine cards today. Creating software drivers that would allow incompatible cards and systems to work together is another idea.

This will become more of an issue as non-Intel devices that could use PCMCIA — for example, personal digital assistants such as the Newton and the AT&T EO Personal Communicator — become more widespread. While all will be PCMCIA-compliant, cards for one system may not work in the PCMCIA slot of another, Prophet said.

Better mobile network infrastructure needed

By Michael Fitzgerald and Joanie M. Wexler
DALLAS

Data communications issues remain major stumbling blocks for notebook users, according to attendees at Dataquest, Inc.'s Mobile Computing Forum here last week.

For example, during a conference session, Sheldon Laube, Price Waterhouse's national director of information technology, lambasted vendors for implementing a communications infrastructure — both wired and wireless — that shows a lack of foresight.

"Today's systems are aimed at short, fast transactions; they're not good for big files," Laube said.

Users need the same access to data on the road as they do from their desktops, Laube said, and with vendors talking about features such as voice annotation and video, the data infrastructure is not yet adequate.

However, several initiatives are under way to address some of these issues. In the wireless world, for example, the next generation of cellular technology will convert today's analog cellular network, which can carry data at only about 2,400 bit/sec. because of its poor quality, to digital, said Paul Nikolich, a senior engineer at Racal-Datacom, Inc. and wireless standards committee member.

Digital cellular should boost individuals' wireless wide-area network access to 100K bit/sec. per user — speeds comparable to what users end up with on shared local-area networks.

Also, the Federal Communications Commission has approved a technology called CellularVision, patented by the company of the same name in Freehold, N.J. It can reportedly run videoconferencing, multimedia and other high-bandwidth applications at 1G bit/sec. speeds — potentially rivaling fiber optics [CW, Dec. 21, 1992].

In addition, vendors such as SimWare, Inc. offer compression software and processing techniques for laptops to reduce the volume of data going out over WANs, said Charles Nahabedian, vice president of corporate development at wireless carrier RAM Mobile Data in Woodbridge, N.J.

Dataquest predicted that 2.2 million notebooks will sell this year, compared with 1.8 million in 1992.

Not holding their breath

Several users agreed with Laube's central points, and few said they were counting on wireless technology soon.

For instance, at Energy Industries, a division of Holt Co. in Corpus Christi, Texas, that services gas compressors, "there is no way we can outfit our field service technicians with notebooks under the current way of doing things," said David Stephens, Energy's information systems manager.

Vendors acknowledged the communications issues. "People have got to play with this stuff for a while," said William A. Frezza, director of marketing and business development at Ericsson GE Mobile Communications, Inc. in Paramus, N.J. "If we try to solve problems before we bring the technology to market, we don't know what the problems are."

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News Shorts

Quarterdeck recalls software

Quarterdeck Office Systems, Inc. has recalled some 100,000 copies of Quarterdeck Expanded Memory Manager (QEMM) 7.0 to fix problems reported by early users. QEMM 7.01 will be available soon and should resolve complaints, particularly those involving interaction with **Microsoft Corp.**'s DoubleSpace disk compression, that were discovered after the product had already been sent to dealers.

Wireless speeds up

Advances in wireless networking debuted last week from **Motorola, Inc.** and **AT&T Paradyne**. Motorola's Flex High Speed Paging Protocol, to be used over radio-based paging networks, reportedly boosts transmission speed, data integrity and battery life while operating at 1,600, 3,200 and 6,400 bit/sec. AT&T Paradyne's Enhanced Throughput Cellular protocol is said to also address the throughput and reliability issues facing mobile computer users today in the cellular networking environment.

SEC scrutinizes Storage Tek

Storage Technology Corp. said it is being investigated by the Securities and Exchange Commission on possible charges of insider trading and/or violations of federal disclosure or reporting laws. The investigation follows a class action suit filed earlier this year by investors who claimed Storage Tek executives sold chunks of company stock just before the firm announced delays of its Iceberg disk array. Storage Tek said it intends to cooperate with the investigation.

IBM names strategy guru

IBM has named Bernard Puckett senior vice president of corporate strategy and development; he will report to Chief Executive Officer Louis Gerstner Jr. A 26-year IBMer, Puckett was most recently senior vice president of the Application Solutions line. Industry watchers differed over whether this was a plum meant to show the existing raft of IBM execs that there could still be career advancement within IBM or a signal of Gerstner's intent to reorganize some parts of IBM along customers' lines of business.

PC price war casualties mount

There were signs last week indicating that last year's price wars are continuing to exact a toll on the PC industry. While **Groupe Bull**, owner of **Zenith Data Systems**, bought a piece of **Packard Bell Electronics, Inc.**, **CompuAdd Computer Corp.** filed for bankruptcy. Bull bought a 20% stake in Packard Bell and said Packard Bell and Zenith Data will co-develop a line of PCs — expected to be low-cost machines — to round out Zenith Data's product line. Packard Bell will resell Zenith Data's low-end notebooks. CompuAdd, meanwhile, declared Chapter 11 bankruptcy.

Vendors promote Unix standard

A group of 33 vendors have joined to promote standard application programming interfaces for storing data under Unix. The Data Management Interfaces Group includes **IBM**'s AdStar peripherals business, **Hitachi Computer Products, Inc.** in Santa Clara, Calif., **Auspex, Inc.** in Houston and **E-Systems, Inc.** in Dallas.

SHORT TAKES **United Parcel Service, Inc.** will build a $55 million data center in Atlanta to back up its primary facility in Mahwah, N.J. . . . **3Com Corp.** announced record sales of $167 million and record earnings per share of 40 cents for the quarter ended May 31.

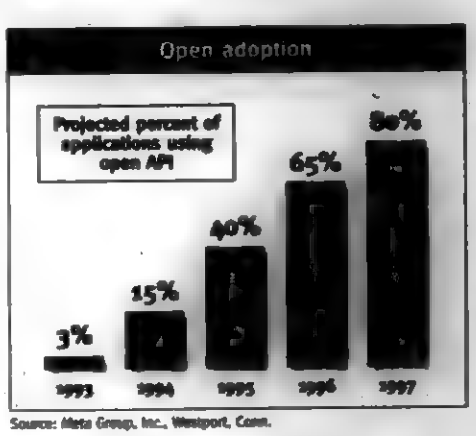
News shorts, *page 16*

ODBC drivers lack power

By Michael Vizard

Vendors such as Microsoft Corp. are talking up the importance of Open Database Connectivity (ODBC) drivers for linking front-end PC databases and applications to back-end SQL databases. But industry analysts are warning information systems directors that performance considerations are going to make ODBC interfaces a secondary choice for developing client/server applications.

ODBC, Microsoft's implementation of the SQL standard from the SQL Access Group, was designed to give developers a common SQL interface that can be applied to multiple back-end databases.



Source: Meta Group, Inc., Westport, Conn.

Earlier this month, Microsoft delivered Version 1.1 of its Access database, which includes ODBC drivers for accessing data stored on SQL databases from Microsoft, Oracle Corp. and Sybase, Inc. [CW, June 7].

But industry analysts stressed that the performance trade-offs associated with the current ODBC implementation will push most developers into working with faster, existing proprietary interfaces for accessing SQL databases.

"ODBC is a marketing initiative that's not going to perform well in production applications," asserted Richard Finkelstein, president of Performance Computing, Inc., a consulting firm in Chicago.

In fact, developers are already shying away from both ODBC and Borland International, Inc.'s Integrated Database Application Programming Interface initiative until they see how widely they are accepted, said Noah Ross, director of technology at Cap Gemini USA, a systems integrator in New York.

Finkelstein maintained that ODBC will never evolve into a real industry standard because it is a lowest common denominator interface, which limits functionality.

"Every time developers come up against a limitation, they use escape clauses in ODBC to access native drivers. The real industry standards are the Oracle and Sybase native interfaces," he said.

Finkelstein also noted that ODBC drivers do not support complicated database calls.

In defense

For its part, Microsoft takes exception to any suggestion that ODBC is a lowest common denominator interface.

"We're not telling people that there isn't any room for proprietary APIs, but there is no empirical data that says ODBC is any slower than any other interface," said Kyle Geiger, ODBC general manager at Microsoft.

In fact, developers at Xerox Corp. in Rochester, N.Y., are using ODBC to link Access to Oracle and IBM's DB2 database over Transmission Control Protocol/Internet Protocol.

That application, which currently consists mainly of one-way queries, runs exceptionally well, said Doug Long, a senior programming analyst at Xerox.

But as developers move to program more robust interactive applications, they may find native interfaces offer richer choices.

"A specific driver is going to be much faster than a standard driver. Our tests here show that ODBC is definitely much slower than the native drivers," concurred Swaroop Conjeevaram, manager of product marketing at Dharma Systems, Inc. in Nashua, N.H.

MS-DOS support plan raises user questions

By Michael Fitzgerald
and Christopher Lindquist

Users who buy software bundled on their hard drives may be in for a surprise the next time they call Microsoft Corp.: The company appears to be enforcing a 2-year-old policy that says it is responsible for supporting only its retail customers.

Last week, users said the policy, if continued, could spark an outcry.

Microsoft and various hardware vendors agree that if a box comes bundled with DOS, Windows or Microsoft applications preinstalled, the hardware vendor, not Microsoft, should handle support for it [CW, June 21]. Before Microsoft went retail with DOS 5.0, all DOS was sold with systems and was officially supported by OEMs.

"Let me stress that I have not experienced this, but if it was true, we would have to sit down with Microsoft," said Glenn Jurmann, section manager of office technology at Baxter Healthcare Corp. in Deerfield, Ill.

But Douglas Murphy, director of MIS at Comcast Corp., said he recently called Microsoft on a routine DOS 6.0 issue and was surprised when on three separate calls, "Microsoft told me that they won't support DOS 6.0 if it's preloaded by the manufacturer." He was referred to his manufacturer for support. Murphy's shop uses PCs from Compaq Computer Corp., Dell Computer Corp. and AST Research, Inc.

Microsoft receives 20,000 support calls a day worldwide. With electronic and other forms of support added in, that number jumps to 50,000.

Microsoft winnowed Murphy out by asking for a serial number found on retail copies of its products. But this practice appears to be arbitrary. Jurmann said he has been asked for a serial number, but despite not having one, received support anyway.

Microsoft said its policy has always been to refer users of OEM versions of Microsoft software to the hardware vendor. However, the procedures were not always in place to make sure only retail customers were supported, which may be why a half-dozen users contacted said Microsoft has always supported them.

"In general, we have been consistent about enforcing" the policy, said Kathy Fiander, marketing manager in product support services at Microsoft. "Of course, in any given situation we try to be flexible to customer needs, such as when laptop users may be traveling and do not have their serial number with them."

Referring users to the manufacturers could become common. One well-placed source at a major hardware maker said Microsoft "has been telling us in the last few months that it plans to start cracking down on this."

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Network management systems connect

SunConnect and Novell partnership to provide centralized administration

By Elisabeth Horwitt

In a highly complementary alliance, Sun Microsystems, Inc. subsidiary SunConnect and Novell, Inc. have agreed to interconnect their respective network management systems, SunNet Manager and NetWare Management System (NMS).

The idea is for SunNet Manager to provide central administrators with an overview of the enterprise network, leaving NMS users to concentrate on specific NetWare issues, Sun said.

The agreement puts Novell's huge NetWare installation within reach of SunNet Manager, which needs to strengthen its position in the local-area network client/server management arena, according to Brad Hecht, a senior analyst at Gartner Group, Inc., a market research firm in Stamford, Conn.

Source: International Data Corp., Framingham, Mass., and Burton Group, Salt Lake City

Conversely, SunNet Manager is the dominant player in multivendor, Simple Network Management Protocol-based internetwork management, an area that Novell is only just beginning to enter.

Sun also brings to the party broad third-party network management application support, which is still comparatively limited for the newer NMS.

The NMS connection will address the needs of users who had been using SunNet Manager to manage "the big [Unix] boxes and routers and letting the PCs take care of themselves," said Sun spokesman Stan Baldwin. "They said they wanted to see what those [PC] guys are doing to make it part of the overall networking plan."

The initial offering, due out in first-quarter 1994, will allow the two systems to share information for managing the NetWare environment. For example, NMS will allow SunNet Manager to access detailed information about NetWare servers, including print queues and print jobs, LAN subsystems, NetWare Loadable Modules, memory, CPU and disk use and software configurations.

Sun's next-generation network management architecture will define how multivendor network management systems can cooperatively manage enterprise network installations.

Looking ahead

Future interoperability will include an autodiscovery tool that reportedly will allow a SunNet Manager administrator to map out and diagram topology information about NetWare servers and attached devices.

"People tend to have Unix, Sun and Novell intertwined already" at corporate sites, Baldwin said.

He added, "SunNet Manager will provide a central view but also manage Novell servers pretty thoroughly" via NMS.

The agreement represents the first solid piece of Sun's next-generation network management architecture, which will define how multivendor network management systems can cooperatively manage enterprise network installations, Baldwin said.

Sun plans to enter similar partnerships with other network management vendors over time, in order to bring additional aspects of enterprise networking, such as telecommunications devices and services, under the SunNet Manager umbrella.

Sun boosts management

CONTINUED FROM PAGE 1

ment platforms, according to consulting firm Kaptronix, Inc. in Haworth, N.J. Last week Kaptronix published a report comparing SunNet Manager, NetView/6000 and OpenView, based on an in-house evaluation of the three products (see story this page).

Introduced in the late 1980s, SunNet Manager has long enjoyed a dominant market position as a development platform that third parties could use for their own network management systems. However, Sun has fallen far behind rivals HP and IBM when it comes to targeting user companies that are in the process of picking their enterprise network management system, analysts and users said.

IBM and HP have been aggressively fitting their products with graphics-based Help tools, applications and automatic utilities that screen users from the complexities of Simple Network Management Protocol (SNMP). These tools make it a lot easier to switch between the different applications and views needed to manage a network, according to Atul Kapoor, Kaptronix president.

Unloved interface

A lack of such features has made SunNet Manager awkward and frustrating to use, according to Kaptronix. Users agreed: "It has an ugly excuse of a human interface, very sparse, and the graphics are not all that useful," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del., which bought a copy of the product to manage Sun workstations. "That's one reason we don't use it [more widely]. It's not the easiest thing to install, either."

"We use SunNet Manager because we've got a cheap site license [with a large Sun workstation installation], not because we're particularly fond of it," said Kevin Oberman, a network manager in the engineering department at University of California Lawrence Livermore National Laboratory in Livermore, Calif. "It does a job reasonably well in an awkward manner."

> "We use SunNet Manager because we've got a cheap site license, not because we're particularly fond of it."
>
> —*Kevin Oberman, Lawrence Livermore National Laboratory*

The list price for SunNet Manager is $3,995, while OpenView Network Node Manager and NetView/6000 both cost approximately $15,500.

The enhancements coming out this summer will address "many of the case-of-use features" that the Kaptronix report identifies as missing from SunNet Manager, Borcich said. The enhancements will not change SunNet Manager's price, he added.

Several users expressed a strong preference for Motif over SunNet Manager's current proprietary graphical user interface, OpenLook. Sun will deliver Motif support in the second half of next year, Borcich said.

Beyond the user-friendly features expected out this summer, Sun is preparing the next generation of SunNet Manager, a cooperative architecture in which "no single platform [from any one vendor] will do everything," Sun spokesman Stan Baldwin said.

Taking a partner

Sun made its first move in that direction last week with the announcement that it will partner with Novell, Inc. to develop interoperability across SunNet Manager and Novell's NetWare Management System (see story above).

The architecture will support industry application programming interfaces such as the X/Open Management Protocol and provide services for coordinating resource management and information exchange across different management domains, according to Sun.

This strategy, on the face of it, fits well with a network management architecture that Ontario Hydro has been developing prior to actually shopping for products, according to Simon Chan, a telecommunications engineer at the Toronto-based utility.

"Our criteria is openness and the ability to integrate not just vertically across multivendor element management systems but horizontally between management functions and domains," Chan said.

Is good Help hard to find?

In a comparison of the following end-user Help features, NetView/6000 provided the greatest functionality and ease of use in the following areas, with OpenView coming in second followed by SunNet Manager, according to Kaptronix.

- Software utilities that guide users through the process of installing the network management platform on a Unix system, screening them from the complexities of Unix, SNMP and Transmission Control Protocol/Internet Protocol.
- User-configurable icons that make it easier to track and quickly call up crucial applications or windows into a particular network installation or view.
- Autodiscovery that automatically finds devices on the network and then plots their relationships on a topological map. SunNet Manager can "find" network boxes but does not plot the relationships, Kaptronix said.
- Ability to zoom down to greater and greater levels of detail about what is happening on the network.

All three products need work on:

- Documentation sufficient to help users set up network management applications, particularly complex ones.
- Understandable error messages. Current ones require in-depth understanding of how SNMP works.
- Determination of the probable cause of a problem once it is reported.

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Win32 web

CONTINUED FROM PAGE 1

and security and symmetrical multiprocessing, that are included in the full Win32 kit.

But as Windows developers begin to master the basics of 32-bit programming, many of them are now looking at whether they should move beyond Win32s to the full Win32 kit or opt to program to a separate kit, referred to as Win32c.

This latter kit will allow applications to run on Microsoft's forthcoming Windows 4.0 operating system for Intel Corp. platforms, a 32-bit preemptive multitasking environment known as Chicago.

In contrast, the full Win32 kit allows applications to take full advantage of the features in both Intel and RISC platforms, the company said.

"People are looking toward Windows 4.0 and are becoming much braver in terms of working with the Win32 kits," said Noah Ross, director of technology at Cap Gemini USA, a New York systems integrator.

Stability needed

"Developers are climbing the walls trying to figure out what API to write to. Microsoft needs to stabilize the target platforms; otherwise, they are threatening these people's business," added John Donovan, an industry analyst at WorkGroup Technologies, Inc. in Nashua, N.H.

According to Microsoft, Win32c is the first step toward 32-bit computing that gives applications access to a flat memory model. And although the Chicago project is still evolving, most developers using Win32s on Intel platforms should look to Chicago as their growth path, said Brad Struss, manager of Win32 developer relations at Microsoft.

Meanwhile, Struss said developers working with the full Win32 kit on Intel and RISC systems should probably look to Microsoft's Cairo project, an object-oriented file system due in 1995, as their growth path.

For example, IMRS, Inc., which develops financial software, used the Win32 kit to develop its 32-bit applications, which will run on both Intel and RISC platforms without taking advantage of the multithreading capabilities of the RISC platforms.

Because IMRS will focus more on adding new features to its software during the next year, IMRS will probably move to support the features set in Win32c rather than write to the full Win32 application programming interface (API), according to Dave Morehead, director of research at Stamford, Conn.-based IMRS.

"Which kit you choose depends a lot on how much you want to take advantage of features like multithreading on platforms other than Intel. You just have to figure out how much extra performance multithreading gets you on some platforms and the importance of the security features. But it's about the same amount of work with either API," Morehead said.

Different targets

In general, Struss said the major differences between NT, which requires at least 16M bytes of memory, and Chicago, which is expected to require only 8M bytes of memory, is that the latter project is aimed solely at Intel platforms, while NT is a portable offering that has higher levels of security and multithreading capabilities.

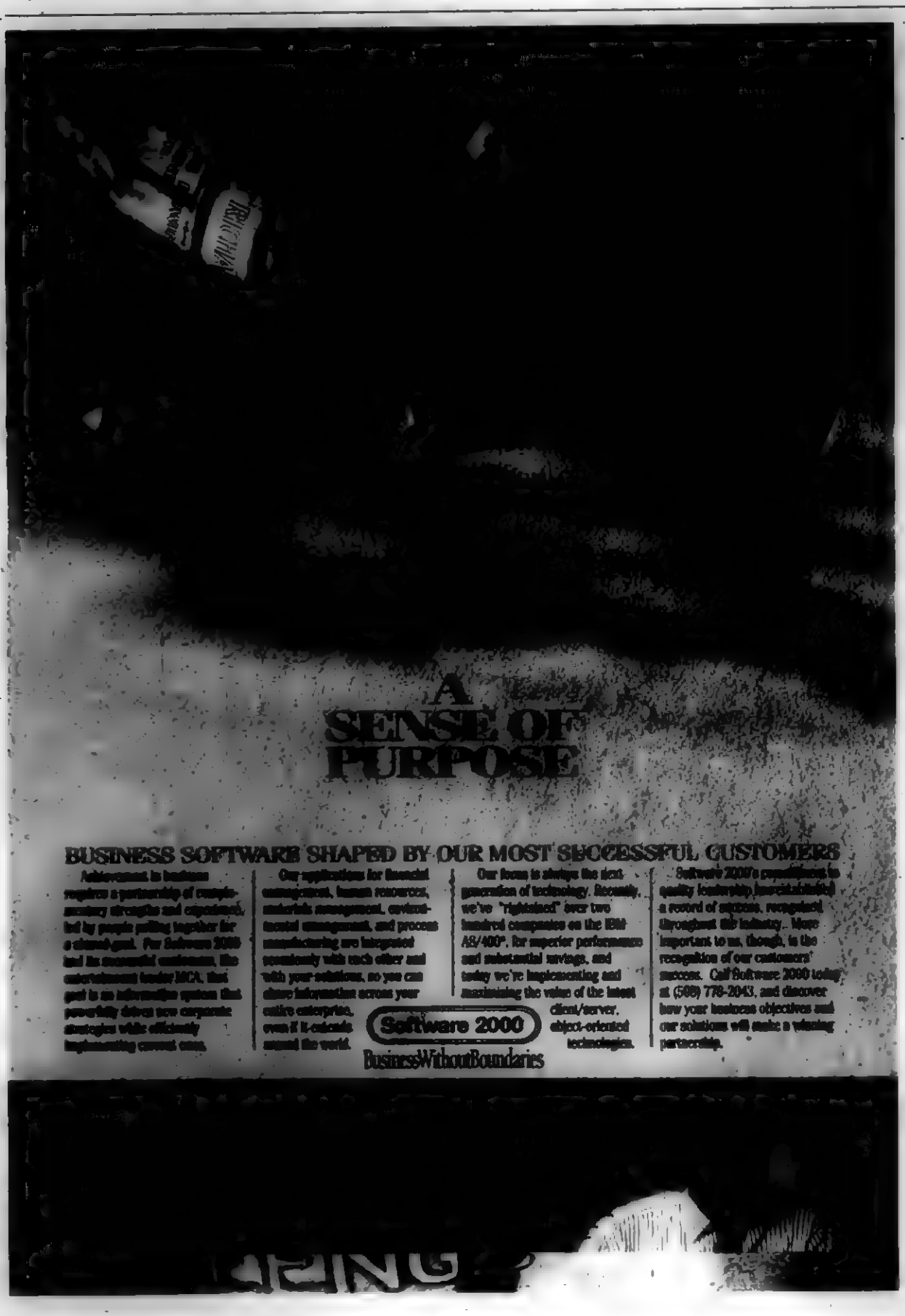
In addition, NT will eventually have a higher level of peer-to-peer networking services as part of the migration to Cairo, he added [CW, May 31].

As a result, developers such as Lotus Development Corp. said they see Win32s as a kit targeted at client applications, while the full Win32 kit targets NT server- and RISC workstation-class applications.

"We see Chicago as being sort of an NT-lite that will fit on the desktop, while Cairo is kind of an NT-2," Morehead added.

And the time frame for when developers want to deploy those applications may ultimately decide which Win32 kit they choose.

"If you want to deploy it in 1993, you'll use Win32c. If it's 1994, you can use the full Win32 kit for NT, and if it's 1995, you can think about Chicago," said David Cearley, a vice president at Meta Group, Inc., a Stamford, Conn.-based consulting firm.



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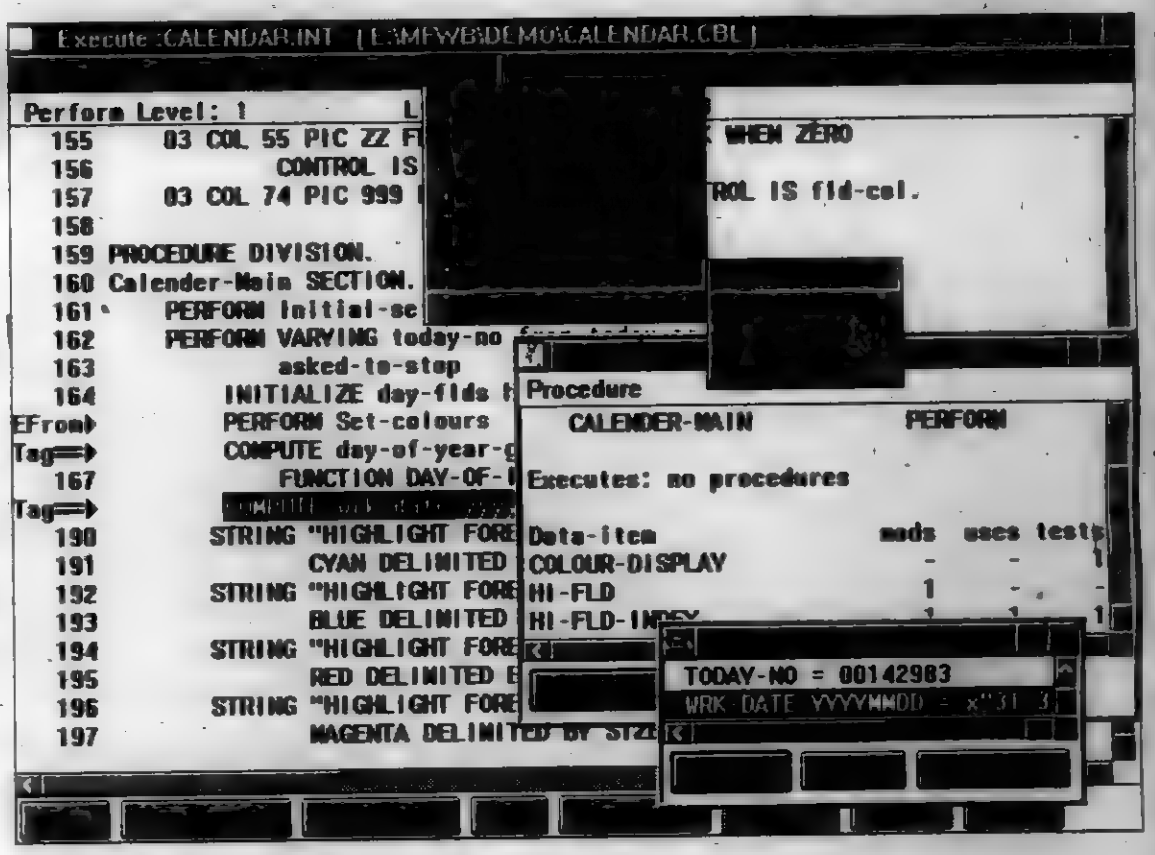

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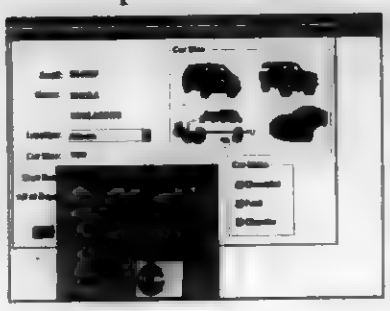

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Peer-to-peer networking

IBM releases APPN control

By Joanie M. Wexler
RESEARCH TRIANGLE PARK, N.C.

An abrupt pasing of the gavel at an IBM developers' conference last week unshackled third parties from IBM's long-standing dictatorship over key networking technology.

The unexpected industry milestone — brought about by a third-party rebellion against IBM at its Advanced Peer-to-Peer Networking (APPN) Implementors Workshop here — had many developers grinning from ear to ear as they got peeks at new technology, received reasonable software licensing terms and welcomed a democratic change of pace.

IBM realized that if APPN — its emerging technology approach to distributed networking — is to hold its own against Transmission Control Protocol/Internet Protocol (TCP/IP) as a viable next-generation backbone, "it will have to open its doors to other vendors' input," said Terrence Bishop, vice president of marketing at Insession, Inc., a Boulder, Colo., builder of IBM Systems Network Architecture (SNA) software for Tandem Computers, Inc. systems.

The epiphany means users will eventually get technology no longer chained to IBM's development pace and view of the world, a situation that should result in an acceleration of interoperable products, developers said.

Attendees take action

Much of the conference flurry centered around the future of Data Link Switching (DLS), an IBM-generated scheme for routing SNA traffic by encapsulating it in IP packets. Conference attendees witnessed so much contention between IBM and router bigwig Cisco Systems, Inc., which touts its own encapsulation technique, that they reportedly got fed up and ousted both IBM and Cisco from leading the DLS development efforts.

Instead, they elected a "neutral" third-party consultant, Louise Herndon Wells at the Internetwork Technology Institute, to chair a DLS Special Interest Group, a democratic first at an IBM developer's conference. Herndon Wells set up seven working groups focused on DLS issues such as congestion control and Ethernet interoperability.

The DLS committee agreed to work toward a common method for running SNA over IP "so different routers can communicate," said Alan K. Bartky, manager of technology at Sync Research, Inc. in Irvine, Calif. Bartky said he was concerned going into the "initially tension-ridden" meeting about whether his company's wide- to local-area network adaption devices would interoperate with IBM's 6611 router, but he said his worries were alleviated.

Common ground

Bartky also predicted that Advanced Peer-to-Peer Internetworking, Cisco's rival to APPN, and DLS will "eventually merge toward a common standard."

Other signs of APPN progress included the following:

- IBM opened up its APPN Network Node interoperability testing service to any vendor with an APPN implementation. Previously, only companies that licensed APPN Network Node source code from IBM (for $400,000) could earn IBM's interoperability seal of approval for their products.
- IBM agreed to license APPN End Node software, including the right to use all APPN patents, for a onetime $5,000 fee. "This is very fair and means nothing now stands in our way with end node development," said Miles Ulrich, SNA technology center manager at Wall Data, Inc., an SNA gateway maker in Redmond, Wash.
- IBM revealed snapshots of its High-Performance Routing and Discovery architectures, enhancements that add dynamic functions to APPN.
- A group met to foster progress for a technology that would enable a 3270 terminal to attach to an APPN network.

Coming attractions

In last week's preview of details of some upcoming Advanced Program-to-Program Communications (APPC) announcements:

APPC is IBM's SNA-based protocol for allowing programs to communicate over a local- or wide-area link. It includes features such as security, encryption and database transaction synchronization.

The products, which will be available to users via CompuServe upon shipment, include the following:

- APPC File Transfer Protocol will support file transfer between any two systems running APPC. Currently, APPC implementations on different types of systems cannot communicate.

The initial product, available next month, will run on OS/2, DOS and IBM VM systems, with support for IBM MVS, AIX and Application System/400 machines scheduled for delivery by year's end. IBM is working with other vendors to port the software to non-IBM systems.

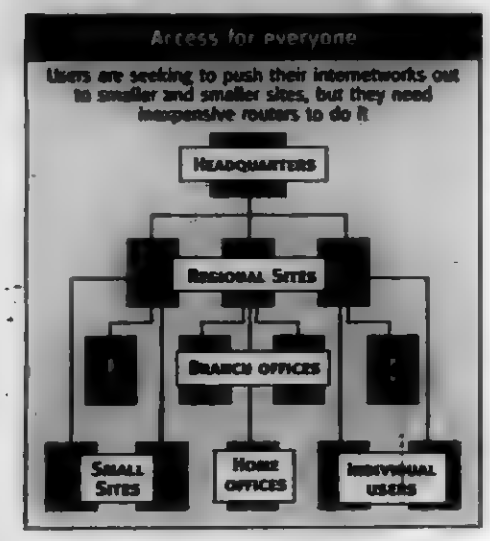
- APPC/3270 allows 3270 applications to run over an APPC data stream. This solves the problem of letting users on PCs access 3270 host applications over a peer-to-peer APPN network, an IBM spokesman said. However, older SNA devices, such as 3270 terminals, cannot run it. Availability is slated for October.
- Names Server, to ship in October, will allow users to rename a Logical Unit, or SNA resource, with an easier-to-remember nickname. — *Elizabeth Horwitt*

Cisco offers low-end links

By Joanie M. Wexler
MENLO PARK, CALIF.

Companies looking to blend ever-smaller sites into their corporate internetworks gained more options at palatable price points from router leader Cisco Systems, Inc. last week.

In a competitive response to 3Com Corp.'s Boundary Routing architecture — a low-cost, bridge-like technology announced last December that many companies are eyeing for their network peripheries (see story at right) — Cisco introduced an ultra low-end platform, called the Cisco 2000, with prices starting at $3,195.



Most low-end routers on the market today begin in the $5,000 price range.

Cisco also enhanced existing remote router models and added overarching administration and management tools, which include the ability to centrally install far-flung routers.

The rollouts look to be a "good fit for our small sites — and we have a lot — mainly because of cost," said Reuben Lantto, director of international telecommunications at Cargill, Inc., a Cisco shop in Minneapolis.

"The centralized installation will be very useful when deploying a big network and you're short on people and time," he said.

Protocols run

The Cisco 2000 fixed-configuration router runs a limited protocol set: Internet Protocol, Novell, Inc. IPX, Apple Computer, Inc. AppleTalk, X.25, bridging, frame relay and bandwidth-conserving dial-on-demand capabilities.

The wide-area links, plus a basic-rate Integrated Services Digital Network interface added to the larger Cisco 3000, aim to let users choose the lowest cost telecommunications service in a given part of the world, said David Gudmundson, Cisco product manager.

"The cheaper the routers are, the less we have to charge for our services," said the telecommunications manager at a Canadian government agency that provides network services to nonprofit public organizations.

British Columbia Systems Corp. runs about 200 Cisco routers, said Al Teasdale. He said taxpayers pay for network services to hospitals, schools and government ministries. "We're pushing Cisco for something under $1,000."

"There's clearly a lot of interest in the super-low end," said Fred McClimans, an analyst at Gartner Group, Inc. in Stamford, Conn. "And Cisco has decided the market is ripe for another price cut and has changed the rules."

McClimans predicted that with low-end routers priced just a few hundred dollars more than bridges, users will opt for routing to gain bandwidth management capabilities.

Cisco's reply

- Cisco 2000 platform: $3,195 model with one Ethernet and one serial port; $4,195 model with one Token Ring and one serial port.
- Cisco 3000 models: $5,795 version with one Ethernet, two serial and one ISDN port; $6,995 Token Ring version.

Bandwidth management, please

The invisible hand of competition may be casting a Hatfield-and-McCoy-like aura around Cisco and 3Com. But in the true spirit of capitalism, users will benefit.

3Com said last week it will seek to reduce users' cost of WAN ownership by 50% by enhancing its router line this year with more bandwidth management capabilities and additional Boundary Router wide-area network interfaces. Boundary Routing is a low-end 3Com router architecture that simplifies and reduces the cost of remote routing where a given site connects to just one other site.

Janet L. Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., said that in contrast, Cisco's announcement "is their answer to Boundary Routing — and it's not a very creative one."

She said users would have benefited by more bandwidth management capabilities, akin to 3Com's enhancements, in Cisco's first release. — *Joanie M. Wexler*

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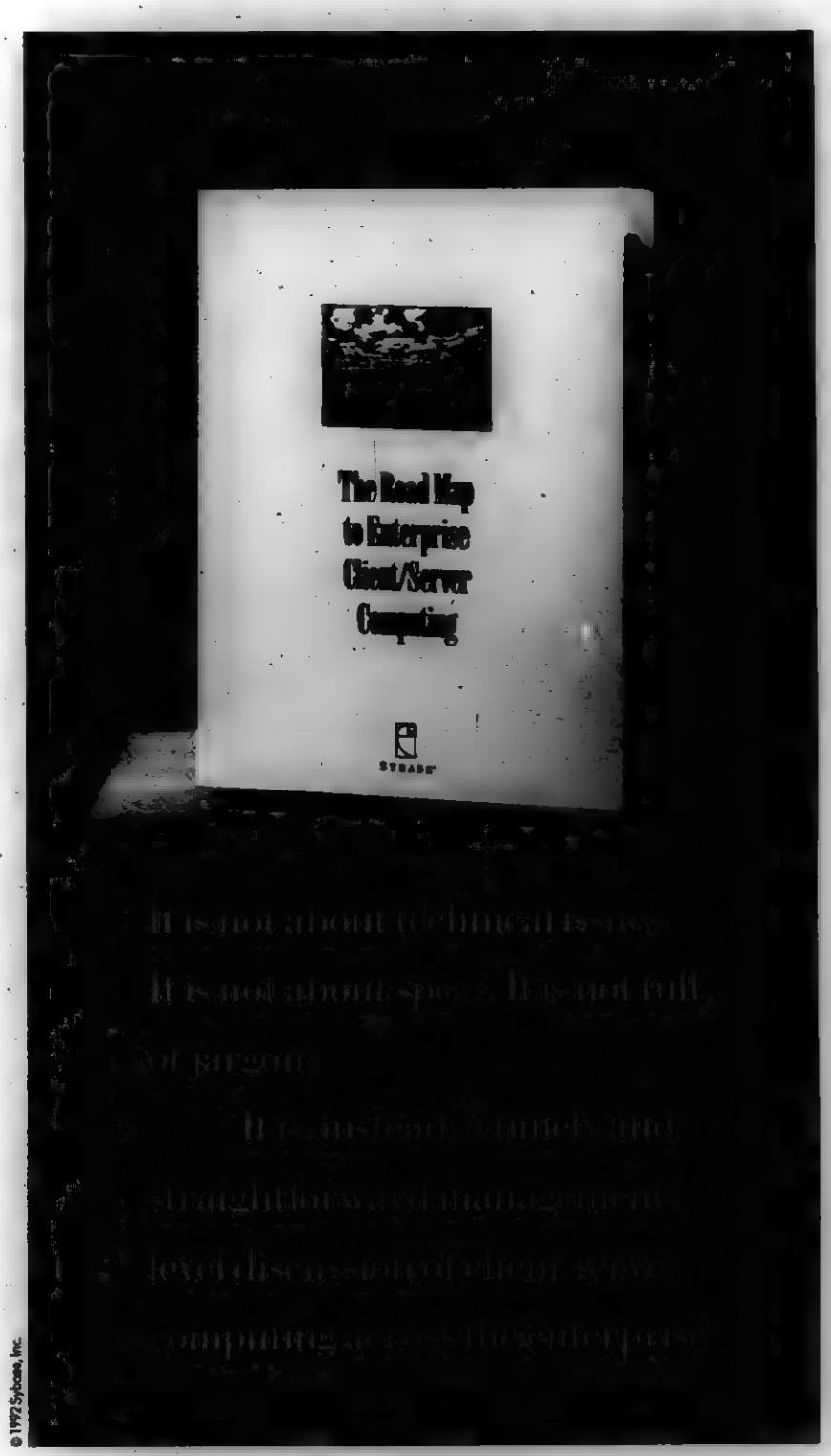

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Show spotlights emerging wares

Sights to include WordPerfect's Amber, HP's Vectra VL, Lotus' Improv

By Michael Vizard and Michael Fitzgerald

This week's PC Expo will offer attendees a walking tour of bleeding-edge technologies.

WordPerfect Corp., for example, will showcase WordPerfect applications working on top of the Amber technology that is being developed by Apple Computer, Inc. and Novell, Inc. Amber is a set of facilities similar to Microsoft Corp.'s Object Linking and Embedding protocol for Windows that was designed to link applications across Macintosh, Novell NetWare and Unix environments. In addition, Borland International, Inc. will demonstrate development tools that work across the Amber architecture.

Meanwhile, Hewlett-Packard Co. will announce its entry into the low-end PC market with the Vectra VL line. The line features three basic models, built around Intel Corp. 25-MHz i486SX, 33-MHz 486DX or 33/66-MHz DX2 processors, and will start at less than $1,250.

The day when you have an interactive conversation with your PC may come sooner than you think. IBM will demonstrate prototypes of the WordPerfect word processing software and Lotus Development Corp.'s 1-2-3 spreadsheet running on OS/2 equipped with speech-recognition software. IBM will also ship speech-recognition developer kits for Windows in 30 days, according to Elton Sherwin, IBM manager of speech recognition.

PC Expo attendees will also witness the first point release of Lotus' Improv spreadsheet, which thus far has 200,000 licensees delivered. Release 2.1 includes support for the WK4 file format found in 1-2-3 Version 4.0, a database access driver from Pioneer Software, Inc., support for the Application Field Exchange that will link Improv to the Notes groupware offering and a network-ready installation procedure. Improv is available for $199 to anyone who already has spreadsheet packages.

Users looking for a way to upgrade their 386 systems to 486 systems without replacing the motherboard will likely be glad to see Cyrix Corp.'s CX486DR^2 chip upgrade. The chip lets users with 16-, 20- or 25-MHz 386DX systems upgrade to 486-class power by just replacing a chip. Cyrix will make a clock-doubled version of each speed, priced at $349, $399 and $499. The 16/32-MHz and 20/40-MHz chips are available now, while the 25/50 will ship in September.

In addition, the pen may prove mightier than the keyboard after all. Inforite Corp. in San Mateo, Calif., plans to launch pen-based technology that will allow its MP 100 Writing Pad to interface with off-the-shelf Windows and DOS applications.

Toshiba America Information Systems, Inc. continues to buck portable trends. It is expected this week to release its T6600C luggables, which are larger and weigh more than their predecessors. Still, the trade-off could be worth it for users because the systems include room for two expansion slots and have a 510M-byte hard drive, a 10.4-in. color screen, a built-in 5¼-in. double-speed CD-ROM drive and a MediaShare Mambo digital video interactive card. Pricing ranges from $7,699 to $9,499 for the three models, which range from 17.1 to 19.3 pounds.

Wireless connections

[redacted]

IS to gain application control

CONTINUED FROM PAGE 1

ros, or agents, that can be deployed across multiple Microsoft applications running on Windows and Macintosh desktops.

Also, the common macro language, which will be included in forthcoming Microsoft applications, will make it easier for corporate developers to integrate custom applications built using Visual Basic with shrink-wrapped Microsoft packages.

"We need to incorporate Word and Excel into our applications, which today requires low-level programming," said Bob Remmington, project leader for the computer human interface for the rapid prototyping laboratory at Lockheed Missiles & Space Co. in Sunnyvale, Calif.

> The common macro language will be able to call application-specific macros as subroutines embedded in a Visual Basic macro.

The Visual Basic offshoot is based on technology created under Microsoft's Object Basic project. The latter technology will form the foundation of future iterations of the Visual Basic language for 32-bit platforms, according to Robert Bach, group product manager for Microsoft's Office.

However, only the next major releases of Excel and Project will support the common macro language. Other Microsoft applications such as Word will add support for the common macro language in future releases. Meantime, Bach said the common macro language will be able to call Excel-, Word- and other application-specific macros as subroutines embedded in a Visual Basic macro.

Microsoft is expected to use this technology to create a series of templates for automating specific tasks.

One of those tasks will be a budgeting template that will collect and consolidate data from a variety of spreadsheets, according to Matt Cain, program director for desktop computing strategies at Meta Group, Inc. in Westport, Conn.

But while Microsoft is likely to win kudos from IS shops for better integrating its applications, independent software vendors are somewhat miffed that Microsoft does not plan to offer this technology to them for inclusion with their software.

Visual Basic's "Applications Edition has been optimized to work with our applications. It is unique to our applications," Bach said.

As a result, third-party applications will have to rely on OLE to integrate their applications with Microsoft applications.

"So long as you expose your applications as an OLE container, you'll be able to work with Visual Basic or any other macro language," said Alex Morrow, vice president of cross-architecture platforms at Lotus Development Corp. (see story page 15).

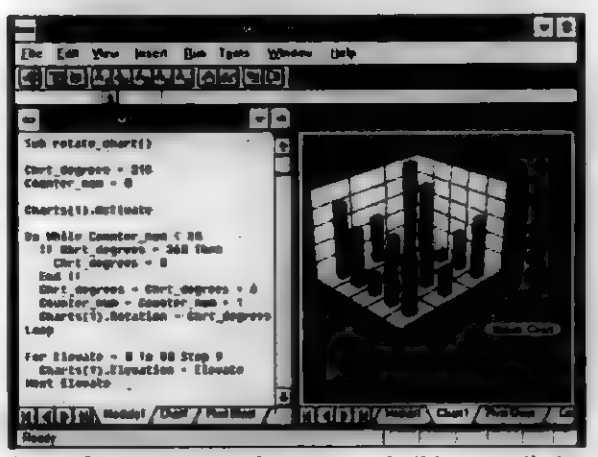
But some developers said they were led to believe that Microsoft planned to develop a common macro language for all applications and are grousing that Microsoft has decided to leverage its Windows work into a competitive advantage.

"The people who can benefit from an open standard are small [independent software vendors] that could use Visual Basic to make their objects more intelligent," said Brent Williams, program director for PC software at International Data Corp. in Framingham, Mass.

"We knew that Microsoft wasn't going to publish an API for Visual Basic, but that's because we asked them. They weren't trying to hide it, but they weren't screaming it from the rooftops either," said Dave Morehead, director of research at IMRS, Inc., a Stamford, Conn., developer of financial software.

But it will still be a number of years before this lack of support for third-party applications becomes a problem, Williams said. Most sites will continue to work with their existing macro languages, with the transition to Microsoft's common macro language taking place during the next two years.

"We don't really have a need to integrate applications other than Microsoft's with our applications at this time. But I can see how it might be a problem in the future," Remmington added.



Microsoft's common macro language *can build macros that can be deployed across multiple applications*

32-bit plans face compatibility issues

Microsoft plans to bring its Visual Basic programming language into its 32-bit environments but conceded there will be some compatibility issues that will need to be worked out. Among them is the fact that developers will not be able to call Dynamic Link Libraries across 16- and 32-bit Windows implementations, said Tom Button, Microsoft group product manager for application programming.

IBM to unwrap PC-DOS 6.1, Pen for OS/2 software

By Christopher Lindquist
NEW YORK

IBM is set to announce its version of DOS 6.0 as well as several multimedia tools and a pen addition for OS/2 this week at PC Expo.

PC-DOS 6.1 will come complete with what IBM calls "full-function" utilities, compared with those found in Microsoft Corp.'s MS-DOS 6.0. IBM's additions include an antivirus package, a complete backup package that supports both tape and disk drives, Central Point Software, Inc.'s RAMBoost memory optimizer and an editor that supports multiple files.

While the latest version of PC-DOS was originally slated to contain data compression, Walter Casey, director of marketing, said IBM has decided to perform more testing before releasing a version of PC-DOS with AddStor, Inc.'s SuperStor compression package later this summer. Purchasers of the current release of PC-DOS will find a coupon in the box offering them a free upgrade.

PCMCIA support

The new PC-DOS will also directly support Personal Computer Memory Card International Association 2.0 and have elementary pen functionality that will allow purchasers to use a pen-input device, much as they do a mouse.

PC-DOS 6.1 will be available bundled on some hardware as well as in a retail package for purchase by end users.

OS/2 will also get some pen support. Pen for OS/2 will be available as an add-on for OS/2 2.1 and will include handwriting recognition and a development environment for pen applications.

IBM will also unveil several "Ultimedia" multimedia products for OS/2, including Ultimedia Builder, a multimedia presentation development tool; Ultimedia Perfect Image, an image-editing package; and Ultimedia WorkPlace, which provides a means of adding extensions to images to allow sorting and searching in a database.

All three products are due next month at a list price of $345 each for Builder and WorkPlace and $175 for Perfect Image. As a promotional offer, Builder and Perfect Image will be bundled for $99, or WorkPlace alone will sell for $99.

Pricing for PC-DOS 6.1 and Pen for OS/2 was not available at press time.

Alternative styles

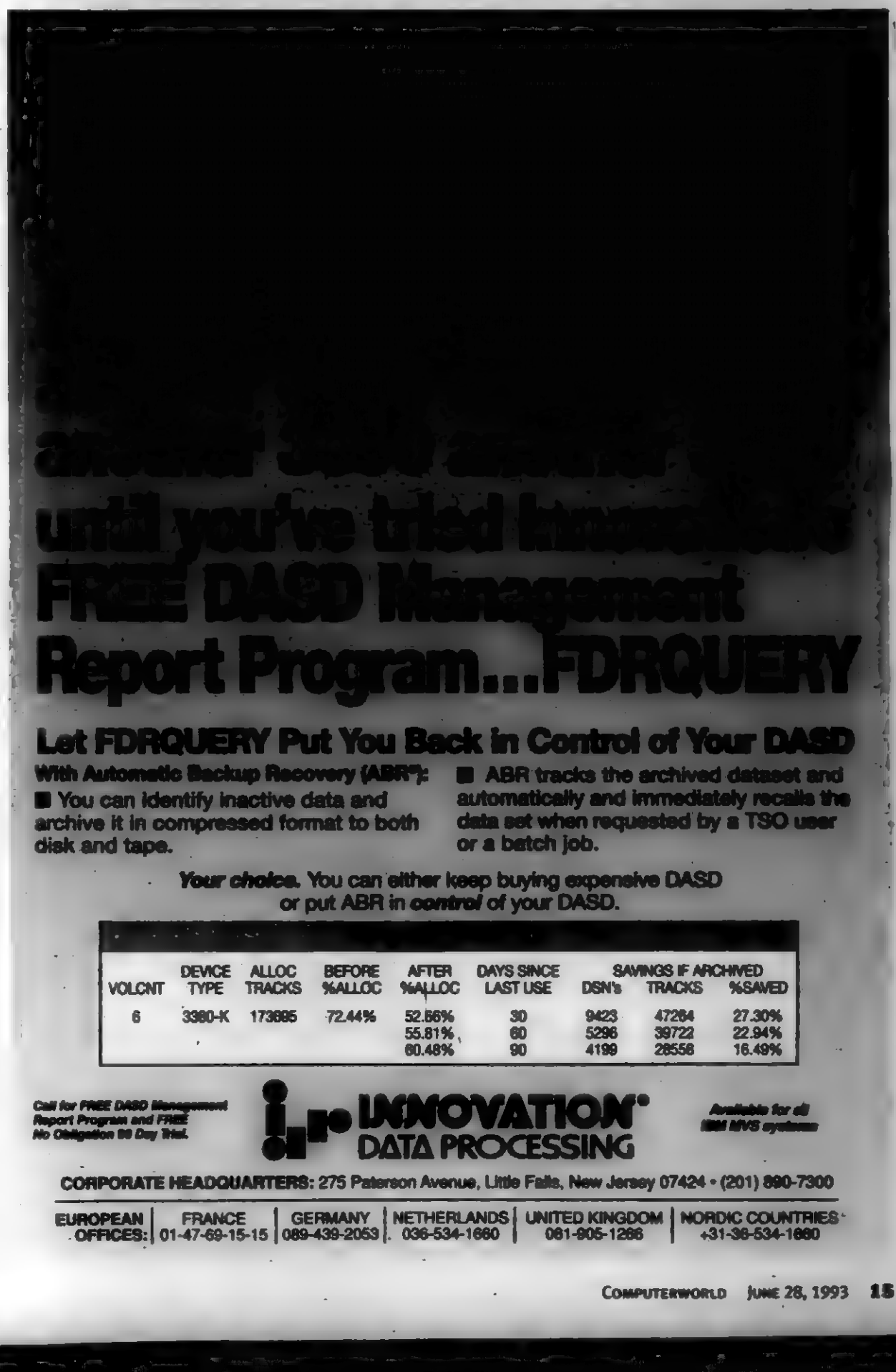
While Microsoft is pushing Visual Basic as its common macro language, both Lotus and Borland International, Inc. are pursuing alternative strategies.

Lotus is in the process of adding LotusScript, a derivative of the Basic language optimized to its applications. Unlike Microsoft's effort, however, Lotus intends to enable LotusScript macros to be invoked by Lotus applications running across Windows, Unix, DOS and Macintosh platforms, according to Alex Morrow, Lotus' vice president of cross-platform architecture. The first iteration of LotusScript is in Lotus' Improv for Windows spreadsheet.

Meanwhile, Borland said a common macro language defeats the purpose of optimizing certain tools for specific applications. Instead, Borland plans to increase the level of interaction between its tools under the Borland Object Component Architecture.

Both companies said a key component of their integration strategies with other vendors is to make their applications comply with Microsoft's OLE Version 2.0.

—Michael Vizard



News Shorts

Novell development framework to debut

Novell, Inc. is expected today to lay out the details for AppWare, an object-oriented application development environment that will run on top of NetWare. The architecture is expected to incorporate technology from Hyperdesk Corp., Software Transformation, Inc. and Serius Corp. — three recent Novell acquisitions that specialize in cross-platform application development tools [CW, June 14]. The aim, according to industry sources, is to make it simpler to develop applications that make use of NetWare services in an enterprisewide environment.

Traders sign up for network

A dozen Wall Street brokerage firms, including Merrill Lynch & Co., Salomon Brothers, Inc. and Morgan Stanley Group, Inc., have agreed to link to the Intermarket Trading Network. The new network, developed by Merrin Financial, Inc., was designed to allow brokerage firms and money managers to execute trades and update all clearing and trade processing systems simultaneously.

United wary of interference

United Airlines last week became the latest carrier to limit use of personal electronic devices — including PCs — during takeoffs and landings. United Airlines said its policy, which goes into effect Thursday, is a precautionary measure designed "to address the possibility of such devices causing electromagnetic interference with cockpit navigation or communications systems."

Multimedia for the masses

Kaleida Labs, Inc. made a splash at last week's Digital World trade show with the long-awaited unveiling of ScriptX, a developer's tool for crafting a single multimedia title that can work on devices ranging from desktop computers to consumer electronics products. The Mountain View, Calif.-based company also introduced a new developer's program to encourage the creation of ScriptX products.

CSC division suspended from fed bids

Computer Sciences Corp. (CSC), a systems integrator in El Segundo, Calif., said its Applied Technology Division was temporarily suspended from bidding on federal contracts because of an outsourcing contract dispute with the Environmental Protection Agency (EPA). Last year, auditors probed allegations that CSC overbilled the EPA under a $347 million contract awarded in 1990. The suspension does not affect other CSC business units.

Net management standard touted

The Distributed Support Information Standards Group last week announced the availability of an initial specification for defining systems management information, including configurations, faults and performance.

SHORT TAKES Bell Communications Research has announced the successful trial of a multigigabit/sec. research network linking four states and several laboratories and universities.... H. Michael Morand, former vice president of marketing at AST Research, Inc., was named president of Leading Edge Products, Inc. He replaces Al Agby, who left earlier this year over a pay dispute.... NationsBank in Charlotte, N.C., has signed a $2.3 million disaster recovery agreement with CSC.... System Software Associates, Inc. is developing an object-based version of its suite of applications software to run on IBM and Hewlett-Packard Co. Unix systems.

Price options swamp users

At the contracting stage, however, talk is outpacing any action

By Nell Margolis and Johanna Ambrosio

Users who begged their software vendors for greater pricing flexibility and got it are finding out that having a basketful of options is no picnic.

Although suppliers, including IBM, Legent Corp. and Computer Associates International, Inc., have caved in to users' demands for more pricing options and contractual terms [CW, May 24], this diversity has spawned confusion.

Users are swamped by more licensing-related paperwork and decision-making than ever before. Many said they are besieged with too many potential players, platforms and pricing alternatives to be sure they are making the best deals or even understand the deals they are making.

How time-consuming is it? "A third of the paperwork going through my desk right now [relates to] contractual issues," said John Stevenson, vice president of MIS at Dallas-based Dr Pepper Co./The Seven-Up Co.

And if a sudden barrage of pricing models — such as user-based, usage-based, client-based, enterprisewide and a raft of combinations — are rolling out at too hectic a pace, a widely acknowledged new spirit of fairness and quest for clarity in the contracting process is still at the stage where talk outpaces action, according to many industry observers.

These issues were brought to light at last week's Information Technology Association of America-sponsored electronic town meeting on software licensing and subsequent *Computerworld* interviews.

The new software pricing diversity "has put on us a burden of analysis," noted Robert Rubin, vice president of information services at Philadelphia-based Elf Atochem North America, Inc. Nor are all the announced options even available, he added. "The new mechanisms some vendors are touting have not gotten down to the field reps."

State of confusion

Companies transitioning from host-oriented to distributed computing are also confused by the mind-boggling array of licensing options. Buffalo, N.Y.-based American Steamship Co. is in the market for help desk and inventory tracking management software to run on its PC local-area network. Business systems and telecommunications manager Jim Guarino said he likes the product he is looking at, but licensing it is proving an embarrassment of riches.

"I had to call the vendor and go through the price sheet line by line so they could explain to me what I need now and what later," Guarino said. "They have six different categories of how to price this stuff out. One was 'unlimited user environment.' Another was '250-user environment or clients,' but they don't mean the actual users on the system." Part of the 20-minute phone call was spent nailing down the vendor's definition of "client" and "user," he said.

Elf Atochem's Robert Rubin: *Software pricing has his company feeling 'burden of analysis'*

Some aspects of the contracting process are distinctly improving, said Barry D. Weiss, a partner in the Chicago-based law firm Gordon & Glickson. Inspired by IBM's efforts to boil its software licensing contracts down to plain English, Weiss said, "A number of our vendor clients are rewriting their software contracts to make them easier to read, to enable businessmen to tailor them without a team of lawyers." On the other hand, he said he sees vendors soliciting lawyers' input on the front end of the contracting process, harnessing legal means to productive ends such as creating "contracting users' manuals."

Contracts are not just getting clearer — they are getting shorter: Legent said Executive Vice President Bill Drummey keeps its contracts to a single page.

Better attitude

And parties on all sides reported a clear change in the attitude users and vendors alike are bringing into contract negotiations these days. "Clients realize that we've been creative in our approach to their pricing requests, and they appreciate it," said CA Executive Vice President Arnold Mazur.

But few are ready to decree the licensing issue as out of the woods.

"I'm still skeptical about many of the agreements when you sit down and parse them out," said Harry Glasspiegel, a partner in the Washington, D.C., law firm Shaw, Pittman, Potts & Trowbridge. "Do they really protect the user? I've seen some vendors drafting more user-friendly contracts, but they're in the minority. Software contracting is still a 'caveat emptor' situation."

Take five

Parties on all sides of the bargaining table offered tips for smoother license contracting:

•"Take a long-term view of the user-vendor relationship, said Bill Drummey, executive vice president at software house Legent in Vienna, Va. "Don't go in looking for the greatest number of wins for yourself. Think about ever going away with something of value."

•"Take time before you seal the deal, said Harry Glasspiegel, partner in the law firm Shaw, Pittman, Potts & Trowbridge. "The best protection is still the old-fashioned one. Be clear, define what is [in the deal], put everything in writing and be careful what you sign."

•"Take a look at the boilerplate, said Barry D. Weiss, a partner in the law firm Gordon & Glickson. "Foresee possible objections to terms and conditions you wish to include, and prepare."

•"Take a step back and remember why you came to this party, said Arnold Mazur, executive vice president at CA. "What's being bought and sold here is software, not a contract."

•"Take heart, said a veteran of the deal-making wars. "While 'partnership' may be an overstatement, Mazur said, "There is room for more mutual advantage in both sides of the desks."—Nell Margolis

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4. Multidimensional arrays for high-performance read/write

InterBase's multidimensional arrays store and retrieve data 10 to 40 times faster than traditional rows-and-columns formats. Plus, indexed arrays make it far easier for developers to build and maintain applications.

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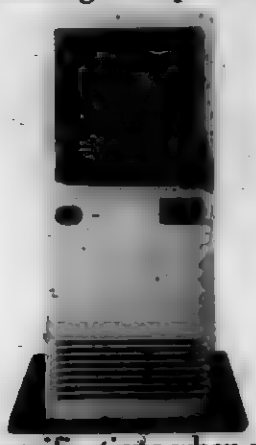

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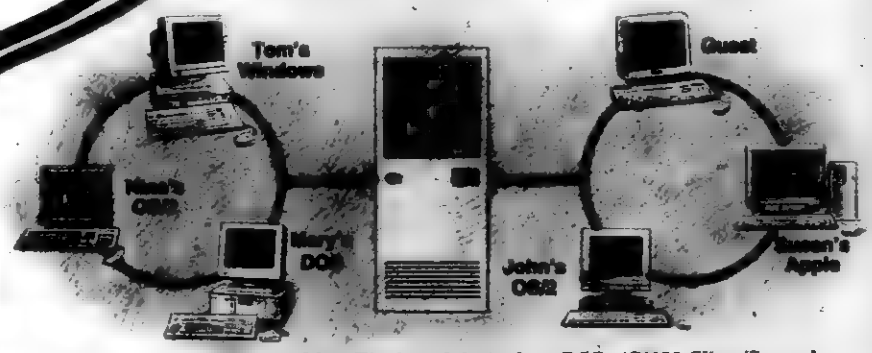

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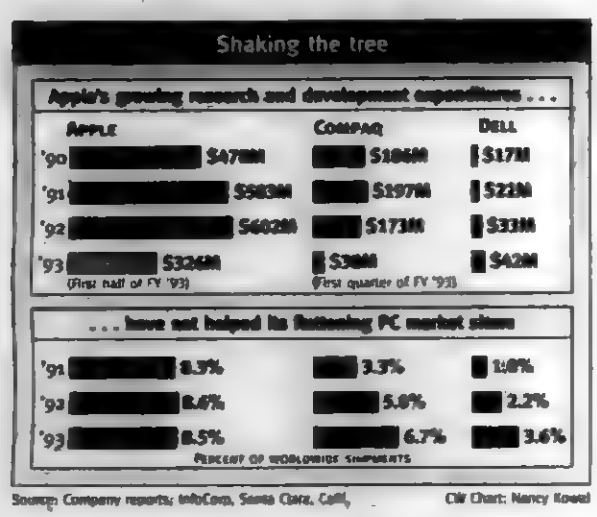
Spindler

CONTINUED FROM PAGE 1

not an aberration; it's the shape of things to come," said Doug Kass, a principal analyst at The Viewpoint Group, a research firm in Santa Cruz, Calif. "I think we're going to see a top-to-bottom overhaul on both management and product levels."

Some of the expensive R&D projects Sculley had forged as chief technologist — and pumped hundreds of millions of dollars into along the way — could come under the ax. "Apple has many, many people working on projects that ain't coming to market in anyone's lifetime, and they're going to bail out," said Al Canton, a high-technology consultant and Apple specialist in Fair Oaks, Calif.

Some users said they fear that Apple's many technological initiatives may have diluted the strength of its move to provide



Source: Company reports; InfoCorp, Santa Clara, Calif. CW Chart: Nancy Kowal

wares for the corporate environment.

"Apple is going in too many directions at once without focusing on the business needs of today," said Eric Jos, manager of information systems at BC Hydro in Burnaby, British Columbia.

In the face of anticipated R&D cuts, Apple is expected to continue teaming with other companies to expand its technology base (see story above right). Users said such cross-platform teamwork is crucial.

"These kinds of partnerships carry a lot of clout because they legitimize Apple in the eyes of a lot of IS folks," said Robert Anderson, a senior analyst at A. O. Smith Automotive Products Co. in Milwaukee.

Analysts' predictions for what stays and what goes as Spindler takes command include the following:

▶**PowerPC-based Macintosh:** Full steam ahead. Motorola, Inc. delivered the first chip earlier this year, and plans are still firmly in place to deliver a PowerPC-based Macintosh PC and server in the first quarter of 1994.

"Moving to the PowerPC and keeping users interested along the way is absolutely the most critical battle for Apple to win," said Jean-Louis Gassee, former head of Apple Products Division.

Apple's Michael Spindler *will likely pare down costly R&D projects*

▶**Lots of new Macintoshes:** Good-bye. Users complain that Apple delivers too many models too fast without making clear what distinguishes one from the other.

"They're confusing the hell out of everybody," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. "They need to have fewer well-rounded products instead of dozens of machines aimed at specific niche markets."

Sharp pruning could quickly add to the bottom line. "It's time to go pluck, pluck, pluck and snip, snip, snip and make the company more profitable in the process," Gassee said. Early targets: the Macintosh IIVX (which competes with the more popular Centris line) and the PowerBook 165C (a color model that uses the less advanced passive-matrix screen).

▶**Newton:** Still a definite, but it has experienced early rough spots. Initially scheduled for a June release, an early prototype reportedly had trouble in some groups. "Apple already had software burned into ROM and was ready to roll it out, but it was disastrous," said one source familiar with Apple's plans.

▶**Unix initiatives:** Up for grabs. Morris Taradalsky, Enterprise Systems Division general manager, recently said Apple is cooperating with IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and Unix System Laboratories, Inc. to put the Macintosh user interface on machines running Unix. Some said this could blow up in Apple's face.

"Why pay for a Macintosh when you can get a much cheaper Unix box with a Mac interface?" asked Tim Harmon, program director for desktop computing strategies at Meta Group, Inc., a consultancy in Westport, Conn.

▶**Voice recognition:** Uncertain. Apple's voice-recognition technology, code-named Casper, is still a laboratory curiosity and might fall under Spindler's ax.

▶**Cross-platform technology:** A high priority. At a recent developer's conference, Senior Vice President David Nagel announced, "No major technology will be introduced from Apple that won't have cross-platform, near-simultaneous release."

His words met with ringing applause from the 3,000 developers in attendance and are a clear sign to Macintosh users that Apple is teaming up with the right people.

Some of the longer term and more consumer-oriented projects of Apple's Personal Interactive Electronics Division could take the hardest hit in the next year. Insiders said that while Apple remains emotionally committed to exploring new technologies, the here-and-now demands of running a profitable company mandate the reshuffling of priorities.

Senior writer Michael Fitzgerald contributed to this report.

AT&T reaches out to Apple

Speculation abounds that Apple will team with telecommunications giant AT&T to pool mobile computing and wireless networking expertise.

Some observers said they see synergy between Apple's laptop clout and efforts with its Newton personal digital assistant and certain AT&T business interests. These include its pending 33% interest in McCaw Cellular Communications and 51% ownership of EO, Inc.

While EO directly competes with the still unshipped Newton, "it wouldn't be hard to merge the two directions," said Danny Briere, president of TeleChoice, Inc., a telecommunications consultancy in Verona, N.J.

"Look for a telecommunications link between Apple and AT&T," such as running Newton transmissions over the AT&T Easy-Link messaging network, a source at AT&T said.

That fits in with AT&T's strategy to basically link its customers to the world via EasyLink, which is also gaining wireless connections.

—Joanie M. Wexler and Michael Fitzgerald

A matter of time

Did John Sculley jump, or was he pushed?

That was the question around watercoolers from Cupertino to Wall Street last week as Sculley handed over the CEO reins to his handpicked successor, Michael Spindler.

Most analysts agreed that rumblings about the transition had been heard for some time, and Sculley had not been actively involved in Apple's day-to-day operations for more than a year.

The final decision reportedly came in a board meeting two weeks ago, soon after Sculley warned Wall Street that Apple's earnings would be down sharply in the second quarter and hinted at price cuts and layoffs [CW, June 14]. One Apple insider said that at one point, Sculley was asked to leave the room. When he returned, he had been voted out as CEO. "Sculley was really ready to go, and the board gave him a nudge in the right direction," said Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa. *—James Daly*

Betwixt and between

Blame it on timing. Or, more specifically, a lack of it.

Innovative technologies such as Apple's delayed personal digital assistant, Newton, and the reduced instruction set computing-based PowerPC Macintosh are on the horizon, but they will not be available for months or contribute financially for a year or more.

Additionally, Taligent — the Apple/IBM joint venture that is building an object-oriented operating system — will not deliver goods for at least another 18 months.

While users tap their toes, Apple must also what is left out of the life cycle of the 8-year-old Macintosh. So far, it has only promised that certain high-end models will be upgradable to the new PowerPC chip, which will be used in Apple PCs due early next year.

Meanwhile, pressure from low-cost PC clones and Windows PCs has forced Apple officials to get out their red markers and cut Macintosh prices at least three times this year so far. This month's cuts shaved as much as 12% off the price of some models.

The price cuts are having an impact; Sculley said recently that sales on Macintoshes are already up more than 30% over last year.

Apple is not strapped for cash: It still has more than $1 billion in the bank. But more housecleaning is anticipated, including price cuts, the simplification of its product line and even layoffs. "Apple is like a person who goes on a yo-yo diet," said Jean-Louis Gassee, former head of the Apple Products Division. "One year it's fat, the next it's thin. That seems to be the way things always are." *—James Daly*

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IBM unwraps full-duplex Ethernet

By Lynda Radosevich

Continuing to expand beyond its traditional role as a provider of Token Ring products, IBM last week introduced the first "full-duplex" Ethernet adapter along with other new Ethernet, Token Ring and Fiber Distributed Data Interface (FDDI) local-area network products.

Full-duplex Ethernet is a fledgling technology that effectively doubles Ethernet's 10M bit/sec. transmission rate by allowing users to send and receive signals at the same time [CW, May 24]. IBM's full-duplex card is called EtherStreamer, and it can work at full- or half-duplex, allowing 10M or 20M bit/sec. transmission speeds. An autosensing feature can also automatically configure the adapter for 10Base-T, 10Base-2 and 10Base-5 cabling types.

To get the full benefits of the new technology, users will need a switching hub, which IBM has no immediate plans to offer. However, one was announced last month by LAN switch vendor Kalpana, Inc.

IBM's expansion into Ethernet and FDDI is aimed in part at customers who are looking beyond Token Ring products for future LAN installations, observers said.

For instance, Brad Baldwin, a program director at Gartner Group, Inc., said many of his IBM Token Ring clients ask about Ethernet because emerging fast networking technologies focus on Ethernet and because Token Ring adapters continue to cost two to three times more than their Ethernet counterparts for comparable products.

However, in IBM Token Ring shops such as Enron Corp. in Houston, IBM may have trouble breaking into new technologies.

Network hubs keep growing:

- According to International Data Corp., total shipments of LAN adapters grew 36% between 1991 and 1992, from 9.2 million to 12.5 million units.
- The number of installed LAN adapters grew 39%, from 28.2 million in 1991 to 39.2 million in 1992.
- Worldwide revenue increased from $2.5 billion in 1991 to $3 billion in 1992.

While Enron does not plan to install Ethernet LANs, the company does buy FDDI adapters from Networth, Inc. in Irving, Texas, for its high-end servers and routers, which are connected by an FDDI backbone.

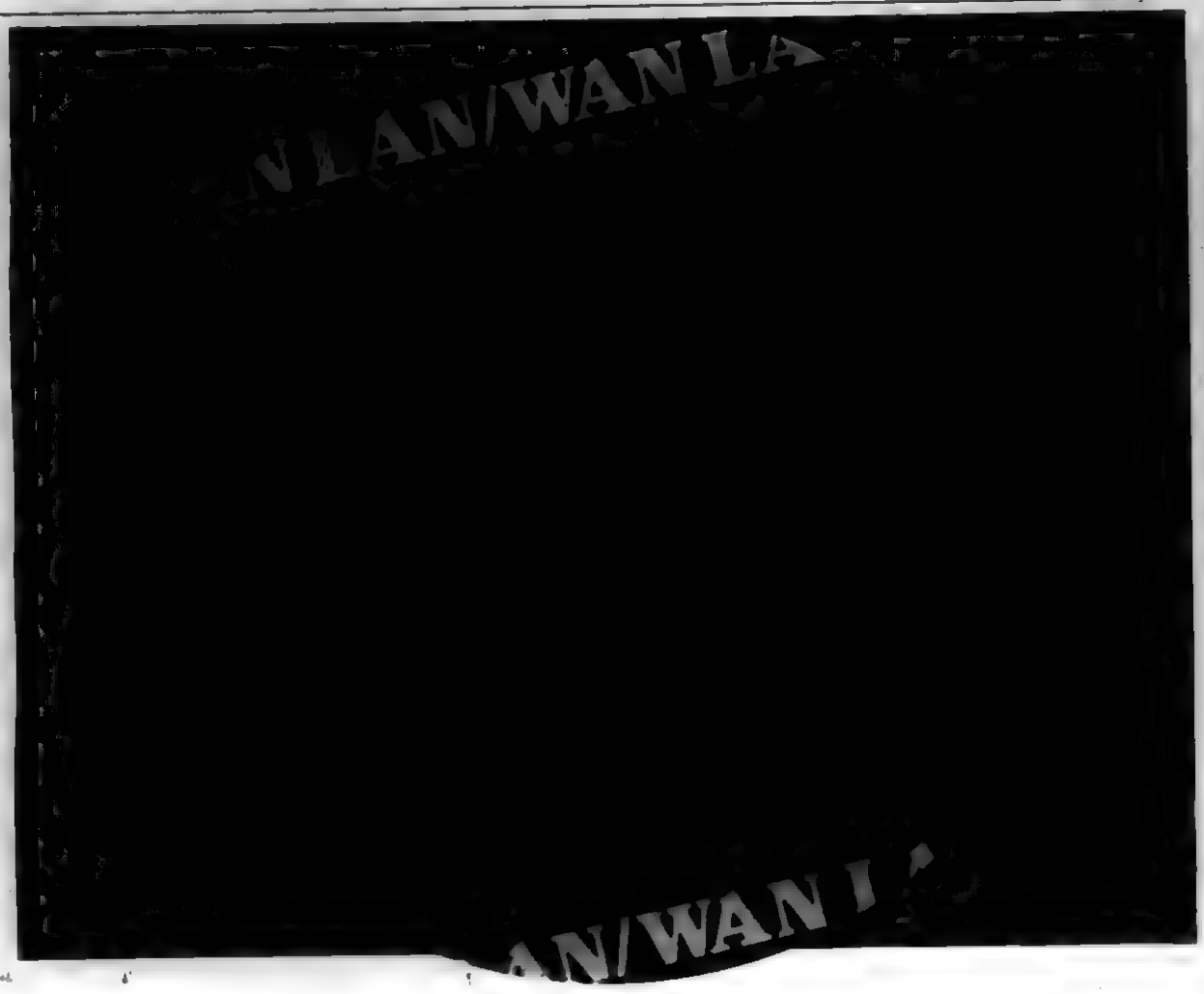
"We may evaluate IBM's FDDI cards, but we aren't in any rush to switch vendors," said Jim Queen, director of enterprise networking at Enron.

Overall, an IBM spokesman said that being first to market with a full-duplex Ethernet adapter shows the revamped company "can turn down the screws and turn out the technology quickly," an approach that IBM will continue to take with its Token Ring products as well, he said.

Fast connections

IBM's new LAN adapters, hubs and bridges span a range of price and performance

Product	Price	Availability
LanStreamer 16-bit MCA Token Ring adapter	$645	Now
Six-port Ethernet hub	$345	July 30
Full-duplex Ethernet adapter for 32-bit MCA-based computers	$995	July 30
FDDI adapters	$700 to $1,700	July 30
LanStreamer Token Ring bridge	$1,995	July 30
Updated AIX intelligent hubs	$4,500 to $10,000	July 30



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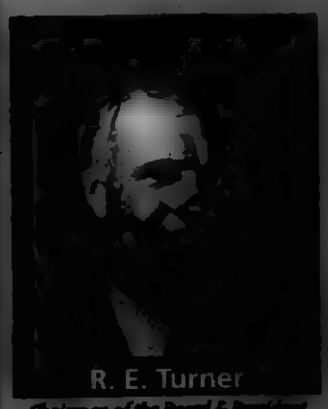

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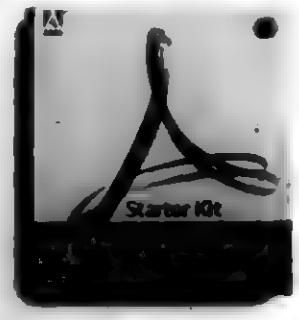

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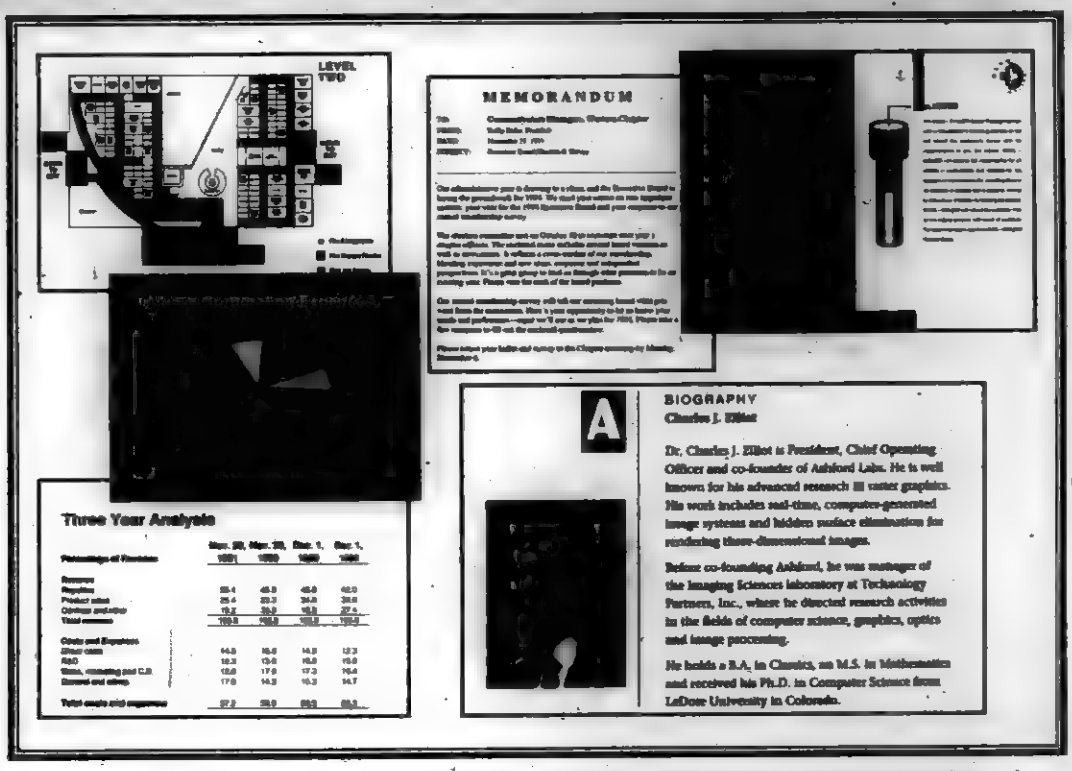

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Tech Talk

HDTV proposal

The much-ballyhooed age of high-definition television (HDTV) edged a bit closer last month, thanks to an agreement to merge competing HDTV transmission proposals. Negotiated on and off for the past two years, the so-called "grand alliance" proposal will present the Federal Communications Commission's Advisory Committee on Advanced Television Service (formed in 1987) with a single plan.

The consolidated proposal will contain the best elements of the four systems developed by three groups: Zenith Electronics Corp. and AT&T; General Instruments Corp. and MIT; and a consortium led by Europe's Thomson Consumer Electronics and North American Philips, along with the David Sarnoff Research Center.

Xerox displays

Scientists at Xerox Corp.'s Palo Alto Research Center announced last month the development of color and black-and-white flat-panel displays with resolutions of 1.6 million pixels. Xerox's displays, shown for the first time at last month's Society for Information Display conference in Seattle, are reportedly the highest pixel-count active-matrix LCDs ever developed. The 13-in. monochrome screen, with 3,072- by 2,048-pixel resolution, offers approximately 20 times the pixel count of 13-in. monochrome Video Graphics Array desktop displays. The color screen offers 1,536- by 1,024-pixel resolution.

Cable Prodigy?

Prodigy Services Co., operator of the Prodigy on-line service, became the latest player to toss its hat into the on-line multimedia arena. Earlier this month, the White Plains, N.Y., videotext firm said it planned to open its network infrastructure to third parties such as cable operators and producers of interactive cable TV programs and services. Prodigy is also developing its own interactive TV services. Prodigy recently demonstrated a prototype of this integrated TV/videotext service.

On-line at the bus stop

Prototype system will give passengers access to fares, schedules

By Elizabeth Heichler

Waiting for a public bus may never be the same if a prototype vehicle-tracking system slated for testing outside of London gains widespread acceptance.

Next summer, bus passengers in Birmingham, England, will know exactly when the next bus is due to pull up to their stop when a new microcomputer-based route and schedule system hits the streets.

The system will use navigational satellites to continually track the position of individual vehicles, allowing it to calculate and display on terminals at each stop the arrival times and route numbers of the next three buses.

Besides gaining the convenience of knowing when the next bus is due, passengers will also be able to query on-street terminals about the best route to a particular destination, as well as display associated fare and timetable information.

For the pilot system, scheduled to begin operation in the summer of 1994, 50 buses on two routes running to the center of Birmingham will be outfitted with equipment to receive positioning signals from the navigational satellites that make up the international Global Positioning System.

Bus station and ticket offices will be supplied with Intel Corp. 1486-based PCs running Windows; these remote locations will be connected to the ICL computer over Integrated Services Digital Network lines.

The bus stops will be equipped with ruggedized, vandal-resistant on-street terminals designed for public use. These displays will have a simpler Windows-based interface offering passengers "yes" or "no" prompts.

Passengers in England *will find terminals at their bus stops starting next summer*

Heichler is a European correspondent at the IDG News Service.

Go back in 'virtual' time

By Ellis Booker

Arguably the world's most striking display of prehistoric artwork, France's Cave of Lascaux may soon be available to a much larger audience in the form of a virtual reality-based gallery tour.

Benjamin Britton, assistant professor of fine arts at Cincinnati's College of Design, Architecture, Art and Planning, is working on a virtual reality version of the cave and its famous wall paintings.

"I really wanted to take the viewers out the realm of the everyday and give them that sense of timelessness," Britton said, explaining why he wanted to use a virtual reality approach to the cave model. Britton's technical background is in touch-screen and interactive videodisc technologies.

Virtual reality proponents say its educational uses — such as touring a model of a Greek temple as it existed in antiquity — may be among the technology's most valuable applications.

For instance, another virtual reality project at the University of Cincinnati's Advanced Visualization Lab involves building a series of Mycenaean temple complexes. Unlike the Cave of Lascaux project, however, this model will be used for archaeological study.

Meanwhile, some of the most advanced work in the field is being conducted at Carnegie Mellon University's Studio for Creative Inquiry. "This is the first [virtual reality] lab in an art department in the U.S.," explained Carl Loeffler, project director of telecommunications and virtual reality.

"Virtual Egypt"

This fall, Loeffler said he expects to complete the first virtual reality gallery in a "networked, virtual reality art museum." That gallery has been dubbed "Virtual Egypt."

"The goal is to create, in scale, ancient Egyptian architecture that users can walk through," he said.

The Egypt gallery will begin as a stand-alone display in a number of major national and international museums and will eventually be available on-line.

Multiuser and on-line virtual reality, a special interest of the Carnegie Mellon team, will be demonstrated next month. On July 6, two users of Virtual Egypt — one in Pittsburgh and another in Tokyo at the International Conference on Artificial Reality and Tele-existence — will share the gallery simultaneously.

In the Cave of Lascaux tour, due to be completed next fall, students will be able to move about the cave and view Ice Age images of animals, navigating the three-dimensional environment with a joystick.

Going beyond mere presentation of the cave images in a virtual reality setting, the tour also features interactive information about the cave and its contents and images that come alive when viewers stop to look at them for a length of time. Trying to emulate what he suspects was the "ritual/spiritual" aspect of the original cave, Britton's computer model includes an area that, if the viewer stumbles upon it, will offer a secret.

Britton, who developed the project's software, was assisted by a variety of experts, including architects, virtual reality consultants and the conservator of the Cave of Lascaux.

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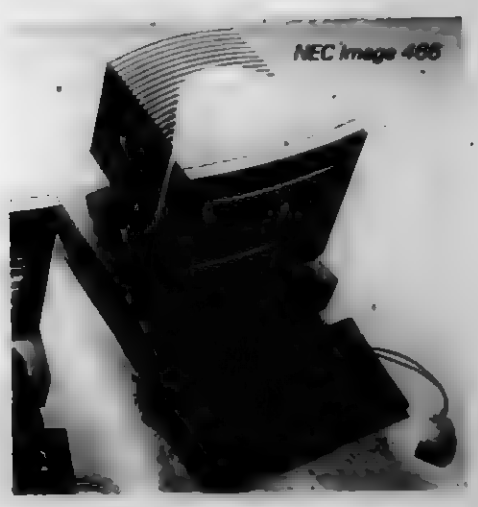

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Sour apples

I remember sitting amid a crowd of stunned reporters at the rollout of the Apple Lisa computer in 1983. The demonstration was mind-boggling for an audience who had never seen a graphical interface. It was pretty clear to me that this was a machine that was going to change computing forever.

And so it did, or at least the Lisa's more successful Macintosh offspring did. The problem is that the Macintosh interface has changed little in 10 years, and competitors have caught up. And that is translating into potentially big troubles for Apple.

For three years, Apple has been searching for a strategy that will take it out of the path of the Windows bullet train. It hasn't found one yet. For price-conscious PC buyers (and who isn't one these days?), the Macintosh no longer commands the price premium it once enjoyed. True, there are still more Macintosh than Windows applications. But that disparity shouldn't last long, as software giants such as Lotus and Borland de-emphasize the Macintosh platform.

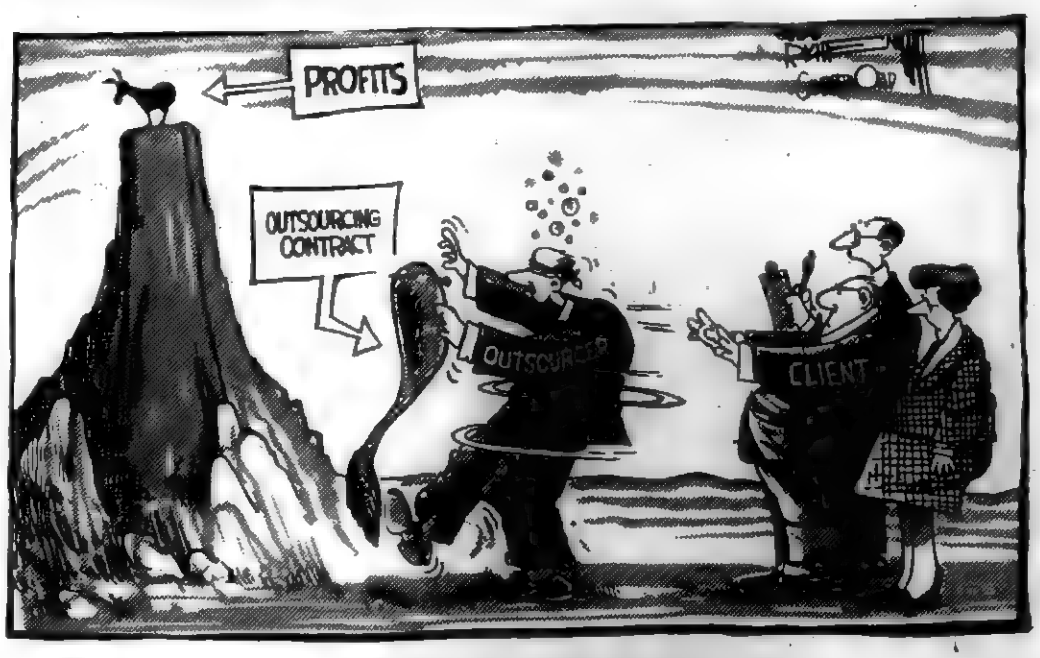
The price cuts Apple must make to stay competitive will continue to savage profit margins at a time when Apple can least afford to curtail investment in new products. Apple's recent moves to spread the Macintosh interface across multiple platforms will pay off slowly, and even then won't inhibit Windows' cross-platform momentum. The Newton, even if it's a great product, will go through the same slow ramp-up that any product experiences when it's trying to create a new market. Users love the PowerBook, but that won't sustain past profit margins. PowerPC looks great, but so do many other chips. No quick fix there. The Microsoft lawsuit? Forget it.

Apple is at a crossroads. It sees the future and knows how to get there, but it has responded too slowly to recent changes in the market to do so painlessly. A particularly bitter pill for Apple to swallow is its continuing inability to define a compelling corporate computing strategy. That certainly hasn't been for lack of effort. Its Vital specification has been well-received by Macintosh fanatics but isn't playing well to a wider audience. The alliance with IBM buys Apple some legitimacy with IS, but the products aren't there yet. And then there's that burden of history. An executive in Apple's business marketing group told me last year that IS people *still* bring up the 1985 "lemmings" TV commercial in Apple focus groups.

Good luck to Michael Spindler, Apple's new CEO. He's got a tough job ahead trying to get a great company back on track.

Sometimes when it ain't broke, you shouldn't fix it. Such is the case with our Page 2 table of contents, which we have fiddled with during the past year in search of a happy medium between something that's comprehensive and easy to read. Our recent minimalist approach was a colossal dud with readers. So the original Page 2 is back, redesigned to match our new look. Thanks for all your comments.

Paul Gillin, *Executive editor*



With choice come consequences

"In users' hands" [CW, June 7] suggested that users are now in the position to dictate software and hardware selection and "then IS can figure out how to tie it all together." Unfortunately, tying things together is easier said than done. IS professionals are already giving up their evenings, weekends and holidays trying to keep the patch quilt of PC hardware and software running, and their resources and capabilities are rapidly approaching a breaking point.

With choice comes responsibility, and it is important for users to understand that their choices have consequences. Incorrect or inappropriate choices are costly and exasperate IS' corporate mission to provide reliable and rapid access to data. It is to the user's advantage to promote a highly integrated and supportable data processing environment.

Encouraging users to do otherwise only makes it more difficult to deliver usable and cost-effective applications.

Richard Finkelstein
Chicago

Readers overrule 'Objection!'

In "Objection!" [CW, June 14], Fabian Pascal demonstrates a serious misunderstanding not just of object DBMS technology, but of the claims of the object DBMS vendors. His cornerstone point — that object DBMSs claim better handling of unstructured data, yet don't deliver — is exactly backward.

The modeling and performance claims of object DBMS products relate to highly structured, complex data — the kind that requires a bewildering number of tables to represent in a normalized relational database — and a SQL query longer than this letter to retrieve. In an object DBMS, data relationships are preserved in the database, not removed as they are in relational normalization. All applications can then benefit from the presence of these relationships to avoid relational joins and achieve performance gains of more than an order of magnitude over RDBMS on comparable data.

It's interesting to observe that just as the leading networking database vendor 10 years ago tried, unsuccessfully, to stop the progress of the relational industry by incorporating some relational features into its products, the leading RDBMS vendor is now announcing plans for a major release (sometime in the future) that will focus on features already offered by several object DBMS vendors. The result will probably be the same.

David L. Gilmour
Executive vice president
Versant Object Technology
Menlo Park, Calif.

I would like to thank *Computerworld* for raising important issues in your In Depth article "Objection!" by Fabian Pascal. Pascal and C. J. Date are both fine writers and thinkers, but I would like to give a practitioner's view.

Application developers have always had to use fundamentally weak tools with many ragged edges. They are accustomed to surmounting shortcomings in the tools to produce robust application paradigms.

But the case with databases is different — relational provides a solid foundation that must be accommodated, not wrestled to the ground. From personal experience, I can attest that an RDBMS can be used to create robust, efficient applications in areas normally associated with object-oriented DBMSs, such as CAD, by using the proper paradigm, such as set-oriented processing.

Databases should not be straitjacketed by procedural thinking. The so-called impedance mismatch is really a paradigm mismatch — the belief that because object-oriented programming is better than the flawed, mainstream development techniques of the past, it is the best model for all processing. Language-oriented techniques such as pointers can be effective for dynamic, in-memory structures within an application but are inappropriate for data that is persistent and distributed.

Lee Fesperman
El Cerrito, Calif.

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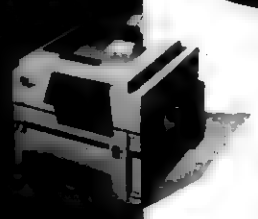

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A (relatively) painless way to move to client/server

Mike Parker

We all know client/server is inevitable. The real question isn't whether to make the move but how quickly and radically to do it. Users want their applications in that environment NOW. But you know that rushing to migrate is a sure way to do serious injury.

You have choices: Give a speech about the dangers of distributing critical data; bow to pressure and scramble to move key databases onto servers — or compromise.

Yes, there is an acceptable middle ground.

Users want access to data from their PC and Unix workstations. You want to minimize development and migration time and maintain a centralized control of the data. The best way to satisfy both requirements is to develop applications using object-oriented approaches to screen building and data retrieval while leaving large databases on the mainframe.

In the past three years, many companies have developed object-oriented approaches not only to building GUIs but for retrieving data across platforms. Tools are available from systems vendors and third-party suppliers.

The need for centralization and enterprise-wide data modeling cannot be overemphasized. In the coming years, effective integration of data is likely to be one of the key distinctions between companies that are efficient and profitable and those that are not. At least for the moment, effective integration is most apt to be achieved by keeping databases on their original platforms.

Photo Alchemy

There are products available that offer access and retrieval of data from multiple platforms. Some work; some don't.

What users want

In most cases, users don't really care where the data resides or how it is managed, as long as they can get to it. Most of them have no interest in time-consuming and unrewarding chores such as logical and physical database design, backup or installation and monitoring of databases. What they are interested in is easy access. Give them that and most will be happy to leave the rest of it in your hands.

This strategy will also give you sufficient time to accurately estimate future database and development costs. Anyone who has negotiated a client/server database contract with a vendor that charges by the total number of enrolled users can testify that the new math involved comes as something of a shock.

Client/server is a permanent shift in computing, so a full-scale transfer of data will have to take place eventually. All I'm saying is don't rush it. Too many deadlines for migration to client/server have been based on expiring mainframe leases. This may make good business sense. However, it may be even more sensible to take advantage of this shift in computing to get great lease rates for mainframes.

Developing modular, object-oriented approaches to migration of applications can give users what they want now and buy you the time you need to ensure the safety of critical data.

Parker, a systems integration consultant in Tulsa, Okla., has also worked in a number of corporate IS departments. In 15 years, he has done more data migrations and conversions than he cares to remember.

With Windows and OS/2, perception is reality

FIRE WATCH *by* John Gantz

While at Comdex last month, I attended a soiree hosted by IBM's Personal Systems Programming (PSP) division for key OS/2 developers, business partners and a handful of consultants. Excitement was high. The OS/2 2.1 release beat Windows NT out the door, and IBM could legitimately call Windows NT vaporware, especially the advanced server version.

It was a nice party. But I couldn't help feeling a general uneasiness. The other name for Comdex was Windows World, after all, and the show floor was full of hardware vendors showing their boxes running NT. Outside the door of the IBM gathering, hoardes of Microsoft velociraptors (see *Jurassic Park*) lay in wait.

Well, at least OS/2 has a powerful parent to protect it. Or does it? I find myself wondering if OS/2 isn't likely to wind up an orphan.

Certainly the IBM PC Co. will have to jump on the NT bandwagon. If Compaq, Dell or AST preinstall NT on their Pentium machines, do you think IBM won't? I haven't run into many IBM PC Co. insiders who believe OS/2 can help them sell iron.

So what's left for OS/2? A useful niche, perhaps, as a client/server operating system in IBM-only shops or as a specialty development system, but not the volume market Microsoft expects for Windows NT or further high-end releases of Windows.

In fact, I expect that sooner or later (probably sooner) IBM will require that development of future versions of OS/2 and related products, such as LAN Manager, be funded out of revenue. That will be a tall order in a market dominated by Microsoft and Novell.

I have data to support a contention that NT is, even before shipment, the mainstream 32-bit operating system for Intel platforms. In a recent survey of 200 volume PC buyers and 100 resellers, my company found that most respondents expected NT to be installed on more PCs than OS/2 will be within 18 months, even among current OS/2 users and resellers.

Worse for IBM, users of OS/2 who had evaluated NT rated NT higher on some features, such as the Workplace Shell user interface, the System Object Model and technical support.

To IBMers and OS/2 developer advocates (and I've talked to more than a few), these results are crazy. Anyone proficient in the Systems Object Model would swear it is light-years ahead of anything NT has. And more than a few technical reviews rate Workplace Shell well above Windows. Besides, NT still isn't shipping and will require 16M bytes minimum when it does. What gives?

What gives is Microsoft's power to brainwash developers and users, the ubiquity of Windows and (compared with IBM) precision drill-team execution. A couple of weeks ago, for instance, I was part of a three-city road show for users of a major PC vendor. Also on the docket were three different Microsoft district managers talking about NT and Microsoft's strategy. All three had the party line down pat. To get a full picture of IBM's strategy, you have to talk to people in Austin, Texas; Boca Raton, Fla.; Somers, N.Y.; and who knows where else.

OS/2 still has some momentum. More applications come every day, more pilot systems are being rolled out across whole departments, and IBM has been debugging it for years. But there's little doubt in my mind that NT will, sooner or later, roar past OS/2 in applications available, platforms supported, units shipped and profits made.

With luck, OS/2 will be successful enough to sell Microsoft on the idea of future joint development that merges the two operating systems. If that happens, we'll have things back the way they were supposed to be at the start of all this.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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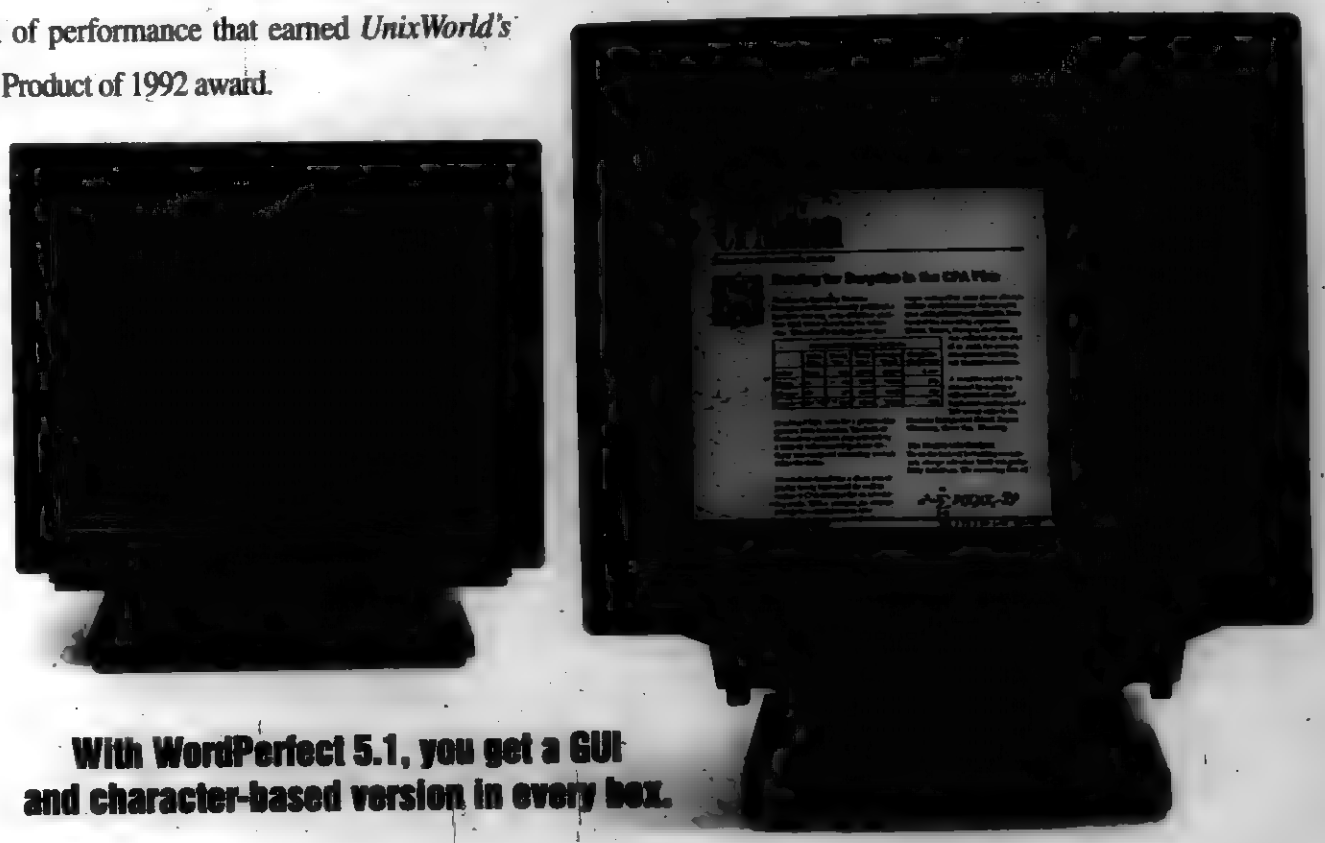

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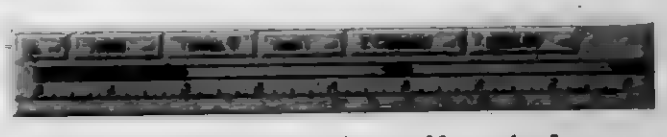

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Charles Babcock

Relational backlash

You know that what used to be the younger generation isn't so young anymore when its leaders start taking shots at the talent coming up behind them. That's what's happening now with some of the proponents of relational databases as they train their sights on object database management systems (ODBMS).

This is strange because at one time, the hoary guardians of hierarchical and Codasyl systems said the same sort of things about relational. John Cullinane, president of the late Cullinet Software, used to tell me, "IBM may ship a lot of copies of DB2, but they're all sitting on the customers' shelves." *Right*. Cullinet was acquired by Computer Associates about a year later.

Once again, you can hear the volume of disparaging comments beginning to pick up: "You don't need object-oriented systems. Relational can do everything they can do. . . . You can store unstructured data in relational tables. . . . Object-oriented results in a loss of data independence, not a gain." And so on.

It is hard for relational advocates, having been on the leading edge for 10 to 12 years, to wake up and find that fashionable opinion has moved on to something else. The temptation is to tell the upstarts they don't know what they're talking about.

At their worst, the relational defenders say ODBMSs represent a step backward. ODBMSs resemble the old Codasyl databases with their dependence on pointers to locate stored objects, but it is hard to see this as a vice if the systems then manage objects effectively.

Object databases answered a real need for C++ and Smalltalk programmers who needed a place to store their persistent data. CAD and CAE users in particular sought to store objects, and object-oriented databases sprang up to serve that purpose.

Whatever their deficiencies, ODBMSs succeed in dealing with objects as objects. They do not need to break them down or flatten them as relational systems do. There are a variety of methods used, but the chief one is to assign each object its own identifier and then use that identifier to locate the object intact.

The nature of this system gives object databases a claim to speedier retrieval because there is no mathematical basis on which to do more sophisticated operations such as joins. Clearly relational systems would retain advantages in dealing with massive amounts of tabular data. But relational advocates are reluctant to give object databases their due.

ODBMSs are built as object-handling systems capable of preserving the characteristics of the objects they store — classes, inheritance and messaging.

Because objects are a combination of data, processes and messages, it is difficult to restrict them to a few simple data types. To store an object, "you have to have the processes inside the database as well as the data," notes James Odell, chief methodologist at Inference Corp. and co-author with James Martin of *Principles of Object Oriented Analysis and Design*.

Relational systems can store objects, but to do so, they must break them down into components and store them in tables. In an analogy that originated with Esther Dyson, editor of the newsletter "Release 1.0," this is like driving your car home and then disassembling it to put it in the garage. It can always be reassembled again in the morning, but one eventually asks whether this is the most efficient way to park a car.

Relational systems were designed to deal with a few data types within the confines of a strict logic. Object databases were designed to deal with the rich variety of data types in a few limited ways. Relational advocates can't wave a magic wand and make the difference go away.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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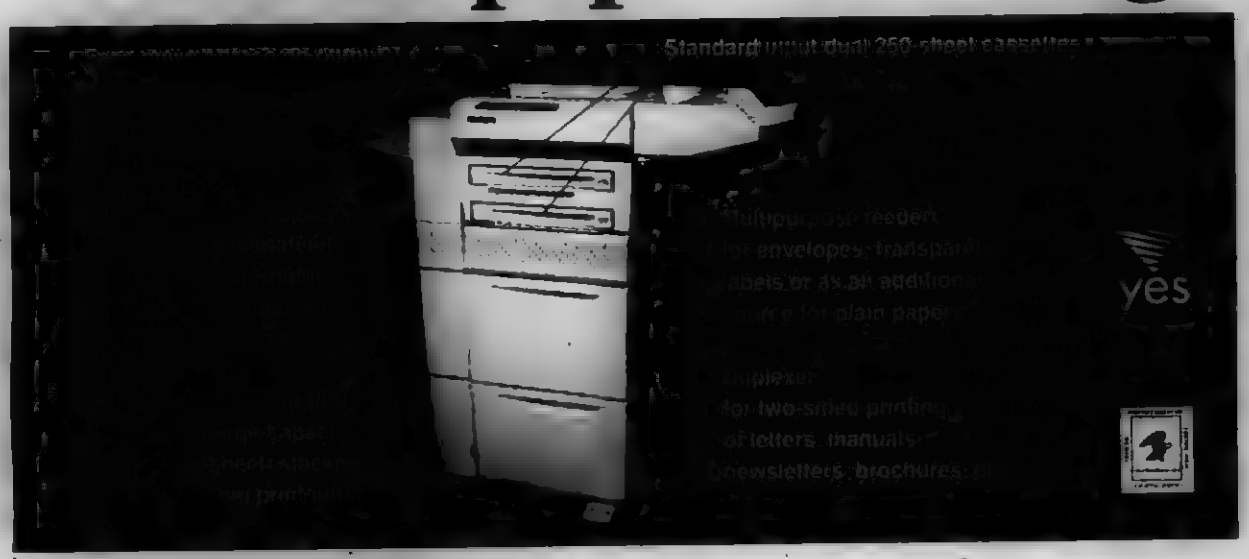

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	Intel Pentium	PowerPC 601™
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SPECfp92	56.9	>80
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How powerful is our first tangible result of the Apple, IBM, Motorola alliance? Unlike any other microprocessor, the PowerPC Microprocessors have the power to change the course of computing.

The PowerPC family of microprocessors will bring unprecedented high performance to everything from hand-held computers to desktop computers to supercomputers. It will run circles around its only real competitor, the Intel®

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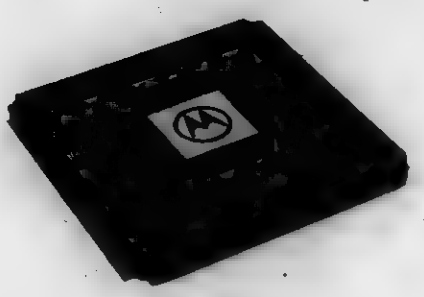
Speed comparisons are based upon press reports of performance of the 66MHz version of the Pentium as announced by Intel, and Motorola's announced simulation performance of the 66MHz version of the MPC601. Thermal comparisons is based upon preliminary Intel specification for the 66MHz Pentium, and the performance of samples of the 66MHz version of the MPC601.



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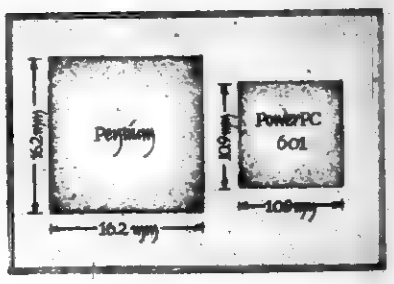

Pentium™ microprocessor, and it will do so at a fraction of the cost. It will run today's standard computer operating systems, as well as those that are being developed for pen-based and object-oriented computing. In fact, PowerPC Microprocessors will play a pivotal role in the imminent convergence of computing, communications and lifestyle products.

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It has the power to blow away Pentium.

The latest in the line of X86-compatible microprocessors from Intel, Pentium, is quite powerful. However, it is not nearly as powerful as the PowerPC family of microprocessors from Motorola.

The first of Motorola's PowerPC Microprocessors, the PowerPC 601™ Microprocessor, will bring workstation-like performance to low-cost PCs. Its integer performance (how fast it handles basic computer functions) is equal to Pentium's. In floating-point performance (the speed you need to crunch numbers, run graphics, video, voice and the like), the 601 is a full 40 percent faster than Pentium, with no loss in integer performance.

While the 601 outruns Pentium, it actually runs cooler, because it draws only 8.5 watts of power to 16 watts for Pentium.

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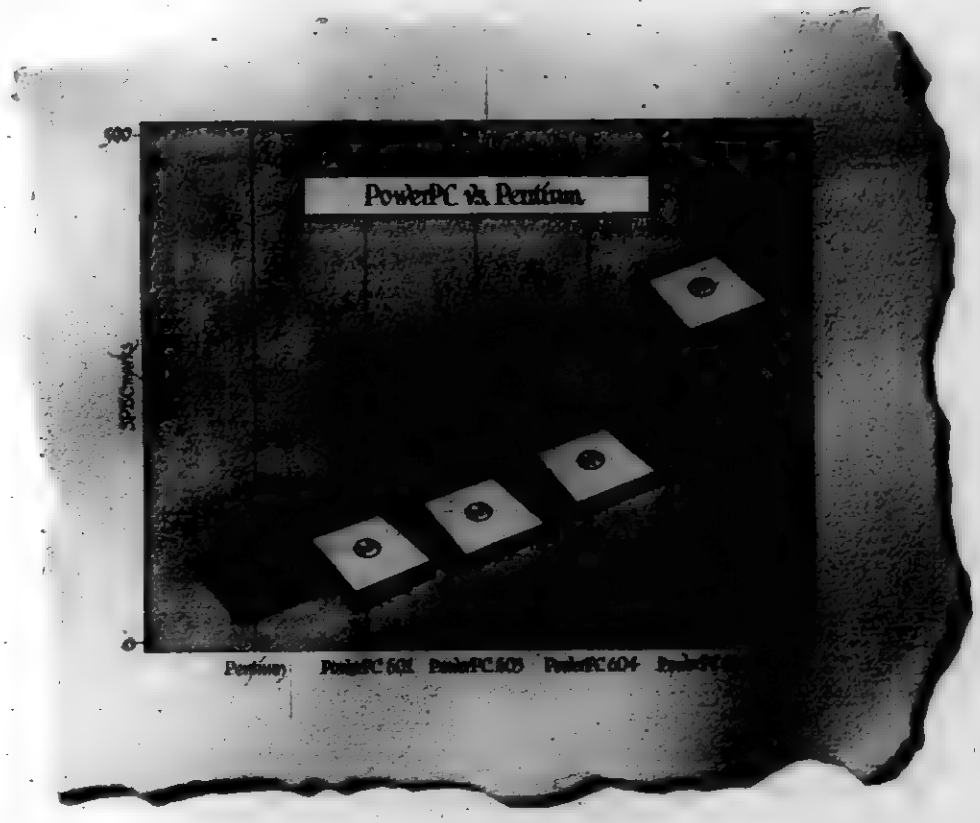
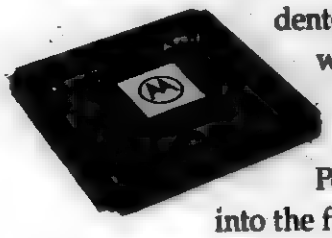


The 601, of course, is only the beginning. Over the next eighteen months, we'll ship ever more powerful versions of the PowerPC Microprocessor. The low-wattage PowerPC 603™ Microprocessor will bring unprecedented performance to battery-powered computers. The PowerPC 604™ Microprocessor will push high-end PC and server performance to new highs. The PowerPC 620™ Microprocessor will run at 200 to 400 SPECmarks in high-end workstation, server and supercomputer applications.



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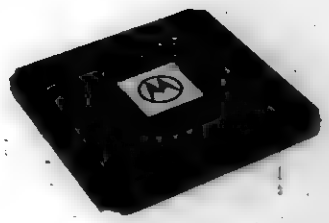
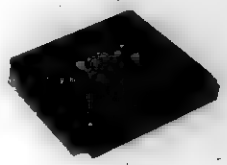
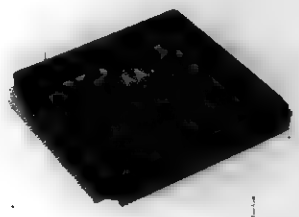
It has the power to lead a revolution.

Personal computers are on the verge of becoming infinitely more useful, more usable, more communicative and more mobile than they are today. A number of advanced technologies—real-time video, wireless networks, voice and handwriting recognition and object-oriented programming, among many others—are ripening, converging and becoming affordable all at once.

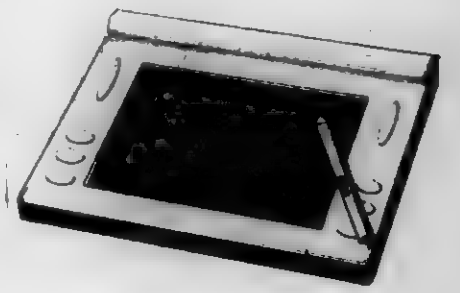
The one thing all those technologies need is extraordinary processing power. Processing power that only PowerPC Microprocessors can deliver.

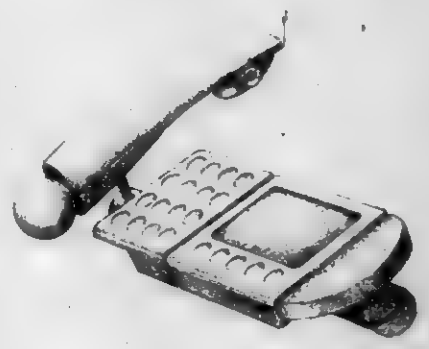


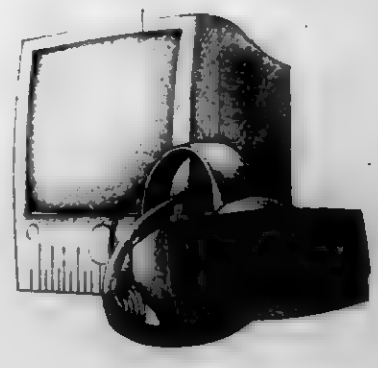




Motorola's family of PowerPC Microprocessors will serve computing needs from hand-held computers to supercomputers. The 601, 60-80 SPECmarks, is designed for high performance, low cost personal computers. The 603 is a low-wattage microprocessor perfect for battery-powered hand-held and other mobile computers. The 604 is a high performance microprocessor for high-end PCs, workstations and servers. The 620 ultra-high performance microprocessor, 200-400 SPECmarks, is right for high-end workstations, servers and supercomputers.







In its various forms, the PowerPC Microprocessor will provide the right combination of high performance, small size, low power consumption and low price that make it the only real choice for an incredible variety of applications. From massively parallel central servers, desktop computers and pocket-sized digital notepads to voice/data communications systems and automotive control units.

In the very near future, computing will look very different. That difference will be powered by PowerPC Microprocessors from Motorola.

PowerPC Microprocessors. *Changing the course of computing. For the better.*

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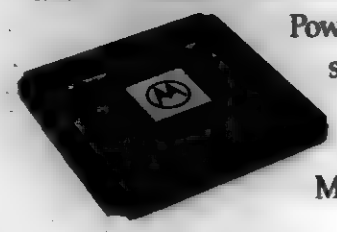
It's as open as it is powerful.

With the arrival of the PowerPC Microprocessors from Motorola, computing is officially open—wide open. PowerPC Microprocessors will run every popular personal computer operating system, including the Apple® Macintosh® OS, OS/2®-Windows™ and, via emulation, even DOS. They'll also run standard variations of the UNIX® operating system, specifically, the PowerOpen™ Environment (based on IBM®'s AIX® with the Macintosh interface) and Solaris® from Sunsoft®.



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Perhaps most importantly, PowerPC Microprocessors soon will run the new processor independent operating systems, including the one forthcoming from Taligent (the Apple/IBM joint venture); as well as the real-time operating systems for embedded confrol and those emerging for mobile, pen-based computing.

PowerPC Microprocessors from Motorola. From supercomputers to pocket computers, the world is now open.

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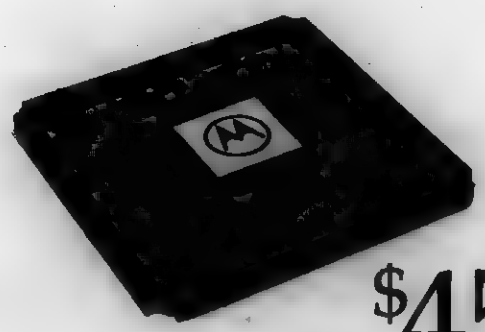
Of course, power has its price.

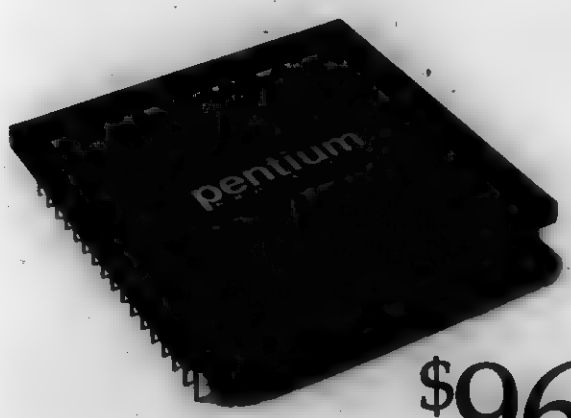
That price is low, as in personal computers priced under $2500 that are faster than any PC on the market today.

You see, PowerPC Microprocessors from Motorola not only deliver significantly more power than Intel's Pentium microprocessor, they deliver it at a fraction of the cost.

The reasons are quite simple. Through Motorola's superior design and manufacturing technology, we've packed more power into fewer transistors. We deliver that power on a chip that's less than half the size (120 square millimeters vs 262 square millimeters).



$450



$965*

Essentially, that means we can manufacture over twice as many microprocessors in the same time and space as Intel can.

PowerPC Microprocessors from Motorola. For those who make computers, they offer the opportunity to build high performance, low cost computers profitably. For those who buy computers, they will cost you a lot less to be powerful.

PowerPC Microprocessors. *Changing the course of computing. For the better.*

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*Price comparison is based upon the announced Intel price for a 1,000 piece quantity of the 66MHz Pentium and the estimated price of the 66MHz MPC601 for the same quantity. Prices are subject to change without notice.

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To take a closer look at the future of computing, call Motorola today at 1-800-845-MOTO.
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David Coursey

Microsoft for all

If reports are to be believed, the Feds are finally starting to look at accusations that Microsoft deliberately hid operating system features from other application developers. Microsoft denies any wrongdoing, and the issue is likely to wind its way around Washington and Redmond for quite some time, tarnishing a company that is most certainly a national treasure.

So, instead of investigating Microsoft, I'd like to make a "modest proposal" of my own, one that would really make Microsoft a national asset. Being a reporter, I'll shift into my best Associated Press style to share my idea with you. Here goes:

WASHINGTON, D.C. — In a surprise move, President Bill Clinton today announced a $75 billion plan to nationalize Microsoft Corp. and create a special tax to provide free software to all Americans. Clinton also appointed the company's cofounder, William H. Gates III, to a lifetime term as U.S. technology czar, a newly created cabinet-level post.

"It used to be a chicken in every pot, but today we need a computer in every home and that requires software," Clinton said in announcing the federal buyout, which will pay Microsoft shareholders the full value of the company's stock at the close of trading yesterday. Vice President Al Gore, who had promoted the buyout idea in private White House discussions, will shepherd the deal through Congress, the president said.

Export strategy

Clinton described Microsoft as a key component in his plan for a resurgence in American trade overseas.

Gates, who founded the company as a teenager, will remain in day-to-day control of Microsoft but will gain new responsibilities as the nation's chief strategist on technology policy.

"There is no one more qualified, more able, than Bill Gates to guide America's development of the technology necessary for an information-based economy," Clinton said. "In his government role, Bill will be able to develop policies that

Coursey, *page 52*

Xerox develops OCR for Windows

By Michael Vizard
PALO ALTO, CALIF.

Xerox Imaging Systems, a wholly owned subsidiary of Xerox Corp., is about to deliver a $99 optical character recognition (OCR) software package for Windows. It converts paper documents into an editable format that is compatible with word processors from companies such as WordPerfect Corp., Microsoft Corp. and Lotus Development Corp.

Based on technology developed at the Xerox Palo Alto Research Center, TextBridge makes use of neural network technology and other mathematical algorithms to convert digital images that were either faxed or scanned into PC file formats that are compatible with the leading word processing, spreadsheet and database software packages. Those documents can be written in English, French, Italian, German or Spanish using virtually any typeface.

"This is one of the few software packages that actually does what it is advertised to do," said Ed Letourneau, president of Hydro America, Inc., a consulting firm for electric power plants that is based in Bennington, Vt.

Thus far, Letourneau said he has used a beta-test version of TextBridge to import about 3,000 pages of technical documents into a file format that is compatible with FrameMaker from Frame Technology Corp. in San Jose, Calif., and Lotus' Manuscript offering.

"TextBridge is about as fast as any of the OCR packages out there, and it's far more accurate," Letourneau said.

TextBridge, which includes a Dynamic Data Exchange facility to link it with other Windows applications, will ship next month.

Mobile computing

Transition time for pen

First word processor for digital ink debuts to applause

By Michael Fitzgerald

Pen computing is dead! Long live pen computing!

There is a new model for the pen computing market. A slew of announcements seeks to meld pen input technology with conventional computing and make good on promises made by vendors six months ago.

"Pen computing is not a market, just like wireless communications is not a market," said Richard A. Shaffer, editor of "Computer-Letter," an industry newsletter in New York. "They're technologies, and customers don't buy those. They buy real benefits."

Shaffer said the benefit of pen input is the way it enhances highly mobile computers that are too small to effectively accommodate a keyboard.

Recent vendor announcements signal a trend toward pen input being seen as part of mainstream computing, rather than something unto itself:

▶ Pen pioneer Grid Systems Corp., following its sale to AST Research, Inc., added to its Convertible line. The initial Convertible 386, which accepts both pen and keyboard input, is Grid's current best-seller. The Grid Convertible 486 uses an Intel Corp. 25-MHz I486SL chip. It is also one of the first portable systems to bundle socket services for the Personal Computer Memory Card International Association slot. The product will retail for $2,699 when it debuts in July.

Grid Systems' Convertible 486 accepts input with either a pen or a keyboard

▶ After an aborted attempt a year ago, Zenith Data Systems also has added pen computing to its list of technologies. The Z-NotePad 425LN turns the Z-Note 425LN notebook into a combination notebook and pen-based computer, much like the Convertible, but with a detachable screen. The Z-NotePad will cost $2,999 and is shipping now.

▶ Aha Software Corp., a Mountain View, Calif., start-up, introduced InkWriter, which allows users to manipulate text entered with a pen without having to first convert the information to computer characters. Effectively the first word processor oriented for pen input, InkWriter can also turn ink sketches into computer graphics. It will cost $249 but will be introduced at $199 in July and August.

▶ Borland International, Inc. and Redwood Shores, Calif.-based Communication Intelligence Corp. said they have developed pencentric objects for Borland's dBase IV. This will allow dBase to recognize and use data that has been entered with a pen.

▶ Notable Technologies, Inc. in Oakland, Calif., and Compsoft Services, Inc. in Greenwich, Conn., said they would jointly develop new host-to-pen computer-oriented communications software for Go Corp.'s PenPoint operating system.

▶ Dauphin Technology, Inc. in Lombard, Ill., said it is shipping its DTB-1, a Cyrix Corp. 486SLC-based pen and keyboard mobile computer that weighs less than 4 pounds.

▶ Compaq Computer Corp. also cast its name into the ring of vendors that support pen computing when it announced it would build technology into a new family of computers called Mobile Companions.

> InkWriter could make it possible to computerize hospital patient care, a $900 billion market now entirely driven by ink.

Of these announcements, observers said they were pleased to see more 486-based pen computing hardware because pen-oriented software has run slowly on 80386 technology. The product that seemed to intrigue them most was Aha's InkWriter.

"Aha is a major step in mobile computing because it makes it more apparent that you can in fact do real work with pen input that has nothing to do with handwriting recognition," Shaffer said.

Doug Smith, president of Filbitron Systems Group, Inc., a systems integrator in Toronto, called Aha's InkWriter an "enormous" development and said it could make it possible to computerize patient care in hospitals. "That's a $900 billion market that can't be computerized because it's entirely driven by ink," Smith said.

Observers said Aha was the first company to enter the market for pen-based word processing. WordPerfect Corp., which has discontinued development of PenPerfect, said it was still looking at pen technology but had nothing immediately planned.

Separately, AT&T, which has started a major push behind the EO, Inc. Personal Communicator, clarified its marketing plans. Harriett Donnelly, managing director for the personal communicator business at AT&T, said the company has decided against a seeding plan it was considering, in favor of other ideas. For instance, AT&T is negotiating with the National Basketball Association to outfit NBA teams with the Personal Communicator.

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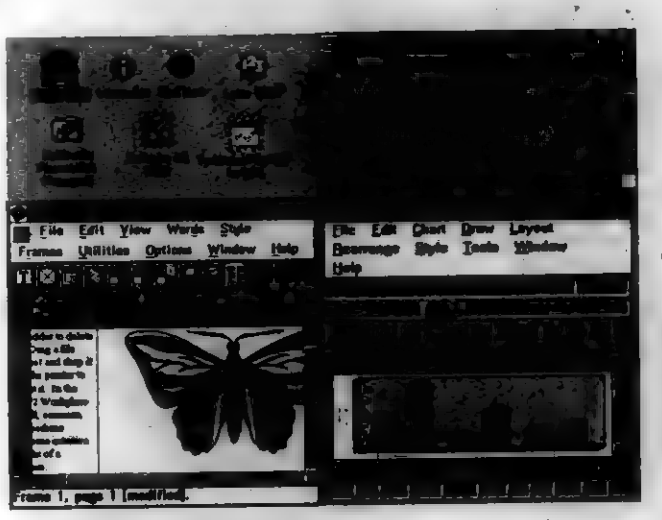

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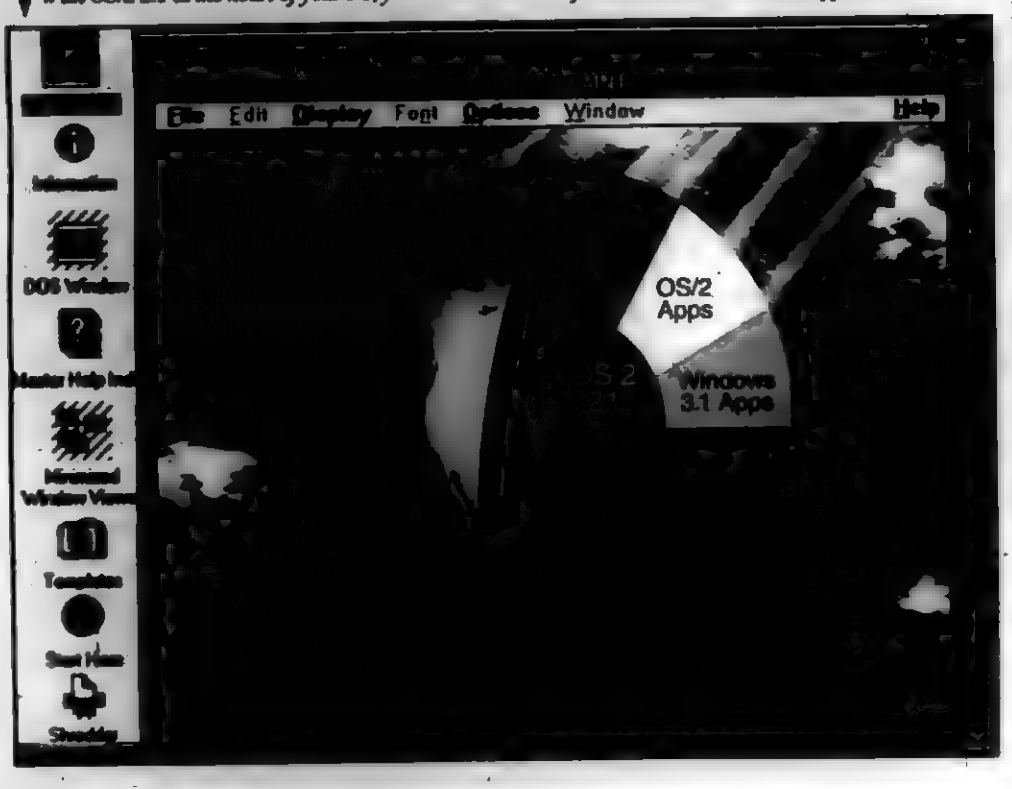

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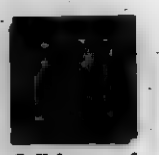

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- New TrueType fonts, Windows applets, File Manager.
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- OS/2 Crash Protection and pre-emptive multitasking.

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- Now also available on CD-ROM.
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Advanced 32-bit architecture
- Seamless SVGA support.
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IBM

Viruses continue to wreak havoc at many US companies

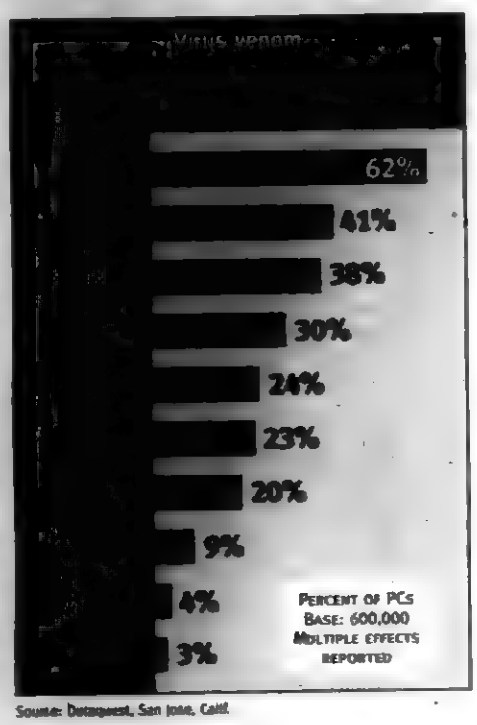
By Gary H. Anthes

Shortly after the White House announced that it had hooked up President Bill Clinton and Vice President Al Gore to the Internet, Gore said, "The Clinton administration enthusiastically supports National Computer Virus Awareness Day."

White House officials refused to say whether novice Internauts Bill and Al had met Michelangelo, Dark Avenger, Jerusalem, Stoned or any other digital demon, but such a high-level statement of support for virus awareness would have been unimaginable just a few years ago.

Even discounting the tendency for hype that has plagued the virus and security issue, corporate computerdom will see things get worse before they get better, computer experts said. Among the statistics put forth at the June 9 Virus Awareness Day kickoff on Capitol Hill were these:

- In a survey of corporations by the National Computer Security Association (NCSA) and Dataquest, Inc., 63% of respondents said they had battled a computer virus.
- Viruses will cost American business $2 billion next year.
- More than 2,100 viruses are known to exist and 50 more are created each month.
- The average virus attack affects 142 PCs and takes 2.4 days to eradicate. One quarter require more than five days to correct.



Source: Dataquest, San Jose, Calif.

Myths abound

Many corporations refuse to discuss their experiences with viruses or their efforts to avoid them. But 3M Co., which sponsored Virus Awareness Day with the NCSA, did not hold back. Virginia H. Hockett, information technology manager at 3M and an alumna of the National Security Agency, said a survey of employees showed that while 98% had heard of computer viruses, the majority were not sure what viruses do.

"The majority ... regarded antivirus software as a complete cure ... [and] more than 55% answered that they had spent no time in the past year educating themselves on how to prevent or combat viruses," Hockett said.

NCSA board member Peter S. Tippett, director of security and enterprise products at Symantec Corp., said the following common misconceptions still exist:

- "Viruses will eat your data." In fact, viruses rarely destroy either data or software. The biggest problem is just getting rid of them.
- "Computer bulletin boards are a leading source of viruses." No. The common boot-track-type viruses cannot be easily transmitted this way. No corporate policy related to bulletin boards will have a noticeable impact on the virus problem.
- "Most viruses travel in pirated software; few are transmitted via data-only diskettes." Just the opposite is true; while viruses do not infect data per se, they do infect diskettes carrying data.
- "There are good viruses and bad viruses." There are no benign viruses; because all by definition replicate without the user's knowledge or consent, all must be removed, sometimes at considerable expense.
- "Viruses come in waves." No, news of various viruses — for example, Friday the 13th, Columbus Day and Michelangelo — comes in waves, but the viruses themselves have grown steadily and predictably.

On the rise

Micki Krause, minicomputer and microcomputer security manager at Rockwell International Corp., said Rockwell saw virus incidents peak at 600 in 1990, then decrease as stringent antivirus measures were taken. Now, however, she said they are on the rise again at Rockwell as the number of viruses increases geometrically.

"Viruses are being written so fast that antivirus software can't keep up," Krause said. One infection cost the company an estimated $44,000 to cure.

Protection policy

3M's antivirus policy contains the following provisions, among others:

- Change passwords every 30 to 90 days.
- Write/protect files when possible so that an error will occur if a virus tries to modify the file.
- Use "shareware" only under strict guidelines and "freeware" not at all.
- Never run programs at work obtained from university systems.
- Learn the signs of a virus attack, which include unexplainable loss of free memory, programs taking longer to load or execute, changes in file or program size, print routines that stop working, "freezing up" of the computer, strange beeps or messages or computer reboots in the middle of a process.

TransferPro unveiled

Unix given access to Mac, MS-DOS files

By Christopher Lindquist

LOS ALAMOS, N.M.

Digital Instrumentation Technology, Inc. has announced the availability of TransferPro, a software product that allows Unix systems to read and write to Macintosh and MS-DOS files.

DIT began life in 1989 developing technology for Next, Inc. system floppy drives.

With TransferPro, users can perform most file-related tasks on DOS and Macintosh disks, including copying and moving files and directories and formatting and browsing through file contents. Various file-filtering techniques ease the transfer of files from one system to another, including file name filters that rename files in accordance with the standards of each system.

TransferPro is currently available for Sun Microsystems, Inc. systems and Silicon Graphics, Inc.'s Iris and Personal Iris systems. A version for Hewlett-Packard Co. Unix workstations is due shortly. Pricing begins at $99.

Coursey

CONTINUED FROM PAGE 49

will affect all Americans."

Dubbed a "Microsoft tax" by one GOP senator, Clinton's National Software License Fee will be collected as a surcharge on the income taxes paid by Americans with annual household incomes higher than $50,000, a treasury department official said. Revenue from the tax is expected to total $15 billion, or $60 for every American. For that amount, Clinton promised free software for all, including the latest interactive games and business applications. New software will be released through post offices and other federal agencies, although long-term plans call for distribution via cable television.

The president's strong endorsement of Gates clearly suggests the 39-year-old billionaire might have carte blanche to develop policy as he pleases.

'No comment'

Administration officials would not comment on what effect the Microsoft buyout might have on the company's reported plans to form a new company, CableSoft, to create software for interactive televisions and other devices. A White House spokesperson said talks between Microsoft, media giant Time Warner, Inc. and cable television leader Tele-Communications, Inc., would continue. Microsoft will be in a much stronger bargaining position as a result of the buyout, the spokesman said.

It is unclear whether Gates' administration position might enable him to pressure the Federal Communications Commission to accept Microsoft-inspired plans for interactive cable television or a proposed national telecommunications system designed to bring entertainment and data networking services to U.S. homes and businesses. The president's strong endorsement of Gates, however, clearly suggests the 39-year-old billionaire might have carte blanche to develop policy as he pleases.

The moves were widely hailed on Capitol Hill as important elements in the establishment of a national technology policy, with both Democrats and Republicans predicting swift approval by Congress.

Others were not so sure, however, criticizing the tax allowing any American unlimited use of Microsoft software and also providing government funding for software companies adversely affected by the nationalization move. One Republican senator vowed to fight Clinton's proposal, even against the wishes of the Senate's GOP leadership.

Job for Jobs?

In a related move, the president also said he was revising his controversial jobs bill to provide $16 billion to fight unemployment at object-based operating system companies in Redwood City, Calif. The money would specifically target Next, Inc., where former computer whiz-kid Steve Jobs continues a fight for survival.

Republicans have already said the jobs bill is a sham, not intended to provide a job for Jobs but to distract Ross Perot, who holds a major stake in Next, from entering the 1996 presidential campaign.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

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Of course there's compatibility with previous 1-2-3 versions and other Lotus products, too. In fact, there's incredible integration when installed with Freelance Graphics® for OS/2. All in all, when you see how much it offers, you have to give this 1-2-3 a 10.

To order or to find out more about OS/2 2.1 or Lotus 1-2-3 for OS/2, call **1 800 3-IBM-OS2.** In Canada, call **1 800 465-7999.**

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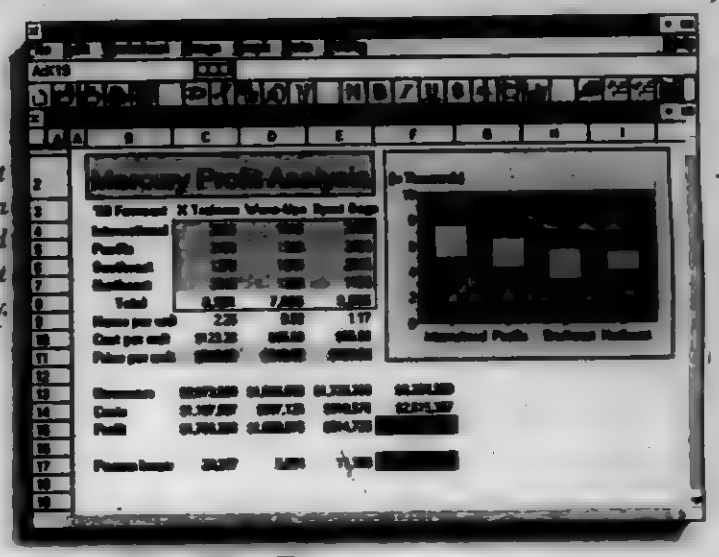

A true 32-bit implementation of Lotus advanced spreadsheet technology.

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IBM

Mac accelerator cards step on the gas

By James Daly
DALLAS

Tired of being jealous of the guy down the hall who always has the speediest machine around?

If you're a user of an older Macintosh, you have a new ally in Applied Engineering, Inc., which recently unveiled a series of accelerator cards for older Macintoshes.

The TransWarp Eclipse 4300, 2300 and 1300 cards offer the ability to dramatically increase the speed of Macintosh models LC, LCII, LCIII, Performa 400, SE, Classic, Color Classic, Mac II, IIX, IICI, IISI, IIFX, IIVI and IIVX.

Applied Engineering officials say the boards can boost the computational power of even the most sluggish Macintosh by as much as 12 times.

The boards use two acceleration methods: the addition of Motorola, Inc. 68030 and 68040 chips and a technique called "static RAM caching."

A static RAM cache is a very fast section of memory that resides between the main motherboard and the CPU. It works by taking instructions from the slower motherboard memory and placing them in fast static random-access memory. The instructions are executed much more quickly, resulting in greatly improved performance.

With optional support for Apple's Virtual Memory feature, users will be able to use hard disk space as if it were system RAM.

The boards could have an enormous market among the millions of users of older Macintosh models. Pieter Hartsook, editor of the Macintosh-geared "Hartsook Letter" in Alameda, Calif., estimated that there are 10 million Macintoshes on the market, many of them older machines.

All models of the TransWarp line are expected to be available this summer with prices starting at $199.

XyWrite for Windows set for August delivery

By Michael Vizard
BALTIMORE

Diehards who have remained loyal to the XyWrite word processing software from The Technology Group are about to have their patience rewarded with the long-awaited arrival of XyWrite for Windows.

Due in August, a Windows implementation of XyWrite will bring many professional writers and editors into the Windows mainstream for the first time. Currently, XyWrite users, many of whom are professional journalists, must exit Windows in order to access their XyWrite word processing software under DOS.

"I've got a late beta version of XyWrite for Windows, and I haven't been able to crash it yet," said Tony Kahn, a producer for American Public Radio in Boston.

Added features

New features in XyWrite for Windows include the ability to create multiple notebooks that hold related files, the ability for writers to create their own shorthand notations that are then automatically expanded into full proper names, and the ability to create style sheets that maintain uniform formats across mutiple projects.

In addition, XyWrite for Windows includes a command line that allows users to reduce keystrokes and mouse clicks. It also provides a library of buttons that users can customize with the commands they use most often.

Kahn, who acknowledged that he is not much of a Windows enthusiast, said he prefers XyWrite over other word processing packages because it is simpler to use.

"With XyWrite, I don't have to go through multiple commands and menus to change a format," Kahn said.

Priced at $495, XyWrite for Windows requires 2M bytes of random-access memory and anywhere from 3M to 9M bytes of disk space.

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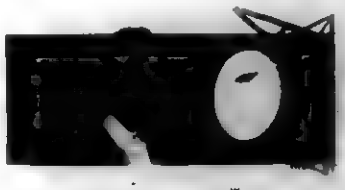

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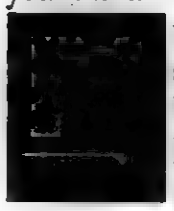
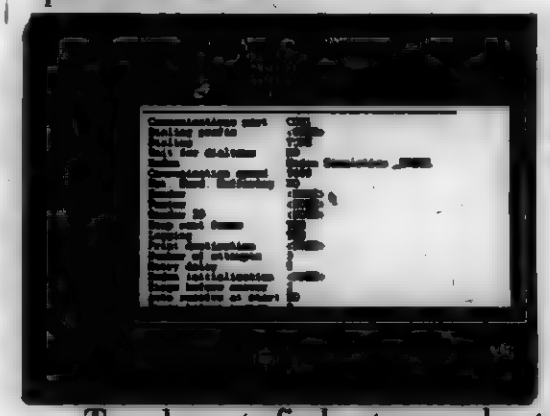


You can send faxes right from the Workplace Shell by simply dragging and dropping a data object to the fax object. And thanks to OS/2's true pre-emptive multitasking capabilities, you can send, receive and print faxes in background mode while you continue working with other applications.

Features like these are too good to keep to yourself, so there are also OS/2 versions available for LAN and client-server environments, all CID enabled. And application developers will appreciate APIs that allow for integration of the Fax/PM engine into custom applications.

We could go on about how Fax/PM and OS/2 can make your PC an even more productive place. But we'd rather let the fax speak for themselves.



Send faxes right from the Workplace Shell, or from any full-screen DOS, Windows or OS/2 application.

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IBM

Firm finds Support Advantage with ProActive Software

By Christopher Lindquist

"Customer service" is just another popular catchphrase — unless your customers are not getting it.

So when Boehringer Mannheim Corp. decided to install a major new system for its 2,000 users, it also set out to find a third-party help-desk package to bring its support services to a higher level.

Boehringer had previously used an in-house application that Pete Van Dyke, manager of MIS administration, described as an "electronic notebook" with limited functionality. "Basically all we could do was log calls," he said.

That was not going to be sufficient when the new system went on-line. Van Dyke was looking for reporting, escalation and prioritization capabilities to keep better track of support calls and, he hoped, make the entire process more efficient and less expensive along the way. "Any time you reduce confusion in an organization and make it more efficient, there are cost savings in there," he said.

After investigating a variety of packages, Boehringer settled on three from which to choose. Unfortunately, in the final evaluation, none of the three proved up to the task, Van Dyke said. So the company took a step back and returned to ProActive Software, Inc., a Mountain View, Calif.-based company that had previously refused to submit a quote for the job because of Boehringer's tight time frame, Van Dyke said.

Good match

This time they struck a deal, and Boehringer took part in the beta-test program for ProActive's Support Advantage package, which provides work-flow automation for support personnel.

Personal design

Boehringer found at least one plus to being a beta-test user for Support Advantage: ProActive was willing and able to modify the program to suit the company's needs.

With Support Advantage, Van Dyke said, support calls go into a two-person support desk where they are either answered or referred to the appropriate person on the staff of nearly 100 support personnel. If the request for support is not answered within preset time limits, it is automatically sent to the next person in line until someone deals with it.

In emergency situations, the system can also call a support person's pager. That technician can then log on to Support Advantage at the nearest workstation and retrieve information about the problem.

Support Advantage soon had noticeable results, Van Dyke said, noting that "the backlog of calls has diminished." While Van Dyke said he is pleased with the additional efficiency, he is still waiting to determine just how much money Support Advantage is saving him.

"I'm hoping to get some reports to determine some metrics," Van Dyke said, noting that ProActive is still working with him to produce report modules to do just that.

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Macintosh product

MicroTouch Systems, Inc. has introduced Mac 'n Touch SA-14 Monitor, a high-resolution touch-screen monitor designed for the Macintosh.

The product can be used for kiosk, business, multimedia or training applications. Mac 'n Touch is composed of a 14-in. display, controller and a Mac OS driver, the company reported.

The Mac 'n Touch Monitor costs $1,495.

▶ *MicroTouch Systems*
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(508) 694-9900

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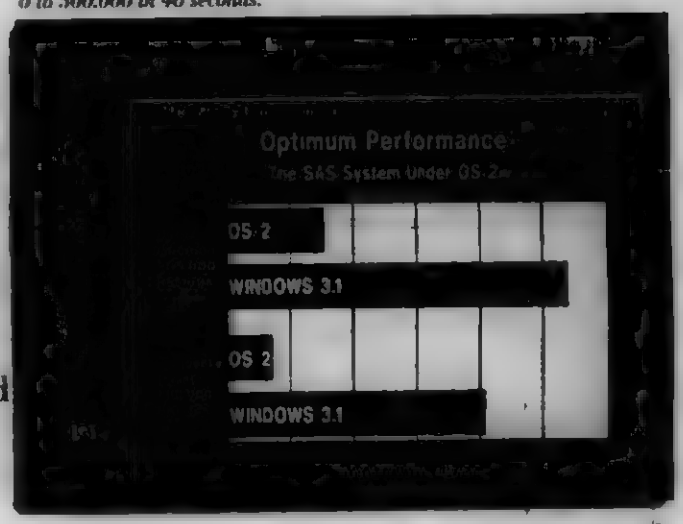

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IBM

[redacted]

Data storage

RYBS Electronics, Inc. has started shipping Version 8.17 of AtLast Upper Memory Optimizer.

This version offers easier integration and more available DOS memory. According to the company, an additional 5K to 30K bytes of usable conventional memory is available because the product includes full support and improvement of MS-DOS 6.0.

To continually provide maximum available DOS memory, AtLast can independently track and optimize each configuration option.

According to the company, a Smart TSR feature optimizes utilities to ensure the best use of memory space.

AtLast costs $79.95.

▶ *RYBS Electronics*
3109 28th St.
Boulder, Colo. 80301
(303) 444-6073

Peripherals

APS Technologies, Inc. has started shipping Toshiba Corp.'s 213M-byte, 2½-in. internal hard drive.

According to the company, the APS Toshiba 213 was designed for use with every Apple Computer, Inc. PowerBook, including the new PowerBook 165C.

The APS Toshiba 213 is said to have sustained Small Computer Systems Interface transfer rates as high as 1,300K byte/sec. It delivers an access time of 27 msec with an average seek time of 12.1 msec.

The internal version of the APS Toshiba 213 costs $599. The external AC-only version costs $650, and the AC/DC version costs $729.

▶ *APS Technologies*
6131 Deramus
Kansas City, Mo. 64120
(816) 373-5800

Database management

Progress Software Corp. and Q+E Software have announced that Q+E now supports the Progress relational database management system.

Through Q+E Software products, users will now be able to access Progress-based data via an assortment of Windows tools.

The Q+E Database Editor, the Q+E Database Library and the Q+E Multi-Link/VB are the three Q+E Software products offered with Q+E Software for Progress.

The Q+E Database Editor provides Dynamic Data Exchange and dynamic information exchange between any Windows application or tool that supports the Progress RDBMS.

A lower level, SQL-based interface to the Progress RDBMS is offered in the Q+E Database Library.

Microsoft Corp.'s Visual Basic applications are linked to more than 20 PC and SQL databases, including Progress with the Q+E Multilink/VB.

Q+E Database Editor costs $299. Q+E Database Library and Q+E MultiLink/VB each cost $399.

▶ *Progress Software*
14 Oak Park
Bedford, Mass. 01730
(617) 280-4000

JV Consultants has started shipping DocsDB Pro Version 4.0, a document manager for Microsoft Corp.'s Word for Windows.

According to the company, this version allows full integration among portable, office and network computers.

When users copy documents from one machine to another, the DocsDB Pro naming structure is simultaneously transferred to a new location.

A database created by DocsDB Pro has categories called Subjects, Folders and Cabinets. File names of up to 255 characters in length can be assigned.

Native Word for Windows commands such as File Open, File Close, File Save and File Save As are used.

DocsDB Pro requires Windows Version 3.0 or higher and Word for Windows Version 2.0 or higher installed on a hard disk.

DocsDB Pro costs $129.95.

▶ *JV Consultants*
3013 Yale Ave.
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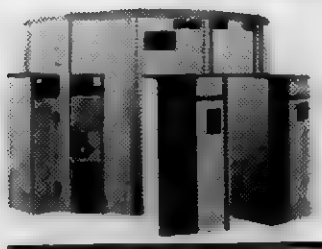

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— Bard White, Spalding's CIO and Worldwide Director of MIS

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Replication catches on, but approaches still differ

By Kim S. Nash

Hot on the heels of Sybase, Inc.'s splashy introduction of Sybase Replication Server this month, The ASK Group, Inc.'s Ingres Products Division confirmed that it will start beta-testing a similar replicator this summer, according to an Ingres executive.

The as-yet unnamed product grew out of an internal tool that Ingres consultants have used for several months to set up distributed database architectures at more than 20 U.S. customer sites, said Russ Donovan, director of product marketing at Ingres in Alameda, Calif.

The Ingres replicator is due to ship by the end of the year, he said. Meanwhile, Oracle Corp. and Informix Software, Inc. have touted the built-in replication features of their latest database engines.

But positioning is strictly in the database market, said Colin White, analyst at Database Associates, a consulting firm in Morgan Hill, Calif. "What it comes down to is what works, and we just haven't seen enough yet from the newest products to decide which is the better approach," White said.

Ingres plans to ship a replication server this year. It will be an amalgamation of the approaches of Oracle and Sybase, containing two-phase commit and other replication features, said Ingres' Russ Donovan.

Better tools

Despite the hype, the concept of data replication is not new. But the tools for doing it have improved with the latest round of database upgrades from the major players. That is because users are more loudly demanding the ability to manage databases and keep changing data in sync across different geographic locations, analysts said.

For example, a brokerage with headquarters in New York that makes stock trading decisions based on currency exchange rates in London and Tokyo would want to keep that data as current as possible in all locations. Replication lets databases running in those spots pull information at regular intervals from other locations, keeping each database synchronized with the others even in the event of network failure.

"Doing distributed database is not as easy as setting up a replicator," White warned. "But that is a big part of it."

Echoing the sentiments of other observers, White noted that database vendors can go only so far in making client/server a reality for big worldwide users. Internetworking products and their applications have to be built and built solidly, he said. And that is the responsibility of more than one vendor.

In a nutshell, distributed database schemes let databases at two, 10 or many more sites share updated data at regular intervals. A typical scenario: Several local retail stores regularly feed sales and inventory data to a corporate-level database at the retailer's headquarters. The corporate database, in turn, might send duplicate information to databases in another location, which would act as backup in case of a disaster or downtime at headquarters.

Efficient data replication, whether the function is built into database engines or available as a separate product, is key to distributed computing, observers agreed. A good replication plan, they said, must accomplish the following important tasks:

- Duplicate and send data according to user-defined parameters, such as every five minutes or each time a certain threshold is reached.
- Continue to function and remember information and changes when system or network failures happen.
- Synchronize data changes with databases in different locations so local users do not work with stale information.

The differing approaches of two database powerhouses illustrate the basic replication debate, according to David McGoveran, an analyst at Alternative Technologies, a consulting firm in Boulder Creek, Calif.

Keeping watch

Sybase's Replication Server contains a Log Transaction Monitor that looks over the shoulders of Sybase database users to see what changes they make to data and whether those modifications should be sent to other locations. If a receiving locale is down as a result of a network failure, for example, the Log Transaction Monitor sends the data until it is accepted.

The Oracle 7 database keeps a separate table of data being modified — a snapshot — with each row identified. Predefined changes trigger a message to the engine to send the information to other databases. Oracle's two-phase commit requires that the sender and receiver agree to exchange data at a specified time.

Which scheme is better often depends less on the technology than on the know-how of the database administrator, McGoveran said. Plus, although users will probably adopt the replication technique of their database vendor, widespread adoption of the concept will not occur with the first release of the technology, he noted.

"You don't want to risk a critical application on first-generation product," he said.

DBMS

- Sybase offers Replication Server, a separate product that works in conjunction with the database engine. It's shipping now for Sun Microsystems, Inc. and IBM RISC System/6000 systems.
- Oracle offers add-on features, such as triggers, snapshots and two-phase commit, that users can buy for the Oracle 7 engine.
- Informix offers several features similar to Oracle and Sybase, such as two-phase commit, as part of its Informix-SE and OnLine databases.
- Ingres plans to take a Sybase-style approach with a separate replication product expected to be announced this summer and to ship before year's end.

Next leverages NextStep with access to high-speed servers

By Jean S. Bozman
SAN FRANCISCO

Next, Inc. intends to capitalize on its object-oriented software strategy with a new product that allows applications running on client machines to "borrow" objects from high-speed network servers.

The product, Portable Distributed Objects (PDO), will work with clients and servers running the NextStep operating system. But it will also shuttle objects between Next clients and Unix servers, said Brett Bachman, director of product marketing at Next.

PDO, announced at the recent Object World show here, was described as a way to allow enterprisewide applications to tap the on-line resources of multiple servers in real time.

PDO is a leading-edge technology that larger vendors are likely to emulate, said Rikki Kirzner, principal analyst at Dataquest, Inc. in San Jose, Calif.

"It once again shows that the innovative thinking and advanced features from Next could push the industry forward," she said. "They're still a leading-edge player, but I think that the technology will be copied in one form or another."

Next Chief Executive Officer Steve Jobs has said Next is working with Hewlett-Packard Co. and Data General Corp. to get NextStep applications to scale up from the desktop to high-speed network servers. PDO-compatible products are expected from HP and Data General by year's end, according to Next.

Next, which is expected to ship PDO by year's end, is not giving out any pricing information until then.

Banyan adds tighter Novell server links

By Michele Doctert
WESTBORO, MASS.

Banyan Systems, Inc. has announced a new version of its network services for NetWare product. It will allow users of Novell, Inc.'s NetWare and Banyan's Vines local-area network operating systems to share file and print services with a single log-in.

The product, called Enterprise NetWork Services (ENS) for NetWare 1.1, provides distributed directory and security services and optional mainframe communications services to NetWare LANs. It is scheduled to ship next month. Prices will start at $3,995 per server.

Although Banyan has aimed ENS primarily at NetWare-only environments, the new Vines/NetWare file and print capability was designed to make ENS attractive to users in mixed environments.

"We use NetWare, but the rest of the state uses Banyan; so we put in an ENS 1.0 server so we could attach files to E-mail messages and send them to Banyan users that way," said David Russo, manager of the PC information center at the Massachusetts Registry of Motor Vehicles in Boston. "With ENS 1.1, we can not only send files directly, but other state agencies can print to our high-speed network printer, generating revenue for our department."

The new release also adds support for Novell's newly released NetWare 4.0 operating system.

IS directors get Notes help from DSSI

By Michael Vizard
WESTLAKE VILLAGE, CALIF.

While Lotus Development Corp.'s Notes empowers end users by allowing them to build their own database applications, managing the proliferation and quality of those applications across an entire organization represents a substantial challenge for information systems departments.

To help solve this problem, Distributed Systems Solutions International (DSSI) has launched a set of utilities designed to allow database managers to perform control, auditing and reporting functions on Notes 3.0 databases.

Scheduled to ship this summer, the DSSI tools consist of Usage/Reporter and Replication/Reporter utilities, which produce reports of Notes database activity, and a Design/Monitor utility that tracks changes made to the design of Notes applications and database servers. The DSSI tools are priced at $995 each.

"Any company that is coming out of Notes 2.0 and moving to Notes 3.0 is looking at re-engineering and managing their Notes applications," noted Mark Fackler, director of professional services at Workgroup Productivity Corp., a Notes reseller in Oak Brook, Ill.

"People have a tendency to do business as usual. But with Version 3.0 of Notes, it's going to be more like being a database administrator," Fackler said.

While Lotus has provided dramatically improved administration tools for configuring individual databases in Notes 3.0, the DSSI tools are intended to give IS directors a global view of all the Notes databases on a network, said Stewart Bloom, DSSI vice president of marketing.

The previous lack of system administration tools has been "an impediment" in the growth of Notes, said Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif. "As Notes moves towards enterprisewide computing, IS departments expect the reliability they got with mainframes. Notes 3.0 fixes a lot of that for Lotus. The tools are radically improved," Chalstrom said.

"Most IS departments don't have control over the vast majority of their Notes databases, so there is an enormous duplication of data," Fackler added.

Close eye

Johnson & Higgins, Inc., a New York-based insurance brokerage firm, is evaluating the Usage/Reporter utility as part of an effort to determine which Notes databases are actually in use.

"We'd like to evaluate how much [each database is] used in order to either overhaul them or trash them," said Ed Catlett, an assistant vice president at Johnson & Higgins.

Because users can build a Notes database, the company has hundreds of them spread throughout its organization, he explained. The company does keep a tight control over which databases can be replicated to other departments, in particular, focusing on how usable the database is, whether it supports standard fields adopted by Johnson & Higgins and whether it will run on a laptop system.

In general, Fackler said, it will be particularly important for IS shops to monitor Notes databases once Lotus delivers a lookup capability for its DataLens drivers in Notes later this year. This capability will allow Notes users to access data stored in both Notes and SQL databases.

"The tools to manage Notes are definitely there, but it's like mining for gold. You have to dig for them," Fackler said.

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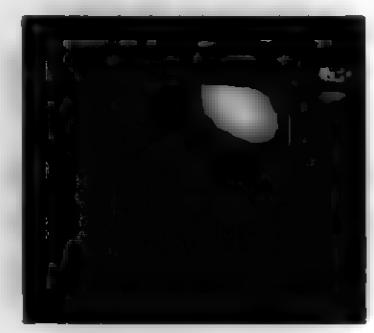

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Unixasaurus stars in Jurassic Park

By Jean S. Bozman
SAN RAFAEL, CALIF.

When Industrial Light & Magic/LucasFilm Ltd. produced the special effects for the movie *Jurassic Park*, it was Unix workstations and object-oriented software programs that helped breathe life into the sharply defined images of long-extinct dinosaurs.

Director Steven Spielberg originally planned to use robotic stand-ins for the dinosaurs of 100 million years ago. But a new generation of Unix hardware and software created convincing computer graphics, such as a herd of bi-ped dinosaurs running over hills past the film's actors. That tipped the balance toward the use of more computer animation and less use of robots, except for extreme close-ups.

Preproduction work on *Jurassic Park*, including prototyping of models, began two years ago. "None of the technology to do the picture was available when we started," said Tom Williams, executive in charge of digital production at Industrial Light & Magic. For example, he said, "We had to extend the boundaries in terms of animation and modeling complexity to get the wrinkles in the skin, the dirt in the skin and the movement of the skin over the bones."

But a team of 14 programmers created new software tools, based on the C++ object-oriented programming language, that supported the new level of digital detail, Williams said. Then, a group of 30 animators applied those software tools to control the animation process.

Industrial Light & Magic used Silicon Graphics, Inc. workstations to make special effects for *The Abyss* and *Jurassic Park*. The firms have worked together since 1987.

Recently, Industrial Light & Magic and Silicon Graphics created a joint venture, called Joint Environment for Digital Imaging, or JEDI, that links more than 70 Silicon Graphics workstations into a high-speed computer network [CW, May 10]. It was used for *Jurassic Park* and will prototype new effects for future films.

In *Jurassic Park*, the Unix machines also had a cameo appearance in the movie, displaying three-dimensional weather maps and color-coded security systems in Jurassic Park's control center.

A new generation of *Unix hardware and software made* Jurassic Park's *dinosaurs more convincing than robots*

> "None of the technology to do the picture was available when we started," said Industrial Light & Magic's Tom Williams. "We had to extend the boundaries."

The computer room on set had an Ethernet network with 17 Silicon Graphics Iris reduced instruction set computing workstations, including 11 Indigo workstations, four Crimson workstations and two 4D/440 graphics workstations.

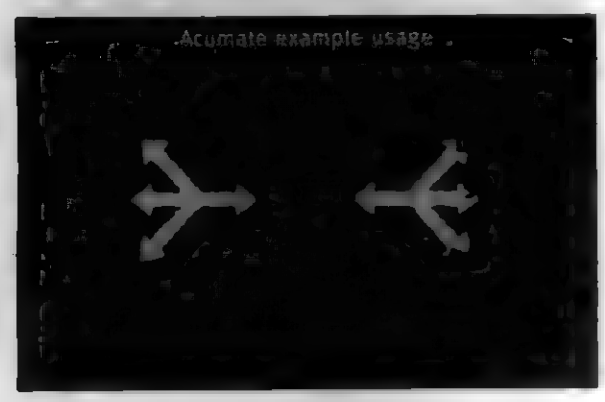
"We made a live network of computers, and we kept them offstage," said Michael Backes, the film's display graphics supervisor. The machines in that off-screen computer room were lent to Industrial Light & Magic from July to October 1992, Silicon Graphics said.

Kenan makes Windows push

By Michael Vizard
CAMBRIDGE, MASS.

As part of an overall effort to re-engineer its executive information and decision support software for emerging client/server environments, Kenan Technologies Corp. has unveiled a Windows version of its Acumate decision support software.

Currently available on a range of mainframe and minicomputer platforms, the Windows version of Acumate marks the company's first foray into a desktop market other than OS/2.



Acumate for Windows includes a multidimensional database packaged with an executive information system and a library of standard reports.

Data used to populate the Acumate server can be drawn from IBM's DB2, Informix Software, Inc.'s Informix, The ASK Group, Inc.'s Ingres Products Division's Ingres, Sybase, Inc.'s SQL Server, Oracle Corp.'s Oracle or Digital Equipment Corp.'s Rdb databases and then accessed using a predefined set of end-user queries.

For example, Zeneca Pharmaceuticals, a division of Zeneca, Inc. in Wilmington, Del., gives middle managers PCs and X terminals to run queries against data drawn from an Ingres database running on a VAX, without giving them the ability to change data stored in production databases.

To accomplish this, Zeneca uses a variety of VT emulation software packages on the PCs.

"The emulation software runs under Windows, but it's not a true window. You can't cut and paste across applications," said Don Hobson, technical systems manager at Zeneca Pharmaceuticals, who said the Windows version of Acumate will allow him to do that.

Kenan is also working on Release 13 of Acumate for high-end servers, which last week went into beta testing. With Release 13, information systems managers will no longer have to proactively manage Acumate databases in addition to their existing databases. Instead, Acumate will support both static and dynamic SQL links to the database, said Brian McGill, development manager at Kenan.

"You no longer have to worry about administering the Acumate database. You'll be able to set up predefined update periods where the Acumate database is populated via SQL databases using any set of predefined multidimensional formats," McGill said.

Release 13 is due this fall, McGill said.

"We've got one database that has seven dimensions to it and one database with 30 million rows. With Release 13 of Acumate, we expect to be able to use the Windows implementation as a front end to the VAX systems," Hobson said.

Acumate for Windows prices start at $4,500.

Local-area networks

Intel announces eight products for NetWare

By Michele Doetert

Intel Corp. is evidently serious about selling more than chips. Last week, the company's networking division announced eight new local-area network storage, printing, virus protection and management products, all available now, for networks running Novell, Inc.'s NetWare v3.11 operating system.

In the network management arena, Intel's new LANDesk Manager software allows administrators to manage and take inventory of desktop hardware, configuration and software.

> Intel's new LANDesk Manager software allows administrators to manage desktop hardware, configuration and software

Administrators can view or remotely control client desktops. LAN managers can also use the product to monitor application use as well as network traffic.

Also on tap

Intel also announced two optional LANDesk add-ons: Virus Protect for scheduled or on-demand scanning of any system on the network, and SNMP Gateway, which will work with a variety of network management consoles.

Although LANDesk Manager allows easy access to Novell's NetWare administration utilities, it does not yet report into Novell's Network Management System (NMS).

"We certainly intend to work with NMS, but we're waiting for Novell to add a database to it where we can store the information LANDesk gathers," said Chris Thomas, manager of technical alliances at Intel's Networking Division.

Choices abound

The company also announced two new LAN software packages: LANspoolExpress Print Accelerator was designed to boost printing performance on either background or dedicated workstations. And a new fax package, the NET SatisFAXtion 2.0, provides direct inward dialing support by integrating user phone numbers with their network addresses, thus automatically routing faxes to the intended recipient.

Intel also expanded its line of plug-and-play backup servers, which includes a processor, software and a tape drive.

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> *1-2-3 leapfrogs Excel and Quattro...*
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IT'S MORE POWERFUL BUT VERY SIMPLE.

While adding dozens of major new features, hundreds of macros and hundreds of tools and @ functions, Lotus has actually simplified the way you work in a spreadsheet.

For example, Release 4 features an @ function pull-down menu to help you build spreadsheets faster. Cell copying is now a simple drag-and-drop operation, with meaningful visual feedback. And changing text and font attributes is done in one dialog box. (Excel often requires three.)

So 1-2-3® is not only a lot friendlier and easier to use than any other spreadsheet, it's a significant advance over Microsoft® Excel in usability.

THE FIRST CONTEXT-SENSITIVE USER INTERFACE.

> *The SmartIcons in 1-2-3 for Windows are smarter, and Lotus' approach to swapping different tool-bars in and out beats Excel's and Quattro Pro's.*
> *–PC Computing 6/93*

Release 4 actually anticipates what tools and functions you'll need. Depending on what you're doing, 1-2-3 presents only the menu choices and **SmartIcon**™ palettes appropriate to the operation at hand.

This means you won't spend time clicking through menus looking for the features.

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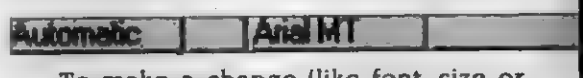

To make a change (like font, size or decimal points) you just click on the appropriate section of the status bar. Then scroll up to your chosen attribute and click again.

And unlike Excel, 1-2-3 R 4 includes **In-Cell™ Editing**, so you can enter and edit any information right in the cell.

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Anyone who works on multiple worksheets will appreciate the new 1-2-3 **Worksheet Tabs** which can be labeled with real words. So you can go directly to any sheet simply by clicking on the appropriate tab.

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DATABASE FUNCTIONS MADE EASY.

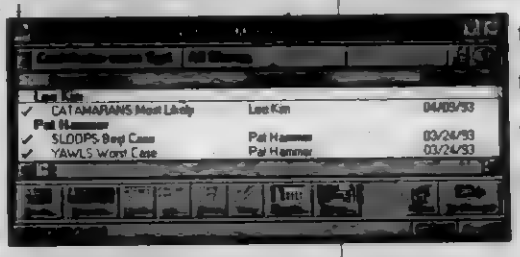
The 1-2-3 database now has a new, completely graphical interface that makes using it easier than ever. Plus 1-2-3 provides a range of built-in tools that are powerful without being perplexing.

> *1-2-3 for Windows has always had more powerful database features than Excel or Quattro Pro, and now these features are also easier to use.*
> *–BYTE 6/93*

For example, to modify or create a query, you don't generate criteria and output ranges with cryptic commands. Just bring up the Query Dialog Box and select the fields and records by name. Changing your query is as simple as drag-and-drop.

THE FIRST SPREADSHEET FOR WORKGROUPS.

Have you ever forgotten why you used a particular number? Or wanted to track more than one value in a cell or range? Suppose you've sent a spreadsheet to a co-worker who develops a whole new version and sends it back? How do you integrate it into your work?



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> *It (Version Manager) also makes Microsoft Corp.'s Scenario Manager in Excel 4.0 look like a toy by comparison.*
> *–PC Week 5/3*

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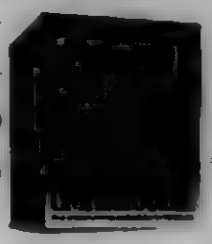

Lotus 1-2-3 Release 4
SPREADSHEET FOR WINDOWS

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[redacted]

LAN software

Object Design, Inc. has introduced the Object Design NetWare Loadable Module (NLM) Server, an object-oriented database for Novell, Inc. NetWare networks.

According to the company, the product was designed to simplify the development of new classes of distributed applications. NetWare users can develop applications that distribute and manage data, providing access to advanced services for imaging, multimedia, document management and groupware.

The ObjectStore NLM Server is accessible through an assortment of networking protocols, including native IPX/SPX and Transmission Control Protocol/Internet Protocol.

A developer license costs $7,500, and an end-user runtime license costs $2,250.

▶*Object Design*
One New England Executive Park
Burlington, Mass. 01803
(617) 270-9797

The Enterprise Systems Division of Apple Computer, Inc. has announced full support of Transmission Control Protocol/Internet Protocol (TCP/IP) for its Data Access Language (DAL) server software products.

According to the company, TCP/IP users can now access data on any Apple DAL-supported server from a DOS/Windows client or a Macintosh.

The DAL Server for MVS TCP/IP was also announced. Through TCP/IP, this software product provides Windows and Macintosh PCs with DAL client software access to IBM's DB2 relational database manager.

Two existing products, the DAL Server for Application System/400 and the DAL server for VAX/VMS, also received extended TCP/IP support.

Prices for the DAL Server for MVS TCP/IP range from $35,000 to $50,000, $6,000 to $12,000 for the DAL Server for VAX/VMS and $4,250 to $20,000 for the DAL Server for AS/400.

▶*Apple Computer*
20525 Mariani Ave.
Cupertino, Calif. 95014
(408) 996-1010

Cheyenne Software, Inc. has released Arcserve 5.0 for NetWare-Windows Edition.

Arcserve 5.0 is client/server backup and recovery software for single-server or large multiserver Novell, Inc. NetWare enterprises.

Enhancements include a "point-and-click" Windows interface plus an improved one-step backup command called Quick Start.

Tape cascading, parallel streaming and stacker and changer support are other features incorporated into the product.

Arcserve also provides an on-line database backup option, heterogeneous environment support, storage management services, tape rotation management and a file-tracking system, according to the company.

Pricing begins at $395.

▶*Cheyenne Software*
3 Expressway Plaza
Roslyn Heights, N.Y. 11577
(516) 484-5110

Palomar Software, Inc. has announced Version 1.1 of its On The Road software.

According to the company, the software was designed to extend seamless Macintosh PowerBook connectivity to Novell, Inc. networks.

The product provides deferred printing and automates volume remounting and print spooler selection for PowerBook users with Novell's NetWare 4.0 or v3.11 servers equipped with NetWare for Macintosh, the company said.

Version 1.1 supports NetWare 4.0, Apple Computer, Inc.'s Express Modem, the PowerBook 165C and Adobe Systems, Inc.'s PostScript Level 2 printer driver.

On The Road Version 1.1 costs $99.

▶*Palomar Software*
Suite D
2964 Oceanside Blvd.
Oceanside, Calif. 92054
(619) 721-7000

Workgroup software applications

NCR Corp. has introduced ProcessIt, a set of process management software.

ProcessIt was created to help users design, implement, execute and manage mission-critical business processes, the firm reported. To manage work flow throughout the enterprise, ProcessIt provides a suite of Windows-based tools.

An advanced database-oriented workflow engine is employed to automatically route work based on a company's policies and procedures, and ProcessIt uses graphical user interface-based tools to implement, measure and alter processes without affecting work in progress or existing applications, the company said.

A typical 30-user configuration of ProcessIt costs about $1,245 per user.

▶*NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Storage

Plasmon Data Systems has introduced Version 2.01 of the ReflectionManager, an optical-disc jukebox integration kit.

Improved network performance and compatibility with Windows 3.1 have been added to this version.

According to the company, ReflectionManager now offers substantially higher data-transfer rates and access times because of the implementation of a data caching system. Up to three single-drive jukeboxes or one single- and one double-drive jukeboxes can be integrated.

ReflectionManager prices start at $2,250.

▶*Plasmon Data Systems*
1654 Centre Point Drive
Milpitas, Calif. 95035
(408) 956-9400

MicroNet Technology has introduced the Micro/Raven 800 high-speed, 16-bit, external disk array systems for the Quadra 800.

According to the company, the disk array systems deliver up to 9.2M byte/sec. sustained data-transfer rates with average access times as fast as 4 msec. One drive of the product connects to the native Small Computer Systems Interface port of the Quadra 800, while the other drive is attached to the MicroNet NuPort III SCSI-2 host adapter.

A true parallel 16-bit data path is then created.

The systems were designed for disk-intensive applications and can be used for other applications, including file servers, full-rate digital video and computer-aided design and manufacturing.

Prices range from $4,090 to $14,490.

▶*MicroNet Technology*
20 Mason
Irvine, Calif. 92718
(714) 837-6033

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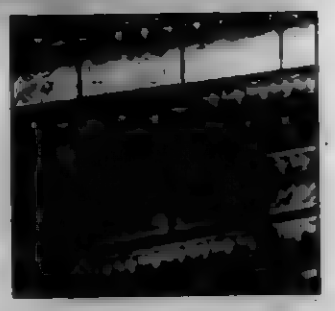

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Internet commercial uses blossom

Videoconferencing makes use of existing infrastructure

By Joanie M. Wexler

Projects afoot to pump videoconferences across the far-reaching Internet have already begun boosting user participation in standards-setting activities, unleashing educational opportunities and fueling the "virtual" corporation.

The budding services, which deliver one- or two-way videoconferences to desktop computers, include the Internet Engineering Task Force's (IETF) Multicast Backbone (nicknamed "Mbone") and the CU-SeeMe project from Cornell University in Ithaca, N.Y.

Mbone and CU-SeeMe leverage the Internet's expansive infrastructure so millions of users can eventually participate in meetings, lectures and other activities previously off-limits because of cost and time constraints. The two services deliver video through a server at the user's site or at the regional network management center connecting the site to the Internet.

Mbone, which links to Unix workstations, is the "C-SPAN of the Internet," said David P. Grubb, manager of computing standards and technology assessment at the University of California Lawrence Livermore National Laboratory in Livermore, Calif. Grubb is "attending" IETF standards committee meetings from his desktop computer via Mbone.

Having "real users" looking over standards committee members' shoulders and detecting, for example, that the committee is putting too many functions or restrictions in a standard could accelerate getting useful products to market, observed Dan Lynch, chairman of Interop Co., a Mountain View, Calif., firm focused on heterogeneous networking.

At-a-distance participants can send electronic mail to the meeting, and committee members can take comments on-line.

Common touch

In contrast to Mbone, CU-SeeMe is more of an "everyman" service, delivering black-and-white video to Macintosh computers equipped with CU-SeeMe software. The service is running, for example, in the National Science Foundation's Global Schoolhouse Project, an endeavor to allow junior high students worldwide to communicate with each other, teachers, scientists and others.

Global Schoolhouse students in California, Tennessee, Virginia and England are already communicating.

CU-SeeMe is not based on multicast technology — a factor impeding Mbone development.

Multicast schemes allow conservation of wide-area network traffic: A sending site can

Videoconferencing, *page 73*

Next step: Writing an Internet policy

As Internet use shifts beyond techies and engineers and into the corporate mainstream, information systems managers say they must create a corporatewide Internet policy to address such issues as security, privacy, directory services and pricing questions.

The first step is to decide what Internet services users need to access and limit their access to those services, Joseph Jesson, a senior analyst at Chevron Corp., said at a recent E-mail conference.

Internet options include E-mail, binary file transfer, mailing lists, "chat" sessions, news services and Telnet.

Other issues and recommendations include the following:

- **Security:** Because universities have access to the Internet, the probability of students finding an application "hole" is high. To combat this, Chevron created a "fire wall" consisting of filters and limits to Internet access. Users should also weigh the risks of certain Internet applications, such as E-mail and file transfer, against the risk of having the information in those applications exposed, Jesson said.
- **Privacy:** Good encryption can keep messages and data private, but the government wants to keep open a "trapdoor" that could weaken encryption methods.
- **Reliability:** "99% reliability is fine unless it's your message that's lost," Jesson said. One option is to train people to use the Internet for informal mail and use a private, secured network for crucial traffic.
- **Storage:** Because end users have access to so much more information, such as news, data storage costs inevitably rise, said Eric Arnum, editor of the "Electronic Mail & Micro Systems" newsletter.
- **Costs:** Commercial connections vary from around $30 per month for a single-user dial-in connection to $65,000 per year for a corporate T1 connection, so managers must examine their needs and buy accordingly.
- **Cultural issues:** Internet bulletin boards are largely unmonitored, and company employees have been known to download and upload compromising and embarrassing material such as pornography. "What if Jesse Helms were going to get hold of something like this and says your company publishes porn?" Arnum asked.
- **Service:** Managers can expect a huge increase in help desk calls as mainstream corporate users, unfamiliar with Internet addressing and services, call for help, said Rob Mainor, a general manager at CompuServe, Inc. — *Lynda Radosevich*

Service could offer small businesses access to 11,000 networks worldwide

By Gary H. Anthes
WASHINGTON, D.C.

Sprint Corp. and Microelectronics and Computer Technology Corp. (MCC) have announced a joint service for electronic commerce on the Internet.

The service consists of two layers: data transport via Sprint's Transmission Control Protocol/Internet Protocol SprintLink network service and common user services such as electronic mail, security, directory services and remittance services via MCC's Enterprise Integration Network (EINet). Users will add a third layer consisting of industry-specific applications such as electronic data interchange for retailing.

Sprint and MCC said the combined network service offers the connectivity and tools necessary to enable access to any of 11,000 networks on the global Internet to support business processes such as manufacturing and concurrent engineering. For example, a purchasing agent might use the service to look up parts in an electronic catalog of suppliers worldwide, view images of items for purchase and order and pay for them on-line.

"This ... agreement with Sprint provides a broad distribution channel for bringing EINet to small and medium-size companies, enabling them to partner more effectively for market development," said Craig Fields, chairman and chief executive officer of MCC, the Austin, Texas-based consortium for research and development in information technology.

At a congressional hearing last year on the proposed federal National Information Infrastructure, Fields pointed out that a number of large companies — The Boeing Co., General Motors Corp., Kmart Corp., Wal-Mart Stores, Inc., Caterpillar, Inc. and Ford Motor Co. — lowered costs and improved quality by custom-building their own data superhighways linking their operations with suppliers and customers.

By providing a standard for interconnection between companies, the EINet and SprintLink combination offers the same benefits to smaller companies at a far lower cost, MCC said last week.

Electric Power Research Institute (EPRI), a consortium of 700 electric power utilities, is converting its dial-up mainframe information service to a distributed system available to members over

Service, *page 73*

European flavor

If Microsoft Corp.'s experience is a good yardstick, corporate America is embracing the Internet while corporate Europe is embracing X.400 for external messaging connections. According to Tom Austin, general manager of the workgroup division at Microsoft, sales of gateways between Microsoft Mail and the Internet's Simple Mail Transport Protocol are "exploding" in businesses in the U.S. In Europe, the combination is all in X.400 gateway sales.

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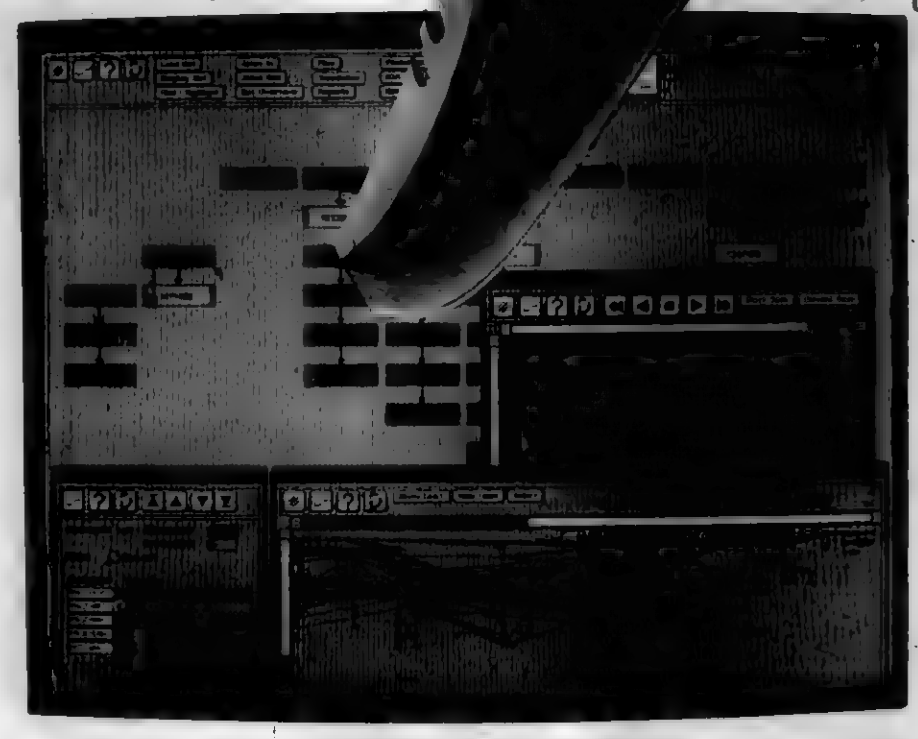

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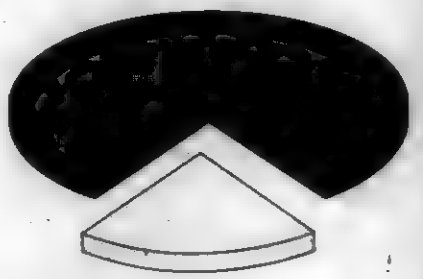

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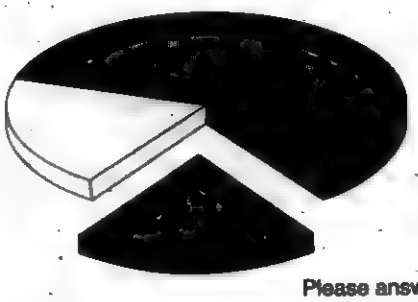

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Auto repair needs EDI standards fix

By Joanie M. Wexler

The birth of auto insurance claims applications that give industry players access to a common, detailed vehicle database has generated enthusiasm for further electronic ties within the collision industry.

Sophisticated technology has emerged to ease estimating disagreements among repair shops and auto insurance carriers, which have traditionally argued for days over costs. This means customers are seeing improved turnaround time on their car repairs [CW, June 21].

Desktop delirium

- Repair shops need standards among insurance applications to get the flexibility they had with pencil and paper

However, incongruous electronic transactions have frustrated some service companies enough to form a standards consortium called the Collisions Industry Electronic Data Interchange Standards (CIEDIS) group, said Erick Bickett, CIEDIS chairman and director of information technology at Caliber Collision Centers, a nationwide repair shop franchise based in Fountain Valley, Calif.

A key goal is to preclude the need for separate computers running estimating applications designed for different platforms from multiple vendors. These vendors include Automatic Data Processing, Inc.'s (ADP) Automotive Claims Services division in San Ramon, Calif., Certified Collateral Corp. in Chicago and Mitchell International in San Diego.

ADP's system graphically depicts a vehicle's entire anatomy; Mitchell's allows adjusters to use a bar-code reader to scan parts numbers into a database, and Certified Collateral's system is text-oriented.

Aside from needing separate computers for these applications, repair shops must run an-

other set of computers for each vendor's proprietary electronic data interchange (EDI) program and still another set for imaging applications, Bickett said. "This could feasibly total 14 computers," he noted. "We want to communicate using one machine."

"ADP's application has worked well for us for estimating," said Joe Pych, information systems team leader at The Travelers Corp. in Hartford, Conn.

However, Mitchell has come up with a total loss evaluation application, called Vista, that Travelers would like to use, he said.

"We'd like them to talk to each other. Otherwise, we'll have to rekey all our administrative data from the ADP estimating application into Vista," Mitchell said.

Setting goals

To these ends, four committees under CIEDIS' auspices have been charged with the following tasks:

- Determine business requirements and related communications needs among auto claims business partners.
- Foster standards among now disparate auto repair EDI document formats and bring proposals to the ANSI X12 EDI standards committee.
- Fuel interoperability among different auto repair estimating, management and accounting applications.
- Encourage vendors to create multiple-platform imaging systems. For example, "Insurance companies want to bring images to the mainframe, and nobody has an imaging package for the mainframe yet," Bickett explained.

The bottom line with CIEDIS: To gain the flexibility users had with manual processes. While technology has put important data at users' fingertips, what they can do with it is limited by who interoperates with what — unlike in the days of paperwork, Bickett said.

More value

The Insurance Value Added Network Service (IVANS), a nonprofit communications network serving member companies in the insurance industry, recently signed a $6 billion contract with MCI Communications Corp. — MCI's largest to date. Video services are included, allowing a claims adjuster to remotely view and evaluate still images for damage extent, said Fenwick Lewis, IVANS vice president.

Electronic standards in the insurance industry would allow the various players to re-engineer their business relationships and hop on the "virtual corporation" bandwagon, said Paul Ramsey, The Travelers' PC claims director.

Service

CONTINUED FROM PAGE 71

MCC's EINet. Doug Moench, EPRI's project lead network engineer, said many utilities will connect their local-area networks via SprintLink.

That will allow each utility to interactively access EPRI's news services, bulletin boards, resource catalogs and documents as well as EINet directory services and many other Internet services, Moench said.

He said the utilities are also likely to use the setup for business transactions such as locating and ordering parts from a database of utility industry suppliers.

EPRI is now integrating its member services with MCC's EINet directory and security services — which Moench said were especially robust and sophisticated — plus information products from other vendors into a seamless suite of services for utilities.

"EINet already had some products in place that integrated various technologies [such as X.500 directory services] and that made it very easy to integrate our core services," Moench said.

Videoconferencing

CONTINUED FROM PAGE 71

ship just one video packet to a location wishing to download the videoconference to multiple desktops. The receiving router replicates the packet and redistributes it to the users. However, with the exception of devices from Proteon, Inc. in Westboro, Mass., routers today do not include multicast software.

Market leader Cisco Systems, Inc., upon whose products many regional Internet segments are based, expects to deliver the capability in 12 to 18 months, said Heidi Iacurto, product manager.

Meanwhile, simulating what is becoming known as the "virtual corporation," a new packet video consortium of 20 companies including Compression Labs, Inc., IBM and Sun Microsystems, Inc. is using Internet videoconferences to actually develop Internet videoconferencing technology, said John E. Drescher, manager of program development at MCNC Center for Communications in Research Triangle Park, N.C., which focuses on advanced networking research.

The consortium's aim is to put together a guideline of standard equipment and software for using Internet videoconferencing. To that end, representatives from the disparate companies are meeting via Mbone. However, efforts are being slowed by scarce multicast and Internet Protocol traffic prioritization schemes, Drescher said.

Apple adds E-mail server to open systems messaging

By James Daly

CUPERTINO, CALIF.

With the words "open systems" on the lips of many client/server system designers, Apple Computer, Inc. continued its move into this potentially lucrative environment last week with the introduction of two new versions of its MacX.400 electronic-mail server.

The MacX.400 Version 1.1 was designed for enterprise networks, while the MacX.400 SD (Single Domain) is optimized for small organizations and workgroups that need to communicate with only one X.400 server. Both will be available later this summer, Apple officials said.

Both will provide users with the ability to send messages from Macintoshes to other platforms over the Internet and to recipients on other platforms connected to X.400 networks, said Apple senior director John Nauman.

Major pipeline

E-mail has grown in importance in recent years largely because of its close ties with such things as databases and electronic data interchange. Some analysts have even predicted that messaging with E-mail will become the major communications pipeline for desktop applications in the 1990s.

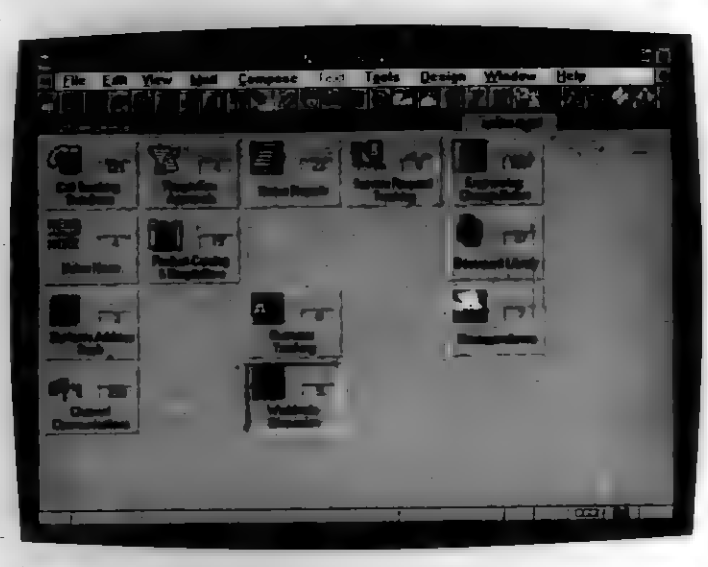
Apple's new E-mail server products also include support for Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI). For instance, customers can run X.400 messaging applications over the Internet using their existing TCP/IP infrastructure.

Open transport

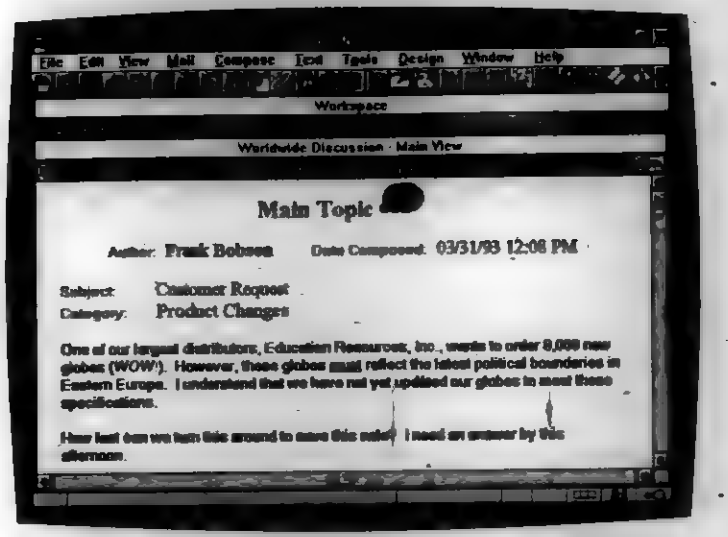
Apple's OSI transport, OSI Connection for Macintosh Version 1.1, will include support for the ISO Transport protocol that provides end-to-end connection in multivendor environments. It will be included in MacX.400 Version 1.1 and will also be available as a stand-alone product.

Nauman said Apple will provide additional products for multivendor system-wide messaging in the future.

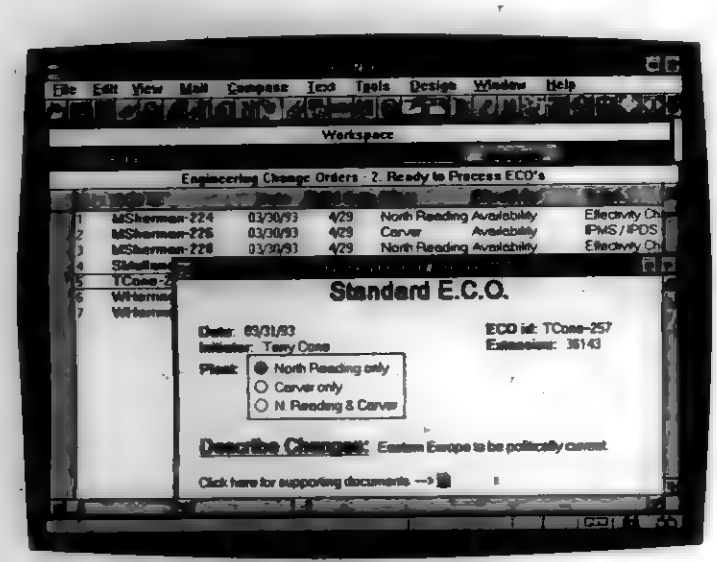
The MacX.400 SD has a suggested retail price of $2,950, while the MacX.400 server Version 1.1 is priced at $4,950. The stand-alone version of the OSI connection package costs $199.

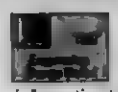


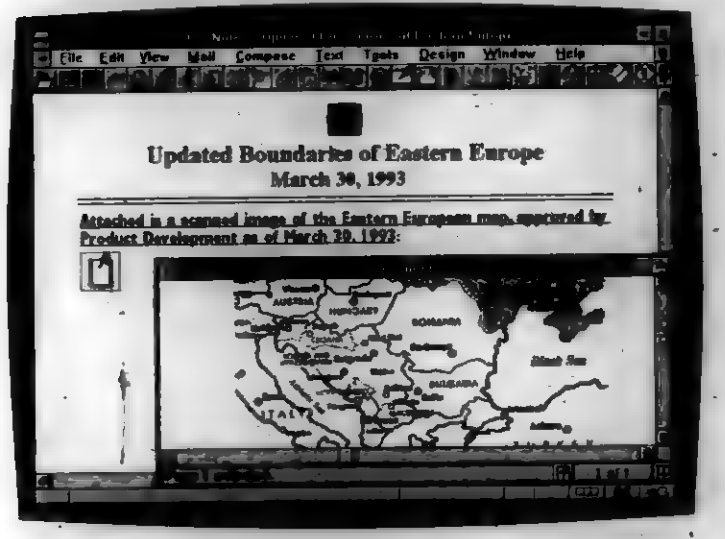
1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems worldwide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.



5.  Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.



6. After lunch he opens a document from Ellen in product development who has responded with the necessary changes and scheduling information. The new art was scanned directly through Lotus Notes® Document Imaging from the art department. James approves the art for manufacturing.

How Lotus Notes Relea

Thousands of companies already know how Lotus Notes® helps them respond more quickly and effectively to the demands of everyday business. Now Release 3 extends that power to new dimensions.

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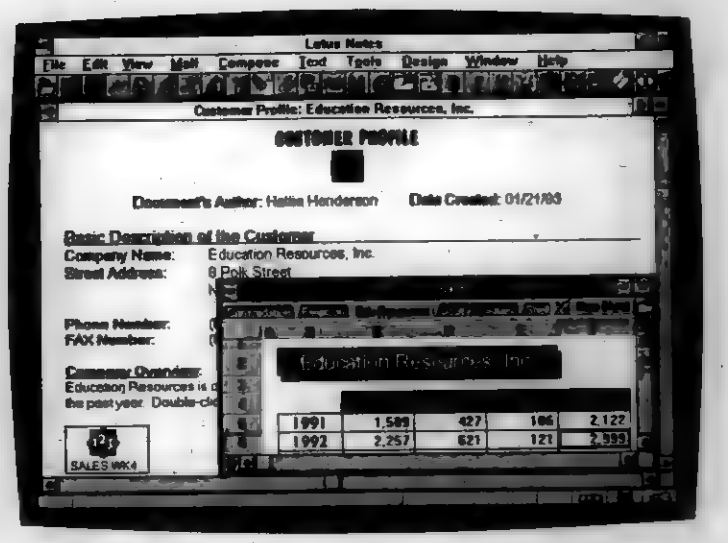
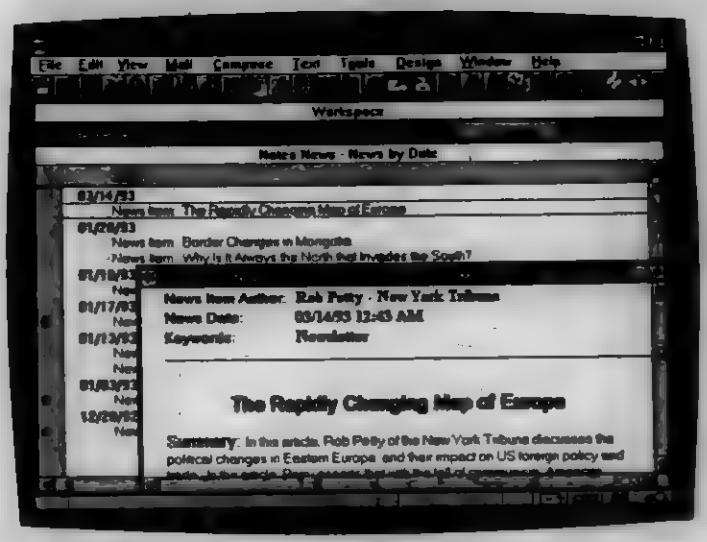
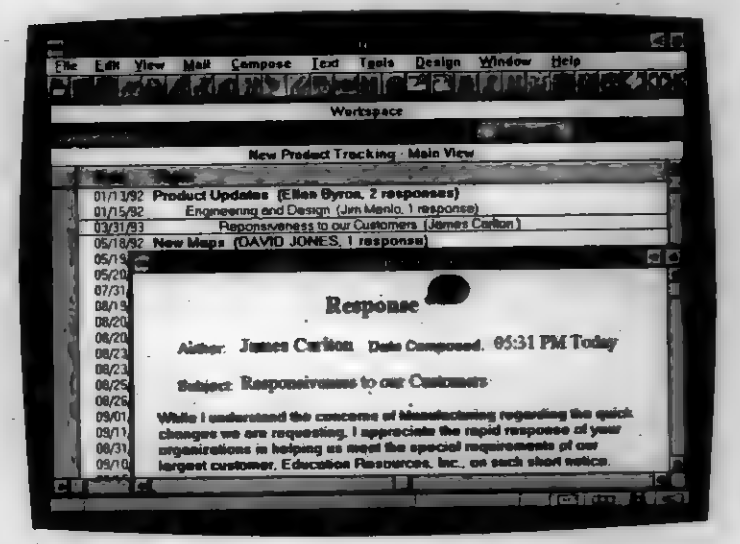


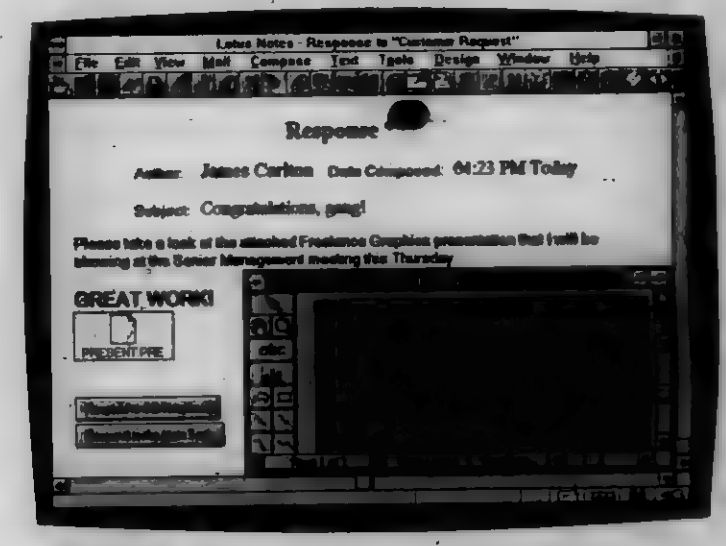
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database so everyone can see how the team rearranged the world to save a big account.

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E-mail products, services multiply

Prospects for large-scale and global electronic-mail systems improved at the recent **Electronic Mail Association** conference in Atlanta as vendors demonstrated and rolled out products based on international standards for interconnecting mail networks.

The benefits of standards compliance, including interoperability and market competition, may be apparent, but at least one conference speaker voiced some reservations. In a keynote speech, Richard Miller, vice president at **General Magic**, a software developer in Mountain View, Calif., said that today's technology standards are "well meant" but "not quite there." He added that standards entrenchment could stymie creative growth.

notebook

To make his point that internationally approved standards are not always where the action is, Miller noted that the White House, which recently published an Internet address, is not in compliance with government requirements to use Open Systems Interconnect protocols, including X.400 messaging.

Meanwhile, vendors pushed ahead with partnerships and products meant to more universally integrate E-mail.

Lotus said that by the end of the year, users of the remote version of CC:Mail will be able to tap into MCI Global Messaging Services. MCI will operate a CC:Mail server on site that connects to MCI networks. Lotus and MCI would not reveal pricing plans.

Lotus also announced arrangements with 10 public messaging companies, including **Sprint** and European **Postal Telephone and Telegraph** authorities, to allow CC:Mail users to message one another directly across the public networks.

AT&T, MCI, Bellcore and other telecomm providers demonstrated an X.500 directory pilot project for looking up names, phone numbers and E-mail addresses by E-mail across their various services. To provide software interfaces for the demonstrations, however, the companies had to borrow applications built by academicians and available on the Internet. An AT&T employee said users should expect to be able to use X.500 services by around 1996.

Separately, MCI said it will begin commercially supporting the 1988 version of the X.400 protocol in December. The new services relay all X.400 message types, including Electronic Data Interchange messages conforming to the X.435 standard. MCI currently supports the 1984 X.400 standard and said that 1984 and 1988 versions will appear as a single domain to outside users.

Los Angeles-based Isocor introduced server software for networks of DOS-based PCs. Isocor said the software, which is based on the X.400 messaging protocol, differs from other X.400 products because it does not require a Unix or high-end PC server to run the server software.

OSIware said its Messenger 400 messaging software, which is based on the 1988 X.400 standard, will be available in August for the IBM RISC System/6000 AIX operating system. The software currently runs on many other platforms.

The **Isode Consortium**, a group of 60 vendors and end users that promotes product interoperability, released source code for the X.500 directory service and X.400 message handling services. The consortium provides members with source licenses that can be used as delivered or as the basis for products or services.

Worldtalk said it will use the X.500 protocol in its directory synchronization software and that its X.400 messaging "backbone" software now works with Lotus' CC:Mail and Microsoft's Mail client software. — *Lynda Radosevich*

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[redacted]

Network management

Compu-Design Group, Inc. has announced LANutil Version 1.3, an Open VMS-based management and support utility package for PCs.

Support of multiple stacks for Digital Equipment Corp.'s Pathworks, Microsoft Corp.'s Windows for Workgroups, Novell, Inc.'s NetWare and OS/2 servers is provided. According to the company, LANutil offers a set of high-level utilities that operate networkwide and reference a single PC or a group of PCs.

The product can be run from any PC, VMS terminal or batch queue, and with this version, PC text files can be edited from a VAX.

A 10-PC license for LANutil 1.3 costs $150.

▶ *Compu-Design*
2nd Floor
217 West Central St.
Natick, Mass. 01760
(508) 655-1177

WAN software

BT North America, Inc. has introduced network security products and services for its Global Data Network to address the $3 billion to $5 billion annual loss in the telecommunications industry due to security breaches. The firm's Security Products Portfolio comprises four network security components: data encryption, user identification and authentication, specialized consulting services and customized security reports.

Prices vary depending on the product and service. Security Dynamics Secure ID offers a three-year contract for 1,000 to 1,500 users for approximately $7 per user per month. TCC Data Encryption costs approximately $490 to $470 per box per month.

▶ *BT North America*
2560 North First St.
San Jose, Calif. 95161
(408) 922-0250

Gateways, bridges, routers

Novell, Inc. has introduced its NetWare Multiprotocol Router (MPR) 2.1.

This version adds source-route bridging of IBM's Systems Network Architecture and NetBIOS protocols between Token Rings. According to the company, users can design more efficient, cost-effective internetworks using NetWare MPR and a single PC to perform source route bridging, routing and multiport wide-area connectivity.

The NetWare Multiprotocol Plus 2.1 was also announced. This product includes the same features as NetWare MPR 2.1 and offers the additional capability of wide-area network connectivity.

The NetWare Multiprotocol Router 2.1 costs $995, and the NetWare Multiprotocol Plus 2.1 costs $1,495.

▶ *Novell*
122 E. 1700 South
Provo, Utah 84606
(801) 429-7000

Madge Networks, Inc. has introduced Smart 16/4 Bridgenodes, a line of adapter cards designed for high-performance source-route bridging and routing with Novell, Inc.'s NetWare Multiprotocol Router (MPR) 2.1.

A software-based bridge/router solution can be implemented using MPR and Smart 16/4 Bridgenodes, which have a source-code routing Application Specific Integrated Circuit chip that supports NetWare MPR's high-speed source-routing function.

Pricing for the Smart 16/4 Bridgenodes begins at $1,045.

▶ *Madge Networks*
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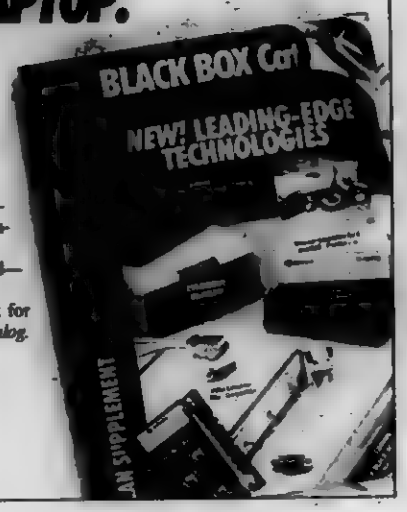
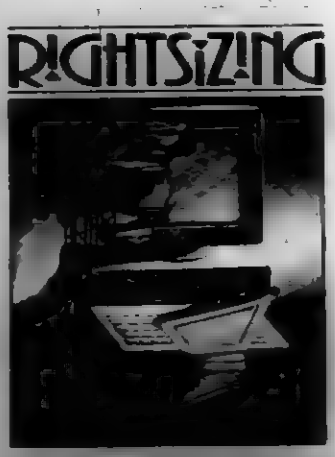


Rightsizing

Intelligent Electronics has created a new magazine called ***Rightsizing*** to help you explore the biggest computing trend of the decade! In ***Rightsizing***, you'll learn why so many companies are moving into distributed computing environments. You'll also read about some of the hottest computer products on the market and how they figure into the rightsizing equation. Order your free copy of Rightsizing today by calling 1-800-423-1715



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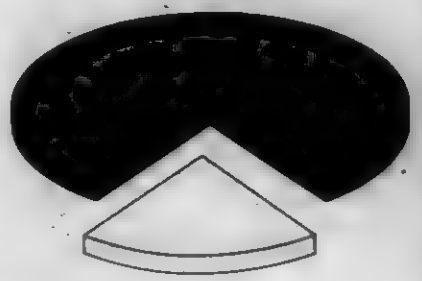

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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
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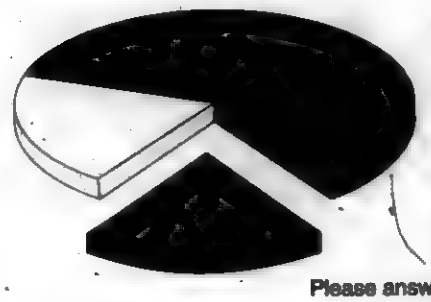

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Worldspan Travel's plan for single system takes flight

By Rosemary Cafasso
ATLANTA

Worldspan Travel Information Services shifted into high gear with its information systems overhaul earlier this month as it signed a $100 million deal with IBM for hardware, software and services.

Worldspan, which services about 11,600 travel agents worldwide and competes with such industry giants as AMR Corp.'s Sabre, plans to complete a new mainframe-based system later this year and be fully operational with it in 1994, according to George Balog, senior vice president of operations and technology.

Worldspan's George Balog: *'Change is always traumatic'*

The company, formed in 1990, is currently owned by Delta Airlines, Northwest Airlines, Trans World Airlines (TWA) and Abacus Distribution Systems Pte Ltd. in Singapore.

Since its launch, Worldspan has been working toward consolidating its travel-related services onto one system. It had been leasing computer services from its owners and providing travel information to two distinct customer bases. One customer set used the Pars reservation system, which belonged to Northwest and TWA, and the other used the Delta Datas II service.

As a result, Worldspan often did twice the work it needed to do. For instance, if airfares changed, Worldspan needed to adjust each system separately.

Today, Worldspan is getting closer to its goal of one system. Earlier this year, it purchased the Pars Service Partnership — the data processing and network communications operation — from Northwest and TWA for $25 million. It will use that system as the foundation for its new operation and include some functionality from the Delta Datas II environment.

The IBM deal includes Enterprise System/9000 mainframes, software, storage devices, fiber-optic technology and service. IBM will work with Worldspan to develop the new core system, which will continue to be based on the IBM Transaction Processing Facility, the 26-year-old operating environment used by the airline industry.

While Worldspan considered newer technologies, including client/server, it determined that newer platforms could not provide the large-scale database management and high transaction throughput the company needs.

The Worldspan system handles up to 1,000 transactions per second on average and up to "several thousand per second" during peak vacation and travel periods, Balog said.

"I think this is really a legacy issue," said Brad Power, a consultant and vice

Worldspan Travel, *page 84*

HP fills Unix gap

Midrange systems more affordable but slower

By Mark Halper
PALO ALTO, CALIF.

■ Since introducing the big rig of its multiuser line more than a year ago, Hewlett-Packard Co. has discovered that some users want only minivans and are unwilling to pay a half-million dollars or so for heavy equipment.

So today, HP adds six models to its Unix line of minicomputers to fill a price/performance gap between its top-of-the-line Unix Corporate Business Servers and the remainder of the HP 9000 Series 800 Unix family.

At the same time, HP will cut prices between 10% and 30% on all entry- and midrange-level Unix minicomputers.

Base prices for the six new models range from $50,000 to $129,500 compared with a range of $335,000 to $650,000 on the Corporate Business Servers, which were introduced in May 1992 as the centerpiece of HP's mainframe alternative program.

And while the new models do not approach the performance of their more expensive brethren, users said the more appealing price tags could lead them to make upgrades they have been putting off.

At Oregon Steel Mills in Portland, Ore., for instance, system engineer Rick Kay said his company has been pushing performance limits on its HP Unix equipment for some time but has found the price tags of the Corporate Business Servers to be prohibitive.

"Now we may be able to go with one of these," he said, referring to the new models.

Another HP user, who asked not to be identified, said the Corporate Business Servers are too expensive and that HP was now offering a more reasonably priced upgrade path.

HP claims its Corporate Business Systems line — which includes the Unix Corporate Business Servers as well as versions based on HP's proprietary MPE/IX operating system with Unix hooks — has been successful.

The company said it took orders for

Unix gap, *page 86*

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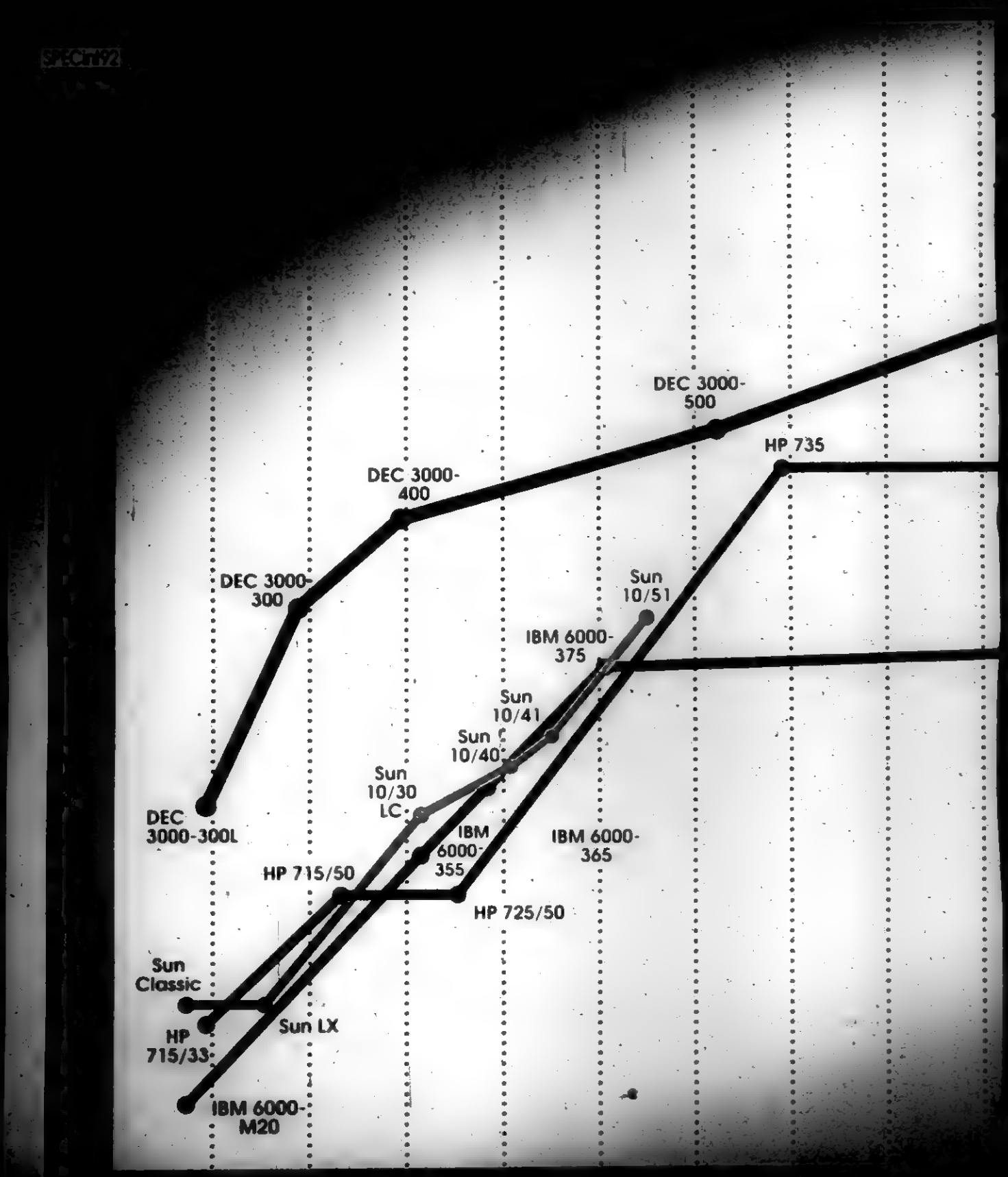

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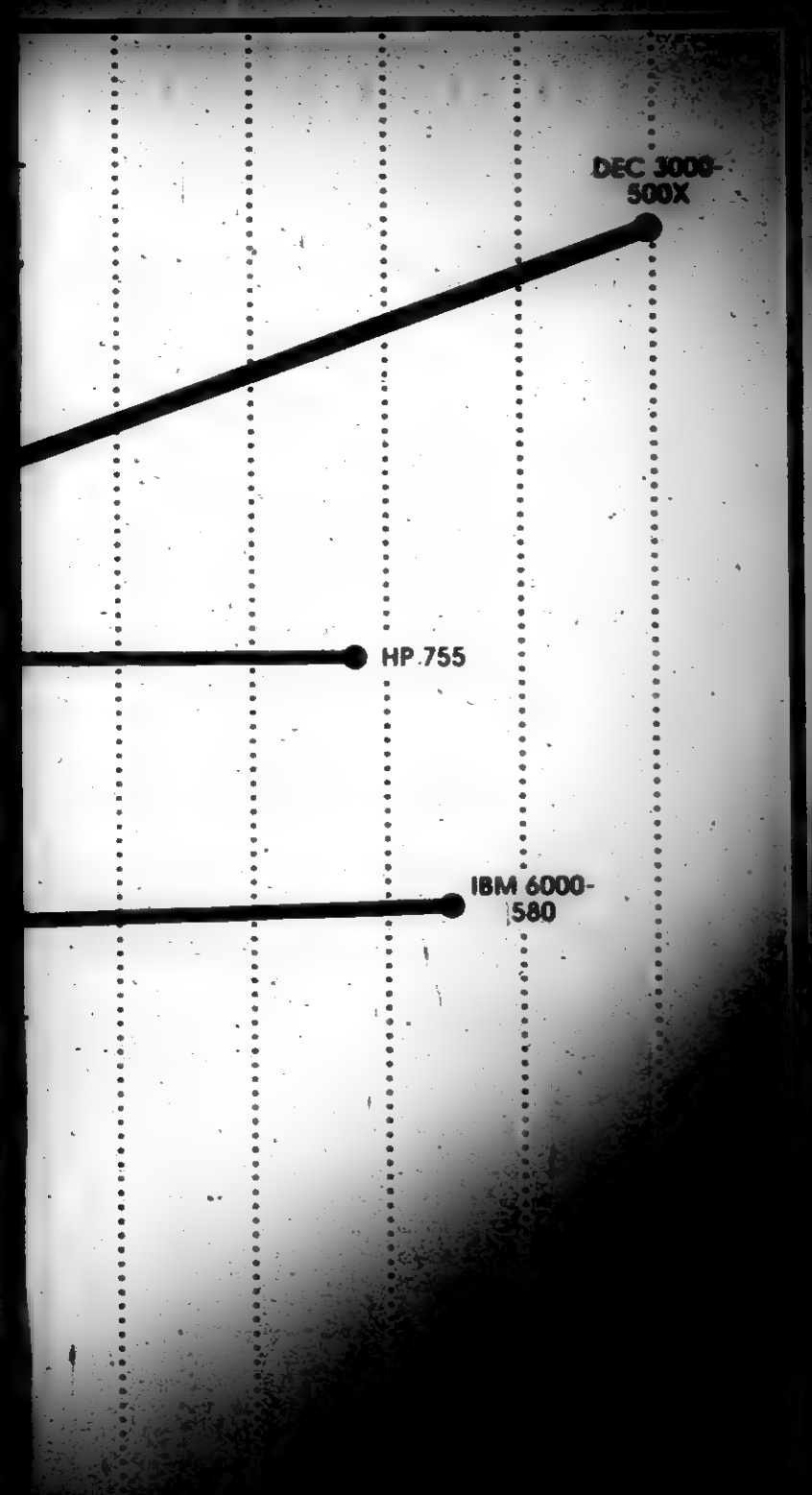


digital

DEC advances dates for key AXP features

By Craig Stedman

Digital Equipment Corp. is now committed to adding support for both volume shadowing and file journaling to the Alpha AXP version of its OpenVMS operating system this year, ahead of its original first-half 1994 schedule.

Both technologies are critical functions for commercial users wanting to build production systems based on the Alpha AXP hardware. Volume shadowing in particular is important to clustered machines, as it enables disk drives to be mirrored so that data will not be lost in the event of a drive failure.

"That's key for a production environment," said Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc., a Cypress, Calif., health maintenance organization that is putting in place a new VMScluster based mainly on VAX 7000s that are board-upgradable to the Alpha hardware.

While DEC already supports basic clustering in the new Version 1.5 of OpenVMS AXP, full-blown Alpha clusters will not be possible until volume shadowing is available, added Wes Melling, program director for mid-range computing strategies at Gartner Group, Inc., a consulting firm in Stamford, Conn.

Leaving leeway

DEC continues to leave itself some wiggle room for developing a full 64-bit implementation of OpenVMS. "That's certainly our long-term goal, but we may find out that there are certain aspects that customers don't have any interest in," said Donald Harbert, vice president of OpenVMS engineering.

Delivery dates

DEC is now promising the shadowing functionality for shipment by December. The journaling capability for the company's Record Management System (RMS) file system is due out during the summer, according to a delivery schedule the company announced earlier this month.

RMS journaling records transactions and updates of other forms of data in a separate journal file that can be used to restore actual files if a system or network is disrupted. Both Alpha AXP and VAX systems will be able to access the same journaled files in mixed-architecture clusters, DEC said.

Also expected on a relatively short-term basis for OpenVMS is a Windows 3.1 user interface for system management applications. It would run on top of DEC's Pathworks local-area network software and enable users to manage OpenVMS machines from PCs.

A prototype Windows interface was shown at the recent Digital Equipment Computer Users Society (DECUS) spring conference in Atlanta, and DEC's goal "is to have something out within a year," said Donald Harbert, vice president of OpenVMS engineering.

"That's not a commitment, though, because we don't even know if we're going in the right direction on this," Harbert added. The first version would also not support the full base of system management applications now available under the company's Motif and command language interfaces, he said.

On a longer term basis, DEC is working on a new OpenVMS file system that will replace RMS. Multiple personalities will be supported, allowing it to be accessed from various non-OpenVMS operating environments, including Unix, Windows NT, Windows, DOS and Macintosh machines.

The future file system will also support much larger databases than RMS. DEC originally proposed a hundredfold increase, but users have told DEC they want to see a thousandfold improvement, Harbert said. "We're trying to get it bigger, but we're not sure how we're going to do that yet."

Nor is DEC setting out a shipment schedule for the file system at this point. "It's beyond any kind of time frame that we can talk about schedules on," Harbert said.

Worldspan Travel

CONTINUED FROM PAGE 81

president at CSC Index, Inc. in Cambridge, Mass., who worked with Worldspan when it was first launched. "If you could develop from scratch today, you would probably opt for, say, parallel processing. But with this, what they've got is a system that works."

The IBM agreement follows another $100 million deal that Worldspan signed with AT&T just three months ago. AT&T will provide a single nationwide network to link Worldspan travel agents.

When the pieces come together, Worldspan will have moved the Pars operation, now based in Kansas City, Mo., and will run one centralized system from Atlanta.

In the meantime, it is working to help customers prepare for the new platform.

The Pars users, who are more than half the Worldspan customer base, will have a less difficult migration than the Delta group. But both customer sets will face change, "which is always traumatic," Balog said.

As a result, Worldspan is keeping a focus on the migration concerns, and a team is setting up a training program that will include on-site help at a travel agency.

"We are compelled to give them the best service possible," Balog said.

Tandem vows to cut downtime

By Craig Stedman
BOSTON

Tandem Computers, Inc. plans to bring out by the end of 1994 a range of software capabilities aimed at reducing typical downtimes on its flagship Guardian fault-tolerant computers. The company hopes to diminish downtime to 10% of current levels, in part by allowing on-line system reconfigurations.

On-line reconfiguration will be provided through a new Dynamic System Configuration (DSC) package that eventually will support both IBM Systems Network Architecture (SNA) environments and non-SNA networks, said Timothy Chou, general manager of Tandem's NonStop Availability Initiative.

The DSC product will also work with local-area networks and magnetic and optical disc drives, Chou added. Also planned as part of the availability initiative are enhancements to Tandem's NonStop SQL database, Transaction Management Facility and its SNA Communications Services implementation of SNA.

Tandem's move to reduce downtime comes as rival Stratus Computer, Inc. continues to work toward a commitment to running its systems at 99.9% availability. "Within a couple years, we would expect we'll be close to that," said Jim Holley, Stratus' director of product marketing.

However, both Stratus and Tandem are still unsure of a method for extending so-called continuous or permanent availability to the application level. "That's the whole key, application availability," Holley said. "But it's a very complex topic. There's nothing which fits into a ready-made formula."

Some Tandem users agreed that applications are critical. "It's not much good to have fault-tolerant hardware and software if your application doesn't have it," noted John Nickerson, manager of computer services at Kaiser Permanente of Northern California, a Walnut Creek, Calif.-based health organization.

But both Nickerson and Michael Kelly, chief information officer at the Chicago Mercantile Exchange, said the system vendor should not be saddled with sole responsibility for the application problem. "That's probably more of a management issue" at the user level, Kelly said.

Nothing is perfect

Kelly said he was pleased that improved system recovery capabilities will be part of Tandem's plan for reducing downtime. "We've been banging away at them for five years" on that subject, he said. "I would rather have a system that has a fast recovery time than one that purports to never go down because there's no such thing."

Nickerson said Tandem is heading in the right direction. "We're happy with their products now, but as you get more and more into the realm of 24 [hour] by 7 [day] availability, any outage of any sort is significant," he said.

Richard Schreiber, president of consulting firm ATB Associates in Wellesley, Mass., said he views Tandem's biggest hurdle as "lateness to the market" brought on by shortcomings in its marketing. "They're a brilliant technology company," he said. However, "their marketing has been half-baked."

Tandem's new products will require the Posix-compliant version of the Guardian operating system due out later this year, Chou said. The firm's Integrity line of Unix systems is not targeted for the work now underway, he added.

Disproportionate impact

While mean times between major system failures are on the rise, Tandem views "transient," or minor, failures as a problem that is not going away. Those account for 80% to 85% of all failures and can cause system outages out of proportion to their severity by corrupting databases.

Unix platforms host Bull DPS 6 apps

By Craig Stedman
BILLERICA, MASS.

Groupe Bull has introduced emulation software said to enable applications written for the company's proprietary GCOS 6 operating system to run on its IBM RISC System/6000-based DPX/20 Unix hardware, albeit with a significant impact on application performance.

Maurice Gervais, Groupe Bull vice president of North American/Pacific products and services, said applications would run at "a ratio of 1-to-3 or 1-to-4" under the new GCOS 6 HVX software for the DPX/20, as compared with the native performance on the company's DPS 6 and 6000 small systems.

However, with development of the DPS 6 and 6800 processors stopped, Gervais said the emulator provides a growth path for users of those machines.

The initial version of GCOS 6 HVX, due in September for the full DPX/20 line, will run uniprocessor GCOS 6 applications as is, Gervais said. Support for multiprocessor applications is expected to follow in the second half of 1994.

A midrange DPX/20 Model 400 with HVS and support for 32 users costs $53,361, plus $5,630 for annual maintenance.

Groupe Bull also expanded its DPX/20 line with the Model 130 compact desktop server and the Model 630 deskside server, priced from $5,445 and $27,450, respectively. The firm is also building support for the Windows NT operating system and Windows Open Services Architecture into its Distributed Computing Model for multivendor applications.

Intelligent expert systems

Legent recasts help desk server plans

By Gary H. Anthes
PHOENIX

Legent Corp. has scrapped its original concept for a help desk product — a rules-based "expert system" shown as a prototype at its annual user conference more than a year ago — in favor of one that will in essence build its own intelligence based on experience.

Chief Technology Officer Robert Yellin told customers at Legent's user conference here last month that the company had made the wrong choice between two approaches to automating problem diagnoses in distributed systems.

"Our idea was if we could just get a really smart person to code up the rules as to how to diagnose a problem, we could systematically diagnose [problems] by going through that knowledge base," Yellin said.

The idea for Legent's "Professional Help Desk Adviser" did not pan out, Yellin said, because of the difficulty of finding experts who had the required knowledge and could communicate with "knowledge engineers" building the system.

Probing deeper

Now Legent is working on a product that will be driven by a database of actual configurations and "events" — captured by electronic probes — that are digested in a process called "intersection analysis."

"You look for things in common — for patterns, for interrelationships among things that existed in every instance of a problem," Yellin explained. "You do a lot of matching, a lot of permutations and combinations."

Yellin said the approach is an example of case-based reasoning, and he jokingly said he hopes to name the product Deja Vu.

He said the resulting "help desk server" will become "the epicenter" of the data center. "Most of your staff growth in the 1990s will occur around the help desk because the situation out there is so complex," he told data center professionals at the user conference.

"We see fewer traditional operators and more systems managers," said a Legent customer at the conference who asked not to be named. "And the systems managers need a help desk environment more than a console operator environment. Legent will be consolidating a lot of information, but in order for someone to troubleshoot in a distributed environment, you're going to need that gamut of information."

The help desk server will be connected to an array of other specialized servers, Yellin said, for functions such as user administration, archiving, software distribution, application management, performance management and scheduling.

For example, the distribution server will automatically send software updates to users, and the results will be sent back to the schedule server and the help desk server. "We'll need some very sophisticated probes out in the network," Yellin said.

And the data captured by the probes will have to be very detailed. If a PC user calls the help desk with a problem, the help desk technician will want to see a click-by-click record of everything that user did for some time leading up to the problem, Yellin said.

In addition to the help desk server, Legent is developing a server for distributed backup and recovery.

Using pattern recognition techniques for which Legent is seeking patents, the backup server will avoid duplication by recognizing a piece of software or data that it has already backed up. When this happens, all it has to do is log in a directory the identity of the item to be backed up and its source.

The scheme is intended to save storage space and reduce network traffic. For example, if the distribution server sends out thousands of copies of new PC software from a mainframe to departmental servers and from there to desktops, the backup and recovery server will recognize that it is getting the same thing back multiple times when individual end users run their incremental backups the next day. Only one copy will be saved.

The product will create diskettes for each server. When a server goes down, its diskette can be carried to a server elsewhere, where it will drive the recovery process, automatically going wherever necessary on the network to get the information needed for recovery.

"If it really does the job correctly and efficiently, it will be an amazing success," said Pete Clark, systems programming manager at Olan Mills, Inc. in Chattanooga, Tenn. "Anything that will allow me to ensure that I have an archived copy of the most pertinent data is going to be very attractive."

Connectivity chaos

"Customers are going through a crisis of connectivity. They can't answer the question of how software interoperates, why the network is not available, why the server is down, why response time is bad or whether they have received the last update of application software from the data center. All these calls are going to be coming into the help desk, and it's going to be a lot more complex than just figuring out what's in the lower left-hand corner of the 3270 and asking someone to reboot a controller," said Legent's Robert Yellin.

Syncsort software simplifies mainframe-to-Unix migration

By Jean S. Bozman
WOODCLIFF LAKE, N.J.

Users who installed beta-test versions of Syncsort, Inc.'s Unix software in recent months said it eased the migration of mainframe applications to Unix workstations. Syncsort, which has been selling its data-sort software to mainframe shops for 20 years, said it recently began shipping production copies of a Unix version.

Large volumes of data — ranging from several gigabytes up to 300G bytes or more — may require presorting for use with some downsized Unix applications, users said. That is because the smaller Unix system sometimes cannot handle the sheer volume of transactional data held in mainframe flat-file records.

Syncsort software was traditionally applied to batch-processing jobs that ran against large volumes of flat-file data, the users said.

Now that the AT&T data is sorted on the Unix server, the application's throughput is three times faster.

AT&T has millions of records to process for some internal consumer marketing applications, said Ivan Hungria, a senior software engineer in AT&T's Consumer Communications Services Department in Basking Ridge, N.J. "We handle so much data that we cannot put it all into one database," Hungria said.

The AT&T site had used Syncsort on mainframes for four years. But in recent months, the customer billing application was moved to a Sun Microsystems, Inc. server with the data stored in local flat files.

Triple the throughput

Now that the AT&T data is sorted on the Unix server, the application's throughput is three times faster, Hungria said. "It was very uncomfortable to ship the data up to the mainframe for sorting and then ship it back to the Sun system," he said. The Syncsort software, installed two months ago, was priced at about $7,000 for the Sun server — roughly half its mainframe price, he said.

Paul Zyla, a programmer/analyst at the National Marrow Donor Program in Minneapolis, said Syncsort's Unix sorting software has cut end-of-month processing time in half — from two days to less than one. The program, which matches donors and recipients for bone marrow transplants, has Sybase, Inc. relational databases running on its Sun SPARCstation 10 and Sun 690 Unix servers. It uses the new Unix package to sort database extracts for about 80 end-of-month reports, Zyla said.

The Unix version of Syncsort ranges in price from $1,000 for a single-user workstation to $25,000 for a large Unix server, the company said. The Unix version is available for Sun's Solaris, Hewlett-Packard Co.'s HP/UX and IBM's AIX for RISC System/6000s.

Beta-test users said they received their Unix software last winter and installed a production copy in April.

HP fills Unix gap

CONTINUED FROM PAGE 81

200 of them by the end of last year, it has not provided updated numbers. The line was initially troubled by shipment delays.

Last week's additions include three dual-symmetrical multiprocessor machines and three uniprocessors. All six use a 96-MHz version of HP's Precision Architecture-RISC 7100 microprocessor.

The three new multiprocessor models stretch the upper ranges of the middle of HP's Unix minicomputer line by weighing in on the Transaction Performance Processing Council's TPC-A benchmark at 411 trans./sec. running an Oracle Corp. database.

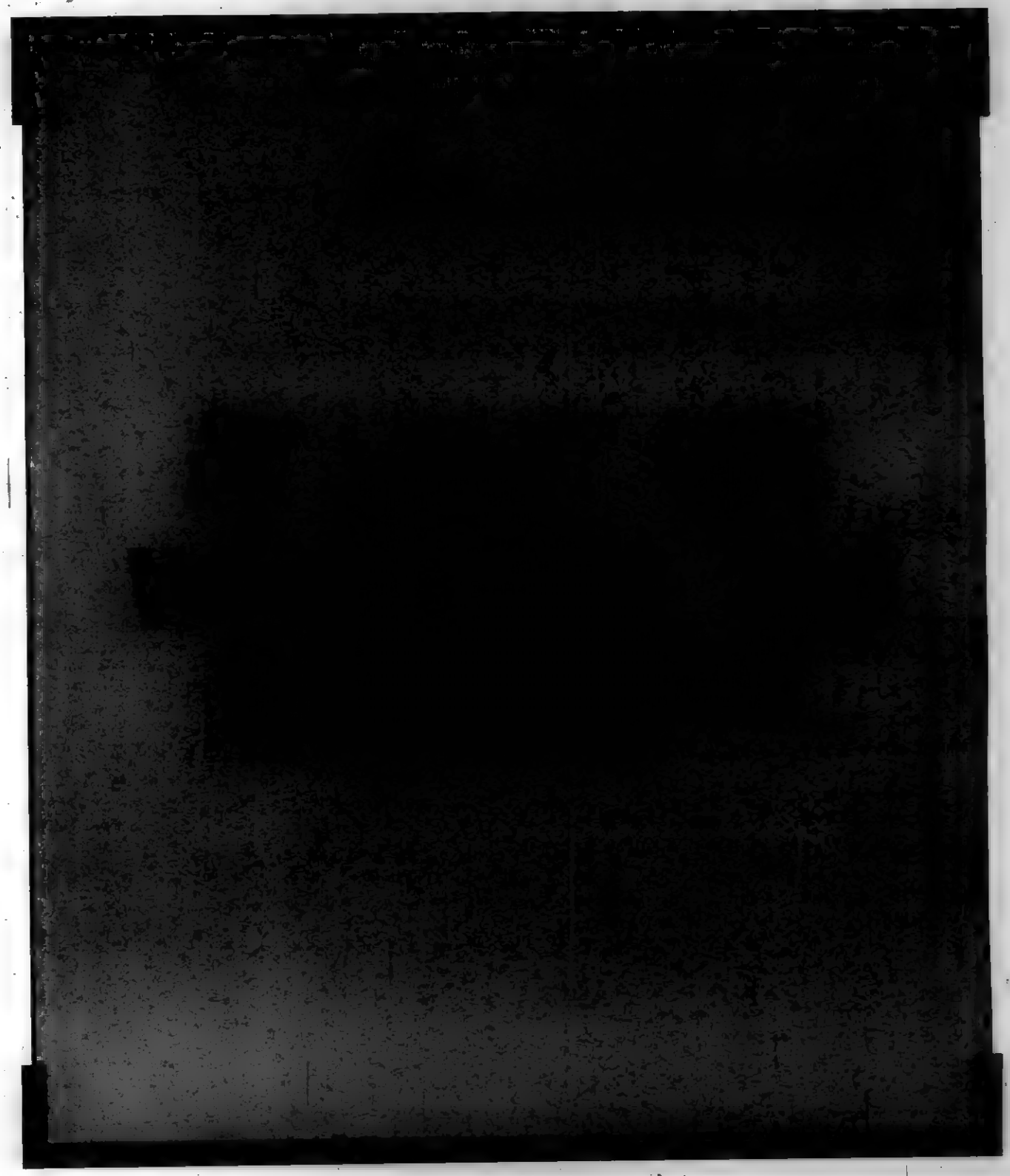
HP claimed the new models outperform systems from Digital Equipment Corp., Sun Microsystems, Inc. and IBM in price/performance. It said benchmark tests showed that one of the dual-processor models, the H70, beats eight-processor systems from Sun and NCR Corp.

HP estimated TPC-A ratings for the three new uniprocessors at 280 trans./sec., said Carol Mills, general manager of HP's General Systems Division, the company's Unix minicomputer operation. That testing is not yet complete, she said.

By comparison, the remainder of the Unix line ranges from an estimated 50 trans./sec. running Oracle to 193 trans./sec. running Oracle, Mills said. Corporate business servers are rated at 710 trans./sec.

The six new models follow a nomenclature HP implemented last December, when it began labeling each machine in the Unix line with a letter corresponding to its number of I/O slots [CW, Dec. 14, 1992].

The uniprocessor G60, H60 and I60 have four, eight and 12 I/O slots, respectively, as do the dual-processor G70, H70 and I70 boxes. The G models come standard with 32M bytes of memory and 500M bytes of storage. The H and I models have 64M bytes of memory; the H models have 1G byte of storage, and the I models have 4G bytes.



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Software application packages

Applicon, Inc. has announced Bravo Version 4 Plus, mechanical design software.

Enhancements and features for the product include Dynamic Modeling; Open Software Foundation's Motif-consistent user interfaces; the ability to send information across various operating systems, including Unix and VMS, seamlessly within the Digital Equipment Corp. environment; and manufacturing applications that include improved tool path animation.

Version 4 Plus also offers a new Variable Declaration Panel designed to make it simpler to create and manage variables that drive designs. It includes 13 hot keys created for keystroke shortcuts that enable users to execute command strings, according to the company.

Applicon's database management application, BravoFrame, now supports Ingres, the Ingres Product Division of Ask Computer Systems, Inc.'s relational database management system.

BravoEdit, BravoConvert, BravoReview and BravoHarness are four new applications that are available with Bravo Version 4 Plus.

Pricing begins at $7,500 per seat.

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Generic Software, Inc. has announced Release 4 of DeskWorks for IBM's Application System/400.

According to the company, DeskWorks is a comprehensive spreadsheet system that offers more than 30 new features and enhancements. Instead of entering cell addresses, a new point mode allows cells and ranges of cells to be chosen by using the spreadsheet cursor movement keys.

Graphic charts can now be displayed on printers, plotters and graphics-capable workstations with a Quick Chart feature.

The results of an AS/400 database file query are returned with a new query function, and performance improvements such as faster spreadsheet calculation, column/row insert, deleting, sorting and printing have been added.

DeskWorks is available for a onetime license fee of $695.

▶ *Generic Software*
986 Madison Ave.
Madison, Miss. 39110
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Utilities

MB Solutions, Inc. has introduced the JCL/Cross-reference, a product that automatically provides MVS users with complete documentation of production job control language (JCL).

Additional storage requirements, programming and data entry are not needed. The product supports Version 4.2 of MVS/ESA.

According to the company, numerous expanded JCL functions and facilities to MVS JCL are added with MVS/ESA Version 4.2, including Nested Procedures, Set, Include and JCL Lib statements. All of these expanded capabilities are supported by the JCL/Cross-reference.

Prices start at $5,500 for MVS systems.

▶ *MB Solutions*
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Compuware Corp. has announced Xpediter/TSO and IMS Release 5.3.

A direct connection to Compuware's fault-diagnostic tool MVS Abend-Aid is also included.

According to the company, the product gives users interactive control over program execution at the source level for diagnosing and fixing programming errors.

Xpediter/TSO and IMS users will have access to extensive diagnostic information provided by the link to MVS Abend-Aid.

The Xpediter/TSO and IMS 5.3 operate under MVS, MVS/ESA and MVS/XA with prices ranging from $33,000 to $89,000, depending on CPU size.

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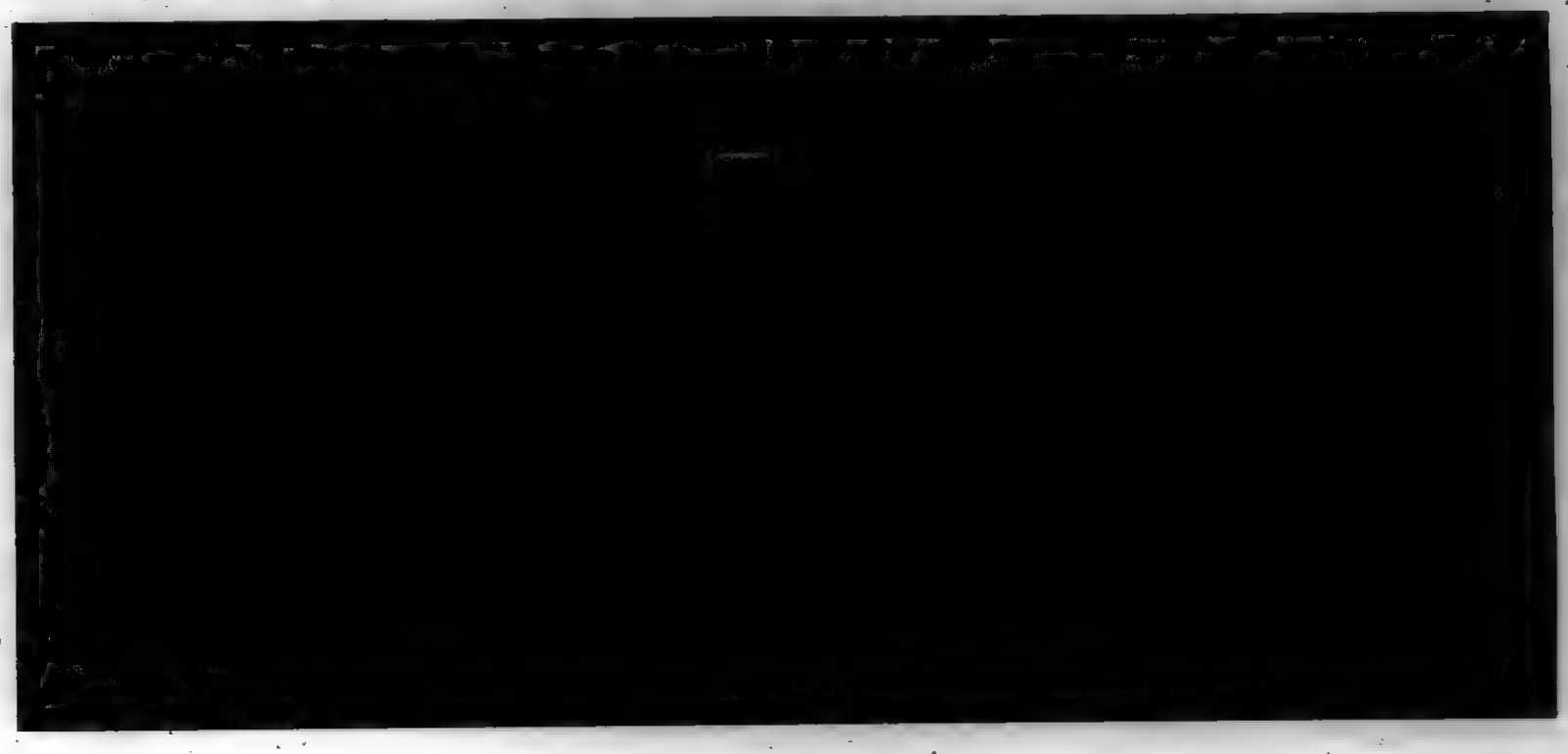

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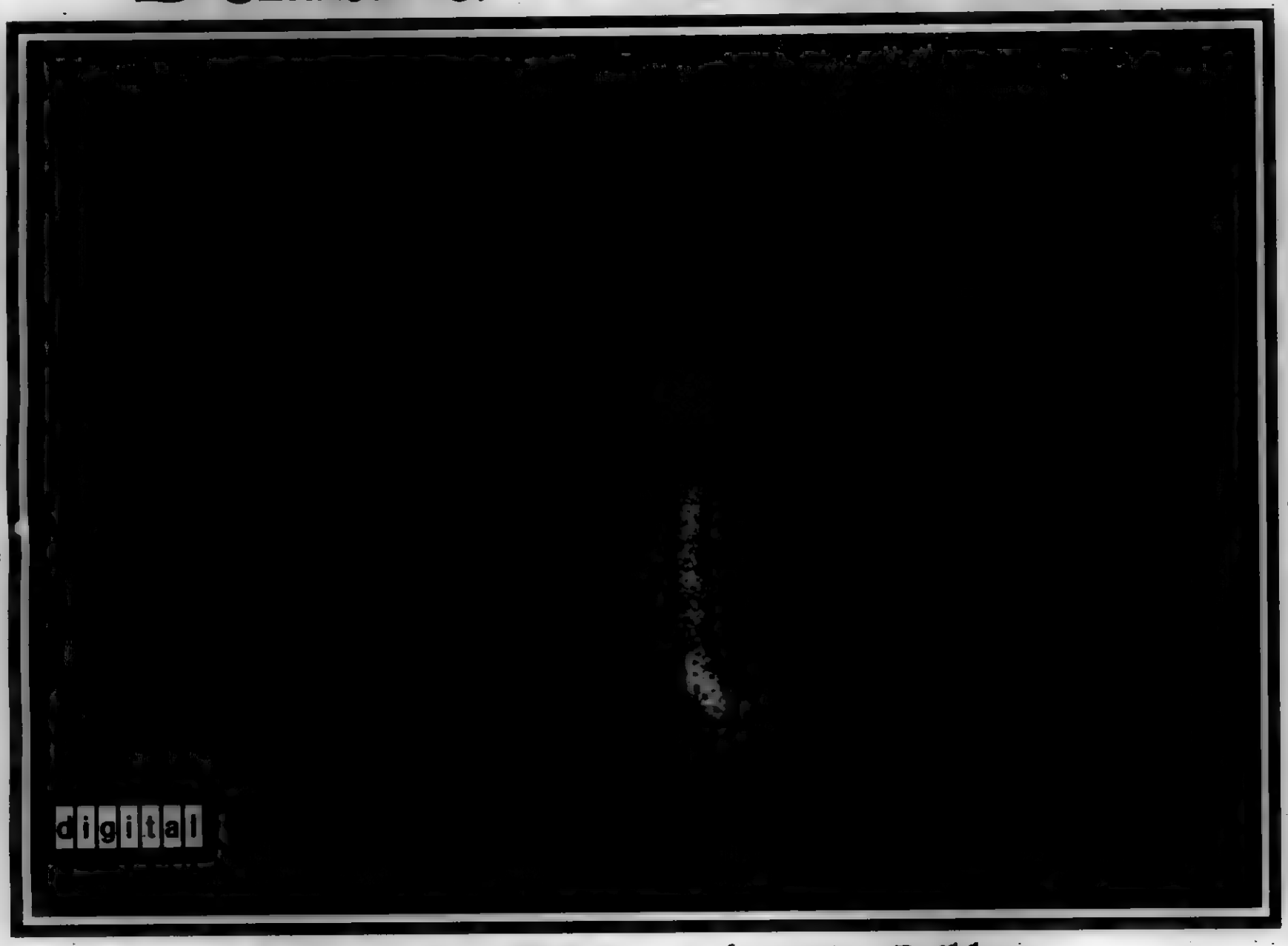

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Software AG aids rightsizing

By Gary H. Anthes
RESTON, VA.

■ Software AG of North America, Inc. last week unveiled an array of professional services for customers and prospects befuddled by downsizing, rightsizing, client/server, distributed computing and related ventures outside the glass house.

Called Spirit — for Strategic Programs for Implementation of Rightsized Information Technology — the initiative moves Software AG more into the world of consulting and orients its sales and customer service efforts more toward the planning and analysis that precede the procurement, development or porting of an application.

"The image that customers have had of us is more technical than we would like it to be," said Jonathan Church, director of central services.

Spirit has the following components:

▶Rightsizing Analysis and Technical Evaluation (Rate) is a consulting service to help users understand the basics of rightsizing, inventory their systems assets with a view toward possible rightsizing and map out a tactical and strategic rightsizing plan.

▶Rightsizing Applications Methodology Program (Ramp) is an eight- to 10- week session of on-site technical and management support that extends Rate to a more detailed level. A small prototype application is delivered at the completion of the effort, which typically will cost between $50,000 and $85,000.

▶Rightsized Environment Achievement (Reach) is a fixed-price, turnkey development of a distributed system.

▶Rightsizing Center is a place users can go to get hands-on experience with major platforms for distributed computing, with Unix and OS/2 boxes and connectivity tools from Hewlett-Packard Co., Sun Microsystems, Inc., NCR Corp., AST Research, Inc., NEC Technologies, Inc. and Digital Equipment Corp.

When used for converting applications from mainframe to distributed environments, use of the center will cost between $1,500 and $2,500 per day.

"Spirit is a good structured way for IBM mainframe shops to take an evolutionary approach to rightsizing their hardware and applications," said John Logan, executive vice president at Aberdeen Group in Boston.

"Except for IBM, they are the only ones to have done this from the mainframe perspective," Logan said. "If you asked Oracle to come into the data center and tell you which applications should be downsized, with what tools and in an evolutionary way, they wouldn't have the slightest idea where to begin except to say, 'Obliterate the mainframe.' If you're a mainframe-trained veteran, this is a great chance to open your eyes to see what the opportunities are, a try-it-before-you-buy-it approach from someone that knows your business and is constructively helping you adjust to the change."

Seer, IBM reveal plans for AD/Cycle technology sharing

By Thomas Hoffman
NEW YORK

IBM Programming Systems tried to pump new life into its AD/Cycle software development program recently when it announced plans to incorporate Seer Technologies, Inc.'s communications connectivity code into future application generator products.

Under the shared technology agreement, Seer plans to embed IBM's Cross System Product 4.1 application generator into Seer's High Productivity System (HPS) application development suite. The deal is expected to further strengthen IBM's object-oriented programming strategy by adding reusable code that can be transferred between IBM and non-IBM platforms, analysts said.

In addition, Seer's middleware components will be bundled into IBM's future AD/Platform products, IBM officials said. AD/Platform, a follow-on to the AD/Cycle program, is expected to comprise a repository-based development environment geared toward local-area network and cross-platform connectivity.

James Archer, director of AD/Cycle for IBM's Programming Systems unit, said AD/Platform products containing the Seer runtime elements will ship by mid-1994. A Programming Systems spokeswoman said the unit will introduce client/server software beginning this fall.

The deal was also seen as a shot in the arm for Cary, N.C.-based Seer, a 3-year-old, $35 million spin-off of The First Boston Corp., whose computer-aided software engineering (CASE) products have gained widespread acceptance by a bevy of Fortune 500 companies. The joint marketing and technology-sharing agreements, which were made here at Seer's Third Annual Customer Council, significantly expand Seer's global reach through IBM's massive sales force. Plus, Seer will receive royalties for the HPS components that will be bundled into IBM's products. IBM purchased a 40% equity stake in Seer in 1990.

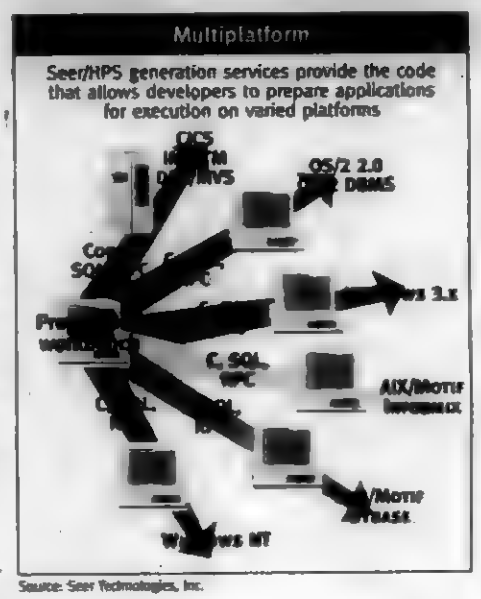
The Seer connectivity software allows users to combine IBM's Systems Network Architecture, CICS and DB2 environments with emerging open systems standards such as Transmission Control Protocol/Internet Protocol and Open Systems Interconnect. The connectivity software would also allow IBM to share its application development data distribution between IBM and non-IBM platforms.

The Seer connectivity software layer will now permit IBM's MVS CICS, MVS IMS, OS/2 and AIX environments to interoperate with Microsoft Corp.'s DOS, Windows and Windows NT, as well as Sun Microsystems, Inc.'s SunOS and Solaris, which Seer's HPS supports.

"What it gives IBM is the ability to generate code to non-IBM platforms," noted Gene Forte, president of CASE Outlook, a Portland, Ore.-based CASE research firm that publishes a bimonthly newsletter by the same name.

Forte said the shared technology deal accelerates IBM's plans to implement reusable code for its application development domain. Reusable code, Forte said, is one of the

AD/Cycle, *page 92*



Source: Seer Technologies, Inc.

Seer users eye redevelopment strategies

A handful of the nearly 500 users who recently jammed Seer's Third Annual Customer Council discussed their plans involving Seer's HPS CASE development environment.

Although project plans varied from one site to another, one common theme appeared: Most of the conference attendees have made plans to redesign or redevelop legacy systems to run on distributed architectures, with HPS acting as the enabler.

"We're looking to redevelop 80% of our systems," said Robyn A. Turk, a senior vice president of operations and systems at PaineWebber, Inc. in Weehawken, N.J. Turk said the brokerage firm plans to shift the bulk of its centralized processing, such as trade bookings, to distributed workstation environments. Meanwhile, the mainframe will be kept to clear trades with stock exchanges and may eventually take on a new role as a large corporate server.

PaineWebber has been using Seer's HPS CASE tools during the past 18 months for workstation application development. The first project is the development of a new customer database that is slated to go on-line by mid-1994. Turk said PaineWebber chose HPS primarily because its upper- and lower-CASE tools are fully integrated.

"When you're rewriting 6 million lines of code, you need a tool to collate the information. From that perspective, HPS integrates everyone together, allowing us all to speak the same language," Turk said.

Charles Schwab & Co. has used HPS Version 5X for the past two years to redevelop three production systems: a mutual funds maintenance system, a customer prospect system and a margins system. All three systems now run on Intel Corp. PC architecture workstations that are cooperatively linked to a Hitachi Data Systems Corp. AS/EX-480 mainframe, according to Jim Stinton, director at the information systems division of the San Francisco-based

Seer users, *page 92*

Seer users eye redevelopment

CONTINUED FROM PAGE 91

brokerage company.

But Schwab's cooperative processing scheme will not last much longer. When the brokerage upgrades to HPS Version 5.3 later this year, Stinton said, Unix servers will be brought in to route information throughout its trading environment.

"We need distributed computing so we don't get blown out of the water if one of our databases goes down since we have to continue trading," Stinton said. Although Schwab plans to retain its HDS mainframe to run its core trading system, Stinton said, the company is planning to offload other applications, such as its accounts payable or accounts receivable systems, onto a Unix platform in the future.

Stinton said he expects Schwab to decide on a server platform by the fourth quarter. The company has already decided to install 4,000 Sun Unix workstations during the next three years as part of the distributed trading environment.

Donna Maria Krasner, a manager of technical services at Cheesebrough-Ponds USA in Trumbull, Conn., attended the conference on behalf of Unilever PLC, British parent of the health care products manufacturer. Unilever's Personal Products division, which includes Cheesebrough-Ponds, Elizabeth Arden Co. and Calvin Klein, Inc., is planning to select either one standard application development environment or "the best of breed" features from several environments by the end of this year, Krasner said.

Krasner worked in IS from 1988 to 1990 at The First Boston Corp., where HPS was created before Seer was spun off into a separate company. Her experience with the CASE environment — and Seer's commitment to the Open Software Foundation's OSF/1 and Distributed Computing Environment standards — spark Krasner's interest in the application development tools.

"Anything that helps us get past the barriers of conflicting hardware and software environments and leads us to a more open environment is of interest to us," Krasner said.

— Thomas Hoffman

AD/Cycle plans

CONTINUED FROM PAGE 91

major cornerstones supporting IBM's AD/Platform strategy.

Still, the Seer/IBM alliance raises questions about the status of CASE AD/Cycle partners such as Sapiens International Corp. and KnowledgeWare, Inc. "When the AD/Cycle alliance first came out, KnowledgeWare was the favorite son. Seer is now being promoted almost in its place," said Peggy A. Ledvina, a program director for application development strategies at Meta Group, Inc. in Westport, Conn.

Framework

Seer and Treasure, Inc. also announced a joint program to market the combined technologies of Seer's HPS CASE environment with Treasure's Encina on-line transaction processing products, which were designed to coordinate the updating of distributed databases.

Meanwhile, the Seer customers and conference attendees seemed more interested in the planned enhancements for HPS than in the IBM AD/Cycle alliance (see story page 91). "DCE and DME compliance is more relevant to us than AD/Cycle," said Donna Maria Krasner, a manager of technical services at Cheesebrough-Ponds USA in Trumbull, Conn.

The next generation of HPS, Version 5.3, will include a distributed computing environment option for multiple transaction management.

HPS 5.3 is currently in beta testing and will begin shipping by the first quarter of 1994, according to Vivek Wadhwa, vice president and chief technology officer at Seer.

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March 8–11, 1994 • Mexico City, Mexico

NCR to supply development tool suite

By Melinda-Carol Ballou

NCR Corp. demonstrated its Application Development Environment (ADE) at the recent Object World show in San Francisco, showing a suite of object-oriented tools for development of client/server applications.

Partners who joined with NCR in providing tools for ADE included Lucid, Inc., Object Design and AT&T Bell Laboratories, Inc.

ADE includes the C/C++ Workbench, an object-oriented programming system for Unix that helps users make the transition to writing C++ code by using familiar programming tools, company officials said. C/C++ Workbench was jointly developed by Lucid and NCR. C Workbench and Cobol Workbench enable programmers to develop applications procedurally in C or Cobol. Both were developed by NCR.

Also included in ADE are nmake, a Unix tool that allows customers to construct, maintain and manage software and documentation; and Sablime, a product administration system that lets managers and developers track changes to software, hardware and documentation. AT&T Bell Labs contributed these tools to ADE.

In addition, ADE will include software development kits that support NCR's Top End transaction management system.

ADE will be available in the third quarter. The C/C++ Workbench will be priced at $3,000 per seat; C Workbench will be priced at $1,500 per seat; and Cobol Workbench will be priced at $1,800 per seat.

Sablime and nmake will be priced at $500, and the software development kit for Top End will be priced at $800.

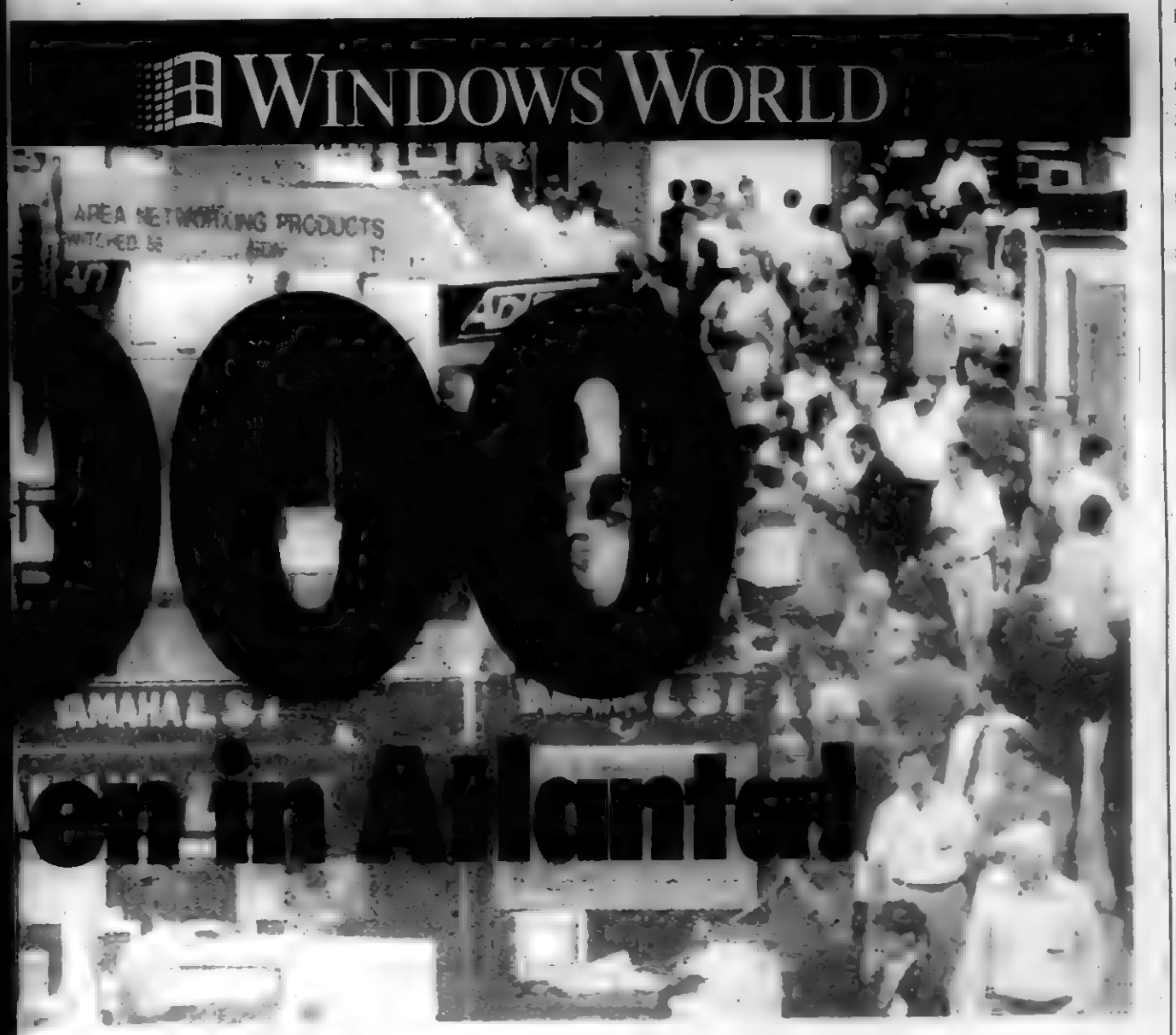
Briefs

Help for ISVs

Unifasc Corp. announced a technology transfer program that enables independent software vendors to provide interfaces among their products and the Unifasc fourth-generation language tools, databases, networks and utilities. Dubbed "Fusion," the new program offers interface "cookbooks" with templates provided by Unifasc and an extensive support program. Participating companies include Cincom Systems, Inc., Information Dimensions, Inc., VMark Software, Inc. and Richard Irwin Associates.

Firm develops Mumps

InterSystems, Inc., vendor of Mumps products, including a database dubbed Open M/SQL, will participate in IBM's Marketing Development Program with five other companies. IBM will use InterSystems' M/SQL to facilitate migration of Mumps users from proprietary environments to IBM's RISC System/6000 series of Unix workstations, IBM officials said.



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Application development tools

Softwarehouse Corp. has announced Network Program-to-Program Communications (NPPC) for Windows.

The product is a Windows-based version of the company's library that is used for developing network applications.

According to the company, NPPC for Windows was designed for users who are creating Windows 3.1 or Windows for Workgroups network applications in C or C++. Available for IPX and NetBIOS networks, the product provides the same application programming interface for both versions.

Either library (NPPC for Windows/IPX or NPPC for Windows/NetBIOS) is available for $195 or $395 with source code. Both libraries (NPPC for Windows/IPX and NPPC for Windows/NetBIOS) can be purchased together for $329 or $729 with source code.

▶ *Softwarehouse*
326 State St.
Los Altos, Calif. 94022
(415) 949-0203

Extrasensory Software has announced Version 2.0 of both PS Error and Sez You, two products for the company's CA-Clipper development tools.

PS Error is a replacement error system, and Sez You is an environment control utility.

PS Error tracks both runtime errors and fatal errors, the company reported. Features for the product include reduced memory overhead, specialized runtime interfaces and CA-Clipper 5.2 compatibility.

Sez You offers new functions to report important machine information, result codes that inform users of problems, a simple evaluation order for configuration settings and CA-Clipper 5.2 compatibility.

PS Error 2.0 and Sez You 2.0 each cost $149.95.

▶ *Extrasensory Software*
Suite 8
4450 Murietta Ave.
Sherman Oaks, Calif. 91423
(818) 981-8367

XDB Systems, Inc. has released XDB-QMT Version 3.0, a product that allows users to develop and test QMF-compatible queries, reports and procedures in the desktop computing environment.

Designed to operate with XDB, DB2 and mainframe DB2 databases, XDB-QMT 3.0 is a PC-based data query, retrieval and reporting facility.

Version 3.0 offers configurable user interfaces, including a QMF-screen mode that lets users work with the same command syntax provided in mainframe QMF.

The product uses the company's Common Windowing Interface, providing features such as pull-down menus, scrollable windows, push buttons and mouse support.

XDB-QMT 3.0 also interfaces with IBM's OS/2 REXX language and requires an IBM PC/AT or a Personal System/2 compatible running DOS or OS/2.

XDB-QMT Version 3.0 costs $1,200.

▶ *XDB Systems*
14700 Sweitzer Lane
Laurel, Md. 20707
(301) 317-6800

Gpf Systems, Inc. has started shipping Version 2.1 of the GUI Programming Facility (Gpf), an OS/2-based interactive point-and-click development tool designed for developing graphical user interfaces.

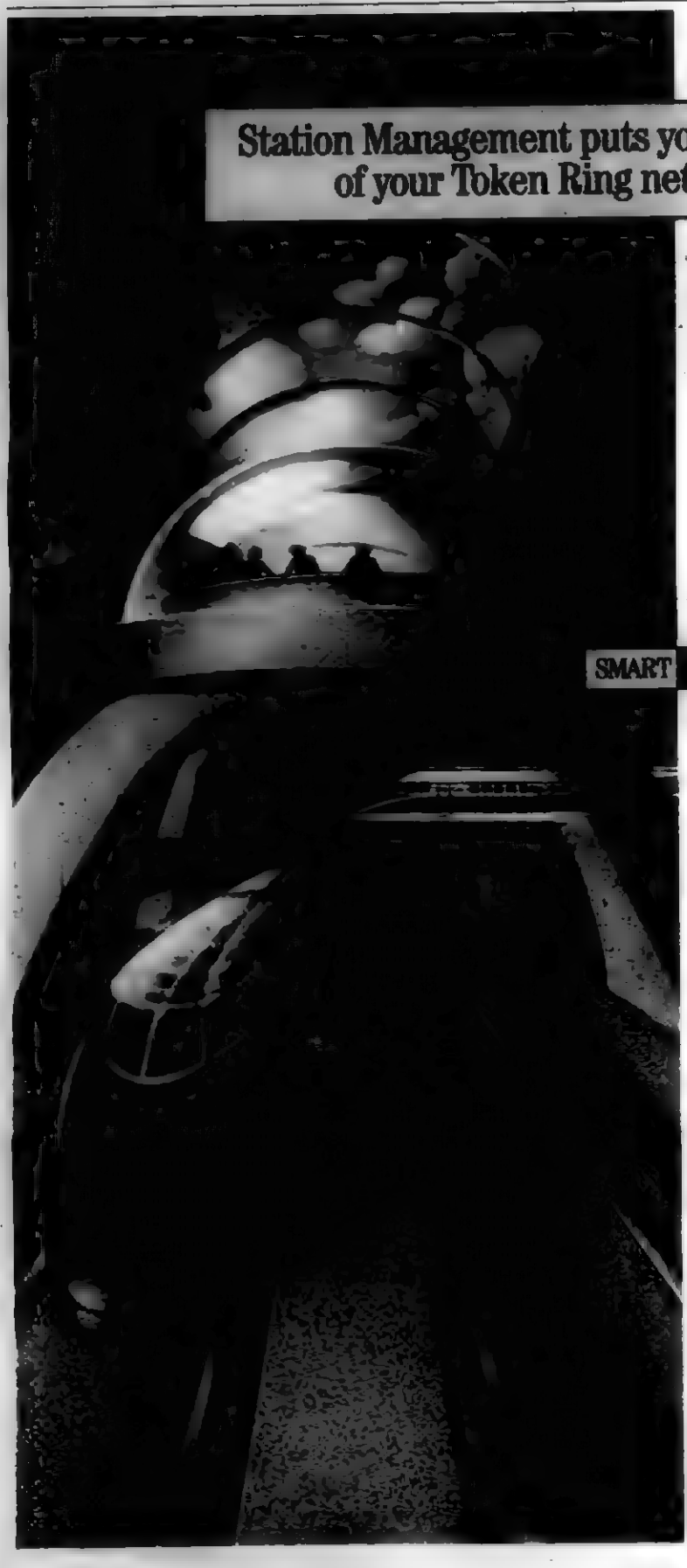
From a single design, this version is said to generate native IBM OS/2 2.1 Presentation Manager WorkPlace Shell and Windows 3.1 interface code, while maintaining a common look and feel across both platforms.

According to the company, Gpf 2.1 automatically generates Dynamic Link Libraries and supports C and C++ compilers.

Gpf 2.1 runs on OS/2 Versions 2.0 or higher and requires a mouse and at least 6M bytes of available hard disk. Six megabytes of random-access memory are recommended.

A single copy of Gpf Version 2.1 costs $1,295.

▶ *Gpf Systems*
30 Falls Road
Moodus, Conn. 06469
(203) 873-3300



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Why not choose the best client-server development tools?

So much hype, so many vendors - choosing the right tools can seem trickier than it really is. Just remember, industry experts and users agree: UNIFACE is the most complete, multi-platform, client-server applications development environment.

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When Computerworld surveyed buyers of the leading Windows client-server tools, UNIFACE received the #1 overall rating.

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UNIFACE received the DB/EXPO '93 RealWare award (co-sponsored by Intel) for Best Interoperability Business Solution of 1993. UNIFACE's 3-schema architecture ensures application interoperability across INGRES, Informix, ALLBASE/SQL, C-ISAM, ORACLE, SYBASE, TurboIMAGE, Rdb and 22 other data sources on over 100 platforms running virtually any operating system.

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For example, UNIFACE supports the native look-and-feel of Windows, Motif, OPEN LOOK, Workplace Shell and character mode - without rewriting a single line of code. And UNIFACE's tight links to multiple CASE tools promotes consistent data definition and modeling for large scale development projects.

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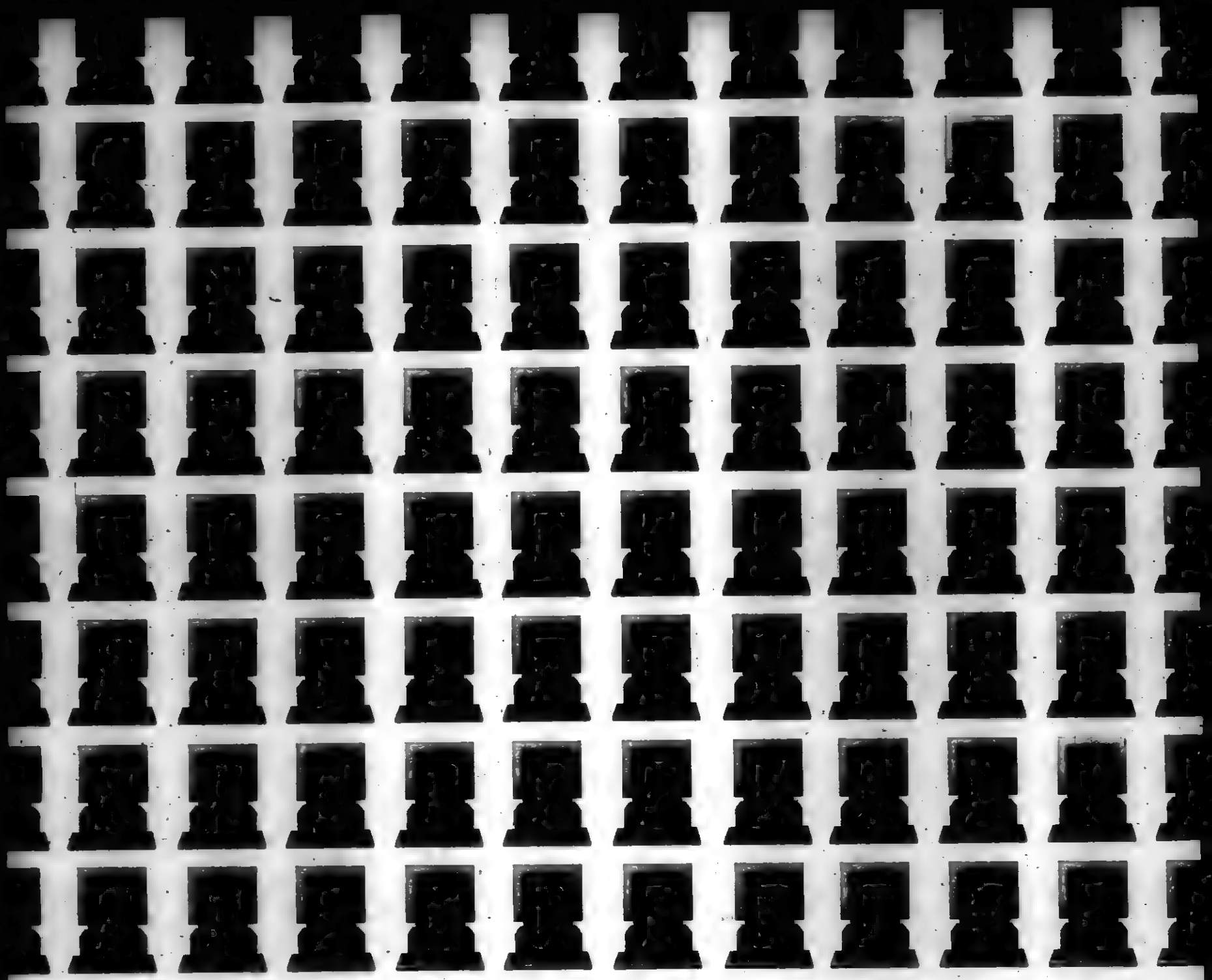

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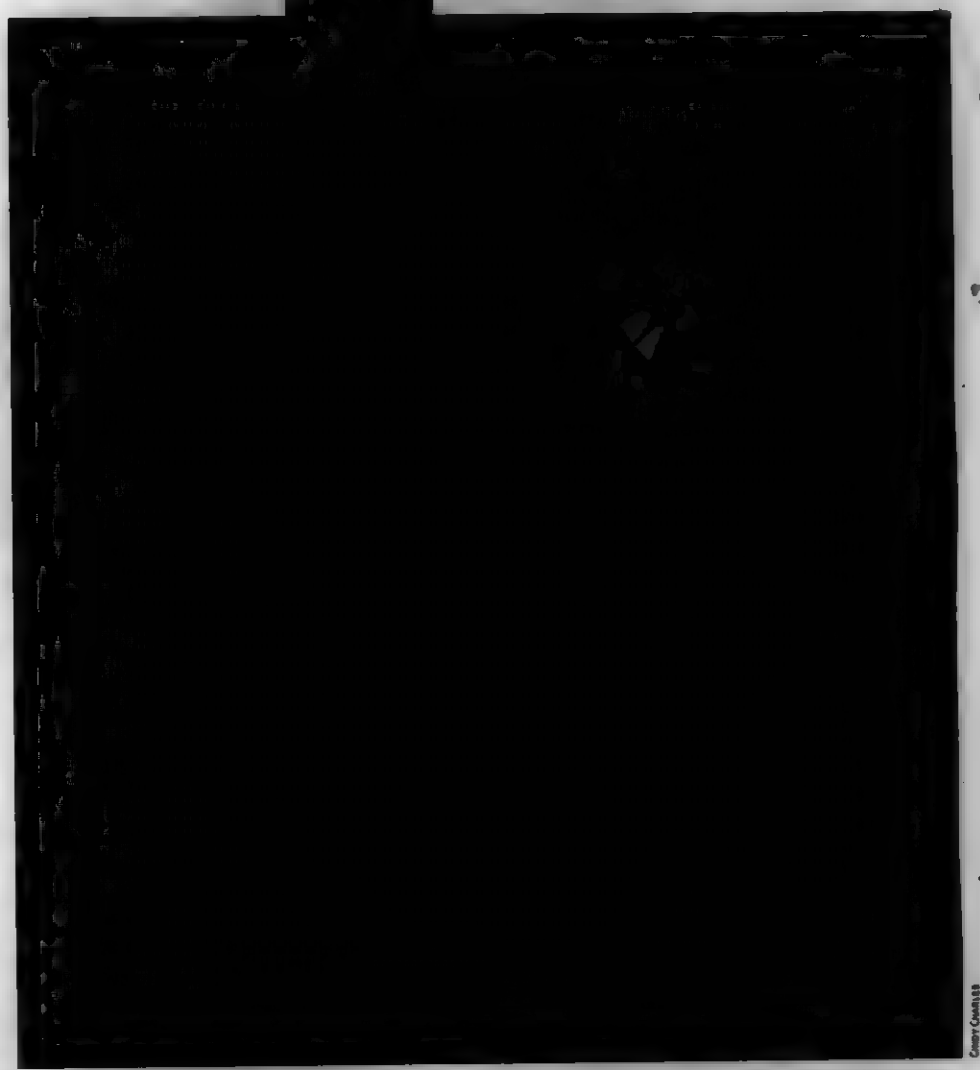
For our report on purchasing portables, see page 107.

TIES that BIND

Mobile technologies are luring your workers onto the road by the thousands. It's your job to help them survive in "the [redacted] corporation."



The Pacific Stock Exchange's Dave Eisenlohr: *'How do you manage people you never see? Communicate, communicate, communicate.'*

By Joanie M. Wexler

A feather-light notebook PC here, a high-speed network there.

Sooner than you might think, the avant-garde work style known as the "virtual corporation" will have invaded American businesses right under our noses, thanks to new technologies that physically untether employees from organizations and let them work wherever they can be most productive.

Advocates of the fledgling concept, popularized by consultant William Davidow last year, say "virtual" businesses can save money on office space, put employees on the front lines and offer flexible work environments to valued personnel. But experts caution there are drawbacks, too.

For starters, business and information systems managers alike need to plan for culture shock caused by quieter corridors, as well as the prospect of employee burnout resulting from round-the-clock electronic access.

Then there's the added burden of creating and supporting a far-flung technology infrastructure.

Lest you think the whole notion is hooey, consider several recent studies that suggest "virtual technology" use is exploding. A recent study from The Yankee Group, for example, notes that the number of cellular network subscribers (voice and data) is expected to nearly double by 1996, to 22 million.

But many observers say most organizations and managers are poorly prepared to handle the challenges a virtual corporation will create.

A recent report from London-based researcher Ovum Ltd. found only 325,000 mobile data subscribers in North America and Europe. The reason? Companies have been slow to im-

· Ties that bind, *page 98*

Mobile ties that bind

CONTINUED FROM PAGE 97

plement the technology because of its major technical and organizational impact.

Despite such lethargy, smart managers will learn to keep abreast of bewildering changes. The best way, according to consultants and IS managers on the virtual path, is to keep in close touch with scattered employees and know when to call them back.

"Successful managers will know how to differentiate when it is appropriate to use technology [to share resources or communicate] and when a face-to-face meeting is called for," says Barton Goldenberg, president of Information Systems Marketing, Inc. The Washington, D.C., consulting firm specializes in mobile computing applications.

Such managers, Goldenberg notes, "will roll with the punches in responding quickly to electronic needs." Managers who can't cope with a feeling of losing control over unseen employees, he adds, are heading for trouble. "They will be recycled into a different function," Goldenberg predicts.

Indeed, others agree that it will take a savvy manager to cook up mobile business practices as effective as a water cooler chat or a spontaneous reward lunch.

Experts say IS managers can get a big leg up by starting now to teach their staffers how to communicate in ways more in sync with a wall-less organization.

"We're talking about reorienting the user with a whole new skill set. How do you manage people you never see? Communicate, communicate, communicate," says David Eisenlohr, vice president of telecommunications and computer operations at the Pacific Stock Exchange, now in the early design stages of a virtual office.

"That is the heart and soul behind success stories of the virtual office," he adds.

An excellent way to create processes to make the virtual workplace work is to send the boss out for a trial run, says Andy Seybold, an industry analyst and publisher of the "Outlook on Computing" newsletter. He says, "When people ask me how to prepare their staffs for the virtual workplace, I tell them to get on a plane for a week and run their offices remotely."

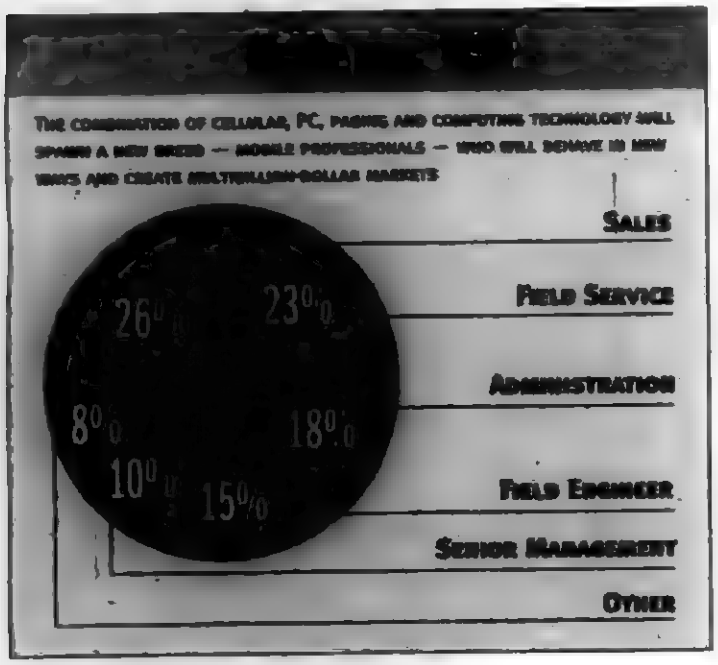
Keep talking

Raymond Perry, vice president and chief information officer at Avon Products, Inc., agrees that good communication is vital. With a worldwide staff of 1.7 million mobile salespeople, the New York-based beauty products maker exemplifies what the typical virtual organization of the future may look like.

"The motivation of people is emotional," Perry says, "[so] we have to get together every couple of weeks in person because people support each other and share experiences. You can't do that over the phone or with a conference call."

To keep up the face-to-face contact, each Avon district manager holds regular sales meetings. There, representatives are shown new products and learn about incentives, Perry explains. The company also keeps regional people current by daily updating sales data to each district.

"We download meaningful information about a district manager's business, such as sales performance data in her territory, every night to her home to jump-start her each morning," Perry explains.



Avon's Raymond Perry: *People need to share experiences, so face-to-face meetings are vital*

At systems integrator and management company NMI, Inc. in Fairfax, Va., many employees telecommute from home, Chairman F. A. Dramis says. To maintain employee/organization ties, core teams meet for one hour every Monday on a conference call and talk about their two most important projects.

Then, says Dramis, a former CIO at Salomon Brothers, Inc., "we tape the conversation and put it on our voice-mail system so any employee can call in and find out the 50 most important things going on in the company."

His secret to making the new approach work? Make a list of things you did in the nonvirtual office, then replicate them with technology. The trick is to "make into formal processes what was once informal," he says.

Virtual burden

The virtual corporation presents IS managers, in particular, with another challenge. Besides the stress caused by virtual employees, there's the additional burden of researching, purchasing, installing and maintaining the technology that will support the communications needs of wandering workers.

For example, Dramis notes that distributed computing technology lets processing and storage be located anywhere in the environment. "It's up to IS to create virtual access to these resources and a virtual computing process to link people together," he says. "IS has to create the virtual data center to match the virtual corporation."

Such access could mean matching applications to appropriate remote networking technologies or outfitting users with portable PCs or pagers containing interfaces to cellular or packet data wireless networks, Dramis explains.

And because stationary users are accustomed to near-instant network response times, corporate IS is faced with the challenge of providing users with services as close as possible to those they can get in the office.

"Basically, you have to be able to give users a mirror image of what they get on their local-area networks" at headquarters, says Phillip Evans, director of telecommunications at Perot Systems Corp., which is also constructing a virtual environment.

That's an especially big challenge because of the relative speed limitations of today's wide-area bandwidth, especially in wireless.

And Eisenlohr also notes that building a virtual computing infrastructure includes educating end users to be more effective at troubleshooting technical problems for themselves.

"It's downright expensive to have support resources at a facility sitting idle while your sales force is out in the field 80% of the time," he observes.

The spy within

Even presuming you can patch together a cohesive infrastructure, experts say your problems are only beginning.

What happens, for instance, when workers and bosses are in 24-hour contact via an electronic link? Intrusion by management, some workers fear.

Mark Lowenstein, a Yankee Group analyst, noted at a recent mobile computing conference that such concerns will inevitably grow. "We're entering the era of the 'no excuses' professional, who will have less guilt-free leisure time," he predicts.

To sidestep this hurdle, Goldenberg advocates a "three-times" policy that reassures users — particularly commission-driven salespeople — that they stand to gain much more than they lose in the virtual corporation.

The idea is simple, Goldenberg explains: "For every piece of information you request from users, give them three back." This ultimately will help them be more successful at their jobs, he says. "For example, give them six pieces of information for one call report that gets shot out to marketing and customer service," he says. ■

Quick

THESE IDEAS CAN HELP YOU START YOUR TRIP ROAD TOWARD BECOMING A VIRTUAL MANAGER:

1 Communicate
Employees are learning a new way to work. Talking them through it is essential.

2 Keep in touch
Set up procedures that help workers feel "connected" to the corporation. For example, personnel should probably be required to make office appearances periodically.

3 E-mail
It's a good idea to institute corporate-wide guidelines about how to effectively write a message and etiquette about the purposes for which it should be used.

4 Voice mail
Train staff on the rudiments of how to leave succinct voice-mail messages.

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Because WordPerfect 6.0 was developed to bring you more features and enhancements than you ever dreamed of asking for.

639 of them, to be precise.

Capabilities that will let you work faster. With less effort. And with a lot better results.

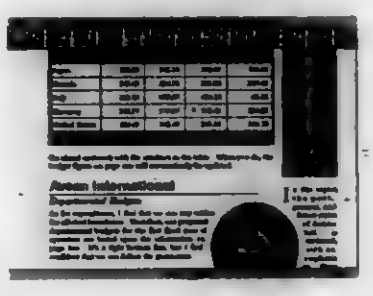
For starters, here are just a few examples.

21. DESKTOP PUBLISHING You don't need another program to make things look great. Not when WordPerfect brings you advanced features like drag-and-drop text and graphics, customizable borders, even contour wrap-around text!

54. QUICKFINDER Now you can index files and with one key word or phrase, locate files instantly.

277. WYSIWYG EDITING With WordPerfect, you don't have to switch to "print preview" to see text, graphics, attributes — even headers and footers — exactly as they'll end up on paper. It's the way you can work all the time.

37. SCALABLE FONTS For the sharpest, clearest typefaces possible, WordPerfect 6.0 displays and supports TrueType™, CG Intellifont, Bitstream Speedo®, and Type 1 font technologies.



315. SPREADSHEET FUNCTIONS Now you can actually crunch numbers while word processing. Because nearly 100 spreadsheet functions are built right into WordPerfect 6.0.

82. COACHES WordPerfect is easier than ever. But when you want to try something new, this is like having a personal instructor for quick advice or step-by-step instructions.

86. EXPANDED WINDOWING These days, nobody has the luxury of working on one thing at a time. WordPerfect 6.0 lets you open and edit up to nine documents at once.

238. SELECTABLE MERGE Once, merging data was a difficult all-or-nothing proposition. Now WordPerfect lets you easily select the records you want to merge into letters or reports.

143. ENVELOPES & BAR CODES Addressing envelopes and labels is about as fun as licking stamps. But now you can do it automatically, even adding bar codes to speed the mail along.

256. FAX FROM YOUR DESK Next time, don't take that hike to the fax machine. With WordPerfect and a FaxBios, Class I, II or CAS compliant fax board, you can fax right from your PC.

The other 629 new features and enhancements to WordPerfect 6.0 include its GUI interface, color printing and sound board support, collapsible outlines, Undo, Button Bar, Grammatik and macro conversion.

But no matter how many new features it has, one thing stays the same: it's still WordPerfect.

Which means all your present WordPerfect 5.1 files are fully compatible. And you have toll-free access to the best user support in the business.

Get the full details about WordPerfect 6.0 today.

Visit your local reseller, or for your free demo disk (along with a list of all 639 features and enhancements) just call (800) 228-2720 ext. 101.

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Calendar

JULY 11-JULY 17

1993 Banyan Technical Conference. Cambridge, Mass., July 11-13 — Contact: Banyan Systems, Inc., Westboro, Mass. (508) 898-1000.

10th National Conference on Artificial Intelligence. Washington, D.C., July 11-15 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

A Time to Restructure: The Annual Industry Future Conference. New York, July 12-13 — Contact: Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

Client/Server Computing: Strategic Directions and Tactical Solutions. New York, July 12-13 — Contact: Ashlet Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6774.

Image World Dallas. Dallas, July 12-16 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Object Expo Europe '93. London, July 12-16 — Contact: SIGS Conference Office, New York, N.Y. (212) 274-0640.

Openbase/Canada. Toronto, July 13-15 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Windows World. Frankfurt, July 16-19 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JULY 18-JULY 24

Guide '93 Conference. Montreal, July 18-23 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

Windows World. Mexico City, July 20-22 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Equipment Resources Planning Institute. Albuquerque, N.M., July 22-23 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2997.

JULY 25-JULY 31

All about IBM '93. Aspen, Colo., July 26-28 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

AUG. 8-AUG. 14

Sounds of Change: Emerging Technologies/Re-engineering State Government. Nashville, Aug. 9-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

International Networking Conference '93. San Francisco, August 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

AUG. 29-SEPT. 4

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Espirit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

SEPT. 5-SEPT. 11

Compuexpo '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3418.

SynOptics smoothly inte into your exist

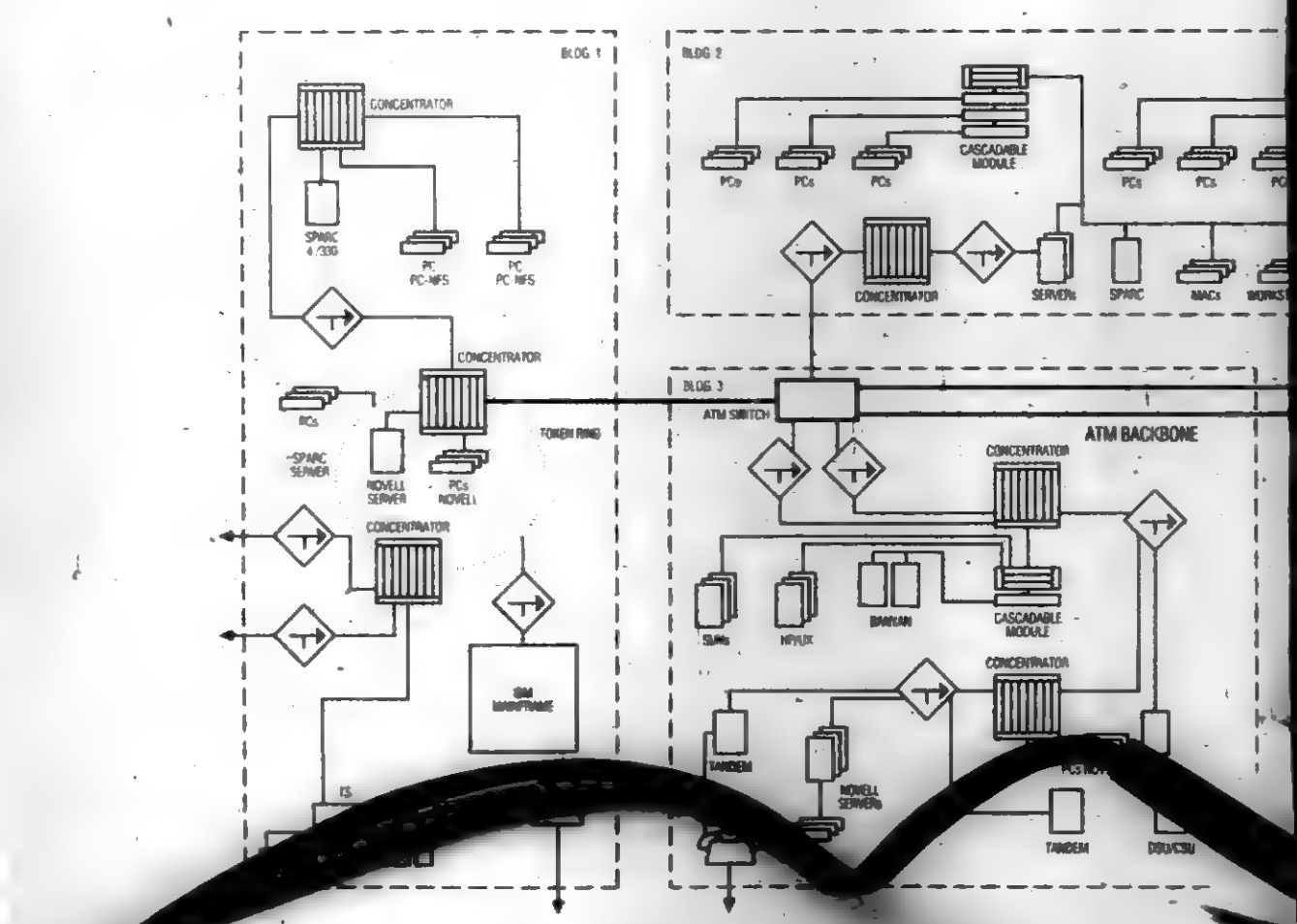
An enterprise network is one of your business' strategic assets. And with the constant arrival of new network technologies, you need a partner to help you merge and manage both the old and the new. That partner is SynOptics.

SynOptics' new LattisCell™ product family enables you to build a complete ATM network, from corporate backbones to desktop connections.

Since the beginning of the intelligent hub revolution, SynOptics has smoothed the transition to new network technologies—from network management, to the first multi-protocol hubs integrating Ethernet, Token Ring and FDDI topologies.

Now SynOptics takes you one step further, with the creation of a cohesive network fabric—an underlying structure that connects and manages individual technologies through the intelligent hub. It provides high-speed network communications. And it's flexible enough to grow as your network does, without sacrificing your existing investment.

When you demand new Asynchronous Transfer Mode (ATM) technology, SynOptics has it. LattisCell,™ our second-generation ATM solution, greatly increases performance both on the backbone and on the



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Intelligence Files

CEO vision

Renato DiPentima, the top information systems executive at the Social Security Administration, is fed up with chief executive officers who get too involved in techno-decisions and toss around terms such as Unix, Application System/400 and Ethernet.

"CEOs should never say those words, That's my job," he said.

DiPentima's message to CEOs: "It's up to you to provide the vision of where you want the business to go, and it's up to me to help you get there [with enabling technology]. If you don't know where you're going, I can get you there, too, like the pilot who says, 'We're lost, but we're making good time.'"

Source: Speech at the Lattanze Center's CEO/CIO Roundtable, Towson, Md., June 8, 1993.

The price of quality

Information systems departments are hopping on the bandwagon to get their processes certified under the ISO 9000 quality standard, but there is a price to pay: The average cost of an ISO 9000 consultant is $939.50 a day, according to a survey of 300 consulting firms.

Only 111 of 660 consultants covered in the survey were formally trained in International Standards Organization assessments, however, underscoring the importance of checking out a consultant's credentials.

Furthermore, the ISO 9000 registrars charge an average of $13,128 for reviewing a small organization and an average of $31,020 for large organizations. Since 60% of first-time applicants fail to win certification, a half-hearted effort can be an expensive blunder.

Source: National ISO 9000 Support Group, Caledonia, Mich., (616) 891-0161.

Process de-engineering

Despite the hype, most new applications of work-flow software are limited to groups of fewer than 50 people. The reason is that it is inherently difficult to define the steps in a process when it is bigger and more complex.

The solution to "de-engineering" a complicated process — that is, breaking it down into components — is to implement a basic automated work-flow system and then monitor what really happens. Use work-flow reporting software that monitors the work in real time and captures the steps in chart form. Then, adjust the work-flow model on an ongoing basis to eliminate inefficiencies.

Source: "The Delphi Workflow Report" newsletter, May 1993, (617) 247-1025.

Cashless society

It may be time to revisit the idea of using information technology to create a "cashless society," which could eliminate armed robbery for cash, money laundering and tax evasion because all income and transactions would be reported to the government.

The authors of this paper propose a government-run transaction processing network of automated teller machines and personal smart cards. The annual cost of the system would be $5 billion, but it would save the economy $100 billion a year. However, privacy and security issues remain.

Source: "The cashless society: It is feasible," a paper by Craig R. Fliks and Laurence L. Loff, Western Illinois University, Macomb, Ill., (309) 298-2302.

Setting the stage

With so many options to choose from, making a presentation can get sticky. Be careful to select the best medium for the message — and the audience. Consider factors such as corporate culture, room size and setting.

Source: *Presentation Products*, June 1993, (310) 456-2283.

grates new technologies
ing network.

desktop. Plus, our complete family of LattisCell products is integrated into a powerful silicon chip set, offering you a significant cost advantage.

SynOptics integrates hardware and software, delivering unparalleled capabilities to manage your network as a single-system solution. Optivity™ network management software gives you the visibility to control connectivity, bridging and routing functions from a single management station, or diagnose problems that may encompass more than one element of the network. Working with SynOptics' ATM solutions, Optivity helps you manage, monitor and diagnose problems across the entire network fabric.

So if you're building or managing an enterprise network, get the wrinkles out with our integrated solutions. Call 1-800-PRO-NTWK for our Solutions Kit on ATM, including our just-released white paper "The Roadmap to ATM Networking." Because at SynOptics, we're smoothing the way for the network of the future.

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"DISK COMPRESSION IS INHERENTLY MORE FRAGILE... ...USERS OF COMPRESSION SHOULD HAVE A COPY OF NORTON UTILITIES 7.0."

PC Week - May 10, 1993

Peter Norton, the leader in data recovery software.

The new compression technology can put you in a squeeze. You wanted the efficiency, but now you're worried about losing data.

Here's some news that might help you relax. No other single product gives you the complete compressed data protection of Norton Utilities® 7.0.

It's the only utility specifically designed to recover data from DOS 6.0 DoubleSpace, Stacker and SuperStor compressed drives. Only with our Speed Disk® feature can you truly defragment the drives, making your recovery a fast, painless process.

You also get the Norton Disk Doctor,® with its nine automated repair functions specific to compressed drives. Plus the new Norton Diagnostics, which analyzes and tests all vital system components, including memory, video, CPU, system boards, communication ports, keyboard, mouse and more.

You can't put a price on peace of mind. But we'll try. Take advantage of the offer below and discover the ultimate security of Norton Utilities 7.0. It just might get you out of a tight spot.

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SYMANTEC.

Purchase DOS 6.0 and receive Norton Utilities 7.0 for only $99.00.* Look for specially marked packages at your local dealer, or order direct by calling 1-800-453-1062 ext. AP91. Users of any previous version of Norton Utilities can upgrade to 7.0 for only $49.00 by calling the toll-free number above.

*Offer good with proof of purchase for new and existing DOS 6.0 owners. Suggested retail price in U.S. dollars plus shipping and applicable taxes. Actual price may vary. Offer good while supplies last. Valid in the U.S. and Canada only. For more information in Europe, call 31-71-353111. In Australia, call 61-2-879-6577. In Canada, call 1-800-465-2266. Everywhere else outside U.S., call 408-252-3570. The Norton Utilities, Norton Disk Doctor and Speed Disk are registered trademarks of Symantec Corporation. Other names are trademarks of their respective holders. Compatible with Windows 3.0 and 3.1, DOS 3.3 and higher. ©1993 Symantec Corporation. All rights reserved.

[redacted]

Joseph Maglitta

Paper slide!

It was a hazy, hot and humid New England morning in August 1992. I arrived at my suburban Boston office early to finish writing an important report. A cup of steaming coffee in hand, I settled down to work.

About 7:15 a.m., the lights flickered, and my terminal screen froze. "Must be too many people running their air conditioners at once," I thought. Irritated, I slapped the side of my terminal.

That didn't work, so I pushed my chair back, got down on my hands and knees and reached under my desk. My systems manager had told me that the quickest way to unfreeze a session is to simply unplug the power cord and plug it back in again. On the way back up, I straightened too quickly, banging my head against the underside of the desk. The next moment, my world turned dark.

Upon awakening, I realized my predicament: Somehow, when I banged my head on my desk, the huge piles of reports, spreadsheets, annual reports, contact lists, newsletters and other computer printouts on and around my desk had toppled onto the floor, completely covering me. I was buried under tons of paper in my office — and suffocating!

Panicked, I flailed my arms, but that only made things worse. A slick, shifting wall of memos, software manuals, employee handbooks, competitive reports, sales summaries, conference proceedings and other documents pressed into my face and chest. My God, I thought, I'm going to choke to death here at my desk!

"Help!" I yelled feebly, but no sound came out. Heavy layers of newspapers and magazines muffled my cries. I tried to rock back and forth to dislodge the paper wall that crushed my head and chest, but it was no use. I was paralyzed.

Lying back, I gasped for breath, cursing myself for not heeding the earlier warnings. How dumb I was! How many times had my boss asked me, begged me, ordered me to toss out anything I didn't need. On her last visit, she had remarked: "Better hope the fire department doesn't come through here. They'll take you away." If only they'd show up now!

Funny, I mused — a dozen years ago when I started in this business, people used to joke that we'd have paperless bathrooms before we had paperless offices. How right they were!

Time passed. Wild thoughts began to flood my mind. A phrase from a business course I'd taken years ago began to haunt me: "When in doubt, throw it out."

Delirious, I imagined The Super Mario Brothers rescuing me. Leading them was

Marcelo Calvo

a database specialist who looked like a Macintosh trash can icon with head, arms and legs. This paper-eating creature ran about gobbling up everything in sight, spitting out a nice stack of neatly labeled floppy disks.

As I became groggy from lack of oxygen, my hand brushed against a cool, hard object. Struggling back to consciousness, my spirit soared. My laptop!

It must have gotten knocked off my desk and pushed under my chair during the paper slide — within usable range!

And even more miraculously, the telephone/modem line was still plugged into its side!

Slowly, painfully, I twisted my wrist to pry open the cover. Because of the tremendous crush of paper, I could only open the top halfway. But that was enough.

Thanks to the easy, menu-driven interface, I was able to log on quickly. The system hummed and beeped comfortingly. I was all set to start the E-mail program when a chilling system message flashed:

Server quota exceeded. Delete unneeded files.

Damn it!, I screamed inside. This is no time for system hygiene! I'm suffocating!

Furiously, I attempted to delete the message. But it was no use; I knew what had to be done. With a groan, I called up my personal directory. In the dim grey light, twisted on my side, I began slowly, systematically scanning each of the hundreds of on-line files. Read. Delete. Execute. Read. Delete. Execute.

After what seemed like days, I reached the bottom of my directory and clacked back to DOS. I never thought I'd be so happy to see a C prompt! Suddenly, I felt a new strength surge through my body. In a flash, I called up the main menu, invoked E-mail and tapped out a terse note to our company's help desk.

Buried in paper at desk. Cubicle near men's room. Help!

I hit SEND and slumped back, exhausted. At that moment, the whole pile shifted. A massive word processing manual rammed into my rib cage, making it even harder to breathe. Please God, I prayed, just let me hang on a little longer. Soon after, I lapsed back into blackness.

I was wrenched back to consciousness by a loud BEEP. New mail! Pain ripped through my hand as I reached for the laptop. In the half-light, I read the glowing words that made my heart leap for joy:

Have contacted building services. Help coming. Hang on.

By now I could barely feel my typing finger. Somehow I managed to peck out:

God bless you, IS.

As I lapsed back into unconsciousness, a joyous thought spread over me: "I'm saved!"

Announcer: This lucky victim spent the next 90 minutes recovering in the company cafeteria. After three cups of coffee, a glazed chocolate donut and a walk around the building, he went back to work with no ill effect.

Thanks to the crack efforts of highly trained IS professionals, serious injury to the individual or business was avoided. Others might not be so lucky.

If you know of any dangerous paper buildups in your own firm, don't wait for disaster to come along. Actively seek out vital information and put it on-line. Your users and management will thank you.

But don't stop there. To protect against serious on-line "data slides," teach your staff and users to weed out and purge any information that isn't absolutely vital for the functioning of your business. Insist that people regularly clean out their own files and directories. While you're at it, campaign against junk E-mail.

Taking these simple steps could mean the differepce between life and death for your organization, your users — and maybe even your job.

We'll be back next week with another Real Office Drama. Until then, remember: Real IS heroes know when to put data on-line and when to take it off. ■

Maglitta is a senior editor, management, and a recovering fire hazard.

Executive Track

Richard J. Switzky is the new senior vice president of technology and operations at **Metropolitan Financial Corp.** in Minneapolis. At his new post, the former senior vice president and manager of operations support services at Minneapolis-based First Bank Systems will be responsible for management information systems as well as deposit operations.

West Virginia University Hospital in Morgantown, W. Va., has a new distributed systems operations analyst.

Mary B. Wise, who was formerly senior management engineer at neighboring AMS, recently assumed the hospital position.

In Livingston, N.J., **John J. Fischer Jr.** is newly in place as senior vice president and chief information officer at **The CIT Group.** Fischer joined the $13 billion commercial and consumer financing company — a joint holding of Japan's Dai-Ichi Kangyo Bank Ltd. and New York-based Chemical Banking Corp. — in 1992 as vice president of business applications development.

Prior to that, Fischer served as vice president of technology and strategic services at the New York Stock Exchange.

Lewis B. Redd, formerly senior vice president at First Data Corp., is newly on board as partner in **Ernst & Young's** Atlanta-based health care practice.

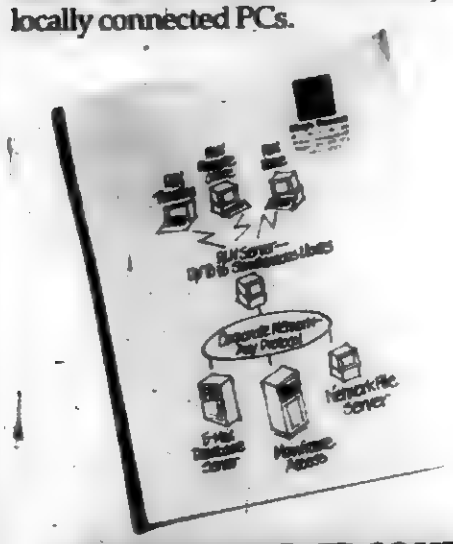
Redd brings some 14 years of health care information systems experience to his new post, including an 11-year stint as a consultant at Andersen Consulting developing strategic and IS plans for hospitals.

James R. Geletka has been named the new executive director of **RESNA**, a 1,600-member, Washington, D.C.-based interdisciplinary association for the advancement of rehabilitation technologies. He formerly served as executive director of the Information Technology Foundation, an industry-based organization dedicated to developing uses of information technologies that aid disabled people.

WHEN REMOTE ACCESS PRODUCTS WERE TESTED IN THE ARIZONA DESERT, GUESS WHO HAD THE HOTTEST SOLUTION?

The test was part of a comprehensive analysis of remote network access solutions done by *Corporate Computing*. They packed up nine dial-in server products and sent a technician out to do some real field testing—in the town of Sedona, Arizona, pop. 7940.

He dialed in to the ZD Labs LAN in Foster City, California. And when he logged off, he had a winner: Remote LAN Node® (RLN™) from DCA®—a unique software solution that lets up to 16 remote users dial in at once and function just like locally connected PCs.



RLN PROVED IT COULD TAKE THE HEAT.

We'll let the article do the talking. "The best product was Remote LAN Node—a software solution that acts like a multiprotocol router when installed on a PC on a LAN."

The magazine went on to say, "Our winner, DCA's RLN, stood out for its capability to handle multiple communications protocols," commenting that "it won hands-down on flexibility, allowing our remote users to connect to both IPX and IP servers in the same call."

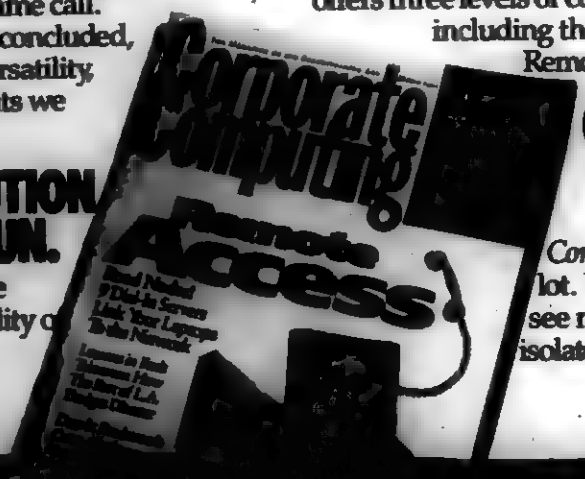
All in all, the article concluded, if you're looking for versatility, "None of the other units we tested came close."

THE BEST SOLUTION UNDER THE SUN.

Remote LAN Node extends the full capability of the network to remote users, allowing them to function as true remote nodes.

RLN is both protocol- and application-transparent. So you can access any network protocol, such as IPX/SPX (Novell®), SPP/IPC (Banyan®), NetBEUI (Microsoft®) and TCP/IP—or any interconnected combination. And, as *Corporate Computing* pointed out, you can access them simultaneously.

You only dedicate one PC as a comm server for 16 concurrent users. And RLN offers three levels of configurable security, including the industry's first Remote Security Adapter.



GET IT WHILE IT'S HOT.

We've quoted *Corporate Computing* a lot. But we'd like you to see more than just a few isolated sentences. So call us, and we'll send you a reprint of the article. We'll also send an informative booklet, "Just Like Being There—A Guide To Remote Network Access."

And finally, we'll let you make the same sort of test *Corporate Computing* did. We'll send a free copy of RLN client software, so you can dial in to our LAN Lab server and judge for yourself.

You won't have to go to the desert. Or even leave your office. But you'll find yourself in a whole new world.

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SEE US AT PC EXPO BOOTH #3360.

The CW Guide to Mobile Computing

For our report on managing mobility, see page 97.

On the LOOSE

When you outfit your staff with portables, mobility takes on a life of its own. Before long, you'll have new security and networking issues to deal with, as well as a whole host of miniature technologies to explore.

Anyone who has armed users with portable computers should know the monster they've created. Soon you get requests for links to electronic mail; then it's personal information management software. Then they want fax modems, faster downloads, on-line access to the local-area network — it's enough to make you wish the little critters were never invented.

But these requests aren't easily ignored because soon they're coming not just from the users but from the head of sales or, heaven forbid, from the chief information officer himself. That's because many benefits of mobile computing go straight to the heart of COMPETITION.

The smartest companies are examining mobile computing "for the competitive advantage it will give them," says Greg Pellegrino at American Management Systems, Inc. in Roanoke, Va., a high-technology consulting firm.

What's dangerous is that this market is never short on gadgetry. "Vendors show up with their latest feature, and firms get wowed without looking at how it can be meaningfully applied," says Barton Goldenberg, president of Information Systems Marketing, Inc. in Washington, D.C. "The need to establish a mobile computing environment should be market-driven, not technology-driven."

With that in mind, our guide will lead you through the issues of building mobile computing architectures, from the latest hardware features to remote-access techniques to what users are saying about the notebooks they've already bought. ■

AFTER YOU BUY pages 110-111

- "What about my E-mail?" Or, what happens after you've outfitted the staff with mobile computers.

WHAT'S IN THE BOX pages 112-114

- What you REALLY need in a notebook computer.
- A quick look at the smaller bunch, including subnotebooks, palmtops, personal digital assistants and more.
- Plus . . . the hottest new features in notebooks.

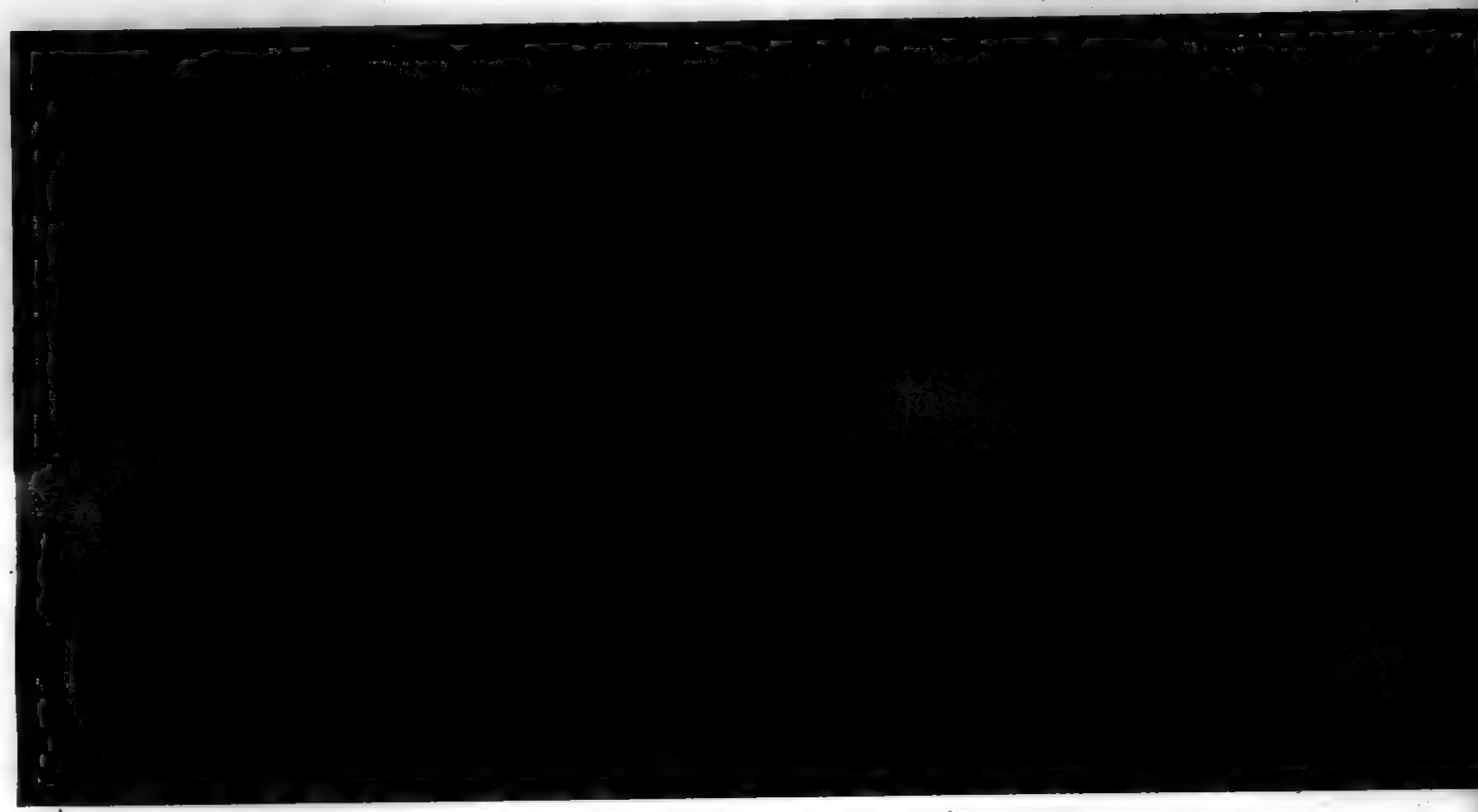
REMOTE LINKS pages 116-117

- Two ways to hook remote users to the LAN.
- Plus . . . vendors that can help with your remote-access needs.

USER RATINGS pages 141-145

- IBM scores highest satisfaction among top color notebook models.
- Firing Line participants give Apple's PowerBook 180C rave reviews.

Is there anything your mainfra



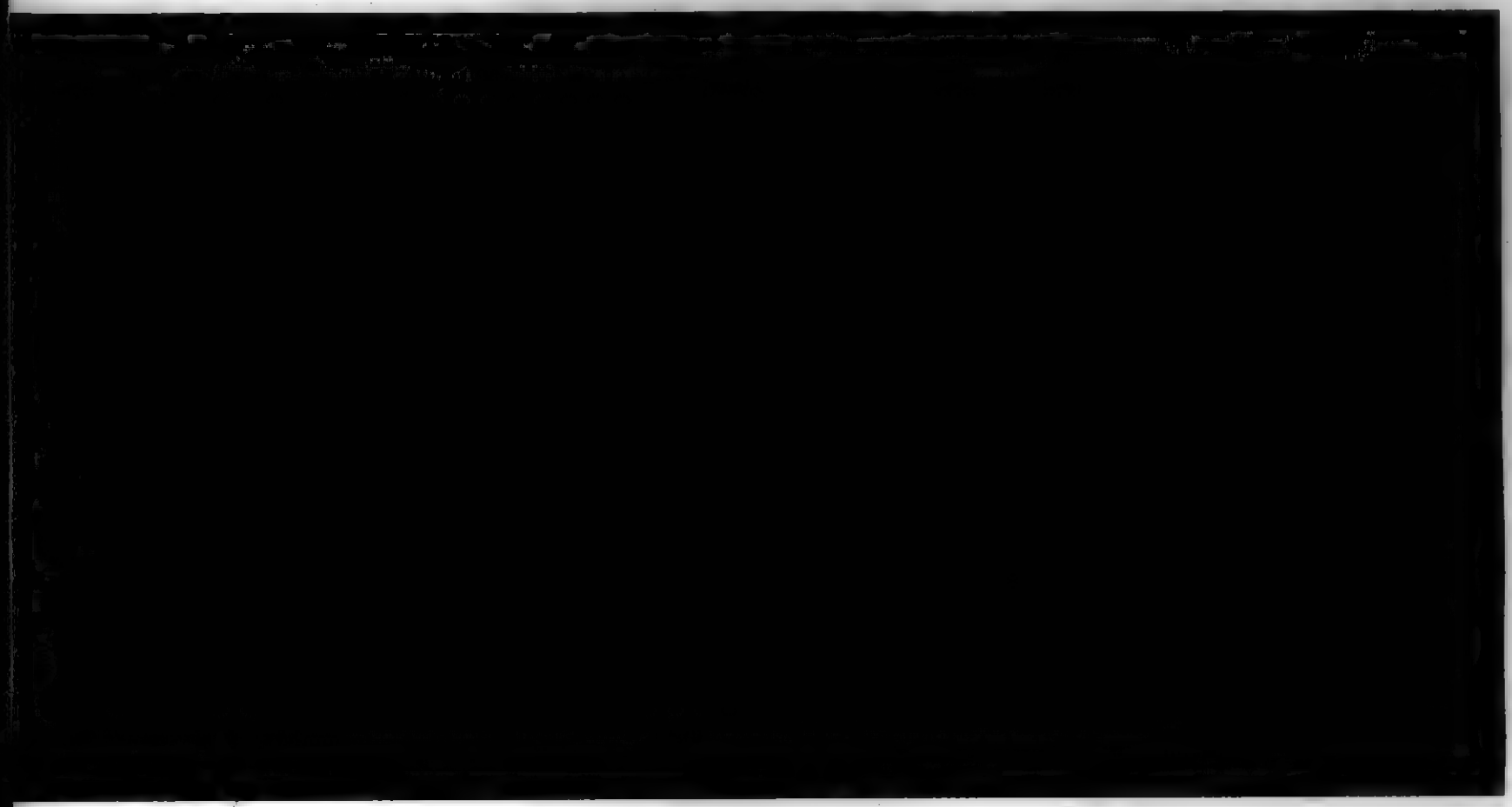
Once upon a time, mainframes and networks didn't get along. They were so different, they feared each other. But now, with the upswing in downsizing, client/server and PC networks, mutual cooperation is in order. So you're probably asking: *"How can I leverage my investment in mainframe applications and data to benefit my network clients?"* Which is tough enough to say, let alone do.

We have a simple suggestion: let your big strong mainframes help your smaller networks with NetWare for SAA. NetWare for SAA integrates mainframe and NetWare environments, giving DOS,

NetWare + NetWare for SAA **= Network-to-Host Integration**

All Novell products work together. So your NetWare network is a platform to build on for years to come. That's why, now more than ever, NetWare *is* networking.

me can do to help your network?



Windows, Macintosh and OS/2 network clients smooth access to mainframe and AS/400 applications. Including databases and E-mail. Yet it allows you to apply mainframe system management tools (like NetView) to the network. With NetWare for SAA, a mainframe can distribute software to your networks and even serve as an archive to ensure network data integrity. If you have a NetWare environment, NetWare for SAA brings the power of the mainframe to users who need it. And finally, everyone will live happily ever after.

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yes NetWare

yes

Now you can have the most powerful network-to-host solution.

Get both NetWare for SAA™ and the best client software–IRMA™ WorkStation for Windows, OS/2, DOS, and Mac–from one company: DCA. The only place to get single-source training and support for the finest network-to-host solution.

IRMA WorkStation software will greatly enhance your NetWare for SAA gateway by providing ease-of-use and client server development tools and a similar interface across four platforms. Call 1-800-348-3221, ext. 49X, for limited-time special pricing for the NetWare for SAA/IRMA WorkStation solution.

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DCA

Call 1-800-892-2922 to make reservations in your area for the Novell*/DCA Road Show.

Beyond the notebook

AFTER YOU BUY

By Stephen Rood

Mobile computing doesn't just mean notebooks anymore — or subnotebooks for that matter. No, it runs much deeper — and much closer to the business — than that. As soon as you hand an executive or a salesperson a notebook, you've opened the floodgates.

"If you give somebody a mobile computer, the next thing they ask is, 'What else can I do?' " says Andy Seybold, publisher of the "Outlook on Computing" newsletter.

And for good reason. The executive who can access electronic mail faster or the salesperson who can deliver an order faster is a contributor to the bottom line.

"[We had to] address this technology

Bausch & Lomb reps remotely download reports that forecast sales.

David Phillips
Bausch & Lomb

first before our competitors did," says William O. Bauserman, vice president and director of MIS at O'Sullivan Corp., a manufacturer of soft plastics in Winchester, Va. The company is in the beginning stages of outfitting its 45-member sales force with notebooks that dial into the local-area network server to access updated inventory data and place orders electronically.

Remote LAN access is one of the hottest topics these days in terms of setting up a mobile computing architecture. According to a recent Forrester Research, Inc. report, network vendors offering mobile LAN solutions will see revenue increase from $529 million this year to $2.8 billion by 1997.

Forrester attributes the high interest in mobile LAN access to two factors: the move to client/server (and the accompanying demand to access information on host systems) and the increase in LAN-based sales, marketing and service applications (see chart below).

One of the most common reasons for establishing remote LAN access is E-mail. At MCA/Universal Studios, a "remote LAN" was built to allow division executives to remotely access E-mail on the Apple Computer, Inc. LocalTalk LAN as well as corporate financial information downloaded from an IBM 3090 and Application System/400. Each executive uses an Apple PowerBook equipped with a 9.6K or 14.4K bit/sec. modem.

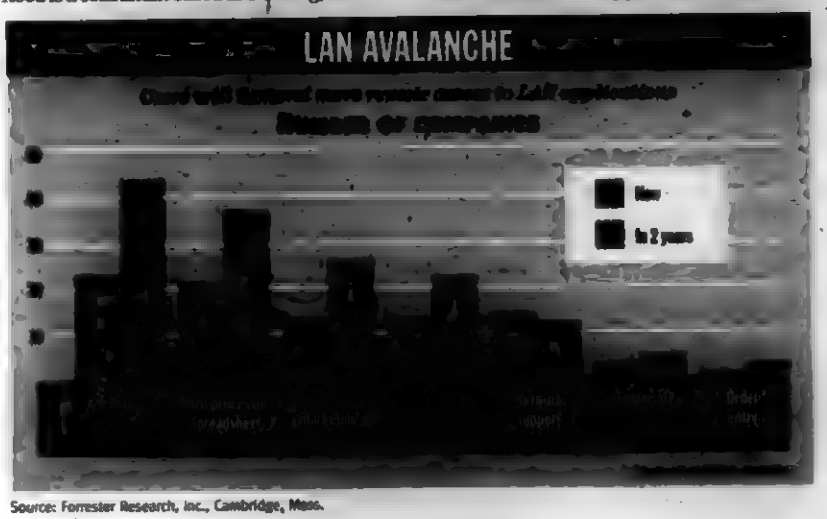
But even with just 10 to 15 people dialing in, MCA/Universal has already tangled with some of the issues that industry analysts say will hit any information systems department supporting remote access. These issues range from establishing security and monitoring use to allowing adequate network bandwidth and tracking software licensing.

At MCA/Universal, network response has already become a concern. The company is currently using LocalTalk-based modems from Shiva Corp. and achieving a throughput of 250K bit/sec. It plans to switch to Ethernet-based NetModem/Es, also from Shiva, to achieve Ethernet's 10M bit/sec. throughput, according to Thes Hansen, technical consultant at the company.

But an even bigger concern with dial-up access is security. The very first decision you must make when providing LAN access, Seybold says, is: "Do you put a modem on everyone's desk or do you put a communications server on the network and let people go in through the server?" Either way, he says, there are security concerns and, in the latter case, a lot of unknowns.

In most cases, current security needs to be beefed up, Seybold says. The most common techniques are dial-back, where the modem calls back the person requesting access to ensure identity, and varying levels of password protection. Hansen relies on the user ID and password features of AppleTalk Remote Ac-

Rood is a consultant based in Ossining, N.Y.



Source: Forrester Research, Inc., Cambridge, Mass.

cess. However, it is not compatible with MCA/Universal's primary security system, Datalock, which resides on the mainframe systems.

Common sense is one of the best safeguards. At Rochester, N.Y.-based Bausch & Lomb, sales technology manager David Phillips sends his sales force their Toshiba America Information Systems, Inc. laptops separately from a diskette containing the telephone numbers and passwords needed to access the LAN.

Phillips also limits the information users can access or download, a technique that also quells bandwidth concerns.

The Bausch & Lomb sales force automation system supports Lotus Development Corp.'s CC:Mail and report distribution to a staff of 40 sales representative and managers.

A remote account servicing system "has positioned us to respond better than our competition."

Mike Mulligan
Applied Data Systems

In some cases, it's not enough for users to just download files from the LAN; they need to operate as a full-functioning node, as if they were in the office. This has sprung the lock on a new type of LAN access, called "remote node" (see chart page 116).

With remote node access, users are full-functioning nodes on the LAN. With the more traditional "remote control" technique, users become terminals to LAN-attached PCs.

According to Forrester, new software is emerging that was specifically designed to run in a remote node environment, including mail, file transfer and application software. Examples include Notes, CC:Mail Remote, Traveling Software, Inc.'s Laplink and Xcellenet, Inc.'s RemoteWare (see story page 117).

Beverage Distributors Corp. in Denver used RemoteWare to set up a sales force automation system that employs an "update server." This type of device is something a lot of companies are starting to use to provide periodically updated information on, say, the latest inventory counts or patient records in a hospital.

In Beverage Distributors' case, the server is a 486 PC that downloads information from an IBM 4381 to provide the 120-person sales force with updated inventory information and a means to process orders of liquor sales to stores and restaurants, says Mike Mulligan, president of Applied Data Systems, a division of Beverage Distributors.

RemoteWare provides an easy-to-use front end as well as connectivity to the server. "The system helps the salespeople throughout the day as they call on various accounts and process orders directly on-site using a 386 notebook PC," Mulligan says.

For example, a salesperson for a restaurant can work with the owner to compile a seasonal wine list and be sure that the wine will be available for delivery. Seen in this light, mobile computing is an emerging technology with a plethora of new issues to consider. But while most of the technical problems can be solved, answers to the management issues are not so clear-cut. For instance, Barton Goldenberg, president of Information Systems Marketing, Inc. in Washington, D.C., asks, "How safe is mobile computing [referring to the recent wireless cellular health concern]? How will this new technology affect sales team spirit with everyone always out in the field? Who's going to train the growing number of remote computing users?" (For more on management issues, see story page 97.)

With all of this to consider, it's clear that this small-format technology will continue to create anything but small changes for IS departments with users on the move. ■

Where wireless fits in

It's still not entirely feasible for most companies to consider wireless technology to meet the remote access or E-mail needs of a geographically dispersed sales team. All three options demand high transmission costs per character, and each poses its own hurdles:

- Satellite offers seamless, nationwide coverage but at a price up to 20 times that of land.
- Cellular is cheaper than satellite but offers uneven quality between cell sites. Also, the degree of possible contention with existing cellular voice traffic is unknown, and security in data transmissions remains a concern.
- Specialized mobile radios offer proprietary network protocols that cannot be used with existing corporate applications without extensive customization.

What's more doable is to create a wireless system that allows remote access or E-mail within a building or campus. Likely applications would be medical reporting and inventory management, as long as users are within 500 feet of the server when indoors or within 800 feet when outside.

That's what is promised with new products from NCR Corp. with its soon-to-be-released WaveLAN/PCMCIA product and Proxim, Inc. with its RangeLAN/PCMCIA offering. Both of these products use the Personal Computer Memory Card International Association (PCMCIA) Type-II plug-in card slot now offered on most new notebook PCs.

yes

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Making sense of features

WHAT'S IN THE BOX

By Keith Richard Aleshire

Portable computer makers excel at marketing new gadgetry. But with prices 30% to 40% more than those of comparable desktop models, you certainly don't want to fall for the latest craze.

There are not only more features but also more size categories. Laptops and notebooks are in the "over-four-pound" grouping, while subnotebooks, pocket organizers, palmtops and the very new personal digital assistants are in the less-than-four-pound category (see chart below).

Of the lot, notebook computers are stealing the show at a slim four to seven pounds. Subnotebooks — at just under four pounds — eliminate the built-in floppy drive, have smaller keyboards and require you to carry an external drive or a cable and software to transfer files.

Aleshire is an independent author and writer, as well as owner of Minneapolis-based Computer Consumer Services, Inc.

Palmtops offer lots of portability, as they can last for weeks on ordinary AA batteries. However, tiny keyboards make typing-intensive applications impractical. Hence, palmtops tend to be used as electronic calendars, calculating machines and contact lists.

Since the majority of people still choose notebooks, we've outlined the features you should be aware of and how to select among them:

Screen possibilities

Most notebook screens today use backlighting or edgelighting to improve readability, especially in dim light. A few exceptions, such as Dell Computer Corp.'s 320SLi, exclude backlighting to lengthen battery life. If your users will ever need to work in a dim area, though, insist on backlighting.

Most LCDs use passive-matrix displays, where each dot, or pixel, on the screen shares electrodes with other dots. Because of this sharing, passive screens can't keep up with the movement of the mouse pointer in Windows, causing it to blur or "disappear" if you move it quickly, reappearing wherever it stops on-screen.

The more expensive active-matrix screens (also known as a thin-film transistor or TFT) have a separate transistor

HOW SMALL CAN YOU GET?

The industry continues to churn out tinier and more functional devices.

- Average price: $1,500.
- Weight: Less than 1 pound.
- Description: 8086-based machines that are specifically programmed and contain an inexpensive docking station.
- Typical user: Field service person with data entry applications.
- Future capabilities: More vertical applications.
- Vendors: American Mitac Corp.'s Mitac 1600A; Atari's Portfolio; Epson America, Inc.'s EHT-29; Fujitsu Personal Systems, Inc.'s Poget PC; Psion, Inc.'s HC series, Organiser II, Series 3 Palmtop; Sharp's PC-3000 Palm Executive; Vortex Systems, Inc.'s PT-100.

ACTIVE MATRIX SCREENS

[illegible]

LOW-ENERGY PROCESSORS

[illegible]

NICKEL-METAL HYDRIDE BATTERIES

These batteries provide 80% longer battery life, and you can recharge them when they are not yet fully worn down without shortening battery life.

PCMCIA SLOT

PCMCIA slots allow you to plug a device the size of a credit card into your laptop. Check that the laptop and cards support Version 2.0, which allows you to run software from the card without a performance penalty.

BUILT-IN POINTING DEVICE

Because of the rise of GUIs, more people prefer built-in pointing devices to toting around a portable mouse. Try out the ergonomics of the trackball's location, especially if buying for left-handed employees. Center placement may be best.

for each pixel, providing quick response and razor-sharp images. Monochrome active-matrix screens are found on some Apple Computer, Inc. PowerBooks and on Compaq Computer Corp.'s LTE Lite/25E.

Selecting a color screen is a choice between money and vivid color. Passive-matrix color LCDs add only $500 to $800 to a portable notebook's price, but colors tend to be washed out. Active-matrix color screens provide better colors than does a desktop computer — but jack the price up $700 to $900 over passive-matrix color.

The ultimate battery

Most notebooks still use a rechargeable nickel cadmium (NiCad) battery pack, which gives the user a battery life of about two to three hours. One problem with NiCad batteries is the "memory effect," where the battery recognizes ever-earlier charge points as its limit until it becomes unusable.

For this reason, nickel-metal hydride, or NiMH, batteries are slowly replacing NiCad batteries.

However, while they provide

Hardware, *page 114*

PERSONAL DIGITAL ASSISTANTS

- **Average price:** $1,000.
- **Weight:** Less than 3 pounds.
- **Description:** A powerful, handheld communications-intensive device with a focus on ease of use.
- **Typical user:** PC-phobic mobile users who desire two-way communications, for either business or personal use.
- **Future capabilities:** More subscribers, an interface to standard E-mail, more information to query.
- **Vendor sampling:** Tandy Corp./Casio's Zoomer; Apple Computer, Inc.'s Newton; Sharp (not yet shipping).

SUBNOTEBOOKS

- **Average price:** $2,000.
- **Weight:** Less than 4 pounds.
- **Description:** A device with full PC functionality but with a reduced keypad and screen and no floppy drive.
- **Typical user:** User with non-RAM-heavy applications.
- **Future capabilities:** Voice and fax capability, cellular communications, standard docking stations.
- **Vendor sampling:** Apple Computer, Inc.'s PowerBook Duo; Dell Computer Corp.'s 320SLI, 325SLI; Dauphin Technology, Inc.'s DTR-1; Gateway 2000, Inc.'s Handbook; HP's OmniBook 300; IBM's ThinkPad 500; Zeos' Conenda, Zenith Data Systems' Z-lite

PEN-BASED DEVICES

- **Average price:** $3,000.
- **Weight:** Less than 6 pounds.
- **Description:** A device with an input stylus using either the PenPoint or Pen Windows operating system.
- **Typical user:** Field service person with data entry applications.
- **Future capabilities:** More applications and handwriting recognition.
- **Vendor sampling:** AST Research, Inc.'s Pen Exec; Grid Systems Corp.'s Grid Convertible, Grid Pad; IBM's ThinkPad 700T, 710T; Logitech, Inc.'s Pen Reference Design; Microslate, Inc.'s Datelite; NCR Corp.'s 3130 NotePad; NEC Technologies, Inc.'s Ultralite; Toshiba America Information Systems, Inc.'s T100 X Dynapad.

Source: Meta Group, Inc., Westport, Conn., and *Computerworld*

yes

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Hardware

CONTINUED FROM PAGE 113

80% more battery life, they also come with a 50% price premium.

Tied up at the dock

If your users use a single machine to serve them in-office and on the road, consider docking stations. A docking station is an encasement the portable plugs into, providing additional expansion slots and a larger hard drive.

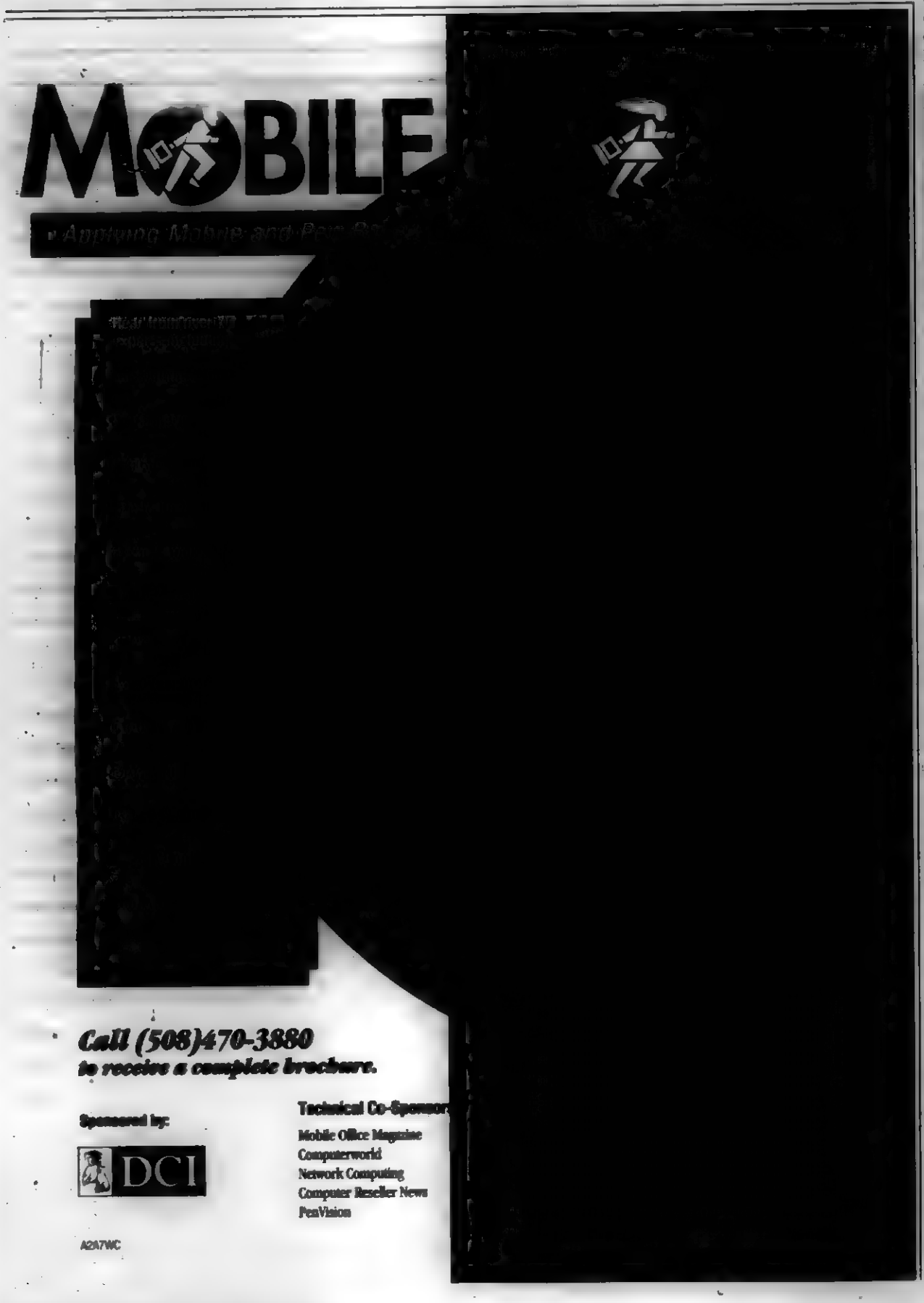
An external monitor is usually placed on top of the docking station so that, in effect, the portable serves as the "brain" of the docking station. Toshiba America Information Systems, Inc.'s Deskstation IV, for example, has two expansion slots and ports for an external monitor and keyboard.

An alternative is the smaller port replicator strip. Zenith Data Systems and AST Research, Inc., among others, offer these devices, which let you attach or detach a notebook from a desktop keyboard, monitor and printer in one step.

PCMCIA convenience

You've probably been hearing a lot about that way-too-long acronym PCMCIA, which stands for the Personal Computer Memory Card International Association specification. Once you get past all the letters, the technology is quite useful. It puts modem, fax, storage or local-area network connection capabilities on a small PC card that slides into a thin slot on compliant notebooks. A 2- by 3-in. PC card can provide an RJ-45 plug to connect a notebook to a network.

There are three and soon to be four designs of PC cards. All three types use the same female 68-pin edge connector but differ in thickness. Type I accommodates thin memory cards; larger Type II PC cards provide LAN connections or modems; and Type III cards can accommodate cards with moving parts, notably hard disks of 100M bytes or greater.



SUBNOTEBOOK GROWTH

Subnotebooks will experience dramatic growth, says Jeff Henning, senior industry analyst at IMS Strategic Decisions. He expects subnotebook sales to more than triple between '92 and '93. But they won't overtake the industry. The reasons, Henning says, include the fact that they're less powerful, lack floppy drives and people prefer the notebook form factor.

Currently, you cannot add or remove PCMCIA cards without turning off your computer. But eventually, you will be able to do things such as use a modem card to download information from another computer, remove the modem card and insert a flash memory card to copy the data while your portable is still on.

Many low-end and high-end portables now include a PCMCIA slot.

Insist on PCMCIA cards that comply with the PCMCIA 2.0 standard released last September. It allows applications to run directly from the card, start more quickly and not require random-access memory. The technology is still new; most vendors are reluctant to install the crucial PCMCIA socket services, which read cards, onto their systems. This forces PC card makers to write separate drivers for each vendor's machine.

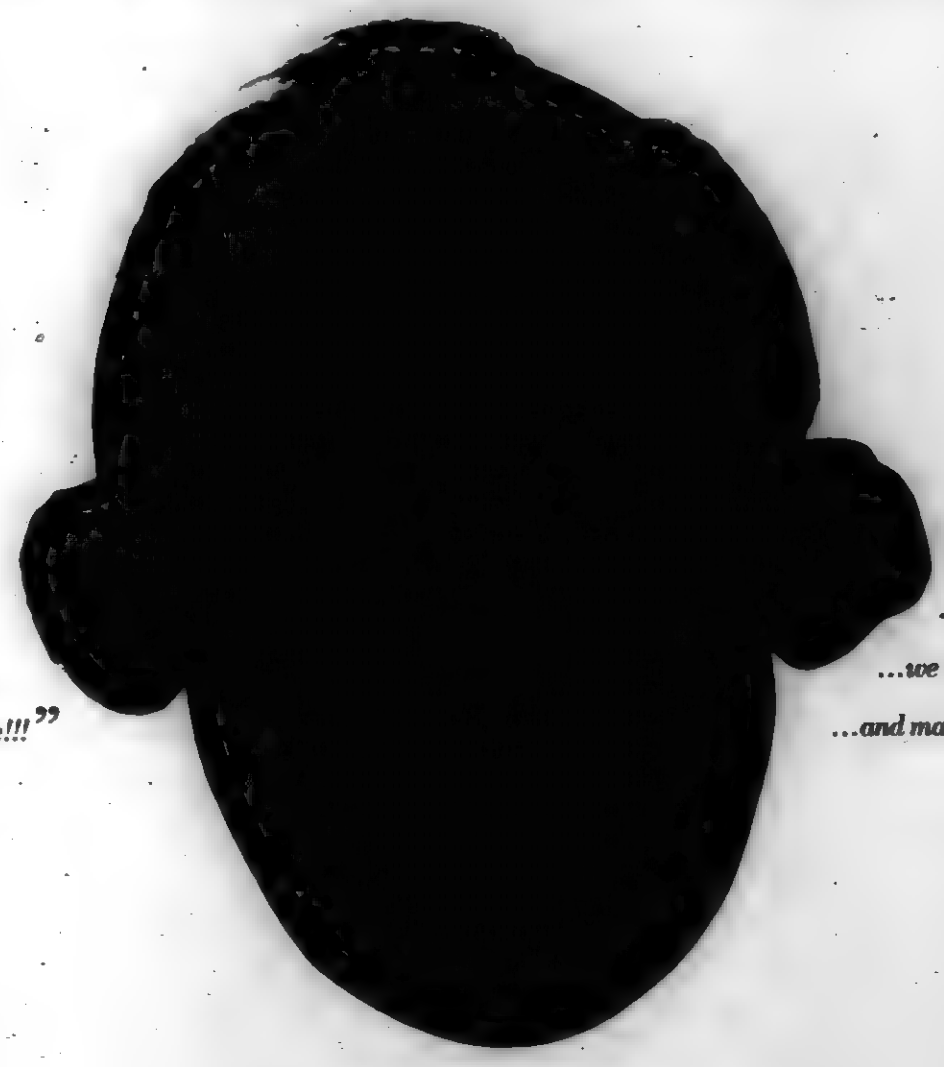
Of mice and modems

If your users run Windows, you'll need to consider either a machine with a built-in pointing device or one of the many portable mice. Placement differs from vendor to vendor. Compaq, for example, places its trackball next to the screen.

AST and Zenith Data have copied Apple's ambidextrous PowerBook design by putting a trackball front and center, below the space bar. Others use the cursor arrows as mouse keys or provide a special mouse key that responds to fingertip pressure in all directions.

IBM's TrackPoint II, a little red stick in the middle of the keyboard, is also on the market. ■

Diagnosis: *Acute Demanditis*



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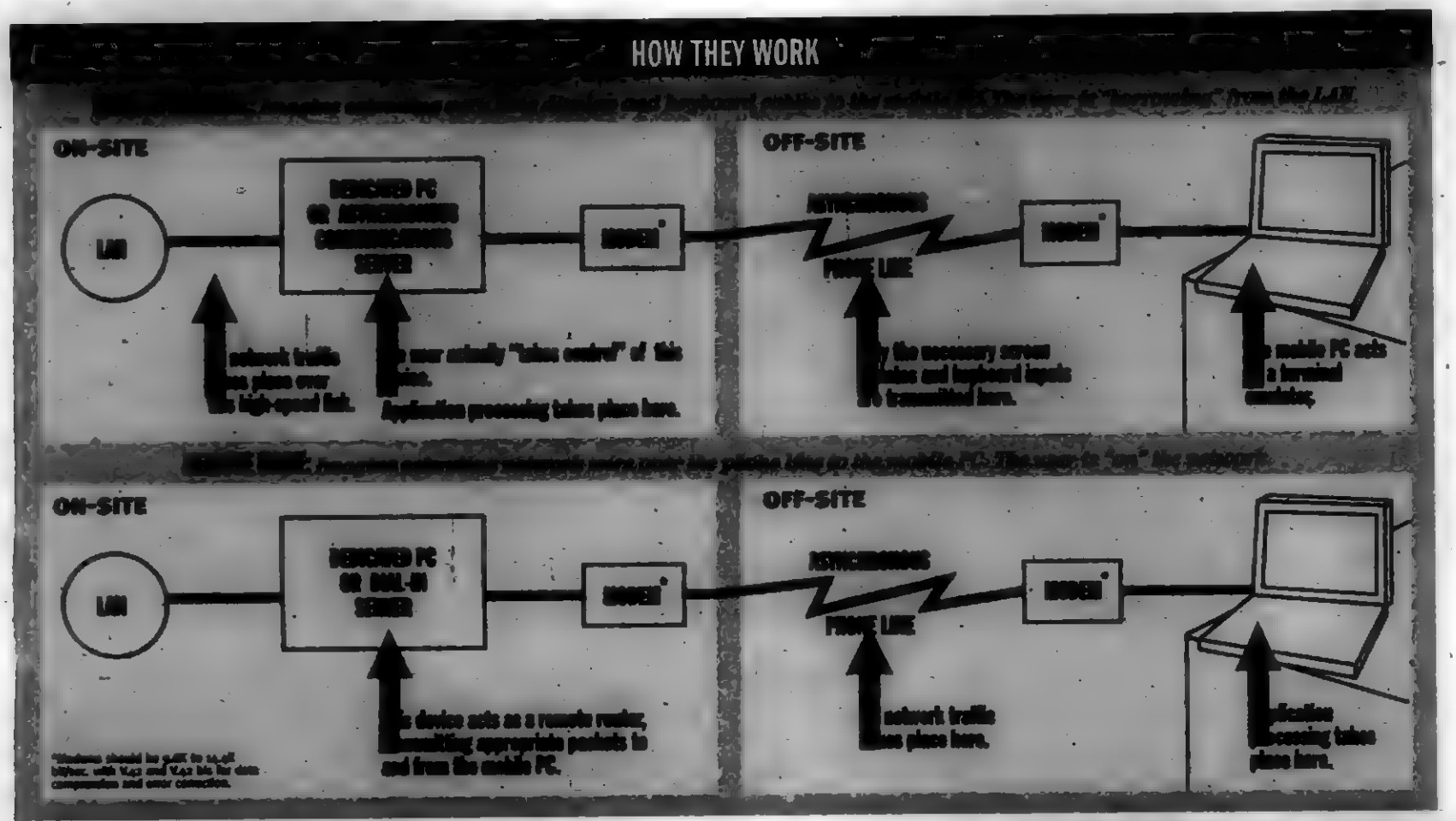
Two ways to make the LAN connection

REMOTE LINKS

A new technique turns mobile PCs into live nodes, not terminal emulators

HOW THEY WORK



HOW THEY DIFFER

Cost

REMOTE CONTROL
Typically more expensive per port because there must be either a dedicated PC or an asynchronous communications server with a dedicated PC board for each dial-in port.

REMOTE NODE
No need for a dedicated PC board for each dial-in port. As a result, typically less expensive on a per-port basis.

Best applications

REMOTE CONTROL
Must be server-based. Best suited to DOS server/workstation applications or those requiring significant network traffic (as the actual network packets aren't transmitted over the asynchronous line). Best for on-line, interactive applications such as databases, order entry, inquiry, certain E-mail packages, etc.

REMOTE NODE
Must reside on the mobile PC. Better suited to graphics and client/server applications as well as those requiring relatively little network traffic. Also better for programs such as word processors and spreadsheets where the user can work off-line, using the network primarily for file transfer and related operations.

User interface

REMOTE CONTROL
Typically not as intuitive, as users must constantly be aware that they are controlling a different PC than their own. This is particularly true for file transfer, where a separate file-transfer utility is used instead of the traditional COPY or XCOPY commands.

REMOTE NODE
The user interface is exactly the same in a remote or local environment. The user has direct access to the local drives in the mobile PC and can use standard COPY or XCOPY commands to transfer files to and from a network file server.

Number of users supported

REMOTE CONTROL
Because users work on-line with remote control and their sessions tend to be longer, fewer users per port can be supported (typically in the range of 10 to 20 users per port).

REMOTE NODE
Because remote node connections are typically shorter (more of the user's work is performed off-line), remote nodes can support more users per port (typically 20 to 40 users per port).

WHERE TO GET THE PRODUCTS

Centrum Communications, Inc.'s CentrumRemote
San Jose, Calif.

Cubix Corp.'s LCS/ACS
Carson City, Nev.

Gateway Communications, Inc.'s LAN Expander
Irvine, Calif.

Integrated Workstations, Inc.'s Communique
San Jose, Calif.

J&L Information Systems, Inc.'s Chatterbox
Chatsworth, Calif.

Novell, Inc.'s Shared Access LAN Modem
Provo, Utah

U.S. Robotics, Inc.'s Shared Access Communications Server 386
Skokie, Ill.

Cayman Systems, Inc.'s GatorLink
Cambridge, Mass.

Digital Communications Associates, Inc.'s Remote LAN Node
Alpharetta, Ga.

Gateway Communications, Inc.'s LAN Expander
Irvine, Calif.

Microtest, Inc.'s LANModem
Phoenix

Shiva Corp.'s NetModem/E, LanRover/E
Cambridge, Mass.

Telebit Corp.'s NetBlazer ST, NetBlazer 40
Sunnyvale, Calif.

UDS Motorola's LanFast
Huntsville, Ala.

U.S. Robotics' Shared Access LAN Modem, Shared Access Communication Server 386
Skokie, Ill.

Central Point Software, Inc.'s Commute
Beaverton, Ore.

Microcom, Inc.'s Carbon Copy
Norwood, Mass.

Norton-Lambert Corp.'s Close-up
Santa Barbara, Calif.

Ocean Isle Software's ReachOut
Vero Beach, Fla.

Symantec Corp.'s pcAnywhere
Cupertino, Calif.

Triton Technologies, Inc.'s CO/Session
Iselin, NJ

A third consideration: Remote-ready apps

Along with "remote control" and "remote node" comes another alternative for remote LAN access: remote-ready applications.

These programs were specifically designed for remote use with modems over a phone line. Lotus' CC:Mail Remote (a companion product to CC:Mail), for example, allows remote users to download their mail via modem and then work off-line to reply to the messages and/or create new ones. On the next connection to the network, these messages are uploaded and new ones downloaded, etc.

This type of off-line operation can make remote-ready applications very appealing to the mobile professional.

Because they run in the mobile PC, remote-ready applications act more like remote node than remote control. Many of them, however, require a dedicated PC on the LAN to act as a gateway for the remote users. And while they can be efficient and simple to use, they often don't provide all of the functionality of their conventional counterparts.

In addition, since they're dedicated applications, they don't satisfy the need for a general remote LAN access solution. On the other hand, if you need remote LAN access only for a specific application, such as E-mail, remote-ready applications can be a viable solution.

These programs are few and far between, however, and you should investigate carefully to make sure the one you choose has all the features you need. In the future, remote operations will increasingly be built into conventional applications.

Steve Magideon is an independent consultant specializing in networking and portable connectivity. He can be reached on CompuServe at 72727,3216.

Software distribution

REMOTE CONTROL
Software updates and distribution are simplified because the applications are server-rather than mobile PC-based.

REMOTE NODE
As applications are updated, they must be distributed to each mobile PC user. This can cause additional work for network administrators.

Popularity

REMOTE CONTROL
Has about 60% market share, but that's dropping. Still more popular when multiple ports need LAN access. Often used when individuals simply need to access their desktop PC from a remote portable, often without the need for LAN access.

REMOTE NODE
Increased in popularity in the past year. Trends toward client/server and GUIs indicate it will become the predominant choice within the next one to two years.

Impact on management

REMOTE CONTROL
Network management is centralized because the nodes are locally connected to the LAN.

REMOTE NODE
While some solutions support tools such as SNMP, network management can be more difficult because the actual network nodes are remote from the LAN.

Security

REMOTE CONTROL
Because most solutions use a separate utility for file transfer and this utility can be disabled on a user-by-user basis, remote control can offer additional security by restricting which mobile users can transfer files to or from the file servers, irrespective of their access rights in a local environment.

REMOTE NODE
Users have the same access rights in a remote environment as in a local one, including the ability to copy potentially sensitive files to or from the network. There is typically no convenient way to give a user different access rights in a remote vs. local setting.

Software licensing

REMOTE CONTROL
Two issues: First, you need to acquire only one software license for each LAN node on the network, as this is where the applications are actually executed. The number of LAN nodes is typically much lower than the total number of remote users. Secondly, most remote control products charge a separate license fee for each remote user, although this fee is nominal.

REMOTE NODE
Because applications reside on the mobile PC, there must be as many licenses as there are mobile PCs. Network managers must be careful, however. Since requested applications are downloaded and can often be stored on the mobile PC if they don't already reside there, it is possible for a user to inadvertently violate a license agreement. And as with remote control, many remote node vendors charge additional license fees for their software based on the number of remote users.

Two PCMCIA 2.0 Slots, Type II (5mm) and Type "IV" (16mm): Twice the expandability. Easily accepts multiple cards including hard disk drives, modems and network adaptors.

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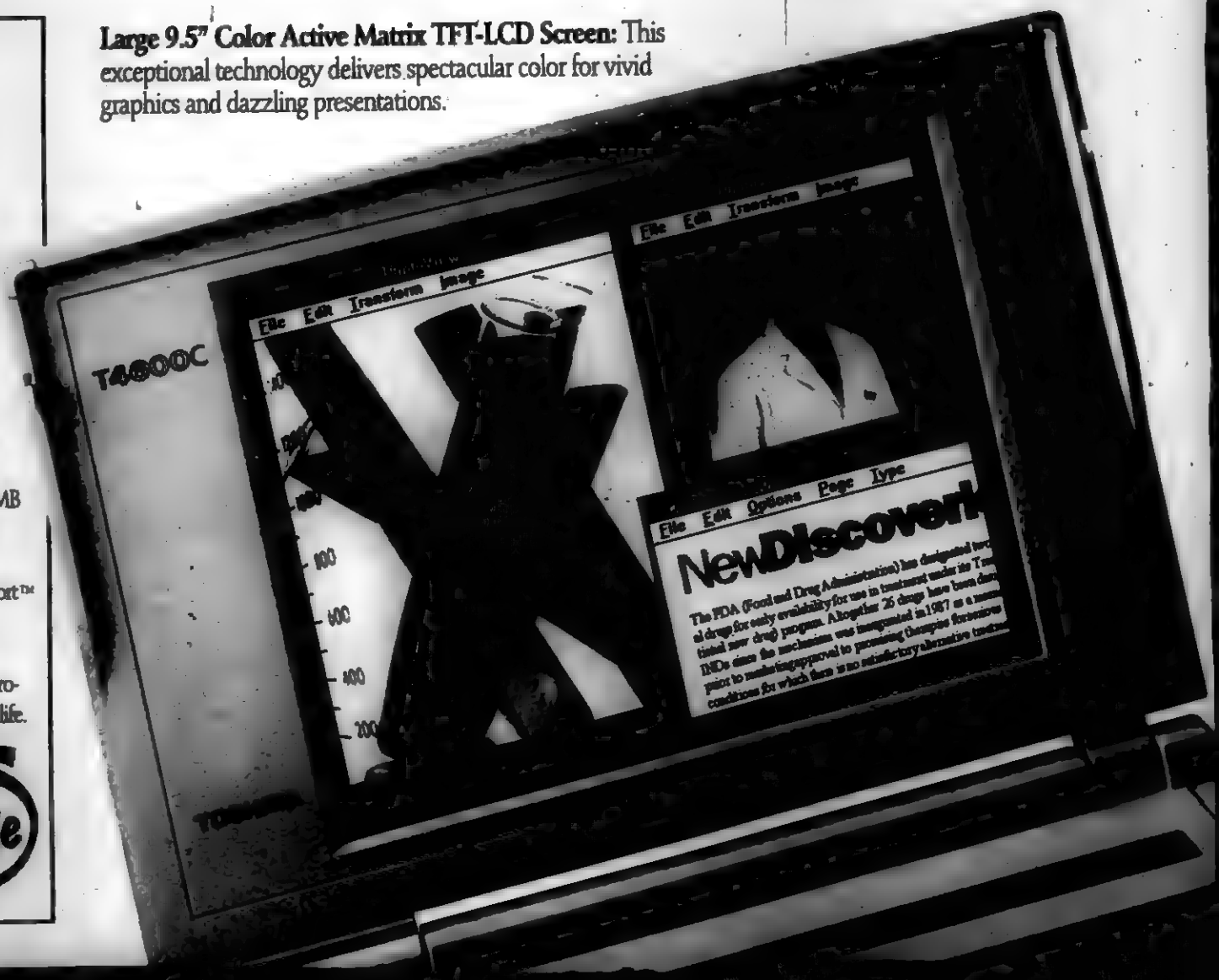
- 9.5" color active matrix TFT-LCD screen
- 120/200/340MB HDD
- 6.9 lbs.
- NiMH battery

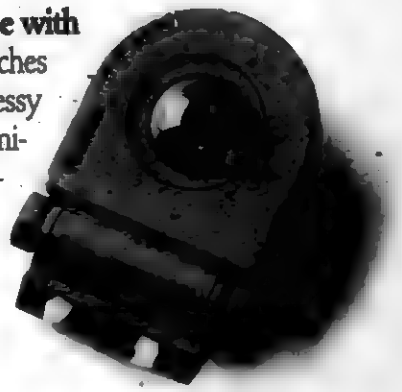
T4600
- 9.5" high-contrast, black and white LCD screen
- 120/200MB HDD
- 6.4 lbs.
- NiCd battery

BOTH MODELS
- Intel 486SL/ 33MHz, 3.3 volt processor with 8K cache
- 4MB RAM expandable to 20MB
- Type II (5mm) and Type "IV" (16mm) PCMCIA slots
- BallPoint™ mouse w/QuickPort™
- Toshiba MaxTime™ Power Management system, and extensive 3.3v components provide industry-leading battery life.
- Pre-installed software: DOS 6.0, Windows® 3.1, and UltraFont.™

intel inside

Large 9.5" Color Active Matrix TFT-LCD Screen: This exceptional technology delivers spectacular color for vivid graphics and dazzling presentations.





BallPoint™ Mouse with QuickPort™: Attaches easily, without messy cords, for ergonomically ideal input—perfect for Windows® applications.

Replace Your Desktop: Just snap your notebook into the Desk Station IV, and you're instantly connected to your printer, VGA monitor, mouse, and full-size keyboard. Now you only need one computer.

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Introducing the T4600 Series. Make no compromise.

Get the awesome power of a 33MHz i486™SL processor, and don't sacrifice battery life. Add a 9.5" color active matrix TFT-LCD screen, and access all 185,193 eye-popping VGA colors. Pack a massive 340MB hard drive and never have to leave a file at home. Get your hands on the BallPoint™ mouse, snap it into its QuickPort™, and never waste a moment or a motion.

Carry two slots for industry-standard PCMCIA cards—including one large enough for the new generation of removable hard drives—and take the next big step in peripherals.

Glance at the QuickRead LCD status icon bar for an instant read of battery life, power management, keyboard settings, and more. This is no time for compromise. This is the time to get your hands on the T4600 Series.

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In Touch with Tomorrow

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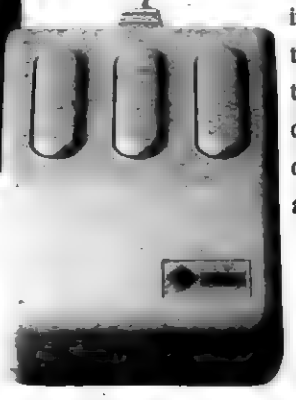
Funny thing. Seems like every time we talk to a potential customer about our ONline intelligent switching hub, the competition immediately starts discounting the price of their units.

The reason is obvious: Since Chipcom has consistently led the way in hub technology right from the beginning, what choice do the others have?

First with Fault-Tolerance. Chipcom has built fault-tolerance into all its networking hubs since 1988. Today, our ONline System Concentrator provides the industry's most complete fault-tolerant solution for large facility-wide networks, with features like backup power supplies, and Controller Modules, redundant links, backup concentrator configurations, self-healing network management and fault-tolerant transceivers.

First with Multiple Networks. When we introduced the TriChannel™ backplane, our biggest challenge was getting people to understand that now one hub could do the work of three or more, supporting up to 3 Ethernet, 7 Token Ring and 4 FDDI networks with integrated bridging and routing. Or to understand how much money it would save them on equipment purchase and operating costs.

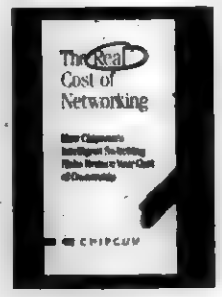
First with Port-Switching. Armed with Port-Switching, a network manager can do moves, adds and changes, and can reassign any Ethernet port from one network to another with a couple of clicks of a mouse. And only Chipcom's ONdemand™ Network Control System lets you design an intelligent network that can reconfigure itself on the fly, do load-balancing on demand, and even shoot trouble itself. Without the ONdemand system and Port Switching, you get to make trips to the wiring closet to move cables. In fact, a lot of trips.



What does all this mean to you? It means that when you specify Chipcom, you're buying from a company that has always looked at networking differently. While the others were struggling with workgroup and departmental LANs, Chipcom hubs were running the huge manufacturing and financial networks of some of the largest companies, banks and universities in the world. Under conditions considerably tougher than any you're likely to encounter.

Does this cost more? A Chipcom network may actually cost less. And, over time, much less. In fact, with the savings you can realize just from eliminating closet-level moves, adds and changes alone, you can recoup the entire installation costs of your network in less than three years. To learn more, call **1-800-228-9930** and ask for your free copy of *"The Real Cost of Networking."* And learn more about the real economies of using Chipcom.

What does it mean to you? Quite the contrary.



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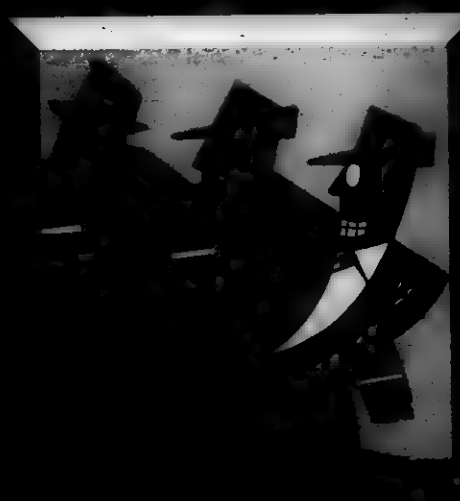


Redesigning the Enterprise

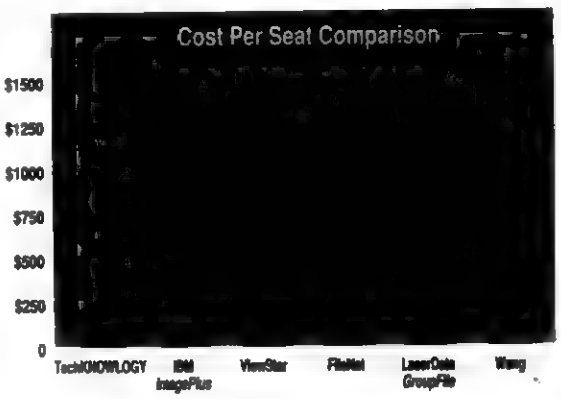
Buying an imaging and workflow solution shouldn't necessitate reengineering your budget.

It's a pretty much agreed upon principle that the whole purpose of business process reengineering is, ultimately, to save money and boost profits.

So why is it that so many companies are considering imaging and workflow solutions so costly to implement that any benefit is offset by the capital outlay and maintenance?

A bottomless bottom line.

A lot of imaging vendors talk about how "easily" their systems fit in to your business process. They'll try to dazzle you with examples of the positive impact their system could have on productivity in your organization. Some will even offer complicated analyses which show just how much money your company could save — if only you implemented one of their solutions.



However, what they *don't* like to talk about is how much money your company will have to spend to implement their system in the first place.

The high price of productivity.

All those wonderful gains in productivity come at a pretty hefty price. Most imaging and workflow solutions have a bare bones price of $1000 or more *per user*. And that's just for the basic software. What about the cost of hardware? Or developing and implementing an indexing system for your documents? And how about developing the workflow application? A number of so called "solutions" won't even work with your current systems!

All of this ultimately defeats the purpose you originally had in mind when you first considered an imaging and workflow solution — saving money.

A sane solution.

TechKNOWLOGY has an alternative. A full-featured imaging solution at a cost of as little as $395 per user. And, that buys you a *lot* of power and performance. Like scan rates 50% faster than ViewStar, 87% faster than LaserData and more than *twice* as fast as FileNet. And you get lightning fast *automated* document indexing, group III/IV fax compatibility, jukebox support, and built-in scalability.

A real team player.

Unlike most of the solutions available, TechKNOWLOGY's imaging and workflow solution was designed and written to work at the *deepest level* of Novell Netware. Which means you get *significantly* higher performance and speed for your applications. And there's never a compatibility issue. Which means you don't lose a penny on your investment in current technology. In fact, Novell liked our solution so much they now use it as their *performance standard* in evaluating imaging systems.

A simple matter of addition.

Lower cost. Better performance. True compatibility. If you're considering an imaging and workflow solution for your company, it all adds up to TechKNOWLOGY.

If you'd like more information about the TechKNOWLOGY imaging and workflow solution, or a copy of the white paper "Selecting an Electronic Document Imaging Solution," call us at (800) 264-0713 or write:

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141 East 5600 South, Suite 300
Salt Lake City, UT 84107

yes it runs with NetWare

Developer tested only.
Novell makes no warranty with respect to this product.

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The Imaging and Workflow Solution for Novell Networks.

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Introduction

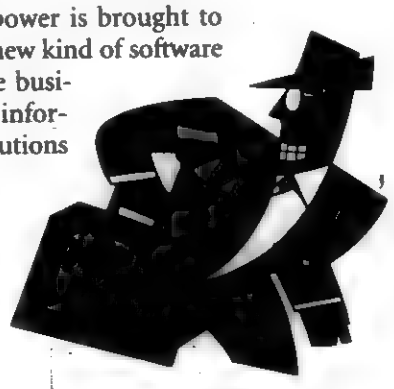
Over the past several years, the computer market has been increasing its focus on the concept of business process automation. This is due in large measure to two factors. The first is a recognition among business and information systems (IS) executives that competitiveness in the '90s demands automating the entire process of doing work, not just the individual discrete tasks.

The second factor is the emergence of a new universal desktop computing environment — one capable of truly integrating multiple windowed applications while networked to other equally powerful desktop systems throughout the enterprise.

Despite the huge investment in white collar work automation over the past 25 years, many studies have shown that office productivity has not substantially increased. This stands in stark contrast to factory automation, where investment in computing technology has dramatically increased the manufacturing output per worker.

The rise of global competition for markets has now made productivity a basic survival issue for most companies, and in recent years there have been tremendous changes in the way companies are organized to perform office work. Those changes include decentralization, flatter management structures and more sophisticated information systems strategies.

Even as companies continue to invest in computing power, however, it has become clear that there is something in the nature of office work that resists improvement no matter how much power is brought to bear. This resistance can only be overcome with a new kind of software that deals directly with the inherent nature of the business process. Such software must integrate both information from multiple applications and the contributions of many individuals within the organization.



Driven by the combination of tremendous economic pressure and the recent transformations in office computing, this software — workflow software — has arrived.

This White Paper was written by
Bruce Silver of BIS Strategic Decisions, Inc.
For more information on the White Paper Program, please call 508-879-0700.

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WORKFLOW: Redesigning the Enterprise

Like many high-tech buzzwords, "workflow" is frequently mentioned and widely misunderstood. Simply defined, it is the process by which individual tasks come together to complete a transaction — a clearly defined business process — within an enterprise.

Such transactions may occur repetitively in the normal course of business and follow a standard set of procedures — processing an insurance claim is a good example. Or they may be purely ad hoc, occurring rarely and in ever-changing forms. In either case, they involve the coordination of multiple applications or users. As a result, they need to be tracked and automated.

Some transactions are not part of the regular business process, but recur from time to time and follow a more or less standard procedure. These may include a check clearance request, a travel authorization or the scheduling of job candidate interviews.

A transaction or process may be relatively simple, consisting of only a few steps. Example: take a customer's call, find the requested information or activity

status and pass the requested information back to the customer. Or the transaction can be extremely complex, spanning many different departments, requiring the involvement of a dozen or more individuals, and consisting of hundreds of discrete tasks. Workflow automation in the broadest sense includes both of these situations.

Production vs. Ad Hoc Workflow

While establishing the broad business need for workflow software and services is easy, defining the market for them is more complex. The market is formative, and most users are still trying to understand basic concepts and the relative values of specific functions.

There is a variety of workflow software products currently available. Some automate a line-of-business process while others manage a general office procedure. Some are intended to be used by clerical workers, while others are designed for professional, "knowledge" workers.

Savvy would-be users have to understand their own needs before buying workflow software. They should ask themselves if their work is driven by documents or folders, or if it is better viewed as a set of tasks and decision options that may or may not include attached documents.

Perhaps the best way to differentiate workflow software products is by breaking them into two categories: production workflow and ad hoc workflow.

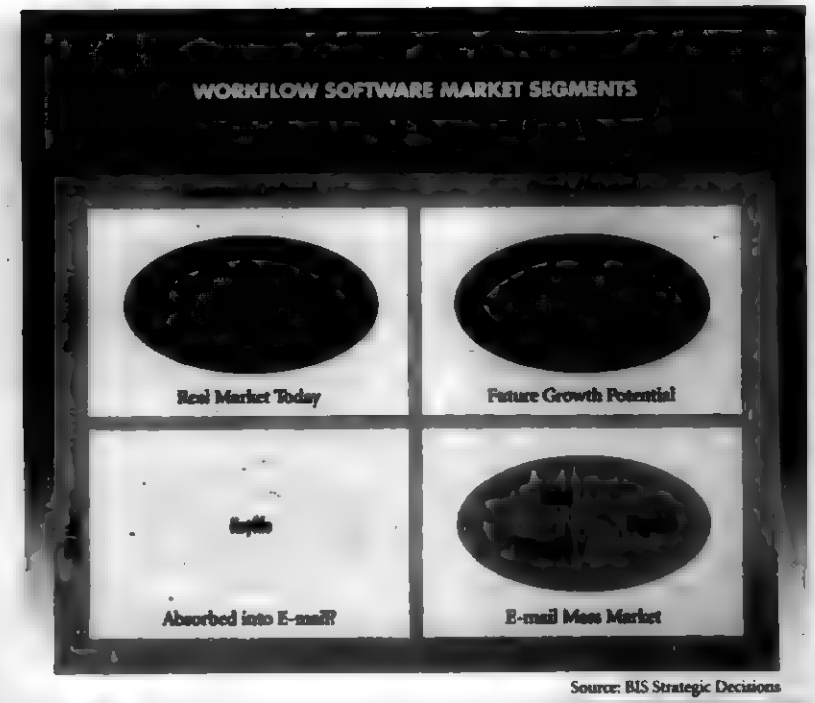
Production workflow software automates repetitive mission-critical processes such as insurance claims, loan origination, accounts payable or sales order entry. Most often, these processes are clerical, document-driven and tightly integrated with line-of-business computer applications. They may, however, represent a routine office activity such as a travel authorization or an expense report. In a production workflow environment the process obeys sets of codified rules and policies that are consistently applied to every work item.

Ad hoc workflow, on the other hand, automates unique or occasionally used processes. These processes may be mission-critical to the core business but are more often associated with routine office procedures, such as correspondence management, interview scheduling or document revision and approval. They are typically used by knowledge workers, but are not usually document-driven or tightly integrated with line-of-business application software.

With ad hoc workflow software, the process required for a given work item is not predefined, but more a matter of individual judgment and decision. Where production workflow software seeks control and transaction efficiency by integrating information, ad hoc workflow software is more concerned with coordinating and integrating human activity.

The majority of the workflow software business today is concentrated on the production side. And most of that has been associated with document imaging technology. The software has largely been provided by the document image management vendors. The use of imaging technology with workflow software is not a requirement — the need for workflow automation goes far beyond the imaging market — but it is a common occurrence.

In the mid-'80s, FileNet Corporation was the first to perceive that the essential problem document imaging solved for businesses overrun with paper was not so much storage and retrieval as much as it was moving and coordinating paper-based information throughout a department or enterprise. In a word, work-



Source: BIS Strategic Decisions

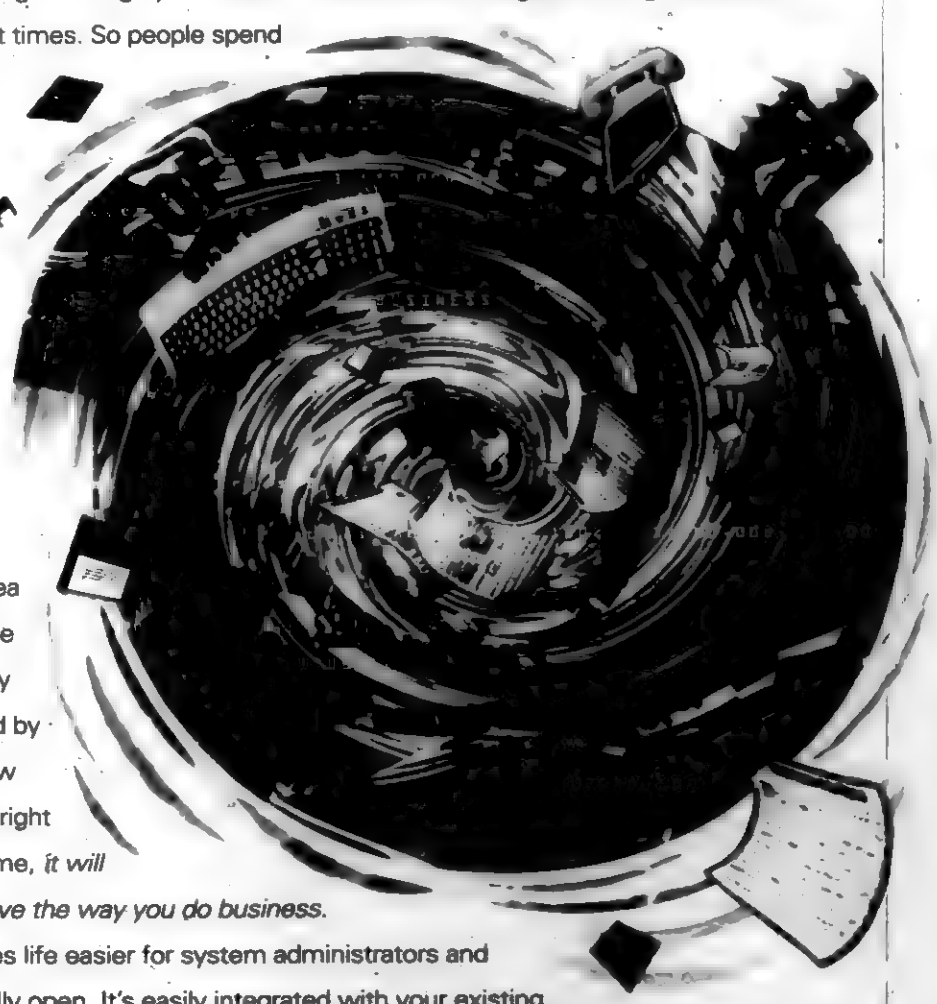
Production workflow software automates critical repetitive processes, while ad hoc workflow software automates unique or occasionally used processes.

XEROX

So, you SAY you don't have a problem with workflow?

Although companies have invested billions of dollars in technology, the hourly output of the average worker has increased by only 1% per year, over the last two decades.

What went wrong? It's largely a matter of different technologies moving in different directions, at different times. So people spend more time thrashing than they do getting work done.



Fortunately, there's a way to get everyone working in sync: InConcert Workflow Management Software, from XSoft.

InConcert goes beyond the typical idea of "software," because it's tailored specifically to your business. And by synchronizing the flow of information to the right people at the right time, *it will fundamentally improve the way you do business.*

InConcert makes life easier for system administrators and users because it's fully open. It's easily integrated with your existing hardware and software and compatible with any database you choose. But more importantly, InConcert is extraordinarily easy to use. Users can complete even the most complex tasks through a simple graphical interface. So they actually enjoy using it.

Curious? We'll send you a free white paper, "Getting the Job Done: A Guide to Workflow Management." **Just call 1-800-828-6775, ext.146.**

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flow. FileNet put workflow automation tools at the heart of its document imaging software. The company defined the core set of services, development tools and administrative functions that virtually all document imaging vendors offer in some form today.

The buyer's motivation for purchasing ad hoc workflow software comes from a sense that routine office work needs new tools for coordinating and tracking activities that involve multiple users.

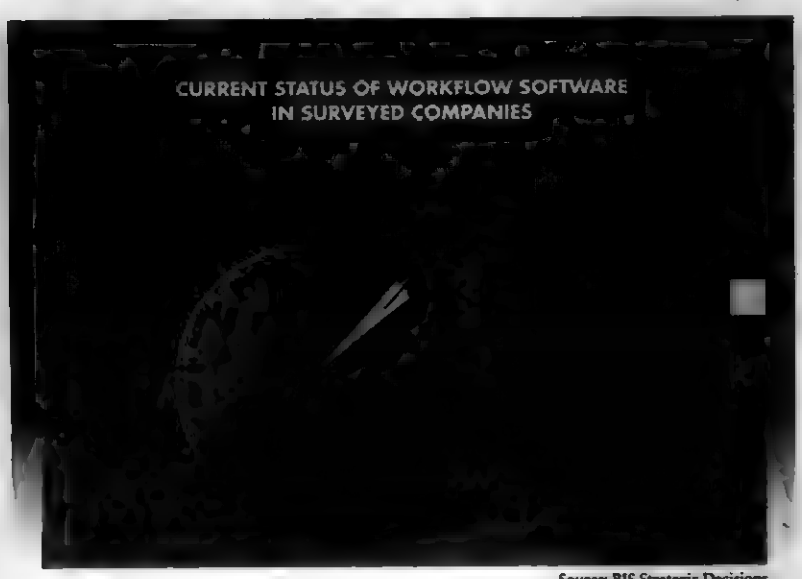
The association of imaging with workflow is a natural one because the businesses with the biggest transaction processing costs are typically ones with high-volume, paper-driven operations involving complex interactions between multiple users. Because paper-processing costs are high, the value of improving transaction efficiency with workflow software is also high.

For this reason production workflow software, particularly in conjunction with imaging, can command prices of $2,000 per user or higher and still generate a high return on investment.

Where production workflow software usually can be justified by reducing the cost of a particular business process, ad hoc workflow software is geared to a less specific need. The buyer's motivation for purchasing ad hoc workflow software comes from a sense that routine office work needs new tools for coordinating and tracking activities that involve multiple users.

Despite the proliferation of E-mail for point-to-point messaging, and specific personal productivity tools like project management or calendar software, these products by themselves do not track and coordinate processes involving multiple steps or multiple users.

Unlike the situation with production workflow software, the need for ad hoc workflow software is quite broadly based, touching essentially all office workers. This need will continue to expand, as will the number of ad hoc users.



Source: BIS Strategic Decisions

Information Systems departments make up a large percentage of the 37% of respondents who say they are not considering workflow software.

The demand for ad hoc workflow software is a logical by-product of the tremendous growth in PC networking and E-mail, the most significant computing phenomena of the '90s. Without workflow software, users today are connected over the network but unable to fully coordinate their work. Workgroup productivity suffers accordingly. Workflow software aims to rectify that situation.

Unfortunately, in the case of routine office work, the cost of not having workflow software is difficult to calculate. Cost-justifying ad hoc workflow software is hard because the cost of the process it improves is unknown. How much is it worth? If it is viewed as an extension of E-mail or a network operating system, does that mean it is worth only a fraction of those packages? In this environment of uncertainty, workflow software's value is being determined by the norms applied to mass market PC applications. Consequently, the ad hoc workflow software market, in contrast to the production workflow market, is more likely to be driven by the mass market players.

Workflow Software Market Segmentation

Although production and ad hoc workflow are the two most notable workflow software elements, there are others. They include "document-centered" versus "user-centered" tasks. In a document-centered task, the required processing is determined by a work package, often a document or folder. User-centered tasks are more general and are performed by multiple users in a coordinated fashion.

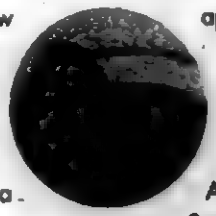
Document-Centered Production Workflow

Of document-centered versus user-centered applications, the document-centered production segment — as shown in the upper left quadrant of the preceding "Work-

WORKFLOW IN ACTION:

Aetna Health Plans

Aetna Health Plans (AHP) processes approximately 80 million health insurance claims per year in 34 claims offices nationwide. Its use of workflow software in conjunction with document image management is an outstanding example of a document-centered production approach. AHP's implementation is based on software from ViewStar, a leading vendor of production workflow software packaged as part of a document management system.



Processing health claims is one of the most paper-intensive of all transactions, and one that typically involves the movement of documents among many individuals in an office. Customer service representatives, who answer questions for policyholders, require constant access to new and historical documents. Claims representatives must know that claims have been received, their current location, and their processing status from the minute they arrive in the mail room.

Before the implementation of workflow software at AHP, this information was unavailable until the claim processing was complete, up to nine days after the claim was received.

AHP's workflow starts in the mail room where the incoming claims are barcoded and scanned. The workflow software automatically imports barcoded information into the ViewStar database, logging the claim, assembling all the attached documents into a folder and generating a unique ID number before forwarding the information to an indexer.

The indexer retrieves work from a queue and enters claim data from the scanned images. After indexing, each folder is forwarded to a workflow server, which makes complex processing decisions based on instructions programmed in ViewStar's fourth-generation language script.

Software on the workflow server then does the following:

- confirms that each folder represents only one family. If a folder mistakenly contains two claims in one, the workflow server will automatically split it apart.
- checks the claim data against mainframe-based eligibility files, routing the folder to an exception queue for research if necessary, or to a fax queue if the claim must be forwarded to another Aetna office.
- adds additional data to the folder from the policyholder file. This data may include group number, patient name, and codes to assist in claim processing or automatic generation of form letters.
- searches the system for other folders relating to the same family, merging them for processing.
- identifies "special handling" claims — for example, those with high dollar amounts — and routes them to priority queues for fast review.
- distributes validated claims to the appropriate work queue for adjudication and payment. Claims processors drawing work from these queues are presented with a customized Windows screen including a 3270 host window, an image window and a data form. They can key information into the host application from the images, place folders on hold pending additional documentation, or attach annotations and send the folder to a supervisor or analyst for further review.

Within nine months of initial implementation, AHP was enjoying a 25% reduction in claims processing time, a 15% reduction in the processing of invalid or duplicate claims, and a tremendous overall improvement in customer service. Based on 80 million claims per year, these benefits add up to millions of dollars in savings. In addition, customer service representatives now can access submitted claims within 24 hours of their arrival, instead of waiting nine days. Finally, AHP is able to increase market share based on its ability to process more claims.

flow Software Market Segments" chart — is more mature. This segment is dominated by the image management vendors. Within it, the work process is document-driven, mostly by paper. Because of the high cost of processing transactions based on manual paper routing, the combination of workflow software and imaging technology provides a particularly high return on investment within this segment.

In fact, the benefits of workflow automation often represent the key to payback on the overall document imaging investment, which is still very expensive.

More than simply providing work routing, workflow software in this segment is increasingly concerned with automating complex processes involving multiple disparate computer applications. In fact, integrating information from

multiple sources is a workflow software feature that production workflow software vendors typically stress even more than automatic user-to-user routing.

Production workflow software allows work to be routed to shared processing queues.

This integration usually involves the automatic exchange of data between multiple applications simultaneously running in windows on a single user's desktop. A typical example includes a terminal emulation program running a mainframe application, a LAN-based document management system and a desktop word processing program.

Because the work is part of a production process, multiple users are often performing similar tasks. Production workflow software allows work to be routed to shared processing queues, from which it is dynamically distributed to the next available user in assembly-line fashion.

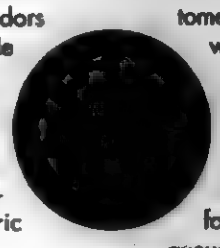
Saying that the work process is "document-driven" means that the particular set of tasks that is executed fits a standard pattern associated with a particular document type or set of documents. Examples include an application for credit, an invoice, or an insurance claim. Today, these transaction source documents are often paper, but they will increasingly be electronically generated.

Standardization and proliferation of Electronic Data Interchange (EDI) will force production workflow software products to embrace these new types of documents. This will also be the case with the growth of a host of new technologies connecting mobile sales, service and professional workers with centralized administrative processing centers. These technologies include pen computing, wireless networks and digital signature authorization via E-mail. The nature of the document may change but the process remains one of transaction automation.

Group-Centered Ad Hoc Workflow

The bottom right quadrant of the "Workflow Software Market Segments" chart represents a contrasting vision of workflow automation. Group-centered ad hoc workflow starts because a work process requires the coordination and the tracking of tasks performed by multiple individuals. Workflow consists of work routed from individual to individual. "Work" is a request to the user to perform some task or make a decision, e.g., "approve or reject this proposal."

WORKFLOW IN ACTION:
Consolidated Edison



Document-driven production workflow does not require imaging, although the imaging vendors today have the most mature tools to handle high volume transactions. In this example, an imaging workflow vendor, Sigma Imaging Systems, has used workflow software with ASCII text files, not images, to solve a major customer service headache for Consolidated Edison, New York City's electric power utility.

Con Edison of New York has 20 sites and 1,000 service representatives in its customer service organization. Each day meter readings are taken by field support staff throughout the New York metropolitan area. The readings are transferred to the central mainframe, which identifies inconsistencies and generates account investigation listings (AILs) for problem resolution. Approximately one million AILs are generated each year.

Prior to the implementation of workflow software, AILs were printed, manually sorted and delivered to customer service reps for follow-up. This process included thousands of pages per day. The reps were limited in their ability to respond promptly to customer inquiries because supporting documents were not at hand. As a result, much time and energy was required to retrieve filed (and misfiled) documents.

Using Sigma Imaging's OmniDesk software, Con Edison is able to load mainframe AIL data directly into OmniDesk forms. This data is automatically indexed and queued for workflow processing and distribution to customer service representatives.

Workflow routes are constructed to meet a wide variety of local needs, and can involve hundreds of routing rules. Because of the graphic nature of OmniDesk workflow tools, these routes can be defined by non-technical customer service managers; they do not require a programmer. Customer service reps now retrieve the AILs from their workflow inbox, and by accessing multiple windows on the workstation, can view the data, compare it with a mainframe-based account history, and resolve the problem. Con Edison anticipates it will save almost $2 million annually with this system.

THE ALTERNATIVE TO MISHMASH.

ODESTA'S *OPEN ODMS*™ FOR WORKFLOW, IMAGE AND DOCUMENT MANAGEMENT.

The following true stories are about companies that have experienced a breakthrough in the quality of their business processes. They tell how information anarchy and organizational sludge were finally overcome. They demonstrate how new tools like version control, routing, status tracking, and cross platform development can quicken the pulse rate of a business – processes that took days or hours are now accomplished in minutes. They show how the mishmash of priorities, information, software and hardware scattered from desktop to mainframe was replaced by a single integrating system – Open ODMS.

To a leading pharmaceutical company in New Jersey, the solution was a research and development system developed with Odesta's Open ODMS. A process that used to require three different expensive, slow, and hard-to-use systems now runs on an industry standard SQL database in a client-server environment. What used to take between two hours and four days now takes between two minutes and ten minutes. Now research scientists and other knowledge workers use Macintosh and Windows PCs to search whole fields of research data and documents by keyword and with a third-party content-based retrieval product integrated into the system. The system provides version control and a common interface for word processor files. It even supports remote researchers from other locations in the U.S. and Europe over a T1 link. Together, we got the system up and running in 92 days.

To a leading energy company in Alaska, the solution was an engineering document management system developed with Odesta's Open ODMS. To work with critical maintenance and repair documents such as pipeline schematics or scanned valve specifications, it had been necessary to search through skids full of drawings and stacks of printouts for hours, sometimes days. Now this critical information is available in minutes to any user with a Macintosh or Windows PC. Where version numbers and change orders were usually ambiguous or nonexistent, all documents are now automatically version controlled, annotated, and managed with RS-6000s, SQL databases, and optical servers from above the Arctic Circle in Prudhoe Bay to Anchorage. The system was up and running in 90 days.

To a leading aerospace company in Seattle, the solution was a cost document integration system developed with Odesta's Open ODMS. Key to the success of proposals for major contracts, the cost document must incorporate text, graphics, images, and tabular reports from many sources. What had been done manually and used to take one month now takes two days. Now, when cost information is entered into Macintosh and Windows PCs, an automatic transfer of data from the IBM mainframe to the VAX server takes place. The cost document integrates word processing, spreadsheet, and scanned image files from the desktop. The whole cost document (30-30,000 pages) is then automatically built with Microsoft Word on a Macintosh and printed. The system was up and running in 87 days.

To a leading airplane maintenance operation in San Francisco, the solution was a technical data routing system developed with Odesta's Open ODMS. The old paper routing process that took 60 days and was of inconsistent quality now takes three days and is quality assured. Now as airworthiness directives from the FAA and service bulletins from manufacturers are received, they are automatically routed to the appropriate engineer. The system provides on-line query capabilities as well as an audit trail for each document. An in-house e-mail system is used for notification. Management can get a report on all the unresolved technical maintenance issues in between one and five minutes. When it is fully rolled out, this client server system will support 900 engineers. The system was up and running in 73 days.

ODESTA SYSTEMS CORPORATION

Technology With a Human Face™

4084 Commercial Ave. • Northbrook, IL 60062 • 708.498.5615 • Fax 708.498.9917 • Northbrook, IL • Cambridge, MA • San Mateo, CA • Los Angeles, CA • Tokyo, Japan

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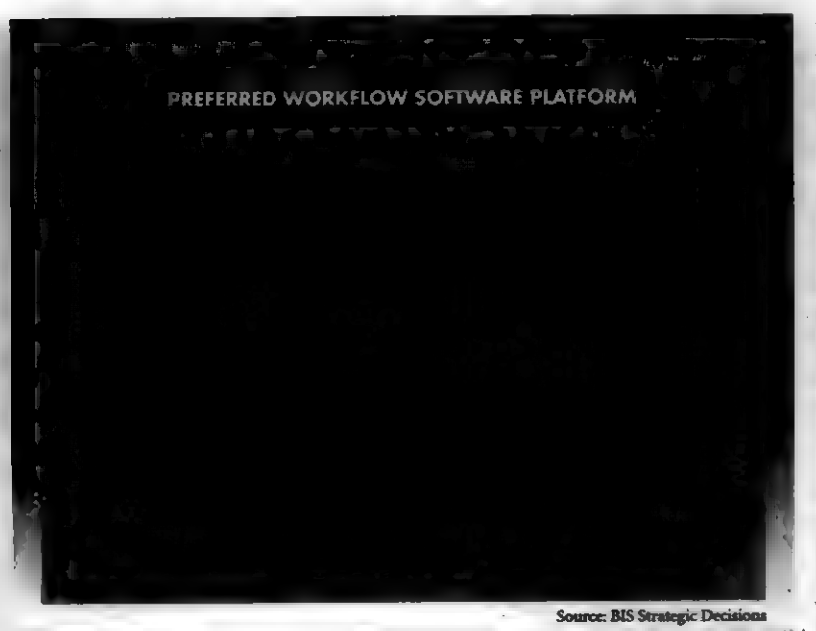


Source: BIS Strategic Decisions

The huge installed base of PC/LAN users is fertile ground for workflow software implementations.

In its simplest form, this type of workflow software exerts no control at all over external computer applications. It just routes messages embodying these requests for action or decisions, typically as part of an electronic form. Each user performing work indicates completion of the requested task or decision via a check box or action button on the electronic form.

This automatically forwards the work package to the next user defined in the workflow, possibly dependent on the specific action or decision indicated. Each user receiving the work package in succession may see a different version of the form, reflecting the particular work request and decision options defined by the workflow originator.

Such a baseline capability — delivering messages to users on a network — is already available to most networked computer users today in the form of E-mail. Adding workflow to this sequential forms routing process represents a major enhancement and will be provided within a year by most E-mail vendors, including Microsoft and Lotus.

Thus this form of workflow software will become nearly universal within two or three years as a basic E-mail function at little or no cost. As such, it will bring workflow capabilities to the mass market. And this E-mail-enabled workflow software will not be underpowered compared with standalone packages.

While the work may not generally be document-driven, documents, including images and annotations, can easily be included as E-mail attachments. In addition, software "agents," or background programs monitoring a user's mailbox for incoming messages, will be able to detect and filter arriving workflow

WORKFLOW IN ACTION:
Young and Rubicam

Although group-centered production workflow software is still in its infancy, there are a few intrepid users. A pioneering example can be found in the project traffic control system at Young & Rubicam, one of the nation's largest advertising agencies. The traffic control system is embodied in the internal client project management process, which involves a mass of paper forms and the need to coordinate the activities of many groups.

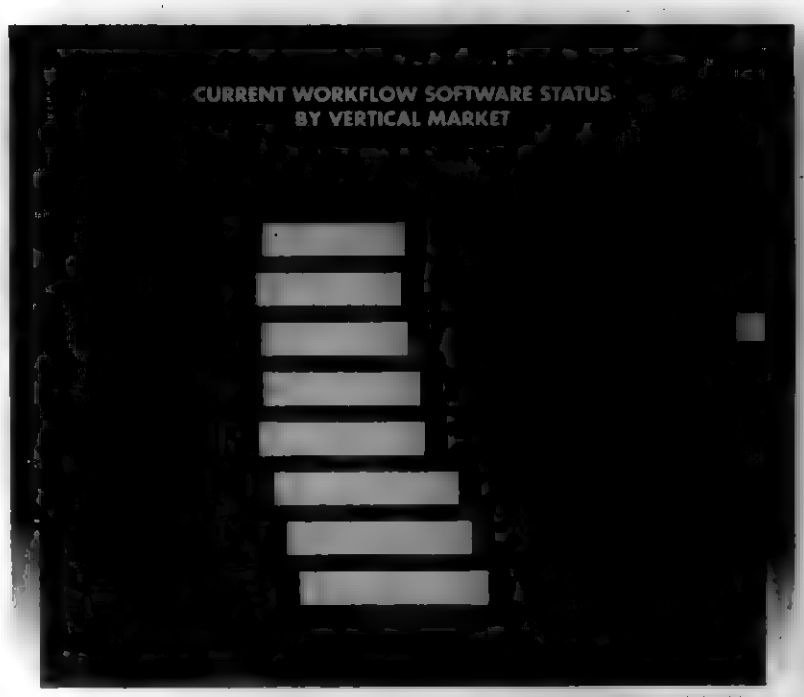
The process starts with a work order form created by the account executive. The work order is then copied and distributed to creative services, which prepares concepts and layouts. Layouts must be approved, distributed and filed. Cost estimates must be prepared by the art director, production manager and media planner. Client signoff is required. Final art must be prepared and approved by the client. Finally, supplier purchase orders must be created. In the traditional traffic process, all this work adds up to a paper nightmare.

Y&R's workflow application uses Action Technologies Inc.'s workflow companion product to Lotus Notes. Notes constitutes the document database environment for Action's unique workflow methodology. Action views every major activity within a workflow sequence as consisting of four steps: a request, an agreement, work completion and acknowledgement of satisfaction. The firm's methodology consists of analyzing workflows

packages. They can then initiate certain desktop functions automatically. Deadlines for each work step can even be assigned, and alarm messages sent automatically if the work is late.

Such function provides significant task coordination with very little change to standard mail systems. By itself, however, it offers little in the way of control over the work process. It cannot answer basic questions like, "Where is the work now?," "What has been done to it?" and "What are the actions remaining?"

These kinds of questions require a central information repository or database that is updated by all the individual workflow processing events. Such a function is beyond standard E-mail capabilities. Nonetheless, a workflow tracking database will be a key component of specialized workflow software engines that allow the group-centered work model to deal with critical business problems.



Source: BIS Strategic Decisions

The most avid workflow software vertical industry groups include financial services, transportation, communications, utilities and insurance.

Group-Centered Production Workflow

The need to organize and track complex processes performed by workgroups leads to a grander vision of workflow, one in which coordinating human activities is as important as integrating computer applications. The group-centered production workflow quadrant, in the top right corner of the "Workflow Software Market Segments" chart represents that vision.

Here the processes are coordinated to obey a stable, but sometimes

and breaking them down into graphic "loops," each of which embodies this four-step cycle. Y&R's workflow application differs from those at Aetna and Con Edison in that it does not require integration of computer programs so much as the coordination of human work. Even so, assistance by Action's consultants was necessary to analyze and map the workflow. This analysis forced Y&R to apply a logical structure over a sometimes chaotic process. It also identified bottlenecks and gray areas in the current process. As an extra benefit, the process also made Y&R clients more aware of their responsibilities.

While many users and managers were skeptical at first, the initial pilot, involving a single advertising client, has proven to be a great success. No formal cost payback data is available, but a very revealing survey of users before and after three months of the pilot shows that they believe they are working much more efficiently.

For example, the percentage of users stating it takes too long to prepare a brief dropped from 71% to zero. Those saying it takes too long to file and sort documents fell from 50% to zero. Frequent duplication of effort fell from 42% to zero. Jobs finished on time with no rush rose from 32% to 52%. Jobs completed on budget rose from 73% to 87%. Y&R expects to roll out the Notes/Action workflow to other clients in the near future.

fuzzy, set of rules and procedures. This is clearly not an ad hoc environment. Examples of group-centered production workflow applications include processing purchase requisitions, resolving field service problems and even new product development. The goal in each case is a faster and smoother process achieved by coordinating the activities of multiple individuals or groups.

The ability to forward work to "roles" rather than named users is another production-level feature that goes beyond standard E-mail capabilities.

In contrast to those in the document-centered production segment, these processes are often measured in weeks rather than seconds or hours. They also do not require dynamic work distribution to functionally equivalent human processors. Consequently the group-centered production segment tends to rely on E-mail rather than a shared database connection as the basic link between workflow participants. It does, however, require more than basic E-mail capabilities.

For example, intelligent rules-based routing is required, as well as interfaces to exchange information with external applications on both the LAN and glass house hosts. The ability to forward work to "roles" rather than named users is another production-level feature that goes beyond standard E-mail capabilities. Administrative utilities that map users to a set of roles, or override the workflow route and move work from one queue to another, are also typical in this type of workflow software. But the most important differentiator is work tracking and reporting.

Document-Centered Ad Hoc Workflow

Finally, the fourth quadrant in the "Workflow Software Market Segments" chart, document-centered ad hoc workflow, comprises an unusual combination. As in the group-centered ad hoc segment, the work flows represent occasional processes, but processes revolving around the handling of external documents, either electronically generated or in the form of scanned images. Examples include managing correspondence and routing documents for comment or approval.

Products in this category provide tools that allow any user to initiate an ad hoc workflow closely integrated with a document management system. Such an arrangement, while less flexible in some ways, is useful if the workflow involves the sharing of significant document volumes, particularly images or other large object types.

The link to a document management system allows documents to be moved "by reference," i.e., without moving the physical file over the network.

At some point in the future, facilities for indexing and high-volume storage of large objects will be commonly found in network operating systems. A current example is Novell's Image Services for NetWare. When all network operating systems are thus endowed, E-mail vendors will be able to provide much of the function required for this segment.

Workflow Software and Reengineering

Because of the strong association of workflow software with "the business process," the implementation of workflow software often occurs in conjunction with a broader reengineering initiative. Business process reengineering involves analyzing how organizations do their work now, and how, with the right technology, they can be made more efficient.

While business process reengineering is a great help in maximizing the economic benefit of workflow software, it is not required, and sometimes not even recommended, before the initial application of workflow technology. A lesson learned by the first generation of workflow users is that often the ultimate solution cannot be predicted by analysis alone; it has to evolve through experience. Today, users are increasingly getting their initiation with workflow software on a pilot basis, and then incrementally reengineering the business process as they go.

What Users Want: Products

Even though the workflow market is in its early stages of development, some user demands are already clear. For instance, most users are looking for workflow products that:

Allow them to get started quickly. If developing a workflow application requires months of study and massive program development as part of a monolithic reengineering effort, users will not commit. Experience has shown that an incremental approach, evolving from a quick pilot application and embracing a gradually increasing number of users and reengineered process functions, has a greater chance of success.

Allow them to modify and evolve the workflow themselves. Users know intuitively that the right workflow design will require their own experience, plus a certain amount of trial and error. They do not want workflow modification requests to add to the IS application backlog. Quick response is mandatory. For this reason, users are increasingly demanding graphic tools that allow non-programmers to modify, maintain and even develop workflow applications.

Handle real-world exceptions. Handling a fixed sequential process is easy; the payback from workflow comes from handling the exception cases. The old maxim that 80% of the time or cost is spent on 20% of the work applies here. That 20%

WORKFLOW IN ACTION:

British Petroleum Exploration

British Petroleum Exploration in Alaska has responded to regulatory and business requirements with Open ODMS, a workflow and document management system from Odesta Systems Corp. BP needed to manage its 200,000 engineering drawings in support of the company's North Slope activities. The combination of document management and workflow software was required to achieve an "evergreen" state of information currency, improve business performance and address regulatory requirements.

In Alaska, BP operates its production facilities well above the Arctic Circle, 800 miles north of its offices in Anchorage. A distributed, client-server approach was required to support the mission-critical engineering needs across such distances. Up to 200 staff members in both Anchorage and in the remote field facilities can now search, retrieve and view drawings and other documents from a Macintosh for review, analysis, change management and audit purposes.

Mark-up and edit tools allow the technicians, operators and engineering staff at all sites to comment on field conditions or suggest modifications graphically. The information can now be shared electronically across multiple engineering projects and geographically dispersed sites.

Workflow software is used in revising the original drawings, as well as for work package routing for the review, preparation and approval of drawing changes. While the primary process of revision control has already been streamlined, incremental process reengineering opportunities are surfacing as familiarization with the technology increases.

Benefits from the Open ODMS solution are expected to approach $2.5 million annually. And this figure is expected to increase significantly as the further potential of the technology for risk management and enterprise-wide workflow and document management is realized.

represents the cases that require special handling. Workflow software products that allow complex branching based on identifying exception cases are already the norm, at least in the production workflow segments. What is new is that a user processing work in the middle of a workflow route can perform two tasks: note an exception condition totally unanticipated by the workflow application developer, and add some processing steps on the spot. The use of object-oriented technology in workflow software is a key part of this development.

What Users Want: Services

Beyond workflow automation products, users are also looking for professional services to help them analyze their existing processes and reengineer them. Here, too, they are looking for basic essentials such as:

Proven experience. Many computer vendors are rapidly expanding their service businesses as hardware margins shrink, but not all have the process redesign or analysis experience to back it up. Users want to see evidence of past success, preferably in a similar industry or application.

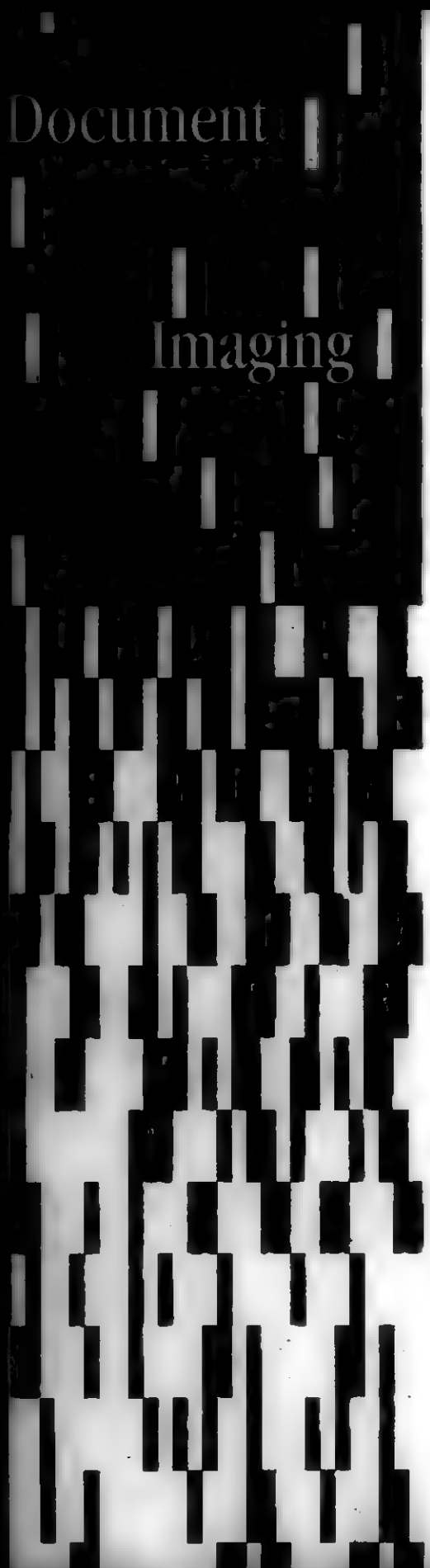
Reduced investment risk. Users are willing to spend money on workflow analysis and design services when these products reduce, rather than increase, the risk of a bad technology investment. Gone are the days when users readily accepted a $200,000 design study for a $350,000 investment. If there is risk, users want the service provider to share it, and perhaps provide incremental services to go along with a gradual workflow implementation.

Use of a standard methodology. Process redesign and application development services that make use of a standard methodology give the workflow software vendor strong credibility with users. It usually means better trained consultants who can draw on experience gained through the repetitive use of a standard methodology. Users want a methodology that employs a software tool to model the workflow, simulate how it would work, identify the bottlenecks it is likely to encounter and generate the actual workflow software.

Involvement in the reengineering process. Many users have a justifiable fear of being shut out of a process reengineering effort led by an outside vendor or even internal IS staff. The users have to live with the end result so they want to be part of the process. The most successful implementations of workflow analysis and development projects heavily involve users, IS and the vendor or vendors.

Workflow Market Profile

BIS Strategic Decisions, in conjunction with *Computerworld*, recently conducted a survey of 600



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U.S. users to determine the current profile of the workflow software market and to project future trends. The respondents represent purchasing decision-makers spread across a wide spectrum of industries and company sizes. Two-thirds of the respondents come from IS; the rest come from a line of business. Acceptance of workflow software technology is already high. A healthy 11.9% of all respondents have installed a workflow application, and another 2.6% say they have selected a product, but have not yet installed it. Acceptance is especially strong for the line-of-business users. Over 19% of them have installed or selected a workflow product, compared with only 12% of the IS respondents.

In addition, 48% of all respondents are investigating the need for workflow. Only 37% are not considering the adoption of workflow automation at this time, because IS appears more inclined to reject the technology.

The following vertical industry groups are particularly bullish on workflow: financial services, transportation, communications, utilities and insurance. On the other hand, wholesale/retail, government, education and professional services are more conservative in their workflow adoption plans.

Overall, respondents rate today's need for workflow software in general office processes equal to the need for workflow systems in line-of-business applications. Today's workflow market, however, is predominantly concerned with production applications in line-of-business processing. Counting only those respondents with workflow applications installed, workflow automation of line-of-business applications is more important than workflow automation for office applications.

In particular, respondents interested in document imaging rate the importance of workflow technology for line-of-business applications higher than they do for office or ad hoc processes. Line-of-business workflow processing is also rated higher by those favoring the following large system workflow platforms: mainframes, minicomputers and Unix client-servers.

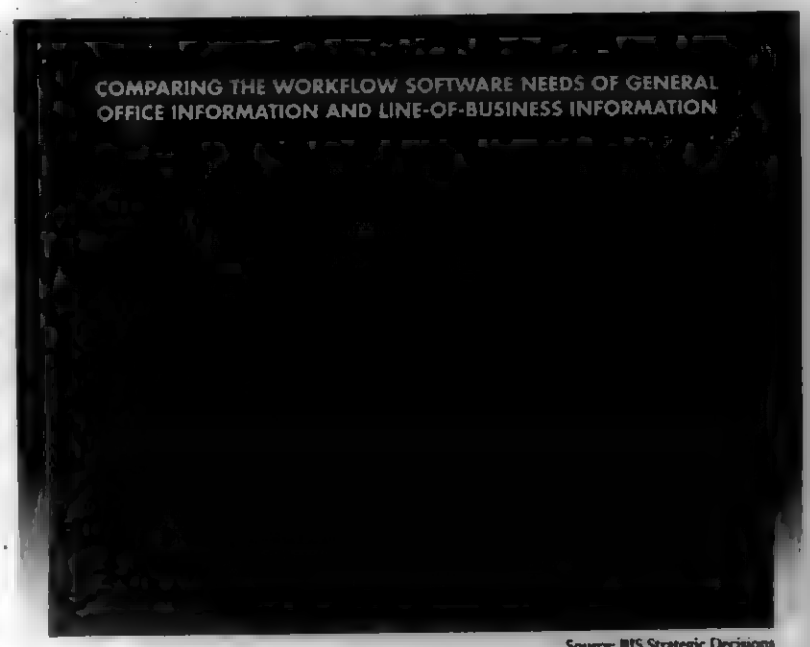
LOB Importance

Line-of-business workflow applications are viewed as significantly more important than office workflow opportunities in certain vertical industries, as well. These include banking and finance, insurance, transportation, communications and utilities. By way of contrast, wholesale/retail, education and government users consider office workflow software to be more important.

Line-of-business processing covers a mix of production and ad hoc functions, but tends to be more production-oriented. For instance, workflow procedures for line-of-business applications are viewed by most survey respondents as structured and relatively static. This view is especially strong among imaging users, a fact that reinforces the perceived strong connection between document imaging and "paper mill" industries with production workflow software.

The need for workflow software in line-of-business applications is higher within the largest companies with over $100 million in revenues than it is in smaller ones with under $1 million in revenues. On the other hand, office automation workflow software is rated equally important by respondents in all company sizes except for those with under $1 million in annual revenues.

Surprisingly, over the next three years, respondents foresee a stronger rise in the importance of line-of-business workflow than they do for office workflow. This is surprising because the technology for production workflow automation software



Source: BIS Strategic Decisions

When counting only those respondents with workflow software installed, workflow automation of line-of-business applications is viewed as significantly more important than office applications.

Source: BIS Strategic Decisions

Twenty percent of all European survey respondents have installed or selected a workflow product.

in line-of-business applications is more mature and better established than is ad hoc office workflow software technology.

Of course, the proof is in the actual adoption plans. The adoption rate as measured by respondent plans for an initial pilot within one year favors line-of-business workflow software over office workflow software by a two-to-one margin (43% to 23%). Within three years, however, the adoption of office-based workflow automation will occur in nearly as many companies as line-of-business-based workflow (69% vs. 78%). Overall, the adoption rate of workflow technology for office automation appears to be about one year behind that of line-of-business applications.

Based on survey results, users are more optimistic than IS about initial adoption plans for both types of workflow software applications during the next 12 months. However, looking out two years or more, both users and IS predict the same rate of initial workflow adoption. As might be expected, large companies are planning much more aggressive implementation schedules for workflow systems than are smaller ones.

Who are the likely users of workflow technology? Overall, respondents view the importance of workflow software for clerical workers slightly higher than they do for professional workers or management. Within three years, however, they say the importance of workflow systems will increase to all three groups, but still more so for clerical workers.

Survey respondents clearly pick PC LAN client-server as the currently preferred workflow platform. And that preference will only strengthen. Overall, 55% pick PC LAN as their current workflow platform, compared with 44% for the desktop, 24% for minicomputer, 18% for Unix client-server and 17% for mainframe.

The survey clearly shows that users view workflow software application development as a responsibility of customer organizations, not vendors. Overall, 64% of respondents look to their IS organizations as a primary source of workflow applications while 24% view line-of-business end users as primary workflow developers. System integrators are next (20%), with workflow software vendors (14%) and independent software vendors (12%) trailing.

Respondents also indicate a strong preference for the incremental reengineering approach. Asked to rate four approaches to reengineering on a five-point scale, respondents clearly favor a combination of gradual reengineering after implementing an initial workflow software application. The second preference is for a complete reengineering before initial implementation.

Workflow Software: Business Tool for the '90s

The workflow software vendors are responding to user demands for this technology with an increasing number of product and service offerings in all segments of the market. Even products that bridge the production-ad hoc divide are emerging, as established workflow software vendors seek to broaden their markets. Interest among users is high, but they are asking for robust tools they can use themselves.

Major PC software vendors are just now getting into the arena, and this will greatly advance the education of the mass market, creating additional opportunities for small workflow software specialists. Because an incredibly wide spectrum of price expectations still exists, all vendors face a period of market education. They can only expect slow movement toward accepted price/value relationships for specific workflow software functions.

One thing is certain, however: The economic pressures to increase the productivity of office work, in combination with the nearly universal networking of powerful multiwindowing desktop computers, makes the future growth of workflow automation software a sure thing. ■

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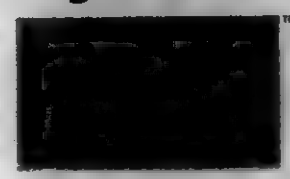

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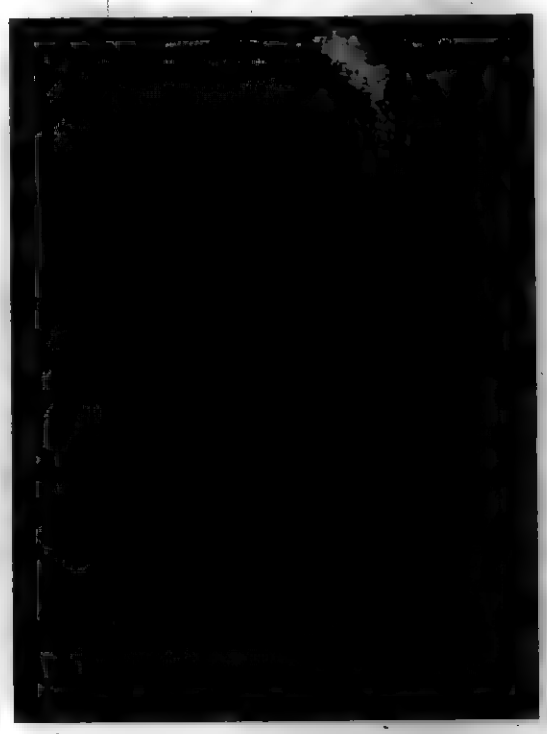

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

IBM's ThinkPad tops user ratings in competitive notebook market

By Kevin Burden

The notebook market has become a battle royal — roughly 100 vendors are now fighting for their share of the spoils. Market research firm Frost & Sullivan, Inc. said it expects notebook sales to make a sizable 24% increase this year to 2.7 million units.

In the Buyers' Scorecard survey on color notebook computers, IBM ThinkPad 700C came in as the leader in the user satisfaction ratings with an overall score of 79. Both Toshiba America Information Systems, Inc.'s T4400C and T4500C SX and Compaq Computer Corp.'s LITE Lite 425C systems took second-place honors, achieving scores of 75, followed by AST Research, Inc.'s Power Exec 425SL at 74.

IBM's ThinkPad has been available for less than a year and should continue to build market momentum. The ThinkPad's color display and battery life topped the other systems in user satisfaction. Users also seemed to be taken with its joystick cursor control and its docking station capabilities. But the lack of a Personal Computer Memory Card International Association card in the 700 and its early obsolescence by the introduction of the 720 had many users wishing they had delayed their purchase plans a few months.

Unlike its competitors, Toshiba has ignored the desktop PC market to concentrate solely on portables. The company has managed to maintain at least 20% of the market for several years. Its T4400C and T4500C notebooks were awarded high scores for screen clarity and readability. However, many users said they would prefer a larger display.

Toshiba's systems also scored high in durability, equaling the ThinkPad in that category.

While Compaq's brand name and reputation can lure potential buyers, the quality of its support can be enough to land them. Respondents said Compaq's service and support for the LTE Lite 425C has lived up to the company's reputation; the Compaq product earned high satisfaction marks in these areas.

The LTE fared well in many areas. If the model has an Achilles' heel, it is its battery life. Users gave it the lowest rating among the four rivals for battery life, a crucial notebook feature which on this model can be monitored on a gauge.

AST's Power Exec is priced to attract users, and its power and performance helped it to the highest satisfaction ratings in value for the dollar. However, it scored below the other systems in overall reliability.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their notebook computers in 20 specific categories.

All categories were factored into the final scores. The scores for each product in the seven most important categories are listed in the charts. ■

IBM's ThinkPad 700C

OVERALL SCORE: **79**

Would you buy the product again?

LIKELY
REASON: Quality product

RESPONSE BASE: 32 USERS

Compaq's LTE Lite 425C

OVERALL SCORE: **75**

Would you buy the product again?

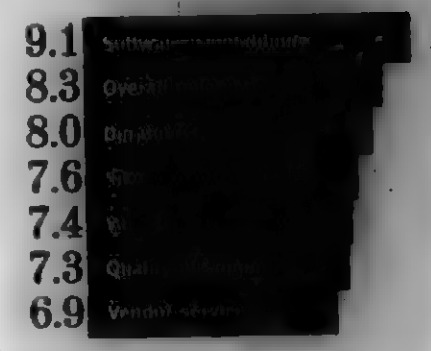
LIKELY
REASON: Good price/performance, quality product

UNLIKELY
REASON: Better systems available

RESPONSE BASE: 40 USERS

Toshiba's T4500C, T4400C

OVERALL SCORE: **75**



Would you buy the product again?

LIKELY
REASON: Dependability, durability, quality

UNLIKELY
REASON: Screen is too small

RESPONSE BASE: 39 USERS

AST's Power Exec 425SL

OVERALL SCORE: **74**

Would you buy the product again?

LIKELY
REASON: Reliability, durability

UNLIKELY
REASON: Problems with battery life, poor service

RESPONSE BASE: 30 USERS

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 141.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

Computerworld thanks the following individuals and firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Janet Cole, Dataquest, Inc.; Richard Zwetchkenbaum, International Data Corp.

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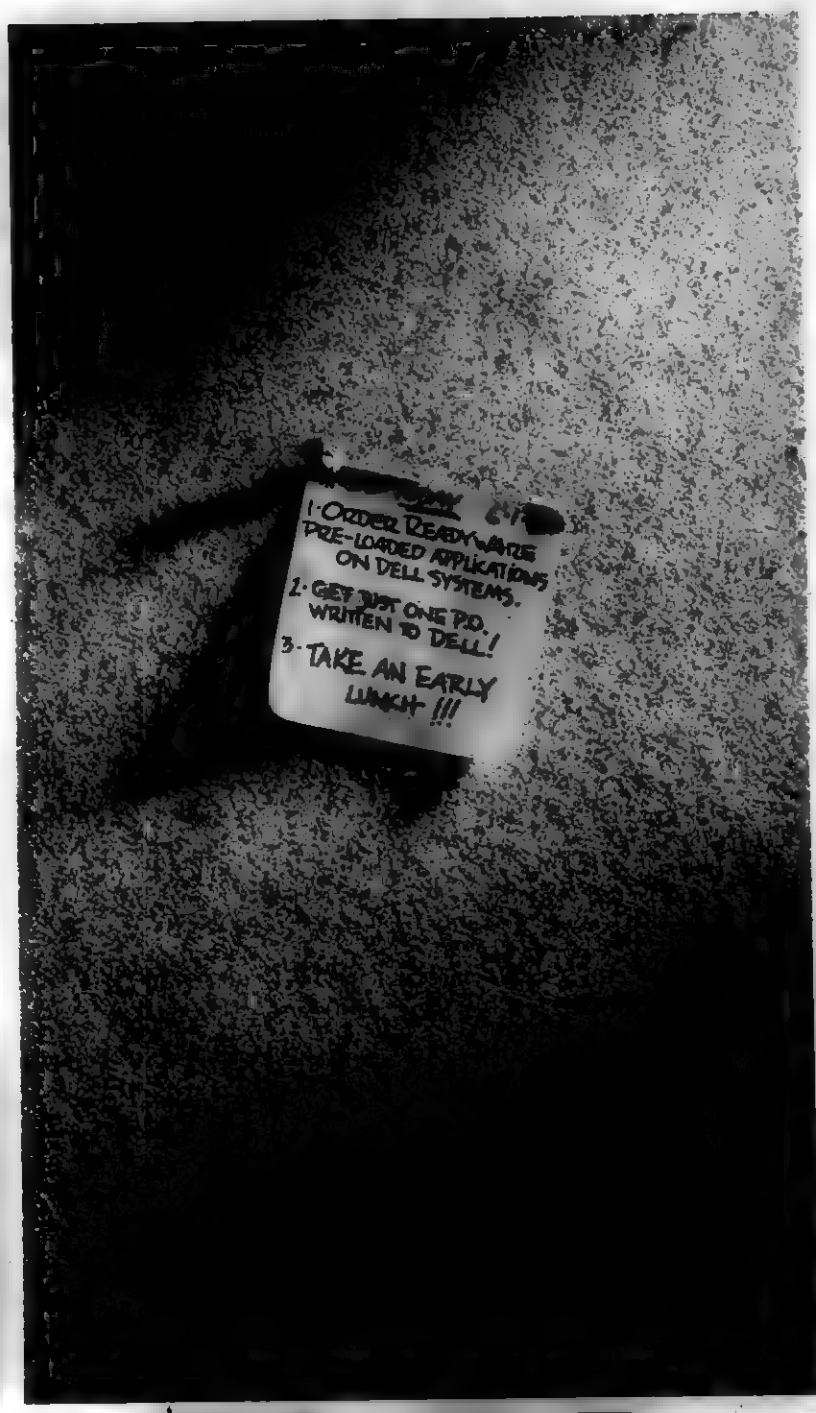

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Apple's PowerBook 180:
Easy-to-use notebook a hit, although short battery life frustrates users

PowerBook 180

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- The high-end Apple Computer, Inc. PowerBook 180 is lauded by evaluators because it is easily configured, easy to support and popular with users.
- Evaluators also said the PowerBook needs a longer battery life and is a bit more expensive than DOS-based systems.

Firing Line evaluators included senior information systems managers from a major metropolitan university, an entertainment agency, a computer hardware manufacturer and an international business consulting firm.

The evaluators managed the acquisition and support of more than 1,700 Macintosh PowerBooks, more than half of which were PowerBook 180s. The remaining mix included PowerBook Models 140, 170 and 165C. In addition, a small number of PowerBook Duos were deployed by these managers.

The applications installed on these systems generally included a suite of Microsoft Corp. programs, including Word and Excel. Other systems were equipped with the less powerful (but perhaps more versatile) Microsoft Works or Claris Corp.'s ClarisWorks.

All PowerBook models were also equipped with custom software that varied among the sites. For the most part, this software was designed with databases and/or telecommunications in mind.

This evaluation was prepared with the aid of Pieter Hartsook, editor and publisher of "The Hartsook Letter" in Alameda, Calif.

Reliability

Notebook computers generally suffer more pounding and thrashing than do desktop systems. The rigors of travel — whether across town or across the ocean — generally mandate that notebooks be of reliable construction and sound durability. As our manufacturing evaluator said, "Notebooks, in general, are more likely to be abused than desktop systems. So reliability makes more of a difference."

Although the PowerBook 180 did not survive an accidental "baseball bat test" that the consulting evaluator witnessed, all evaluators agreed that the PowerBook line has become increasingly durable and reliable during the last year. The 3.7 rating reflected problematic quality control during initial manufacture of the PowerBook line.

Consultant: "Other than people dropping the units, we haven't had too many problems."

Entertainment firm: "Someone took one to the beach and got sand in the disk drive and keyboard."

University: "Poor-quality DOS and Windows notebooks have a higher failure rate."

Compatibility

Compatibility with existing Macintosh software did not seem to cause a problem for any of the evaluators. With only minor exceptions, both off-the-shelf and in-house applications seemed to run flawlessly on the PowerBook 180.

Where compatibility was a problem, it was attributed to Apple's System 7.1 operating system rather than to the PowerBook 180. The consulting evaluator said some in-house applications were undergoing slight revision to remedy display problems.

Consultant: "We had a few problems related to System 7.1."

Manufacturer: "We didn't run into any surprises, and our software suite ran as expected."

Performance

With a 33-MHz 68030 processor, the PowerBook 180 is equivalent in power and performance to some of Apple's desktop systems. But the notebook drew only average reviews for an entirely different reason.

Although they considered the PowerBook 180 to be an able performer on the road and the desktop, the evaluators said they were concerned about the short battery life of 45 to 90 minutes. That criticism came from all of the evaluators, who said it reflected the opinions of PowerBook users.

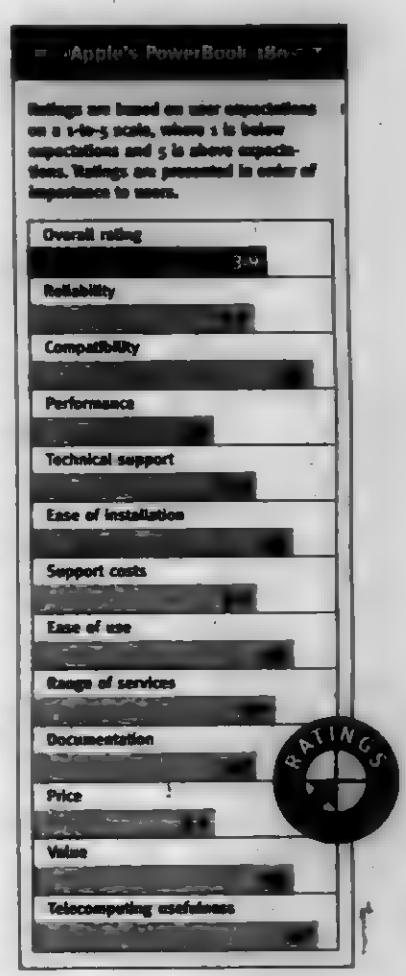
Consultant: "Battery life is minimal."

Entertainment firm: Our users say "it should get you from L.A. to New York on one battery."

Technical support

In most cases, the evaluators said the PowerBook 180 required substantially less technical support than DOS and Windows notebook systems. Indeed, they claimed PowerBook 180 users rarely used the system manuals, and Apple's built-in networking support — Apple Remote Access — made telecommunications and network access far easier than with any other system.

The manufacturing and enter-
PowerBook, *page 146*



Installation descriptions for users who evaluated Apple's PowerBook 180

	Consulting firm	Entertainment firm	University	Computer hardware firm
Using PowerBooks since	1992	1992	1991	1991
Number of PowerBooks in use	1,000+	200+	200+	300+
Standard configuration	8M BYTES RAM, 120M-BYTE HARD DISK, 14.4K-BYTE MODEM	8M-16M BYTES RAM, 120M-BYTE HARD DISK, 14.4K-BYTE MODEM	8M BYTES RAM, 120M-BYTE HARD DISK, 9.6K BIT/SEC. MODEM	8M-16M BYTES RAM, 120M-BYTE HARD DISK, 14.4K-BYTE MODEM
Primary use	ON-SITE CONSULTING	CLIENT TRACKING, EIS	ACADEMIC	SALES SUPPORT, CUSTOMER SERVICE
Desktop environment	60% MACINTOSH, 40% DOS/WINDOWS	80% MACINTOSH, 20% DOS/WINDOWS	45% MACINTOSH, 55% DOS/WINDOWS	15% MACINTOSH, 75% DOS/WINDOWS, 10% UNIX

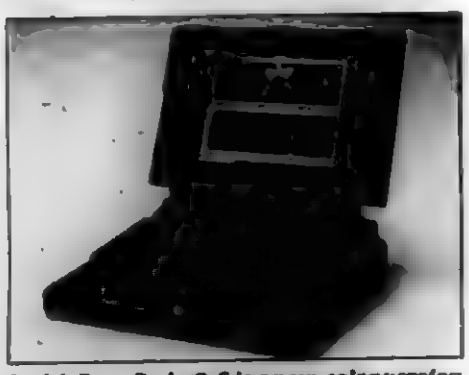
Evaluators said the PowerBooks have become more durable and reliable in the past year

CONTINUED FROM PAGE 145

tainment evaluators said Apple provided excellent technical support and repair services when required.

Entertainment firm: "Questions are typically, 'How do I send a fax?' The vast majority [of our technical support] is fax-related."

Manufacturer: "I have one person manning the PowerBook help desk. That's less than we expected."



Apple's PowerBook 180C is a new, color version of the unit discussed in this evaluation

Ease of installation

Like other systems in the PowerBook line, the 180 includes built-in support for networking using the AppleTalk protocol. An AppleTalk port is included on all PowerBooks. In addition, a Small Computer Systems Interface (SCSI) port allows connection of the PowerBook to peripherals usually related to desktop systems, such as CD-ROM drives, tape backup devices and the like.

The evaluators said that using these devices posed few problems.

Support for extra hardware devices is included either in Apple's System 7.x operating system or in easily configured programs delivered by hardware vendors.

Entertainment firm: "What impressed me was the multiprotocol support. Configuring it was a dream."

University: "A pleasant surprise was configuring Macs using a SCSI Ethernet adapter."

Manufacturer: "We chose [the PowerBook] because of the installation relative to Windows."

Support costs

Because the PowerBook 180 runs the same software as all other Macintosh models, evaluators said support costs were distinctly lower than that of equivalent DOS and Windows systems. They attributed other support reductions to the intuitive Macintosh user interface, which they said was easier to use than Windows.

University: "There are less support costs in the PowerBook than in DOS notebooks."

Manufacturer: Support costs might go up "because most PowerBook users are sales reps. They need more support than engineers."

Ease of use

The evaluators agreed that the PowerBook 180 could easily be adopted by novice users.

They said the Macintosh interface insulated users from operating system arcania and was fairly consistent across applications.

Entertainment firm: "It takes about half an hour to get a user up and running. That's about a 10-to-1 ratio" compared with others.

University: "You get more from PowerBooks than from other notebooks."

PowerBook 180 features

- Includes 33-MHz 68030 processor and 68882 floating-point math coprocessor.
- Back-lit, active-matrix display with 16-level gray scale.
- Priced at $3,699 with 4M bytes of RAM and 80M-byte hard disk.
- Announced October 1992.

Range of services

The PowerBook 180 includes a wealth of options not found on most DOS and Windows notebook systems. These include a built-in SCSI port for connection to external devices, a built-in AppleTalk networking port and a pointing device that is embedded in the keyboard.

Entertainment firm: "Everything is built-in: a SCSI port, networking and a mouse."

Documentation

The evaluators had little to say about PowerBook documentation, primarily because users had little need for it. They did say the "balloon Help" facilities included in the System 7.x operating system vastly reduced the need for printed documentation. They said Apple's online Help was generally sufficient for most users.

Entertainment firm: "Our agents don't want [documentation]. They don't want anything to do with it."

University: "Most PowerBook owners don't read the manual."

Price

At a list price of $3,699 when equipped with 4M bytes of random-access memory and an 80M-byte hard disk, the PowerBook 180 is quite a bit more expensive than Intel Corp. 1486-based notebooks.

The evaluators responded to PowerBook pricing with only average ratings.

University: "It's in the ballpark."

Manufacturer: "You pay a premium for the PowerBook."

Value

Despite the higher cost of ownership, the evaluators said the PowerBook provided more value than equivalent DOS and Windows systems. They cited lower support and training costs as justification for the higher PowerBook cost.

Entertainment firm: "I have fewer calls to the help desk. Configuration, training and support are less. I can have fewer technical people."

Telecomputing usefulness

The evaluators said the PowerBook 180 was a telecomputer's dream. They said few, if any, problems occurred with even the most novice telecomputers. They said the biggest telecomputing problem was finding and using hotel room telephone jacks.

Entertainment firm: "Our agents love it, but the irony is that the quality of [a third-party] fax has sold more PowerBooks than anything else."

University: "The remote networking [support] is very useful. That is not being done with DOS laptops."

Manufacturer: "Apple Remote Access and AppleTalk give the ability to dial in and have network services. You don't lose any functionality" over a desktop system.

Written by senior editor Garry Ray.

Apple responds

The following are Apple's responses to issues raised in this evaluation:

▶ **Battery life:** For all computer users, battery life is clearly a top priority. With this in mind, we have constantly evolved our battery technology since the introduction of the PowerBooks. We have moved from 2.5 amp/hour to 2.9 amp/hour batteries and have developed the EverWatch battery-saving technology. We continue to explore new possibilities for further improvements.

▶ **Pricing:** There have been some very aggressive pricing moves from the PowerBook group this month. We lowered the price of the entry-level model by 25% and the price of the PowerBook 180. In addition, the PowerBooks come with many features that are not standard on the DOS platform: networking, audio, QuickTime and file sharing. Customers are buying a very complete portable solution and know they will not have to invest in new features at extra cost.

▶ **Color displays:** We introduced the passive-matrix color PowerBook 165C earlier this year. While the 165C has been doing well, it was clear that a portion of our customers were interested only in active-matrix color technology. The active-matrix PowerBook 180C was introduced June 7, so we now have a strong offering for all PowerBook customers.

▶ **Availability:** PowerBook demand has been tremendous: 400,000 were sold in the first year. While we anticipated strong demand, this level of success is unusual for a new product. As a consequence of high demand, we have made changes to our manufacturing cycle for PowerBooks to improve availability.

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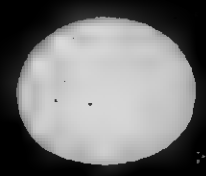

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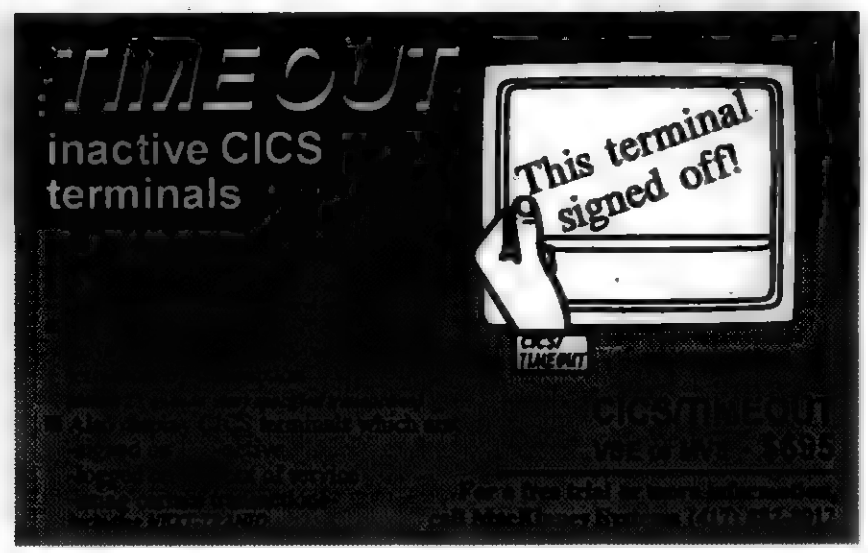

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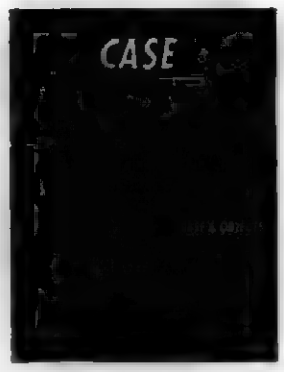

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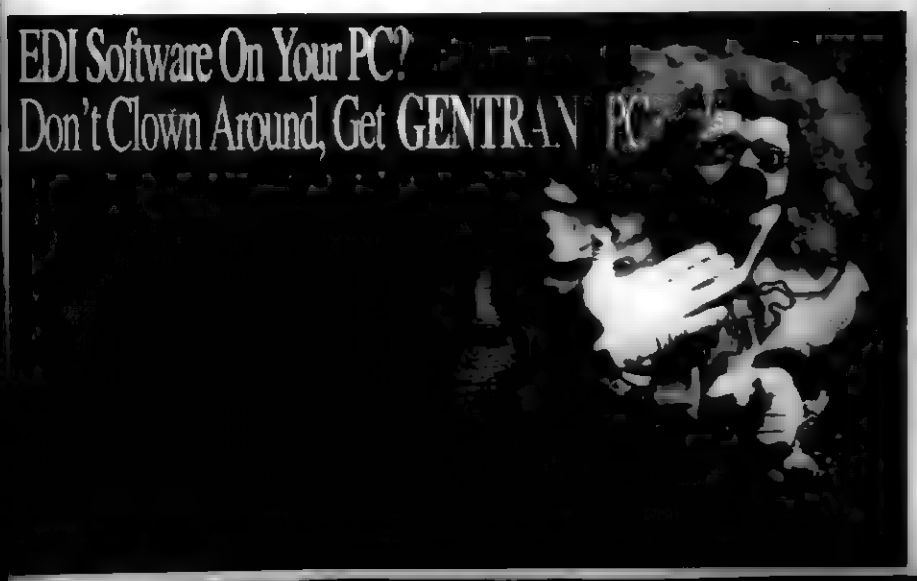

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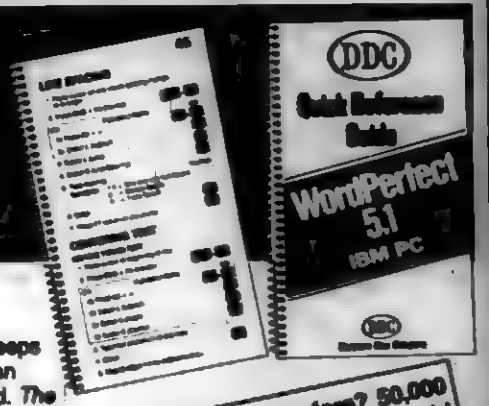

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RE-ENGINEERING REPERCUSSIONS

Business managers, end users and IS staff from Connecticut Mutual, Agway and Kodak speak candidly about how re-engineering has affected their jobs — and their lives

CONNECTICUT MUTUAL

▶ **Re-engineering can create** *massive upheaval for a firm, say Connecticut Mutual IS chief Jan Scites (left), end user Kathleen Pogg (center) and business manager Karen Wetherell*

By Julia King
Special to CW

Two and a half years ago, paper plastered the desks of the 1,900 employees at the home office of Connecticut Mutual Life Insurance Co. in Hartford. A task as seemingly straightforward as a beneficiary change required no fewer than 22 human interventions. Assuming no one lost the paperwork or misfiled copies, the process took up to six days.

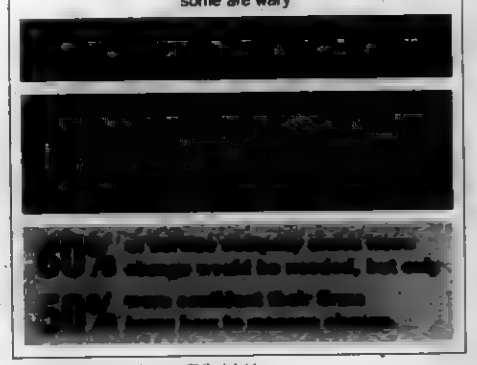
Today, the same task is accomplished in two steps and in seconds, thanks to a multimillion-dollar re-engineering initiative aimed at moving all Connecticut Mutual divisions to a common computing architecture known as One Image.

Since January 1991, the One Image project has involved redesigning work flow across all departments, implementing imaging technology enterprisewide and furnishing all workers with "command centers" — network-based PCs that can access a single database of cus-

Connecticut Mutual, *page 150*

JITTERS

Re-engineering might have its benefits, but a survey of top-level managers at 200 companies found that some are wary



Source: Price Waterhouse, Philadelphia

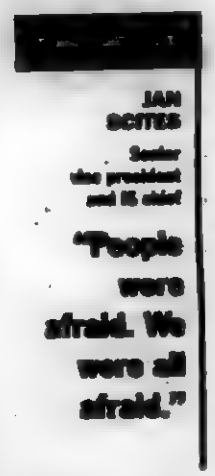
Connecticut Mutual

CONTINUED FROM PAGE 149

tomer information.

Another key element of the $12 billion company's One Image program was the replacement of the traditional management hierarchy with cross-functional teams of workers. These groups are responsible for streamlining old business practices or architecting new ones. Included on these teams are application developers and other information systems personnel who report not to a central IS organization or chief information officer but to a division vice president.

So far, re-engineering has yielded productivity gains of 20% to 60% across all departments in the company's individual life insurance division. Additionally, the division has recouped its $5 million capital investment in the One Image project in 18 months — six months ahead of schedule.



JAN SCITES
Senior vice president and IS chief

"People were afraid. We were all afraid."

Achieving these gains meant significant cultural changes for IS workers. First, application developers and programmers were reassigned to newly created "designer," "architect" and "navigator" positions. These new titles reflected what was expected of IS workers in the re-engineered organization, says Jan Scites, senior vice president and functional IS chief at the company's individual life division.

"As we get more into object-oriented and reusable code, the skill of raw coding is less necessary. [IS workers] need the ability to be intuitive, think spatially and navigate data to end users," Scites explains.

Creating cross-functional teams in which all members have an equal say in how to accomplish work is one of Scites' biggest challenges, she says.

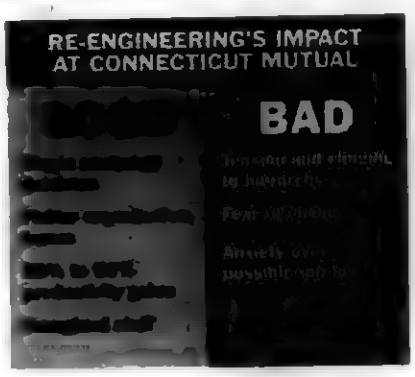
"At the beginning, there was tension and a clinging to hierarchy," she recalls. "We came in and said, 'We're going to re-engineer the whole individual life line, and we need your support.' Because it was uncertain what all of that meant, even to us, people were afraid. We were all afraid."

Open communication and ongoing training programs were instituted to help combat the fear. In 1991, the division provided the employees with 15,000 hours of training in Windows, PCs and imaging. Last year, the figure rose to 25,000 hours.

Other communication activities included regular newsletters, informational videos and company-sponsored technology days when workers could experiment with different hardware and software.

On the positive side, Scites says the challenges associated with the re-engineering program "have energized and excited people as much as they have ever been in their careers."

Staffers feel good about their part in helping the company's 1.5 million policyholders. IS centralized policyholder information to eliminate redundancies.



KATHLEEN POGG
Customer service consultant

"I'm a lot calmer."

Customer service consultant Kathleen Pogg used to spend a good deal of her working day rifling through file cabinets, only to find incomplete paperwork. "I don't know" was her honest answer to many questions Connecticut Mutual agents and policyholders called to ask. Her desk was "a mountain of paper, a real mess," she says. A backlog of three, four and even five weeks was common.

Today, the paper is gone. Pogg now has electronic access to all policy data as well as to legal documents, letters and other correspondence. Upon arrival in the company's mailroom, those paper documents are scanned into a corporate database. Looking at her screen, Pogg can see, among other things, who in her department or in another part of the company has worked on a customer file.

All of this has made her work easier. It has also done wonders for her mental health.

"It feels good to go home at the end of the day knowing that I got a lot done," Pogg says. "I'm a lot less stressed out. I'm not going from drawer to drawer or desk to desk to find something all the time. I can do all my work myself, and I know everything I need is right there in my command center."

KAREN WETHERELL
Customer service vice president

"[People] are anxious about losing their jobs."

Eliminating positions and dealing with widespread worker anxiety over losing jobs was the toughest challenge Customer Service Vice President Karen Wetherell faced. "It's difficult to implement change and ask people to be enthusiastic about it when they are anxious about losing their jobs," she says.

Wetherell's staff has decreased from 250 people in October 1990 to 184 today. While attrition accounts for a portion of that drop, other employees were put out of work by imaging technology and re-engineered work flow.

As the company restructured jobs, Wetherell says, she found that the best way to approach colleagues was directly.

"If we planned to convert files to optical disc, we would tell file clerks before we went in that their jobs would be gone in six months," she says. "By doing that, we developed trust. Employees knew they wouldn't be taken by surprise. They were thankful to us because they could prepare and seek other employment."

Personnel cuts, along with a 665-sq-ft reduction in office space and the elimination of 110 five-drawer file cabinets and costly color-coded paper forms, have made it much easier to bring her department in on budget, Wetherell says.

At the same time, the combination of new technology and re-engineered work flow has boosted productivity 35%.

"Problems are now resolved in one phone call rather than pending for weeks," she says. ■

AGWAY

For years, farmers placed orders at any one of 600 Agway, Inc. stores, which in turn submitted them to the appropriate mill, plant or warehouse. The result: an endless paper flow among Agway's retail, manufacturing and distribution facilities. These sites were ordering from and billing one another, all to serve the same customers.

Agway executives decided to consolidate the number of ordering points to 15. Now, rather than going to the stores, farmers call (800) GO-AGWAY to order all feed, crop and seed supplies directly from regional service centers.

Using an interim computer system that builds on the point-of-sale system used in the retail stores, customer service specialists have PC- and terminal-based access to customer histories, credit information and other data stored both locally at the service centers and on the cooperative's Amdahl Corp. mainframe.

The company opened its first regional customer service center last October. Four others will be operational by mid-summer.

CARLETON WHITTEMORE
IS chief

"Existing systems are far from efficient."

While phone surveys of 80 farmers each week indicate a high level of customer satisfaction with the new ordering scheme, the systems supporting it are inefficient. This remains one of the IS department's chief re-engineering hurdles, says IS chief Carleton Whittemore.

From a business perspective, Agway knew it had to move ahead with its re-engineering plans to stem two straight years of declining revenue, he says. But this required moving to the regional service center concept before the IS group could develop and put in place new systems and tools.

"It took a lot of creative magic on the part of IS people, who have worked long, long hours to tie together a system from the consumer group and two other systems from the agricultural group. But what we have is a conglomeration of existing systems that are far from efficient," he explains.

Meanwhile, the IS department is being overwhelmed by demands from other Agway business units. Agway's consumer and energy divisions are also re-engineering. Also, the cooperative is looking to replace separate financial and control systems with one accounting system.

At the same time, the 125-person IS department is going through a sort of culture shock as it makes the transition from a separate Agway profit center to an internal support organization.

"IS has a tremendous amount on its plate," Whittemore says.

But there are positive results of the restructuring. "IS people are not always on the defensive, having to justify why something is late. They are starting to be looked at as part of a team."

▶ Anna Doe *misses face-to-face contact*

KODAK

In 1988, Eastman Kodak Co. set a company record by rolling out the world's first disposable 35mm camera just 38 weeks after the start of design work. Known as the Fling, the camera was the first Kodak product designed and manufactured by a project team employing concurrent engineering principles; three-dimensional, solid-model computer-aided design (CAD) technology; and a single database of development information — the three basic ingredients of a re-engineering effort that has now spread throughout the entire Consumer Products Division.

Prior to Fling, the company produced cameras and other Kodak products in a sequential, step-by-step manner from design to tool maker to factory floor. When problems surfaced, backtracking would begin.

Earlier this year, Kodak introduced the Cameo, a pocket-size, motor-driven 35mm fixed-focus camera. It is the 10th in a series of products developed since the re-engineering program began five years ago. From design to manufacture, it took 22 people 23 months to produce.

Prior to re-engineering, the same product would have taken more than 60 people between three and four years to get out the door.

WOODY NOXON
Director, systems engineering division

"The power of the team becomes very strong."

The single greatest advantage re-engineering has afforded Kodak engineers is a consistent source of information, which enables each person involved in a project to know precisely how his work impacts others on the team, according to Woody Noxon, director of the Systems Engineering Division and manager of CAD technology.

"In the serial engineering process, designs would be thrown over the wall to the next department, and if there was a change, it had to go back over the wall the other way," Noxon explains. "But now that CAD tools and all the information around a product is available to anybody on the design team, people in different locations can use the same geometry at the same time, and they all know the relationship between the parts and the overall product."

The effect, Noxon says, has been that each person's work is available to everyone on a daily basis. "The power of the team becomes very strong very quickly and comes together around a common goal," he says.

JOHN SPENCER
Design engineer

"We just don't make the mistakes we used to."

John Spencer, a Kodak design engineer and project manager on the Cameo, draws a sharp contrast between life before and after Kodak re-engineered around CAD and concurrent design principles.

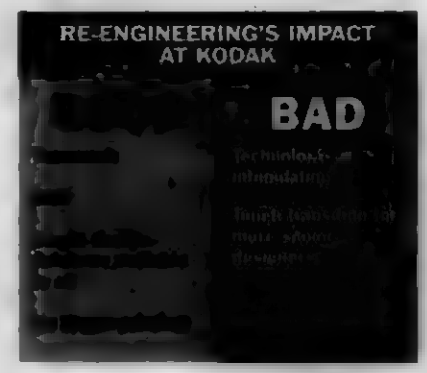
"Before, we'd be blister-packing cameras and still changing features," Spencer recalls. "Now, we put a lot more thought into the process up front. There are 196 parts to the Cameo, and with the very first parts I put together, I built a camera that worked. That was unheard of five years ago. Now, we just don't make the mistakes we used to."

Learning to "trust the technology" took some time, however.

"CAD is not like a drawing board where you can look through vellum and see what you've got," Spencer says. "At first, especially in manufacturing, there was a lot of intimidation because there were no 'drawings' and no signing off on drawings. Instead, manufacturing had to go into the database to do their tooling estimates."

In this sense, Spencer says, the technology has placed an additional burden on designers to be good at technology as well as design.

One of the things Spencer doesn't miss at all about the old way of doing things is the finger-pointing that went on between departments. "Now, it is the team that succeeds or fails."



RAY LIMOGES
Engineering unit manager

"It was a difficult transition."

As Ray Limoges sees it, it is universal access to a single database that represents the largest engineering breakthrough at Kodak. Limoges, engineering unit manager, has furnished all 270 of his staffers with CAD terminals with links to both model and tool shops at Kodak.

"You get better designs with CAD, and the dramatic success of our new products has made people anxious to get on to the next project," he notes.

But it wasn't always that way. "We had a lot of people that had spent their whole career at the drawing board, and it was a difficult transition for some to throw away their boards," Limoges says.

Younger people, meanwhile, adapted much more quickly to the technology, but they lacked design experience.

The solution? Team younger designers with senior staffers, who, Limoges says, generally took about six months to get acclimated to the CAD system.

"We did have to take delivery pressures off senior people in the early stages," Limoges notes. "But when they saw their designs directly transitioned into parts, they became convinced of the value [of CAD]." ■

ANNE DOE
Customer service representative

"We need more training."

Agway's customer service staff members are primarily retrained employees from other parts of the company. Anne Doe, a customer service representative, used to be a store clerk. She says she likes her new job but misses being outdoors, especially during the Vermont spring.

Last year at this time, Doe was loading and unloading trucks, waiting on customers and "doing a little bit of everything" at Agway's farm center store in St. Albans, Vt., she says.

Today, Doe, who is herself a farmer, still works in St. Albans but at Agway's regional service center. There, she sits at a desk in front of a computer terminal, processing phone orders from farmers. "Being inside all year around is about the only thing that really bugs me," she says of her new job.

Because the computer system provides her with previously unavailable background information, such as the kind of feed bought in the past, herd size and even the farmer's spouse's name, Doe says she has been able to more knowledgeably serve customers.

▶ Richard Stowe: *Changing attitudes was hard*

But like Whittemore, she says the computer system supporting the regional centers is inadequate.

"We need more storage because now we can only go back to the previous five orders. But for some of the big farms, five orders represents only a week's time.

"We also need more training," Doe adds. "We have a mainframe system, but as they add new programs, we don't get training. It's kind of hunt and peck."

RICHARD STOWE
Region manager

"We're more competitive."

Listing the benefits of re-engineering comes easy to Richard Stowe, who, as region manager for Agway's feed business, also oversees the St. Albans customer service hub. "The No. 1 benefit is that we've made it easier for customers to do business with us. Farmers can call and talk with essentially the same people every time," Stowe says.

"We're also more competitive and more responsive to customers' needs. Instead of going through one, two or three people to find an answer to a billing problem, each employee is responsible for resolving questions that come to them. Before, a complaint could take several days to weeks to resolve," he notes.

But changing employees' attitudes has been a problem, Stowe says. "They want to know why we're doing it a new way. It is difficult for employees to understand the need for and the rationale for change." ■

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Interested in DATA SECURITY? Beef up sales skills.

By John A. Blackley

THE JOB OF data security manager isn't what it used to be. These days, holding this title means you spend most of your time roaming the organization, and it often entails much higher level tasks than changing the system's access code. To survive, I tell myself to learn to love change. You're in the data security business, and if you don't love change, you'll go crazy.

I'm a certified information systems security professional and a data security manager at a Texas bank. I have almost 10 years of experience in data security, much of it in the banking and financial services industries.

In the past, security managers often doubled as data security administrators. They spent time entering code in a security system, checking it and submitting it for overnight processing. Now, most of these activities are handled by a data security technician. In my company, this person reports to me, as does the disaster recovery manager.

This change in responsibility has freed me to oversee corporate security standards. I write policies, procedure documents, mission statements and requests for information that will enhance the security program. I visit companywide staff meetings, deliver presentations and gather information about security challenges posed by new technology.

Education is a big part of the job. Most security professionals realize education is the key to effective security: If we spend lots of money on access-control technology and do not educate our staff, we've wasted that money. And excellent negotiating skills are required because almost no one wants to set up another meeting just to hear about security.

At my previous company, I used an unusual negotiating tactic. I had difficulty getting one particular department manager to allow me to talk with his group. I called, wrote letters and did other things to get his attention, to no avail. Finally, I sent him a Valentine's Day card that said, "Forgive me for whatever I've done. Please invite me to one of your staff meetings." And he did.

Nobody wants to hear it

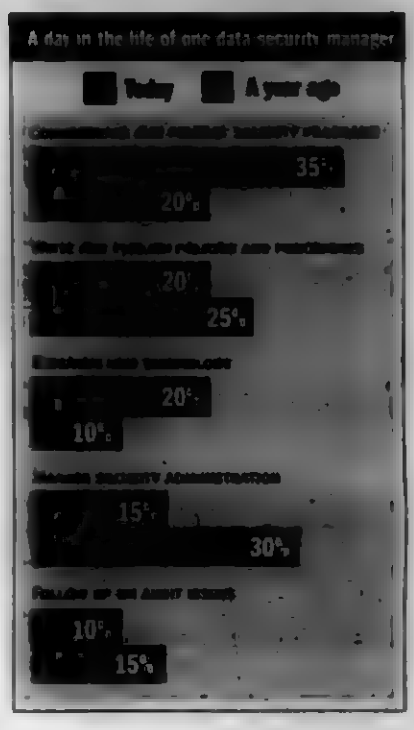
After putting in some necessary time pulling teeth, I have just enough time to research new technology. I must be knowledgeable enough to advise management on security issues before new technology is brought into the company. After all, no wants to hear that the new server can't be brought up on Monday because we don't know how to secure data on it.

I worked at one company that installed a host-to-host communications product. From a security point of view, I told them it was a dog, but they installed it anyway. Afterward, we discovered that any knowledgeable user could easily circumvent some of the product's key security measures. We had to quickly write add-on code to prevent this, and fortunately, nothing bad happened. This emphasized to me how important it is to discuss security before, not after, a product is in place.

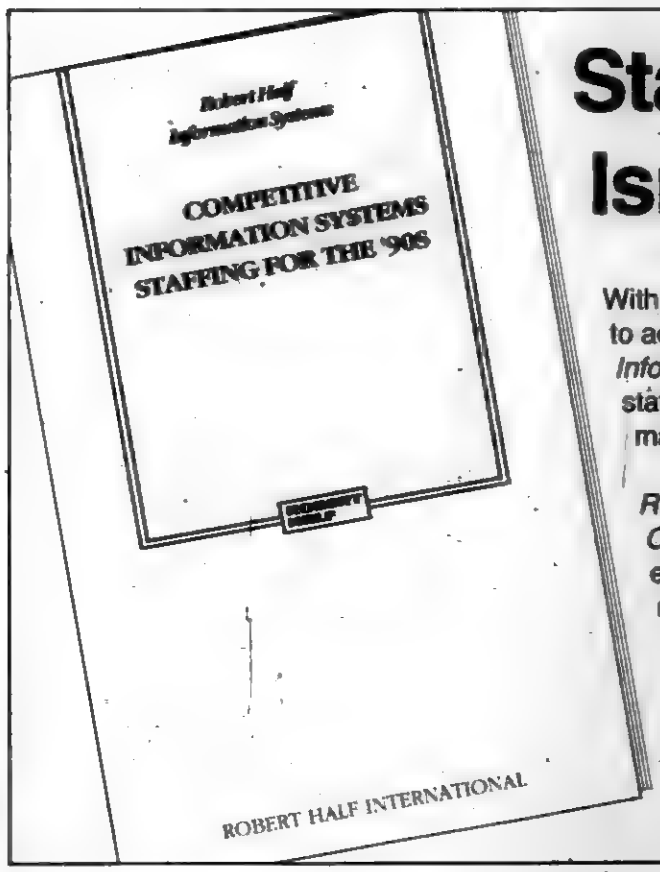
Talk, talk and more talk

I've found that one of the best ways to educate myself about new technologies is to talk with my peers. Computer security professionals tend to be more isolated in their organizations than other IS professionals and need to seek one another out.

If I do all of the above, I just might keep in tune with my customers. If they're happy, so am I. Right now, the biggest thing my customers want is a product that allows a single user ID and password for all of the computing platforms in the organization. Ask any data security user what they hate most about security, and you'll hear: "We're always being told not to write down passwords. But how do we remember all of them when we have so many?" Single sign-on is the answer. Look for security products that promise this, and your customers will love you.



Blackley is a data security manager at a Texas bank.



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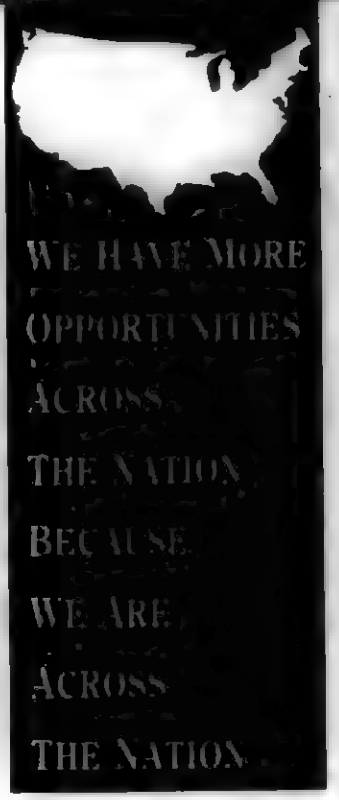

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Can you relate?

Getting comfortable with relational databases is a must if you hope to fit into a distributed environment

By Leslie Goff

You've heard it many times: If you don't want to be left in the dust by distributed computing, you'd better acquire a thorough understanding of relational databases. But where do you begin?

Of course you want to concentrate your energies on the products with the best prospects, and according to George Brown, president of Database Solutions in Marlton, N.J., that means products that are truly relational and have embedded SQL. Beyond that, the choice of products will largely depend on your development environment, experience with fourth-generation languages (4GL), time and budget.

Learning SQL is fairly straightforward. Once you know it, "you can pretty much work your way through any relational database," says Rod Prince, director of technology at National Diagnostic Systems, a medical services consultancy in Burlingame, Calif.

Prince suggests reading SQL manuals for the basics and delving into one package to learn its quirks.

Cobol programmers who have had little or no experience with a graphical user interface (GUI) or the SQL language would probably do best if they started with a product such as MicroFocus Cobol from Dialogue Systems. It is a GUI-based language that makes limited use of object-oriented programming (OOP) techniques and can be used as a front end to a database server environment. But be warned: Price can be an inhibitor. MicroFocus Cobol costs about $1,500 per copy.

To get a good introduction to relational concepts, analysts recommend that you work with Microsoft Corp.'s Access or Borland International, Inc.'s Paradox. Because these products combine a GUI-based, OOP-oriented development environment with the database itself, you can kill two birds with one stone and graduate more easily to database server products.

Take the plunge

Corporate programmers may want to plunge into database servers, says Tim Harmon, workgroup computing strategies program director at Meta Group, Inc., a Westport, Conn.-based consulting firm. Products such as Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, Informix Corp.'s Informix and SQL Server (marketed by Microsoft and Sybase) were designed to run in a client/server environment.

Database servers must be married to a front-end 4GL development tool, such as MicroFocus Cobol, Powersoft Corp.'s PowerBuilder or Microsoft's Visual Basic, which are used to write the applications that are then ported to the database. Visual Basic provides a consistent interface across all your Windows applications, says Urban Cubbage, a programmer and technical instructor at Paramax Systems Corp. in Sunnyvale, Calif., a division of Unisys Corp.

As you get into the idiosyncrasies of a specific relational database and application development environment, you can evaluate the technical differences among the products. Even when high-level product features are similar, products never take exactly the same approach.

Harmon notes that Paradox has a more OOP-oriented language than does Access. However, several analysts recommend Access as a good starting point because it incorporates a subset of Visual Basic into the scripting language.

On the other hand, PowerBuilder is not a true OOP language, Prince says, but it has OOP components.

Goff is a New York-based free-lance writer.

According to analysts, these are must-do's when learning to use PC databases:

Understand the database utilities. If local-area network databases aren't being administered from a centralized point, programmers must have a good background knowledge of the utilities in the database — import and export procedures, backup and recovery and how to create and drop tables.

Understand locking procedures and isolation levels. Multiuser environments require management of shared resources. You must understand what's locking in the data. You have to be aware of what data resources you are allocating for your transaction.

Understand SQL optimization. You must have good, efficient SQL coding techniques and understand how to obtain and analyze access path information.

Know the capacity issues involved in programming a database. Evaluate the physical I/O capability of the hardware and the resource needs of the application to see if they match.

Understand transaction models. You need a tracking mechanism for live transactions.

Keep up on mainframe connectivity issues. In a cooperative processing environment, you'll coordinate the database with mainframe data.

Know how to integrate third-party tools. You may want to couple the database with graphics packages or report writers.

Understand OOP. Applications using a GUI need an object-oriented language.

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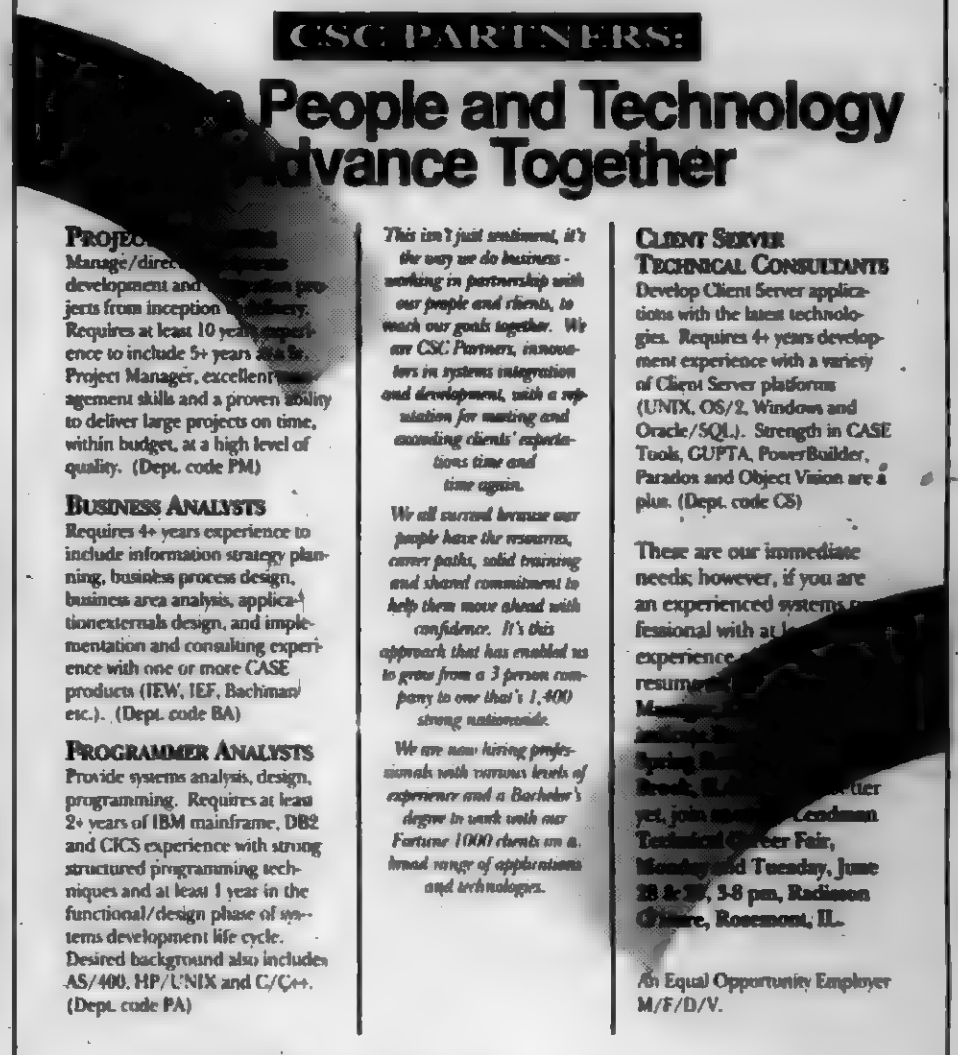

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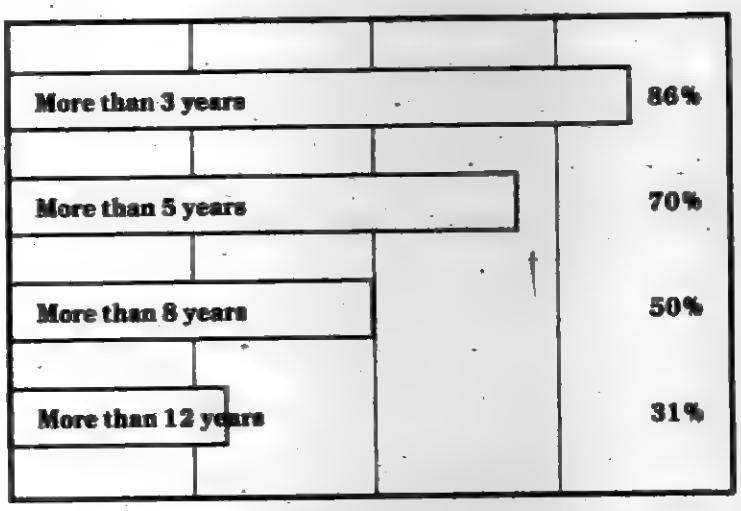

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Give your PC clone a physical exam

By Todd Henschell

FROM THE OUTSIDE, a bargain-priced clone looks like ... well ... another clone. There's no way to know whether the quality is up to par.

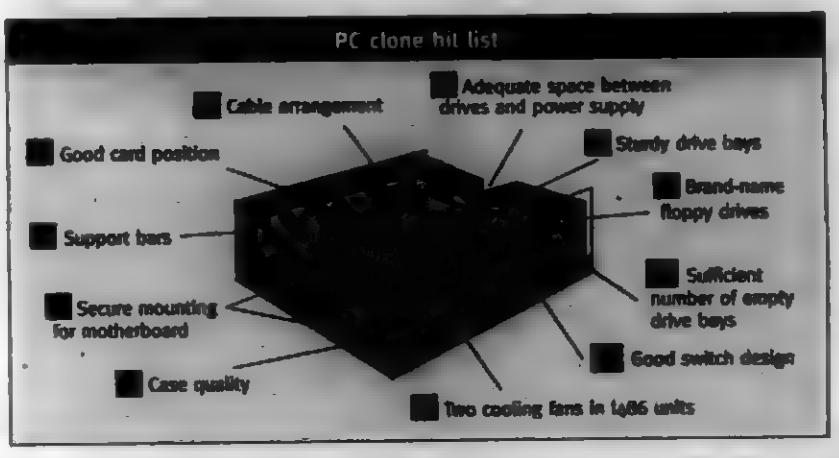
For all you know, the vendor may have squeezed a few bucks back into its profit margin with simple system changes that may not be noticeable at first but could contribute to the early demise of the machine.

While most of these problems aren't found on brand-name PCs, small aggressive companies often do whatever it takes to undercut the current market price.

The safest route is to check out a sample machine. A cursory inspection takes only a few minutes and helps avoid irksome bugs, runtime errors and intermittent hardware crashes. Even better, get a written assurance that the systems you order will be equal to or better than the sample's quality.

The diagram to the right is a generic representation of an average PC. Tower cases differ mostly in that they stand upright. More important, if you were to sit on top of a tower case, it shouldn't flex. If the case wobbles, what's inside wobbles, too. That's bad.

- Once you've pulled the cover, check for support bars on both sides that extend from the front wall of the case to the back wall. If there aren't any, the case will wobble every time it's moved, possibly damaging the motherboard.
- Grab the metal where the drives are mounted and try to bend it. If it flexes like a TV dinner tray, you don't want the machine. Every time you push in a floppy, you could flex the drive bays.
- Examine the cover over the power supply to see if the vents are too close to the flat ribbon cables that supply data to the floppy drive. This is disturbingly common in cheap compact desktop cases. You need enough room to push your hand (about three-fourths of an inch) between them without touching the cable or power supply case.
- The motherboard should be affixed to the chassis with at least three metal screws: two along the back row where the bus slots are and at least one in front. Larger boards should be mounted with four screws. If the board is mounted with only nylon standoffs and one screw, it may wiggle when you insert cards or during normal thermal cycling.
- Look at the general arrangement of drive and power cables to be sure they've been properly "dressed" into position. If they're haphazardly placed, that means the system was sloppily constructed.
- Take a peek at the type of floppy drive (or drives) installed. You want a brand-name drive.



- If the machine is an 1486, you want two cooling fans. One should sit inside the power supply, the other somewhere inside the case (in the bottom-front of the tower cases, for example). The 486 runs hot and can benefit from more than one fan.
- Inspect the general rigidity and quality of the case. Are there irregular or sharp edges in areas you will have to access during service? Cheap cases will have no rolled-over edges. Cases with rolled edges are stronger and safer but more expensive to make.
- Establish that the cards fit into the bus slots correctly and are standing upright. Some bargain machines won't allow the cards to stand at a perfect 90 degree angle in relation to the motherboard.
- If there are empty drive bays, the installed drives should be spaced apart to permit more air to flow for better cooling. Also, there should be sufficient room for expansion.
- Look at the front panel of the case. Are the power and reset buttons close to the buttons for ejecting a floppy disk? I've seen cases where they were less than an inch apart. Instead of ejecting a disk, the operator might inadvertently turn the power off.

Henschell is a free-lance writer and PC consultant in Burbank, Calif.

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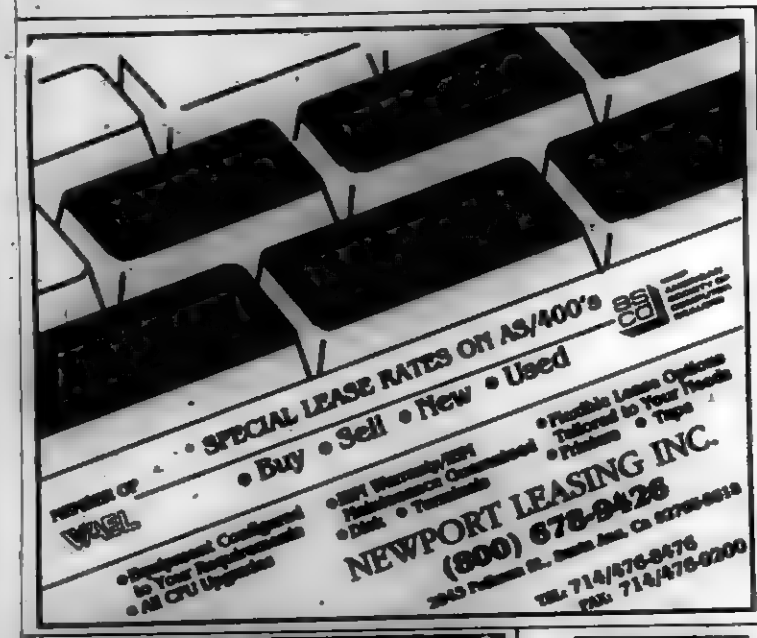
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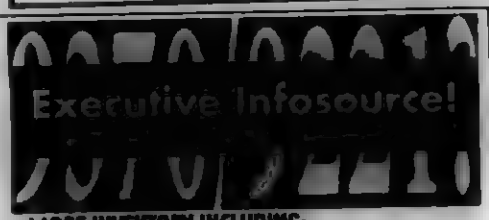

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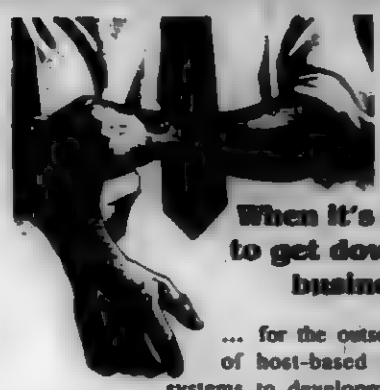

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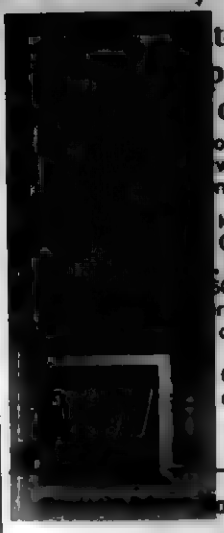

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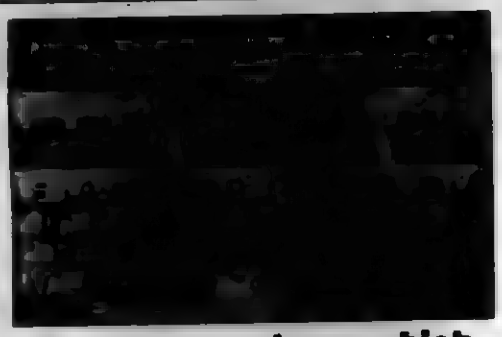

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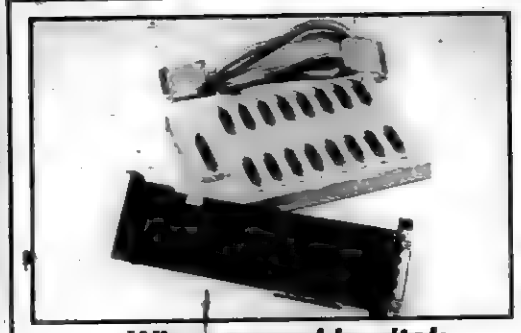

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Gainers

Percent

Shoptronix Technology	26.4
Telematics Int'l, Inc.	18.9
Dell Computer Corp.	18.3
VLSI Technology	18.0
3 COM Corp.	17.7
Progress Software Corp.	14.8
Intelligent Info. Systems (H)	14.0
Bantam Systems Inc.	11.7

Dollar

Powerdesk Software Corp.	5.50
Motorola Inc.	4.29
3 COM Corp.	4.00
American Power Conversion	3.75
Intelligent Info. Systems (H)	3.50
Chipcom Corp.	3.50
Dell Computer Corp.	3.25
Cabletron Systems	3.25

Losers

Percent

Antel Communication Corp.	-23.8
Data Race Inc.	-18.2
Amacomp Inc.	-16.7
Group I Software	-15.0
Jetform	-14.3
Commando Inc.	-13.8
Microdole Corp.	-12.5
Dynatech Corp.	-11.8

Dollar

Data Race Inc.	-3.50
Jetform	-2.25
Cirrus Logic	-2.13
Lotus Development	-2.00
Synoptic Corp.	-1.88
Rainbow Technologies Inc.	-1.75
Borland Int'l, Inc.	-1.75
Alpha Corp.	-1.63

Breaking in

Internetworking equipment — routers, bridges and smart hubs — is the latest industry sector to prove the old adage, "There's no such thing as a free lunch."

Jumping into that booming market is no guarantee of success on Wall Street. While share prices have skyrocketed for market leaders such as Cisco Systems, Inc. (CSCO), Wellfleet Communications, Inc. (WFLT) and SynOptics Communications, Inc. (SNPX), a number of other high-tech issues have languished as companies struggle to carve out a piece of the internetworking market.

Although The Yankee Group predicted the multiprotocol router market will swell to $1.3 billion in 1995, "it isn't necessarily a 'rising tide lifting all boats' situation," said Eric Buck, a senior analyst at Donaldson, Lufkin & Jenrette Securities Corp.

The following companies have tried to diversify into the internetworking market, with varying degrees of success:

•Proteon, Inc. (PTON). Proteon's stock started the year at approximately 10 and is currently trading around 5. Analysts said Proteon, which has relied primarily on third-party distributors to move its routers, illustrates the difficulties faced by companies that move into internetworking from other areas.

"The issue with a router sale is that it's not a box sale; it's an expensive product and more of an infrastructure sale," said Doug Carey, a technology analyst at RAS Securities. "It helps for the salesperson to be tied in with the appropriate person in the customer company. Companies that don't focus completely on routers face a big challenge."

•3Com Corp. (COMS). 3Com's share price has deflated recently in the face of fluctuations in its key adapter card business. However, 3Com has been relatively effective in expanding into internetworking. The company's router business grew 22% sequentially in the last quarter, according to Maria Lewis, managing director at Cowen & Co. "They don't have a marketing plan to challenge Cisco on the backbone, but I think they're a very viable remote-access solution," Lewis said. 3Com is among the Top 6 vendors in market share in both multiprotocol routers and smart hubs.

•Telebit Corp. (TBIT). Telebit, currently trading near its low of 3, moved into internetworking with its NetBlazer dial-up router products. The company still suffers from a high degree of exposure to the enormously competitive, lower margin modem business, according to James Kedersha, an analyst at Cowen & Co. Kedersha said he does not recommend purchasing Telebit stock, but the company has made several moves recently that may strengthen its market position. —*Derek Slater*

Exch	52-Week High	52-Week Low		June 25 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS EQUIPMENT						
OTC	60.00	9.63	3 COM Corp.	26.63	4.00	17.7
NYS	81.00	62.75	American Info Techs Corp. (H)	78.50	-0.25	-0.3
NYS	63.88	40.63	AT&T	62.13	0.50	0.8
OTC	4.06	0.75	Antel Communication Corp. (H)	3.00	-0.94	-23.8
OTC	24.50	10.25	Bantam Systems Inc.	16.75	1.75	11.7
NYS	57.50	44.25	Bell Atlantic Corp. (H)	57.50	0.75	1.3
NYS	57.50	46.75	Bellsouth Corp.	54.75	1.13	2.1
NYS	8.00	3.63	Bolt, Beranek & Newman	7.50	0.25	3.4
OTC	18.50	9.50	Brooktrout Technology	13.75	2.88	26.4
NYS	108.38	47.00	Cabletron Systems	104.75	3.25	3.2
OTC	22.75	3.88	Certigram Communications	22.00	2.00	10.0
OTC	43.50	19.00	Chipcom Corp.	42.25	3.50	9.0
OTC	56.25	22.13	Cisco Systems Inc.	53.75	2.50	4.9
OTC	16.38	5.50	Compression Labs Inc.	12.50	-0.13	-1.0
OTC	36.00	11.25	CrossComm	29.00	-0.25	-0.9
OTC	4.63	1.25	Data Switch Corp.	2.63	-0.25	-8.7
NYS	19.88	12.38	Digital Comm. Assoc.	12.50	0.00	0.0
OTC	12.75	6.50	Digital Systems Int'l Inc.	4.75	-0.50	-9.5
OTC	69.50	4.38	DSC Communications (H)	69.50	1.38	2.9
OTC	9.50	6.88	Fibronics Int'l. Inc.	6.50	-0.13	-1.9
OTC	24.75	8.75	Fibronics Int'l. Inc.	11.75	0.50	4.4
OTC	4.38	1.50	Gandalf Technologies Inc.	2.88	0.00	0.0
OTC	2.06	0.69	Gateway Communications	1.06	0.00	0.0
NYS	15.75	2.88	General Datacomm Inds.	13.88	-0.38	-2.6
ASE	3.75	2.00	Go Video	2.69	-0.25	-8.5
NYS	37.75	31.63	GTE Corp.	36.25	0.88	2.5
NYS	85.75	62.75	ITT Corp. (H)	83.88	-1.25	-1.5
OTC	57.13	30.75	MCI Communications Corp.	56.38	0.88	1.6
OTC	8.00	2.25	Microcom Inc.	3.50	0.00	0.0
OTC	24.25	4.75	Metrix Corp.	5.25	0.00	0.0
OTC	19.00	8.75	Network Computing Devices	10.00	0.75	8.1
NYS	15.00	5.38	Network Equipment Tech.	7.38	-0.50	-6.3
OTC	20.13	8.00	Network General	9.75	0.63	6.8
OTC	15.75	8.38	Network Systems Corp.	8.50	-0.50	-5.6
OTC	46.25	7.50	Newbridge Networks Corp. (H)	43.25	0.00	0.0
NYS	46.00	30.50	Northern Telecom Ltd.	36.88	-1.38	-3.6
OTC	35.25	22.50	Novell Inc.	27.25	0.75	2.8
NYS	92.50	77.00	Nynex Corp.	87.75	-0.75	-0.8
OTC	30.00	14.50	Octel Communications Corp.	20.75	0.00	0.0
OTC	6.13	3.38	Penril Data Comm Networks	4.13	0.13	3.1
OTC	30.50	10.25	Picturetel Corp.	20.63	0.13	0.6
OTC	15.25	4.63	Proteon Inc.	4.88	-0.25	-4.9
NYS	35.00	15.00	Scientific Atlanta Inc.	31.63	0.88	2.8
NYS	40.75	29.94	Southwestern Bell Corp.	37.25	-0.63	-1.7
NYS	33.75	21.38	Sprint Corp.	33.75	2.00	6.3
OTC	27.00	10.50	Standard Microsystems Corp	15.75	-1.13	-6.7
OTC	18.50	6.88	Stratacom Inc.	11.75	-0.50	-4.1
OTC	42.75	9.75	Synoptics Communications	34.75	2.75	8.6
OTC	7.00	3.63	Talent Corp. (L)	3.63	-0.38	-9.4
OTC	9.38	2.13	Telematics Int'l. Inc.	7.88	1.25	18.9
OTC	25.50	18.38	US Robotics	23.50	1.75	8.0
NYS	45.00	35.25	US West Inc.	44.75	0.75	1.7
BTC	55.50	12.00	Wellfleet Communications	49.88	3.13	6.7
OTC	15.50	7.00	Xircom	15.50	1.25	8.8
COMPUTERS AND WORKSTATIONS						
OTC	5.56	2.50	Advanced Logic Research	3.75	0.00	0.0
OTC	65.25	39.50	Apple Computer Inc. (L)	40.00	-0.75	-1.8
OTC	24.25	11.25	AST Research Inc.	15.00	0.00	0.0
NYS	10.63	2.63	Commodore Int'l.	2.75	-0.13	-4.3
NYS	61.75	24.00	Compaq Computer Corp.	53.63	0.25	0.5
OTC	49.88	16.00	Dell Computer Corp.	31.00	3.25	18.3
NYS	89.25	50.25	Hewlett Packard Co.	82.88	2.13	2.6
NYS	38.50	16.25	Silicon Graphics	36.38	1.63	4.7
OTC	41.00	23.38	Sun Microsystems Inc.	29.38	1.13	4.0
NYS	32.38	22.25	Tandy Corp.	29.00	-1.13	-3.7
OTC	7.00	2.75	Zeos International Ltd.	3.50	-0.38	-9.7
DISK DRIVES						
ASE	10.38	4.63	Amdahl Corp.	5.25	-0.13	2.3
NYS	8.75	4.25	Convex Computer	5.00	-0.63	-11.1
OTC	6.13	1.88	Cray Computer	3.13	0.00	0.0
NYS	30.88	19.00	Cray Research Inc.	26.00	-1.50	-5.5
NYS	13.88	7.50	Data General Corp.	10.00	0.50	5.3
NYS	49.25	30.38	Digital Equipment Corp.	40.75	0.00	0.0
NYS	38.63	26.75	Harris Corp.	37.38	-0.50	-1.3
NYS	100.38	45.88	IBM	49.38	0.00	0.0
OTC	22.00	5.50	Kendall Square Research	16.75	-0.50	-2.9
NYS	127.50	83.00	Matsushita Electronics	118.75	1.38	1.2
OTC	23.75	8.25	NetFrame	13.75	-2.25	-14.1
OTC	15.50	9.25	Parallan Computer	12.75	-0.50	-3.8
OTC	19.00	6.00	Pyramid Technology	18.50	0.75	4.2
OTC	24.00	13.75	Sequent Computer Sys.	17.00	-1.38	-7.5
OTC	9.63	1.38	Sequoia Systems Inc.	2.00	-0.19	-8.3
NYS	48.38	29.50	Stratus Computer Inc.	30.63	-0.38	-1.2
NYS	16.88	9.88	Tandem Computers Inc.	11.63	-0.38	-3.1
OTC	21.50	10.63	TriCord Systems (H)	19.88	1.63	8.9
NYS	13.88	7.75	Unisys Corp.	11.50	0.38	3.4
SOFTWARE						
OTC	76.00	25.25	Adobe Systems Inc.	66.50	-1.13	-1.7
OTC	20.75	10.25	Alcus Corp.	16.00	-1.63	-9.2
OTC	14.25	5.50	American Software Inc.	7.75	-0.13	-1.6
OTC	28.13	9.75	Ask Computer Systems	10.75	-0.38	-3.4
OTC	56.50	32.75	Autodesk Inc.	52.50	-0.75	-1.4
OTC	13.00	2.50	Bachman Info. Systems	3.00	0.00	0.0
OTC	43.00	32.00	BGS Systems Inc.	32.13	0.13	0.4
OTC	64.13	37.25	BMC Software Inc.	49.50	2.75	5.9
OTC	28.25	17.00	Boole & Babbage	24.25	0.00	0.0
OTC	49.00	17.50	Borland Int'l. Inc.	22.75	-1.75	-7.1
OTC	5.38	1.00	CE Software	3.50	-0.25	-6.7
ASE	30.25	6.25	Cheyenne Software Inc.	28.75	-0.38	-1.3
OTC	19.50	8.25	ChipSoft	10.25	-0.25	-2.4
OTC	9.25	5.63	Cognos Inc.	7.00	0.38	5.7
NYS	31.38	11.13	Computer Associates	28.38	0.75	2.7
NYS	12.38	2.75	Computervision Corp.	3.63	-0.25	-6.5
OTC	34.25	19.25	Computrade Corp.	25.75	-0.63	-2.4
OTC	14.75	5.75	Comsmart Inc.	6.25	-1.00	-13.8
OTC	17.25	10.75	Corel Corp.	16.50	-0.25	-1.5
OTC	23.00	5.25	Easel Corp.	5.50	-0.75	-4.3
OTC	25.25	12.00	4th Dimension	18.50	0.38	2.1
OTC	19.50	5.38	Frame Technology	5.75	-0.13	-2.1
OTC	20.75	8.50	Group I Software	8.50	-1.50	-15.0
OTC	35.25	17.50	Gupta	17.50	1.50	9.4
OTC	8.75	3.75	Hogan Systems Inc.	7.75	0.25	3.3
OTC	25.75	11.25	IMRS	18.63	0.38	2.1
OTC	36.00	19.00	Information Resources	35.00	-0.75	-2.1
OTC	24.88	6.06	Informix Corp.	23.75	0.50	2.2
OTC	16.75	8.88	Intergraph Corp.	9.38	-0.50	-5.1
OTC	13.63	6.88	Interleaf Inc.	8.50	-0.13	-1.4
OTC	18.00	5.50	Intersolv Inc. (L)	5.88	-0.38	-6.0
OTC	16.00	7.75	Knowledgeware Inc.	9.75	0.38	4.0
OTC	54.75	26.00	Legent Corp.	35.75	2.25	6.7
OTC	37.00	14.75	Lotus Development	32.50	-2.00	-5.8
OTC	23.00	6.50	MathSoft	7.25	0.50	7.4
OTC	23.25	5.25	McAfee Associates	7.25	0.50	7.4
OTC	33.63	1.88	Mega Software	10.00	-0.25	-2.4
OTC	13.00	5.25	Mentor Graphics	10.38	-0.25	-2.4
OTC	46.00	27.25	Micro Focus	31.75	-1.63	-4.9
OTC	17.25	4.38	Microgate Inc.	6.00	0.50	9.1
OTC	98.00	65.50	Microsoft Corp.	87.75	-1.50	-1.7
OTC	46.00	14.38	Oracle Corp.	46.00	2.75	6.4
OTC	34.25	15.38	Parametric Technology	29.75	-0.50	-1.7
OTC	30.50	22.50	Peoplesoft	29.50	0.50	1.7
OTC	7.13	3.50	Phoenix Technologies	5.38	-0.25	-4.4
OTC	40.00	22.00	Powersoft	27.50	-0.25	-0.9
OTC	41.50	17.00	Platinum Software	23.50	-1.50	-6.0
OTC	25.00	11.25	Platinum Technology	12.25	-1.13	-8.4
OTC	61.50	32.25	Progress Software Corp.,	44.75	5.50	14.0
OTC	12.50	2.56	Quarterdeck Office Sys.	5.38	0.06	1.9
OTC	28.25	11.75	Rainbow Technologies Inc.	25.25	-1.75	-6.5
OTC	12.25	4.00	Rasterops	8.63	-0.88	-9.2
OTC	15.25	3.63	Ross Systems	12.50	-0.25	-2.0
OTC	27.50	9.25	Sapiens Intl. Corp. N.V.	25.50	0.00	0.0
OTC	14.50	6.75	Software Publishing Corp.	7.13	-0.38	-5.0
OTC	12.00	2.00	Software Toolworks Inc.	9.63	0.25	2.7
OTC	3.50	0.75	Spinnaker Software	1.19	-0.06	-5.0
OTC	12.75	3.25	State of the Art	8.75	-0.75	-7.9
NYS	24.63	14.63	Sterling Software Inc.	18.50	-1.00	-5.1
OTC	21.50	8.00	Struct. Dynamics Research	16.38	-1.13	-6.4
OTC	72.75	22.75	Sybase Inc.	72.50	2.63	3.8
OTC	48.00	5.88	Symantec Corp.	14.00	-1.88	-11.8
NYS	12.50	5.25	Systems Center Inc.	9.88	-0.50	-4.8
OTC	25.50	10.00	System Software Assoc.	19.25	-0.75	-3.8
OTC	6.38	2.50	Trilogy Corp.	3.00	-0.38	-11.1
OTC	22.75	9.13	Viewlogic Systems	18.75	1.25	7.1
OTC	23.50	6.75	Walker Interactive Systems	7.25	-0.25	-3.3
OTC	3.19	1.38	Worldtalk	1.56	-0.06	-3.8
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices	21.50	0.75	3.6
NYS	21.38	9.38	Analog Devices Inc.	18.88	-0.38	-1.9
OTC	25.50	7.63	Atmel Corp. (H)	24.63	-0.50	-2.0
OTC	7.25	2.75	Chips and Technologies	3.38	-0.25	-6.9
OTC	39.75	13.00	Cirrus Logic	17.50	-2.13	-10.8
NYS	14.50	7.38	Cypress Semiconductor Corp.(H)	13.00	-0.63	-4.6
NYS	16.13	8.25	Dallas Semiconductor	13.75	-1.00	-6.8
OTC	60.63	27.13	Intel Corp.	54.75	-0.75	-1.4
NYS	15.50	4.88	LSI Logic Corp. (H)	15.00	0.38	2.6
NYS	33.25	13.75	Lattice Semiconductor	25.75	-1.50	-5.5
NYS	36.63	13.63	Micron Technology (H)	36.13	1.88	5.5
NYS	88.00	37.63	Motorola Inc.	85.63	4.25	5.2
NYS	16.25	8.50	National Semiconductor (H)	16.25	0.50	3.2
OTC	16.50	6.50	Sierra Semiconductor	7.00	-0.50	-6.7
OTC	43.25	22.25	SynOptics	43.00	2.75	6.8
NYS	70.88	34.50	Texas Instruments	68.50	-1.13	-1.6
OTC	9.00	6.00	VLSI Technology	9.00	1.38	18.0
OTC	10.38	2.13	Wafertech	8.63	-0.50	-5.5
ASE	9.63	3.75	Western Digital Corp. (L)	3.75	-0.25	-6.3
OTC	38.50	14.50	Xilinx	36.50	2.13	6.2
OTC	33.00	13.00	Zilog Inc.	28.75	2.50	9.5
PERIPHERALS AND SUBSYSTEMS						
OTC	39.25	11.75	American Power Conversion	37.75	3.75	11.0
OTC	20.16	13.84	Banctec Inc.	17.75	0.00	0.0
OTC	18.88	5.75	Cambex Corp. (L)	5.75	-0.75	-11.5
ASE	18.38	6.50	Cognitronics Corp.	7.13	-0.63	-8.1
NYS	25.50	9.25	Conner Peripherals (L)	9.38	-0.50	-5.1
OTC	38.50	10.75	Creative Technologies Inc.	27.75	0.13	0.5
OTC	30.75	14.25	Data Race Inc.	15.75	-3.50	-18.2
ASE	17.00	4.75	Databank Corp.	9.00	0.13	1.4
NYS	20.63	5.06	EMC Corp. (H)	20.63	1.88	10.0
OTC	10.50	5.38	Emulex Corp.	6.75	-0.25	-3.6
OTC	19.00	13.25	Evans & Sutherland	15.50	-0.50	-3.1
OTC	33.00	9.25	Exabyte (L)	9.25	-0.75	-7.5
OTC	28.50	7.09	Intelligent Info. Systems (H)	28.50	3.50	14.0
OTC	8.88	3.75	Ionica Corp.	4.13	0.13	3.1
OTC	21.25	5.75	IPL Systems Inc.	8.00	0.25	3.2
OTC	24.00	10.75	Komag Inc.	17.25	-1.25	-6.8
OTC	19.63	5.88	Maxtor Corp.	6.63	0.13	1.9
OTC	11.25	5.75	Micropolis Corp.	6.13	-0.88	-12.5
NYS	117.00	95.38	3M Corp	100.00	-0.38	-0.3
OTC	7.75	4.00	Printronix Inc.	6.75	0.00	0.0
NYS	17.25	6.88	QMS Inc.	9.00	0.13	1.4
OTC	17.88	9.75	Quantum Corp. (L)	11.38	0.75	7.1
OTC	12.75	3.13	Radius Inc.	4.00	0.00	0.0
NYS	16.50	7.63	Recognition Equipment	14.38	0.50	3.6
OTC	13.88	4.25	Reson Inc.	4.25	-0.38	-8.1
OTC	22.38	12.00	Seagate Technology	15.38	-0.25	-1.6
NYS	45.00	18.00	Storage Technology	35.50	-1.00	-2.7
NYS	27.88	16.88	Tektronix Inc.	24.38	0.38	1.6
NYS	88.88	66.75	Xerox Corp.	79.50	2.13	2.7
SERVICES						
OTC	23.75	16.25	American Mgmt. Systems	16.00	-0.50	-3.0
NYS	4.75	2.50	Amacomp Inc.	2.50	-0.50	16.7
OTC	35.75	16.25	Analysts Int'l.	39.13	1.88	6.9
NYS	56.13	38.75	Auto Data Processing	48.13	0.88	1.9
NYS	17.25	11.13	Ceridian Corp.	14.75	0.25	1.7
NYS	17.38	13.13	Comdisco Inc.	14.38	-0.13	-0.9
OTC	8.25	4.50	Computer Horizons	7.75	0.38	5.1
NYS	80.50	57.00	Computer Sciences	78.63	0.88	1.1
NYS	9.25	6.50	Computer Task Group	7.00	-0.25	-3.4
NYS	40.50	22.00	CompUSA Inc.	32.88	1.00	3.1
OTC	14.25	6.00	Corporate Software	11.00	1.00	-8.3
OTC	19.25	7.38	Egghead Discount Software	8.88	0.13	1.5
NYS	35.88	25.25	General Motors E (EDS)	30.63	0.50	1.7
OTC	25.50	9.50	Inacom Corp.	30.75	0.25	1.2
OTC	15.38	6.50	Intelligent Electronics	12.75	-0.13	-1.0
OTC	13.00	6.63	Measel	10.50	-1.00	-8.7
OTC	16.25	5.75	Micrilage Inc.	15.50	-0.25	-1.6
OTC	43.00	22.00	Paychex	39.00	0.00	0.0
NYS	87.25	32.88	Policy Management Sys.	36.63	0.63	1.7
NYS	38.50	26.81	Reynolds and Reynolds	36.38	0.50	1.4
OTC	33.00	22.00	SEI Corp.	30.75	-0.13	-0.4
OTC	24.38	17.75	Shared Medical Systems	23.00	0.00	0.0
OTC	12.63	5.75	SHL Systemhouse	10.50	-0.38	-3.4
OTC	29.25	18.25	Software Spectrum Inc.	29.00	0.25	0.9
OTC	33.75	22.50	Sungard Data Systems	30.25	0.00	0.0
NYS	4.38	1.13	Ultimate Corp.	3.25	-0.25	-7.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Nynex to shed unit

Nynex Corp. last week agreed to sell The BIS Group Ltd., an international provider of software and services, to ACT Group in Birmingham, England, for $140.3 million. BIS is best known for its banking and health care software and integration services. The deal is expected to close next month. Not included in the acquisition was BIS' Norwell, Mass., marketing consultancy arm, BIS Strategic Decisions.

Cognos posts profit

Cognos, Inc., an Ottawa application tools vendor, posted first-quarter fiscal profits of $100,000 (Canadian), a 50% decline from the comparable period last year. Revenue in the period rose 2% to $36 million (Canadian).

EMC sets acquisition

EMC Corp. has agreed to acquire Magna Computer Corp., a Salem, N.H., developer of IBM-compatible Application System/400 tape storage products. Terms of the deal were not disclosed.

SHORT TAKES IBM has completed its acquisition of CGI Informatique, a Paris software and services company.... SunGard Data Systems, Inc. in Wayne, Pa., has agreed to acquire Sun Data, Inc.'s AS/400 disaster recovery business.... SPSS, Inc., a Chicago developer, has floated an initial public offering of 2 million shares priced between $9 and $11 per share.... Quantum Corp., a Milpitas, Calif., disk drive vendor, expects fiscal first-quarter profits to be below expectations due to continuing pricing pressure.... Advanced Visual Systems, Inc., a Waltham, Mass., developer of visual computing software, has acquired Jaguar Software, a provider of visualization technology for Windows and Windows NT environments.

New kid on management block

Start-up's software tracks and manages systems across enterprise network

By Johanna Ambrosio
SADDLE BROOK, N.J.

■ One of the computer industry's newest players is trying to dent the market for software used to manage computers throughout an enterprise.

Called Novadigm, the upstart recently showed off its wares in seminars across the country. Headed by two former Pansophic, Inc. managers, the company has a war chest of almost $7 million in start-up capital and has about 10 paying customers for Enterprise Desktop Manager (EDM), its family of client/server software management packages. Another 15 customers are slated to begin trials shortly, according to H. Kent Petzold, president and chief executive officer.

Novadigm's Albion Fitzgerald: *Managing diversity is key*

Prudential Securities, Inc. in New York helped Novadigm develop EDM during the past two years and plans to use it to help distribute and manage software on the more than 10,000 workstations going into its branch offices nationwide.

"We're changing our environment from dumb terminals to intelligent workstations," said Mohammed Mosaad, senior vice president of Prudential. "We want to be able to manage everything from our central site in New York. This product is very important to us."

EDM is a collection of systems management software, including applications to handle security, asset management, change management, configuration management and distribution of PC software from a central site.

Novadigm officials said that when a user changes the desktop configuration, or if a new version of software needs to be distributed, EDM can handle such changes either automatically or on demand.

The applications run across multiple platforms, including IBM mainframes, OS/2 and Windows; Unix support is planned within the next 12 months.

Similarly, EDM supports communications protocols such as IPX, NetBIOS, Transmission Control Protocol/Internet Protocol and IBM's Systems Network Architecture.

At the core of EDM is an object-oriented architecture that includes a server, client and an administrator component. The server contains a proprietary database that configures and manages software based on company policies.

Users can integrate their existing systems management software into EDM, including IBM RACF mainframe security and NetView network management, and can also integrate into EDM data repositories from other third-party suppliers. Prices are $25,000 for the server and administrator and $100 per client. All the systems management applications are included with the core system.

The main idea behind EDM is to provide a tightly integrated set of applications that can track and manage software across an entire enterprise. "It's a question of managing diversity," said Albion Fitzgerald, Novadigm's chairman and chief technology officer.

Good potential

One outside observer gave Novadigm — which stands for "new paradigm" — a good chance of success. "The founders have a proven track record, have good funding, and the technology is pretty sophisticated," said Igor Stenmark, an analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn. "They're providing a policy-based mechanism for controlling desktops and services."

At the same time, however, Novadigm is battling a bevy of well-entrenched competitors on all fronts.

Many vendors are trying to get a piece of the enterprise systems management market, including traditional players such as Candle Corp., Legent Corp. and Computer Associates International, Inc.; start-ups Emprise Technologies in Pittsburgh and Openvision Corp. in Pleasanton, Calif.; hardware suppliers Novell, Inc. and IBM; and application software vendors such as Microsoft Corp.

Novadigm was founded in 1990 and has 22 employees. The company plans to sell EDM through direct sales and value-added resellers, among other channels.

Amdahl, EDS ally to provide cross-platform development

By Melinda-Carol Ballou
DALLAS

Amdahl Corp. and Electronic Data Systems Corp. have formed a venture to provide users with tools to handle cross-platform application development in areas ranging from business rules to work-flow analysis.

Known as the Antares Alliance Group, the venture will oversee ongoing development and integrate Amdahl's Huron prototyping development tools and EDS' InCase and Apache modeling software by mid-1994.

The two companies seek to leverage EDS' clout as a systems integrator and the complementary features of their product sets to target users wanting a single source to define, develop, test and execute applications.

At a glance

Amdahl holds an 80% interest in Antares, and EDS holds the remaining 20%.

Competitive computer-aided software engineering market leaders include TI's Information Engineering Facility, Andersen Consulting's Foundation (a division of Arthur Andersen & Co.) and Sapiens International Corp.'s Sapiens tools.

Industry analysts were positive in their assessments of the benefits of uniting the products, though they said Antares will face a challenge in effectively marketing them. After two years of shipping Huron, for instance, Amdahl was only able to gain a user base of 50. Breaking into an arena saturated with development tools was no easy task for a company that has mainframes as its primary business.

More irons in fire

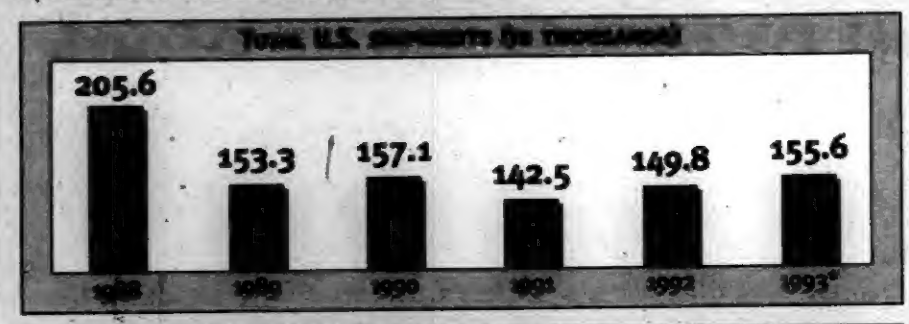
EDS also has competing alliances to juggle. For example, EDS is currently bidding on a number of projects in which it plans to use Texas Instruments, Inc.'s IEF application tool kit, which competes with Antares.

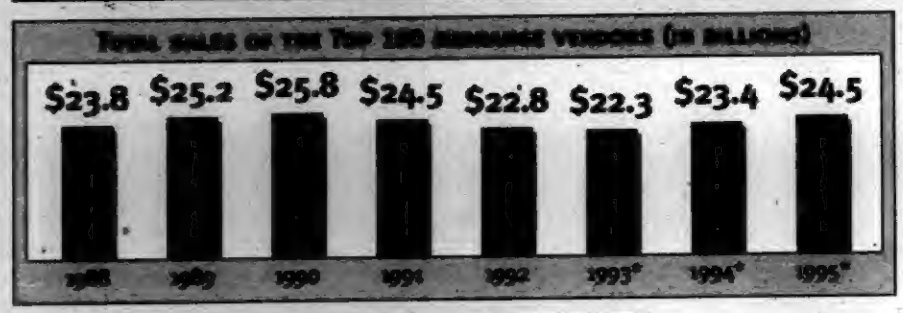
Huron is a prototyping tool that allows access to multiple databases for its proprietary database repository. It also provides the ability to externalize business rules and build them into applications, said Jim Sinur, an analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn. And InCase offers modeling capabilities that are lacking in Huron, he said. EDS' Apache offers the ability to incorporate work flow in applications.

"If they build bridges across those three, they will have one of the few products that covers the whole life cycle from business rules through to work-flow analysis," he said. Antares officials said they will use Amdahl's and EDS' direct sales channels and indirect channels such as third parties, OEMs and value-added resellers.

INDUSTRY PULSE: Midrange systems

The recent surge of Unix-based client/server systems being installed has caused an upturn in what was a shrinking midrange market





Top 5 vendors by U.S. shipments

1991 midrange systems		1991 small systems	
IBM	3,150	IBM	30,115
DEC	2,807	DEC	23,313
HP	1,181	NCR/AT&T	11,808
DG	1,060	Unisys	9,070
Sequent	543	Sun	7,895
1992 midrange systems		**1992 small systems**	
IBM	4,866	IBM	31,820
DEC	1,535	DEC	24,915
DG	772	HP	10,787
HP	670	Sun	7,970
Tandem	630	NCR	7,159

IDC defines midrange systems as those that comprise both small-scale (those costing $10,000 to $100,000 and supporting two to 32 users) and medium-scale (those costing $100,001 to $1 million and supporting 33 to 128 users) systems.

*Projected

Source: International Data Corp. (IDC), Framingham, Mass.; Gartner Yardstick, Stamford, Conn.

The 5th Wave *by* Rich Tennant

Inside Lines

Seeking advice

Knowledge Ware, a corporate asset management firm developing in Colorado, last week on how best to restructure the company, which is expected to post a loss of at least $14 million after restructuring charges for the fiscal year ending June 30, according to Drew Brennan, an analyst at Cowen & Co. As a cost-cutting measure, Knowledge Ware will close its corporate office in Atlanta for two weeks next month. Other shareware report: Symbio has reopened negotiations to acquire the maker of application development tools [CW, April 6, 1992]. Knowledgeware officials refused to comment on the report. They did say, however, that they have completed layoffs and have stabilized the number of employees at 300.

Licensing at work

Microsoft is reportedly close to signing on to use DEC's upcoming Polycenter software licensing technology as a utility within Windows NT, although the deal is apparently taking a bit longer to close than DEC had hoped. DEC originally wanted to go public with it this week but is now looking toward a mid-July announcement. The company hopes to have endorsements from other platform vendors by then as well, although industry watchers are not sure DEC can pull that off. The Polycenter license manager, code-named Omni and due later this year, will compete primarily with Gradient Technologies' IFOR/LS technology (formerly called NetLS).

Northern exposure

If Canada is the great frontier for outsourcers these days, then Northern Telecom may be the next one in point. The telecommunications giant will soon choose between Computer Sciences Corp. and IBM subsidiary Integrated Systems Solutions Corp. for a deal that one source valued at around $8 billion. Merrill Lynch analyst Steve McClellan estimated that the winner will purchase approximately $180 million in computer assets from Northern. It will be interesting if ISSC wins because Northern is a large Hewlett-Packard shop. EDS, which was busy trying to close its erstwhile British Telecom deal, was never in the Northern picture, according to sources.

Not so North-bound

Although Litton Computer Services announced last month that it was negotiating a seven-year deal to take over operations of the North reservation system for Hilton Hotels Corp. and Budget Rent A Car Corp., it conceded recently that Budget may not be around for the long haul. Thomas Gibson, Litton vice president of business development, said he expects Budget to stay on for at least two years, but beyond that he is less certain. Sources said Budget might prefer to move off the 20-year-old North system, which was designed more for hotels than for car rental companies, and onto a next-generation system. Litton is slated to replace AMR as North's operator next month.

Two-way street

An expected agreement between IBM, Maxtor Corp., Seagate Technology, Inc., Toshiba Corp. and SunDisk Corp. to make their PCMCIA hard drives interchangeable has been delayed. Sources said the deal is now targeted for a mid-July announcement [CW, May 31].

What's in a name? Depends on the spelling. The latest issue of CompuServe Magazine *played with anagram programs and ran some of the more amusing ones. For example, you might not think President William Clinton and talk show host Rush Limbaugh have much in common, but their anagrams, Million Liars Tic and Hi Bug Arm Limb, aren't so far apart. In the computer industry, Bi Bush Jelly has been in the news a lot as he heads over the reins at Apple, whose best-known product is the Show Tools. Bug Bill, meanwhile, is the dominant motherboard maker's nickname, and Big Stalk wants us wimpy people to run Windows as possible. Please, for* CompuServe Show Editor *Alan Alper with your tips at (800) 848-8474, (800) 878-5331 or 70537,2432, respectively. Or try* Computerworld*'s 24-hour voice-mail hotline at (800) 669-6554.*

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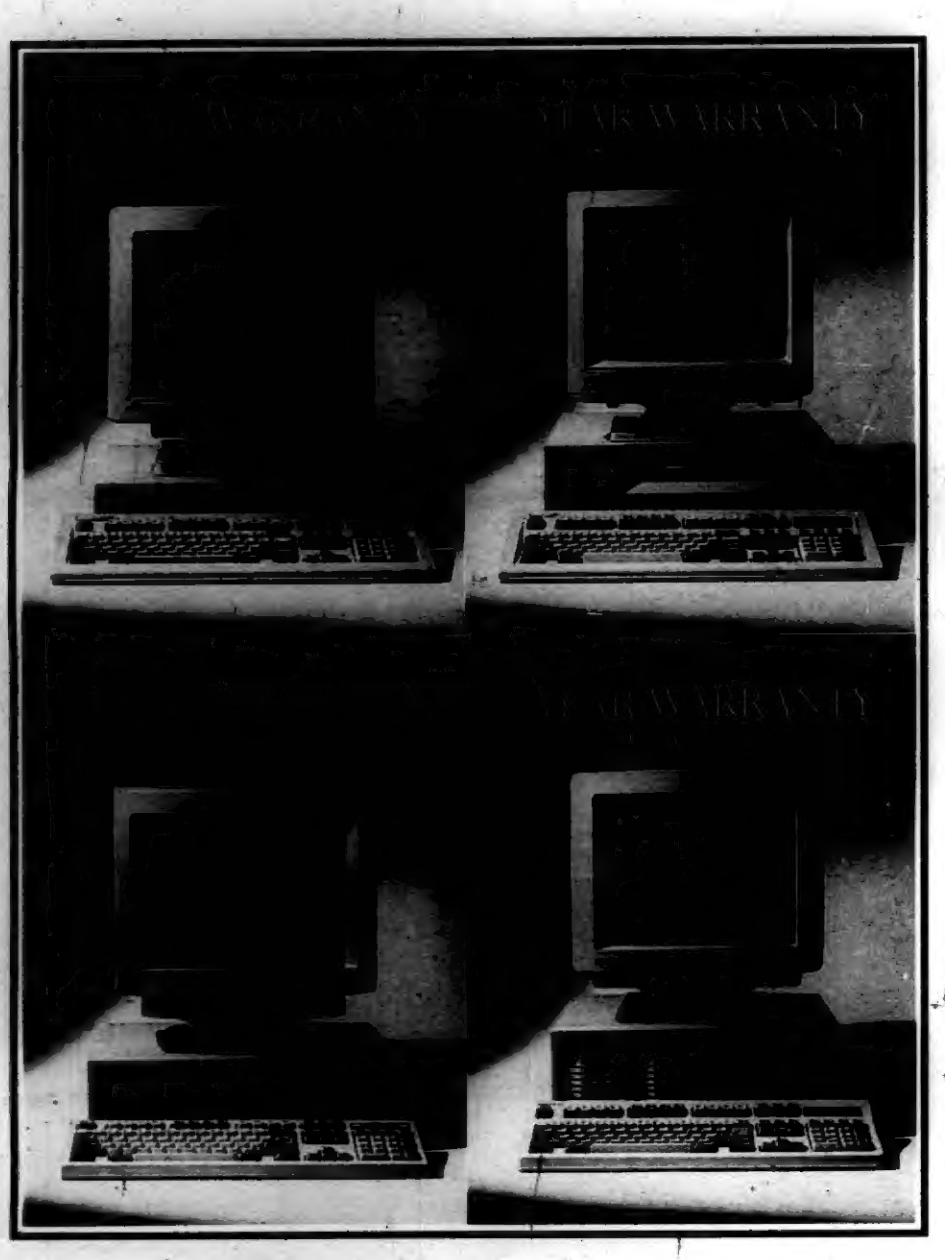

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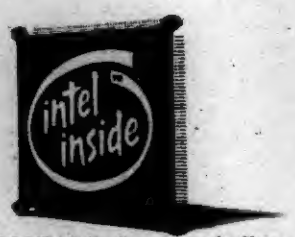

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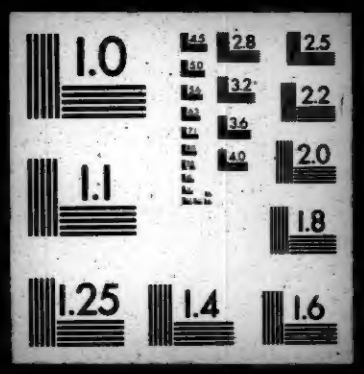
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